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# SOCIAL AND COGNITIVE INFLUENCES ON PRESCRIBING DECISIONS AMONG NON-MEDICAL PRESCRIBERS

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PhD 2017

# SOCIAL AND COGNITIVE INFLUENCES ON PRESCRIBING DECISIONS AMONG NON-MEDICAL PRESCRIBERS

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# Abstract

Non-medical prescribers make an increasing contribution to healthcare across the UK yet little is known about influences on their prescribing decision-making. The aim of this programme of research was to explore and describe prescribing decision-making by non-medical prescribers. A two stage programme of research was carried out.

Stage 1 was a systematic review of the social and cognitive influences on prescribing decision-making by non-medical prescribers. Despite a paucity of research, various influences on prescribing decision-making were reported including evidence based guidelines, peer support and patient (or parental) relationships and expectations. While confidence and clinical experience as a practitioner were cited as influences, the lack of prescribing experience and aspects of pharmacological knowledge also impacted on prescribing decision-making, resulting in a cautious approach.

Stage 2 of the research employed a phenomenological methodology underpinned by the Theoretical Domains Framework of behavioural determinants (TDF). It comprised three phases. In Phase 1, semi-structured interviews with five nurse prescribers and eight pharmacist prescribers in NHS Grampian explored their experiences and perceptions of influences on their prescribing decision-making, and the impact of these influences. Multiple and sometimes contradictory influences were uncovered. Twelve of the fourteen domains of the TDF were found to be influential along with multi-disciplinary working and experience; optimism and reinforcement did not feature.

In Phase 2, these participants recorded reflections on prescribing decisions which they considered noteworthy in relation to their practice, and in Phase 3 participants were interviewed about their reflections. Complexity was a feature of many, in the patients' clinical or social circumstances or in relation to wider concerns. The same 12 domains were found to be influential as were multi-disciplinary working, experience and complexity.
This programme of research has produced original findings which it is hoped will impact on the education, training and practice of these increasingly important prescribers.

Key words: non-medical prescribers; prescribing decision-making; influences; systematic review; Theoretical Domains Framework; interviews.

# Acknowledgements

I have been helped and supported by many people over the last years.

First, I am very grateful to my supervisors, Dr Scott Cunningham, Professor Derek Stewart, Dr Katrina Forbes-McKay and Dr Dorothy McCaig for their wisdom and guidance, their encouragement and also their sense of fun. Supervisory meetings are always lively and although I will continue to work with Scott and Derek I shall miss the time we have all spent together working on my PhD.

Scott has been an invaluable support during my PhD and more broadly as my line manager. He is very experienced, has a keen sense of perspective and is determined always to look on the bright side. "Being positive…" are his watch words, and excellent advice.

Derek has been at my side (and sometimes a voice in my ear) throughout my postgraduate studies. He was my MSc supervisor and we have worked together on several undergraduate projects related to prescribing and other areas of pharmacy practice. His expertise shines through.

Katrina's role in helping us particularly with the psychology elements of my research has been very much appreciated by us all. She has brought a new perspective and helped us to see through a different "lens". Dorothy, now retired, has shared her many years of experience and provided insightful advice and a very welcome listening ear.

My colleagues have been very supportive. I'm especially grateful to Toni Latimer-Simpson and Ed Watson, our e Learning Advisors for help with all things "e" and Colin MacLean our Research Support Librarian for his help with my systematic review and my references.

Without my participants there would be no thesis. They were welcoming, generous with their time and honest and I feel hugely privileged to have gained an insight into the work they do. I am so impressed by their dedication to their patients and hope that I have done them justice.

Next to my friends, who have encouraged me throughout and have seen me through some difficult times as well as very happy ones. Maggie, Linda, Vickie, Pauline, Clare and Margaret, thank you all for your great friendship and all the tea and biscuits. Special thanks to Vickie, Clare and Margaret and to my daughter Aspen for their help with preparing my thesis.

My children Peter, Aspen and Gavin were early teenagers when I started with RGU. They have grown into fine adults and I'm proud of them all and grateful for their love and encouragement always.

Neither of my parents is with us. My father George Lumsden was a GP and died two weeks before I graduated with my BSc (Honours) Pharmacy; my mother Margaret was a teacher and musician and died earlier this year. I think they would have been pleased and proud of me.

I dedicate this thesis to my friends, my children and my parents.

# Outputs

McINTOSH, T., CUNNINGHAM, S., STEWART, D., FORBES-McKAY, K., McCAIG, D., 2013. *Protocol. A systematic review of the social and cognitive influences on prescribing decision-making among non-medical prescribers.* York, UK: PROSPERO.

McINTOSH, T., CUNNINGHAM, S., STEWART, D., FORBES-McKAY, K., McCAIG, D., 2014. A systematic review of the social and cognitive influences on prescribing decision-making among non-medical prescribers. *International Journal of Pharmacy Practice,* 22(S1), pp. 45-46.

Poster with two minute presentation at Health Services Research and Pharmacy Practice conference 2014 in Aberdeen.

Won Best Poster prize and attendance at Health Services Research and Pharmacy Practice conference 2015.

McINTOSH, T., STEWART, D., FORBES-McKAY, K., McCAIG, D. AND CUNNINGHAM, S., 2016. Influences on prescribing decision-making among non-medical prescribers in the United Kingdom: systematic review. *Family Practice,* 33(6), pp. 572-579.

McINTOSH, T., CUNNINGHAM, S., STEWART, D., FORBES-McKAY, K. AND McCAIG, D., 2017. Influences on prescribing decisions by non-medical prescribers: a qualitative study. *International Journal of Pharmacy Practice,* 25(S1), pp. 35-36. Presented at the Health Services Research and Pharmacy Practice conference, Nottingham 2017.

Keynote address at the NHS Grampian/ Robert Gordon University Non-medical Prescribing Conference, Aberdeen 2017.

# Foreword

This foreword describes a programme of research exploring prescribing decision-making by non-medical prescribers. It also records my progress towards and during my PhD study.

Before coming to the (then) School of Pharmacy I was a stay at home mum to my three children and did the occasional locum. Times and circumstances change and I took up a position as lecturer in pharmacy practice in 2006, part time at first while I carried on doing locums, then full time. I felt I had found my niche and know I'm very fortunate to be doing a job I love.

Almost as soon as I joined the School I started on the MSc Prescribing Sciences course. One module has stayed in my mind: *Medicines, prescribers and people*, with the topic *Non-clinical factors influencing prescribing behaviour.* My interest in prescribing started then and continues. My MSc project was *An exploration of the views and attitudes of Robert Gordon University pre-registration trainee pharmacists towards a possible future role as pharmacist prescribers*, again evidencing my interest in prescribing. At the beginning of my studies I set up electronic alerts with relevant organisations and with the British Library and I pass this valuable suggestion on to my students.

I achieved Distinction in my MSc Prescribing Science and also in my postgraduate Certificate in Higher Education, Learning and Teaching, and was encouraged to consider PhD studies. In 2012 as part of preparation and assessment of my suitability I carried out *Non-clinical factors influencing prescribing decisions: a scoping review of the literature.* Almost all of the literature I retrieved and reviewed focused on doctors' prescribing, demonstrating a gap in the literature on non-medical prescribing and indicating an area for my PhD.

I was very fortunate to be allocated experienced supervisors for my PhD with whom I have worked closely. My Principal Supervisor (and Teaching Group Leader) is Dr Scott Cunningham; he and Professor Derek Stewart are both pharmacists and colleagues. They have researched and published in the area of pharmacist prescribing since its inception as has Dr Dorothy McCaig, a pharmacologist and former colleague now retired. Dr Katrina Forbes-McKay is a

psychologist from the School of Applied Social Studies with a special interest in the application of social and cognitive theories to clinical decision-making.

For the last several years I have taught on the School's Pharmacist Independent Prescribing course and on the School of Nursing and Midwifery's Non-medical Prescribing and Community Practitioner Nurse Prescriber courses. I am now School Lead for pharmacist and non-medical prescribing and a member of NHS Education for Scotland's Pharmacist Prescribing Advisory Group.

My teaching on the Non-medical Prescribing and Community Practitioner Nurse Prescriber courses has given me a very good understanding of the different roles, scope of prescribing and formularies of non-medical prescribers and Community Practitioner Nurse Prescribers. Given these differences and through discussion with my supervisors it was decided to exclude Community Practitioner Nurse Prescribers from my study. For the same reason Optometrist Independent Prescribers were also excluded.

As I come to the end of my PhD studies I am sure my involvement with non-medical prescribing research will continue and possibly expand in new directions. In March this year I was asked to speak at the West African Postgraduate College of Pharmacists' Scientific Symposium on *Pharmacist prescribing: lessons from the Scottish experience* and on my PhD research. My trip to Monrovia, Liberia was one of the highlights of my career. Pharmacists in the WAPCP are determined to do as much as they can to improve healthcare in their region in sometimes very difficult circumstances, and see pharmacist prescribing as one way to do this. I met many dedicated pharmacists, have helped a little already and hope to do more. Who knows?

# Abbreviations

| Abbreviation | Title |
|---|---|
| A&E | Accident and emergency |
| ACE inhibitors | Angiotensin converting enzyme inhibitors |
| ACP | Anticipatory care planning |
| AF | Atrial fibrillation |
| AHP | Allied health professional |
| BNF | British National Formulary |
| BP | Blood pressure |
| CABG | Coronary artery bypass graft |
| CASP | Critical Appraisal Skills Programme |
| CINAHL | Cumulative Index to Nursing and Allied Health Literature |
| CKD | Chronic kidney disease |
| CMP | Clinical management plan |
| COPD | Chronic obstructive pulmonary disease |
| CPD | Continuous professional development |
| CRD | Centre for Reviews and Dissemination |
| DMcC | Dorothy McCaig |
| DS | Derek Stewart |
| ECG | Electrocardiogram |
| EFNP | Extended Formulary Nurse Prescribers |
| eGFR | Estimated glomerular filtration rate |
| ERIC | Education Resources Information Centre |
| GI | Gastrointestinal |
| GP | General practitioner |
| GPhC | General Pharmaceutical Council |
| HCPC | Health and Care Professions Council |
| IHD | Ischaemic heart disease |
| IM | Intramuscular |
| INR | International normalised ratio |
| IP | Independent prescribing |
| IPA | International Pharmaceutical Abstracts |
| IT | Information technology |
| IV | Intravenous |
| KFM | Katrina Forbes-McKay |
| LFTs | Liver function tests |

| | |
|---|---|
| MDI | Metered dose inhaler |
| MeSH | Medical subject headings |
| MSc | Master of Science |
| NHS | National Health Service |
| NICE | National Institute for Health and Care Excellence |
| NMC | Nursing and Midwifery Council |
| NMP | Non-medical prescriber |
| NMPs | Non-medical prescribers |
| NOAC | New oral anticoagulant |
| NP | Nurse prescriber |
| NYHA | New York Heart Association |
| PCT | Primary care trust |
| PEG | Percutaneous endoscopic gastrostomy |
| PLP | Period of learning in practice |
| PMR | Patient medical record |
| PND | Paroxysmal nocturnal dyspnoea |
| PP | Pharmacist prescriber |
| PPIs | Proton pump inhibitors |
| PSA | Prescribing Safety Assessment |
| QOF | Quality outcomes framework |
| RGU | Robert Gordon University |
| RTI | Respiratory tract infection |
| SC | Scott Cunningham |
| SIGN | Scottish Intercollegiate Guidelines Network |
| SP | Supplementary prescribing |
| TDF | Theoretical Domains Framework |
| TM | Trudi McIntosh |
| U and Es | Urea and electrolytes |
| UKCPA | United Kingdom Clinical Pharmacy Association |

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# Chapter 1 Introduction

In this first chapter of the thesis an overview of prescribing will be given: the background including models of non-medical prescribing (NMP) in the United Kingdom (UK), the policy context, education and training of non-medical prescribers (NMPs) and what is known about their practice including the contribution made to patient care. A review of the literature will describe influences on prescribing decision-making including the current research base on those influences on NMPs' prescribing decision-making. The complexities of prescribing will also be explored. The programme of research will then be laid out.

## 1.1 Introduction

Prescribing is one of the principal interventions related to patient care made by those with the legal right to prescribe; in 2010 the British Pharmacological Society asserted that it was:

> "the main approach to the treatment and prevention of disease in modern healthcare."
> (British Pharmacological Society 2010)

Prescribing authority remained the preserve of doctors, and latterly of dentists and vets, for centuries. More recently other suitably trained non-medical healthcare professionals have been granted prescribing rights as NMPs (Crown 1999, Department of Health 2005, Health and Care Professions Council 2017a).

Prescribing is complex. Patient safety and wellbeing are vital concerns but prescribing also impacts more widely on resource availability within health and social care, the economy and on important current and future public health issues such as antimicrobial stewardship (Department of Health 2016). It is important that prescribing decision-making is understood so that it may be optimised; this thesis describes a programme of research exploring influences on NMPs' prescribing decision-making.

## 1.2 Prescribing

### 1.2.1 Overview of prescribing

Various definitions of what constitutes "good prescribing" have been proposed. In 1973 Parish defined "good" prescribing as that which is appropriate, safe, effective and economic (Parish 1973). This definition stood until the early 1990s when as part of a doctoral thesis Bradley published a study on uncomfortable prescribing decisions among GPs in England (Bradley 1992a). He showed that their prescribing decisions were based on a variety of clinical and non-clinical factors including patient expectations, the doctor-patient relationship and the doctor's previous behaviour. GPs' discomfort around some of these decisions was again multifactorial.

In view of changes to medical practice since the 1970s and Bradley's seminal work, Barber (1995) proposed what he considered should be the aims of a prescriber: to maximise effectiveness, minimise risks, to minimise costs and to respect the patient's choices. Barber recognised that some of these aims might be in conflict and encouraged resolution of such conflict. Building on this, Cribb and Barber (1997) described prescribing as having three aspects:

- prescribing as a discrete clinical act
- prescribing as a health professional process
- prescribing as a policy process

They defined appropriate prescribing as a balance between the right technical properties, what the patient wants done and the greater good. The right technical properties include diagnosis, drug selection and regimen, monitoring and review with further adjustment of diagnosis and/ or treatment as required. The process is complex and challenging, but should be informed by good quality evidence, rather than being empirical (National Prescribing Centre 2012).

Since the 1990s there has been increasing emphasis on the importance of evidence-based practice, defined by Sacket (1996) as:

> "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of EBM [evidence-based medicine] means integrating individual clinical expertise with the best available external clinical evidence from systematic research."

Evidence-based practice has been supported by the establishment of organisations such as the National Institute for Health and Care Excellence (NICE) (National Institute for Health and Care Excellence 2017a) and the Scottish Intercollegiate Guidelines Network (SIGN) (Scottish Intercollegiate Guidelines Network 2017) which develop and publish evidence-based guidelines on a wide range of health-related conditions. Single condition organisations with a more specific focus contribute to the development of these and other guidelines.

In parallel with increasing emphasis on evidence-based practice came a growing recognition of the importance of addressing the patient's ideas, concerns and expectations about their condition/s and treatment (MacFarlane *et al*. 1997, Barry *et al*. 2000). The previous paternalistic role of the medical prescriber was changing (O'Flynn and Britten 2006) with recognition that it was not sufficient to instruct the patient on how to take their medicine and expect them always to do so. In 2009 the National Institute for Health and Care Excellence (NICE) published its guideline on adherence (National Institute for Health and Care Excellence 2009) highlighting the importance of involving the patient in discussions about their care with the aim of reaching a concordant agreement on treatment. It was hoped that the patient would then follow/ adhere to the agreed treatment plan leading to better outcomes. Patient representatives are now directly involved in guideline development (Scottish Intercollegiate Guidelines Network 2008).

Notwithstanding the existence and use of evidence based guidelines to support prescribing, it is not a straightforward task. Prescribing is complex, requiring information gathering, decisions on appropriate treatment, monitoring and review all informed by evidence-based guidelines and clear communication. With an ageing population and attendant multi-morbidity, increasing numbers of patients are experiencing polypharmacy, commonly defined as taking five or more medicines (Scottish Government Model of Care Polypharmacy Working

Group 2015). This may be entirely appropriate (Payne *et al*. 2014) or may be potentially inappropriate (Cullinan *et al*. 2014) but in either case polypharmacy is likely to increase the risk of medicines misadventure (Scottish Government Model of Care Polypharmacy Working Group 2015). Part of prescribing for a patient experiencing polypharmacy or indeed any patient, particularly as he or she nears the end of life, may be de-prescribing (Jansen *et al*. 2016) to reduce this risk (Scottish Government Model of Care Polypharmacy Working Group 2015).

Prescribing requires the judicious application of a range of appropriate knowledge, skills and attitudes and a person-centred approach is essential (Royal College of General Practitioners 2014, Calderwood 2016). In 2010 the British Pharmacological Society outlined what is required in its publication *10 Principles of Good Prescribing* (see Table 1.1) (British Pharmacological Society 2010).

Table 1.1 The British Pharmacological Society's 10 Principles of Good Prescribing

| **10 Principles of Good Prescribing** |
|---|
| 1. Be clear about the reasons for prescribing. |
| 2. Take into account the patient's medication history before prescribing. |
| 3. Take into account other factors that might alter the benefits and risks of treatment. |
| 4. Take into account the patient's ideas, concerns and expectations. |
| 5. Select effective, safe, and cost-effective medicines individualised for the patient. |
| 6. Adhere to national guidelines and local formularies where appropriate. |
| 7. Write unambiguous legal prescriptions using the correct documentation. |
| 8. Monitor the beneficial and adverse effects of medicines. |
| 9. Communicate and document prescribing decisions and the reasons for them. |
| 10. Prescribe within the limits of your knowledge, skills and experience. |

### 1.2.2. Non-technical skills approach to prescribing

The British Pharmacological Society provides descriptions of the behaviours which contribute to achievement of each of the 10 principles; underpinning many of these are "non-technical skills". These are defined as:

> "a combination of cognitive, social and personal resource skills which compliment knowledge and technical skills, and contribute to safe and effective performance."
> (Dearden *et al*. 2015)

Prescribing is not without risk; if errors are made the consequences for the patient and the prescriber may be serious. Concerning levels of prescribing errors by doctors and particularly by junior doctors have been identified in both primary (Avery *et al*. 2012) and secondary care (Dornan *et al*. 2009, Ross *et al*. 2009). Definitions and reasons for prescribing errors vary but "error-producing conditions" in primary care (Slight *et al*. 2013 p.e713) and "complexity" in secondary care (Pownall 2009 p.1334) have been identified as contributing. In response to these error rates and particularly to some of the reasons ascribed, a nontechnical skills approach to prescribing has been suggested (Ross, Patey and Flin 2013).

Research into NMPs' prescribing error rates is limited. A national early evaluation of nurse and pharmacist independent prescribing in England found that prescribing by NMPs was clinically appropriate in most cases (Latter *et al*. 2012). The addition of a Diabetes Specialist Nurse prescriber reduced error rates for in-patients with diabetes in one hospital trust (Carey *et al*. 2008) and in another, pharmacists' prescribing error rates were found to be 0.3% (Baqir *et al*. 2015). This compares very favourably with doctors' prescribing error rates of around 5% in general practice (Avery *et al*. 2012) and an overall error rate of 8.9% in secondary care (Dornan *et al*. 2009). That said, although the scopes of practice of medical and non-medical prescribers may be different, "error producing conditions" and "complexity" are likely to impact on all.

A systematic review of studies analysing prescribing behaviours and errors by junior doctors identified several relevant behavioural elements, as shown in

Table 1.2 below (Dearden *et al*. 2015). It may be that some or all of these are equally relevant for NMPs.

Table 1.2 Non-technical skills required by junior doctors to prescribe safely
Adapted from Dearden *et al*. 2015

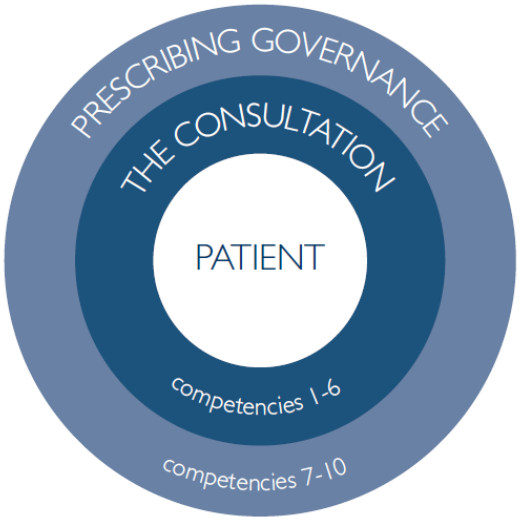
| Category | Element |
|---|---|
| Situational awareness | Awareness of own skills and limitations<br>Awareness of external and internal factors affecting performance<br>Gathering, interpreting and checking information<br>Projection to future states |
| Decision making | Defining the problem<br>Deciding whether to prescribe<br>Applying norms, guidelines and protocols<br>Sending information clearly and concisely<br>Actively receiving information |
| Communication and team working | Identifying and utilizing the skills of other team members<br>Speaking up |
| Task management | Being prepared and utilizing resources<br>Prioritizing tasks and patients<br>Maintaining standards |

### 1.2.3 Prescribing competences for all prescribers

In 2012 the then National Prescribing Centre developed core competences for all prescribers (National Prescribing Centre 2012). These were reviewed in 2016 by representatives of all professions with prescribing authority resulting in a new *Competency Framework for all Prescribers* (Royal Pharmaceutical Society 2016). At present the Nursing and Midwifery Council (NMC) have their own *Standards of proficiency for nurse and midwife prescribers* (Nursing and Midwifery Council 2006) but in May 2017 they agreed to consult on adopting the Competency Framework for all Prescribers as their standards for proficiency for nurse and

midwife prescribers (Nursing and Midwifery Council 2017a). The Health and Care Professions Council (2013) also have their own Standards for Prescribing.

The competencies in the Competency Framework for all Prescribers (Figure 1.1) centre on the patient and are considered under two headings: the consultation and prescribing governance (Royal Pharmaceutical Society 2016).




**THE CONSULTATION**

1. Assess the patient
2. Consider the options
3. Reach a shared decision
4. Prescribe
5. Provide information
6. Monitor and review

**PRESCRIBING GOVERNANCE**

7. Prescribe safely
8. Prescribe professionally
9. Improve prescribing practice
10. Prescribe as part of a team

Figure 1.1 The prescribing competency framework

(Royal Pharmaceutical Society 2016)

## 1.3 Non-medical prescribing

Until recent years, prescribing was the preserve of medical doctors and dentists but suitably qualified members of other healthcare professions may now train, register with a regulatory body and practise as prescribers. Non-medical prescribing has been developed to improve patient care, maintain patient safety, enhance access to medicines and to make best use of healthcare professionals' skills (Department of Health 2005, Department of Health 2006).

### 1.3.1 Background to non-medical prescribing

In 1986 the Cumberledge report *Neighbourhood nursing: a focus for care* recommended that district nurses and health visitors should be given prescribing rights for a limited range of medicines and appliances (Cumberledge 1986). Following this the Crown report (1989) recommended that:

> "Suitably qualified nurses working in the community should be able, in clearly defined circumstances, to prescribe from a limited list of items and to adjust the timing and dosage of medicines within a set protocol." (Crown 1989)

In 1992 legislation was enacted which allowed nurses to prescribe a limited range of drugs in specified circumstances (*Medicinal Products: Prescription by Nurses, etc. Act 1992*) and by 1994 certain suitably qualified district nurses and health visitors (community nurse practitioners) were able to prescribe for their patients from the Nurse Prescribers' Formulary (British Medical Association and the Royal Pharmaceutical Society 2015). The success of this initiative led to a second Crown report in 1999 (Crown 1999) which recommended that additional suitably qualified healthcare professionals should be given prescribing authority. Nurse prescribing developed via two routes: extended formulary nurse prescribing which continued until 2006 (Department of Health 2001, Courtenay and Griffiths 2010) and dependent, later called supplementary prescribing which was also made available to pharmacists (Department of Health 2002) and subsequently over time to various allied health professions i.e. physiotherapists, podiatrists/ chiropodists, diagnostic and therapeutic radiographers and most recently to dietitians (Health and Care Professions Council 2017a). As highlighted in the Foreword to this thesis, prescribing by community practitioner nurse prescribers is out with the scope of this research and will not be considered further.

### 1.3.2 Definitions and scope of non-medical prescribing

Supplementary prescribing is defined as:

> "A voluntary prescribing partnership between an independent prescriber and a supplementary prescriber (nurse or pharmacist) to implement an agreed patient-specific clinical management plan (CMP) with the patient's agreement. The independent prescriber must be a doctor (or dentist)." (Department of Health 2005)

There are no restrictions on the conditions or medicines which may be included in the CMP provided they are within the self-assessed competence of the NMP. The condition/s must have been previously diagnosed by a doctor.

Following successful implementation of supplementary prescribing independent prescribing was enabled in 2006. Again this must be within the independent prescriber's self-assessed competence. Independent prescribing is defined as:

> "Prescribing by a practitioner responsible and accountable for the assessment of patients with undiagnosed or diagnosed conditions and for decisions about the clinical management required, including prescribing." (Department of Health 2006)

In 2009 nurse and pharmacist independent prescribers were permitted to prescribe un-licensed and off-license drugs while other NMPs could prescribe unlicensed drugs in accordance with a clinical management plan (Medicines and Healthcare products Regulatory Agency 2009). Finally in 2012 nurse and pharmacist independent prescribers were able to prescribe all drugs controlled under Schedules 2 – 5 of the Misuse of Drugs Act with the exception of diamorphine, dipipanone and cocaine for the treatment of addiction (Department of Health 2012). Nurse and pharmacist independent prescribers now have the same prescribing rights as the vast majority of doctors.

Nonmedical prescribing has developed according to different models across the world, reflecting very different healthcare systems; NMP in the UK is among the most permissive with NMPs here having one of the widest scopes of practice

(Tonna, Stewart and McCaig 2008, Kroezen *et al*. 2011, Bhanbhro *et al*. 2011, Kroezen *et al*. 2012, Kroezen *et al*. 2013, Maier and Aiken 2016). Table 1.3 gives details of the scope of supplementary and independent non-medical prescribing at April 2017.

Optometrist independent prescribers may only prescribe within their competence for conditions affecting the eye (General Optical Council 2017). Their education, training and scope of practice are very different from those of other non-medical prescribers and for that reason they were not included in this programme of research. They are included in Table 1.3 below for completeness.

Table 1.3 Details of supplementary and independent prescribing authorities and requirements
Adapted from Stewart, MacLure and George 2012

| | **Supplementary prescribing (SP)** | **Independent prescribing (IP)** |
|---|---|---|
| Eligible health professionals | Nurses, pharmacists, physiotherapists, podiatrists, diagnostic and therapeutic radiographers, and dieticians | Nurses, optometrists, pharmacists, physiotherapists, podiatrists, therapeutic radiographers |
| Clinical conditions managed | Any, within their clinical competence | Any, within their clinical competence |
| Diagnostic responsibility | A doctor (or dentist) must diagnose the condition before prescribing may commence | Independent prescriber may assess and manage patients with diagnosed or undiagnosed conditions |
| Need for clinical management plan (CMP) | A written or electronic patient-specific CMP must be in place before prescribing may commence | No need for a CMP |
| Need for formal agreement | The CMP must be agreed between IP, SP and patient before prescribing may commence | No need for any formal agreement |
| Medicines prescribed | Any medicine within their clinical competence | Any medicine within their clinical competence |

### 1.3.3 Policy context for non-medical prescribing

This programme of research was carried out in Scotland and the policy context will be considered in relation to Scotland. As part of devolution arrangements, health is devolved to the Scottish Parliament and is the responsibility of the Scottish Government Health and Social Care Directorate. Primary legislation supporting non-medical prescribing is however not devolved; any amendments to legislation such as the Medicines Act must be implemented separately by the Scottish Government. Delivery of healthcare in Scotland is the responsibility of NHS Scotland (Scottish Government 2014); the health of the Scottish population has historically been poor although it is improving (Calderwood 2016, Scottish Government 2016).

*The Right Medicine*, a strategy for pharmaceutical care in Scotland highlighted the key role pharmacists could play in working with others to improve health and increase access to better quality services for people in Scotland (Scottish Executive 2002). In 2006 *Non-medical prescribing in Scotland* provided strategic guidance for nurse and midwife independent prescribers (Scottish Government 2006); this was built on and developed in *A Safe Prescription. Developing nurse, midwife and allied health profession (NMAHP) prescribing in NHS Scotland* (Scottish Government 2009). In 2011 the Scottish Government published its *2020 Vision* for achieving sustainable quality in the delivery of healthcare services across Scotland (Scottish Government 2011). Prescribing by suitably qualified healthcare professionals in Scotland has helped to meet the aims of these government documents and has been adopted proportionately more by pharmacists in Scotland than England and Wales (personal communication, GPhC, 2017).

In 2013 *Prescription for Excellence: a vision and action plan for the right pharmaceutical care through integrated partnerships and innovation* was published. The vision articulated was that:

> "…all pharmacists providing NHS pharmaceutical care will be NHS accredited clinical pharmacist independent prescribers working in collaborative partnerships with medical practitioners who will continue to have overall responsibility for diagnosis."

(Scottish Government 2013 p.4)

*Prescription for Excellence* has stimulated increased interest in pharmacist prescribing and demand for training courses; there has been a commensurate increase in funding for these courses by NHS Education for Scotland (personal communication F. Reid, NHS Education for Scotland). In 2016 there were 1096 pharmacist prescribers on the NHS Scotland database of whom 48.8% were actively prescribing (NHS Education for Scotland 2017a). Prescribing by nurses in Scotland continues to grow and aligns to the advanced practice agenda (Department of Health 2010).

Despite government support for NMP some healthcare professionals train and qualify as NMPs but do not then go on to practise. A lack of a clear role for prescribing and a lack of organisational support have been identified as reasons (McIntosh *et al*. 2015). A recent 'Return to prescribing' course offered for non-prescribing pharmacist prescribers was cancelled due to lack of interest (personal communication F. Reid, NHS Education for Scotland).

In 2016 the Chief Medical Officer for Scotland published *Realistic Medicine* (Calderwood 2016) challenging doctors and by extension all healthcare professionals in Scotland to:

- build a personalised approach to care
- change their style to shared decision-making
- reduce unnecessary variation in practice and outcomes
- reduce harm and waste
- manage risk better
- become improvers and innovators

### 1.3.4 Education and training for nurse, pharmacist and AHP supplementary and independent prescribers

At present nurses and AHPs wishing to train and practise as supplementary and independent prescribers must have been registered with either the NMC or the

Health and Care Professions Council for three years; nurses must have spent the previous year in an appropriate clinical area (Nursing and Midwifery Council 2006, Health and Care Professions Council 2017b). The NMC has proposed that some theories relating to prescribing should be incorporated into the undergraduate nursing course to allow nurses to access prescribing training more quickly after registration (Nursing and Midwifery Council 2017a). Pharmacists must have been registered with the General Pharmaceutical Council for at least two years before starting prescribing training (General Pharmaceutical Council 2017a). All applicants must have the support of their employing organisation and have identified a suitable area for prescribing on qualification.

Applicants must undertake an accredited university-based education and training programme. The pharmacist prescribing training is at Master's level and requires

- 200 hours university-based education, delivered by a combination of face to face and distance learning
  and
- 12 days period of learning in practice (PLP) supervised by a designated medical practitioner with suitable practice, education and training experience

Non-pharmacist non-medical prescribing students' training is at degree or Master's level and requires

- 26 days of content with a minimum of 8 face to face days and 10 days protected learning time
  and
- 12 days period of learning in practice supervised by a designated medical practitioner with suitable practice, education and training experience.

The university-based education is generic as is the qualification gained; students develop and refine their knowledge and skills in their proposed area of prescribing during the PLP. Assessment is by a combination of university and practice-based assessment (Nursing and Midwifery Council 2006, Stewart, MacLure and George 2012, General Pharmaceutical Council 2017b, Health and Care Professions Council 2017b). Successful students become eligible for annotation on the relevant Register as supplementary or independent prescribers

and must ensure that they practise and prescribe within their self-assessed competence (Nursing and Midwifery Council 2006, General Pharmaceutical Council 2017b, Health and Care Professions Council 2017b).

### 1.3.5 Diagnosis by independent non-medical prescribers

The inclusion of previously un-diagnosed conditions in the remit of independent non-medical prescribers was contentious, particularly among some doctors (Day 2005) but "clinical management including prescribing" (Department of Health 2006 p.2) does not mean that the independent non-medical prescriber must treat any new condition diagnosed. If the prescriber feels that the condition is out with their competence then "clinical management" will involve referral to another suitably qualified healthcare professional, very often to a doctor. Pharmacist supplementary prescribers' lack of diagnostic ability was identified as a concern for doctors (Stewart *et al*. 2009a), for pharmacist supplementary prescribers themselves and for their mentors (Lloyd, Parsons and Hughes 2010). The need for appropriate consultation and clinical assessment skills have been addressed by the GPhC, NMC and HCPC in their requirements for prescribing training (Nursing and Midwifery Council 2006, General Pharmaceutical Council 2017b, Health and Care Professions Council 2017b).

## 1.4 Literature review of research into non-medical prescribing

Little published research has been identified on NMP other than by nurses and pharmacists. Physiotherapists have had prescribing rights since 2005 yet a systematic review of the literature on extended roles for physiotherapists, occupational therapists and speech pathologists made no mention of prescribing (Saxon, Gray and Oprescu 2014). Much of the research into NMP is descriptive using self-reporting, qualitative methods although there have been some larger scale questionnaire-based studies.

Research into NMP has focused largely on:

- NMPs' views of their prescribing-related education and training
- Implementation and practice of NMP

- Views of patients and the public on NMP
- Views of doctors on NMP
- Clinical outcomes from NMP

Influences on NMPs' prescribing decision-making will be considered along with those on medical prescribers' prescribing decisions making later in this chapter.

### 1.4.1 Non-medical prescribers' views of their prescribing-related education and training

Research into nurse prescribers' perceptions of their prescribing-related education and training has identified a range of views. An early nationwide study in England found that educational programmes for both nurse and pharmacist independent prescribers were fit for purpose (Latter *et al*. 2010). An evaluation of the expansion of nurse prescribing in Scotland similarly found the educational programmes for nurse prescribers suitable, and described the underpinning knowledge of pharmacology in the course as a strength (Watterson, Turner, *et al*. 2009). On the other hand nurse prescribers have expressed concern about a perceived lack of pharmacology in their prescribing course (Creedon *et al*. 2009, Scrafton, McKinnon and Kane 2012).

Concern had already been expressed about a lack of pharmacology and therapeutics in medical education for prescribing; this led to recommendations for prescribing practice for all prescribers from the British Pharmacological Society in *Education for new prescribers* (Leathard *et al*. 2007) and from the Royal College of Physicians in *N=1. Why people matter in medicine* (Royal College of Physicians 2011).

Continuing professional development (CPD) is a requirement for all healthcare professionals and must be appropriate to support individuals' practice. Nurse prescribers have identified a lack of CPD opportunities as an issue impacting on their confidence and their practice (Courtenay and Carey 2008, Courtenay and Gordon 2009, Scrafton, McKinnon and Kane 2012, Coull *et al*. 2013, Creedon *et al*. 2015, Nimmo, Paterson and Irvin 2017). Weglicki and colleagues (2015)

found high levels of anxiety among primary and secondary care nurse prescribers interviewed about their CPD needs. Revalidation was introduced by the NMC in 2015; prescribers are likely to require specific evidence of CPD relevant to their roles and this may help to address perceived gaps in their CPD (Nursing and Midwifery Council 2017b).

Pharmacists prescribers found their education and training useful and appropriate (Cooper *et al*. 2008) with clinical assessment skills (Cooper *et al*. 2008, Tann *et al*. 2010), communications skills training (Cleland et al. 2007, Cooper *et al*. 2008) and the period of learning in practice (Tann *et al*. 2010) particularly valued. CPD needs have been identified primarily to allow pharmacist prescribers to extend their scope of practice (Winstanley 2010); pharmacist prescribers in the north east of England felt a lack of CPD opportunities limited their prescribing for chronic pain (Adigwe *et al*. 2013). All non-medical prescribers employed by NHS Scotland must engage with the Knowledge and Skills Framework (NHS Scotland 2017); this process will help with identifying learning needs and opportunities for CPD.

### 1.4.2 Implementation and practice of non-medical prescribing

Nurse and pharmacist non-medical prescribing has been widely implemented and accepted in all settings across the UK, as shown in Table 1.4 below (personal communications, Nursing and Midwifery Council, General Pharmaceutical Council, Pharmaceutical Society of Northern Ireland and Health and Care Professions Council, 2017).

Table 1.4 Non-medical prescribers in the UK by profession

| | Nurse | Pharmacist | Chiropodist/ podiatrist | Physio-therapists | Radiographers |
|---|---|---|---|---|---|
| Total in UK | 36871 | 5077 | 522 | 1150 | 96 |

Most prescriptions are written in primary care where indeed most patient care occurs. Again no peer reviewed literature has been identified on prescribing by allied health professionals although there are case study reports. As an example

two physiotherapist supplementary prescribers have published a report on prescribing for adults with cystic fibrosis (Forster, Henry and Bell 2015).

Nurse independent prescribers (IPs) in one study in primary and secondary care described prescribing "as opportunity presents, for specific conditions and for individuals" (Bowskill, Timmons and James 2013, p.2077). There was some evidence in this study that nurse IPs in primary care had more autonomy over their prescribing decisions than those in secondary care (Bowskill, Timmons and James 2013).

NMPs have been found to be developing expertise in their roles, facilitated by integration of knowledge and skills with practice which allows contextualisation of both (Abuzour, Lewis and Tully 2017). Supportive colleagues and the use of evidence-based guidelines were also found to be helpful in development of expertise among NMPs (Abuzour, Lewis and Tully 2017). NMP was found to improve patient access to medicines thereby improving choice and convenience for patients (Bhanbhro *et al*. 2011, Coull *et al*. 2013, Carey, Stenner and Courtenay 2014, Tinelli *et al*. 2015, Crooks *et al*. 2016, Famiyeh and McCarthy 2016).

Facilitators to NMP implementation include supportive colleagues (Adigwe *et al*. 2013) and in secondary care, easy access to patient notes and laboratory testing facilities (Bourne, Baqir and Onatade 2016). Barriers include time constraints (Bourne, Baqir and Onatade 2016), a lack of organisational support (Coull *et al*. 2013, Bourne, Baqir and Onatade 2016), and a lack of underpinning organisational and professional strategies (Baqir, Clemerson and Smith 2010, Courtenay, Carey and Stenner 2011, Hinchliffe 2015, Coull *et al.* 2013, McIntosh *et al*. 2015). Where such strategies were in place NMP was implemented more successfully (Courtenay, Carey and Stenner 2011).

NMPs derive professional satisfaction from their role (Bradley, Hynam and Nolan 2007), enjoying the enhanced autonomy and opportunities to improve patient care (Stewart *et al*. 2009a, Coull *et al.* 2013, Carey, Stenner and Courtenay 2014, Stewart *et al*. 2017) but are very aware of the additional responsibility inherent in the role (Bradley, Hynam and Nolan 2007, Cousins and Donnell 2012, Maddox *et al*. 2016) and of the attendant additional stress (Cousins and Donnell 2012).

### 1.4.3 Views of patients and the public on NMP

Patient awareness of pharmacist prescribing was initially limited (Stewart *et al*. 2008a, McCann et al. 2012b) although it improved with time (Stewart *et al.* 2011) as pharmacist and NMP became more widespread. One or two studies identified general acceptance by patients but a preference for seeing a doctor rather than a pharmacist prescriber (Stewart *et al*. 2008b) particularly for initial diagnosis or if the illness was perceived as serious (McCann *et al*. 2012b). The importance of the multidisciplinary team in non-medical prescribing was emphasised by patients in one study (McCann *et al*. 2012); participants identified differing areas of expertise and hence responsibility, shared input and a holistic approach to patient care as benefits of the multi-disciplinary approach. Some patients expressed concern about a possible lack of resources in community pharmacies to support pharmacist prescribing in that setting (Hobson, Scott and Sutton 2010) and some members of the general public had concerns about a lack of privacy in community pharmacy settings (Stewart *et al.* 2009b). Other early research identified some doubts about nurse prescribers' qualification and training (Dhalivaal 2011, Banicek 2012).

Patients are now very accepting of NMP and patient satisfaction with NMP has been found to be high (Courtenay, Carey and Stenner 2009, Stewart *et al*. 2011, Coull *et al.* 2013, Tinelli *et al*. 2015). Patients being treated by NMPs for acute respiratory tract infections were very satisfied with almost 90% treated with "patient centred management strategies" (Courtenay *et al*. 2017, p.1). A Cochrane review (see later) identified comparable patient satisfaction levels for non-medical and medical prescribers (Weeks *et al.* 2016).

### 1.4.4 Views of doctors on NMP

Early research showed a lack of understanding of the NMP role by some doctors (Bradley and Nolan 2007, Cooper *et al*. 2012). Other GPs in early research were found to have retained control over prescribing by dictating the scope of prescribing by NMP colleagues (Blenkinsopp *et al*. 2008, Weiss and Sutton 2009, Cooper *et al*. 2012); arguably this is still the case (Weiss *et al.* 2016). None the less non-medical prescribing within multi-disciplinary teams is effective where the team is suitably structured and trust exists between team members (Lloyd,

Parsons and Hughes 2010, Bowskill, Timmons and James 2013, Weiss *et al.* 2016); this is particularly the case where doctors have acted as mentors to the NMPs (Lloyd, Parsons and Hughes 2010). There is however some debate as to whether NMP relieves pressure on doctors (Bradley and Nolan 2007, Lloyd, Parsons and Hughes 2010, Coull *et al.* 2013).

In a large-scale evaluation of nurse prescribing in Scotland patients, the public, nurse prescribers, physicians and other healthcare professionals were all very positive about the patient benefits of nurse prescribing, particularly for those in remote and rural areas where access to doctors can be limited (Coull *et al.* 2013). GPs and physicians in another, smaller Scottish study were found to have limited awareness of the scope of prescribing by heart failure specialist nurses but none the less viewed the service very positively, recognising the benefits to patient care of optimal professional working (Shannon and Spence 2011).

### 1.4.5 Clinical outcomes from non-medical prescribing

As non-medical prescribing has become more the norm in healthcare research has broadened to include patient and health service outcomes.

NMPs' prescribing practice has been found to be comparable in many ways to that of doctors. The performance of Scottish pharmacist prescribers in the Prescribing Safety Assessment (PSA), an on-line test of prescribing proficiency, was found to be similar to that of final year medical students (Reid *et al*. 2017). Latter and colleagues found that purposively selected nurse and pharmacist prescribers working across a range of settings in England made clinically appropriate prescribing decisions (Latter *et al*. 2012).

Antimicrobial resistance is of increasing concern to health services worldwide (World Health Organisation 2014) and a focus for prescribers in the UK (National Institute for Health and Care Excellence 2017b). There is evidence that despite variability, nurse prescribing of antibiotics in primary care in Scotland improved overall between 2007 - 2013 (Ness *et al*. 2015a). More recently NMPs across the UK were found to be providing patient-centred care for patients with respiratory tract infections which did not result in an antibiotic prescription in response to perceived patient expectation (Courtenay *et al*. 2017). A recent systematic review found strong similarities between nurses' and doctors' prescribing

regarding types of medicines prescribed and patient health outcomes (Gielen *et al*. 2014). Most notably, a Cochrane review found that non-medical prescribing delivered comparable results to that of medical prescribing for measures of systolic blood pressure, glycated haemoglobin, low-density lipoprotein, medication adherence, patient satisfaction, and health-related quality of life in acute and long term conditions, in primary and secondary care (Weeks *et al*. 2016).

This brief review of the literature demonstrates that nurse and pharmacist prescribers are embedded into practice where they are making a strong contribution to patient care. The overarching aim of this programme of research is to explore influences on their prescribing; it will be useful next to outline what is already known about influences on prescribing decisions albeit that most of the literature focuses on medical prescribing.

## 1.5 Literature review: influences on prescribing decision-making

Prescribing is a complex process informed by the patient's clinical condition, by social and cognitive influences related to both prescriber and patient and by the interaction between these dyads. The first formal research into prescribing in the UK appears to have been completed in 1949, when medical academics at the University of Edinburgh reviewed 17,301 prescriptions written by GPs in England and commented in broad terms on the prescribing of certain drugs and formulations (Dunlop 1952). Since this time much of the research has been carried out in primary care, where indeed most prescribing occurs. Research has continued, much of it in the 1990s and early 2000s and among medical prescribers, driven by Bradley's seminal work on influences on GPs' prescribing decision-making (Bradley 1992a, Bradley 1992c). This review of the literature will consider what is known about social and cognitive influences on doctors' and NMPs' prescribing decision-making and identify the research methods used.

### 1.5.1 Prescriber-patient relationship

Doctors' relationships with their patients have been found to be paramount and frequently influence their prescribing decision-making (Butler *et al*. 1998, Stevenson *et al*. 1999, Britten *et al*. 2000, Little *et al*. 2004, Petursson 2005,

Lewis and Tully 2011, Lucas *et al*. 2015, Strumiło *et al*. 2016, Horwood *et al.* 2016). Doctors in both primary (Butler *et al.* 1998, Petursson 2005) and secondary care (Lewis and Tully 2011) admitted to prescribing inappropriately on occasion to maintain good relationships with their patients. Some GPs over-estimated the strength and importance of patient demand for prescriptions in an effort to protect this relationship (Stevenson *et al*. 1999, Coenen *et al*. 2006, Peters *et al*. 2011).

Hospital consultants treating patients with a range of long-term conditions reported having a more enduring relationship with some patients than might be expected and admitted that they sometimes gave in to patient pressure to prescribe for the sake of this relationship (Lewis and Tully 2011). More junior doctors in the same study without this on-going patient relationship felt a lack of patient trust as a result. Sometimes the junior doctors found it easier than their seniors to resist perceived pressure to prescribe (Lewis and Tully 2011) but sometimes they too "capitulated" (p.9) and prescribed as they thought inappropriately in order to preserve their relationship with patients and with other healthcare professionals.

The absence of a doctor-patient relationship could be perceived as problematic. GPs in Iceland, where patients do not register with a doctor, reported feelings of insecurity due to unfamiliarity with patients; these feelings, along with a fear of conflict, sometimes led to inappropriate prescribing of antibiotics (Petursson 2005). Lack of knowledge of the family was identified as an influence on nurse prescribers' decisions whether or not to prescribe antibiotics during out of hours consultations (Philp and Winfield 2010). The nature of general practice in the UK is changing; consultations are shared out between doctors and other health care professionals and patients no longer see "their own" GP each time. It may be that this will impact on various aspects of healthcare provision including prescribing.

In a study of prescribing of antibiotics for sore throats, GPs asserted that patients came to them "wanting something done" (Butler *et al.* 1998, p.638). The GPs preferred to fulfil the patients' perceived expectations for antibiotics where practicable, even when they were probably not indicated, primarily in order to build and maintain beneficial therapeutic relationships with their patients. More recently, GPs and nurse prescribers treating children with

respiratory tract infections would sometimes prescribe antibiotics for a range of non-clinical influences including to preserve their relationship with parents (Horwood *et al*. 2016).

Nurse prescribers similarly had experienced patient pressure to prescribe for the sake of their relationship with the patient or parent (Philp and Winfield 2010), particularly antibiotics (Rowbotham *et al*. 2012, McIntosh *et al*. 2014). Both GPs (Björnsdóttir and Hansen 2001, Peters *et al*. 2011), non-medical prescribers (Courtenay *et al*. 2017) and particularly nurse prescribers (Peters *et al.* 2011, Rowbotham *et al.* 2012, McIntosh *et al*. 2014) felt that they had a role in educating patients in the appropriate use of antibiotics.

### 1.5.2 Communication between prescriber and patient

The General Medical Council describes the doctor-patient partnership as one based on openness, trust and good communication (General Medical Council 2012) and several of the competencies in the Competency Framework for all Prescribers are concerned with communication (Royal Pharmaceutical Society 2016). As will be seen research in this area has extended over two decades, evidencing its on-going importance. Patients want a patient-centred approach within consultations involving clear communication, partnership (centred on communication) and health promotion, and possibly a prescription (Little *et al*. 2001). Effective communication improves health outcomes (Stewart 1995) and problems with communication between GPs and their patients result in poor adherence-associated outcomes (Jenkins *et al.* 2003) but communication between doctors and their patients is not always good or clear (Butler *et al*. 1998, Barry *et al*. 2000, Britten *et al*. 2000, Stevenson *et al*. 2000, Barry *et al*. 2001, Lewis and Tully 2011, Cabral *et al.* 2014).

Doctors and patients may be speaking a different language. One study of consultations in primary care found patients used Mishler's "voice of the lifeworld" (Mishler 1984) to express their health concerns in the context of their daily lives, while GPs used the "voice of medicine", focussing only on the clinical condition and ignoring the context (Barry *et al*. 2001, p.487). Not surprisingly, where this linguistic mismatch existed it was found to result in poorer outcomes for patients. There was evidence that both patients and GPs could and did switch

between the two “languages” and it was suggested that GPs be encouraged to recognise and deal with patients' “lifeworld” issues.

In a study of GP-patient communication, Britten and colleagues found a lack of patient involvement in the consultation resulted in numerous misunderstandings which resulted in potential or actual adverse consequences, generally around adherence (Britten *et al*. 2000). In a meta-ethnography of lay experiences of medicine taking GPs seemed unaware of the relevance of patients' ideas and preferences for treatment and particularly of their reluctance to take medicines (Pound *et al*. 2005). Clear and effective communication between healthcare professionals and their patients is one of the cornerstones of the NICE guideline *Medicines adherence: involving patients in decisions about prescribed medicines and supporting adherence* (National Institute for Health and Clinical Excellence 2009).

Barry and colleagues identified complex patient agendas in general practice consultations which were neither expressed by patients nor elicited by GPs (Barry *et al*. 2000). Patients were explicit about their desires for diagnosis and treatment; unvoiced agendas included their concept of what might be wrong, worries about the diagnosis, pharmacotherapy-related concerns and the social context of their illness, linking to the “voice of the lifeworld” above (Barry *et al*. 2001). Researchers found that "in consultations, patients seem only partially present" (Barry *et al*. 2000 p. 1249). Most of the associated misunderstandings resulted in potential or actual problems for patients, again often related to non-adherence with un-sought medicines. The researchers recommended that doctors be encouraged to address their communication with patients in order to encourage fuller exchange of information (Barry *et al*. 2000).

In a systematic review and meta-ethnography, Cabral and colleagues (2014) found a disconnect between doctor and parents’ communication within consultations for acute illness in children, which affected prescribing decisions. Parents expressed their concerns and need for information while doctors were focussed on diagnosis and treatment options. In relation to the treatment of children's respiratory tract infections (RTIs), clinicians' perception of parental requests for antibiotics might also have been interpreted as more general comments and information-seeking (Cabral *et al*. 2014). Cabral and colleagues

recommended targeted training to help clinicians interpret parents' communication in a more neutral way.

In secondary care a critical incident study of prescribing decisions found examples of problematic communication between doctors and patients, some of whom were perceived by doctors as aggressive, manipulative and emotional (Lewis and Tully 2011). A narrative review of the literature in the specific area of cancer treatment found that good communication between professionals and patients, along with a patient-centred approach, facilitated chemotherapy decision-making in elderly patients. Poor health literacy, possibly combined with sensory and cognitive impairment in participants, acted as a barrier (Johnson 2012). Finally in a study using a discrete choice experiment patients with symptoms indicative of cancer risk were prepared to wait up to 3.5 weeks to consult a doctor with good listening skills and an extra week to consult their preferred GP (Whitaker *et al.* 2017). This behaviour may or may not be replicated in real life but indicates the importance patients place on doctors' communication skills.

In a small scale interview-based study, primary care nurses in Cornwall treating otitis media in children acknowledged that prescribing antibiotics might contribute to their relationship with patients' parents (Philp and Winfield 2010). Research among NMPs has suggested that effective communication with patients by NMPs could support their decisions not to prescribe antibiotics (Rowbotham *et al*. 2012 McIntosh *et al*. 2014, Courtenay *et al*. 2017).

### 1.5.3 Patient pressure and perceived patient pressure to prescribe

Patient pressure on doctors to prescribe, and doctors' perception of this, have been found to be strong influences on prescribing decision-making; again research has been on-going (Britten and Ukoumunne 1997, Björnsdóttir and Hansen 2001, Little *et al.* 2004, Coenen *et al*. 2006, Lewis and Tully 2011, Murphy, Byrne and Bradley 2011, Peters *et al*. 2011, Murphy, Bradley and Byrne 2012, Coenen *et al*. 2013, Dempsey *et al*. 2014, Lucas *et al*. 2015). Doctors' perceptions may however be faulty (Britten and Ukoumunne 1997, Britten *et al*. 2000, Gunnarsdóttir and Kinnear 2005, Coenen *et al*. 2013, Cabral et al. 2014).

Patient demands were influential on Scottish GPs' decisions whether to prescribe conventional or cyclo-oxygenase 2 inhibitor non-steroidal anti-inflammatory drugs (Gunnarsdóttir and Kinnear 2005). Little and colleagues (2004) in a study of consecutive patients found that although the patient's perceived medical need was most influential, GPs' perceptions of patient pressure were strongly associated with examination, prescribing and referral decisions and were more influential than the GPs' perception of patient preferences.

In secondary care, pressure from patients, relatives or carers to prescribe, particularly for controlled drugs, sedatives and antibiotics, was a source of discomfort for doctors and especially those working in the Accident and Emergency department (Lewis and Tully 2011). In almost half of cases doctors prescribed what the patient asked for, sometimes as the doctors thought inappropriately, generally for the sake of the doctor-patient relationship or to avoid conflict with the patient which might have impacted on the multi-disciplinary team. Junior doctors issued "tactical prescriptions" (p.8) in response to pressure but tended to feel badly afterwards; some junior doctors found not knowing the patient helpful in resisting pressure to prescribe. Doctors working in nursing homes faced pressure from staff to prescribe in response to elderly residents' challenging behaviour (Wood-Mitchell *et al.* 2008) and depression (Iden, Hjørleifsson and Ruths 2011).

Flemish GPs were found to prescribe antibiotics for acute cough more frequently when they perceived patient demand for this, but only when the patients were not unduly ill (Coenen *et al*. 2006). Lucas and colleagues (2015) identified clinicians' perceptions of parental pressure for antibiotics as influencing their decisions to prescribe these for acute childhood infections. Parental preference to avoid antibiotics or indeed any treatment for their children was also identified.

NMPs have similarly reported feeling subject to patient pressure to prescribe, most commonly antibiotics for the treatment of respiratory tract infections (Philp and Winfield 2010, Rowbotham *et al*. 2012, McIntosh *et al*. 2014, Courtenay *et al*. 2017), and also antibiotics more generally (Ness *et al*. 2016). Provision of patient education about the condition and on appropriate self-care was felt to be helpful in managing this pressure, particularly in relation to antibiotics (Rowbotham *et al.* 2012).

Rowbotham and colleagues felt that NMPs in their study did not explore their perceptions of patient pressure sufficiently. In a larger scale, mixed methods study, NMPs' perceptions of patient expectations for antibiotics to treat acute respiratory tract infections were found frequently to match patients' actual expectations (Courtenay *et al.* 2017 p.40). NMPs in this study prescribed antibiotic and non-antibiotic treatments and adopted "patient centred management" of the conditions.

Delayed prescribing of antibiotics is recommended as one strategy to promote antimicrobial stewardship in the treatment of self-limiting respiratory tract infections (National Institute of Health and Care Excellence 2014) and may help in managing patient demand. Its use varies. Peters and colleagues (2011) found that GPs, GP trainees and nurse prescribers in the north west of England used this infrequently as did GPs in a large-scale, Europe-wide study (Francis *et al*. 2012). On the other hand NMPs treating otitis media in children used delayed prescribing frequently to aid in managing parental demands for antibiotics (Philp and Winfield 2010) while other NMPs used it for certain high-risk conditions (Courtenay *et al.* 2017). A recent survey of households in England found that most members of the public did not understand the term 'delayed prescribing'; those who did had mixed views of the practice (McNulty *et al*. 2015).

Much of the literature reviewed concerns patient or family pressure for antibiotics although as in Lewis and Tully's study (2011) pressure can also be perceived for controlled drugs and sedatives. There will be specialist research in this area; it may be that prescribers manage pressure for substances liable to abuse differently.

### 1.5.4 Patients' ideas, concerns and expectations and prescribers' perceptions of patient expectations

The tension between perceived patient "wants" and "needs" has been described as "one of the handful of fundamental questions in the philosophy of health" (Cribb and Barber 1997, p.294). Most patients believe their medicines are necessary but some have strong concerns about their long-term effects (Britten 1994, Horne and Weinman 1999) and may resist taking even those for long term conditions (Pound *et al.* 2005), a subsection of prescribing where adherence is

poor (World Health Organisation 2003). These beliefs and concerns influence adherence (Pound *et al*. 2005, National Institute for Health and Care Excellence 2009) but are not always expressed by patients nor elicited by doctors (Britten 1994, Barry *et al*. 2000, Britten *et al*. 2000, Stevenson *et al*. 2000, Matthys et al. 2009).

Matthys and colleagues (2009) found that the concerns of general practice patients in Belgium centred on diagnosis and treatment and were expressed in 42% of consultations and more frequently during consultations for a new condition; when patients' concerns and expectations were expressed, GPs prescribed fewer new drugs.

GPs' perceptions of patient expectations can be highly influential, particularly in the area of upper respiratory tract infections (Britten and Ukoumunne 1997, Butler *et al.* 1998, Coenen et al. 2013). Coenen and colleagues (2013) researching across 13 European countries found that GPs' and nurse practitioners' perceptions somewhat matched patients' expectations, hopes for and requests for antibiotics to treat acute cough, and that these significantly influenced antibiotic prescribing. In an Australian study, independent of the condition, patients who expected a prescription were three times more likely to get one than those who did not, while those whom the GP thought wanted a prescription were ten times more likely to get one (Cockburn and Pit 1997).

Independent nurse and pharmacist prescribers were criticised in an early nationwide evaluation of their prescribing for failing to elicit their patients' beliefs about medicines, and particularly their beliefs about whether the medicines were necessary for them (Latter *et al.* 2010). Patients in this study considered this attribute the most important for prescribers for long-term conditions. Sibley and colleagues (2011) analysed medication discussion between nurse prescribers and people with diabetes and found a focus on "instruction-based discussion" with little consideration of the patients' perspectives. More recently, pharmacist and nurse prescribers were found to be better than GPs at picking up patients' emotional cues and concerns in primary care consultations (Riley *et al*. 2013) albeit that the pharmacist prescribers had much longer consultations than others. Courtenay and colleagues found that clear communication regarding patients' concerns, provision of information including that on treatment

decisions, physical examination and adequate consultation time all contributed to patient satisfaction with NMPs' consultations for respiratory tract infections (Courtenay *et al.* 2017). In this study patients' expectations regarding their treatment matched NMPs' perceptions of their expectations; those perceived as wanting an antibiotic who did not receive one were less satisfied with their consultations.

### 1.5.5 Shared decision making

Shared decision making between patient and prescriber regarding treatment is a key component in promoting adherence and requires communication, increasing patient involvement, understanding the patient's knowledge, beliefs and concerns about medicines and providing information (National Institute for Health and Care Excellence 2009). Not all patients however want this and rather trust their doctor to make decisions for them (Solomon *et al*. 2012). GPs in the Netherlands wanted shared decision making when managing patients with multi-morbidity (Luijks *et al.* 2012); on the other hand, in the specialist area of cancer treatment shared decision making was found to have weak or no influence on patients' quality of life (Kashaf and McGill 2015). In a vignette-based study, GPs felt that shared decision making would be helpful with parents of children with co-morbidities presenting with respiratory tract infections (Ashdown *et al.* 2016). GPs, Primary Care Trust (PCT) prescribing advisors and patients were found to prioritise elements contributing to shared decision-making differently; patients had a very personal perspective, PCT prescribing advisors prioritised evidence-based practice and GPs were somewhere in the middle (Solomon *et al.* 2013).

Nurses prescribing for patients with diabetes asserted that they resisted pressure to "medicalise" their consultations (Stenner, Carey and Courtenay 2010, p.29), claiming to take a more holistic, patient-centred approach. Non-specialist nurses in this study who may not have had diagnostic skills preferred to prescribe according to protocols, whereas diabetes specialist nurses were comfortable with more complex decision-making.

### 1.5.6 Influence of evidence-based guidelines

Potential conflicts between the use of evidence-based guidelines and maintaining a GP-patient partnership were identified in a mixed methods study carried out in the North of England (Solomon *et al*. 2012). Most GPs in this survey supported both guidelines and the doctor-patient partnership but where they felt these were incompatible prioritised their relationship with the patient and took a "flexible" approach to prescribing (p. 277). Other GPs adhered closely to guidelines at the expense of their relationship with patients. Some patients in this study perceived clinical guidelines as proscriptive and restrictive and considered the idea of a doctor-patient partnership unrealistic. A focus-group study carried out among GPs in Merseyside found similar doubts about the applicability of guidelines to individual patients (Cranney *et al*. 2001). Shared decision-making requires that the patient's values and beliefs about treatment options are taken in to account and these may conflict with evidence-based treatment options (McCartney *et al*. 2016).

Research on NMPs' adherence to guidelines has identified a range of approaches. A systematic review of independent nurse prescribers' antimicrobial prescribing behaviour found that guidelines and protocol influenced both whether to prescribe an antimicrobial and which one to prescribe (Ness *et al*. 2016). This two-step approach to prescribing decisions has previously been identified (Bradley 1992c, Maddox *et al*. 2016). Some evidence of prescribing out with guidelines was found in an early nation-wide evaluation of nurse independent prescribers and pharmacist independent prescribers, although their prescribing was judged to be safe and effective (Latter *et al.* 2012). Nurse prescribers (Philp and Winfield 2010) and non-medical prescribers (Rowbotham *et al*. 2012) treating upper respiratory tract infections and otitis media said that they occasionally prioritised other influences such as clinical uncertainty and experience over evidence-based guidelines, where they perceived this would be best for their patients (McIntosh *et al.* 2014).

## 1.6 Research methods used in these studies

Methodological approaches to research will be considered in Chapter 2 but it is useful to note that a wide range of methods have been used singly or at times in

combination to research influences on prescribing decisions. All have strengths and limitations.

Quantitative research methods used:

- local, regional and nation-wide postal and online questionnaires
- scenario-based questionnaires
- analysis of prescriptions written
- review of patient notes
- retrospective analysis of a national prescribing dataset

Qualitative research methods used:

- semi-structured telephone and face to face interviews
- focus groups
- vignettes
- observation
- audio or video-taped consultations
- field notes
- participants' diaries
- patients' symptom diaries
- critical incident-based interviews
- case studies combining two or more approaches
- literature review including systematic review

An example of the complexity of qualitative research is seen in a multi-method case study undertaken by a team of researchers exploring influences on medical prescribing decision-making and doctor-patient communication about drugs (Stevenson *et al*. 1999, Barry *et al*. 2000, Britten *et al.* 2000, Barry *et al*. 2001, Stevenson *et al.* 2002). Patients were interviewed before and after consultations with a purposive sample of GPs in England, the consultations were recorded and field notes taken and GPs were interviewed after each consultation. The researchers acknowledged limitations. Patient recruitment methods varied: some patients were interviewed at home a day or two before the consultation whereas others were interviewed in the surgery waiting room immediately prior to it. Patients were then interviewed again one week after the consultation when memories might have begun to fade or perceptions change. Interestingly

although the researchers gathered data from 62 patients they decided only to analyse data from 35. This research was regarded as of very high quality and culminated in a report for the Department of Health (Stevenson *et al*. 2001).

## 1.7 Programme of research

Research into NMP then has focused on NMPs' views of their prescribing-related education and training; implementation and practice of NMP; views of patients, the public and doctors on NMP and clinical outcomes from NMP. NMPs are making a substantial contribution to patient care across a wide range of areas in primary and secondary care yet much less research has been undertaken into influences on their prescribing decisions, and this was the area for this programme of research.

The overall aim of the programme of research was to explore and describe prescribing decision-making by non-medical prescribers.

The following programme of research was designed:

### Stage 1: synthesis of findings from the literature

A systematic review was undertaken of social and cognitive influences on prescribing decision-making by non-medical prescribers.
(McIntosh *et al.* 2013, McIntosh *et al*. 2014, McIntosh *et al*. 2016).

The aim of the systematic review was to identify and characterise social and cognitive factors and perceived factors influencing the prescribing decision-making process among non-medical prescribers.

The objectives of the systematic review were:

- to determine the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK
  and
- to report on the methodologies and methods used and quality of peer reviewed published studies in this area

## Stage 2: data generation

### Phase 1: semi-structured interviews exploring prescribing decision-making by NMPs (McIntosh *et al.* 2017).

The overall aim of Stage 2 of the programme of research was to explore participants' experiences and perceptions of influences on their prescribing decision-making, and the impact of these influences.

The objectives of Stage 2 Phase 1 of the research were to explore:

- participants' in-depth descriptions of their experiences of making prescribing decisions
- their views and reflections of influences on the prescribing decisions they make
  and
- their opinions on the impact of these influences on their prescribing decision-making

### Stage 2 Phase 2: self-recorded reflections on individual prescribing decisions participants felt were noteworthy in some way

### Phase 3: semi-structured interviews based on these recorded reflections

The objective of Stage 2 Phases 2 and 3 was to explore:

- participants' experiences and perceptions of influences on their prescribing decision-making, and their impact **in relation to noteworthy prescribing decisions.**

# Chapter 2 Research Methodologies

## 2.1 Introduction

Chapter 1 provided the background to this programme of research, outlining what is already known and demonstrating the need for further research into influences on prescribing decision-making by NMPs. This research was undertaken in two stages, the second of which had three phases:

### Stage 1: synthesis of findings from the literature

A systematic review of social and cognitive influences on prescribing decision-making by non-medical prescribers was undertaken; see Chapter 3 and publications (McIntosh *et al*. 2013, McIntosh *et al.* 2014, McIntosh *et al.* 2016a).

### Stage 2: data generation

Phase 1: semi-structured face to face interviews with NMPs exploring their prescribing decision-making (McIntosh *et al.* 2017)

Phase 2: self-recorded reflections on individual prescribing decisions participants felt were noteworthy in some way

Phase 3: semi-structured face to face interviews with participants based on their recorded reflections

In this chapter systematic review as a research tool will be described. Then the philosophical approaches, research methodologies, theoretical frameworks and methods which may inform the design of a programme of research will be considered. At each stage the approaches taken in this study will be identified and justified. Information on the setting and context of this study will be given. Finally the steps taken throughout to ensure good research governance will be described.

## 2.2 Systematic review of the literature

The first step in undertaking a programme of research is to review the literature to establish what is already known; this will make the case for the research and inform study design. Grant and Booth (2009) identified fourteen types of literature review. These are listed in Table 2.1 below along with their key characteristics; note that there is some overlap between study characteristics. Grant and Booth's typology has been criticised for not including narrative reviews and reviews of reviews (MacLure, Paudyal and Stewart 2016) and these have been included for completeness.

Table 2.1 Types and key characteristics of literature reviews
Adapted from Grant and Booth 2009

| Label | Description | Label | Description |
|---|---|---|---|
| **Critical review** | Extensive critical evaluation; often results in a hypothesis or model | **Rapid review** | Systematic but time-limited review of literature on policy or practice |
| **Literature review** | Generic term | **Scoping review** | Preliminary assessment of nature and extent of literature |
| **Mapping review/ systematic map** | Maps and characterises existing literature to identify gaps | **State of the art review** | Examines more current matters |
| **Meta-analysis** | Statistical combination of results of quantitative research to enhance reliability of results | **Systematic review** | Systematic search, appraisal and synthesis of evidence; often used in guideline development |
| **Mixed methods review** | Combines results from different research approaches e.g. quantitative and qualitative research | **Systematic search and review** | Comprehensive search strategy + critical review of literature over a broad area |

| Label | Description | Label | Description |
|---|---|---|---|
| **Overview** | Generic term for a summary of the literature | **Systematised review** | Uses some but not all elements of the systematic review process |
| **Qualitative systematic review** | Thematic integration of findings from qualitative research | **Umbrella review** | Compiles evidence from multiple reviews (not primary research). Broad focus |
| **Narrative review** | Generally descriptive with often no systematic search | **Review of reviews** | A systematic review of systematic reviews |

As stated in the Foreword, prior to commencement of MRes/ PhD studies the doctoral student carried out a scoping review of literature on non-clinical factors influencing prescribing decisions. This identified several areas of interest and provided the foundation for this study. A more detailed understanding of what was known specifically about influences on NMPs' prescribing decision-making was needed and this was achieved by means of a systematic review of the literature. The aim of a systematic review is to identify, appraise critically and synthesise relevant literature to answer specific research question/s (MacLure, Paudyal and Stewart 2016).

Grant and Booth characterise systematic reviews as requiring comprehensive searching, quality assessment which may determine inclusion or exclusion and narrative synthesis with the use of tables of evidence; these requirements are set out in a protocol developed in advance. Findings will include an evaluation of the quality of the research and may be used to inform future practice and/ or highlight areas for further research.

Booth (2006, p.422) described qualitative systematic review as:

> "a method for integrating or comparing the findings from qualitative studies. The accumulated knowledge resulting from this process may lead to the development of a new theory, an overarching narrative, a wider

> generalization, or an interpretative translation. [The goal is] interpretative in broadening understanding of a particular phenomenon."

By definition a systematic review, whether qualitative or not, should have a protocol which specifies exactly what is to be done. This protocol should include the review question/s, inclusion criteria, search strategy, study selection, quality assessment, data extraction, data synthesis and plans for dissemination (Centre for Reviews and Dissemination 2013 p.6). Publication of the protocol provides evidence of peer review and therefore of the quality of the protocol. It also alerts other researchers that the review is being undertaken and reduces the possibility of duplication of the work.

Several organisations exist to promote the production and use of systematic reviews to inform evidence-based practice, for example the Cochrane Collaboration (Cochrane Central Executive 2017), the Joanna Briggs Institute (Joanna Briggs Institute 2017) and the Centre for Reviews and Dissemination (CRD) at the University of York (University of York 2017).

### 2.2.1 Approach taken to systematic review in this programme of research

Chapter 3 of this thesis provides details of a systematic review carried out of the social and cognitive influences on prescribing decision-making among non-medical prescribers. The review was undertaken according to guidance provided by the CRD and used a narrative synthesis approach to analysis (Popay *et al*. 2006). According to the CRD:

> "The defining characteristic of narrative synthesis is the adoption of a textual approach which provides an analysis of the relationships within and between studies and an overall assessment of the robustness of the evidence."
> (Centre for Reviews and Dissemination 2009 p. 48)

The review protocol was published by the CRD (McIntosh *et al.* 2013). Findings from the review have also been published (McIntosh *et al*. 2014, McIntosh *et al.* 2016a).

## 2.3 Philosophical approaches to research

Various philosophical approaches to research exist. Until recently explicit use of such philosophies and associated "theoretical lenses" was rare in reporting of pharmacy practice research (Stewart and Klein 2016, p.616) and in research in medical education (Bunniss and Kelly 2010), although more common research into nursing practice (Bunniss and Kelly 2010). It is important that the appropriate philosophical approach is selected at the beginning of a programme of research so as to ensure alignment with the methodological choice, research strategy, time horizon and data collection methods, thus producing a coherent research design (Creswell 2013). These terms are clarified below:

- philosophy has been defined as "the study of the fundamental nature of knowledge, reality, and existence, especially when considered as an academic discipline" (Oxford Dictionaries 2010). Research philosophy is therefore the way in which some aspect of the fundamental nature of knowledge, reality, and existence is studied

- the methodological choice made sets out the broad approach to the research taken i.e. quantitative or qualitative research

- the research strategy outlines the type/s of study design to be used

- the time horizon is the time over which the research will be carried out, for example a snap shot in time or a longitudinal study such as a cohort study

- the method/s used in this study describe in more detail how data will be collected and analysed

Saunders and colleagues developed the research onion (Figure 2.1 below) as a way of illustrating the relationships between research philosophies, methodological choices, research strategies, the time horizon and data collection methods ("techniques and procedures") (Saunders, Lewis and Thornhill 2012, p.59).

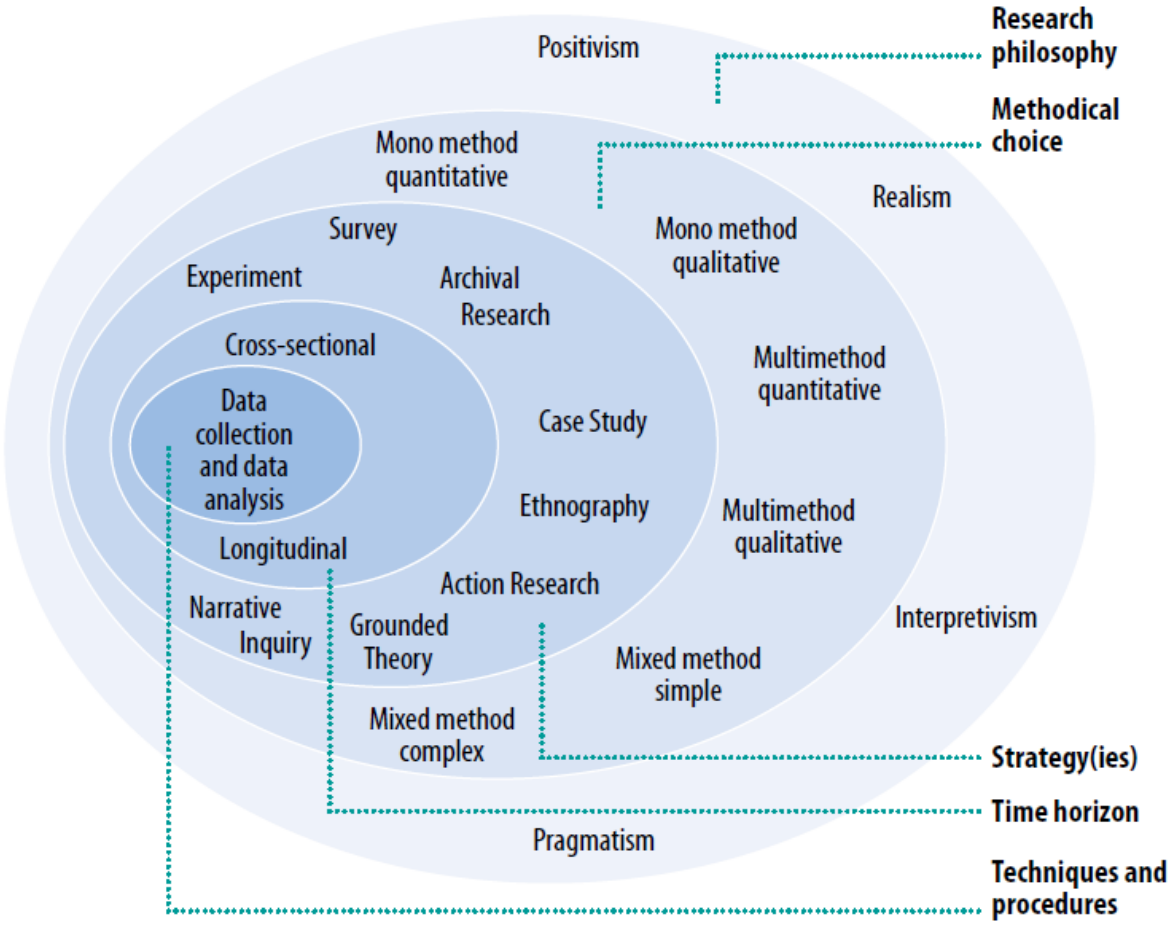



Figure 2.1 The research onion

(Saunders, Lewis and Thornhill 2012)

### 2.3.1 Research philosophies

Several research philosophies exist: Creswell (2013) lists positivism, postpositivism; interpretivism, constructivism, hermeneutics; feminism; radicalised discourses; critical theory and Marxist models; cultural studies models; queer theory and postcolonialism. Positivism and interpretivism will be considered further as these philosophies are frequently used in social science and health research (Bowling 2002).

Positivism assumes that reality exists and can be measured; a deductive approach is taken where a hypothesis is developed and tested for veracity generally by quantitative means, possibly resulting in the positing of a new theory. Interpretivism takes an inductive approach and uses observation to develop fresh understandings and possibly theories (Bowling 2002). Contrasting aspects of these philosophies in social science and health research may be

considered with regard to their ontological, epistemological, axiological and methodological beliefs, as in Table 2.2 below. First these terms will be explained:

- ontology in philosophy is "the branch of metaphysics that deals with the nature of being" (Oxford Dictionaries 2010). Ontological beliefs therefore concern the nature of reality and inform the choice of research philosophy

- epistemology is defined as "the theory of knowledge, especially the critical study of its validity, methods and scope" (Oxford Dictionaries 2010). Epistemological beliefs concern the source, formation and structure of knowledge

- axiology is "the theory of moral and aesthetic values" (Chambers 2017). Axiological beliefs relate to the role of values in the research

- methodology describes the approach to enquiry taken within the research i.e. quantitative or qualitative

Table 2.2 Contrasting aspects of the research philosophies positivism and interpretivism in social science and health
Adapted from Creswell 2013 p.36 and 37

| | **Positivism** | **Interpretivism** |
|---|---|---|
| Ontological beliefs (the nature of reality) | A single objective reality exists | Multiple realities are constructed through our lived experiences and interactions with others |
| Epistemological beliefs (how reality is known) | Reality can only be approximated. Interaction with subjects is kept to a minimum | Reality is co-constructed between the researcher and the researched and shaped by individual experiences |
| Axiological beliefs (the role of values) | Researchers' biases need to be controlled and not expressed in a study | Individual values are honoured and are negotiated among individuals |

| | Positivism | Interpretivism |
|---|---|---|
| Methodology (the approach to inquiry) | Use of scientific method. The objective is to create new knowledge; deductive methods are important e.g. testing theories, specifying variables, comparing groups.<br>Methods used are quantitative and include randomised controlled trials, cohort studies and questionnaires | Use of an inductive method to identify emerging ideas.<br>Methods used are qualitative and include interviewing, observing and analysis of texts |

The approaches taken to research within these two philosophies are different but not mutually exclusive. It is possible to include interpretivist, qualitative elements within a positivist quantitative methodology for example by asking for additional comments within a questionnaire (McColl *et al.* 2001, Bowling 2002). It is also possible to use mixed methods to explore an area of research. As an example, themes may be identified in a small qualitative study and then explored more widely using a questionnaire to survey a much larger but similar population. Equally, participants in a questionnaire study may be asked whether they would participate in interviews or focus groups to allow more in-depth exploration. Aspects of the use of positivism and interpretivism in social science and health research are shown in Table 2.3.

Table 2.3 Aspects of the use of positivism and interpretivism in social science and health research

Adapted from Bowling 2002 and Creswell 2013

| Positivism | Interpretivism |
|---|---|
| Deductive approach | Inductive approach |
| Quantitative approaches | Qualitative approaches |
| Include surveys, experimental methods | Include interviews, focus groups |
| Statistical analysis of data (numbers, percentages, scores etc) | Thematic analysis of data (transcribed recordings, field notes etc) |

## 2.4 Methodological approaches

As above, although quantitative and qualitative approaches align most naturally with positivism and interpretivism respectively there can be some overlap. Awareness of the characteristics, strengths and limitations of each approach is important to ensure that the most appropriate one is used to answer the research question. These are outlined in Table 2.4 below.

Table 2.4 Characteristics, strengths and limitations of quantitative and qualitative research approaches in social science and health
Adapted from Bowling 2002

| | Quantitative approaches | Qualitative approaches |
|---|---|---|
| Examples of data collection methods | Questionnaires, surveys | Interviews, focus groups (see Table 2.7) |
| Aim | Descriptive survey; hypothesis testing; aiming for generalisability of results | Exploring in-depth views, attitudes, experiences; aiming for trustworthiness of findings |
| Numbers of participants | More suited to larger numbers; power calculation needed to facilitate robust statistical analysis. May produce only descriptive statistics if response rate is lower | More suited to smaller numbers e.g.one to one interviews or focus groups with ideally 6 – 10 participants for each group |
| Mode of administration | Postal, on-line or questionnaire administered face to face | Face to face, telephone, video conferencing, Skype® |
| Content | Standardised questions with fixed responses; psychological tests, scales e.g. Likert scale<br>Some open questions or requests for comment | Structured, semi-structured or unstructured interview schedule or free association narrative interview<br>Topic guide for focus groups |
| Development of data collection tool | Demands rigorous development from the literature using appropriate theoretical underpinning | Demands rigorous development from the literature using appropriate theoretical underpinning |
| Ease of use for researchers | Postal and on-line questionnaires relatively straightforward to send once contact details obtained | Time-consuming, expensive and require highly trained researchers to undertake interviews and facilitate focus groups |

| | Quantitative approaches | Qualitative approaches |
|---|---|---|
| Ease of use for participants | Should be designed to minimise cognitive burden for participants. Pre-coded response options may not be sufficiently comprehensive to allow participants to make a choice which accurately reflects their opinion | Should be designed to minimise cognitive burden for participants but likely to make more demands than quantitative methods |
| Data generated | Largely quantitative with some qualitative elements | Qualitative with some quantitative data e.g. demographics |
| Sources of bias (Sackett 1979 and Bowling 2003) | During development of data collection tool, sampling bias, social desirability bias, "yes-saying" bias | During development of data collection tool, sampling bias, interviewer bias, social desirability bias |
| Analysis | Descriptive and inferential statistical analysis used to characterise participants and to try to establish statistically significant results. These may then be used to infer what the views of a wider, similar population may be | Thematic analysis using most commonly the Framework Approach (Ritchie *et al*. 2014) or Grounded Theory (Glaser 1967) |

### 2.4.1 Justification of the use of the interpretivism philosophy in this programme of research

The interpretivism philosophy was used in this programme of research. The programme of research explored influences on NMPs' prescribing decision-making. Use of the interpretivism philosophy may be justified by application of the philosophical beliefs associated with interpretivism to this study (see Table 2.5).

Table 2.5 Aspects of the interpretivism research philosophy applied to this programme of research

Adapted from Creswell 2013, p.36

| | Interpretivism | In this programme of research |
|---|---|---|
| Ontological beliefs (the nature of reality) | Multiple realities are constructed through our lived experiences and interactions with others | NMP participants: different professions, settings and scopes of practice. Likely that multiple realities will have been constructed through participants' lived experiences |
| Epistemological beliefs (how reality is known) | Reality is co-constructed between the researcher and the researched and shaped by individual experiences | Data generated via semi-structured interviews undertaken by doctoral student; one "general" phase and one based on participants' reflections |
| Axiological beliefs (the role of values) | Individual values are honoured and are negotiated among individuals | Bracketing (LeVasseur 2003) used to describe and acknowledge doctoral student's professional role. Neutral stance taken throughout |
| Methodological beliefs (the approach to inquiry) | Use of an inductive method to identify emerging ideas; methods used are qualitative and include interviewing, observing and analysis of texts | Inductive method used i.e. semi-structured interviews including one phase based on based on participants' reflections |

## 2.5 Research methodologies used within interpretivism

Creswell (2013) lists five qualitative approaches to inquiry within the interpretivism research philosophy: narrative research, phenomenology, grounded theory, ethnography and case studies. Qualitative observational methods may also be used. Key aspects of these are considered in Table 2.6.

Table 2.6 Key aspects of narrative research, phenomenology, grounded theory, ethnography, case studies and qualitative observational approaches in research Adapted from Creswell 2013

| Research method | Key aspects |
|---|---|
| Narrative research | "Experiences as expressed in lived and told stories of [one or two] individuals" p. 70 |
| Phenomenology | Examines the lived experience of a phenomenon as experienced by research participants |
| Grounded theory | Research starts in the absence of a hypothesis or *a priori* theoretical underpinning. Data are gathered into themes which are used to construct a new theory |
| Ethnography | Used to explore cultural phenomena; the researcher embeds him/herself in the community or group being studied |
| Case studies | A case or a small number of cases are explored through detailed examination using different methods and several sources of information |
| Qualitative obervational methods | The researcher acts as a neutral observer and makes field notes, recordings and videos which are then analysed thematically |

### 2.5.1 Phenomenology

A phenomenological approach was used in this programme of research. According to Creswell (2013, p.76):

> "A phenomenological study describes the common meaning for several individuals of their lived experiences of a concept or a phenomenon."

Creswell (p.81 and p.82) goes on to describe the steps in conducting phenomenological research:

- the suitability of the research area for a phenomenological approach should be assessed. Creswell suggests using phenomenology when exploring "individuals' common or shared experiences of a phenomenon" to understand it further or to develop practice or policies

- the researcher should acknowledge and bracket out his/ her own experiences; this is particularly the case in psychological or transcendental phenomenology

- potential participants are identified who have experienced the phenomenon. Data are generated often by means of in-depth interview/s although other methods of data generation such as observation and diaries may also be used

- participants are asked a few open questions about their experience of the phenomenon and influences on this

- data are analysed, looking for "significant statements" which offer an insight into participants' lived experiences of the phenomenon. These may be synthesised to produce themes

- "significant statements" and themes are used to produce a "textural description" of the phenomenon and a "structural description" of the context or setting that influenced participants' experience of the phenomenon

- finally, these are used to create a composite statement of the "essence" of the phenomenon

### 2.5.2 Justification for the use of phenomenology in this programme of research

Alternative research approaches as in Table 2.6 will be considered briefly, then aspects of phenomenology will be outlined and considered in relation to this programme of research thereby justifying the use of this approach.

As in Table 2.6, narrative research focuses on the stories of one or two individuals and would not therefore be suitable. As described in Chapter 1, influences on medical prescribing have been identified and some related research has been carried out among NMPs. A theory could be proposed based on what is already known so grounded theory would not be appropriate for this study, nor

would ethnography, which looks closely at a particular social group over a period of time. This programme of research is concerned with the personal views and experiences of several individuals experiencing the phenomenon of prescribing decision-making and so a case study approach would not be suitable. Qualitative observational methods have been used in combination with pre-and post-consultation interviews in case study research on influences on medical prescribing (Barry *et al.* 1999, Barry *et al*. 2000, Britten *et al*. 2000, Stevenson *et al*. 2000, Stevenson *et al*. 2001, Barry *et al*. 2001, Jenkins *et al*. 2003). This multi-method, case study research was carried out by a team of researchers who none the less acknowledged limitations in the approach.

In this study, the lived experience of the phenomenon of prescribing decision-making was explored among a sample of non-medical prescribers who make these decisions as part of their usual professional roles. In-depth semi-structured interviews (Chapter 4), participants' self-recorded reflections on "noteworthy" prescribing decisions and critical incident-type interviews based on these (Chapter 5) were used to generate data. Interviews were recorded *verbatim* and analysed thematically using the Framework Approach (Ritchie *et al.* 2014), the domains of the Theoretical Domains Framework (TDF) being used to create the initial framework (Cane, O'Connor and Michie 2012). "Significant statements" (p.82) were synthesised to produce themes, which were illustrated using representative quotations (Bowling 2002). "Structural descriptions" (p.82) of influences on participants' prescribing decision-making in general and more specifically may be found in Chapters 4 and 5 respectively. Finally Chapter 6 provides a composite statement of the "essence" (p.82) of the phenomenon of prescribing decision-making by non-medical prescribers.

Two types of phenomenology have been identified:

- hermeneutical phenomenology (van Manen 1990) where the researcher takes an overt role, interpreting or mediating between participants' lived experiences

- psychological or transcendental phenomenology (Moustakas 1994) where the researcher brackets his/her own experiences and focuses on describing the experiences of research participants.

As above, Creswell (2013, p.36) describes the epistemological approach in interpretivism as when "Reality is co-constructed between the researcher and the researched and shaped by individual experiences". Notwithstanding this, the doctoral student believes that as far as possible the researcher should acknowledge his or her previous experience then bracket it to minimise his/ her influence on the data generation process. The doctoral student and her supervisors felt that transcendental or psychological phenomenology resonated with this belief and this approach was taken. This will be considered in a structured way in the section on Reflexivity.

### 2.5.3 Bracketing

LeVasseur (2003) considered the role of bracketing in phenomenology and used the analogy of a familiar object hidden from view inside a paper bag. Preconceptions based on previous knowledge of the object are bracketed by the researcher's inability to see and therefore recognise it. The researcher must explore the object afresh and will develop new understandings through this exploration. LeVasseur (p.419) goes on to assert that:

> "The project of bracketing attempts to get beyond the ordinary assumptions of understanding and stay persistently curious about new phenomena."

Creswell (2013) suggests that bracketing should be addressed by an initial statement of the researcher's background and relevant experience of the phenomenon, as has been done in the Foreword to this thesis and in Section 2.11 Reflexivity.

## 2.6 The time horizon

The time horizon or time frame for a research study must be appropriate to the aim of the research. If for example the aim is to follow patients from the point of diagnosis of a particular condition until a specified end point then a prospective longitudinal study would be appropriate. If on the other hand the aim is to obtain a "snap shot" in time then the study will be cross-sectional with the time horizon dictated by logistical factors.

### 2.6.1 The time horizon in this programme of research

This overall aim of this programme of research was to explore and describe prescribing decision-making by NMPs. This was done by means of interviews with no need for a prolonged, longitudinal study design.

## 2.7 Qualitative data generation methods

As above and as in Tables 2.2 and 2.3, the interpretivist paradigm and phenomenology are more aligned to qualitative methods of data generation. The most common of these are interviews and focus groups and aspects of these are compared in Table 2.7 below.

Table 2.7 Comparison of aspects of interviews and focus groups as data generation tools
Adapted from Bowling 2002 and Creswell 2013

| | Interviews | Focus groups |
|---|---|---|
| Participant/s | One participant per interview. Each interview gathers data from one participant | Several participants (often 6-10) per focus group. Participants may be purposively selected to have similar or disparate backgrounds. Interaction between participants may generate additional perspectives |
| Data generation tool | Interview schedule: various approaches. May be structured, semi-structured or unstructured and may be based on critical incident/s. Development of schedule from the research; should have relevant theoretical underpinning. Development may be iterative based on analysis of data from previous interviews | Topic guide: key themes to be explored identified in advance but direction of discussion less structured than interview. Development of topic guide from the research; should have relevant theoretical underpinning. Development may be iterative based on analysis of data from previous focus groups |
| Researcher/s | Interviewer | Facilitator plus observer/ note taker |
| Suitability | Suitable for all topics | Less suitable for confidential/ sensitive topics |

| | Interviews | Focus groups |
|---|---|---|
| Data capture | Interview digitally recorded and transcribed. Notes not usually made as may disrupt flow of interview | Discussions digitally recorded and transcribed + field notes made by observer |
| Data analysis. | Themes identified from individuals' experiences/ views etc. Framework Approach (Ritchie *et al*. 2014) or grounded theory approach (Glaser 1967) to analysis; may be theoretically informed. | Themes identified from individuals' experiences/ views etc. and from interactive discussions between two or more participants. Framework Approach (Ritchie *et al.* 2014) or grounded theory approach (Glaser 1967) to analysis; may be theoretically informed |

### 2.7.1 Justification for the use of interviews in this programme of research

The focus of this programme of research was participants' prescribing decision-making behaviour. Notwithstanding the opportunities for generation of rich data through focus group discussions (Bowling 2002) it was anticipated that since participants' reflections might be very personal they might feel more comfortable sharing these in anonymised one to one interviews rather than with several strangers in a focus group (Bowling 2002). The research was undertaken in the NHS Grampian area and all locations were within three hours of the doctoral student's home. Face to face interviews were therefore chosen as the primary method of data generation. Interviews will be considered further in Section 2.8.

## 2.8 Theoretical underpinning of the programme of research

### 2.8.1 The need for theoretical underpinning

This programme of research will use an interpretivist, phenomenological, qualitative approach to explore in-depth influences on non-medical prescribers' prescribing decision-making. Qualitative research has been criticised as lacking rigour (Greenhalgh *et al.* 2016) with a lack of clarity about the role of theory (Wu and Volker 2009). A strong theoretical underpinning enhances the rigour of qualitative research and the robustness of quantitative research (Stewart and

Klein 2016) and is particularly important for translation of research findings into practice (Meyer and Ward 2014).

Bradbury-Jones and colleagues (2014) assert that theory may be used in qualitative research at five different levels, ranging from being apparently absent to being consistently applied throughout, where it drives all stages of the research. They recommend the latter approach wherever possible to achieve methodological congruence (Morse and Richards 2002), where theory informs and is explicit throughout the research aim, questions, methods, analysis and results.

It is important that the appropriate theoretical perspective is used (Stewart and Klein 2016). The aim of this programme of research was to explore NMPs' behaviour of prescribing decision-making so as to clarify influences on this. It is already known that doctors' prescribing decisions are subject to influences other than the patient's clinical condition and evidence-based guidelines; the limited evidence available suggests that the same is true of NMPs. It was thought possible that one of the outcomes from this study might be recommendations about educational interventions to support and possibly improve NMPs' prescribing decision-making, should the research suggest this is necessary, for example to promote the uptake of evidence into their practice.

Any intervention targeting behaviour change must be appropriate (Bandura 1998) and must be delivered in the right way; this too will be enhanced by a strong theoretical basis. A summary of 44 systematic reviews of methods of promoting implementation of evidence-based practice in healthcare found that educational outreach i.e. education delivered in person to health professionals in their own settings, was broadly effective (Grimshaw *et al.* 2001). Such education should be delivered at an individual level (Scottish Intercollegiate Guidelines Network 2008) thus any theory underpinning research into influences on prescribing decision-making should also focus at this level. A systematic review of educational interventions to improve prescribing competency in medical and non-medical prescribers identified continuing medical education and individual feedback on prescribing as being helpful (Kamarudin et al. 2013); this too suggests that interventions should be designed and delivered at the individual level. The Competency Framework for all Prescribers emphasises the importance of all prescribers assessing and maintaining their own competence

(Royal Pharmaceutical Society 2016); this again emphasises the importance of understanding influences on prescribing decision-making at an individual level.

### 2.8.2 The Theoretical Domains Framework

Numerous theories of behaviour change at the individual level exist. In 2005 a large group of health researchers, psychologists and health psychologists identified 33 psychological theories with 128 explanatory constructs (parts of theories) which were relevant to the implementation of evidence-based practice. They classified and simplified these theories and constructs to form an integrative framework of theories of behaviour change, the Theoretical Domains Framework, initialially 12 domains. The aim was:

> "to simplify psychological theory relevant to behaviour change and to make it accessible to those involved in EBP [evidence based practice] implementation."
> (Michie *et al*. 2005 p.29).

The framework was later refined and validated by a group of behavioural experts in 2012; domains were adjusted resulting in 14 domains (Cane, O'Connor and Michie 2012) which are given in Table 2.8. The TDF encompasses both the automatic and the reflective elements of behaviour and has been used in several approaches to promoting implementation of evidence-based practice.

In recognition of the complexity of behaviour change interventions and their determinants, Michie and colleagues developed the behaviour change technique taxonomy (BCTTv1) with the aid of 400 researchers and stakeholders across several countries (Michie *et al.* 2015). They suggest that this taxonomy is used to identify the content of complex behaviour change interventions and to support related research. Michie and colleagues classified ninety three distinct, non-overlapping behaviour change techniques within the taxonomy but recognised that these are likely to be impractical to use individually. They mapped eighty seven of the techniques into the fourteen domains of the TDF (Michie *et al.* 2015), demonstrating its usefulness as a theoretical underpinning for research into implementation-related behaviour change.

The TDF has been used in a wide range of studies to examine the determinants of health-related behaviour, including research into implementation of evidence-based guidelines (Francis, O'Connor and Curran 2012) and into prescribing errors by junior hospital doctors (Duncan *et al.* 2012). Other recent studies using the TDF include behavioural determinants to healthcare professionals reporting medication errors (Alqubaisi *et al*. 2016); adherence to evidence-based indicators in primary care (Lawton *et al*. 2016) and in healthcare implementation projects (Phillips *et al.* 2015). French and colleagues used the TDF to identify barriers and facilitators to implementation of evidence-based practice and suggested specific behaviour change techniques to address these (French *et al.* 2012).

### 2.8.3 Justification of the use of the Theoretical Domains Framework in this programme of research

This programme of research was undertaken using an interpretivist, phenomenological, qualitative approach in which data was gathered by means of interviews with individual NMPs. Most interventions in healthcare occur at the individual level between a healthcare professional and a patient. Given that the focus of the research was individual participants' prescribing decision-making behaviour it is appropriate that underpinning should be provided by a theory which encompasses a number of validated domains influential in behaviour and behaviour change at an individual level.

The TDF was used in this programme of research to inform development of data collection tools, create an initial framework for data analysis (Ritchie *et al.* 2014) and to report and discuss findings in this thesis and via dissemination elsewhere (McIntosh *et al*. 2017). The domains of the TDF are given in Table 2.8 along with descriptors.

Table 2.8 Descriptions of TDF domains

Adapted from Stewart and Klein 2016 and Cane, O'Connor and Michie 2012

| TDF domains | Descriptors |
|---|---|
| Knowledge | An awareness of the existence of something |
| Skills | An ability or proficiency acquired through practice |
| Social/professional role and identity | A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting |
| Beliefs about capabilities | Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use |
| Optimism | The confidence that things will happen for the best or that desired goals will be attained |
| Beliefs about consequences | Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation |
| Reinforcement | Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus |
| Intentions | A conscious decision to perform a behaviour or a resolve to act in a certain way |
| Goals | Mental representations of outcomes or end states that an individual wants to achieve |
| Memory, attention and decision processes | The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives |
| Environmental context and resources | Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour |
| Social influences | Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours |
| Emotion | A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event |
| Behavioural regulation | Anything aimed at managing or changing objectively observed or measured actions |

## 2.9 Interview design

Interviews were used to generate data in Stage 2 of this programme of research. Various types of interviews exist and these are considered below.

### 2.9.1 Structured interviews

Structured interviews are similar to self-completed questionnaires in that a fixed set of questions is asked although participants may be able to make additional comments. There may also be structured guidance for the interviewer, for example a form of words to use should clarification of a question be needed.

### 2.9.2 Semi-structured interviews

Semi-structured interviews are the most commonly used type of interviews in qualitative research (Smith 2005). A semi-structured interview schedule is used; this comprises mainly open questions and is designed to elicit more in-depth data than with structured interviews. There is scope for the interviewer to probe if required using for example "Can you tell me a bit more about that?" or to use a follow up question should this be felt appropriate or necessary.

### 2.9.3 Unstructured interviews

Unstructured interviews use an interview guide to set broad parameters for the interview but the content is participant-driven with data likely to reflect the participant's perspective rather than that of the interviewer.

### 2.9.4 Free association narrative interviews

In free association narrative interviews the researcher uses a very few, very broad questions such as "Tell me about your experience of…?" The aim is to uncover the participant's sometimes subconscious perspectives of experiences which may have been troubling in some way (Hollway and Jefferson 2008).

### 2.9.5 Critical incident-based interviews

Critical incidents may be the focus of any of the above types of interview but the term has a more particular meaning. Critical incident-based interviews have been developed from Flanagan's early critical incident technique used in selection of aircrews for the US Army Air Forces during World War 2 (Flanagan 1954). Flanagan defined a critical incident as one:

> "… where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects."
> (Flanagan 1954, p.327)

Flanagan used four methods to generate data: individual interviews, group interviews, questionnaires and record forms, and considered that accuracy was determined by the levels of clarity, honesty and detail in participants' contributions (Flanagan 1954). Flanagan's original technique has been extensively adapted as he himself predicted it would be. It has been used to examine practice across a very wide range of settings, often by means of retrospective self-report of a critical incident (Butterfield *et al.* 2005). Critical incident interviews still rely on participants' honesty and openness as do all interview-based studies but additional steps have been developed to enhance the trustworthiness of findings from qualitative studies in general (Shenton 2004) and from critical incident studies (Butterfield *et al*. 2005).

Critical incident interviews have been used in several studies of prescribing-related behaviour (Bradley 1992a, Bradley 1992c, Lewis and Tully 2009, Lewis and Tully 2009, Lewis and Tully 2011, Lewis *et al.* 2014) and several techniques have been used to capture participants' recollections of the critical incidents. In most cases participants were asked to focus on one particular type of critical incident, for example those generating feelings of discomfort in the participant (Bradley 1992a, Bradley 1992c, Lewis and Tully 2009). Some participants were contacted in advance and sent a form on which to record incidents prior to the interview (Bradley 1992a, Bradley 1992c, Lewis and Tully 2011, Lewis *et al.* 2014); others were asked to think of incidents in advance (Lewis and Tully 2009). Some researchers did not state the way in which the recollection was triggered.

### 2.9.6 Justification of the use of critical incident-type interviews in this programme of research

Critical incident interviews allow the phenomenon of interest to be explored within its context and from the participants' perspectives. Data is generated by the participant, gathered by the researcher during interviews and analysed inductively. These aspects resonate with the qualitative, phenomenological approach taken in this programme of research and therefore critical incident interviews were used in this study for Phase 2 (self-recordings of individual reflections i.e. a form of retrospective self-report) and Phase 3 (interviews based on these reflections).

## 2.10 Sampling

It may be logistically impossible to include the whole of a population of interest in qualitative research; instead various approaches to sampling may be used as outlined in Table 2.9.

Table 2.9 Approaches to sampling in qualitative research
Adapted from Bowling 2002

| Sampling method | Features |
|---|---|
| Convenience/ opportunist sampling | Recruitment on the basis of convenience e.g. ease of access, personal knowledge of participants, or by taking advantage of an opportunity to recruit |
| Purposive sampling | Criteria are set for participants i.e. that they will share a certain characteristic. This method is also used when piloting a data collection tool; criteria will match those of the target population to allow testing of the data collection tool |

| Sampling method | Features |
|---|---|
| Snowballing | Research participants are asked whether they know of others who are in the target group; these contacts are then recruited and asked to recruit others. This method can impact on participant diversity |
| Theoretical sampling | Used in grounded theory research (Glaser 1967). An initial small sample is recruited and interviewed to gain an understanding of the research area; additional participants who may challenge developing understandings are then recruited. Recruitment stops when data saturation appears to have been reached |

### 2.10.1 Sample size in qualitative research

As above, qualitative research is used to explore in-depth participants' views, attitudes and experiences. Whereas in quantitative research a power calculation is used to determine the optimum sample size (Bowling 2002), in qualitative research the optimum sample size is influenced by several study-specific and more general factors. These include the complexity of the study, the diversity of the target population, methodological approach, data generation methods used and the financial and human resources available (Mason 2010).

Some authors have suggested guidelines as to a range of suitable sample sizes depending on the methodological approach being taken; Polkinghorne (1989) suggested between 5 – 25 interviews for phenomenological studies.

### 2.10.2 Data saturation

Data saturation is an important concept in qualitative research and is defined as:

> "…the point in data collection when no new additional data are found that develop aspects of a conceptual category."
> (Francis *et al*. 2010 p.1230).

Guest and colleagues (2006 p.60) asserted that:

> "…saturation has … become the gold standard by which diversity samples are determined in health science research"

Mason reviewed sample size and saturation across 560 qualitative interview-based PhD studies (Mason 2010). In phenomenology studies he found a range of 7 – 89 participants/ interviews required to reach data saturation with a mean of 25 and a mode and median of 20 (Mason 2010). Mason also found a significantly high proportion of studies which had reached data saturation at a sample size of some multiple of 10 and pointed out that there was "no logical (or theory driven) reason" why that should be.

Francis (2010) reviewed studies published between June 2006 – September 2007 in the multidisciplinary journal *Social Science and Medicine.* Eighteen studies mentioned data saturation of which fifteen claimed to have achieved it but there was very little information about how this had been established. Francis proposed a method of establishing whether data saturation had been reached (p.1235):

- *a priori* setting of an "initial analysis sample" using stratified sampling and based on the research question/s, interview schedule, diversity of participants and analytical approach used

- *a priori* setting of a "stopping criterion" i.e. how many more interviews would be conducted and analysed beyond the point where no new themes emerge

- rigorous analysis conducted independently by at least two researchers

- provision of details of how data saturation was established

Francis' somewhat quantitative method does not fit well with the qualitative approach taken in this study and so the method was adapted: no *a priori* targets or criteria were set but graphical representation was used to illustrate the emergence of themes.

### 2.10.3 Information and justification for setting and sampling used in this programme of research

#### 2.10.3.1 Information on setting: NHS Grampian

The research was carried out among non-medical prescribers employed by or contracted to NHS Grampian. This serves a population of half a million people living predominantly in and around the city of Aberdeen and in several towns, numerous villages and an extensive rural area. Healthcare is delivered locally where possible via a primary care network of 86 GP practices, community pharmacies and others providing professional health-related services. Again where possible primary care provision includes specialist services formerly available only in secondary care. Secondary care is provided in large hospitals in Aberdeen and Elgin and in local community hospitals across the region. The NHS Grampian Clinical Strategy 2016-2021 highlights the importance of staff working together and with partner health and social care organisations to deliver on the priorities of primary and secondary prevention, self-management of health conditions, planned care and unscheduled care (NHS Grampian 2016a). Integration of health and social care recognises the importance of multi-disciplinary working and is a key part of the Scottish Government's *2020 Vision* (Scottish Government 2011). In recognition of this, increasingly the term "person-centred" is used in preference to "patient-centred". Participants in the study were healthcare professionals and invariably described those for whom they were caring as "patients". This term is also used throughout the literature which informs this thesis and so "patient-centred" has been used in this thesis.

At the time of the study in 2015 there were 612 nurse independent prescribers and 52 pharmacist independent prescribers employed by or contracted to NHS Grampian. Given that data was to be collected by face to face interviews it was decided to set the research in the NHS Grampian area.

#### 2.10.3.2 Justification for sampling

The aim of this programme of research was to explore and describe prescribing decision-making by non-medical prescribers. The sampling frame was non-medical prescribers employed by or contracted to NHS Grampian. As stated in

Chapter 1, at the start of the study in 2015 there were 667 of these nurse and pharmacist independent prescribers. It was anticipated that recruitment might be limited; potential participants would be busy people and would not necessarily prioritise participation in research. It was therefore decided to ask that the recruitment e-mail be sent to all. At the time of this study NHS Grampian employed a senior pharmacist to lead on pharmacist prescribing (the Pharmacist Prescribing Lead) and a senior nurse to lead on prescribing by non-pharmacist NMPs (the NMP Lead). Using purposive sampling recruitment e-mails were sent by these professionals to all non-medical prescribers employed by or contracted to NHS Grampian. Snowballing was also used to increase participant numbers. Had recruitment allowed, further purposive sampling would have been used to ensure representation from nurse and pharmacist prescribers in primary and secondary care.

## 2.11 Trustworthiness in qualitative research

Rigour in qualitative research is represented by the concept of trustworthiness (Guba 1981). Guba proposed four constructs which ensure trustworthiness in qualitative research. They are given below with their quantitative research equivalents:

- credibility (rather than internal validity)
- transferability (rather than external validity/ generalisability)
- dependability (rather than reliability)
- confirmability (rather than objectivity)

Shenton (2004) elaborated on these constructs, identifying approaches necessary to promote trustworthiness in a study.

### 2.11.1 Approaches in this programme of research contributing to trustworthiness

Some of Shenton's recommended approaches to promoting trustworthiness have been used in this programme of research, as shown in Table 2.10.

Table 2.10 Elements in this programme of research contributing to trustworthiness

Adapted from Shenton 2004

| Constructs contributing to trustworthiness in qualitative research | Used in this programme of research |
|---|---|
| Credibility | • adopting a recognised research method used previously by researchers working in the area<br>• being familiar with the culture of participating organisations (in this case NHS Grampian)<br>• giving potential participants the opportunity to refuse to participate and to withdraw at any time<br>• encouraging honest participation<br>• emphasising the independence of the interviewer<br>• having frequent meetings between researcher and supervisors<br>• having peer scrutiny of the research project<br>• providing thick description of the phenomenon<br>• examining previous research in the field carefully |
| Transferability | Providing information on the context of the research<br>• the employing organisation (NHS Grampian)<br>• any restrictions on the types of participants<br>• the number of participants<br>• the data collection methods<br>• the number and length of interviews<br>• the data collection time period |
| Dependability<br><br><br><br>Dependibilty | Providing information on<br>• the research design and its implementation<br>• the operational detail of data gathering<br>• reflective appraisal of the project<br>Use of overlapping methods i.e. general and critical incident-based interviews |
| Confirmability | Providing<br>• detailed methodological descriptions<br>• justification of methods used<br>• reflexive approach<br>• critical review |

### 2.11.2 Approaches contributing to trustworthiness in critical incident-based interview studies

Butterfield and colleagues at the University of British Columbia have developed expertise in using modified versions of Flanagan's critical incident technique in a range of research areas (Butterfield *et al*. 2005). They describe the evolution of a series of credibility checks (p.484) which they believe are congruent with Flanagan's ideas and which enhance the robustness of critical incident-based research.

### 2.11.3 Approaches contributing to trustworthiness in this programme of research

Several of Butterfield's credibility checks were included in the design of Phases 2 and 3 of this study, again enhancing the credibility and trustworthiness of findings:

- interviewing participants after thematic categorisation of their "critical incident" recording
- *verbatim* transcribing of recorded interviews
- duplicate analysis of a sample of data [in this case, all data]
- establishing the point of data saturation
- reviewing of tentative themes by relevant experts, and
- establishing theoretical agreement by reference to the literature

## 2.12 Reflexivity

In qualitative research the researcher has a particular and integral role in data generation and analysis, in addition to other elements common to all research, and there is potential for him or her perhaps unconsciously to exert influence on these processes. The professional identity of a researcher may in any case

impact on participants' contributions in interviews (Richards and Emslie 2000); this may particularly be the case where the focus of the interview is prescribing decision-making (Stevenson *et al*. 2000) and perhaps even more so if the interviewer is known to be a pharmacist. Again during data analysis and interpretation the researcher's personal, perhaps unacknowledged opinions and beliefs may bias findings.

Measures described elsewhere were taken throughout the programme of research to try to minimise the impact of the doctoral student's profession and professional background. During interviews the shared frame of reference with participants was however beneficial, ensuring a shared understanding of allusions and ideas, for example "a Friday afternoon prescription". According to the interpretivist philosophy such a shared understanding is essential to the development of knowledge (Bunniss and Kelly 2010).

LeVasseur (2003) suggested that "bracketing" is a natural part of qualitative research. In some way researchers have to suspend their previous knowledge or understanding in order to approach the research area free of assumptions and preconceptions. The doctoral student has extensive experience of prescribing:

- as Module Coordinator for the Pharmacist Independent Prescribing module
- as a lecturer contributing to the education of non-pharmacist NMPs
- previous published research on aspects of NMP
- as a member of the NHS Education for Scotland Non-medical Prescribing Pharmacy Advisory Group
- as a pharmacist, counter prescribing for a wide range of minor ailments and supplying medicines under Urgent supply and the Chronic Medication Service (Community Pharmacy Scotland 2017)
- as a patient

These experiences and particularly the doctoral student's teaching, research and reading have informed her interest in the process of prescribing decision-making.

As described in the Foreword the research student is already an experienced researcher and supervisor of Masters and degree level research. She has been aware throughout of the potential for her background to "cloud" the research process and has been scrupulous, as have her supervisors, in attempting to avoid this.

## 2.13 Bias

Bias is a threat to the quality of all research, including to the trustworthiness of this study. Awareness of potential sources of bias allows development of a method which mitigates these; the potential for bias in this programme of research will also be considered in the discussion of findings.

### 2.13.1 Approaches taken to mitigate bias in this programme of research

Bowling (2002) lists a number of biases which are considered in Table 2.11 along with steps taken in this study to mitigate them. In addition, as described earlier the approaches recommended by Shenton (2004) and Butterfield (2005) which have been incorporated in the study design will also promote trustworthiness.

Table 2.11 Possible sources of bias and steps taken to mitigate these
Adapted from Bowling 2002

| Bias | Steps taken in this programme of research |
|---|---|
| Acquiescence ('yes-saying') bias | Rigorous development of Phase 1 interview schedule; open questions used throughout Phase 1 and 3 |
| Assumption (conceptual) bias | Study designed by experienced, multi-disciplinary team with input from relevant external experts |
| Design bias | As above |
| Information bias | Rigorous approach taken to analysis of data: coding frame developed from the literature and agreed with supervisors, doctoral student used NVivo® to support analysis and all transcripts analysed by two researchers |
| Interviewer bias | Researcher aware of potential for this; trained and experienced in carrying out qualitative research including interviews. Neutrality of researcher explained before each interview |

| Bias | Steps taken in this programme of research |
|---|---|
| Non-response bias | Participants self-selected and may have been different in some way to those who chose not to participate. No attempt was made to survey non-responders |
| Reactive effect | Related to social desirability bias below. Participants were given assurances of anonymity and confidentiality, except if they chose to share information relating to possible patient harm |
| Recall bias | Participants were asked to record their Phase 2 reflections in a timely way. These were replayed to participants before their Phase 3 interviews to mitigate recall bias |
| Sampling bias and selection bias | As above; sampling frame was all NMPs employed by or contracted to NHS Grampian and participants self-selected |
| Social desirability bias | Participants assured of anonymity and confidentiality as above and encouraged to be honest. Some shared information which did not portray the participant in a good light, suggesting candour |

## 2.14 Confounders

Confounders are variables which are not themselves being studied but which may be linked to study findings. In quantitative research randomised controlled trials attempt to match as many of these confounders as possible as one way of optimising the reliability of results. In qualitative research rigorous data analysis is required and purposive sampling may mitigate the effects of confounders.

### 2.14.1 Approaches taken to mitigate confounding in this programme of research

Analysis of data was carried out by two researchers independently and any disagreements resolved by discussion. Purposive sampling of all the NMPs employed by or contracted to NHS Grampian was used.

## 2.15 Data analysis

Data analysis is the means by which results (or "findings" in qualitative research) are generated from research data. Analytical rigour is required to prevent

information bias and ensure that findings reflect the data. Several broad approaches to analysis of qualitative data have been developed and are considered in Table 2.12 below.

Table 2.12 Approaches to analysis in qualitative research
Adapted from Bowling 2002

| Approach | Features |
|---|---|
| Grounded theory<br>(Glaser 1967) | Used to generate or discover a general explanation or theory to explain a process, action or interaction. No pre-conceptions; open coding followed by axial then selective coding. Findings and hence any theory are grounded in and emerge from the data |
| Framework Approach<br>(Ritchie *et al.* 2014) | Used where there is pre-existing knowledge from the literature about the research area, and/ or an appropriate theoretical underpinning, allowing construction of an initial framework to be used for analysis. Categories may be added or removed as required.<br>See Chapters 4 and 5 |
| Narrative approach<br>(Creswell 2013) | Used in narrative research.<br>Participants' narratives may be re-organised (sometimes chronologically) into a general framework; participant validation checks may be included |
| Analysis in ethnographic studies<br>(Creswell 2013) | Detailed description and analysis of data from field work focuses on the aspects of the culture-sharing group and emerging themes, producing an overall interpretation and a cultural portrait of the group |
| Analysis in case studies<br>(Creswell 2013) | Detailed description of the case followed by holistic analysis of the whole case or embedded analysis of particular aspects. The context of the research is important and used in creating the meaning of the case study |

### 2.15.1 Justification for method of data analysis used in this programme of research

This programme of research was underpinned by reference to the TDF and to the literature. Given this theoretical underpinning and pre-existing knowledge it was appropriate that a Framework Approach to data analysis was taken using the 14 domains of the TDF to form the initial coding framework (Cane, O'Connor and Michie 2012, Ritchie *et al*. 2014). The Framework Approach has five steps (Pope, Ziebland and Mays 2000):

- familiarisation with the data: listening to recordings, reading transcripts, going over field notes, studying any other data sources
- identifying a thematic framework from the literature or underpinning theoretical framework; this may be added to as analysis progresses
- indexing: ascribing all "significant statements" (Creswell p. 82) to the appropriate part or parts of the framework
- charting: synthesising and arranging the data thematically
- mapping and interpreting: a process whereby broader themes are identified from the data and in relation to the framework categories

Use of specialist software has been found to enhance the rigour of analysis in qualitative research (Kelle, Prein and Bird 1995). NVivo® (QSR International Pty Ltd. 2016) was used by the doctoral student to support data analysis.

## 2.16 Research ethics

Medical ethics have been described as having four components: beneficence, non-maleficence, respect for autonomy and justice (Beauchamp and Childress 2013).

In relation to this programme of research, beneficence required that the study was carried out in a way that offered benefits to all participants. Non-maleficence required the avoidance of causing harm to participants or others.

Respect for autonomy was achieved by providing sufficient information to allow participants to give informed consent at each stage of the study and by reporting/ reflecting their contributions honestly. Justice in this study had two components: it required that all participants were treated in the same way and that the study design ensured compliance with relevant policies and legislation.

In addition to these four components, pharmacists, of whom the doctoral student is one, are guided by the requirement to adhere to the General Pharmaceutical Council's Standards for Pharmacy Professionals (General Pharmaceutical Council 2017d). The ethical issues of this study will be considered with respect to these components and standards.

### 2.16.1 Beneficence and non-maleficence

Research participants were pharmacist and nurse independent prescribers. These are relatively new roles requiring extensive study at postgraduate level and participants, particularly those who had been prescribing for some time, might be considered as "early adopters" (Rogers 2003). Participants were informed in the recruitment e-mail (Appendix 2.1) that findings from the research "may help to improve education and training around prescribing decision-making and hence patient care." Participation therefore offered opportunities for beneficence but also maleficence for example should participants' contributions become identifiable. Conduct of the study was designed to ensure that participants' identities remained confidential; they were described only by their profession, practice setting and gender and any identifiers were removed following transcription.

Again in the recruitment e-mail and before the start of each interview participants were reminded that if they chose to disclose an issue which in the opinion of the doctoral student might compromise patient-safety then this would be discussed with the supervisory team and shared with the NHS Grampian pharmacist or non-medical prescribing Lead. In any case all transcripts were discussed with the supervisory team and analysed by the doctoral student plus one of SC, DS and KFM. Healthcare professionals in Scotland have a legal duty of candour (*Health (Tobacco, Nicotine etc. and Care) (Scotland) Bill.*2016) in addition to the requirements of their professional Code and Standards (Nursing

and Midwifery Council 2105, Health and Care Professions Council 2016, General Pharmaceutical Council 2017d). Participants could choose what to disclose to the doctoral student, satisfying autonomy and possibly beneficence. The reminder about the potential for information to be shared satisfied non-maleficence and the doctoral student's own obligation to act with candour.

### 2.16.2 Respect for autonomy

Participants were provided with initial information about the study via the recruitment e-mail (Appendix 2.1). This included a link to an on-line consent and copyright form providing additional information including a 'frequently asked questions' section. Participants were asked to provide written consent to participating in each of Phases 1, 2 and 3 separately and to having their anonymised data shared with the research team and published. Participants were reassured that their responses would be kept confidential. Notwithstanding that they were asked to consent to any information which might compromise patient safety, including participant identity, being discussed with the research team and the NHS Grampian Pharmacist and Non-medical prescribing Leads if required, following the principle of non-maleficence. Participants were also told that they could withdraw from the study at any time without giving a reason, again respecting their autonomy.

In Phase 1 of the programme of research participants were asked to take part in a semi-structured, face to face interview lasting approximately 30 minutes, exploring influences on their prescribing decisions. The interview schedule was designed to elicit the required information while minimising the cognitive burden on participants. Participants were asked to choose the interview locations; all chose their places of work which again minimised any burden to them.

In Phase 2 of the programme of research participants were provided with digital recorders, instructed in their use and asked to record a short reflection on a prescribing decision they made which they felt was noteworthy in some way. No direction was given as to the type of decision on which they should reflect, upholding their autonomy.

In Phase 3 of the programme of research participants were interviewed by the doctoral student on their Phase 2 reflection/s.

### 2.16.3 Justice and ethics

Conduct of the research was informed by the School of Pharmacy and Life Science Standard Operating Procedure for good research conduct (School of Pharmacy and Life Sciences 2011). It was also carried out in accordance with the requirements of the Data Protection Act (1998) and RGU Data Protection (Robert Gordon University 2016a), Research Ethics (Robert Gordon University 2016b) and Research Governance and Integrity (Robert Gordon University 2016c) policies. Measures taken by the doctoral student to ensure compliance with these procedures and legislative controls are described in Chapter 4 and Chapter 5.

Ethics approval was obtained from the Research Ethics Committee, School of Pharmacy and Life Science, RGU (4th September 2014, Appendix 2.2 and amended proposal approved 19th December 2014, Appendix 2.3). The North of Scotland Research Ethics Service advised that NHS ethics approval would not be needed (13th August 2014, Appendix 2.4). Approval was obtained from NHS Grampian Research and Development (23rd July 2015, Appendix 2.5; approval for extension to the study duration 26th April 2016 Appendix 2.6).

The doctoral student is trained in qualitative research methods and is experienced in supervising and carrying out qualitative research including interview-based research. She has completed NHS Grampian Good Clinical Practice core training for researchers (non-drug) (NHS Grampian 2016b) and applied for and was granted a Research Passport as part of the NHS Research and Development approval process (National Institute for Health Research 2010).

The General Pharmaceutical Council's Standards for Pharmacy Professionals (2017b) outline responsibilities which match those inherent in good research governance, for example with regard to taking responsibility for one's own working practices, showing respect for the autonomy of others and ensuring the

well-being of all those involved. These responsibilities were met throughout this study.

## 2.17 Summary

Stage 1 of this programme of research was a systematic review of the literature on social and cognitive influences on prescribing decision-making by NMPs (McIntosh *et al*. 2013, McIntosh *et al*. 2014, McIntosh *et al*. 2016a). Results from this systematic review informed the development of Stage 2 of the programme. This was undertaken according to an interpretivism philosophy using a qualitative research methodology and was underpinned by reference to the TDF. A phenomenological, cross sectional study was designed. Data were generated by means of three phases carried out with NMPs in NHS Grampian:

Stage 2 Phase 1: semi-structured face to face interviews exploring their prescribing decision-making (McIntosh *et al*. 2017)

Stage 2 Phase 2: participants' self-recorded reflections on individual prescribing decision/s which they felt were noteworthy in some way

Stage 2 Phase 3: semi-structured face to face interviews with participants based on their reflections

# Chapter 3 Systematic review

## 3.1 Introduction

A systematic review of the literature on social and cognitive influences on prescribing decision-making among non-medical prescribers was carried out to inform development of the programme of research. As described in Chapter 2, systematic reviews identify, appraise critically and synthesise relevant literature to answer specific research question/s (MacLure, Paudyal and Stewart 2016).

It has been suggested that synthesising i.e. combining the findings of qualitative studies in some way does not align with the epistemological and ontological beliefs of the interpretivist philosophical approach which informs qualitative research (Pope, Mays and Popay 2007). If multiple realities exist, constructed and known by lived experiences and interactions with others perhaps it is artificial to try to combine these to present one definitive version of reality. Be that as it may, the benefits of drawing together the results of multiple studies in facilitating the accumulation of research-derived knowledge are well recognised. Systematic reviews provide Level 1 evidence in the hierarchy of evidence (Scottish Intercollegiate Guidelines Network 2008).

Various approaches to synthesis of evidence from qualitative research exist; these are outlined in Table 3.1 below.

Table 3.1 Approaches to synthesis of evidence from qualitative research
Adapted from Pope, Mays and Popay 2007

| Approach to synthesis | Used |
|---|---|
| Interpretive synthesis | A process of qualitative re-interpretation and re-analysis of text-based forms of evidence using constant comparison. Includes grounded theory, comparative case study and meta-ethnography |
| Thematic analysis | Identifies the most prominent or most relevant themes for the research question again by a process of comparison |
| Realist synthesis | Tests the causal mechanisms or theories of change which underlie a particular type of intervention |
| Narrative synthesis | Uses text to explore and synthesise the findings of multiple studies |
| The EPPI approach (Evidence for Policy and Practice Information and coordinating (EPPI) Centre at the Institute for Education, London) | Combines the results of multi-mixed methods studies in a meta-synthesis |

A narrative synthesis approach was taken throughout this review, facilitating analysis of relationships between and within studies (Popay *et al.* 2006, Centre for Reviews and Dissemination 2009). This choice of method is discussed further in Section 3.6. The review was published in 2016 (McIntosh *et al*. 2016)

## 3.2 Database search for any pre-existing systematic review

An initial search for pre-existing systematic reviews was carried out in the following databases: The Centre for Reviews and Dissemination, the Cochrane Database of Systematic Reviews, the National Institute for Health and Care Excellence, Science Direct, Medline, International Pharmaceutical Abstracts (IPA), Web of Knowledge and Google Scholar (Gehanno, Rollin and Darmoni 2013). No systematic review was found.

## 3.3 Systematic review objectives

The overall aim of the systematic review was to identify and characterise social and cognitive factors and perceived factors influencing the prescribing decision-making process among non-medical prescribers (McIntosh *et al*. 2013).

The objectives of the systematic review were:

- to determine the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK

- to report on the methodologies and methods used and quality of peer reviewed published studies in this area

## 3.4 Development of protocol

Protocol development was informed by the *Guidance for undertaking reviews in healthcare: systematic reviews* published by the Centre for Reviews and Dissemination (CRD) (2009), whose approach and recommended structure were followed. Discussions with the supervisory team clarified the objectives, particularly in relation to the term "social and cognitive influences", and specialist librarians advised on the search strategy and searching techniques (Grant and Booth 2009). The systematic review protocol (Appendix 3.1) was accepted for registration and published by Prospero, the international prospective register of systematic reviews in health and social care maintained by the CRD (Centre for Reviews and Dissemination 2013), registration number CRD42013004729 (McIntosh *et al*. 2013).

A search strategy was developed iteratively through discussion as above and through study of the search strategies of several key systematic reviews in the separate areas of prescribing decision-making and non-medical prescribing (Ostini *et al*. 2009, Bhanbhro *et al.* 2011, Kroezen *et al*. 2011, Teixeira Rodrigues *et al*. 2012, Brennan and Mattick 2013).

### 3.4.1 Inclusion and exclusion criteria

Inclusion criteria:

- Peer-reviewed studies published since 2003 (the date of implementation of supplementary and independent non-medical prescribing in the UK) reporting primary and secondary (if any) research focussing on the prescribing decision-making of these non-medical prescribers.

- Studies published in English

Exclusion criterion:

- Studies where data from prescribers other than supplementary and independent non-medical prescribers were included but this was not reported according to the prescribers' professions.

### 3.4.2 Databases

The following databases were searched separately during June 2013 and results combined:
MEDLINE, PsycARTICLES, Cumulative Index to Nursing and Allied Health Literature (CINAHL), International Pharmaceutical Abstracts (IPA), Education Resources Information Centre (ERIC), the Cochrane Library and Google Scholar. Table 3.2 shows the characteristics of these databases.

Table 3.2: Characteristics of databases used in systematic review search

| Database | Description from webpage |
|---|---|
| Medline (U.S. National Library of Medicine 2017) | The US National Library of Medicine® premier bibliographic database containing more than 23 million references to journal articles in life sciences with a concentration on biomedicine |
| PsycARTICLES (American Psychological Association) | The database of full-text peer-reviewed articles published by the American Psychological Association and affiliated journals |
| Cumulative Index to Nursing and Allied Health Literature (EBSCO Industries 2017a) | CINAHL Database provides indexing of the top nursing and allied health literature available |

| Database | Description from webpage |
|---|---|
| International Pharmaceutical Abstracts (EBSCO Industries 2017b) | Provides indexing and abstracts for pharmaceutical and medical journals published worldwide |
| Education Resources Information Centre (Institute of Education Sciences) | An internet-based digital library of education research and information |
| The Cochrane Library (Wiley Online Library 2017) | A collection of databases in medicine and other healthcare specialties provided by Cochrane and other organizations |
| Google Scholar (Google 2017) | Provides a simple way to search for scholarly literature across many disciplines and sources |

### 3.4.3 Search terms

Search terms were discussed and agreed with the supervisory team and specialist librarians. Boolean terms AND and OR and truncations were used to expand the search. Search terms were:

prescrib*

AND

the (truncated) names of relevant non-medical professions ie

pharm* OR nurs* OR physiotherap* OR podiatr* OR radiograph*

AND

influenc* or decision* or decid* or judge* or factor*.

Citation searching was used to expand the search and electronic current awareness alerts were set up with NHS Evidence, Google Scholar and the British Library. Medical Subject Headings (MeSH) terms were not used as there was no MeSH term for "prescribe" (US National Library of Medicines 2017).

### 3.4.4 Recording and managing the search

All documentation was stored in a folder on the University shared drive accessible to supervisory team members. Search results were recorded using

Microsoft Word®. References were stored in Refworks® bibliographic software (ProQuest 2017).

### 3.4.5 Study selection

A sequential, three stage search was carried out. Search terms were used in the title and/or abstract within MEDLINE, PsycARTICLES, CINAHL and IPA or (within ERIC) in keywords to identify papers for initial inclusion. A similar approach was taken when searching in the Cochrane Library, and the advanced search facility in Google Scholar was used (Gehanno, Rollin and Darmoni 2013, Google 2017).

Stage 1: duplicate studies were removed. Titles of all retrieved studies were considered alongside inclusion and exclusion criteria. Those which did not meet these were excluded and the reason documented; where there was doubt they were included and reviewed again at the next stage.

Stage 2: abstracts of retained studies were assessed for relevance as above. Again where there was doubt studies were included.

Stage 3: full texts of all studies retained after Stage 2 were obtained and their relevance assessed as above. References from papers included were hand searched.

Decisions were made by the doctoral student; at each stage a 10% sample was independently assessed by one of supervisory team members SC, DS and KFM and any disagreements resolved by discussion.

The selection process was piloted on 50 studies and discussed with the supervisory team; no adjustments were deemed necessary. A PRISMA flow chart (Moher *et al*. 2009) summarising the study selection process is given in the results section (Figure 3.1, page 88).

## 3.5 Quality assessment

Studies were assessed for quality using the Critical Appraisal Skills Programme tool for qualitative research (CASP-UK 2013) which has clear guidelines to support its use (Katrak *et al*. 2004). Had any quantitative research papers been

included they would have been critically appraised using an appropriate tool (CASP-UK 2013, Institute of Social and Preventive Medicine 2009). As above, decisions were made independently by the doctoral student and one of the supervisory team and any disagreement resolved by discussion.

## 3.6 Data extraction

A data extraction form was prepared based on the review objectives, guidance from the CRD (2009) and in consultation with the supervisory team. Publication details, study aims/ objectives, setting, recruitment and participant details, unit of analysis, approach to analysis, theoretical underpinning (if any) and a summary of outcome data and conclusions were included. The data extraction form was piloted on one paper and found to be suitable.

Data extraction was carried out independently by the doctoral student and one of the supervisory team as above and results compared; any disagreements were resolved by discussion.

## 3.7 Method of data synthesis

Study findings were synthesised using the narrative synthesis approach developed by Popay and colleagues (2006) on behalf of the Economic and Social Research Council Methods Programme. This was endorsed in CRD guidance on undertaking reviews in healthcare (Centre for Reviews and Dissemination 2009).

Popay's approach uses text to summarise studies and synthesise findings; given the largely textual nature of the data this was considered appropriate. The method is systematic and transparent; a framework including various tools and techniques is used to facilitate robust evaluation of quality and synthesis of findings. The synthesis process itself is then subjected to critical reflection by the author (Busse *et al.* 2002).

## 3.8 Findings of systematic review

### 3.8.1 Literature search results

The results of the literature search are shown in the PRISMA flow chart (Moher *et al.* 2009) (Figure 3.1) below.

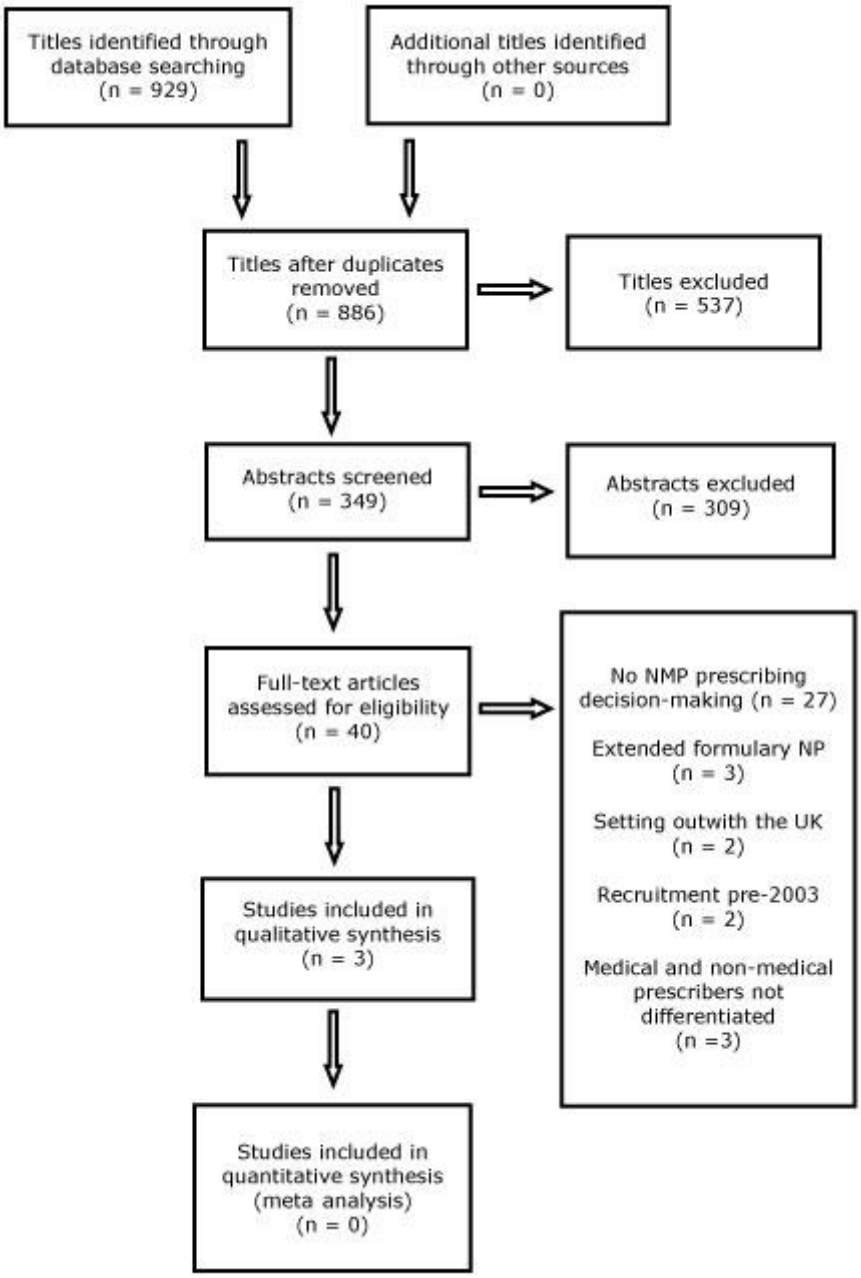



Figure 3.1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher *et al.* 2009)

After exclusion of duplicates, 886 titles, 349 abstracts and 40 full studies were sequentially screened. Thirty seven studies were excluded for the following reasons:

- no NMP prescribing decision-making (n=27)

- Extended Formulary Nurse Prescribers (EFNP) (n=3)
- setting out with the UK (n=2)

- recruitment pre-2003 therefore prescribers were EFNP or community practitioner nurse prescribers (n=2)

- medical and non-medical prescribers not differentiated in reporting of results (n=3)

Three studies were included in the review:

• Philp and Winfield, 2010. Why prescribe antibiotics for otitis media in children?

• Rowbotham, Chisholm, Moschogianis, Chew-Graham, Cordingly, Wearden and Peters, 2012. Challenges to nurse prescribers of a no-antibiotic strategy for managing self-limiting respiratory tract infections.

• Offredy, Kendall and Goodman, 2008. The use of cognitive continuum theory and patient scenarios to explore nurse prescribers' pharmacological knowledge and decision-making.

Tables 3.3, 3.4 and 3.5 provide summaries of quality assessments of the three papers. Tables 3.6, 3.7 and 3.8 provide data extraction summaries.

Table 3.3 Quality assessment summary Philp and Winfield 2010

| Author year | Clear state-ment of aims | Qualitative method-ology appro-priate | Design appro-priate | Recruitment strategy appropriate | Data collection appropriate | Reflexivity considered | Ethical issues considered | Rigorous data analysis | Clear statement of findings | How valuable is the research |
|---|---|---|---|---|---|---|---|---|---|---|
| Philp and Winfield 2010 | Yes<br><br>But only stated clearly in abstract | Yes<br><br>Justified:<br><br>in-depth exploration | Partial<br><br>Semi-structured interviews; topic guide used, no detail on this | Partial<br><br>Invitation/ information letters sent via practice managers; no follow up | Partial<br><br>Semi-structured interviews lasting 30 – 45 minutes. Setting not considered or justified; no detail on topic guide; no discussion of data saturation; no theoretical framework | Partial<br><br>No detail on research team; no attempt to bracket. Extent of involvement of researchers in constructing a version of participants' world not clear | Partial<br><br>Good detail re obtaining consent but not clear whether this was oral or written. No detail on organi-sations giving ethics approval; no consid-eration of potentially trouble-some "fall-out" | Partial<br><br>Detailed description<br><br>No discussion of reflexivity; may have benefitted from a theoretical framework | Yes<br><br>Explicit; also clear statement of implication. No real discussion of evidence for and against the re-searchers' arguments | Valuable<br><br>Provides useful information on nurse prescribers' perspective; findings discussed in relation to what is known about medical prescribing |

Table 3.4 Quality assessment summary Rowbotham *et al*. 2012

| Author year | Clear statement of aims | Qualitative method-ology appropriate | Design appropriate | Recruitment strategy appropriate | Data collection appropriate | Reflexivity considered | Ethical issues considered | Rigorous data analysis | Clear statement of findings | How valuable is the research |
|---|---|---|---|---|---|---|---|---|---|---|
| Rowbotham *et al.* 2012 | Yes<br><br>But slightly different between abstract & paper | Yes<br><br>In-depth exploration of participants' experiences and thereby issues | Partial<br><br>Interviews & focus groups but not clear why both; allocation of participants not clear. Topic guide used for interviews; no detail on focus groups | Partial<br><br>More detail needed of setting and sampling frame; recruitment not clear; focus groups part of a training intervention | Partial<br><br>Semi-structured interviews & focus group discussions appropriate. No detail of interview schedule; no mention of focus group topic guide. No theoretical framework described, no discussion of sample size. Mentioned reaching thematic saturation | Partial<br><br>No details on researchers. Possibility of social desirability bias acknowledged but non-judgemental stance claimed and supported by reference to participants' sometimes un-edifying responses | Yes<br><br>NHS ethics approval received. Clear detail of procedure for obtaining informed consent and ensuring security of data | Partial<br><br>Detailed description of method of analysis but no theoretical framework or discussion of researcher roles | Yes<br><br>Themes with supporting quotations clearly set out. Focus groups: participants' professions not clear but over-whelmingly nurse prescribers | Valuable<br><br>Recent study addressing prescribing decision-making processes of nurse & to a lesser but unknown extent pharmacist and physio-therapist prescribers |

Table 3.5 Quality assessment summary Offredy, Kendall & Goodman 2008

| Authors year | Clear statement of aims | Qualitative methodology appropriate | Design appropriate | Recruitment strategy appropriate | Data collection appropriate | Reflexivity considered | Ethical issues considered | Rigorous data analysis | Clear statement of findings | How valuable is the research |
|---|---|---|---|---|---|---|---|---|---|---|
| Offredy Kendall & Good-man 2008 | No<br><br>Different in abstract and inside paper | Partial<br><br>Qualitative method appropriate for "in-depth" understanding Quantitative approaches included; appropriate to test knowledge | Partial<br><br>Some justification for method in discussion. Describe testing knowledge of pharmacology then later use the more accurate term "medication-related issues" | Partial<br><br>Not clear. Purposive sampling stated but no details | Partial<br><br>Exploring knowledge & decision-making; semi-structured interviews appropriate. Rating scheme used to assess knowledge and Cognitive Continuum Theory (CCT) used to categorise decision-making. Unclear how confidence was rated. No consideration of sample size or data saturation | No<br><br>No mention of Researchers back-grounds, stances or potential bias | Partial<br><br>Relevant ethics approval obtained. Some aspects of data governance not clear | Partial<br><br>Mainly quantitative analysis (frequency of participants within a category, ratings etc); limited elaboration of themes or how the content was analysed in relation to CCT. No coverage of own role, bias etc. Unclear how data presented were selected | Partial<br><br>Mix of nurse prescribers and trainee nurse prescribers but some results not separated by groups; quotations, categories and decision-making types not ascribed to participant type | Reasonably valuable<br><br>Relatively recent study addressing prescribing decision-making processes of nurse prescribers. Claims that cognitive continuum theoretical framework can help explain these |

Table 3.6 Data extraction summary Philp and Winfield 2010

| Authors, years | Aims/ objectives | Study design | Inclusion/ exclusion criteria | Recruitment | Participants/ setting | Unit of analysis | Method of analysis | Findings |
|---|---|---|---|---|---|---|---|---|
| Philp and Winfield 2010 | Describe evidence-based guidelines used by nurse prescribers in their prescribing practice.<br>Explore their perceptions of this guidance.<br>Explore how they think through their prescribing practice and influences upon this.<br>Explore perceptions held about their prescribing practice when treating otitis media in children | Qualitative<br>Audio taped semi-structured interviews | Nurse practitioners (n=8) with independent prescribing privileges who had undergone the Royal College of Nursing training pathway | Letters sent via practice managers of all medical practices in Cornwall for forwarding to potential participants. No second mailing, no enquiries about whether the practices had any nurse practitioners as detailed | 8 nurse independent prescribers working as nurse practitioners in general practice in Cornwall | Individual audio-taped semi-structured interviews based on topic guide and lasting 30 – 45 minutes | Thematic analysis using a framework developed from transcripts. Iterative process with "a considerable amount of abstraction and synthesis" | Participants aware of clinical guidance but unsure of quality; didn't always follow. Contexts, situations or patient groups also influenced prescribing decision-making. Parents' expectations and prescriber-patient relationship also influential. Participants comfortable with their prescribing |

Table 3.7 Data extraction summary Rowbotham *et al*. 2012

| Authors, year | Aims/ objectives | Study design | Inclusion/ exclusion criteria | Recruitment | Participants/ setting | Unit of analysis | Method of analysis | Findings |
|---|---|---|---|---|---|---|---|---|
| Rowbotham *et al*. 2012 | To explore how nurse prescribers and other NMPs experience consultations for respiratory tract infections + challenges faced in trying to implement a no-prescribing strategy | Qualitative Semi-structured interviews (n=15) + 3 focus groups (n=5, 4 & 12) | Not reported | Not clear Direct contact with practices + via local training event. Purposive sampling: location, discipline, age & scheduled/ unscheduled care | Not clear Abstract: 34 NPs, 1 PP & 1 Physio P. Paper: 31 NPs, 1 PP & 1 Physio P (both only in focus groups). North West of England.<br><br>(NP = nurse prescriber PP = pharmacist prescriber Physio P = physio-therapist prescriber) | 15 audio-recorded interviews (NPs). Quotations ascribed to individuals. 3 audio-recorded focus groups (NPs n=19 + 1 PP & 1 Physio P). Quotations ascribed only to one of three focus groups. No interview schedule; no topic guide; no detail on development but interviewers were responsive to issues emerging from participants' accounts | Iterative thematic analysis. Thematic saturation reached | Consultations found challenging; most felt they possessed some appropriate skills to manage these without prescribing antibiotics. Protocols supported decision-making; peer support helpful particularly with "demanding" patients. Newness of role resulted in a cautious approach by some. Little on prescribing decision-making other than the decision not to prescribe |

Table 3.8 Data extraction summary Offredy, Kendall & Goodman 2008

| Authors, year | Aims/ objectives | Study design | Inclusion/ exclusion criteria | Recruitment | Participants/ setting | Unit of analysis | Method of analysis | Findings |
|---|---|---|---|---|---|---|---|---|
| **Offredy, Kendall & Goodman 2008** | Abstract: to explore & test nurse prescribers' pharmacological knowledge & decision-making. Paper: to use an exploratory approach to test the usefulness of patient scenarios in addressing the reasons why nurses decide whether or not to prescribe | Qualitative. Semi-structured interviews (n=25) based on case scenarios | Nurse prescribers (n=18) and those training as nurse prescribers (n=7) | Purposive sampling (no detail). Information sent to managers of two primary care trusts for onward posting to all nurse prescribers & those undertaking a nurse-prescribing programme | Total of 25 nurse prescribers and those training as nurse prescribers, in two primary care trusts in south east England | Transcriptions of individual audio-taped semi-structured interviews based on patient scenarios. Quotations ascribed to individuals | Content analysis: text coded and categorised to assess participants' knowledge of medication-related issues and identify the type of cognition used to respond to the scenarios | Disparate prescribing rates & areas, commonly prescribed items. Most participants unable to identify clinical issues, failed to provide an acceptable solution, claimed issues were out with their competence & said they would refer to the GP. All rated themselves "knowledgeable" about drugs commonly used in their own clinical areas; most felt confident in their own clinical areas. Most commonly used modes of decision-making were moderately strong quasi-rational thought and weak quasi-rational thought. Knowledge (or lack of it) may dictate the mode of decision-making |

## 3.9 Summary of studies

### Critical appraisal of studies

All three studies justified the qualitative approach taken. Offredy and colleagues' study (2008) included additionally a quantitative, theoretically-derived element designed to explore participants' pharmacological knowledge. Theoretical underpinning was absent from the other two studies. Details on study design and recruitment were limited in all three studies as was any consideration of reflexivity. Data analysis was not always clear, with consequent lack of clarity in the statements of some findings.

All three studies were small-scale and carried out in primary care in separate areas of England. Philp and Winfield (2010) interviewed eight nurse practitioner prescribers about their treatment of otitis media. Rowbotham and colleagues (2012) explored the challenges of a no-antibiotic policy when treating self-limiting respiratory tract infections largely among nurse prescribers through interviews and focus groups (but included two other non-medical prescribers); numbers of participants were not clear. Offredy (2008) examined 25 nurse participants' knowledge of pharmacology and their prescribing decisions in general.

Systematic review inclusion criteria specified a focus on prescribing decision-making by supplementary and independent non-medical prescribers, however Offredy and colleagues also included trainee nurse prescribers. Some of their participants were extended formulary nurse prescribers, treating a limited list of conditions with a specific formulary of medicines. Given the small number of studies retrieved it was decided to include all three studies in data extraction and synthesis.

## 3.10 Synthesis of findings from systematic review

### 3.10.1 Approach to synthesis

Synthesis is one aspect differentiating a systematic review from a review of the literature (Centre for Reviews and Dissemination 2009); several approaches may be taken.

All three studies used qualitative research methods to explore aspects of non-medical prescribers' prescribing decision-making, although this was not the specific focus of any of them. Rather they focused more broadly and included perceptions of clinical guidance, patient and parental expectations, participants' levels of comfort with their prescribing decisions, participants' experiences of their consultations and scenario-based tests of participants' pharmacological knowledge. The largely qualitative nature of the data precluded meta-analysis while disparate study types and participants meant that results could not simply be 'pooled'. Instead, a robust narrative approach including critical reflection was needed to combine and synthesise study findings, generating original understandings. Such an approach should include combining the results of studies, evaluating the evidence, identifying any consistencies and exploring any discrepancies (Centre for Reviews and Dissemination 2009).

### 3.10.2 Narrative synthesis

Narrative synthesis considers not only study findings but also the relationships within and between studies, and evaluates the evidence to support its conclusions. The process should be transparent and robust (Centre for Reviews and Dissemination 2009). Various methods may be used; the Centre for Reviews and Dissemination endorses framework-based guidance produced as a result of work carried out for the Economic and Social Research Council Methods Programme (Popay *et al*. 2006). This takes a narrative approach, using text to summarise and synthesise studies and findings. This was thought appropriate given the largely textual data reported.

The framework has four stages which should be worked through iteratively, revisiting stages and techniques as appropriate:

- developing a theory
- developing a preliminary synthesis
- exploring relationships within and between studies
- assessing the robustness of the synthesis

The framework includes various tools and techniques which may be used as appropriate to support analysis and enhance transparency and ultimately the rigour of the final synthesis.

Popay's method is multi-stage; an iterative, integrated approach is described where the reviewer moves between the different stages, revisiting some as a result of insights obtained from others. This was done; at each stage it was necessary to select appropriate tools and techniques, encouraging an inductive, reflective approach which was felt to be very beneficial. In Tables 3.9, 3.10 and 3.11 selection or rejection of tools/ techniques and approaches has been justified briefly.

Guidance is only available by application to Professor Popay at the Division of Health Research at Lancaster University; those using it must undertake to provide Professor Popay with copies of any publications arising from its use.

### Stages in the synthesis

#### 3.10.2.1 Developing a theory

Social and cognitive influences are known to impact prescribing decision-making by doctors (Britten 1994, Butler *et al*. 1998, Stevenson *et al*. 1999, Britten *et al*. 2000 and Stevenson *et al*. 2001). Non-medical prescribers come from different disciplines and different traditions from those of doctors (Weiss and Fitzpatrick 1997, Weiss and Sutton 2009) and it was not known whether similar or additional social and cognitive influences might impact on their prescribing decision-making. This systematic review of social and cognitive influences on prescribing decision-making among non-medical prescribers was carried out to explore this.

#### Objectives

The review had two objectives which informed development of the review protocol (Appendix 3.1):

- to determine the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK

- to report on the methodologies and methods used and the quality of peer-reviewed published studies in this area. Consideration of the quality of the studies will be given in detail as part of the synthesis process

#### 3.10.2.2 Developing a preliminary synthesis

This provides an overview of study findings. Various elements may contribute; Popay and colleagues (2006) suggest that reviewers select whichever of the tools and techniques they consider appropriate for the types of studies and data i.e. quantitative, qualitative or a mixture of both.
Table 3.9 illustrates the range of tools and techniques, comments on these and states whether and why they were used.

Table 3.9 Tools and techniques for preliminary synthesis of findings
Adapted from Popay *et al.* 2006

| Name of tool/ technique | Comment | Selected? |
|---|---|---|
| Textual descriptions | A very brief textual summary of each study | Yes. Helped to identify key points, provided a useful summary and generated questions which informed subgroup analyses when exploring relationships in the data |
| Tabulation | Provided clear "at a glance" summaries of papers | Yes. Data extraction and quality assessment summaries prepared prior to synthesis |
| Groupings and clusters | Sorting according to populations, settings, study design or another aspect. Useful when considering larger numbers of disparate studies | No. Settings and target populations similar (almost all nurse prescribers/ trainees working in primary or acute care). Only three studies included in review |

| Name of tool/ technique | Comment | Selected? |
|---|---|---|
| Transforming data:<br><br>constructing a common measure | Useful when considering data from quantitative studies | No. Not applicable to textual data from qualitative research |
| Translating data (integrating themes and concepts reported across studies) | Would be useful in a larger systematic review to help make sense of possibly quite disparate studies | No. Only three studies included so not necessary at this stage. Used when exploring relationships within and between studies |
| Vote-counting as a descriptive tool | Useful when considering quantitative research | No. Not relevant |

### Textual descriptions of studies

These provided a summary of the studies and identified possible moderator variables and areas to be explored in sub-group analysis.

### Philp and Winfield, 2010. Why prescribe antibiotics for otitis media in children?

Philp and Winfield (2010) explored nurse prescribers' treatment of otitis media in children using semi-structured, audio-taped interviews with eight nurse prescribers working in primary care in Cornwall. Iterative thematic analysis of transcripts included researcher and participants "[being] interactively engaged in constructing a version of the participants' world" (p.15).

Participants valued and used evidence-based guidelines but felt that they were not appropriate in all circumstances; all described situations where external influences and/or concerns about possible clinical complications were more influential. All participants had been aware of parental pressure to prescribe antibiotics as they felt inappropriately; experience, confidence, knowledge of the patient and the support of colleagues were helpful in resisting this pressure. All but one reported having prescribed antibiotics against guideline recommendations as a result of external influences. Participants all reported feeling comfortable with their prescribing, citing knowledge of the patient and experience as contributing to their level of comfort.

Methodological weaknesses are described in Table 3.3 quality assessment summary and in Section 3.12.2 Methodological approaches, methods and quality of studies included in the systematic review.

### Rowbotham *et al*., 2012. Challenges to nurse prescribers of a no-antibiotic strategy for managing self-limiting respiratory tract infections

Rowbotham and colleagues (2012) sampled purposively non-medical prescribers in the northwest of England based on practice locations, age, discipline and care setting. They conducted one to one semi-structured interviews (nurse prescribers) and focus groups (nurse prescribers, one pharmacist prescriber and one physiotherapist prescriber) to study participants' experiences of managing patients with self-limiting respiratory tract infections.

Participants felt that some patients sought reassurance that their condition was not serious. Others wanted treatment with antibiotics, generally due to a lack of understanding of the condition and/ or previous treatment with antibiotics. Consultations could be time consuming and complex and participants worried about misdiagnosis, leading to a cautious approach. Some had prescribed antibiotics in the past in response to time pressure, patient expectation and/or clinical uncertainty but most said that they would no longer do so. Patient education and good communication skills were considered important and peer support and the use of guidelines helpful in resisting patient pressure for antibiotics.

Methodological weaknesses are described in Table 3.4 quality assessment summary and in Section 3.12.2 Methodological approaches, methods and quality of studies included in the systematic review.

### Offredy, Kendall and Goodman, 2008. The use of cognitive continuum theory and patient scenarios to explore nurse prescribers' pharmacological knowledge and decision-making

Offredy and colleagues (2008) sampled purposively nurse prescribers and trainee nurse prescribers working in primary care and in the acute sector in the southeast of England, to get a "mixed group of prescribers" p.860. They used semi-structured interviews including previously-validated clinical scenarios to score participants' pharmacological knowledge and ascribe their decision-making

in response to the scenarios to one of six modes according to Hammond's Cognitive Continuum Theory (Hammond 1978). They also asked participants about medication-related issues, and "to rate their knowledge and confidence of medication used in their area of practice" (p.858). Participants were not allowed access to the British National Formulary (BNF) (Joint Formulary Committee of the British National Formulary 2017) when responding to the scenarios.

It was found that participants working in general practice and some community settings prescribed more frequently than those in the acute sector, due regular patient contact and a good working relationship with the GP. Participants commonly prescribed for abdominal problems, infections, family planning, wound dressings, some antibiotics and analgesics. Some described extensive peer and organisational support for prescribing. Participants' knowledge of pharmacology was poor; most could not respond appropriately to the scenarios, particularly without access to the BNF, which some said they would consult before prescribing or offering advice. Participants who were unable to respond said they would refer the patient to the GP as the situations were out with their experience and competence. Most participants rated themselves as confident in dealing with medication-related issues. Participants' prescribing decision-making was categorised by Offredy and colleagues as involving moderately-strong or weak quasi-rational thought although the method by which this was done was not always clear.

Methodological weaknesses are described in Table 3.5 quality assessment summary and in Section 3.12.2 Methodological approaches, methods and quality of studies included in the systematic review.

#### Tabulation

Quality assessment and data extraction and forms were prepared according to the methods described in Section 3.5 (quality assessment) and Section 3.6 (data extraction). Results may be seen in Tables 3.3, 3.4 and 3.5 (quality assessment) and Tables 3.6, 3.7 and 3.8 (data extraction).

### 3.10.2.3 Exploring relationships within and between studies

According to Popay, findings of individual studies should be considered in relation to various aspects of the studies themselves, then all findings should be

considered together. Various tools and techniques are suggested to support this; details, a brief commentary and justification for use or not are given in Table 3.10 below.

Table 3.10 Tools and techniques to be used in exploring relationships within and between studies

Adapted from Popay 2006

| Name of tool/technique | Comment | Selected? |
|---|---|---|
| Graphs, frequency distributions, funnel plots, forest plots and L'Abbe plots | Provide visual, generally descriptive summaries of quantitative data | No. Not appropriate for qualitative data |
| Moderator variables (yes) and subgroup analysis (no) | Moderator variables analysis used to explore variables within studies which may influence their findings | Yes. Study designs, sampling strategies and theoretical underpinning and methods of analysis considered |
| Concept mapping | Useful to model key aspects relevant to the review and any relationships between them. | Yes. Concept map prepared. See Figure 3.2 |
| Quantitative case descriptions | Textual descriptions which attempt to explain differences in quantitative findings | No. Not appropriate for qualitative data |
| Visual representation of relationships between study characteristics and results | Concept mapping displays relationships between various elements of studies | Yes. Concept map prepared as above, Figure 3.2 |
| Concept triangulation | This allows the same concept to be examined in two different ways | Yes. Offredy 'scored' participants' knowledge of pharmacology/ medicine-related issues; the relationship (if any) between this and participants' self-assessed knowledge and confidence of medication used in their area of practice was explored |

| Name of tool/technique | Comment | Selected? |
|---|---|---|
| Reciprocal translation | Integrates themes and concepts reported across studies | Yes. "Pharmacological knowledge" and confidence in prescribing role were explored across all studies |
| Investigator (no) and methodological (yes) triangulation | Compares and contrasts findings from studies with respect to the investigators' backgrounds and disciplines or the study design | No mention in any study of investigators' backgrounds. Studies will be compared with respect to study designs |

### Concept mapping

A diagrammatic representation of all three studies was created and is reproduced below (Figure 3.2). Construction of the map showed that pharmacological knowledge was not identified as influential in the studies by Philp and Winfield (2010) and Rowbotham and colleagues (2012), and that the relationship between pharmacological knowledge and prescribing decision-making was not clear from Offredy's study (2008).

The following abbreviations are used to represent the papers:

P = Philp and Winfield 2010

R = Rowbotham *et al.* 2012

O = Offredy *et al.* 2008

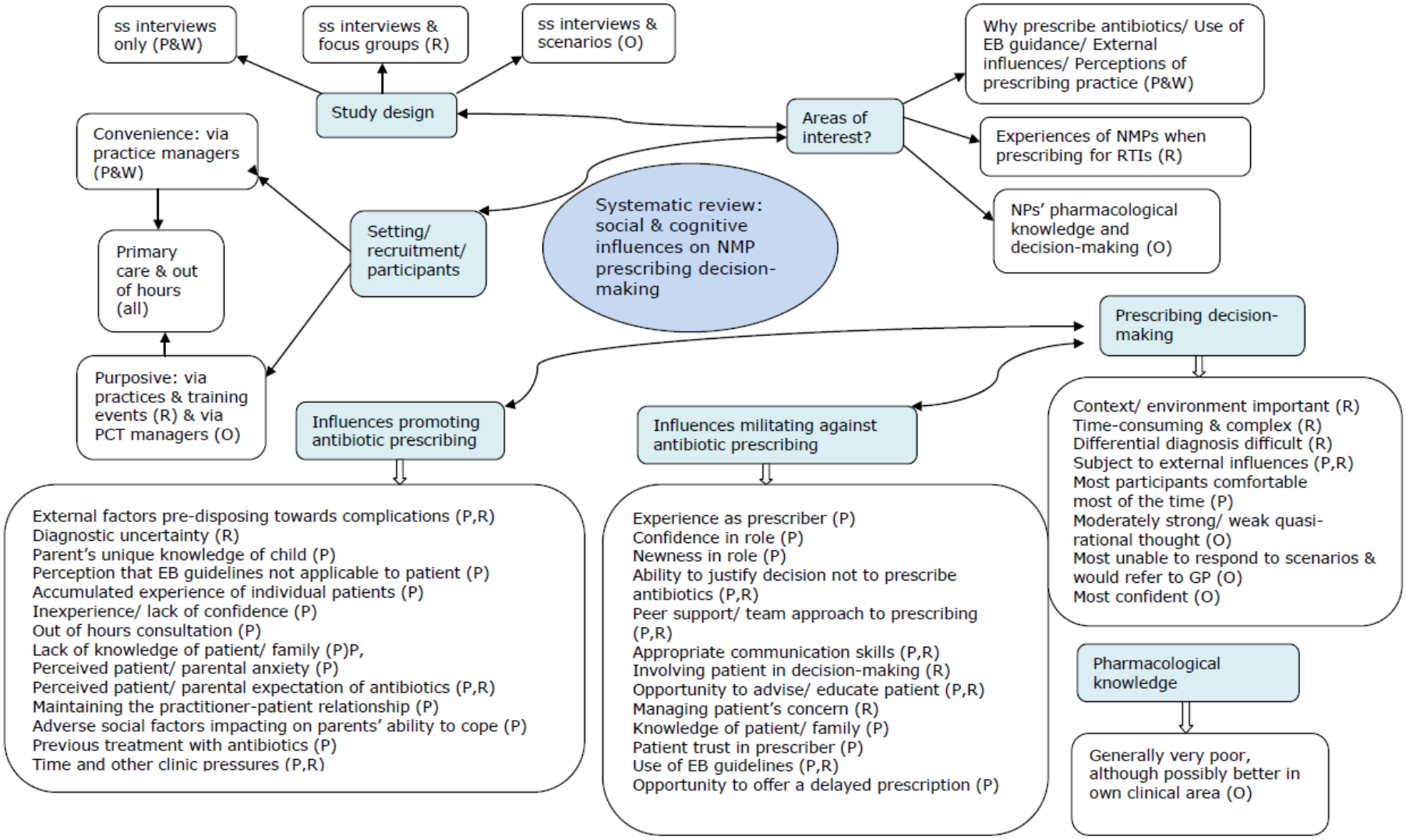



Figure 3.2 Concept map showing links between concepts in studies

#### 3.10.2.4 Assessing the robustness of the synthesis

The last stage in Popay's narrative synthesis process is to assess the robustness of the synthesis. A number of approaches are offered which may be used to support this; Table 3.11 lists the approaches along with brief commentary and a justification for their use or not.

Table 3.11 Approaches to assessing the robustness of the synthesis
Adapted from Popay *et al*. 2006

| Approach | Comment | Selected? |
|---|---|---|
| Weight of evidence (Gough 2007) | Studies are assessed first according to relevance criteria set for the review, then according to methodological quality | No. All studies meeting the criteria were included due to small number |
| Best evidence synthesis (Slavin 1995) | Focus is on inclusion of studies based on the strength of evidence | No. All studies meeting the criteria were included due to small number |
| Use of validity assessment (Task Force on Community Preventive Services *et al*. 2005) | A method of categorising studies on the basis of study quality then deciding on inclusion | No. All studies meeting the criteria were included due to small number |
| Reflecting critically on the synthesis process (Busse *et al*. 2002) | A critical discussion: of the synthesis method, evidence used, any assumptions made, identifying discrepancies | Yes. The multi-stage approach taken in previous sections facilitated this |
| Checking the synthesis with authors of primary studies (Britten *et al*. 2002) | Allowing authors to comment on validity of interpretation and synthesis-derived findings | No. The synthesis was discussed with supervisory team |

## 3.11 Results

### 3.11.1 Study designs

All studies used qualitative methodologies; this was appropriate as they aimed to explore in-depth not only behaviours but motivations, perceptions and decision-making processes (Pope and Mays 1995). All reports included details of ethics approval; Philp and Winfield (2010) went in to some detail but it was unclear whether they obtained written or verbal informed consent. Both Philp and Winfield and Rowbotham and colleagues (2012) explored antibiotic prescribing for self-limiting conditions: Philp and Winfield for otitis media in children and Rowbotham and colleagues for self-limiting respiratory tract infections. Interviews were audio-recorded and transcribed.

Philp and Winfield (2010) gave detailed justification of their use of semi-structured, in-depth interviews to gain insights into participants' "attitudes, beliefs and perceptions" (p. 15). They described using a topic guide with mainly open ended questions but gave no further details.

Rowbotham and colleagues (2012) used semi-structured interviews and focus groups "to allow in-depth exploration" of their participants' experiences (p.2624) and to permit triangulation of data. They did not justify the use of one rather than (sometimes as well as) the other method. A topic guide (no detail given) was used for interviews; little detail or justification was given for the use of focus groups and participants were recruited and the groups run at a training event, which researchers acknowledged may have resulted in recruitment bias (Sackett 1979). Essentially, the design of these two studies was broadly similar, with the addition of focus groups by Rowbotham, and there was some overlap of results.

Offredy and colleagues (2008) used validated patient scenarios including a scoring system (Sodha et al. 2002) within semi-structured interviews to assess participants' pharmacological knowledge and characterise their cognition when deciding how to respond, according to Hammond's Cognitive Continuum Theory (Hammond 1978). They also asked participants to rate their confidence in dealing with medication matters; these aspects resulted in a combination of both

quantitative and qualitative reporting of their results. They categorised participants' decision-making according to the Cognitive Continuum Theory (Hammond 1978) although little justification was provided for this categorisation.

The design and focus of Offredy's study was thus quite different from those of the others but all three studies found that external influences in addition to patients' clinical condition and evidence-based guidelines impacted on participants' prescribing decision-making.

### 3.11.2 Sampling strategies

All authors could usefully have given more information on recruitment and sampling, for example none gave details beyond the number of participants. Potential numbers and those (if any) initially accepting then subsequent refusing might have been included. There were also apparent deficiencies in the recruitment strategies reported.

Philp and Winfield (2010) wrote to nurse practitioners throughout Cornwall via practice managers but did not check whether the practices had nurse practitioners or follow up their initial approach. They interviewed eight nurse prescribers.

Rowbotham's study (2012) was carried out as part of a larger study examining the views and experiences of different prescribers. It was the only study to include a pharmacist prescriber and a physiotherapist prescriber albeit only in one of three focus groups. Recruitment was purposeful according to practice location, discipline, age and care setting, through direct contact (no details) with medical practices in the northwest of England and at a training event. It is possible that those attending this training were in some way different from other non-medical prescribers, as indeed may participants in all three studies have been.

Offredy and colleagues (2008) recruited via letters sent to the managers of two primary care trusts and used purposive sampling to recruit a mixture of qualified

and trainee nurse prescribers. Some participants were extended formulary nurse prescribers and results were not differentiated according to the type of nurse prescriber. Given that only two other studies met the inclusion and exclusion criteria this was this was deemed acceptable and the study was included in the review.

### 3.11.3 Method of analysis and theoretical underpinning (if any)

Philp and Winfield (2010) used a complex, iterative method of data analysis. A thematic framework was created from issues identified during interviews along with the aims and objectives of the study. Matrices were used to categorise the transcribed data in a "flexible and dynamic way" (p.15) and "a considerable amount of abstraction and synthesis" (p.15) resulted in core themes which were reported. They described using illustrative quotations to support their assertions.

Philp and Winfield (2010) made no reference to theoretical underpinning. They described the chief investigator and participants as being "interactively engaged in constructing a version of the participants' world, rather than merely reporting them" (p.15). Despite this the writers did not describe their own backgrounds and experiences which might have been influential during this process.

Rowbotham and colleagues (2012) described an iterative, thematic approach to analysis of data, with themes and sub-themes identified and used to inform subsequent development of topic guides. Digital recording and verbatim transcribing was used but there was no mention of field notes having been made during focus group discussions. By using two complementary methods researchers hoped to triangulate their data but there was little differentiation in reporting of results from the two methods and participant details were not clear. Again, theoretical underpinning was absent.

Only Offredy and colleagues (2008) described using theory to support their approach to study design. Very clear textual and diagrammatic descriptions of Hammond's six modes of cognition were given but it appeared that at least three

of the modes, based on experimental designs, could not be applicable. Offredy and colleagues did not make clear the basis on which participants' decisions were assigned to a mode of cognition and in fact seemed unclear themselves, for example when they said "This response could indicate an organising principle which used both analytical and intuitive thinking but this cannot be said with certainty because of the partial response by participants" (p. 864).

Reporting of data analysis focused on scoring participants' responses to the patient scenarios, which were included, and identifying the type of cognition. No information was given on the method of analysis of other data from the semi-structured interviews for example on participants' self-rated knowledge and confidence in medication-related issues. 10% of transcripts were returned to participants for critical comments, resulting in some clarification but no change in meaning.

### 3.11.4 Assumptions made by authors

Philp and Winfield (2010, p. 18), with only eight participants, claimed that their study "informs us how nurse practitioners think through their prescribing practice for OM [otitis media]". Rowbotham and colleagues (2012, p.2630) with around 32 participants stated that "the results are likely to be applicable to the rest of the UK and to other countries where nurses have prescribing powers". Only in Offredy's study (2008, p.866) was it acknowledged that "the study covered a small sample of nurse prescribers."

### 3.11.5 Conceptual triangulation of pharmacological knowledge and self-rated knowledge and confidence:

#### Offredy *et al*. 2008

Eighteen of Offredy's twenty five participants were nurse prescribers; the remainder were training for this role. Most results were not reported according to prescribing status making differentiation difficult. Most participants scored zero or (less commonly) one out of a possible three when responding to the clinical scenarios; they were unable to identify potentially problematic issues or

suggest acceptable solutions other than referring the patient to the GP. None of the scenarios related to prescribing decision-making although in one participants were asked to recommend an over the counter remedy for sinusitis in a patient taking anti-hypertensive medicines. Trainee prescribers scored less well than prescribers in response to the scenarios.

All participants rated themselves "knowledgeable" about commonly used medicines in their own fields and most as "confident" about medicine-related governance issue, adverse effects of drugs and advising patients about medicines including over the counter medicines. Again trainees' self-rated confidence was lower. Confidence was ascribed to a supportive working environment and knowledge of the patients and their medical conditions. Four prescribers rated themselves as "not confident" in these areas, attributing this to inadequate pharmacological knowledge, heightened awareness of issues of prescribing governance and logistical difficulties delaying their prescribing. A few expressed concern about dealing with patients receiving polypharmacy.

No attempt was made to link individual participants' scenario-response scores with their "self-rated knowledge and confidence levels in medication" p. 862). Data suggested a mismatch in general between participants' self-assessed knowledge and confidence and what Offredy and colleagues described as their "lack of appropriate pharmacological knowledge" (p.865)

## 3.12 Discussion

### 3.12.1 Findings from the systematic review

Several important findings emerge from this systematic review.

#### Limited research currently

A major finding is the paucity of research in this important area. Only three studies were identified which matched the inclusion and exclusion criteria (Philp and Winfield 2010, Offredy, Kendall and Goodman 2008, Rowbotham *et al.* 2012) and none focussed primarily on prescribing decision-making.

### Social and cognitive influences on prescribing decision-making

All studies examined wider aspects of NMP prescribing (two, the practice of antibiotic prescribing for self-limiting conditions (Philp and Winfield 2010, Rowbotham *et al*. 2012) and one, aspects of pharmacological knowledge (Offredy, Kendall and Goodman 2008) but none focused solely on prescribing decision-making. Studies were carried out in primary care almost exclusively among nurse prescribers; this may have implications for the transferability of findings to secondary care and to other non-medical prescribers.

Participants in all three studies perceived consultations as challenging and complex. Participants with more experience in their role felt that this led them to feel more knowledgeable and confident about medicine-related issues (Philp and Winfield 2010, Offredy, Kendall and Goodman 2008, and when making prescribing decisions (Philp and Winfield 2010). The prescribing decision-making process was also complex. Some nurse prescribers and trainee prescribers appeared to rely on intuition and experience in the absence of adequate knowledge in their responses to clinical scenarios, although they maintained that they felt knowledgeable about medicines used in their own clinical areas (Offredy, Kendall and Goodman 2008). There was no evidence that participants' confidence and prescribing decision-making was informed by knowledge of pharmacology (Offredy, Kendall and Goodman 2008).

Evidence-based guidelines were perceived as offering rigorous, clear guidance on treatment for ear and respiratory tract infections (Philp and Winfield 2010, Rowbotham *et al.* 2012). Most participants claimed to follow such guidelines (Philp and Winfield 2010, Rowbotham *et al*. 2012) yet others had chosen to ignore them and prescribe antibiotics in response to clinical uncertainty and perceived risk of complications (Philp and Winfield 2010, Rowbotham *et al*. 2012). Some felt this was appropriate given their experience and hence insight into particular circumstances where they felt antibiotics were warranted (Philp and Winfield 2010). They also prescribed in response to external factors such as previous experience, perceived patient pressure for antibiotics, patients' socio-economic status and prescriber's knowledge of the patient or family (Philp and Winfield 2010, Rowbotham *et al*. 2012). Antibiotic prescribing against guidelines

was also more likely to happen during out of hours services partly as a consequence of the attendant lack of knowledge of the patient or family (Philp and Winfield 2010).

On the other hand, evidence-based guidelines were perceived as useful in helping participants to resist patient pressure for antibiotics; this was particularly the case for inexperienced prescribers (Rowbotham *et al*. 2012). Opportunities for patient education were seized (Rowbotham *et al.* 2012); participants felt that this was a key part of their role and was also helpful in explaining why antibiotics were not necessary and would not be prescribed.

The context within which prescribing occurred was important; a team approach to prescribing with peer support and encouragement from doctors helped to build participants' confidence (Offredy, Kendall and Goodman 2008) and helped them to resist patient pressure to prescribe antibiotics inappropriately (Philp and Winfield 2010, Rowbotham *et al.* 2012). That said, some GPs prescribed antibiotics against guidelines themselves, after nurse prescribers turned to them hoping for support for their no-antibiotic stance (Rowbotham *et al.* 2012). This was not felt to be helpful.

Despite evidence from Offredy's study (2008) that participants' pharmacological knowledge in response to clinical scenarios was generally poor and in some cases impacted on their confidence as prescribers, this was not identified as an issue among participants in the other two studies (Philp and Winfield 2010, Rowbotham *et al*. 2012). Despite their low scores in the assessment of their pharmacological knowledge, all Offredy's participants described themselves as knowledgeable about medicines commonly used in their own areas of practice (Offredy, Kendall and Goodman 2008). If participants in the other two studies felt similarly this might explain why pharmacological knowledge did not feature as an influence on their prescribing decision-making.

### 3.12.2 Methodological approaches, methods and quality of studies included in the systematic review

The second objective of the systematic review was to report on the methodologies and methods used and quality of peer-reviewed published studies in this area.

Two of the three studies used qualitative methodologies: semi-structured interviews (Philp and Winfield 2010) and a combination of semi-structured interviews and focus groups (Rowbotham *et al*. 2012). Offredy and colleagues (2008) used a combination of qualitative semi-structured interviews and quantitative methodology, scoring participants' responses to patient scenarios and using graphs and diagrams to represent findings on participants' modes of decision-making and knowledge of pharmacology. None of the studies described the process of prescribing decision-making itself including generating, implementing, evaluating and adjusting a patient-specific plan for prescribing.

Methods of data generation were justified and appropriate and some indication was given of areas covered in semi-structured interviews and focus groups (Offredy, Kendall and Goodman 2008, Philp and Winfield 2010, Rowbotham et al. 2012). More detail might have been provided however, particularly in the case of Rowbotham and colleagues (2012) who provided very little information on their focus groups processes.

Analytical methods were generally described in detail although Offredy and colleagues (2008) acknowledged a lack of clarity in the assigning of decision-making according to Hammond's cognitive continuum theory (1978) and the approach appeared somewhat contrived.

Findings were generally stated clearly but some results were not reported according to profession (Rowbotham *et al*. 2012) or in some cases category of nurse prescriber (Offredy, Kendall and Goodman 2008). Only one pharmacist prescriber and one physiotherapist prescriber were included in one study and results were not differentiated according to profession meaning that no

conclusions could be drawn specifically about prescribing decision-making by pharmacist and physiotherapist prescribers (Rowbotham *et al.* 2012).

All studies had methodological limitations although these would have been unlikely to have resulted in the studies being excluded from the review even had a larger number of papers made this potentially possible. Only one study described having a theoretical underpinning although as above its application was not always clear (Offredy, Kendall and Goodman 2008). Methods of recruitment were not always optimal, perhaps due to issues of research governance precluding direct initial contact between researchers and the sample population (Offredy, Kendall and Goodman 2008, Philp and Winfield 2010, Rowbotham *et al.* 2012) and more detail on recruitment would have been beneficial.

Issues of reflexivity were not mentioned at all and none of the authors discussed their own professional background, experience or stance (Philp and Winfield 2010, Offredy, Kendall and Goodman 2008 and Rowbotham *et al.* 2012). These cannot help but inform the approach to research, particularly in a qualitative study (Bowling 2002) and should have been made explicit and discussed (Barry et al. 1999). All authors acknowledged the possibility of social desirability bias (Sackett 1979) in their results (Offredy, Kendall and Goodman 2008, Philp and Winfield 2010 and Rowbotham *et al*. 2012). All studies gave details of research governance issues and had received ethics approval.

Despite limitations in the three studies, some of which the authors acknowledge, they were the only ones to meet inclusion and exclusion criteria and so provide the only evidence in this area. Philp and Winfield's (2010) and Rowbotham's (2012) studies were published recently and so may be particularly relevant.

A strength of this review is the use of Popay's method of narrative synthesis. The multi-stage, step-wise approach facilitated critical, repeated examination of the review papers from a variety of viewpoints in order to create the final inductive synthesis. A different perspective was developed through each step, sometimes uncovering elements which might have been missed; these "partial

pictures" (Popay 2006, p.21) were then combined to form a whole, allowing the objectives of the review to be met in a robust way.

A limitation is that two of the three papers (Philp and Winfield 2010, Rowbotham *et al*. 2012) explored almost exclusively nurse prescribing only in response to minor self-limiting conditions where antibiotics were one of the treatment options. Participants in the third study (Offredy, Kendall and Goodman 2008) generally prescribed for acute, relatively minor conditions. The review necessarily focuses on these areas of prescribing and can offer no insights into prescribing decision-making by non-medical prescribers working in other areas, where it is likely that most prescribing occurs. Transferability of findings may also be limited by the inclusion of only three papers in the review and by the small study sample sizes of the papers included.

## 3.13 Comparison with the literature

Notwithstanding the small number of studies included in this review it is evident that prescribing decision-making by NMPs is complex and informed by a variety of sometimes contradictory influences, as is the case with medical prescribers. In addition to evidence-based guidelines (not always followed), experience, clinical uncertainty and perceived risk of complications, patient expectations, logistical pressures and peer support were found to influence the prescribing decisions of participants in the studies included in this review.

Knowledge of pharmacology was not found to have influenced prescribing decisions made. In 2005 the British Pharmacological Society recommended that pharmacology teaching for nurse prescribers must be basic and practically grounded (Leathard *et al*. 2007) but there remains concern about nurse prescribers' lack of pharmacological knowledge and the need to augment this (Creedon *et al*. 2009, Scrafton, McKinnon and Kane 2012, Creedon *et al.* 2015).

In an early but (then) comprehensive evaluation of nurse and pharmacist independent prescribing, non-medical prescribers asserted that their prescribing decisions were evidence-based and contrasted this with those of their medical

colleagues (Latter *et al.* 2010). Maddox (2011) found several other influences on the prescribing decisions of NMPs working in primary and community care including patient and colleague factors, the prescribing culture and professional experience. A recent systematic review of influences on independent nurse prescribers' antimicrobial prescribing behaviour found guidelines/ protocols and most commonly diagnostic uncertainty influenced the decision whether or not to prescribe antimicrobials (Ness *et al*. 2016). Thereafter, guidelines/ protocols, the clinical profile of the antimicrobial, patient/ parent pressure and prescriber experience and training were found to influence the choice of antimicrobial agent.

The importance of previous experience was highlighted in this systematic review. Other nurse prescribers have been similarly influenced (Ness *et al*. 2016) and recently-qualified nurse prescribers cited their experience as nurses as contributing to their safety as prescribers (Bradley, Hynam and Nolan 2007).

Experience notwithstanding, clinical uncertainty has also been found to increase doctors' prescribing of antibiotics for children with respiratory tract infections in scenario-based (Arnold *et al.* 2005) and vignette studies (Ashdown *et al.* 2016). Clinical uncertainty was also found to be influential in an interview-based study of GPs' and nurse prescribers' decisions about diagnosis and management of respiratory tract infections in children (Horwood *et al*. 2016).

Participants in studies included in the systematic review identified the importance of colleagues' support for their prescribing. NMPs prescribing for chronic pain in the UK similarly emphasised the importance of colleagues' knowledge and experience (Adigwe *et al*. 2013). Nurse prescribers from UK primary and secondary care identified the importance of support for their prescribing from the multidisciplinary team and the importance of collaborative working (Bradley, Hynam and Nolan 2007). Ward-based junior hospital doctors also recognised the importance of the team around them when making prescribing decisions doctors (Bull, Mattick and Postlethwaite 2013).

Participants in the studies included in the review were aware of patient pressure to prescribe, particularly for antibiotics, and sometimes prescribed in response to that pressure. Other nurse prescribers have been subject to the same pressure and have done similarly (Ness *et al*. 2016). Medical prescribers have also prescribed in response to patient pressure or perceived pressure in primary (Little *et al*. 2004, Petursson 2005, Strumiło *et al*. 2016) and secondary care (Lewis and Tully 2011).

None of the studies included identified the prescriber-patient relationship as influential yet this has been found to be a key influence on medical prescribing decision-making in general practice (Cockburn and Pit 1997, Butler *et al.* 1998, Stevenson *et al*. 1999, Lewis and Tully 2011, Peters *et al.* 2011, Dempsey *et al.* 2014). Medical prescribers in secondary care, particularly those with a regular caseload of patients with long-term conditions, have also been found to prescribe to maintain their relationship with patients (Lewis and Tully 2011).

Non-medical prescribers come from a variety of professional backgrounds but none comes from a tradition of paternalistic relationships with patients or from a position at the top of the healthcare hierarchy (Weiss and Fitzpatrick 1997, Weiss and Sutton 2009). The non-medical prescribers in the studies included in this systematic review were treating acute, generally self-limiting conditions in primary care and may not have had pre-existing long-established relationships with their patients. That said, a lack of relationship continuity has also been identified as influencing prescribing decisions for antimicrobials (Petursson 2005). As healthcare delivery changes, relationships between healthcare providers and recipients will also change with possibly unforeseen impact.

None of the studies included in the systematic reviewed focused directly on the processes of prescribing decision-making by NMPs and more, detailed research is warranted to explore and elucidate influences on individual NMPs' prescribing decisions. In-depth interviews with a range of NMPs focusing on their prescribing decisions would be likely to add to what is known currently. These were carried out in the next phase of this doctoral study.

## 3.14 Conclusions

Very little research has been carried out into the social and cognitive influences on prescribing decision-making by non-medical prescribers in the UK. The studies included in this review had methodological limitations which the authors acknowledged. Evidence-based guidelines, peer and GP support and patient or parental expectations were found to be influential, as was the context within which prescribing occurred. Confidence and clinical experience as a practitioner, or lack of it, were also cited as influences.

Non-medical prescribers continue to make an increasingly important contribution to patient care in the UK. The results of this systematic review suggest that there is a need for further research into their prescribing decision-making and in particular into the social and cognitive influences impacting this.

# Chapter 4 Stage 2 Phase 1 interviews

## 4.1 Introduction

This chapter will report on Stage 2 Phase 1 of the programme of research: semi-structured interviews with non-medical prescribers in the NHS Grampian area, exploring their experiences and perceptions of influences on their prescribing decision-making and the impact of these influences. The objectives of this phase of the research were to explore:

- participants' in-depth descriptions of their experiences of making prescribing decisions
- their views and reflections of influences on the prescribing decisions they make
  and
- their opinions on the impact of these influences on their prescribing decision-making

## 4.2 Methods

### 4.2.1 Research design

An inductive, phenomenological approach was taken; as was discussed in Chapter 2 this is the most appropriate approach to answer the research questions. Qualitative, semi-structured, face to face interviews were carried out with non-medical prescribers in their places of work across the NHS Grampian area. As outlined in Chapter 2, this approach allowed exploration of participants' experiences and perceptions, generating rich data from which relevant themes were identified. Individual interviews were carried out, providing participants with the opportunity to respond without having to consider the possible impact of their words on others, as might be the case for example in focus groups.

### 4.2.2 Setting

The study was carried out in primary and secondary care and in community pharmacies across the NHS Grampian area.

### 4.2.3 Sampling frame

The sampling frame was all supplementary and independent non-medical prescribers employed by or contracted to NHS Grampian.

Inclusion criterion:

- Those who considered that they prescribed as an integral part of their role, to ensure currency of practice.

Exclusion criterion:

- Optometrist independent prescribers

### 4.2.4 Recruitment

As outlined in Chapter 2, at the time of the study two senior NHS Grampian staff had overall responsible for non-medical prescribing: the Pharmacist Prescribing Lead and the Non-medical Prescribing Lead, who was responsible for all other non-medical prescribers. A recruitment e-mail providing outline study information (Appendix 2.1) was sent by the doctoral student via these individuals on 18th September 2015 to all independent and supplementary non-medical prescribers employed by or contracted to NHS Grampian i.e. 612 nurse independent prescribers and 52 pharmacist independent prescribers. The e-mail addresses were known to the Prescribing Leads and as outlined in Chapter 1 the Leads endorsed the study. The e-mail specified that only those who prescribed as an integral part of their role were eligible for the study. A reminder e-mail was sent on 1st December 2015.

"Snowballing" i.e. word of mouth recruitment was also used to increase recruitment. Participants were asked by the doctoral student at the time of their interview whether any colleagues might be interested in taking part in the study; if so they were asked to pass on the doctoral student's e-mail address. The doctoral student also spoke in person to the colleague of one participant just after her interview.

The recruitment e-mails included a link to a study-specific online recruitment and consent form (Snap Surveys 2016). This included a participant information section (Appendix 4.1) providing detail to allow recipients to make an informed decision to participate. Both the consent form and the information section were based on information provided by the NHS Health Research Authority (NHS Health Research Authority 2017); the content of both was developed through discussions among the research team. Those choosing to participate were asked to consent separately within the form to participating in Phases 1, 2 and 3 of the study and to having their interviews and reflections recorded and anonymised data disseminated.

It was made clear in the information section that participants could withdraw from the study at any point. Participants were also informed that if they chose to disclose information with implications for patient safety this would be discussed with the research team and possibly shared with the Pharmacist and non-medical Prescribing Leads in NHS Grampian. The doctoral student is a pharmacist with 35 years' experience; two members of the supervisory team are also very experienced pharmacists and another is a retired lecturer and researcher in pharmacology. Had the doctoral student had any concerns she would have raised them with the supervisory team, who in any case also reviewed all study data during analysis. If the team considered it necessary the doctoral student would have contacted the appropriate Lead.

#### 4.2.4.1 Study demographic data

Participants were asked in the recruitment form for the demographic data below. This was recorded to provide background information including preferred contact

details and to allow limited characterisation of participants, consistent with the requirement to ensure anonymity (Data Protection Act 1998, Robert Gordon University 2016a, Robert Gordon University 2016b, Robert Gordon University 2016c). These demographic data were also gathered to allow purposive sampling if necessary, to ensure a representative sample of NMPs in NHS Grampian. In fact all recruits to the study were interviewed in Phase 1. Data gathered were:

- name, e-mail address, phone number, preferred contact method
- age: 29 years or under; 30 - 39 years; 40 - 49 years; 50 - 59 years; 60 years or over
- professional role: nurse; pharmacist; radiographer; physiotherapist; podiatrist
- number of years in this profession
- supplementary or independent prescriber? How long in each role?
- prescribing setting: hospital; out of hours centre; health centre; community pharmacy; patient's home; other (please specify)
- full time or part time working; if part-time, how many hours per week?
- proportion of the week spent in prescribing-related activities

Completion and submission of the online consent form triggered an e-mail notification for the doctoral student who then contacted the participant by their preferred method to arrange a suitable time and place for the interview.

Participants were give a small honorarium (a £25 Marks and Spencer voucher) at the end of the first interview, Phase 1, in recognition of their contribution to the study.

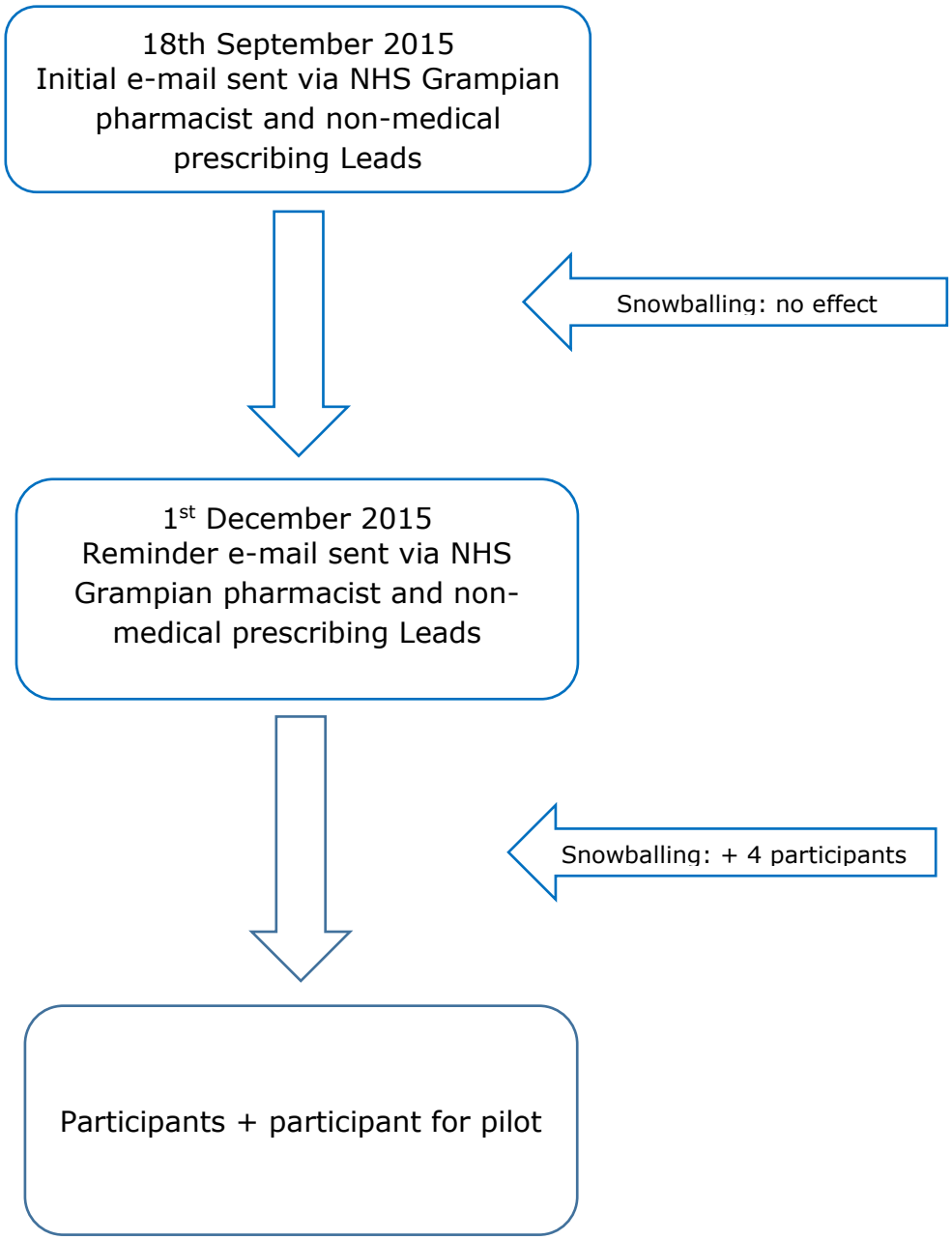



Figure 4.1 Process of recruitment to Phase 1 interviews

### 4.2.5 Development of interview schedule

The interview schedule was developed iteratively during extensive discussions with supervisors and others. At an early stage in the study and before finalising the schedule the doctoral student and supervisors met with the NHS Grampian Leads for Pharmacist and Non-medical Prescribing so that their views could be gathered and incorporated into the study design. The issue of disclosure of possible patient harm was discussed at these meetings.

Supervisory team discussions took the form of weekly face to face meetings during which possible amendments to the schedule were identified and agreed then incorporated by the doctoral student and discussed again the following week. Discussions were informed by:

- the research objectives
- the 14 domains of the TDF (Cane, O'Connor and Michie 2012)
- specific research papers where domains of the TDF have been mapped to individual questions in interview schedules or questionnaires (Islam *et al*. 2012, Patey *et al*. 2012, Huijg *et al*. 2014a, Huijg *et al*. 2014b)
- a systematic review of the influences on prescribing decision-making among NMPs in the United Kingdom (McIntosh *et al.* 2013, McIntosh *et al*. 2014, McIntosh *et al*. 2016a)
- the results of an earlier scoping review of the literature on medical prescribing decision-making carried out by the doctoral student

A draft interview schedule was developed then reviewed for credibility (Guba 1981, Shenton 2004) by three senior prescribers with experience in education and training: a GP, a hospital medical consultant and a pharmacist prescriber. They were selected based on their current roles, experience as prescribers and their previous and/or current experience in teaching undergraduate and postgraduate students including pharmacist prescriber students, in the School of Pharmacy and Life Sciences. Reviewers were sent an e-mail with the draft schedule attached and asked for their comments. Minor comments were received by e-mail from all three and were incorporated into a revised version.

This version was trialled face to face with a pharmacist prescriber in primary care and one in secondary care and a nurse prescriber in primary care and one in secondary care. Three of these prescribers were known to the doctoral student, one was recommended by colleagues and all were approved in advance by the supervisory team. The doctoral student met the NMPs at their places of work,

explained the study and its aims and asked them for any comments as she read through each interview question in turn. The doctoral student took notes during this process. All four NMPs considered the interview schedule easy to understand, appropriate and likely to gather information relevant to the aims of the study. None suggested any changes to the schedule, which became the final version (see Figure 4.2 for the process of development of the interview schedule and Appendix 4.2 for the interview schedule itself). This review by prescribers from broadly similar practice settings to those of potential participants was included as a way further to enhance the credibility of the interview schedule (Gillham 2000, Smith 2005).

Piloting was carried out with one pharmacist prescriber; he had completed the recruitment form but during his interview explained that he no longer prescribed and so was ineligible for inclusion in the study. His data were not included.

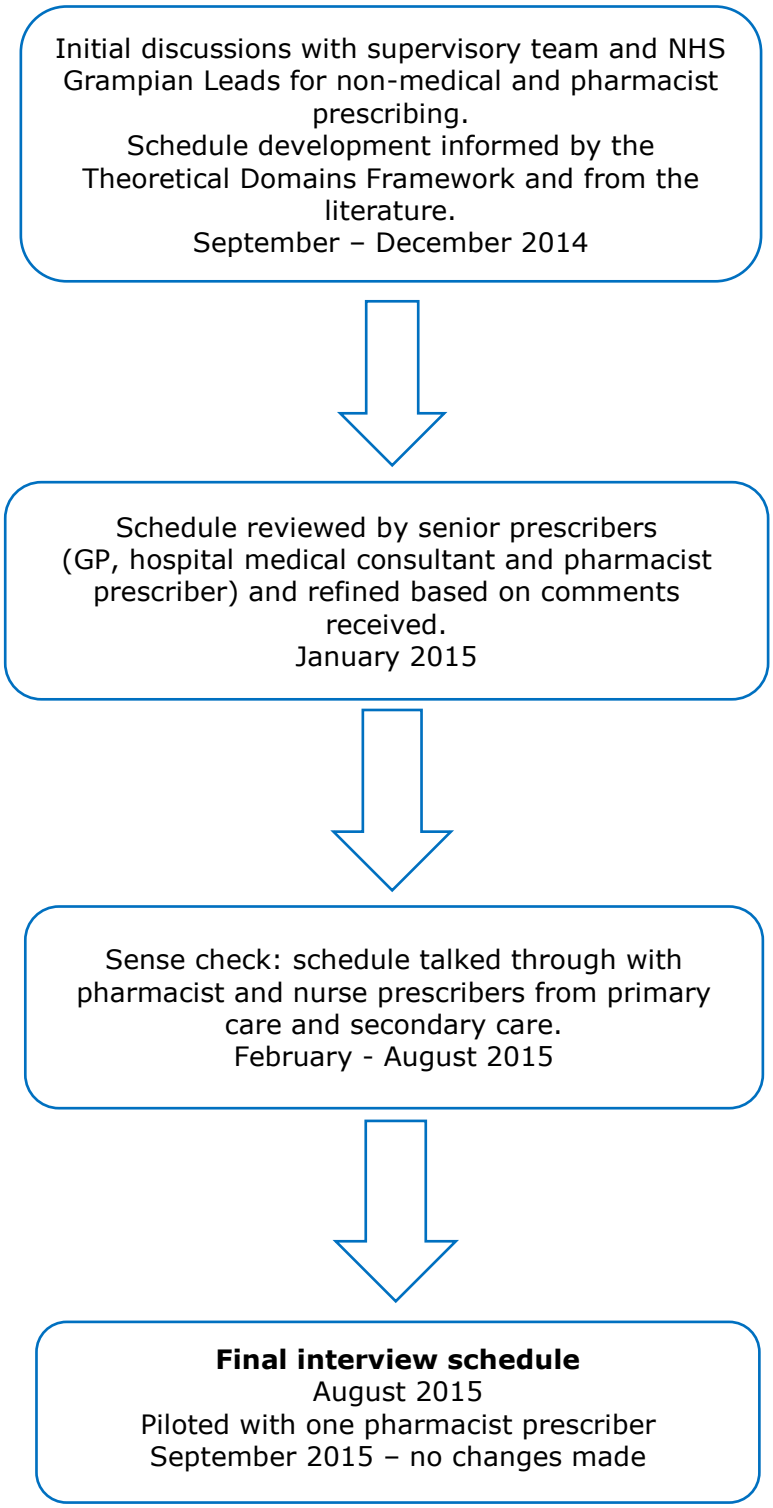



Figure 4.2 Development of interview schedule for Phase 1 interviews

As above and in Chapter 2 the interview schedule was developed from the literature to incorporate questions relating to the 14 domains of the TDF (Cane, O'Connor and Michie 2012) and informed by others' use of this technique (Islam

*et al*. 2012, Patey *et al*. 2012, Huijg *et al*. 2014a, Huijg *et al.* 2014b). The schedule also included questions on participants' current patient groups and prescribing and also their views on how prescribing fits with their professional roles now and in the future. It was felt that some interview questions would elicit information relevant to more than one domain; Table 4.1 maps each question only to the domain/s from which it was derived.

Table 4.1 Mapping of interview questions to domains of the TDF (Cane, O'Connor and Michie 2012)

| Interview question | TDF domain |
|---|---|
| First, you've said you work as a [from demographic questionnaire]; please would you tell me a bit about the patient groups you prescribe for and the types of medicines you prescribe? | Social/professional role and identity |
| Can you talk me through how you decide whether or not to prescribe for a patient? | Memory, attention and decision-processes |
| Once you've decided to prescribe something, can you talk me through how you decide what to prescribe? | Memory, attention and decision-processes, goals |
| How confident do you feel in your ability to make these decisions?<br>Prompt: can you tell me more about that? | Beliefs about capabilities, optimism |
| I'd like to know about how easy you find it to make prescribing decisions. Does this vary sometimes? Please tell me more about this. | Beliefs about capabilities, optimism |
| Do you feel you have the necessary knowledge to decide what to prescribe? What sort of knowledge do you draw on? | Knowledge |
| Do you feel you have the necessary skills to decide what to prescribe? What sort of skills do you use? | Skills |
| Have you had occasions where you became aware that there was a gap in your knowledge in relation to prescribing decision-making? | Knowledge, beliefs about capabilities |
| What about a skills gap; have you ever been aware that you lacked a particular skill in relation to prescribing decision-making or weren't proficient in it? | Skills, beliefs about capabilities |
| How do you deal with any of these gaps during the consultation?<br>What about more generally? | Beliefs about capabilities, environmental context and resources, intentions |

| Interview question | TDF domain |
|---|---|
| Can you tell me a bit about the information sources you use whilst making a prescribing decision? | Knowledge, environmental context and resources |
| Are there things you might forget to consider when you're making a prescribing decision?<br>What about things that might distract you? | Memory, attention and decision processes, environmental context and resources, social influences |
| How does your expertise or experience both as a practitioner and as a prescriber influence your prescribing decision-making? | Social/ professional role and identity, knowledge, skills |
| Are there resources or ways of working that might have an effect on the prescribing decisions you make? | Environmental context and resources; knowledge, skills |
| I'm interested in finding out about whether other people might influence you when you're making a prescribing decision. | Social/ professional role and identity, social influences, environmental context and resources, reinforcement, goals |
| Is there anything about where you work which influences the prescribing decisions you make? | Social/ professional role and identity, social influences, environmental context and resources, reinforcement |
| How, if at all, might your emotions influence your prescribing decision-making? | Emotions |
| Can you tell me about any possible consequences for the patient/ you/ colleagues that might influence your prescribing decision-making?<br>Of these possible consequences, which do you think might be the most influential? | Beliefs about consequences, reinforcement |
| Before this interview, had you ever reflected on how you make prescribing decisions? | Memory, attention, decision-making, behavioural regulation. |
| And finally, I wonder if you can let me have your thoughts around how prescribing fits with current and future roles for your profession? | Social/ professional role and identity |

Outcome measures were:

- participants' in-depth descriptions of their experiences of prescribing decision-making
- their views and reflections of influences on their prescribing decision-making

  and

- their opinions on the impact of these influences on their prescribing decisions-making.

### 4.2.6 Interviews: doctoral student's training and expertise, data generation, recording, data processing and transcription, and data storage.

#### 4.2.6.1 Doctoral student's training and experience

As in the Foreword, the doctoral student is an experienced pharmacist academic. She has received training in qualitative research methods and specifically in carrying out interviews and in using NVivo® as a tool to facilitate analysis of qualitative data (QSR International PTY Ltd 2016). The doctoral student has attended Good Clinical Practice Core for Researchers (non-drug) training and attends update training every two years.

The doctoral student's MSc Prescribing Science project gathered data by means of interviews with pre-registration trainee pharmacists (McIntosh and Stewart 2015). She has extensive experience in supervising degree, Masters and postgraduate Masters level projects including several which were interview-based.

Prior to carrying out interviews for this study the doctoral student and her supervisory team discussed how this would be done and agreed a standard operating procedure (Appendix 4.3).

#### 4.2.6.2 Data generation

At participants' requests, interviews were carried out in their places of work across the NHS Grampian area between September 2015 and April 2016. Interviews lasted between 22 and 58 minutes; details are shown in Table 4.2 below.

Table 4.2 Details of Phase 1 interviews: participant, date and duration of interview

| Participant | Date | Duration |
|---|---|---|
| Pharmacist 2 | 25th September 2015 | 26 minutes 40 seconds |
| Pharmacist 3 | 2nd October 2015 | 48 minutes 21 seconds |
| Pharmacist 4 | 12th October 2015 | 58 minutes 15 seconds |
| Pharmacist 5 | 20th October 2015 | 51 minutes 31 seconds |
| Pharmacist 6 | 2nd November 2015 | 30 minutes 14 seconds |
| Pharmacist 7 | 3rd November 2015 | 52 minutes exactly |
| Pharmacist 8 | 6th January 2016 | 53 minutes 39 seconds |
| Pharmacist 9 | 13th April 2016 | 46 minutes 50 seconds |
| Nurse 1 | 28th October 2015 | 29 minutes 5 seconds |
| Nurse 2 | 29th October 2015 | 39 minutes 36 seconds |
| Nurse 3 | 13th April 2016 | 50 minutes 12 seconds |
| Nurse 4 | 13th April 2016 | 31 minutes 11 seconds |
| Nurse 5 | 13th April 2016 | 22 minutes 46 seconds |

#### 4.2.6.3 Recording of interviews

As above interviews were recorded according to a standard operating procedure developed through discussion with the research team (Appendix 4.3). Two Olympus® WS-832 digital voice recorders were used simultaneously; these recorders were checked immediately prior to each interview to ensure that they were recording.

Interviews took place in participants' places of work, either in the participant's consulting room or in a private office elsewhere in the building. The doctoral student introduced herself and the interview process and read the preamble at the start of the interview schedule before recording began. She asked the participant whether s/he was ready, switched on both recorders and started the interview. Recording continued until the interview was finished, the doctoral student checking visually from time to time to ensure that the recorders were recording.

#### 4.2.6.4 Data processing and transcription

Recordings were uploaded as soon as possible into password-protected computer files on the doctoral student's RGU H-Drive. Participants' names were not recorded and any information which might identify them, others or their places of work was removed from the transcripts during accuracy checking. Participants were allocated an identification code e.g. Pharmacist 3 or Nurse 5 which was used throughout; names and codes were stored securely and separately from the transcripts. Uploaded recordings were checked for audibility and clarity by the doctoral student then erased from the digital recorders.

The doctoral student had arranged for a member of the university staff trained and experienced in transcribing to transcribe the interviews. Recording files were too large to be sent by e-mail from the doctoral student to this person so were uploaded on to a memory stick which was passed by hand to her. She transcribed each interview separately *verbatim* i.e. using exactly the same words (Collins Dictionaries 2013), returned the memory stick and e-mailed the

transcripts back to the doctoral student, who checked them with the original recording for accuracy and completeness. Occasionally the doctoral student corrected a mis-heard word or inserted for example a drug name with which the transcriber was not familiar.

#### 4.2.6.5 Data storage

Documents were stored in password-protected computer files; paper copies were stored under lock and key and only removed for data checking and analysis. Audio recordings and transcripts will be kept in password-protected computer files for 5 years after the date of the last publication from the study, as per School of Pharmacy and Life Sciences Standard Operating Procedures for good research practice (School of Pharmacy and Life Sciences 2011)

### 4.2.7 Data analysis

Data were analysed using a Framework Approach (Ritchie *et al*. 2014) i.e. data familiarisation, identifying constructs (categories of analysis), indexing, charting, and mapping and interpreting (see Table 4.3 below). The initial framework was based on the 14 domains of the TDF (Cane, O'Connor and Michie 2012). One transcript (Nurse 1) was reviewed, discussed and coded by TM, SC, DS and KFM together. Remaining transcripts were analysed by the doctoral student and one of SC, DS and KFM and any differences in coding resolved by discussion.

#### 4.2.7.1 Data handling and analysis using NVivo®

As in Chapter 2 the doctoral student used NVivo® 10 software (QSR International Pty Ltd. 2016) to facilitate data handling and analysis including identification of representative illustrative quotations (Creswell 2013). NVivo® provides a flexible matrix within which interview transcripts may be stored at "nodes", and sections classified into different categories of analysis. The terminology used is particular to NVivo®: principal categories of analysis are referred to as "parent nodes" with subordinate categories within each principal one referred to as "child nodes". For clarity the terms "principal" and "subordinate" categories of analysis will be used

throughout the thesis, with "node" being used to describe the location of these categories within the NVivo matrix.

Categories may be added to or condensed as necessary; this process facilitates close analysis, allocation of text to categories of analysis, and identification of suitable text to be used for illustrative quotations. Quotations were reviewed by supervisors and agreement on which to include reached by discussion. In the selection of quotations for this thesis care was taken to ensure that all participants were represented and that where possible a balance of professions was maintained. Sources have been identified using participants' codes, practice settings and gender.

To allow the doctoral student to become familiar with using the software the first seven interviews were coded only to the principal categories of analysis i.e. the 14 domains of the TDF plus two additional principal categories which emerged, multidisciplinary working and experience.

Text from these transcripts, coded initially at these principal categories of analysis was then re-coded, creating several subordinate categories from each principal one. Remaining transcripts were coded using this expanded framework with fresh principal and subordinate categories or analysis being added as required; again sections of text were allocated to the nodes. Figure 4.3 is a screen shot showing how the principal category of analysis "knowledge" was sub-divided into 14 subordinate categories, each with associated text. Finally categories of analysis were considered in relation to each other allowing the identification of themes and sub-themes.

Table 4.3 Steps in thematic analysis of Phase 1 transcripts using the Framework Approach (Ritchie *et al*. 2014)

| Step | Process |
|---|---|
| Data familiarisation | Recordings were listened to by the doctoral student after each interview, during transcription accuracy checking and during analysis. Transcripts were similarly read, annotated and reviewed repeatedly by the doctoral student and her supervisory team to allow familiarisation with the data and to facilitate analysis |
| Identifying constructs (categories of analysis) | TDF domains were used *a priori* as principal categories of analysis and additional emerging principal and subordinate categories of analysis added as transcripts were coded. Coding was done by the doctoral student and by one of the supervisory team; duplicate analysis of transcripts was shared. Coding was discussed and agreed with any disagreements being resolved through discussion |
| Indexing | Use of NVivo® software facilitated creation and ordering of principal and subordinate categories of analysis, creating hierarchies |
| Charting | Representative illustrative quotations were selected from the categories of analysis. These quotations were reviewed, discussed and agreed by the supervisory team |
| Mapping and interpreting | Principal and subordinate categories of analysis were considered in relation to each other and grouped thematically, creating themes and sub-themes. This allowed influences on participants' prescribing decisions to be elucidated |

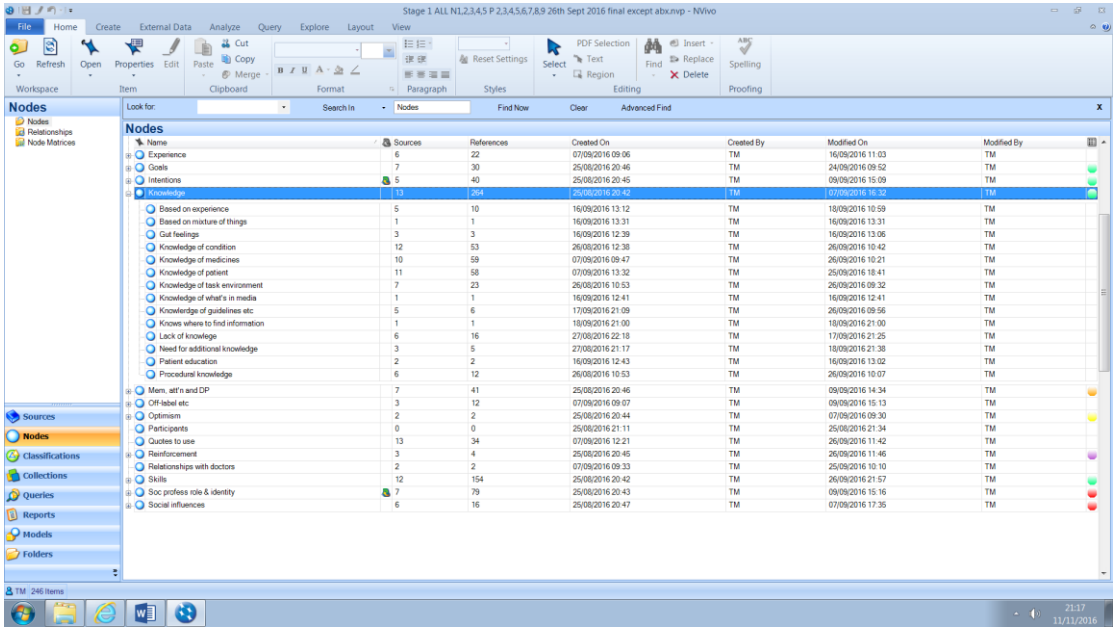


Figure 4.3 Screen shot showing coding of "Knowledge" in NVivo® 10

### 4.2.7.2 Data saturation

As described in Chapter 2 data saturation in qualitative research is assumed to have been reached when no new themes emerge from analysis of the data (Glaser 1967, Francis *et al*. 2010) although the method by which this point is established is not always described clearly in the literature. A modified version of Francis' approach (Francis *et al.* 2010) was used to assess whether data saturation had been reached; the finite number of participants precluded following the method exactly. As described above the initial 7 interviews were coded first at the principal categories of analysis. All seven were then re-coded using principal and subordinate categories. At this point i.e. mid-way through coding, a cumulative frequency graph was plotted of numbers of subordinate categories of analysis identified against interviews carried out, to provide a pictorial representation of the results of the initial process of analysis i.e. indexing. After analysis of each subsequent interview the cumulative number of subordinate categories was plotted onto the graph (see Figure 4.4). It should be noted that this was done before the mapping and interpreting stage of analysis; the number of themes and sub-themes resulting from this final stage was far fewer.

## 4.3 Findings

### 4.3.1 Recruitment

Eight pharmacist prescribers and two nurse prescribers were recruited directly via the online recruitment process. At the time of their own interviews Pharmacists 3 and 6 each encouraged a colleague to participate; these colleagues provided their e-mail addresses and one completed the online form. Both were sent two further e-mails but neither responded. Some months after his own interview Pharmacist 7 recruited four other non-medical prescribers to the study: three nurses and one pharmacist.

One pharmacist (Pharmacist 1) completed the online recruitment form and was interviewed but revealed during the interview that he no longer prescribed. This precluded him from taking part in the study; the interview was used as a pilot and the data not included in the study.

Eight pharmacist prescribers and five nurse prescribers thus met the inclusion criterion and were recruited to Phase 1. Participants' demographics are given in Table 4.4; profession, gender and practice setting were used as descriptors.

Table 4.4 Participants' demographics

| Participant | Gender | Age | Number of years in profession | Practice setting | Number of years as prescriber | Proportion of time spent as prescriber |
|---|---|---|---|---|---|---|
| Pharmacist 2 | Female | 30 – 39 years | 12 years | Secondary care | 4 years | 25% - 50% |
| Pharmacist 3 | Female | 30 – 39 years | 10 years | Secondary care | 3 years | Almost all |
| Pharmacist 4 | Female | 60 years or over | 30+ years | Primary care and community pharmacy | 8 years | 50% - 75% |
| Pharmacist 5 | Female | 50 – 59 years | 30 years | Primary care | 10 years | Almost all |

| Participant | Gender | Age | Number of years in profession | Practice setting | Number of years as prescriber | Proportion of time spent as prescriber |
|---|---|---|---|---|---|---|
| Pharmacist 6 | Female | 40 – 49 years | 20+ years | Community pharmacy | 6 years | Less than 25% |
| Pharmacist 7 | Male | 50 – 59 years | 30 years | Community pharmacy | 3 years | Less than 25% |
| Pharmacist 8 | Female | 40 – 49 years | 20 years | Primary care | 7 years | Less than 25% |
| Pharmacist 9 | Female | 40 – 49 years | 23 years | Primary care | 1 year | 25% - 50% |
| Nurse 1 | Female | 40 – 49 years | 26 years | Primary care | 8 years | Less than 25% |
| Nurse 2 | Female | 50 – 59 years | 39 years | Primary care | 7 years | Less than 25% |
| Nurse 3 | Male | 30 – 39 years | 10 years | Primary care | 8 months | Almost all |
| Nurse 4 | Female | 50 -59 years | 13 years | Primary care | 8 years | Almost all |
| Nurse 5 | Female | 60 years or over | 40 years | Primary care | 11 years | Less than 25% |

### 4.3.2 Data from interviews

#### 4.3.2.1 Participants' areas of practice

Participants were asked first about the patient groups they prescribed for and types of medicines they prescribed. This was a logical starting point and was felt to offer an "easy introduction" to the interview while gathering important contextualising information.

While some participants prescribed for a very specific clinical area others prescribed much more widely particularly nurses in acute care. Other nurses prescribed for related long term conditions, sometimes including palliative care, and one was a specialist in this area.

Most pharmacist participants prescribed for one or more related conditions although one prescribed in a number of unrelated areas. One practice pharmacist had additional responsibilities, prescribing in her own specialism, for minor ailments and dealing with other prescribing-related issues. The two secondary care pharmacist prescribers prescribed in "their own" ward setting, one for a very specific patient group.

Table 4.5 gives a brief summary of participants' areas of prescribing and their own descriptions of these.

Table 4.5 Participants' areas of prescribing and their description of these

| Participant | Patient group and/ or area for prescribing | Supporting quotation |
|---|---|---|
| Pharmacist 2 | Very specific patient group in secondary care | "Well I prescribe predominantly on the ward, for in-patients, mostly it's obviously the wards that I work in which included an intensive care, high dependency area and ward. The patient groups that I prescribe for are both pre and post-op patients." |
| Pharmacist 3 | Very specific patient group in secondary care | "So I'm primarily based in Ward ? which is the out-patient chemotherapy day unit, so we've no patients staying overnight or we've no kind of prescribing on our standard drug kardexs. It's mainly chemotherapy prescriptions and supportive medication that we're involved in the prescribing of." |
| Pharmacist 4 | Small, varied range of long term conditions | "Okay, so I started off as respiratory only … and generally speaking emphysema, COPD but of course asthma gets thrown in … then I think, if I remember rightly, we decided to start a hypertension clinic. Then another opportunity came up to do contraception as in, sexual health to some extent … So I got involved with the pilot for pain and we did two days training on that… So, you've got the respiratory, the hypertension and the sexual health with a wee dash of pain thrown in." |
| Pharmacist 5 | Range of related long term conditions | "The types of patients I prescribe for are mainly cardiac in nature. I suppose with the occasional medication review or ACP polypharmacy review, but normally it's cardiovascular patients, that includes blood pressure, stroke, heart failure, ischemic heart disease and also patients on warfarin regarding their anticoagulation or it might be on a NOAC." |

| Participant | Patient group and/ or area for prescribing | Supporting quotation |
|---|---|---|
| Pharmacist 6 | One specific area | "We prescribe specifically to a group of substance misuse patients and predominantly methadone but we do now have now some suboxone patients that we're prescribing independently." |
| Pharmacist 7 | One specific area + very occasional acute conditions | "So the majority of the prescribing I do is linked to foreign travel and that's both for holiday and business travel. That's obviously an area that's growing so do a fair bit of occupational health stuff in that respect." |
| Pharmacist 8 | One specific long term condition | "It's generally patients who have hypertension only as their chronic disease, although hypertension with asthma, obesity, thyroid, I see, but anybody with hypertension with CKD or diabetes or IHD, I don't see, the doctors review them."<br>[CKD = chronic kidney disease. IHD = ischaemic heart disease] |
| Pharmacist 9 | One specific long term condition + more generally as practice pharmacist | "I prescribe, I run a heart failure clinic so I see patients with left ventricular systolic dysfunction … At other times if there's calls throughout the day and I'm at work and there's minor ailments calls that a pharmacist can deal with then again I'll deal with those *ad hoc* calls as they come in. So, yeah, that's, a broad range I would say. If there are medication issues throughout the day then I get the chance to deal with them…" |
| Nurse 1 | Community-based acute and end of life care | "Okay, so in this role that I'm in just now I'm prescribing primarily for sort of palliative care patients I think. Sometimes for chronic disease as well and also things like winter care as well I would be prescribing at this moment." |
| Nurse 2 | Community-based end of life care | "Right, I, the patient group I prescribe for are patients who are receiving palliative care … I, I limit myself completely to medications used in palliative care." |

| Participant | Patient group and/ or area for prescribing | Supporting quotation |
|---|---|---|
| Nurse 3 | Acute and long term conditions | "Predominately, you know, infections, exacerbations of things, pain, you know, musculoskeletal injuries and, you know, we do get some quite acute things as well that require some sort of emergency type interventions but it's, a bit of everything really, to be honest." |
| Nurse 4 | Acute and long term conditions | "Mainly things that, you know, sort of acute conditions, so lots of infections but all sorts of stuff, you know, gout, you know things that crop up acutely but also, the other thing I suppose is patients who are dying, we quite often get involved with them if they're sort of deteriorating quickly, or you know, there's a sudden change in condition so, yeah, a lot of palliative work as well." |
| Nurse 5 | Long term conditions | "Mostly cardiovascular, I do. I'm sort of the cardiovascular nurse lead for the practice so, hypertensives, statins, anything like that, diabetes as well, very limited in the diabetes, but yeah diabetes, what else? That's mostly, some minor illness things but now since we've got the two advanced practitioners that's, that's less." |

#### 4.3.2.2 Data saturation

The cumulative number of subordinate categories of analysis identified after each interview was plotted against the interview number; note that these subordinate categories of analysis were subsequently subject to a process of mapping and interpreting. As may be seen from Figure 4.4 it appears that data saturation was reached with the subordinate categories of analysis; given that far fewer themes and sub-themes were identified after mapping and interpreting it is highly likely that data saturation was reached.

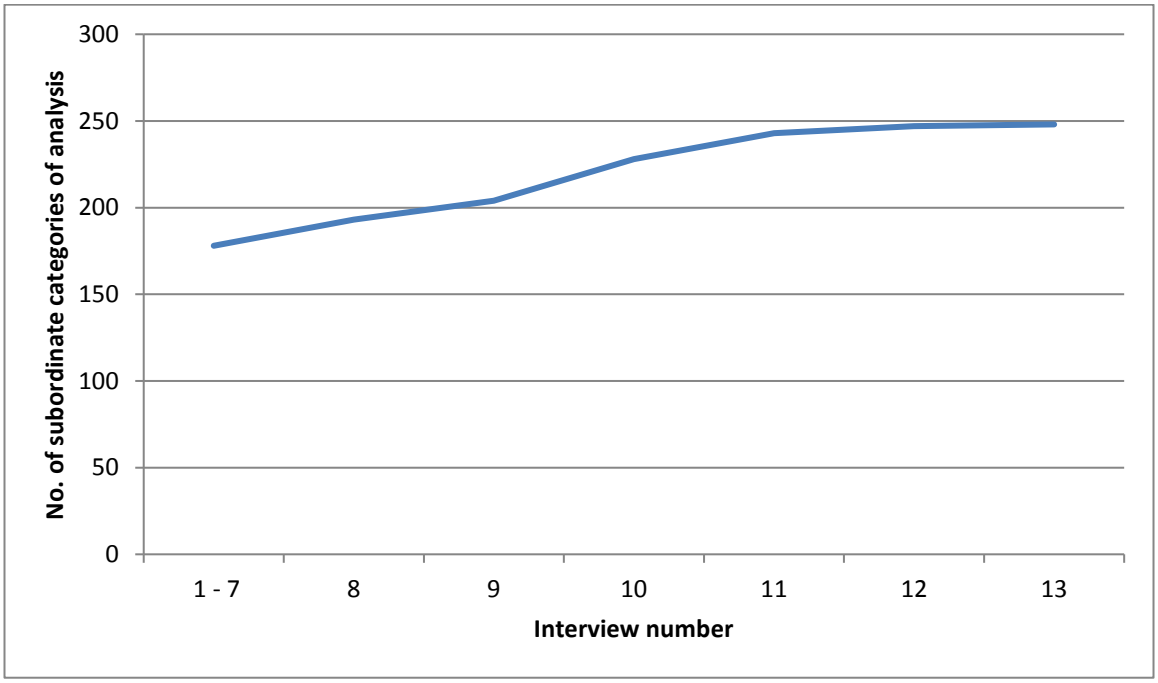



Figure 4.4 Graph of subordinate categories of analysis identified against interviews carried out

### 4.3.3 Thematic analysis of interviews

As above, transcripts were analysed thematically using a coding framework derived initially from the domains of the TDF (Cane, O'Connor and Michie 2012). Themes matched the domains with the exception of optimism and reinforcement which did not emerge as influences on participants' prescribing decision-making, while multidisciplinary working and experience were found to be influential. Within each theme sub-themes were identified and these are given in Table 4.6 below.

Table 4.6 Themes and sub-themes identified from Phase 1 interviews as influences on participants' prescribing decision-making

| Theme | Sub-theme |
|---|---|
| Knowledge | Knowledge of the patient<br>Knowledge of evidence-based guidelines<br>Specific knowledge of particular patient groups or drugs<br>Knowledge of limitations |
| Skills | Communication skills<br>Interpersonal and negotiation skills<br>Physical assessment skills<br>Documentation and IT skills |
| Social/professional role and identity | Background and scope of practice<br>Responsibility as a prescriber<br>Approach to prescribing<br>Professional boundaries<br>Awareness of limitations |
| Beliefs about capabilities | Competence<br>Consultation skills<br>Doubts about capabilities<br>Complexity<br>Sources of support |
| Beliefs about consequences | Consequences for the patient<br>Consequences for the wider care team<br>Consequences of prescribing particular drugs.<br>Experience informing beliefs about consequences<br>Consequences for the prescriber<br>Consequences for the prescriber-patient relationship<br>Consequences for colleagues |
| Goals and intentions | Optimise patient care<br>Encourage self-management<br>Take a rigorous approach<br>Prescribe according to evidence-based guidelines |
| Memory, attention and decision processes | Memory<br>Attention<br>Distractions<br>Telephone consultations<br>Complexity<br>Patient pressure to prescribe<br>Decision processes |
| Environmental context and resources | Guidelines, formularies and protocols<br>Other written sources of information<br>Colleagues and others<br>Physical assessment<br>Practice setting |
| Social influences | Respecting others<br>Learning from others' experiences<br>The influence of the patient |

| Theme | Sub-theme |
|---|---|
| | Prescriber-patient relationship<br>Patient pressure to prescribe<br>Patient's lifestyle |
| Emotion | No sub-themes |
| Behavioural regulation | Prescribing within competence<br>Reflecting on practice<br>Broader targets for prescribing decision-making<br>Dealing with uncertainty<br>Prescribing by proxy |
| Experience | Experience in general<br>Experience of patients<br>Experience vs guidelines etc<br>Experience with medicines<br>Experience of condition |
| Multi-disciplinary working | This emerged as a separate theme as well as being an element in several other themes |

During analysis two additional themes emerged strongly: multi-disciplinary team working and experience. Aspects of these will be considered within individual themes but the influences of multi-disciplinary working and experience pervade much of participants' testimony and they are considered here separately. Illustrative quotations (Creswell 2013) have been provided to evidence the thematic analysis.

#### 4.3.3.1 Multi-disciplinary working

All participants described working within a multi-disciplinary team with resulting benefits both for themselves and their patients. The team could encompass healthcare professionals from out with the practice setting, particularly where uncertainty about treatment and hence prescribing decision-making required specialist advice. Participants in primary care were comfortable discussing and negotiating patient care with GPs and described local community pharmacists as valued resources when making prescribing decisions.

"Yes, yes, I would either come back here and discuss it with a colleague, discuss with a GP, discuss it with a local pharmacist or contact [name of hospice]"
Nurse 2, primary care, female.

"The [name of local substance misuse clinic], the substance misuse, the same as the [name of city clinic], in [name of small town]. So we could contact them any day, any time, if we weren't sure about a particular situation 'cause some things still surprise you and some patient still surprise you."
Pharmacist 6, community pharmacy, female.

In secondary care Pharmacist 2 prescribed in a pharmacist- and nurse-led ward with no full time medical staff. She worked closely with nurse prescribers and also referred to colleagues in other departments.

"But also, when I get into a situation where I'm not comfortable knowing who to contact, you know I'll quite often phone the antibiotic pharmacist, speak with the pain team, if it's, if it's complex pain issues, things like that."
Pharmacist 2, secondary care, female.

#### 4.3.3.2 Experience

All participants were experienced practitioners and all but one were experienced prescribers. Experience emerged strongly as a theme and is considered here and as a sub-theme later. Experience in general was influential as was specific experience of patients and conditions. Participants recognised the importance of evidence-based guidelines but felt that there was scope for prescribing out with these in certain situations, based on their expertise and previous experience. They generally regarded experience as beneficial but were aware of the potential impact of a bad experience.

Prior experience as a practitioner and a prescriber was valued as a good foundation for prescribing; it was felt to enhance participants' confidence in the role, and their practice.

"There's certain things a couple of years ago, that I just wouldn't prescribe, and wouldn't be happy to and I would actually, you know refer to a doctor to, you know, 'Would you mind just signing this for me? I'm just', you know, but I think that just comes with experience and, when, you know, as you're working, yeah."
Pharmacist 3, secondary care, female.

Participants were able to draw on previous experience when making prescribing decisions; one described a very specific incident which continues to influence her prescribing in the same circumstances.

"For instance, a patient I had years and years ago had a particularly unpleasant nausea which was very difficult to control and it was set off by smells ... And I discovered that levomepromazine made a huge, huge difference … That gentleman had prostate cancer, and I discovered quite often men with prostate cancer when they start having problems with nausea and vomiting levomepromazine is the one that seems, because they all have, often have this thing about smells or tastes. I have no idea why, I don't understand all the dynamics or mechanics of it but things like that I suppose I remember say 'Oh, oh, gosh I remember I used that for this and it worked.'"
Nurse 2, primary care, female.

Some participants on occasion prioritised their clinical experience over evidence-based guidelines when making prescribing decisions. Participants' personal circumstances could also be influential, albeit subconsciously.

"You're limited to the formulary or the local guidance policies but not every patient fits into a formulary or a guidance document so I think, you know, you have to draw on your experience or your own clinical judgement to say 'Actually, I don't think this appropriate.'"
Pharmacist 3, secondary care, female.

"I have been aware of other people being influenced, obviously having the sort of oversight of prescribing in the practice there's other clinicians that I've, I am aware that they've been influenced by their own personal

> experiences in the way that they prescribe, so it, I know it happens. Again, we're human so it's, it's the way we work isn't it?"
> Pharmacist 9, primary care, female.

Most regarded experience as a positive influence but one or two reflected on the possible impact of a bad experience on future thinking.

> "…just previous experiences things like that, yeah, would influence you if you had a bad experience of something in the past it would keep in your mind, you would always be thinking back on that previously, yeah."
> Nurse 5, primary care, female.

Participants described prescribing in response to complex situations, as illustrated by the overarching themes of multi-disciplinary working and experience. Using the domains of the TDF in the coding framework was found to be helpful in making sense of that complexity but sometimes multiple influences were identified for one prescribing behaviour. As an example, the decision whether and what to prescribe for pain might be influenced by the patient's social influence, knowledge of evidence-based guidance and knowledge of and availability of certain resources. Only optimism and reinforcement were found not to be influential on participants' prescribing.

#### 4.3.3.3 Knowledge

Participants described drawing on a wide knowledge base when making prescribing decisions. Knowledge of the patient was influential as was knowledge of evidence-based guidelines and particularly of local formularies. Specific knowledge of particular patient groups or drugs was also valued. All participants were aware of their limitations and would not prescribe where they felt their knowledge was inadequate.

##### Knowledge of the patient

Participants relied on a broad and carefully gathered knowledge of the patient and highlighted the importance of knowing their expectations and needs in relation to treatment of their condition.

"I would prescribe something based on the symptoms that are being described by the patient, what is the, what we have in our formulary, it's not actually a formulary is it, the one for palliative care but we do have guidelines. Also based on the patient's age and their other medications that they have and any other pre-existing conditions that they have so it, it's kind of trying to look at everything and getting a broad history of medication and medical conditions and current medication of that particular person and whether or not what we would normally use for them would be appropriate and reasonable to use."
Nurse 2, primary care, female.

"… that's probably the most useful thing to find out, what it is they're looking for and then, you know often the things we're dealing with are self-limiting anyway so, you know, trying to point that out to patients, you know, that it's a self-limiting infection, it will just get better itself and doesn't always need antibiotics."
Nurse 4, primary care, female.

Knowledge of the patient's previous experience of their treatment was also important.

"If they're not taking something because they don't like, they don't like the flavour, they don't like the side effects, it's making them feel sick, whatever, then obviously, you're faced with 'Well what can we do?'"
Pharmacist 4, primary care and community pharmacy, female.

In secondary care too, learning about the patient's perspective was considered valuable.

"I quite often go and just have a catch up with the patient, really just asking them about their symptoms, what they've tried already, you know, obviously I have full access to their medical notes and electronic records so I would be taking, obviously, all the clinical factors into account as well for that patient."
Pharmacist 3, secondary care, female.

On occasion participants requested specific tests to be carried out by others and took account of the clinical information provided.

> "If they were allergic or so on, or if they had been on something previously that had worked then sometimes we use that. We would tend to do wound swabs and things and take some advice from that."
> Nurse 1, primary care, female.

Knowledge of the patients' social circumstances and family support (if any) could be important when making decisions about possibly complex regimens, particularly but not only for the elderly and infirm.

> "… all of my patients I now see at home, in their own home and that gives me a benefit I didn't have in a consultation room because I know exactly what their home situations are like, I know who they've got at home, I know how able they are."
> Nurse 1, primary care, female.

### Knowledge of local formulary and guidelines

All participants were influenced strongly by their knowledge of evidence-based guidelines and in particular by the NHS Grampian Joint Formulary (NHS Grampian Medicines Management 2017) and occasionally individual medical practice or ward formularies.

> "Within the formulary you've got your first choice and you've got your second choice. So, I'll go for the first choice, so for example, the ACE inhibitors, our's is ramipril, first choice, lisinopril, second choice. Calcium channel blockers you've got your amlodipine first choice, felodipine only if you need it."
> Pharmacist 5, primary care, female.

Within this, patient circumstances were also taken in to account.

> "So I generally get the ACE inhibitor up to the maximum dose first but if they're a bit dubious about getting bloods done for a particular reason 'cause they can't come to other appointments then I may be more likely to

> put their beta blocker dose up first because they don't then need an interim blood appointment."
> Pharmacist 9, primary care, female.

### Knowledge of specific patient groups or drugs

Some knowledge was specific to a particular patient group or drug; for some drugs participants had to consider co-prescribing in anticipation of the patient experiencing side effects.

> "If I'm giving them morphine for the first time, you know, I have explain to them it might make them sick and it might, it will very likely make them constipated and we have to go through all that and I have to then give them some anti-emetics so if they are very sick for the first wee whiley [*sic,* a short while] they can use them and also I give laxatives as well."
> Nurse 2, primary care, female.

### Knowledge of limitations

Participants were aware of their limitations and would not prescribe out with what they perceived as their areas of competence. Some pharmacists felt unable to interpret the results of blood tests fully, impacting on their ability to make a prescribing decision.

> "So including my knowledge of, let's say for example, biochemistry. I could have a situation where I could access a patient's GP notes, I can look at the screens, I can see the information but because information is not something that's within my level of expertise then I don't know enough to know whether I can prescribe safely in that situation."
> Pharmacist 7, community pharmacy, male.

#### 4.3.3.4 Skills

Participants identified a range of skills which they used during their consultations and prescribing decision-making. Good communication, interpersonal and negotiation skills were perceived as being essential, as was the ability to use information technology (IT) to support and document prescribing decision-

making. Pharmacist participants' ability to undertake appropriate physical assessment varied.

### Communication skills

The ability to communicate effectively with the patient during the consultation was seen as a key skill influencing prescribing decisions. Participants spoke about the importance of gathering information on which to base their prescribing decisions. This was not always easy.

> "History taking's probably still the key and, and, dare I say it, listening is the most important thing within that, so that we collect all the information before we start to make any decisions about what to prescribe."
> Pharmacist 7, community pharmacy, male.
> "I just have to, I give people the opportunity to tell the truth. I walk round the houses with them, I word questions slightly differently just to try and make sure we've covered everything and, really, with the best will in the world that's all I can do."
> Pharmacist 4, primary care and community pharmacy, female.

For those prescribing in substance misuse, information gathering could include testing for illicit substances in patients' urine so as to check for abstinence; this information could then be used during the consultation.

> "We can test on site [for illicit substances] so it's quite good sometimes to ask them what they've been doing and then test them because then you find out if they're lying or not, as opposed to just test them, or does that make sense?"
> Pharmacist 6, community pharmacy, female.

### Interpersonal and negotiation skills

Participants described the importance of good interpersonal and negotiation skills which they felt contributed to reaching a concordant agreement with the patient as to the need for a prescription.

> "You have to have concordance with your patient of course, so, I would like to think that my background in community pharmacy years ago has,

as an old fashioned pharmacist, has given us this good communication skills and able to talk to the patient and form a good relationship with the patients and, so that the patients'll be honest with you about compliance etc."
Pharmacist 5, primary care, female.

Nurse 3 described the negotiation skills he used when deciding whether a prescription was needed.

"You're assessing people, you know, to try and assess the severity of the problem and do we actually need to prescribe, you know? I think there's this expectation that people come in that we're going give them something and we're keen not to reinforce that so I think a lot of the skills are kind of negotiation with the patient as to why you're not doing something."
Nurse 3, primary care, male.

Pharmacist 9 described her approach to assessing and promoting patient compliance before deciding how to proceed.

"In the heart failure clinic I assess their symptoms, I assess their compliance with treatment and if I think a symptom needs treating and they have been compliant I will prescribe but if I, if their symptom, if they're symptomatic and they haven't been complying I will reinforce compliance."
Pharmacist 9, primary care, female.

Nurses 3 and 4 occasionally made prescribing decisions based on a telephone conversation rather than seeing the patient. Negotiating in those circumstances was perceived as more difficult.

"It's probably not an urgent problem, it's something that's self-limiting, and trying to quickly switch the focus away from, you know, the patient thinking they're going to get something, to self-management advice really and trying to sort of give them things they can do, do by themselves. So that, I've personally found that the trickiest on the phone I think, but it's, it's a developing skill."
Nurse 3, primary care, male.

### Physical assessment skills

As part of the consultation, physical assessment skills were sometimes needed. Some pharmacists had appropriate skills and described how they would use these when making prescribing decisions.

> "And the heart failure clinic, if they're not euvolaemic and they're still symptomatic and I can hear fluid in their chest I'm going to give them diuretics and maybe increase other medication."
> Pharmacist 5, primary care, female.

Others felt they lacked clinical assessment skills and therefore relied on other healthcare professionals to provide some of the information on which prescribing decisions were made.

> "For example, I don't really have clinical assessment skills and I very much rely on the registrar or the nursing staff for physical examination or things like blood pressure, heart rate, those kind of things. I don't, I can't measure those myself, or don't have the skills to measure those myself."
> Pharmacist 2, secondary care, female.

### Documentation and IT skills

Participants regarded having effective IT skills as essential in making and documenting prescribing decisions safely. Some recognised a personal development needs in this area.

> "…and sometimes it's so much easier just to go through and ask a GP for a prescription rather than get logged onto the computer but that will have to change, you know, we're going to have to do that."
> Nurse 1, primary care, female.

### 4.3.3.5 Social/ professional role and identity.

Participants were clear about their professional roles and scopes of practice and were very aware of the additional responsibilities inherent in prescribing. Some contrasted their approach to making prescribing decisions with that of other prescribing professionals; others described boundaries to their own prescribing and working with other healthcare professionals.

### Background and scope of practice

Participants' backgrounds and areas of current practice varied but all characterised their prescribing in relation to their professional role and described how this role influenced their prescribing.

> "My role really is to ensure the safe prescribing of the chemotherapy and then as an add on to that it's the prescribing of supportive medicines."
> Pharmacist 3, secondary care, female.

> "I was a district nurse prescriber before for like five or six years and it was, I suppose hard to get out, you know, there's a different kind of ethos doing that, I think, and most of my work was in sort of palliative care up until the last, so I've been doing this, you know, the last 18 months or whatever, so that definitely had an influence."
> Nurse 3, primary care, male.

Scope of prescribing decision-making varied according to participants' roles and areas for prescribing. Participant 6, prescribing for substance misuse, felt that the scope of her decision-making in this role was quite limited.

> "That's a bit unique I suppose to Substance Misuse, that the patients come to us already being prescribed for. We don't titrate anybody. So although we can move their prescription a small way up or down and we certainly will take patients off of their methadone, we don't make the initial prescribing decision and we don't add anything to their prescribing."
> Pharmacist 6, community pharmacy, female.

Pharmacist 4 prescribed across four clinical areas and was clear about her boundaries.

> "Because I don't do prescribing for depression and I don't think I'm about to start on that, so that would be back to the GP, for example."
> Pharmacist 4, primary care and community pharmacy, female.

Nurse participants' professional roles and hence scope for prescribing similarly varied; some were in very specific roles and limited their prescribing accordingly while others' roles and hence scope was much wider.

"Even if I think that a patient is particularly low in mood and had discussed that with them, I wouldn't prescribe an anti-depressant. I would refer that on to the GP and discuss that with them."
Nurse 2, primary care, female.

"I think not assuming problems are something because that's the only thing you know, for instance, when I was a district nurse the mainstay was swollen, fluidy legs … and it's hard maybe doing this job seeing people that the cause of the swelling might be different … it could be a DVT, it could be an injury, it could be a, something unusual or something horrendous …"
Nurse 3, primary care, male.

### Responsibility as a prescriber

Participants were well aware of the added responsibility they assumed when they prescribed; all accepted that responsibility although with greater or lesser degrees of comfort.

"Pharmacists who are not prescribers, we can recommend medicines to medical staff but when it's you putting your name to it, you are assuming responsibility for that decision."
Pharmacist 3, secondary care, female.

"I take that responsibility, it's on my head. I sign that prescription and I'm happy to do it. I don't have a problem with it."
Pharmacist 4, primary care and community pharmacy, female.

"…as a nurse I hesitate sometimes and think 'No, I'll ask the GP if this is right', yeah."
Nurse 5, primary care, female.

Pharmacist 3 had had a role for several years prior to becoming a prescriber in a specialised team with a particular focus on one type of cancer. She felt that her experience in this area enhanced her confidence in her role as a prescriber.

"…as I've got more experience and more affiliated to the [name of team], where this happens quite a lot, em, I think, I think it's through experience

you gain more confidence to prescribe that, a wider range or for maybe more difficult patients."
Pharmacist 3, secondary care, female.

### Approach to prescribing

Some primary care participants contrasted their approach to prescribing with that of GPs, asserting that as non-medical prescribers they were more motivated to prescribe within evidence-based guidelines.

"As a pharmacist with full knowledge of the formulary I think I'm probably a bit more dogged in that you like to stick between the rules and the lines and all the rest of it so I'm probably more likely to stick to formulary choices."
Pharmacist 9, primary care, female.

"I would imagine the GPs exercise a lot more of their own artist licence in what they do then perhaps the nurse practitioners here do 'cause we're much more guideline driven I think because we don't have the, the training and also, you know, the status and protection perhaps that they have."
Nurse 3, primary care, male.

Nurse 1 went further, highlighting what she saw as the more holistic, all-encompassing approach taken by nurses and contrasting it to GPs' prescribing.

"The big difference between GPs and nurses is that doctor'll go out and do a house visit and they'll hand over a prescription. Nurses are the ones that think 'Well how are you going to get that to the chemist? How's the chemist going to get it back to you and who's going be giving you the drug?' and I don't think, I think that's the benefit in having a nurse that does do all that because just last week I had to admit a patient to hospital who had his antibiotics in the cupboard for 5 days because nobody knew to give him it."
Nurse 1, primary care, female.

### Professional boundaries

Participants spoke about their awareness of professional boundaries and about the potential or actual contribution other healthcare professionals could make to their own prescribing decisions.

> "The nurses are really good at, what I kind of call the 'touchy feely' stuff like chatting with the patients and kind of teasing out what's going on or symptoms and recognising where there's, you know, 'I'm fine' but actually no, there's a serious problem going on here. And then I come in from the medicine expert, you know, kind of hat on and help with the appropriate selection and based on kind of their clinical assessment."
> Pharmacist 3, secondary care, female.

### Awareness of limitations

Participants were clear about their roles and the inherent limitations.

> "I'm not a consultant, I'm not a specialist. I'm an independent prescriber/ surgery/ community, so there is a limitation on what you know but, on day to day patients with respiratory problems, with hypertensive problems, in the area that I work in, yes, I'm pretty sure."
> Pharmacist 4, primary care and community pharmacy, female.

> "Because I'm only dealing with a limited number of patients and for limited conditions I feel really confident doing that."
> Nurse 1, primary care, female.

## 4.3.3.6 Beliefs about capabilities

Participants were all aware of the requirement to prescribe within their area/s of self-assessed competence and were careful to do so. They believed themselves capable and felt confident in their ability to prescribe within these areas including in circumstances where complexity and clinical uncertainty were felt to present additional challenges. Where they had any doubts about their ability they used a range of resources to support their prescribing decisions or did not prescribe. Their beliefs could be categorised as being about:

### Competence

Non-medical prescribers must prescribe within their own areas of self-assessed competence. All participants were aware of this and asserted that they did so.

> "It's very much about sticking to your own competencies, your own area of expertise and not, not trying to go outside of that."
> Nurse 2, primary care, female.

> "So I think we would both feel pretty confident and I think we would also both be quite aware of our limitations when we would need to seek further guidance."
> Pharmacist 6, community pharmacy, female.

Pharmacist 8's previous experience as a community pharmacist influenced her when deciding whether to prescribe for minor conditions out with her own specific areas.

> "Yeah, so mostly anti-hypertensives but things that I will, I will also prescribe things that I feel are within my competence, if it's something that back in the day I would've sold over the counter [as a community pharmacist], I'm quite comfortable with that."
> Pharmacist 8, primary care, female.

Participants generally felt very confident in their abilities to make prescribing decisions. This was largely due to experience in the clinical area, including familiarity with a sometimes narrow range of drugs.

> "… if somebody is reasonably straightforward and it's, it's something that we deal with frequently I'm very confident in, in prescribing and I suppose things like anti-emetics, laxatives, I am more confident about than with analgesia."
> Nurse 2, primary care, female.

> "I suppose with being focused mainly on hypertension it's quite a nice little, relatively straightforward group of drugs that I'm, is my bread and butter I suppose, on my own prescription forms."

Pharmacist 8, primary care, female

### Consultation skills

While participants were generally happy with their consultations skills there were aspects which they found more challenging and which could influence their choice of therapy.

> "And it's very, very hard to get people to motivate themselves to swallow something for two weeks while they're on holiday but [also for] four weeks after they come back."
> Pharmacist 7, community pharmacy, male.
> [In connection with decision on which antimalarial to prescribe.]

### Doubts about capabilities

Participants described situations where they had doubts about their capabilities to prescribe; in response they sought advice from colleagues or indeed refused to prescribe.

> "If it was something I really didn't know about, you know, I would feel quite comfortable just say 'Look, you know, I'm not going to be able to help you with this but let's get someone who can', you know. We've always got a duty doctor alongside us, you know, to refer to."
> Nurse 3, primary care, male.

### Complexity

Clinical, social or other complexity was felt to be particularly challenging when prescribing. Pharmacist 9 felt that her specialist knowledge was needed sometimes, in addition to her more routine prescribing decision-making.

> "Yeah, route of administration, what can they take, what's a suitable route for them, a lot of time the things that come across my desk are more complex 'cause other people have dealt with all the easy answers first, so sometimes it's routine issues as well, and patient preference, I suppose to a certain extent as well. What is it they're actually wanting?"
> Pharmacist 9, primary care, female.

Nurse 3 identified the possibility of complexity when making what might initially seem a straightforward prescribing decision.

> "You know, looking at the interactions, and I think that's where I can get in a bit of a muddle sometimes 'cause you might be dealing with an infected toe nail but that person's on something vastly complicated from a haematologist that you know very little about. This thing, you know, does that interact with that, and you know that takes a bit of, a bit of head scratching sometimes."
> Nurse 3, primary care, male.

Nurse 1 spoke about her ability to make complex prescribing decisions as patients neared the end of life.

> "We are quite good, I think, at assessing, you know, when to start introducing 'Just in case' boxes, when do you need to start introducing syringe drivers and so on, and symptom control drugs as well."
> Nurse 1, primary care, female.
> ['Just in case' prescribing = prescribing of specified drugs in a 'Just in case' box for the end of life]

### Sources of support

Participants described their responses to situations where they had doubts about their ability to respond appropriately to complexity or other difficulties. The use of evidence-based resources such as guidelines and protocols was felt to be helpful when negotiating such complexity.

> "There are some complicated situations, you know, the patients are very chaotic, they surprise you, they do things you don't expect but I think because of the protocol that we work to, the guidelines are quite strict and therefore you're not really making big decisions of your own because you're just sticking to a protocol which you know is safe and tested. So, I think I would find it very easy to make those decisions."
> Pharmacist 6, community pharmacy, female.

Participants described the importance of being able to refer to more experienced colleagues for advice and support in times of clinical uncertainty.

> "As you come across situations where, that you've maybe not come across before or scenarios where, you know, you're running into sort of more complicated options then, yeah, you will come across decisions where you think 'Oh, actually I'm not so confident with this or I think I need a bit of extra advice or someone else to say "Yeah I'd do the same."'"
> Pharmacist 2, secondary care, female.

#### 4.3.3.7 Beliefs about consequences

Participants described being aware of and taking cognisance of the consequences of their prescribing decisions. They considered these consequences primarily in relation to their patients but also in relation to colleagues, the wider care team and for themselves. There was little mention of any financial consequences of prescribing.

##### Consequences for the patient

The consequences of prescribing decisions for the patient were considered paramount. Participants were aware of the risks to patients associated with treatments they prescribed, but also the risks of not prescribing. Certain patient groups were perceived as being more at risk of adverse consequences.

> "Well if I make them ill, really don't want that to happen, so yeah, I think that's always at the back at of my mind 'cause a lot of my patients are frail or elderly or they're already very, very unwell, because I'm going into them."
> Nurse 1, primary care, female

Those prescribing for acute conditions felt it was important initially to explore the patient's expectations from the consultation. Nurse 4 believed that if possible, not prescribing was best for the patient.

> "Finding out what the patient's expectation is is useful, 'cause, you know, if they come in and they're just wanting advice then, you know, that's, that's, obviously that's better than giving them a prescription, so that's, that's probably the most useful thing to find out."
> Nurse 4, primary care, female.

Participants were also aware of the potential for a 'watchful waiting' decision to go wrong.

> "If I make the decision not to prescribe something and maybe think 'I'll wait and see how it goes over the next couple of days' and things could get worse so there's potentially that as a consequence as well."
> Nurse 1, primary care, female.

Prescribing in substance misuse, Pharmacist 6 was aware of the possibility, albeit infrequent, of very good consequences for patients as a result of her prescribing of opiate substitution therapy and other support provided.

> "We've transformed the lives of a few patients. I have a couple who I've worked with for maybe 5 years who've now had a baby and bought a house and they're both working, you know, it's amazing to see but that's unusual, you know."
> Pharmacist 6, community pharmacy, female.

Pharmacist 2 described how clinical uncertainty influenced her readiness to prescribe; again possible consequences for the patient were at the centre of her decision-making.

> "If I wasn't sure what to prescribe at that particular moment then I would, you know, speak to the patient about it and say 'Okay, we maybe need to go discuss this with someone else or I'll have to go and look, you know, do a bit more research till we find the best treatment for you' rather than just going ahead and doing something I wasn't comfortable with or it wasn't best for the patient."
> Pharmacist 2, secondary care, female.

Pharmacist 7 perceived both his prescribing decision and the patient's response to it as having potentially serious consequences.

> "The two things that I always have to consider are the potential danger to the patient if I choose not to prescribe something which I believe they

need, or if I allow them to decide not to, to have something which I believe they need, that could be life threatening."
Pharmacist 7, community pharmacy, male.

Once the decision to prescribe had been made, participants described balancing the risks and benefits of treatment to the patient. Participants appeared to be more focused on the risks while acknowledging the benefits.

"If there has to a degree of accepted risk, you know, I think we have sort of balance that up quite carefully as to whether we, you know. 'Are you going to get more unwell if we don't give you this, but you possibly, we might skew your INR off for a few days but that might be worthwhile 'cause you're so sore you can't get up to feed yourself.'"
Nurse 3, primary care, male.

### Consequences for the wider care team

The potential impact on those caring for patients also influenced prescribing decisions.

"I've got carers to worry about as well because if I'm prescribing a medication then sometimes I'm reliant on carers come in at certain times, and sometimes that can involve changes in care packages and things. So the care manager would then be involved with that or families would be involved in that and that can be quite complex."
Nurse 1, primary care, female.

### Consequences of prescribing particular drugs

Some participants described prescribing a particular drug in certain circumstances despite potential adverse consequences, because of the overall patient benefit.

"I love dexamethasone. For some patients it makes a huge difference to their quality of life but sometimes the down side to that is they lose a lot of their, their, their muscle strength in their thighs and you know, you know that's one of the side effects."
Nurse 2, primary care, female.

### Experience informing beliefs about consequences

Participants all described how previous experience helped them to assess the likely consequences of their treatment decisions at various stages in the treatment pathway.

> "… again past experience, you know, I'm able to look at a wound and think 'Well that probably just needs something to, topically, rather than, you know, a full system antibiotic that's probably going to give the patient diarrhoea and things like that.' So, again that's experience isn't it?"
> Nurse 1, primary care, female.

Most participants described occasions where, based on previous experience, they would prescribe out with guidelines for the patient's benefit. None appeared to be troubled by this. The decision was often but not always made during the palliative stage, where there was perceived to be more leeway in treatment. Nurse 3 had spent much of the previous several years providing palliative care as a district nurse, and described taking a broader approach to prescribing in palliative care. Nurse 2 described her experience with prescribing steroids for a specific purpose.

> "And I think in palliative care there's, there's a bit more room to be, I can't think of the right, experimental's not the right word, but, you know, you've got a bit more licence I think to be able to do things because it'll help the patient, you know, rather than perhaps because of what the guidelines says. We'll use the specialist to sort of recommend things that, you know. Our pharmacist will cross her eyebrows when she looks at them."
> Nurse 3, primary care, male.

> "For instance, one of the things that I will commonly do is if a palliative care patient who is really fast approaching the end of life has something, event, in particular they desperately, desperately want to get to, I would have no compunction if it's, safe to do so, to prescribe them some steroids for a limited period of time to get them through whatever it is they want, and I have done that often."
> Nurse 2, primary care, female.

### Consequences for the prescriber

Participants were aware that the prescribing decisions they made could have adverse consequences for them, and this could influence their actions.

> "So for example, I'll prescribe quite a lot of things like vancomycin, which require ongoing monitoring and the consequences for me, as a prescriber, if that patient has side effects from the vancomycin, you know, obviously could be, could be severe for the patient, and severe for me."
> Pharmacist 2, secondary care, female.

> "I mentioned INRs 'cause that comes up a lot in our elderly folk. Everything you want to prescribe interacts with warfarin and makes life difficult so I think the more the consequence of, or the more the chance of harm the more chance there are of consequences for me, the less likely perhaps I am to, to want to try and add new things in or, you know, find a solution, they're more likely to, you know, deal with immediate acute problem then pass them on to somebody else in that case I think."
> Nurse 3, primary care, male.

### Consequences for the prescriber-patient relationship

Only one participant specifically mentioned possible consequences of prescribing decisions on the prescriber-patient relationship but the patient emerged as a key social influence on participants' prescribing decision-making. The prescriber-patient relationship will be considered under social influences.

### Consequences for colleagues

Participants were aware that their prescribing decisions could impact on their colleagues.

> "Yeah, if you're making bad decisions or prescribing things that are not, not good, it will have consequences on other people 'cause, you know, if you're prescribing every, antibiotics for every, you know, everything that comes in that would be difficult for other people who are then faced with that patient at the next infection or whatever it is and giving different advice. So you need to make sure you're in line with what everybody else is doing."

Nurse 4, primary care, female.

"My employers are probably taking a bit more of a risk than they were before because obviously they didn't have nurses who could prescribe and now they do, so probably it's a bit more of a liability for an employer."
Nurse 1, primary care, female.

Participants believed that their prescribing decisions could have consequences not only for patients but also for the prescriber, colleagues and the wider care team. Participants expressed less concern about specific consequences for the prescriber-patient relationship, employers and for financial consequences. Participants' beliefs were often informed by experience and they balanced what they believed were likely consequences so as to achieve the best outcome for patients.

#### 4.3.3.8 Goals and intentions

As previously the research team felt that there was some overlap between "goals" and "intentions". Cane and colleagues (2012) similarly found this and goals and intentions are considered together here.

For all participants their overarching goals were to ensure patient safety and wellbeing through safe and effective prescribing, including non-prescribing, for their patients. This could encompass optimising patient care, encouraging self-management and taking a rigorous approach to prescribing including prescribing according to evidence-based guidelines.

##### Optimise patient care

Throughout the interviews, and whatever the setting or condition, participants put their patients first and would do what they could to optimise their care while minimising patient harm. Nurse 3 was clear about his priority.

"But, yeah, generally try not to do them any more harm than they had before they came in, is the main thing for me."
Nurse 3, primary care, male.

Participants tried to work with their patients but sometimes had to accept the limitations of this approach.

> "I will try my best to, if I think the treatment is the right treatment I will try my best to convince them to take it, and, you know, just present the pros and cons and all the rest of it, but, if at the end of the day they have very set ideas about a particular drug and you know they're not going to take it then that, I wouldn't prescribe, that's just silly."
> Pharmacist 8, primary care, female.

### Encourage self-management rather than treat unnecessarily

In some instances, and where possible, the intention was not to treat and participants considered how they might manage that.

> "I think people are often expecting, I mean, and people often say 'Well aren't I getting antibiotics for this?' So you know, it's about trying to point out the reasons why that wouldn't be appropriate or educating the patient."
> Nurse 4, primary care, female.

### Take a rigorous approach

Participants described taking a rigorous, stepwise approach to prescribing decision-making.

> "I don't know if everyone has this, but I have my own mental check list before I prescribe something, similar to what, how you would check a prescription, you know, check. So, yeah, just making sure you adhere to your process."
> Pharmacist 3, secondary care, female.

### Prescribe according to evidence-based guidelines

Participants generally felt that prescribing according to evidence-based guidelines or formularies was best and did so. However in some circumstances they chose knowingly to deviate from these where they perceived this to be in the patient's interest.

"I think I try to extract full information out of patients and try and make valid decisions based on what should be our first formulary choices and what are most effective treatments."
Pharmacist 9, primary care, female.

"So, you prescribe off the guideline to some extent, but it's because it's the best of a bad lot and you're trying to do your best for the patient."
Pharmacist 4, primary care and community pharmacy, female.

#### 4.3.3.9 Memory, attention and decision processes

Participants were aware that prescribing decision-making could be challenging and required complex cognitive and other skills. Participants described employing a rigorous, step-wise process in making and documenting their prescribing decisions. They had to gather and process a wide range of information; some acknowledged that their ability to do this was not always optimal and described steps that they would take to address any perceived difficulties.

##### Memory

Some participants admitted having difficulty in remembering specific facts or processes, particularly those concerned with new or unfamiliar medicines and procedures. Some described ways of working which circumvented the need to remember particular details.

"I've looked up things online in my anti-coag *[sic]* clinic for like the Hasbled score and the CHAD *[sic]* score. I've, I've looked up to remind myself, and there's little tools online that you can just tick and it does it almost for you. So I've used that, 'cause it's quite hard to remember what it all stands for sometimes if you only have a new patient maybe every couple of months."
Pharmacist 5, primary care, female.
[Hasbled score and CHAD score = ways of assessing a patient's need for anticoagulation]

One participant who visited patients at home returned to the surgery where she had access to all the relevant information, before writing her prescriptions.

> "I don't tend to ever hand write a prescription which I think a lot of district nurses do. Because we're working in the home I always tried to come back to the health centre and do it on the patient's record once I've got the record open because obviously, you know, I can have a quick look before I go out but I can't remember all the allergies and things like that."
> Nurse 1, primary care, female.

### Attention

Participants were aware of the potential to make errors when prescribing and tried very hard to avoid this.

> "With analgesia, I tend to recheck things over and over again, and quantities and breakthrough doses and things like that…"
> Nurse 2, primary care, female.

### Distractions

Notwithstanding their determination to avoid errors, some participants described being distracted by external influences such as colleagues, patients and their families during the consultation.

> "I had a lady had six children with her the other day, three were her's and three were her neighbour's and, you know, they're jumping up and down on the couch and tipped the toy box out, one's playing drums on the bin, and you're trying to listen to somebody's chest and it's, you know, that can be a little bit distracting…"
> Nurse 3, primary care, male.

### Telephone consultations

Assessment of the patient is one of the cornerstones of patient care yet some participants treating patients for acute conditions routinely consulted and made prescribing decisions over the phone when the patients were perceived to have relatively straightforward conditions.

> "It's a little bit more difficult when you lose the, I suppose the objective look of not having somebody in front of you, you know, to decide how sore

> they are or what have you, but generally I think the ones we speak to on the phone are probably the ones that we're less likely to prescribe for…"
> Nurse 3, primary care, male.

### Complexity

Several participants described the influence of complexity on their prescribing decision-making. Some found it challenging and preferred to pass some complex patients on to more experienced colleagues.

> "You look at repeat list sometimes and it goes onto a second page … and, the more complicated it gets, particularly in an emergency surgery like this, the more complicated it gets the less likely I think I possibly am to do something there and then. You're more likely to just do something to put a sticky plaster on it, to book them into an appointment tomorrow to see somebody else."
> Nurse 3, primary care, male.

Other participants would decide to prescribe out with a product licence where they perceived this would be the best solution to clinical complexity.

> "So, I will prescribe, for example, an unlicensed MDI for COPD, as in unlicensed for COPD, it's still a licenced product, with a spacer, because that may be my only option by the time I've worked my way through everything else [laughs], and that's what I do."
> Pharmacist 4, primary care and community pharmacy, female.

### Patient pressure to prescribe

Participants were aware that they could be subject to patient pressure to prescribe. This will be considered under "Social influences."

### Decision processes

Participants described various approaches to the process of making a prescribing decision, sometimes informed by experience or the involvement of other colleagues. Nurse 3, a relatively inexperienced prescriber, sometimes found making the decision difficult but felt reassured that he had a robust approach which would quality assure this process.

> "It very much varies depending on the patient but I think what I am confident about is the process and the safety net and that steps that I would go through to get to a decision hopefully is reasonably steady."
> Nurse 3, primary care, male.

Pharmacist 2, a much more experienced prescriber in secondary care, went over the details of her prescribing decision-making with the patient.

> "If for example I'm talking to the patient about changing therapy I would go back to them and say 'Oh yeah, we spoke about this, this, this and this' and get them to agree so I knew in my head that I'd gone through that. So it's almost like I go back to the start and go through it again."
> Pharmacist 2, secondary care, female.

Most participants faced circumstances where they found prescribing decisions particularly difficult, for example where several other options had been tried unsuccessfully.

> "If you've got someone on a very complex pain regimen and they're struggling with nausea and they've tried everything and you, and you can't think of any more options really. Obviously that's a lot more difficult because you want to try and do the best for the patient but you're kind of running out of avenues to go."
> Pharmacist 3, secondary care, female.

Nurse 2 described sometimes worrying about a prescribing decisions she had made, and checking the outcome with the patient the following morning.

> "I do, I do often go home at night and think 'Oh, you know, I did that and I hope that was the right decision, you know, think that's the best thing but, you know, I'll phone them tomorrow morning and make sure.'"
> Nurse 2, primary care, female.

#### 4.3.3.10 Environmental context and resources

With regard to their environmental context and resources, participants used guidelines, formularies, protocols and other resources to support their prescribing decision-making. They described the benefits of working as part of multi-disciplinary teams and were respectful of other team members. Participants routinely sought advice and support from colleagues, most commonly GPs for those in primary care, and from others with relevant expertise. Environmental contexts i.e. practice settings and facilities were important and pharmacist prescribers in primary care regarded their inability to prescribe electronically as a major barrier to safe and effective practice.

Nurse 1 listed the spectrum of resources which she had at her disposal when prescribing for patients at the end of their lives.

> "So I mentioned the Grampian Formulary, so I would definitely go to that first. We've got the palliative care guidelines and [name of local hospice] have got some really good guidelines on the internet about 'Just in case' prescribing and symptom control and palliative care. Got the BNF, we've got doctors' meetings once a week that we meet up with the GPs and we can chat about, you know, prescribing there if we need to."
> Nurse 1, primary care, female.
> [Just in case prescribing = prescribing of specified drugs in a 'Just in case' box held in the patient's home in preparation for the end of life]

##### Guidelines, formularies and protocols

Guidelines, formularies and protocols were considered very influential and participants drew on a wide range of these when prescribing. The term "guidelines" was used generically and also to refer to evidence-based clinical guidelines developed and published by organisations such as NICE, SIGN and others. When speaking about "the formulary" participants were generally referring to the NHS Grampian Joint Formulary (NHS Grampian Medicines Management 2017) but could also mean individual medical practice or ward formularies, developed with input from their pharmacists or perhaps they themselves. The term "protocols" was used to describe more prescriptive documents which often included some sort of algorithm to guide treatment decisions. The terms "guidelines" and "formularies" also appeared to be used

interchangeably by some participants so that it was not always clear exactly what was meant.

Most participants were very aware of the content of guidelines and used them to guide their prescribing decisions.

> "There are some excellent guidelines for the area. Respiratory's fantastic, the asthma and COPD guidelines are wonderful and you'd really have to be pretty dim to not be able to follow them."
> Pharmacist 4, primary care and community pharmacy, female.

> "A lot of what I prescribe is guideline driven. To be honest we've come up with and mostly been myself or maybe the consultants and registrars, for general sort of background prescribing guidance in each different scenario, mainly to support the non-medical prescribers that are coming through, so a lot of our guidelines are based around that."
> Pharmacist 2, secondary care, female.

Nurse 3, relatively new to prescribing, had tried to restrict his options even more.

> "I've personally, have almost sort of developed, well as part of the course that I did, obviously that you're aware of, like your personal formulary. Okay that's grown quite a bit in the 9 months since I finished that, so the things on it, yeah, I feel, I feel quite confident because I've spent time, you know, through the, sort of formulary stuff I'm doing has helped."
> Nurse 3, primary care, male.

Protocols similarly were felt to be helpful; this was particularly the case for Pharmacist 6 who prescribed methadone and suboxone for patients with substance misuse difficulties. She and her pharmacist prescriber colleague prescribed within a very strict protocol.

> "So we have a protocol in which we work if they happen to start using again or they're struggling where we can increase their prescription by 5mLs, up to three times, without consulting the Substance Misuse Team,

but we tend to work very closely together anyway so we probably would be discussing that anyway for our own reassurance that we're doing the, doing the right thing."
Pharmacist 6, community pharmacy, female.

Pharmacist 8, treating patients for hypertension, contrasted her own attitude to evidence-based guidance with what she perceived to be that of her GP colleagues.

"I do like a nice policy and protocol and I know some of the GPs in the practice don't and like to be a bit more free-rein with their prescribing decisions, but I do feel more comfortable with policies and formularies and protocols."
Pharmacist 8, primary care, female.

Notwithstanding participants' awareness of and respect for evidence-based guidance, as before several described situations where they felt this did not allow them to meet patients' needs. There could also be tensions with colleagues over off-guideline requests.

"For example, one of the nurses has seen someone. 'She really likes Caphosol®. Can we use Caphosol®? Can you prescribe Caphosol®? Can I prescribe Caphosol®?' and it's, it's the, the rela…, you know, it's like 'I don't want to say "No" to you and affect our professional relationship but these are the guidelines and this is the reason they're there and this is why you should not be using it.' And it's pressure from other people 'cause of their preferences, both professionals and other patients I think, it's quite difficult to deal with sometimes I think."
Pharmacist 3, secondary care, female.
[Caphosol® is a solution used to moisten, lubricate and clean the oral cavity]

### Other written sources of information

In addition to guidelines, formularies and protocols, participants described using the following written sources of information when prescribing, often accessing these electronically:

British National Formulary; Clinical Knowledge Summaries; condition-specific websites; the electronic medicines compendium; the emergency care summary; GP notebook; 'the Green Book' Immunisation against infectious diseases; Martindale; Medicines Complete website; the NHS Grampian medicines information department; Stockley's Drug Interactions; Scottish Medicines Consortium website and Travax.

More broadly, participants described using resources of the National Pharmacy Association and the Royal Pharmaceutical Society, professional discussion forums, courses and conferences to support their prescribing.

### Colleagues and others

Participants all described working as part of a multi-disciplinary team of colleagues and sometimes external experts, and greatly valued the advice and support afforded. Those within a primary care practice setting had a range of options for referral and GPs were a trusted and important source of support.

> "There's lot of stuff that comes in that I wouldn't feel confident with and it's, they're managed in a different way, you know, we pass them on to GPs, book them in for appointments, get a different practitioner to phone them back..."
> Nurse 3, primary care, male.

> "Sometimes I'll go and I've got a mentor GP, and I'll just go and just run it through with him and I know I'm going to give it but I'm just discussing it through and that just helps you to know 'Yeah, that's definitely, definitely fine, that's, that's absolutely fine' and discuss the plan with him."
> Pharmacist 5, primary care, female.

Nurse 3 acknowledged that some prescribing decisions could also challenge GPs.

> "… somebody comes in with a sticky green eye that's obvious as they walk down the corridor, you know, you've made your decision half the time before you've sat down but on another time you can be sitting scratching your head for half an hour trying to decide and you've had to ask two GPs who don't know either."

Nurse 3, primary care, male.

Neither of the secondary care pharmacist prescriber participants mentioned doctors specifically as a source of information or support.

### Physical assessment

Pharmacist participants described requiring help from nurses and doctors with physical assessment and interpretation of blood results.

> "The other, the other resource is like, like for example, if I was looking at an ECG before I can titrate a beta-blocker and I've been a bit worried about whether the PR interval's too long or something there's a nurse and she's very, very good and I'll maybe run it past her, we'll have a look at it, so that's resource as well."
> Pharmacist 5, primary care, female.
> [PR interval = part of the tracing from an electrocardiogram used to monitor heart function]

> "… so it's a bit of comfort blanket for me that if I am unsure then, yes, I, there is some there that I can go and ask and even if it just a case of 'I have no idea what this blood significance is, can you tell me?'"
> Pharmacist 8, primary care, female.

### Practice setting

Participants' practice settings also influenced their prescribing. Pharmacists 2 and 3 worked in secondary care where access to specialist services facilitated certain prescribing decisions.

> "I suppose the ability to closely monitor a patient. I would probably prescribe things here that I wouldn't be happy to prescribe to a patient who's going to walk out the door."
> Pharmacist 2, secondary care, female.

Notwithstanding their electronic access to patients' records, at the time of recording the interviews pharmacist prescribers in primary care could not prescribe electronically; they had to hand-write their prescriptions then record

them in the electronic patient record. This was seen as a barrier to safe and effective practice and was a major issue for those affected.

> "A huge, huge, huge, huge, huge resource problem is the fact that we don't have electronic prescribing stationery to prescribe and I can't say this strongly enough, this is the one thing that would revolutionise what I do because I have to, it's unsafe in a way, it is unsafe. I have to do everything with a patient, counsel, everything, give them a leaflet, then I have to hand write the prescription."
> Pharmacist 5, primary care, female.

> "And because we have to hand write them actually the whole process actually takes you longer than if you were doing it electronically because to do a prescription electronically, seconds, and to hand write it takes much longer so there are probably are more chances of you being interrupted in a hand written prescription then there would be in an electronic prescription."
> Pharmacist 9, primary care, female.

[Note that an electronic prescribing pilot started in NHS Grampian and several other Health Boards in November 2016.]

#### 4.3.3.11 Social influences

Participants all worked with others in multi-disciplinary teams and these and other relationships, or sometimes the lack of them, influenced their prescribing decisions. Participants acknowledged the social influences of the patient and the prescriber-patient relationship on their prescribing decisions. As part of the goal of "putting the patient first" participants were sometimes aware of pressure from the patient or the patient's family to prescribe, particularly antibiotics. Participants used various means to withstand this pressure but acknowledged that occasionally they would prescribe as they saw it inappropriately, in response to patient or family pressure rather than clinical need.

### Respecting others

Participants were keen to respect the prescribing decisions of other healthcare professionals, even when they did not agree with them.

> "So, to ensure that we're getting consistency and continuity, what I would hate to do is, is be in a situation where I would be prescribing something that one of my other colleagues has disagreed with…"
> Pharmacist 7, community pharmacy, male.

> "But if somebody's under the care of a specialist or something I think we'd be even less likely 'cause you think of the consequence of upsetting Mr Whoever, the surgeon at the hospital, you know, by changing what he's done."
> Nurse 3, primary care, male.

Participants found ways to navigate these potential inter-professional tensions.

> "But it's quite, you know, obviously you want to maintain a decent professional relationship with people and you don't want to look as if you're trying to be subversive or whatever but, I think there are times when I wouldn't necessarily agree with a choice of anti-emetic or pain management even. GPs use a lot of, well some GPs use a lot of dihydrocodeine or tramadol and those aren't drugs that I would generally use, so it's just a difference."
> Nurse 2, primary care, female.
> [Dihydrocodeine and tramadol are opiate analgesics]

### Learning from others' experiences

Pharmacist 9 worked within a primary care medical practice and would refer to GP colleagues if she felt unsure about prescribing something.

> "Generally, if it's, if it's very important and I consider that I'm not happy to prescribe I would actually pass it to the GP to deal with the next day with a full spiel of all the things I considered and all the things I want them to ask or consider."
> Pharmacist 9, primary care, female.

Working in secondary care, Pharmacist 3 described learning from informal discussions with colleagues. In a similar setting Pharmacist 2 also considered and learned from the experiences of others.

> "We regularly catch up and reflect on, without actually doing it in a formal way, but we do it all the time, we reflect on our prescribing decisions or recommendations that we've made and we, we learn from each other that way as well."
> Pharmacist 3, secondary care, female.

> "I suppose other people's experiences might, might influence you or if they've prescribed something in the past that they've had a bad experience with, we would meet as a pharmacy sort of peer group and discuss these kind of things. And sometimes you know, you think to yourself 'Oh, my colleague's prescribed that and this went wrong, or this didn't happen', so it might influence the way either you deal with that prescription or it might influence you not to go forward with a prescription as well. So it does make you think twice about it."
> Pharmacist 2, secondary care, female.

### The influence of the patient

Participants were all very focused on the needs of the patient, and all described aspects other than the patient's clinical condition as being influential.

> "I suppose it's, because the guideline's quite influential and, and the BNF, and you know, the bits that keep you safe, I would like to think are the most influential on the decisions I make but, you know, there's always that thing, I think the patient, what they want and what they're expecting you to do. I think sometimes has, has quite an effect."
> Nurse 3, primary care, male.

### Prescriber-patient relationship

Participants described varying degrees of relationships with their patients but all put the patient at the centre of their prescribing decisions. Pharmacist 3 prescribed repeatedly for the same patients receiving treatment in hospital.

> "The thing with our patients here as well, they're back every two, three weeks, so you see them all the time so sometimes you build up quite a relationship with them and if you get to know them, and I hate to use this word, but empathise or feel sorry for them..."
> Pharmacist 3, secondary care, female.

In this sort of situation, participants found satisfaction in helping patients to achieve personal milestones in difficult circumstances.

> "A lady who wanted to get to her son's wedding, prescribed her steroid and she died two days later but she got to the wedding and, and to me it's things like that are really, really, the goals they have or the important events for the families as well and for them to be able to have those memories."
> Nurse 2, primary care, female.

Prescribing for substance misuse can also allow long-term prescriber-patient relationships to develop but Pharmacist 6 was careful not to be influenced by her relationship with her patients into prescribing in a way that potentially put them at risk.

> "We wouldn't put anybody on to a take away prescription unless they were working, that would be the only reason, no matter how much we trusted them or how clean they were."
> Pharmacist 6, community pharmacy, female.

Other participants similarly placed importance on there being a relationship of trust between them and their patients; Nurse 1 spoke particularly about the impact a prescribing decision might have on that relationship.

> "If I make that decision not to prescribe and then, you know, things get worse then obviously there's a lack of trust gone there, isn't there?"
> Nurse 1, primary care, female.

Pharmacist 2 described the consultation as a two-way process, highlighting that a difficulty within the consultation might impact on the patient's willingness to reach agreement with the prescriber.

> "If you had a prescribing consultation that's maybe not gone so well you might, don't know, that might come across to the patient … it might influence the patient as well, in that you're, you know, when you're making that sort of joint decision to go ahead with the prescription, that might influence the patient and what they're doing."
> Pharmacist 2, secondary care, female.

### Patient pressure to prescribe

Most participants described situations where they were aware of patient or family pressure to prescribe in a certain way. Participants described responding to this pressure in various ways.

> "So I wouldn't necessarily prescribe something because the patient wanted, wanted it; and if they didn't want it then have a discuss around why they didn't want it, if there's an alternative they were happy to have that I was happy to prescribe and make sure that you've got agreement with, with the patient, or if it happens to be the patient's family, that, you know, that are involved in that discussion."
> Pharmacist 2, secondary care, female.

> "Yeah, I mean patients come in sometimes with very fixed ideas of what they like and what they don't like and what they want and what they don't want, so in some scenarios you almost do have to just give in to what they want because they'll, there is no point in prescribing and them actually not taking it 'cause they don't have any belief in it."
> Pharmacist 9, primary care, female.

Participants prescribing for acute conditions in primary care described feeling under pressure from patients to prescribe, as they thought, inappropriately.

> "Dare I say, parents of small children that have been on Google®. Fine, you know, we listen to everybody but it's when they come in with a very

set idea that little Johnny needs antibiotics because he's had a cough for 48 hours and they're not going to leave without, you know, we come up against that quite a lot. I find that difficult…"
Nurse 3, primary care, male.

"I'm just thinking about this morning for instance. I had a, three people looking for prescriptions for conjunctivitis in kids, and you know, I always try very hard not to be prescribing these sorts of things 'cause, you know, there's all sorts of complications of, you know, or dangers of prescribing, but I do find that very difficult, you know. Parents want a fix for this and they don't want to wait for it to get better by itself so, you know, your own emotions and, you know, your own resilience does play a part there, you know, if they're really keen to get a prescription off you."
*[Doctoral student: So how might you respond to that kind of pressure?]*
"Might cave in and give it, yeah."
Nurse 4, primary care, female.

In secondary care too, participants were subject to pressure from the patient, or their family, to prescribe what they wanted. Participants sometimes found this pressure hard to resist.

"Yeah, because a patient doesn't care about a guideline the patient just cares about their own, how they're feeling, what their treatment is, or their mum's or their dad's or, you know. They see someone who's suffering, or they're suffering themselves, and you know, you say that we're not allowed to use this in the hospital, 'Why not, why not? I had this last…'"
Pharmacist 3, secondary care, female.

"Your heart goes out to them and you are wanting to help them and, you know. Maybe it's not the most appropriate thing to give them the zopiclone or give them the extra couple of days of steroids but sometimes you feel like 'Oh, you really need this.'"
Pharmacist 3, secondary care, female.
[Zopiclone is a hypnotic]

### Patients' lifestyles

Patients' behaviours or lifestyle choices, either short or long term, could also exert an influence on the prescribing decisions participants made.

> "Someone also may have a variable itinerary within a country, so they may wish to do certain activities that would you know, increase the risk, so again that would be the conversation we'd have and we would have an agreement."
> Pharmacist 7, community pharmacy, male.

> "So we agreed 'Right, you try and get a bit more exercise, cut back on the booze and stop smoking'. Six months later there was no difference. So the negotiation there was, 'Well, are you prepared to cut back on the smoking?' and he had to admit, no, probably not. So we had to put him on tablets. That was the only alternative."
> Pharmacist 4, primary care and community pharmacy, female.

#### 4.3.3.12 Emotion

Some participants asserted that their professionalism precluded an emotional response when making prescribing decisions while others acknowledged that their emotions did play a part. Some identified to a degree with certain patients' circumstances which was emotionally difficult, while others found patient demands challenging at the end of a long day.

> " … you tend to leave your emotions, you know, behind your professionalism. So it doesn't matter how I'm feeling, if I'm having a good day or a bad day I wouldn't take that to work with me, you know."
> Nurse 1, primary care, female.
> "I would never not give them the pill or the morning after pill just because I'm in a bad mood with them, no."
> Pharmacist 4, primary care and community pharmacy, female.

That said, participants acknowledged that they might be influenced by their emotional response to certain patients or situations. Some, and especially those prescribing for patients with life-threatening or terminal conditions, described

feeling sympathy and/ or empathy for their patients and being influenced accordingly.

> "I think the, the social circumstances, your previous experience with the patient, the relationship you have with the patient and how you relate to them I think definitely influences your prescribing. Can be tough sometimes, yeah."
> Pharmacist 3, secondary care, female.

Participants described how they felt and behaved in response to what they perceived as challenging patient expectations. Nurse 5 used the term "Friday afternoon prescription" to describe her response on occasion.

> "I suppose if it's been a long hard day and you're under pressure from somebody to prescribe something that you wouldn't normally or that you'd be reluctant to normally, you know, I guess they can wear you down. So yeah, I guess your emotions do have an impact certainly, you're only human at the end of the day, yeah."
> Nurse 4, primary care, female.

> "Just prescribe something for like a 'Friday afternoon prescription' sort of thing…"
> Nurse 5, primary care, female.

Several participants described worrying over prescribing decisions they had made.

> "It's certainly things that you think about, yeah, if this, if this treatment goes wrong, if there is a, you know, a significant risk of harm, that you know, you wouldn't want to take that risk yourself, yeah, you do. It's certainly a consideration, it does worry you. Sometimes it keeps you awake at night."
> Pharmacist 4, primary care and community pharmacy, female.

#### 4.3.3.13 Behavioural regulation

Participants monitored and reflected on their practice, particularly in relation to prescribing within their areas of competence, broader targets for prescribing decision-making and dealing with uncertainty. This behavioural regulation then informed future practice.

##### Prescribing within competence

Participants were very aware of the limits of their competency and described taking a rigorous, reflective approach which facilitated self-regulation in their prescribing decision-making.

> "It's about having the, the right to prescribe something, having the authority to prescribe something, being in a situation where I believe it may be in the patient's best interest for me to prescribe but not having the relevant knowledge either of what I would prescribe or the patient's own circumstances or background to allow me to do that with 100% safety."
> Pharmacist 7, community pharmacy, male.

> "I generally won't prescribe out with my competence. If I've been asked to prescribe something, for example by one of the consultants that I'm not happy with, then I will pull back from that."
> Pharmacist 2, secondary care, female.

Participants were similarly careful in the processes of prescribing so as to minimise errors.

> "I'd like to think I've got quite a methodical way of going through and just sort of go through each stage at time making sure I've checked this and this and this...and this."
> Pharmacist 2, secondary care, female.

##### Reflecting on practice

Participants also reflected on their own behaviour in relation to prescribing decision-making. Pharmacist 4 identified what she perceived as a shortcoming when considering her options for prescribing.

> "And I've also fallen into the trap that GPs fall into, you prescribe what you're familiar with, and I know I'm doing it and every now and then I have to give myself a stern talking to and say 'Right, get a grip and start branching out just a wee bit.'"
> Pharmacist 4, primary care and community pharmacy, female.

Nurse 3 reflected on the tension between the demands of evidence-based prescribing and the needs of patients seeking help.

> "But I think out of that there's a few specific things, you know, being a bit tougher and bit more robust and sticking to the, you know, sticking to the evidence and the guidelines as much as possible but trying to make that fit around the person that is, is anxious and worried and feeling you don't want to help them, you know. So there's a bit of a juggling act really, but I'm hoping that will get better with time."
> Nurse 3, primary care, male.

Nurse 4 sometimes compared her prescribing practice with that of others

> "I sometimes think, you know, when I'm listening to other people speaking about things that I'm a bit sort of non-interventionist, you know, and you sort of think 'Gosh, well perhaps I should be, you know, doing more.'"
> Nurse 4, primary care, female.

### Broader targets for prescribing decision-making

Not all decisions made were for individual patients. Pharmacist 8 had started to take a broader approach, targeting certain drugs or classes of drugs for "de-prescribing" according to evidence-based guidelines.

> "Most recently I've been, I've been, I've also been reducing doses of PPIs in patients, I've been stopping aspirin for primary prevention, that type of thing, not just 'Here's more new medication.'"
> Pharmacist 8, primary care, female.

### Dealing with uncertainty

Often, participants' response to uncertainty was to seek help from others, most often in primary care from a GP, or from another perceived expert. At other times they would research the issue themselves.

> "I think we would know when to, when to jump ship and when to get extra advice."
> Pharmacist 6, community pharmacy, female.

> "Just find time to search them and look them up and up-skill myself about it. Yeah, so just CPD really, it's part of your, you do every day don't you? Every time you open a BNF it's a bit of CPD."
> Pharmacist 9, primary care, female.

### Prescribing by proxy

Occasionally participants decided not to make the prescribing decision themselves but instead made a recommendation or suggestion to another prescriber and ask him or her to write the actual prescription.

> "You know, sometimes I will say to the GPs that something's not licenced so I'm not happy to prescribe it … but you still have a professional responsibility that you advised that. I'm probably more likely to say 'It's not licenced, I wouldn't do and I would advise you don't do it either, if there's suitable alternative that we can use that's licenced' but there isn't always."
> Pharmacist 9, primary care, female.

### Summary of findings

Participants were very generous, sharing their experiences, views, reflections and opinions on their prescribing decision-making over 9 hours of interviews. Throughout, they evidenced a rigorous, thoughtful and reflective approach, with their patients always at the centre. Rich data were gathered, allowing multiple and sometimes contradictory influences to be uncovered. These will be discussed in the next section.

## 4.4 Discussion

### 4.4.1 Key findings

Eight pharmacist independent prescribers and five nurse independent prescribers, experienced professionals from across the NHS Grampian area, were each interviewed for between 22 and 58 minutes about their experiences of making prescribing decisions, their views and reflections of influences on these decisions and their opinions on the impact of these influences on their prescribing decision-making.

Participants prescribed in primary or secondary care or in community pharmacies. All were very focused on the needs of their patients and put their welfare at the centre of prescribing decision-making. Participants were often dealing with complexity in patients' health or social circumstances and multiple and sometimes contradictory influences on prescribing decision processes were apparent. Most of the 14 domains of the TDF (Cane, O'Connor and Michie 2012) were found to be influential as were participants' previous experiences and multi-disciplinary working.

### 4.4.2 Strengths and limitations

To the doctoral student's knowledge this study is among the first to explore in-depth influences on prescribing decisions by non-medical prescribers. The doctoral student has previously published a systematic review of influences on prescribing decision-making among non-medical prescribers in the UK (McIntosh et *al*. 2013, McIntosh *et al.* 2014, McIntosh *et al*. 2016a); other research includes that by Maddox (Maddox, Tully and Hall 2010, Maddox 2011).

The study has several strengths.

#### 4.4.2.1 Trustworthiness

Qualitative research has been criticised as lacking rigour (Greenhalgh *et al.* 2016) with ongoing debate about its suitability for inclusion in mainstream medical publications (Loder *et al*. 2016). Qualitative research does not aspire to

be generalisable but rather to be trustworthy, and the concept of trustworthiness may be used to evaluate the quality of qualitative research (Guba 1981, Shenton 2004).

The steps taken during the design of the study to promote the four components of trustworthiness i.e. credibility, transferability, dependability and confirmability in the study (Guba 1981, Shenton 2004) are outlined in Chapter 2 and Table 2.10.

### Credibility

As in Chapter 2, the study was designed to enhance credibility. It is felt that this was achieved: the supervisory team had relevant expertise, the interview schedule was developed from the literature with an appropriate theoretical underpinning, peer reviewed by senior non-medical and medical prescribers and used to gather data from volunteer participants across a wide range of settings. The doctoral student's academic and professional qualifications and familiarity with the culture and practice of non-medical prescribing allowed her to establish a rapport with participants before and during the interviews. Thorough analysis by two researchers, internal triangulation using data from all participants (Smith 1999) and detailed consideration of findings in relation to the literature further enhance credibility. External triangulation will be carried out using "overlapping methods" (Shenton 2004, p.71) i.e. Phases 2 and 3 of the study – see Chapter 5.

### Transferability

No-one practises in isolation; all are affected by the context within which they practise as well as by broader influences. In qualitative research the aim is not to achieve generalisability but it may be that findings are transferable i.e. relatable or relevant to others in a similar situation. There is some debate about whether transferability is possible or whether findings are unique to each study (Shenton 2004). The doctoral student feels that elements of her findings may resonate with others in similar positions to those of her participants and to that end has provided contextualising detail.

### Dependability

Good research governance requires that sufficient detail is given to allow the work to be repeated by another researcher (Bowling 2002) and as in this thesis

provision of this level of detail enhances dependability. Triangulation of data as above enhances dependability further.

#### Confirmability

Again provision of methodological detail enhances confirmability, as do internal and external triangulation. Clear descriptions of what was done are given along with diagrammatic representations: Figure 4.2 shows the stages in the development of the interview schedule, Table 4.3 outlines the data analysis process and Figure 4.3 illustrates coding at principal and subordinate categories of analysis using NVivo®. Clear diagrammatic illustration of research processes supports the confirmability of findings; it is important also to consider issues of bias and reflexivity (see later in this chapter and in Chapter 2).

### 4.4.2.2 Design and theoretical underpinning of the interview schedule

The interview schedule was developed in a thorough, step-wise manner from the literature including a systematic review (McIntosh *et al*. 2016a), the TDF (Michie *et al.* 2005, Cane, O'Connor and Michie 2012) and the views of experts. Until recently, theoretical underpinning has been less common in much of pharmacy practice research compared to other disciplines but such underpinning is recognised as promoting quality and relevance in research (Stewart and Klein 2016). Dyson and colleagues compared the effectiveness of qualitative and quantitative research underpinned by the TDF with similar research in the absence of any theoretical basis. They found some overlap but that TDF-informed research elicited more and additional information compared to the atheoretical approach (Dyson *et al*. 2011). The TDF has been used extensively to research health-related behaviours (Francis, Curran and O'Connor 2012) including prescribing errors (Duncan *et al.* 2012) and along with the literature provided the basis around which the interview schedule was developed. The domains of the TDF were also used to prepare an initial coding framework for data analysis.

### 4.4.2.3 Participants

Participants were pharmacist independent prescribers in community pharmacy, primary care and secondary care, and nurse independent prescribers in primary

care, from across the NHS Grampian area. They had extensive experience within their own professions (10 – 40 years) and almost all were also experienced independent prescribers (8 months – 11 years). They prescribed for a wide range of conditions and patient groups in a variety of practice settings. Recruitment matched the professions of non-medical prescribers in NHS Grampian at the time of the study although not their relative proportions. There appears to be little literature on prescribing by NMPs other than nurses and pharmacists and only nurse and pharmacist prescribers were identified in a recent Cochrane review of the effectiveness of NMP (Weeks *et al.* 2014).

#### 4.4.2.4 Participants' contributions

Social desirability bias is always possible (Sackett 1979) but participants spoke apparently freely and at some length, sometimes greatly exceeding the expected duration of the interview. They shared a wide range of information, including some which did not always reflect well on them, and appeared to be speaking honestly.

#### 4.4.2.5 Data saturation

From Figure 4.4 it appears that data saturation was likely to have been achieved. The analytical approach taken precluded the use of Francis' method to establish this (2010); rather it facilitated a detailed examination of the data. Principal categories of analysis were sub-divided into as many as 23 subordinate categories each, with 248 subordinate categories in total. A process of mapping and interpreting of these resulted in 13 themes with 58 sub-themes.

Francis suggests that an initial number of between five and ten interviews should be undertaken, with a minimum of an additional three after data saturation appears to have been reached. Endorsement by pharmacist and non-medical prescribing Health Board Leads, a reminder e-mail and snowballing over a period of months resulted in 13 participants only, but this number is within Francis' proposed method.

### Study limitations

Possible limitations will be considered for each phase of the method; bias is inherent in research and must be acknowledged and mitigated as far as possible (Sackett 1979) as must other limitations.

#### 4.4.2.6 Study design

Data were generated in semi-structured interviews, using the same interview schedule throughout. It is possible that relevant areas for questioning were omitted although the interview schedule was developed rigorously with input and review from relevant nursing, pharmacy and medical experts. The doctoral student reflected on each interview and discussed them with her supervisory team; no lacunae were evident and the interview schedule was not amended.

#### 4.4.2.7 Recruitment

Thirteen participants were recruited from around 664 NMPs in the NHS Grampian area at the time of the study; eight pharmacist prescribers and five nurse prescribers. They represented all areas of practice except nurse prescribing in secondary care. It is possible that those choosing to participate were different in some way from those choosing not to, for example they may have been more experienced or more confident in their role as prescribers. It is also possible that the prescribing decisions of nurse prescribers working in secondary care might be influenced by different or additional influences to those of study participants. No attempt was made to contact non-responders to explore any differences.

#### 4.4.2.8 Conduct of interview

The doctoral student was aware that her background was likely to influence her research; see Chapter 2 Section 2.11 Reflexivity. Participants knew she was a pharmacist and academic and this knowledge may have influenced their responses (Richards and Emslie 2000); social desirability bias (Sackett 1979) was also possible. The doctoral student explained her role as a researcher before each interview and maintained a position of neutrality throughout; if participants seemed to seek her opinion she would reply "We'll talk about that later" or a similar neutral phrase (Smith 2005).

The shared frame of reference between the doctoral student and participants did however facilitate a shared understanding of allusions and ideas (Britten 1995), for example "a Friday afternoon prescription". According to the interpretivism paradigm such a shared understanding is essential to the development of knowledge (Bunniss and Kelly 2010).

It is possible that participants were subject to recall bias (selectively remembering certain information) and reporting bias (not answering certain questions) (Sackett 1979) during their interviews but they appeared to speak freely and answer questions fully.

#### 4.4.2.9 Bias during analysis and reporting of findings

Bias during analysis of data was possible. To mitigate this, supervisors and the doctoral student discussed the approach to analysis and analysed one transcript together. Remaining transcripts were analysed by the doctoral student and one of supervisors SC, DS and KFM, with any disagreements being resolved by discussion. The doctoral student then used NVivo® to support management and analysis; the use of such software has been found to facilitate analysis and increase rigour (Kelle, Prein and Bird 1995).

Supervisor KFM is a psychologist with extensive experience in health-related research; Francis and colleagues recommended inclusion of a health psychologist in teams using the TDF in research (Francis, O'Connor and Curran 2012).

### 4.4.3 Findings in relation to other studies

As above, research in this area is somewhat limited but research on influences on medical prescribing decision-making is extensive.

Maddox studied the prescribing decisions of NMPs working in primary and community care (Maddox 2011) and identified regulatory, patient and colleague factors, the prescribing culture and professional experience, training and information sources and logistical factors as influential.

Bradley carried out seminal research on factors influencing GPs' prescribing decisions which engendered feelings of discomfort for them (Bradley 1992a, Bradley 1992c). This work led to a series of studies throughout the 1990s by Bradley and others culminating in a report for the Department of Health on improving doctor-patient communication about drugs (Stevenson *et al*. 2001).

Findings will be discussed under Maddox's categories of prescribing influences and in relation to other literature.

#### 4.4.3.1 Regulatory factors: evidence-based guidelines

Latter and colleagues carried out a large-scale, although early, evaluation of nurse and pharmacist independent prescribing (Latter *et al*. 2010). Prescribers emphasised the importance of prescribing strictly according to evidence-based guidance and asserted that they did so. Maddox's NMP participants were guided primarily by such guidelines but stated that they would prescribe out with them based on personal experience, unsuitability of guidelines or patient-related factors (Maddox 2011). Nurse prescribers treating otitis media in children and respiratory tract infections made similar prescribing decisions (Philp and Winfield 2010, Rowbotham *et al.* 2012).

Bradley's research on medical prescribing was carried out before the burgeoning of evidence-based guidelines but all his participants experienced discomfort when prescribing for certain clinical conditions and from certain drug groups (Bradley 1992a, Bradley 1992c).

Participants in the present study relied on their knowledge of evidence-based national guidelines, local formularies and protocols when prescribing and also used a wide range of other paper and electronic resources to inform their decision-making. All shared the environmental context of prescribing within NHS Grampian and participants in primary care in particular used the NHS Grampian Joint Formulary (NHS Grampian Medicines Management 2017) as a key resource. All participants also described using specific knowledge of particular patient groups and/ or conditions. Participants were strongly influenced by evidence-based guidelines but most described situations where they would prescribe other

than in accordance with these, based on their experience or on specific patient factors.

There is concern that evidence-based guidelines developed for patients with a single clinical condition may not be suitable for those with multi-morbidities and about a "one size fits all" approach (McCartney *et al*. 2016). Doctors prescribing in secondary care experienced discomfort when trying to prescribe according to evidence-based practice while incorporating their own clinical experience, possibly because they considered that evidence-based guidelines discounted the value of such experience (Lewis and Tully 2009). In a mixed methods study among patients, GPs and prescribing advisors in the North of England, potential conflicts were identified between the use of evidence-based guidelines and maintaining a partnership between doctors and patients (Solomon *et al*. 2012). Participants in this study used their knowledge of guidelines to inform their prescribing but like non-medical prescribers, were subject to additional influences on their prescribing (Maddox 2011, Philp and Winfield 2010, Rowbotham *et al*. 2012, McIntosh *et al.* 2016a).

#### 4.4.3.2 Patient factors

Maddox's NMP participants incorporated a number of patient-related factors into their prescribing, endeavouring to address patients' concerns and improve adherence and hopefully outcomes while withstanding occasional patient pressure to prescribe inappropriately (Maddox 2011). Bradley's medical participants (1992a, 1992c) described feelings of discomfort arising from patient factors including prescribing for those at extremes of age, their relationship (good or bad) with the patient and when prescribing to maintain the doctor-patient relationship. Subsequent research has identified a mis-match between prescribers' perceptions of patient expectations from the consultation and what patients actually wanted (Britten and Ukoumunne 1997, Little *et al.* 2004, Coenen *et al*. 2006). Cribb and Barber (1997, p.294) described the tension between perceived patient "wants" and "needs" as "one of the handful of fundamental questions in the philosophy of health".

The social influence of the patient was important and participants described different types of relationships. Some prescribing for acute conditions might not

have met the patient before; others were able to establish longer-term relationships over a period of weeks, months or sometimes years. Deeper GP-patient relationships have been found to increase the number of issues raised during a consultation with likely benefits to the patient (Merriel *et al*. 2015). GPs have "holding relationships" with some patients, providing support without the expectation of a cure (Cocksedge *et al*. 2011 p. e484); it may be that NMPs managing patients' long-term conditions are establishing similar relationships.

The doctor-patient relationship has been found to be a key influence on GPs' prescribing (Butler *et al*. 1998, Stevenson *et al.* 1999, Britten et al. 2000, Little *et al*. 2004, Petursson 2005, Lucas *et al*. 2015, Strumiło *et al*. 2016, Horwood *et al*. 2016) and that of consultants prescribing in secondary care for long-term conditions (Lewis and Tully 2011). Some GPs admit to sometimes prescribing to maintain the doctor-patient relationship with resulting feelings of discomfort (Bradley 1992a, Horwood *et al.* 2016). This may particularly be the case with antibiotics although some GPs prescribing for sore throats asserted that they did not prescribe antibiotics in response to patient pressure. They did however prescribe antibiotics in response to "pressured clinical contexts", and were generally comfortable with their decisions (Kumar, Little and Britten 2003, p.138).

Some participants in this study admitted to prescribing antibiotics occasionally in the absence of clear clinical need, with potential long-term adverse consequences for the patient and society (Costelloe *et al*. 2010, Leibovici, Paul and Ezra 2012). A retrospective study of dispensing data indicated that on average 20% of dispensed prescriptions written by nurse prescribers in Scotland are for antibiotics, with some evidence of good practice (Ness *et al.* 2015). This is clearly an important issue about which there has been concern over at least the last 25 years.

Participants believed that trust between the prescriber and patient was key to the relationship and would promote good outcomes. Medical prescribers similarly value a relationship of trust with their patients (Cocksedge *et al.* 2011, Ashdown *et al*. 2016) as do NMPs (Philp and Winfield 2010). Patients' own expressed goals were important, with some participants prescribing out with guidelines to allow patients to achieve these. Participants believed themselves capable of

doing this and were influenced to do it by their beliefs about the likely consequences for the patient and their goal of putting the patient first.

At other times participants described feeling subject to social pressure from patients or their families to prescribe, as participants thought inappropriately, particularly for antibiotics; not all believed themselves capable of resisting this pressure. Again doctors have reported perceiving similar pressure and responding by prescribing antibiotics in the absence of clear clinical need (Butler *et al*. 1998, Britten *et al*. 2000, Little *et al*. 2004, Lewis and Tully 2011, Lucas *et al*. 2015, Fletcher-Lartey *et al*. 2016). Strategies proposed for improving antibiotic stewardship include approaches to strengthen prescribers' decision-making in such circumstances (National Institute for Health and Care Excellence, 2017b).

#### 4.4.3.3 Colleague factors

Maddox's participants described being influenced by colleagues, particularly GPs, with some nurse prescribers reporting pressure to minimise costs in their prescribing. They sought informal advice or referred the patient to the GP where they felt it necessary, otherwise they reported that GPs had little influence on their practice (Maddox 2011). In a small scale, in-depth study nurse prescribers in general practice described pressure to prescribe from GPs, patients and reception staff as a "major demand" (Cousins and Donnell 2012, p.226). They resisted it by refusing to prescribe out with their competence.

Participants in the present study did not report pressure from their colleagues. Rather they worked well in the environmental context of multi-disciplinary teams, with those in primary care regarding the opportunities offered by GPs for advice, support and referral as a valuable resource. Several also described seeking support from external experts with specialist knowledge. Participants were respectful of the professional roles of colleagues with little mention of questioning doctors' prescribing decisions. Participants' beliefs about the consequences of their prescribing decisions extended to colleagues as well as about consequences for the patient and for themselves.

Non-medical prescribing with its developing professional roles has been seen by some as challenging the medical hierarchy (Weiss 2011, Cooper *et al.* 2012) but medical prescribers in secondary care have also felt constrained in their prescribing decision-making by the views of more senior colleagues (Lewis and Tully 2009). Participants were aware of and learned from the roles and prescribing decision-making of other NMP colleagues. The behaviour or opinions of peers have also been found to influence medical prescribers (Bradley 1992a, Jacoby, Smith and Eccles 2003, Gunnarsdóttir and Kinnear 2005) and peer teaching has been recognised as being effective in promoting the use of evidence-based guidelines (Chauhan *et al.* 2017).

Participants found colleagues and others very valuable resources particularly when faced with complex or otherwise challenging prescribing decisions and sometimes were influenced by their beliefs about their own capabilities to refer the patient on to others whom they perceived as having more expertise. A recent interview–based exploration of GPs, nurses and pharmacists as prescribers in primary care found differences in the extent to which practices accommodated and adapted to non-medical prescribing; where this was done successfully all benefited from the resultant multi-disciplinary working (Weiss *et al*. 2016). Pharmacist participants working in nurse- and pharmacist-led wards in secondary care sought advice and support primarily from other pharmacist prescribers, including through informal discussions about prescribing-related issues from which all benefitted. They made little reference to the role of doctors. Adigwe and colleagues (2013, p.21) reported on non-medical prescribers prescribing for pain in primary and secondary care and identified the importance of "safety and support within the prescribing environment" provided by their colleagues; this would resonate with participants.

#### 4.4.3.4 Prescribing culture and professional experience

Maddox's participants were influenced by the prescribing decisions of doctors in primary and secondary care. At the same time they could be quite critical of some of the prescribing of GP colleagues which they perceived as sometimes inappropriate (Maddox, Tully and Hall 2010, Maddox 2011). Nurse prescribers treating self-limiting respiratory tract infections felt frustrated and unsupported when GPs prescribed antibiotics following the nurse prescribers' decision that

there was no clinical need (Rowbotham *et al.* 2012). Doctors too are influenced by peers' prescribing (Bradley 1992a, Jacoby, Smith and Eccles 2003, Gunnarsdóttir and Kinnear 2005) and also by feedback on their prescribing data from leaders in the profession (Guthrie *et al.* 2016, Hallsworth *et al.* 2016).

In addition to using national condition-specific guidelines and the NHS Grampian Joint Formulary participants also described using local formularies. In primary care individual practice formularies were developed from the NHS Grampian Joint Formulary; such shared resources and the social influence of informal discussions with colleagues encouraged the development of a very local culture of prescribing. For those in secondary care ward formularies, developed with input from at least one participant, were similarly influential.

Maddox's participants did not identify past experience as a strong influence on their prescribing, in contrast with those of Rowbotham (Rowbotham *et al*. 2012) and others (Cullinan *et al*. 2014, Cabral *et al*. 2015, Ashdown *et al.* 2016) and including participants in this study. All participants were experienced practitioners and, except one, experienced prescribers. All described the influence of their experience when making prescribing decisions, which provided background and specific knowledge and enhanced participants' prescribing confidence. On occasion and like other NMPs (McIntosh *et al*. 2016a) some prioritised experiential knowledge over evidence-based guidelines where this was perceived to benefit patients. GPs have used their experience to manage their perception of tension between the requirements of evidence-based medicine and the needs of individual patients (Tonkin-Crine, Yardley and Little 2011, Solomon *et al*. 2012, Cullinan *et al*. 2014) and in response to clinical uncertainty when treating children with respiratory tract infections (Horwood *et al.* 2016).

#### 4.4.3.5 Training and information sources

Maddox's participants did not identified training as a specific influence on their prescribing decisions and nor did participants in the present study. Participants used a wide range of online and paper resources to inform their prescribing decision-making.

#### 4.4.3.6 Logistical factors

Some of Maddox's participants described appointment time pressures as influencing their prescribing while others with longer appointments did not. NMPs have traditionally had longer appointments than GPs although this may be changing. Time pressures have been reported in GP consultations (Cocksedge *et al.* 2011), sometimes impacting on prescribing decisions (Horwood *et al*. 2016).

Primary care pharmacist participants' inability to prescribe electronically was a major issue for them. On occasion one chose not to prescribe but instead ordered the prescription through the practice repeat prescription service, impacting on the patient's ability to access their medicines in a timely manner. One of the main drivers for non-medical prescribing was to improve patients' access to medicines (Crown 1999) and it seems inexplicable that almost 20 years later this is still not possible, although a pilot scheme started in November 2016.

#### 4.4.3.7 Additional participant-related influences

Maddox did not appear to describe the influence of specific aspects of her participants on their prescribing decision-making. The use of the TDF in development of the interview schedule and as the basis for the initial framework for data analysis facilitated identification of additional participant-related influences.

##### Knowledge

Participants made use of a wide knowledge-base when prescribing. Knowledge of the patient was key; their clinical condition, their previous experience of treatment and their expectations were identified as central influences. These elements are included in the British Pharmacological Society's Ten principles of good prescribing (British Pharmacological Society 2010) and the Royal Pharmaceutical Society Competency Framework for all prescribers (Royal Pharmaceutical Society 2016). They contribute to a patient-centred approach (Lehman *et al*. 2015) which is favoured by patients (Little *et al.* 2001) and likely to contribute to better patient outcomes (Calderwood 2016). Lack of knowledge has contributed to prescribing errors among junior doctors (Lewis *et al.* 2014).

### Skills

Participants' skills, particularly communication and interpersonal skills, also strongly influenced the prescribing decisions they made. Participants considered themselves proficient in these skills although some described challenges when negotiating with patients. Some pharmacist prescribers lacked clinical examination skills and relied on others for these. Concern has been expressed previously about pharmacist prescribers' lack of clinical examination skills (General Pharmaceutical Council 2016) and this is a focus in the GPhC learning outcomes and indicative content for pharmacist prescribing courses (General Pharmaceutical Council 2017c). Doctor-patient communication has been extensively studied (Stevenson *et al*. 2001) with some concern that the use of different "voices" has contributed to misunderstandings (Barry *et al.* 2001, Cabral *et al*. 2014). Exploring patients' ideas, concerns and expectations may reduce prescribing (Matthys *et al.* 2009); pharmacist and nurse prescribers in primary care in England have been found to respond to more of patients' cues and concerns than GPs (Riley *et al*. 2013). Communication skills are among the non-technical skills identified as necessary to allow junior doctors to prescribe safely (Dearden *et al.* 2015).

### Professional roles and identities

Participants described their professional roles and identities as influencing their approach to making prescribing decisions. They benefitted from their previous professional experience and were aware of the additional responsibilities inherent in the prescribing role. Maddox's participants' willingness to take on these responsibilities was influenced by their perceived competence (Maddox 2011); this was also the case in the present study. Interestingly, although there are now over 5000 pharmacist prescribers, (personal communication General Pharmaceutical Council 2016), the role of prescriber was barely mentioned in a recent exploration of pharmacists' perceptions of their professional identity (Elvey, Hassell and Hall 2013).

### Beliefs about capabilities

Participants' beliefs about their capabilities were influential: they were confident but very aware of their limitations and careful not to prescribe for conditions out with their competence. Non-medical prescribers, as all prescribers, must prescribe within their self-assessed area/s of competence (Royal Pharmaceutical

Society 2016) but resisting pressure to prescribe out with these area/s can be challenging. Pharmacist prescribers in Northern Ireland asserted that their naturally cautious approach to prescribing helped them to stay within their competence (McCann *et al.* 2012a) while nurse prescribers in primary care described self-imposed limitations on their prescribing (Bowskill, Timmons and James 2013). Both these approaches resonate with those of participants in this study. Participants felt confident in their ability to prescribe safely and effectively, were clear about their boundaries and were certain that they would not prescribe beyond these. Participants' beliefs about their capabilities are supported by the findings of a recent Cochrane review which established that non-medical prescribers delivered comparable prescribing outcomes to those of medical prescribers across a range of conditions (Weeks *et al.* 2014).

### Goals and intentions

Participants' goals were to put the patient first and optimise patient care. They intended to do this by involving patients in discussions, encouraging self-management and taking a rigorous, evidence-based approach when making prescribing decisions. The patient is at the centre of the Competency Framework for all prescribers (Royal Pharmaceutical Society 2016) and in the British Pharmacological Society 10 Principles of Good Prescribing (2010).

### Memory, attention and decision processes

Participants described the attention to detail required when making prescribing decisions and the strategies they employed to support the associated cognitive demands. Technology was felt to offer some solutions and participants described taking a step-wise approach during prescribing decision-making. Complexity was felt to be particularly challenging. Historically pharmacist prescribers have prescribed in discrete clinical areas (General Pharmaceutical Council 2016) whereas nurse prescribers have more often prescribed for a wider range of conditions (Latter *et al.* 2010, Coull *et al*. 2013). More recently primary care pharmacists working in doctors' practices have taken on wider prescribing responsibilities, including for those with multi-morbidities (NHS Education for Scotland 2017a). A shortage of GPs and an aging population with increasing health and social care needs mean that the way in which healthcare is delivered will change (Imison, Castle-Clark and Watson 2016) and it is likely that complexity will increase for non-medical and medical prescribers.

### Environmental context and resources

Environmental context and resources have been considered under Regulatory factors: evidence-based guidelines and colleague factors.

### Emotion

Although some participants claimed not to be influenced by emotion, others described feeling empathy towards patients in difficult circumstances and obtaining satisfaction from helping them to achieve their goals. A systematic review of patient experience of GPs' empathy found this correlated well with patient satisfaction, enhanced enablement and improved clinical outcomes (Derksen, Bensing and Lagro-Janssen 2013).

In contrast, some participants in primary care reported feeling relentless patient pressure resulting in negative emotions and sometimes in what they described as inappropriate prescribing. Participants treating self-limiting infectious conditions particularly reported feeling pressure to prescribe antibiotics. In the literature, pressure to prescribe, most often from patients, has been identified over a number of years as a stressor for medical (Little *et al*. 2004, Lewis and Tully 2011,) and non-medical prescribers (Philp and Winfield 2010, Cousins and Donnell 2012, Scrafton, McKinnon and Kane 2012).

### Behavioural regulation

Participants practiced reflectively. They were aware of their responsibilities as prescribers and particularly of the requirement to prescribe only in their areas of competence, and were clear that they would do so. The Competency Framework for all prescribers emphasises this need to prescribe only within self-assessed competence (Royal Pharmaceutical Society 2016). None the less nurse prescribers have reported feeling under pressure to take on additional prescribing for example in signing regular repeat prescriptions (Cousins and Donnell 2012, Scrafton, McKinnon and Kane 2012).

## 4.4.4 Summary

This chapter has reported Stage 2 Phase 1 of the programme of research, a qualitative, theoretically-driven exploration of influences on the prescribing decision-making of NMPs by means of semi-structured interviews. Development

of the interview schedule was informed by the literature and by use of the TDF; this along with robust research methods and governance enhances the trustworthiness of findings. Participants' prescribing decision-making was influenced by most but not all of the domains of the TDF; there was some overlap and some linking between domains.

It is important to note that the focus of this phase of the programme of research was broad: participants' descriptions of their experiences of making prescribing decisions, their views and reflections of influences on these decisions and their opinions on the impact of these influences.

A full exploration of influences on their prescribing decision-making required an additional, narrower focus on actual prescribing decisions made, and this was achieved in Phases 2 and 3 of the programme of research:

- Phase 2: self-recorded reflections on individual prescribing decisions participants felt were noteworthy in some way
- Phase 3: semi-structured interviews based on these recorded reflections

# Chapter 5 Phases 2 and 3 of study

## 5.1 Introduction

This chapter will report on Phases 2 and 3 of the study: participants' self-recorded reflections on prescribing decisions which they judged to be noteworthy (Phase 2) and interviews based on these recorded reflections (Phase 3). Again the focus throughout was on participants' experiences, their perceptions of influences on their prescribing decision-making and the impact of these influences.

The aim was to explore participants' experiences and perceptions of influences on their prescribing decision-making **in relation to noteworthy prescribing decisions.**

The objectives were to explore:

- participants' in-depth descriptions of their experiences of making prescribing decisions
- their views and reflections of influences on the prescribing decisions they make
- their opinions on the impact of these influences on their prescribing decision-making

## 5.2 Methods

### 5.2.1 Research design

As before an inductive, phenomenological approach was taken, this time using a novel method of data generation. A brief orientation summary of the research is given below with more detail following.

#### Phase 2

In Phase 2 of the study participants from Phase 1, all of whom had agreed to take part in Phases 2 and 3, were given digital recorders and asked to record reflections on "one or two" of their prescribing decisions which they regarded as noteworthy in some way in relation to their practice.

#### Phase 3

In Phase 3 participants were interviewed by the doctoral student about their Phase 2 reflections.

### 5.2.2 Setting and sampling frame

Again the study was carried out in primary and secondary care and in community pharmacies across the NHS Grampian area. The sampling frame was participants in Phase 1 of the study who had consented to taking part in Phases 2 and 3 of the study.

### 5.2.3 Recruitment

All participants in Phases 2 and 3 had already read the participant information sheet (Appendix 4.1) and completed the study-specific online recruitment and consent form (Snap Surveys 2016) as part of their initial recruitment. They had consented to participating in all three phases of the study and to having their interviews and reflections recorded and anonymised data disseminated.

### 5.2.4 Reflections and interviews: data processing, transcription and data storage and data generation.

#### 5.2.4.1 Data processing, transcription and storage

In Phases 2 and 3 data were processed, transcribed and stored as in Phase 1 except that the doctoral student transcribed the Phase 2 recordings herself and checked them for accuracy.

#### 5.2.4.2 Data generation Phase 2: self-recorded reflections

At the end of their Phase 1 interviews participants were shown by the doctoral student how to use the Olympus® WS-832 digital voice recorder and also given written instructions on how to use it (see Appendix 5.1).

In the participant information letter (Appendix 4.1) participants were told "I will ask you to record your reflections after two prescribing decisions you make over the following four weeks; you may choose what to record but should not include any patient-identifiable information." When speaking to participants at the end of their Phase 1 interviews the doctoral student asked participants to record "one or two" reflections within the following four weeks on prescribing decision/s which they felt were noteworthy in some way in relation to their practice. The doctoral student did not give any further direction as she wanted to leave the selection/s entirely up to participants. Participants were asked to record the reflection/s after the consultation then to contact the doctoral student to arrange collection and return of the recorders.

#### 5.2.4.3 Data generation Phase 3: interviews based on Phase 2 reflections

##### Design of interview schedule

Following transcription and checking of each participant's Phase 2 reflection/s the doctoral student read each several times along with their Phase 1 interview transcript. She considered the Phase 2 reflection/s in relation to the Phase 1 interview, the domains of the TDF and the additional Phase 1 themes of experience and multi-disciplinary working. The doctoral student developed some generic questions for use each time "You said … Can you say a bit more about this, please?" She contextualised these for each reflection and identified key sections and aspects which she wanted to explore using more specific questioning. The doctoral student prepared an interview schedule based on each Phase 2 recording by annotating the relevant transcription electronically using track changes with questions which she would ask. During the interview there was scope to ask additional supplementary questions where the doctoral student felt this was appropriate. Two examples of these annotated reflections used as interview schedules may be seen in Appendix 5.2. These were chosen as illustrating the approach taken by the doctoral student when preparing for the

interview; note that supplementary questions would also be asked as seemed appropriate.

### Phase 3 interviews based on Phase 2 reflections

The doctoral student e-mailed each participant to arrange a suitable day and time for the Phase 3 interview, which at participants' requests were again held in their workplaces. On the day of the interview the same standard operating procedure as in Phase 1 (Appendix 4.3) was used but in addition the participant and the doctoral student listened to the recording/s prior to each interview so as to refresh participants' memories of their reflections. Each participant was then interviewed by the doctoral student who as above used an electronic version of the annotated Phase 2 reflection to guide the interview. This was done to facilitate the interview process; the doctoral student found the text and annotations easier to read on the laptop screen than they would have been on paper.

## 5.2.4.4 Data analysis

Transcripts were analysed using the same Framework Approach as in Phase 1 (Ritchie *et al*. 2014). Although the TDF domains of optimism and reinforcement were not perceived by participants in Phase 1 interviews as influential they were retained in the coding frame for completeness. The additional Phase 1 themes of multi-disciplinary working and experience were also included.

One transcript (Nurse 5, 1st reflection) was discussed and analysed by TM, SC, DS and KFM together to agree the approach to coding. Remaining transcripts were analysed by the doctoral student and one of SC, DS and KFM and any differences in coding resolved by discussion.

Table 5.1 Stages in thematic analysis of Stage 3 transcripts using the Framework Approach (Ritchie *et al.* 2014)

| Step | Process |
|---|---|
| Data familiarisation | Recordings were listened to by the doctoral student after each interview, during transcription accuracy checking and during analysis. Transcripts were similarly read, annotated and reviewed repeatedly by the doctoral student and her supervisory team to allow familiarisation with the data and to facilitate analysis |
| Identifying constructs (categories of analysis) | TDF domains + additional Phase 1 themes of multi-disciplinary working and experience were used *a priori* as principal categories of analysis and additional emerging principal and subordinate categories added as transcripts were coded. Coding was done by the doctoral student and by one of the supervisory team; duplicate analysis of transcripts was shared. Coding was discussed and agreed with any disagreements being resolved through discussion |
| Indexing | Use of NVivo® software facilitated creation and ordering of principal and subordinate categories of analysis creating hierarchies |
| Charting | Representative illustrative quotations were selected from the categories of analysis. These quotations were reviewed, discussed and agreed by the supervisory team |
| Mapping and interpreting | Principal and subordinate categories of analysis were considered in relation to each other and grouped thematically, creating themes and sub-themes. This allowed influences on participants' prescribing decision-making to be elucidated |

#### 5.2.4.5 Processing transcripts using NVivo®

NVivo® 10 (QSR International Pty Ltd. 2016) was again used by the doctoral student to facilitate data handling and analysis, including identification and later use of agreed representative quotations (Creswell 2013). This was an iterative process. Based on the doctoral student's experience in analysing Phase 1 transcripts, fewer subordinate categories of analysis were created during analysis of Phase 3 interviews. Figure 5.1 shows the broad coding of Phase 3 interviews and illustrates the detailed coding of the principal categories of analysis

"environmental context and resources" and "knowledge", producing subordinate categories. Note that "delayed prescriptions" was used as a data cache for future use.

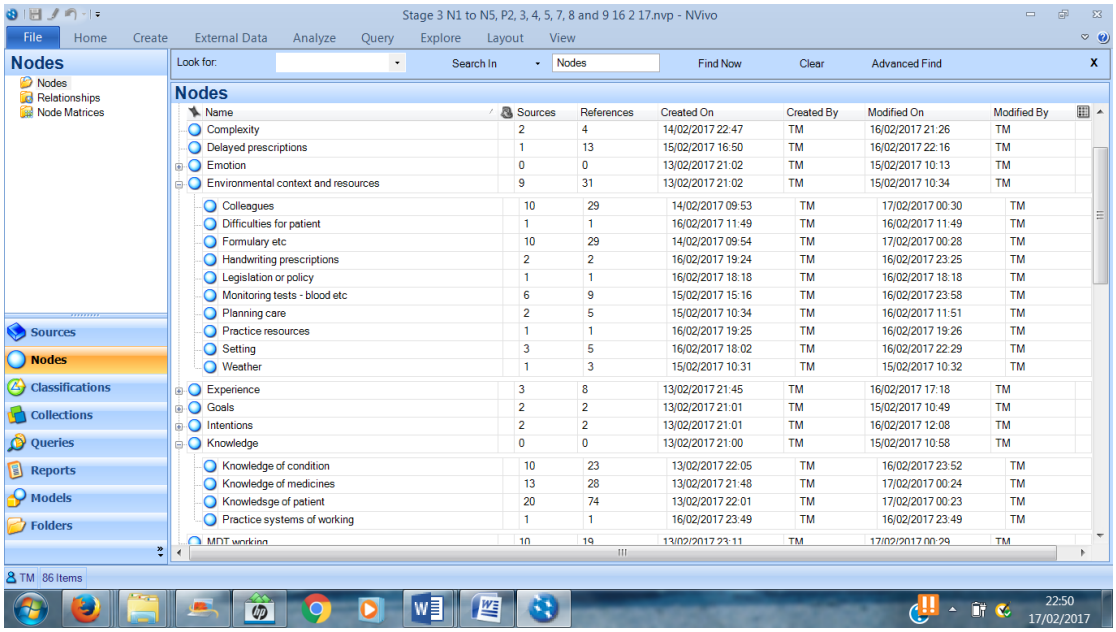



Figure 5.1 Screen shot showing coding of Phase 3 transcripts in NVivo® 10

## 5.3 Findings

### 5.3.1 Summary of Phase 2 reflections

All Phase 1 participants except Pharmacist 6 recorded one, two or three reflections on prescribing decisions they had made which they considered noteworthy in relation to their practice. Pharmacist 6 had agreed to participate in all three phases of the study but withdrew after Phase 1 due to pressure of work. Nurse 2 recorded two reflections and returned the recorder to the doctoral student; she then recorded a third reflection, had it transcribed and sent it to the doctoral student by e-mail. Recorded reflections lasted between 1 minute 31 seconds and 10 minutes 30 seconds; one participant recorded all three reflections together and some made multiple partial recordings of the same reflection. Of note, none of the participants contacted the doctoral student after collection of their digital recorders to ask whether what they had done was appropriate, suggesting that they had no doubt about the suitability of their reflections. Table 5.2 details the duration of participants' Phase 2 self-recorded reflections.

Table 5.2 Phase 2 self-recorded reflections: participants and duration of recordings

| Participant | Reflection 1 | Reflection 2 | Reflection 3 |
|---|---|---|---|
| **Pharmacist 2** | 2 minutes 45 seconds | _____ | _____ |
| **Pharmacist 3** | 6 minutes 6 seconds | _____ | _____ |
| **Pharmacist 4** | 3 minutes 14 seconds | 4 minutes 39 seconds | _____ |
| **Pharmacist 5** | 3 reflections, 10 minutes 30 seconds in total | As in Reflection1 | As in Reflection 1 |
| **Pharmacist 6** | Did not participate in Phase 2 | _____ | _____ |
| **Pharmacist 7** | 3 minutes 25 seconds | 7 minutes 36 seconds | _____ |
| **Pharmacist 8** | 1 minute 52 seconds | _____ | _____ |
| **Pharmacist 9** | 1 minute 32 seconds | 2 minutes 14 seconds | _____ |
| **Nurse 1** | 2 minutes 3 seconds | 3 minutes 4 seconds | _____ |
| **Nurse 2 (multiple recordings)** | 3 minutes 44 seconds | 2 minutes 19 seconds | 1 transcribed and sent in by Nurse 2 |
| **Nurse 3** | 7 minutes 28 seconds | 3 minutes 1 second | _____ |
| **Nurse 4 (multiple recordings)** | 9 minutes 59 seconds | 6 minutes 48 seconds | 3 minutes |
| **Nurse 5** | 1 minute 31 seconds | 1 minute 12 seconds | _____ |

Participants' reflections encompassed a very wide range of prescribing decisions made, as is shown in Table 5.3 (page 225) below.

Transcriptions of two self-recorded reflections are included below: Pharmacist 5, reflection no.2 and Nurse 1, reflection no.2. These reflections were selected by the doctoral student as evidencing many of the domains of the TDF found influential in Phase 1 and the sort of patient-centred, multi-disciplinary approach to prescribing decision-making participants described taking throughout the study. The remainder of Phase 2 transcripts are given in Appendix 5.3.

## Pharmacist 5 reflection no. 2

*Reflection on a prescribing decision involving multi-disciplinary team working for a patient with advanced heart failure.*

*"My second reflection was during my heart failure clinic recently. I've a fairly new patient and she's a very frail, elderly patient, Stage NYHA 3 [New York Heart Association] heart failure. She's an amputee also. She presented on an extra appointment because she'd had orthopnoea and was now showing PND [paroxysmal nocturnal dyspnoea]. She had been unable to lie in her bed and was sleeping on an arm chair. When I examined her she was full of fluid and she was taking her furosemide em, as well as she could em, so that she could get to the bathroom but I'm not convinced she was taking the complete, full dose.*

*Her renal function was very poor and her eGFR was 30 although her potassium was OK. She was clearly having an exacerbation so I had to prescribe for this patient and I was comfortable to prescribe for her because I was able to examine her and I knew what I was doing, I felt competent. The son had managed to bring her in with real difficulty and this, this was because she had to try and get her, her leg on because she was an amputee and of course her stump was even full of fluid so it was a desperate situation and we didn't want to admit her to hospital because she had recently had an exacerbation and was admitted for a stay and was keen for me to try and keep her out of hospital where possible.*

*What I did was talk to her about the need for really, really good compliance on her furosemide and I prescribed her some more furosemide. I also added in spironolactone 25 and commenced her on this and explained how that would work and what type of medication it was and the need for compliance. What I would have liked to give this patient was metolazone but because her renal function was so poor I didn't feel comfortable that I could give the metolazone so I actually referred her to the local cardiologist to be seen as soon as possible, and he saw her then she presented again in another week and he said it was OK to go ahead with the metolazone with close monitoring. So because I had his opinion as well, I went ahead with the metolazone.*

*Normally I would be comfortable to do that but the renal function was really poor and I was putting more pressure on it with increasing the compliance on the*

*furosemide and commencing her on the spironolactone. I reviewed the patient again and we were able to get the district nurses to call and keep a very, very close eye every three days on the renal function, because, on reflecting back, that was one of the reasons I was very happy to look after this patient because I had the cooperation of the cardiologist and also the cooperation of the district nurses willing to do the, the U and Es [urea and electrolytes], bloods and I knew that I could have the lady in, brought in by her son so that I could examine the patient, and she, I saw again, actually, today and she is doing really well. So on reflection, I feel that I, we have kept this lady out of hospital and she is on the mend and improving, albeit with very, very close monitoring so I think quality of life-wise, we have improved things for this lady. She's able to lie down in bed with quite a few pillows and she has been kept out of hospital which is really, really important for her."*

### Nurse 1 reflection no 2

*Reflection on a decision to prescribe diclofenac suppositories for a patient receiving palliative care.*

*"I had a patient with terminal GI cancer. She wasn't used to taking medication, she was quite naive with medication and she had previously had chemo so was still suffering the after-effects of having a metallic taste of everything in her mouth. She didn't really want a lot of pain killers although she was experiencing increased pain and really had asked for sort of anti-inflammatories because she had perceived this pain as inflammation coming from her tumours. She had previous experience of using suppositories for constipation, again she just seemed to prefer using the, the rectal route to treat her constipation rather than trying anything orally. And I think with her advancing cancer that she'd really come off of med, come off managing to take very much by mouth at all.*

*I went to see her and she was complaining of increased pain and I made the decision we should maybe try and use Voltarol® suppositories for her, because this was a patient who was quite experienced in using suppositories, although not for, for pain. She did have 'just in case' medication in the house and she also had a bottle of Oramorph® which she, she hadn't even opened.*
*The alternatives were to set up a syringe driver. One of the, the influences on my prescribing for this that, we actually had a, quite a bad weekend of snow*

*forecast and she lives in a very rural area so I was a bit concerned that if we were to set up a syringe driver, would we physically manage to be there, to, you know, within 24 hours to fill this up?*

*She was opioid naive, as I, as I said earlier, so really wasn't appropriate to be thinking about giving her IM injections of, of controlled drugs. She'd had a quite a rough week, with a lot of emotional exhaustion and although she hadn't been eating much that week we, neither the patient or myself were unsure if this was actually coming up to her end of life care or whether she was just exhausted so I didn't want to rush in with a syringe driver either.*

*I prescribed a certain dosage, I, I did actually phone the chemist, just to see if they had this type of medication in stock because it's quite an unusual medication to prescribe. He did have one however it wasn't the, the usual dose, I normally would have prescribed 75mg twice a day. He only had 100mg available so I made a decision to prescribe 100mg just once a day for her. It was an unusual prescription for me to write but it meant that the patient had her pain, had an option to, to try and control her own pain over the weekend, and it, it worked quite well, so that was."*

### 5.3.2 Summary of Phase 3: interviews based on participants' Phase 2 self-recorded reflections.

As described, participants were interviewed about their Phase 2 reflections. Table 5.3 below gives the details of participants, the duration of each interview and the prescribing decisions chosen by them for reflection.

Table 5.3 Stage 3 interviews: participants, duration of each interview and prescribing decisions they chose for reflection

| Participant | Duration of interview | Area for reflection |
|---|---|---|
| **Pharmacist 2** | 35 minutes 41 seconds | The influence of a Medical Registrar on Pharmacist 2's decision about which antibiotic to prescribe for an infected post-operative wound |
| **Pharmacist 3** | 33 minutes 7 seconds | Prescribing a new oral then an intravenous magnesium supplement for a patient receiving chemotherapy |
| **Pharmacist 4 no.1** | 29 minutes 15 seconds | Re-starting tiotropium for a patient with COPD; the tiotropium had previously been stopped by the patient's GP |
| **Pharmacist 4 no.2** | 33 minutes 31 seconds | In community pharmacy, refusing a second request for an emergency supply of a salbutamol inhaler |
| **Pharmacist 5 no.1** | 15 minutes 9 seconds | Difficulty of eliciting sufficient information to make a prescribing decision for an Eastern European patient taking warfarin who didn't speak English |
| **Pharmacist 5 no.2** | 13 minutes 21 seconds | Multi-disciplinary team working for a patient with advanced heart failure whose quality of life was rapidly deteriorating |
| **Pharmacist 5 no.3** | 11 minutes 54 seconds | Hand-writing prescriptions considered time consuming, unprofessional and a barrier to timely provision of medicines |

| Participant | Duration of interview | Area for reflection |
|---|---|---|
| **Pharmacist 7 no.1** | 5 minutes 58 seconds | Prescribing malarial prophylaxis for a patient in a community pharmacy travel clinic; described by Pharmacist 7 as a straightforward consultation |
| **Pharmacist 7 no.2** | 19 minutes 18 seconds | Prolonged discussions about travel medicine requirements with a patient in a community pharmacy travel clinic |
| **Pharmacist 8** | 26 minutes 33 seconds | Responding to a patient's request to stop her antihypertensive medicine as the patient thought she was taking too many tablets |
| **Pharmacist 9 no.1** | 12 minutes 31 seconds | Responding to a request to prescribe Gaviscon® liquid for a very young and premature infant. |
| **Pharmacist 9 no. 2** | 15 minutes 40 seconds | Prescribing allopurinol for a patient with gout: the importance of careful monitoring and clear communication |
| **Nurse 1 no.1** | 23 minutes 1 second | Treating over-granulating tissue at the site of a percutaneous endoscopic gastrostomy for a terminally ill patient |
| **Nurse 1 no. 2** | 23 minutes 56 seconds | Prescribing diclofenac suppositories for a terminally ill patient nearing the end of her life |
| **Nurse 2 no.1** | 16 minutes 25 seconds | Prescribing for increasing and distressing breathlessness in a patient with pulmonary fibrosis |

| Participant | Duration of interview | Area for reflection | Duratio |
|---|---|---|---|
| **Nurse 2 no.2** | 12 minutes 47 seconds | Prescribing for colicky pain and flatulence in a patient with pancreatic cancer | |
| **Nurse 2 no.3** | 18 minutes 39 seconds | Prescribing for a patient with vulval cancer who was experiencing heavy bleeding and pain. The patient was already receiving treatment for a deep vein thrombosis | |
| **Nurse 3 no.1** | 11 minutes 52 seconds | Managing a request by a new patient for tapentadol, a Schedule 2 Controlled Drug. A GP colleague had recently refused this request | |
| **Nurse 3 no.2** | 8 minutes 24 seconds | Prescribing for a child requiring antibiotics for a sore throat. The child had been allergic to first and second line antibiotics already prescribed for this episode | |
| **Nurse 4 no.1** | 13 minutes 52 seconds | Managing a mother's request for antibiotics for a child with intermittent fever who was not particularly unwell | |
| **Nurse 4 no.2** | 13 minutes 36 seconds | A life threatening situation due to a patient inadvertently taking an overdose of opiates from her multi-compartment compliance aid | |
| **Nurse 4 no.3** | 9 minutes 34 seconds | Managing a request for antibiotics from the wife of a patient who was not unwell | |
| **Nurse 5 no.1** | 7 minutes 2 seconds | Managing a patient's request to reduce the dose of simvastatin he was taking | |
| **Nurse 5 no.2** | 10 minutes 26 seconds | Managing a patient's request for an antibiotic in case a healthy post-operative wound got infected | |

### 5.3.3 Thematic analysis of interviews

As in Phase 1 (Chapter 4) transcripts were analysed thematically using the Framework Approach (Ritchie *et al*. 2014). The framework of principal categories of analysis developed in Phase 1 was used as the initial coding framework for these Phase 3 interviews; although the TDF domains of optimism and reinforcement were not perceived by participants in Phase 1 interviews as influential they were retained in the initial coding framework for completeness. The additional Phase 1 themes of multi-disciplinary working and experience were also retained as principal categories of analysis.

On analysis again neither optimism not reinforcement emerged as influences on participants' prescribing decision-making. "Complexity", encompassing patients' clinical conditions, therapeutic choices, clarity of information presented and patients' wider concerns was added to the framework of principal categories of analysis. Note that as in Chapter 4 "Delayed prescriptions" had been added as a data cache for possible future use; it did not emerge as an influence on participants' prescribing decision-making.

Again as in Phase 1 the principal and subordinate categories of analysis which emerged from the data were considered in relation to each other, allowing the identification of themes and sub-themes. Table 5.3 shows the themes and sub-themes identified as being influential in the prescribing decisions participants chose for reflection.

Table 5.4 Themes and sub-themes identified from Phase 3 interviews as influences on participants' prescribing decisions

| Theme | Sub-theme |
|---|---|
| Knowledge | Knowledge of the condition<br>Knowledge of the medicine<br>Knowledge of the patient |
| Skills | Communication skills<br>Calculation skills<br>Clinical assessment skills<br>Dealing with a complex emergency situation |

| Theme | Sub-theme |
|---|---|
| Social/ professional role and identity | Role as a nurse<br>Role as a pharmacist<br>Role as prescriber<br>Roles of other healthcare professionals |
| Beliefs about capabilities | Confident in own ability<br>Lack of confidence in own ability<br>Capable in addressing patients' wishes |
| Beliefs about consequences | Consequences for the patient<br>Consequences for the patient and for the prescriber<br>Consequences for colleagues |
| Intentions | Patient benefit<br>Follow evidence-based guidelines<br>Provide reassurance<br>Try to mitigate prescribing against the evidence<br>Take account of patients' intentions |
| Goals | Patient benefit<br>Allow natural healing/ don't treat<br>Balance between evidence-based medicine and patients' wishes<br>Treat patient in most appropriate setting |
| Memory, attention and decision processes | Remembering clinical information<br>Unreliability of memory<br>Attending to patients' wishes<br>Using available information<br>Step-wise decision-making process<br>Heuristics<br>Previous experience |
| Environmental context and resources | Colleagues and other healthcare professionals<br>Evidence-based resources<br>Availability of laboratory testing<br>Availability of medicines from pharmacies<br>Practice setting and physical environment |
| Social influences | Colleagues<br>The patient and patient's family |
| Emotion | Feeling worried<br>Feeling uncomfortable<br>Feeling satisfaction<br>Feeling empathy and sadness |
| Behavioural regulation | Stay within competence<br>Minimise prescribing of antibiotics<br>Reflection |

| Theme | Sub-theme |
|---|---|
| Multi-disciplinary working | Advice from pharmacists<br>Working with nurses<br>Ancillary help |
| Experience | Experience of clinical condition<br>Experience in general<br>Others' experiences |
| Complexity | Patient's clinical condition<br>Therapeutic choices<br>Unclear or incomplete history<br>Patients' wider concerns |

#### 5.3.3.1 Knowledge

Participants considered themselves knowledgeable in their prescribing areas and described in their reflections how they used this knowledge. Knowledge of the condition being treated, the patient and of medicines were important influences, allowing prescribers to tailor their prescribing appropriately.

##### Knowledge of the condition

Pharmacist 2's patient was being given an intravenous antibiotic for an infected wound. She described the knowledge she used to judge that it would be appropriate to change this to an oral antibiotic and the consequent benefit to the patient.

> "Well vancomycin's obviously an intravenous antibiotic and the, once the infection has or is showing signs of response that there wasn't as much puss discharge, his legs weren't as red as they were before, he wasn't developing temperatures. All those things show that the infection was settling to such a point that he could be switched to an oral option to allow him to go home, 'cause obviously with intravenous antibiotics he has to stay in hospital."
> Pharmacist 2, secondary care, female.

Nurse 3 was treating a patient with a hypersensitivity reaction to penicillin and knew what the next step should be.

> "It was quite straightforward, you know, hypersensitivity really, you know just a bit of a prickly rash, vomiting, diarrhoea, you know, not too unusual so we decided to stop penicillin and I went to the second one on the formulary."
> Nurse 2, primary care, male.

NMPs must practice within their own self-assessed areas of competence. Pharmacist 4 recognised when her knowledge was insufficient and referred patients on in those circumstances.

> "It's not the first time I've come across cases of angina, or query heart failure, not that I'm expert in that but, I would generally know that these symptoms are not the same as COPD, there's something else going on, so would refer back to the doctor on that."
> Pharmacist 4, primary care and community pharmacy, female.

### Knowledge of the medicine

Nurse 1 and her patient had decided that diclofenac would be an appropriate drug to treat what her patient perceived as inflammation. Nurse 1 based her selection of the rectal route of administration on her knowledge of the drug's side effect profile and on the patient's preference.

> "So when I was thinking well I have to get diclofenac into her, she doesn't really want to take anything orally and also if she's not eating then it's not really safe for her to be taking it because you're supposed to have it with meals."
> Nurse 1, primary care, female.

Nurse 2, prescribing to try to alleviate her patient's frightening breathlessness, chose lorazepam based on her knowledge of its pharmacokinetics.

> "That's the particular drug that we were recommended again, when I was studying breathlessness, that it was recommended that we used lorazepam

because it could be halved and it could be giving in such a small dose because it could be absorbed sublingually."
Nurse 2, primary care, female.

Pharmacist 2 was faced with a dilemma where what she knew about an antibiotic's suitability for her patient contrasted strongly with what she knew about the attitude of the Registrar on the ward to that particular antibiotic.

"I was sort of looking to, there's a great big list of sensitivities and I was going through and I'd say 'Well, can't, he's penicillin allergic, he can't have that' and then I came to the, the doxycycline. I thought 'Oh doxycycline, that's probably quite a good option' and then I thought 'Oh no.' I just ended up thinking to myself 'No', 'cause I know that somebody's going to come along and say 'Oh', you know, 'Why, how did you go for that?', you know, 'We're not sending him home on that.'"
Pharmacist 2, secondary care, female.

### Knowledge of the patient

Participants took into account what they knew about their patients' circumstances and their preferences for care when prescribing. Nurse 1 described what she knew about her patient and her attitude to taking medicines.

"She was about 69 years old, she was a farmer's wife who'd been a teacher, a very practical lady, very matter of fact about everything that was happening, didn't want to go into hospital … I think she was quite resistant to using medication, she wasn't the type of person that takes a painkiller for a headache, for example."
Nurse 1, primary care, female.

Nurse 3 similarly evaluated his patient's attitude towards tapentadol, the controlled drug he had requested.

"He came in with a crutch, he was struggling to walk … He was sort of, I think 'cause he'd been on [tapentadol] for so long this was his other crutch if you like. You know, he was, he was quite worried being off it I think."
Nurse 3, primary care, male.

Nurse 4 was asked for antibiotics by the mother of a child with an intermittent fever; Nurse 4 took into account not just the child's symptoms but also what she knew of the mother's circumstances.

> "She [the child] did have a fever. It wasn't all the time, it was responding, it was responding to paracetamol and ibuprofen and then she [the mother] was worried she was going to be working all weekend and she wanted the girl treated."
> Nurse 4, primary care, female.

When Nurse 4 was called out to visit an elderly patient by her son part of her difficulty was that she had no up to date information about the patient.

> "He said she was lethargic and she'd been vomiting and he hadn't indicated, you know, often people say 'I need somebody out right away' you know, and he hadn't said anything like that. I suppose I was sort of thinking she's not a particularly well lady. I knew she was having, I know she'd had chemo and radiotherapy in the past, I knew she had bisphosphonate treatment as well, and I didn't, I hadn't seen her for a while so I didn't exactly know at what stage of all of that she was at."
> Nurse 4, primary care, female.

Pharmacist 7 prescribes for travel medicine, where knowledge of the patient's travel plans is essential to allow the appropriate recommendations to be made. He reflected on a consultation where this information was not available.

> "Essentially the, the lad couldn't tell me exactly where he was going and when."
> Pharmacist 7, community pharmacy, male.

#### 5.3.3.2 Skills

Participants described using a range of skills to inform their prescribing decision-making, particularly communications skills but also skills in physical assessment, calculations and the ability to balance complex, conflicting responsibilities.

### Communication skills

Nurse 2 explained to her patient how she hoped the drug tranexamic acid might work to control the patient's bleeding.

> "Just really saying to her 'Well, you know, in respect of your, the bleeding that you're having we can try this drug which works at capillary level, which will hopefully reduce the bleeding that you're experiencing.' And I explained it was used for ladies whose periods were very heavy and, you know, that's why we knew it could at times be beneficial and we would hope that it would be effective for her and it wouldn't stop the bleeding but it might reduce it and make it less frightening and alarming for her. And I said 'Was she happy with that?'"
> Nurse 2, Primary care, female.

Nurse 4 had a phone consultation with the mother of a sick child during which she tried to assess the child's illness and any need for a face to face consultation.

> "I was sussing out what the story was and deciding what to do next so, and it all sounded that she was well and I was trying to just advise the mum over the phone and say 'All is well' but she was insisting on being seen."
> Nurse 4, primary care, female.

Pharmacist 7 had a very frank conversation with his teenage patient to clarify the possible risks he might face during his overseas trip.

> "The key thing was to be absolutely upfront and spell things out in plain English. So we had to highlight the risks around tattoos, around sex, sexual activity and around drug use, so by spelling it out, you know, he was of an age where straight talking wasn't a problem so we could have a straight conversation and he understood exactly what the risk were and if he chooses to then behave in a way that puts himself at risk he does so knowing the risks and that's the best we can do sometimes."
> Pharmacist 7, community pharmacy, male.

In reflecting on her difficult interaction with a medical colleague Pharmacist 2 identified the need to develop her consultation skills to prepare for possible future interactions with medical prescribers.

> "But there probably isn't anyone who could essentially go in and overrule a Registrar or a Consultant, but they may be able to support me to develop skills to almost negotiate or, if I felt that that was, that was what I needed."
> Pharmacist 2, secondary care, female.

### Calculation skills

Pharmacist 3 was prescribing Magnaspartate®, a new oral magnesium supplement in sachet form rather than the usual Maalox® suspension, and wanted to check that she had prescribed the correct dose.

> "What I also did was I checked the BNF for the magnesium content of Maalox® and we usually give, kind of, 20 to 40mls a day of Maalox®, and I checked the magnesium content of the sachets and made up an equivalent so it was double check for myself as well to make sure I was supplying an equivalent supplementation to what I had clinic experience of prescribing before. So yeah, I checked up the two of those and that's how I did it."
> Pharmacist 3, secondary care, female.

### Clinical assessment skills

Pharmacist 5 considered that she had good clinical assessment skills but felt that her ability to have efficient patient consultations was compromised by her inability to generate computerised prescriptions.

> "Well I do things quite quickly, you know, as you're putting the cuff on you're asking some lifestyle questions and having a look at their legs before you turn back to the computer and, yeah, it's. I'd like to think it's quite efficient but, but the actual writing just lets you down at the end of the consultation, I think. Some people actually ask 'Are you not going to print them? You've got a printer there.'"
> Pharmacist 5, primary care, female.

### Dealing with a complex emergency situation

Nurse 4 was faced with a life-threatening emergency when she made her house call and described her conflicting responsibilities at that time.

> "I've had lots of experience of this over the years and those minutes while you're waiting for an ambulance are always difficult 'cause you're sort of, you don't know what's happened often, you're trying to piece together the story, you're trying to deal with relatives and you're trying to think what to do and so it's, you know."
> Nurse 4, primary care, female.

#### 5.3.3.3 Social/ professional role and identity

Participants' professional roles as nurses, pharmacists and prescribers were influential. Participants valued the role of prescriber for the opportunity it gave to care more directly for their patients but reported being acutely aware of the attendant additional responsibility. A professional hierarchy was particularly problematic for one participant.

### Role as a nurse

Nurse 1 reflected on the importance of meeting her patient's expectation of the role of a nurse.

> "It's the whole bit as well about you have to always appear confident in front of your patients … Obviously the patient doesn't want a nurse coming and going 'Oh my God, what's this?' You know what I mean?"
> Nurse 1, primary care, female.

Nurse 1 also described making use of a particular sort of knowledge which she claimed as specific to nurses.

> "I tried to use something very simple, it maybe sounds really simple but I think it's often the daft wee things that nurses are really good at sorting."
> Nurse 1, primary care, female.

Pharmacist 3, working in a nurse- and pharmacist-led ward, saw her nursing colleagues very much as partners to be involved in prescribing decision-making.

> "They're taking responsibility as well by administering the drug so they have to be confident that what they're doing is correct too, so they should be involved in, in, in those discussions too."
> Pharmacist 3, secondary care, female.

### Role as a pharmacist

Pharmacist 4 compared the role of non-medical prescribers to that of medical prescribers and perceived a discrepancy.

> "And as non-medical prescribers, do we actually think we're as good as doctors? We might be in certain areas, I'm quite confident with the bits that I do but anything out with that haven't got, well, I've got a clue 'cause I'm a pharmacist."
> Pharmacist 4, primary care and community pharmacy, female.

### Role as prescriber

Participants very much valued their prescribing roles and the benefits they could bring as prescribers to their patients. At the same time they were aware of the additional responsibility prescribing brought and how that influenced their decision-making. One pharmacist described how her inability to generate prescriptions electronically affected her perception of her role.

Nurse 1 reflected on the benefit she and her patient experienced from her ability to prescribe.

> "I was glad I had the flexibility and being a prescriber really helped I think with that because having to come back and maybe negotiate that [using diclofenac suppositories] with a doctor who didn't know the patient, they might've queried why I was asking for it to be honest because, you know, 'Oh, just tell her to take her Oramorph®.' It's like 'Well, she's palliative, you know, she's got cancer so just to tell her to take her Oramorph®, that's what we give dying patients' and sometimes that's not always what dying patients want, you know."
> Nurse 1, primary care, female.

Nurse 3 described feeling additional pressure as a prescriber and what he did to mitigate that when writing up his notes of the consultation.

> "I think particularly as a nurse prescriber we're probably slightly more under the spotlight, and I think, you know, because it was, albeit I had lots of advice from the pharmacist, but it was my name on the prescription, I signed for it and issued it and what have you and so, probably put a bit more justification than you would do normally."
> Nurse 3, primary care, male.

Pharmacist 3 similarly felt additional pressure as a prescriber and compared prescribing to her previous role as a pharmacist.

> "And I think there's a big difference when you're prescribing or advising as a pharmacist. When you've got that pen in your hand and you're putting your name to it there's a whole different feeling associated with that and it shouldn't, 'cause if you're advising a doctor to prescribing, you know, you should be taking equal responsibility for that, you know, you're guiding, potentially a junior doctor, who's got very little experience, you know, you should, but it does feel different when your name, you know, you're putting your name to it."
> Pharmacist 3, secondary care, female.

Pharmacist 8 was clear about her responsibility as a prescriber and how she would respond in the event of what she perceived as an inappropriate patient request.

> "If you're the prescriber at the end of the day the buck stops with you whether the patient says 'I want it' or not and, I haven't had to do this yet, but it would be potentially a case of 'Well I'm sorry, I'm not prescribing that for you.'"
> Pharmacist 8, primary care, female.

Pharmacist 7 acknowledged experiencing a difficulty during patient-centred consultations.

> "Yeah, and that I think was part of the learning, that we like to be right, anyone in health care likes to be right, that's just the nature of how we have to think. So when I give someone advice and they choose not to take it I've got to get over my professional pride and accept that it's their decision."
> Pharmacist 7, community pharmacy, male.

Pharmacist 5 felt very strongly that hand writing prescriptions was unsafe; where she felt she had insufficient time to do this she used an alternative method to generate the prescription and had it signed by a GP. She did not consider this as prescribing.

> "It's just, it's just not possible to hand write so many items in the time really, and not very safe, 'cause you've got to write. We've then to enter them on the system and press F9 twice so that you've actually issued it, so you've got to, you've got to be careful that you've documented everything as well as showing that you've given the prescription, as well as hand write. So I must admit we just get the prescription team to run them off quite often but that's not very professional, you know. I'd like to do the whole job, certainly at this stage, you know, a number of years down the line."
> Pharmacist 5, primary care, female.

### Roles of other healthcare professionals.

Albeit that participants were independent, autonomous prescribers they were subject to direction from those they perceived as clinical experts. Participants found it difficult to challenge this. Nurse 5 explained the reason for differences in statins prescribed for patients in her area.

> "Well, that's a difficult one, 'cause we do try and follow the Grampian Formulary but then, he's the cardiologist in charge of them so we have to go with him as well. So it's difficult to know which one, so if they were getting started off on a statin here, for any other reason, it would be simvastatin, but if he starts them on atorvastatin we just leave it."
> Nurse 5, primary care, female.

Pharmacist 2 felt that the opinion of a Medical Registrar made it impossible for her to prescribe an evidence-based, licensed antibiotic to treat her patient's infected wound.

> "…essentially you have your own knowledge base and your own experience but you've really got to work within the confines that, that the senior medical staff have as well, unless you can influence them in another way but yeah, you really, and it probably isn't until I've become a prescriber that I really appreciated how much you do feel confined by what the senior medical team, you know, by what their opinions are and what they prefer and what they like and don't like."
> Pharmacist 2, secondary care, female.

#### 5.3.3.4 Beliefs about capabilities

Participants' reflections evidenced differing levels of beliefs about their capability in making prescribing decisions. In general they felt very capable, often because of familiarity with the situation, and believed they could make a difference to their patients but they were aware of their limitations and when to seek help. Some chose to reflect on situations where they had been aware of a lack of competence and on how they dealt with that.

##### Confident in own ability

Nurse 4 was confident in her ability to assess a child who presented with an intermittent fever.

> "Very confident. I mean she was really well and, and I, I thought mum was happy when she went out that, you know, all's well and mum was a bit apologetic when she came in because the child was obviously running around and, you know, growling like a lion at me. Doing sort of 'Arrghh.' … It's something that I deal with multiple times every day so yeah, confident."
> Nurse 4, primary care, female.

Pharmacist 3 felt very confident in prescribing an oral magnesium supplement for her patient, although much less so when required to prescribe the supplement for intravenous administration.

> "And obviously because I'm so used to prescribing lots of different oral products and oral treatments, you know, it's, it's, you get very comfortable doing that."
> Pharmacist 3, secondary care, female.

> "Well I prescribed per protocol but it's not something I usually have to prescribe. It's not something we generally have to deal with in the out-patient setting and, you know, I'm quite confident in advising on the magnesium infusions in the in-patient setting as well but there's, there's usually a medical staff that write it, or we guide them to write it up and they sign it."
> Pharmacist 3, secondary care, female.

### Lack of confidence in own ability

Participants felt less certain about their ability when making certain other prescribing decisions, often due to unfamiliarity with some aspect. Nurse 3 described his feelings when deciding to prescribe a previously-unknown controlled drug for a new patient.

> "There's always that bit of doubt when you've just looked something new up. You always worry that you've maybe missed something or, you know, missed the point but. Confident enough to give it to him but not enough that I would've, you know, bet my life on it at that point I don't think. It didn't feel that particularly comfortable I suppose just 'cause it's something, you know, controlled drug, quite strong and things. I was happy enough to do it. I think I'd covered, you know, the basics but obviously not as confident as I would've been prescribing something I knew more about."
> Nurse 3, primary care, male.

Where participants did not feel themselves capable they involved others, sometimes referring the patient on.

> "I felt it was the safest way. I'm not sure I did it the best way, but I was adamant that I wasn't going to be looking after that patient on my own, no."
> Pharmacist 5, primary care, female.

### Capable in addressing patients' wishes

Participants did their best for their patients. Pharmacist 5 described taking account of her patient's wishes regarding treatment for her heart failure.

> "Even beyond that, you know, you can still do something with furosemide IV injection is another possibility, but yeah, until we've done everything we can, unless the patient feels that they would like to just be admitted, and they feel quite scared, but this lady didn't, she wanted to, to be at home, so, so yeah. I wasn't keen to admit her and she wasn't keen to go."
> Pharmacist 5, primary care, female.

#### 5.3.3.5 Beliefs about consequences

Participants' reflections suggested that they put their beliefs about the consequences for the patient at the centre of their prescribing and this appeared as a strong influence. They were also aware of consequences for themselves and for colleagues; after a difficult week one participant had to consider the consequences for her colleagues and make an uncomfortable prescribing decision.

### Consequences for the patient

Nurse 5 was asked by a patient whether he could reduce the dose of simvastatin he took. After discussion Nurse 5 agreed and wrote a new prescription; she was not concerned about any possible impact on the patient's cholesterol.

> "I don't think it'll be much different actually, that's what I expect but, we'll wait and see. 'Cause he'd, he has quite a good lifestyle, he golfs quite a few times a week, he walks, plenty exercise and he's got a fairly good diet so I'm not expecting a huge rise in his cholesterol."
> Nurse 5, primary care, female.

Nurse 1 and her patient hoped that the decision to use diclofenac suppositories rather than strong opiates via a syringe driver would ensure a peaceful weekend for the patient and her family.

> "But I think sometimes they could be a wee bit more creative about what they're putting into these patients because, you know, something like a diclofenac suppository, it just worked really well over that weekend and it avoided having to use a lot of controlled drugs, having to get a lot of strangers into the house."
> Nurse 1, primary care, female.

Nurse 2's patient was experiencing a very dry mouth with her opiate analgesic; Nurse 2 decided to switch to another opiate in the hope that that would alleviate this.

> "I was hoping that just changing the preparation, because I have found in the past, when we've changed a preparation from one opioid to another, that often it suits the person, for whatever it is."
> Nurse 2, primary care, female.

Nurse 2 was also aware that her prescribing for another patient might result in polypharmacy, which she wanted to avoid.

> "Do you know, if I give him something that's going to act against his, his laxatives but then also cause a really dry mouth and he, you know, I'm going to end up prescribing him some artificial saliva to make up for that [laughs], and so it goes on and the patients just become totally bogged down with, with medications so, yeah, that was part of the process of reasoning to it."
> Nurse 2, primary care, female.

Nurse 4 had been asked to make a house call to an elderly, frail patient. When she arrived she had no idea what had happened but very quickly realised that unless she did something the patient would die.

> "I've never, never come across a morphine toxicity like that before so. And of course you don't know, even, you can formulate ideas on what you think it might be but you don't 100% know and so anything you do is a bit experimental really and, you know, certainly, you know, giving the Narcan® and I didn't know whether it was going to help or not help or anything really."

Nurse 4, primary care, female.

Pharmacist 2's concern about feeling compelled to prescribe an unlicensed and possibly less-suitable antibiotic for her patient was driven in part by her expectation that forcing the issue and prescribing her first choice might delay the patient's discharge from hospital.

> "But I thought if, if I prescribe and [the Registrar's] not happy with it he may make the decision not to discharge the patient home which isn't good, for anyone really, particularly not for the patient if they've got to stay in longer."
> Pharmacist 2, secondary care, female.

Pharmacist 3, prescribing an intravenous infusion product for the first time, was very aware of the possible consequences for the patient of errors in the prescription.

> "In an intravenous product it's, you're working out a calculation for the volume to add to the bag, you need to make sure the bag, you've got enough volume in your diluent because if it's, you know if it's too concentrated is that going to cause an extravasation for the patient. Also the administration rate, is it gonna [*sic*] cause side effects if it's given too fast or too slow etc."
> Pharmacist 3, secondary care, female.

### Consequences for the patient and for the prescriber

Nurse 3 was treating a child with a bacterial sore throat who had been allergic to the first and second line antibiotics. He considered the consequences for the child when deciding whether to try a third antibiotic. He also considered whether he needed to get help from a colleague and decided he did, recognising a possible consequence for him as prescriber.

> "I felt that on balance the child was more likely to become unwell from not being treated and that's why we used the clarithromycin. … Yeah, I thought I better ask 'cause it was getting a bit weird and wonderful so I didn't want to get into trouble. "

Nurse 3, primary care, male.

### Consequences for colleagues

Sometimes participants had to consider possible consequences for colleagues as well as the patient when making prescribing decisions. At the end of a difficult week Nurse 4 was faced with fierce demands for an antibiotic from the wife of a healthy, symptom-free patient, just in case he developed a chest infection. To protect her colleagues from further difficulty with the woman Nurse 4 prescribed an antibiotic as a delayed prescription which could not be dispensed until the following day. She fully expected the patient to take it regardless of his condition.

> "I just said to him I didn't think he should start it at the moment. I said, 'You know, you're fine just now, but,' I said 'If your chest gets worse, if you feel you're coughing up sputum and, you know, things are going downhill then to start it' and I just explained it would be, he wouldn't get it until tomorrow. … 'Cause I know occasions where I have given delayed scripts in the past that's exactly what's happened, they've just gone out and taken it and, and then you get them back saying 'Oh, it didn't agree with them' or whatever. So, which is a reason why I don't generally give delayed scripts either but on this occasion I decided that was probably the best thing to do."
>
> Nurse 4, primary care, female.
>
> [A delayed prescription in this context is one which is post-dated, preventing the patient from having it dispensed that day but allowing this possibility should the condition deteriorate over the following days]

## 5.3.3.6 Intentions and 5.3.3.7 Goals

In Phase 1 interviews the research team perceived some overlap between the domains of intentions and goals. It was not always straightforward to differentiate between them or to do this consistently and they were therefore considered together. In Phase 3 interviews, differences between these domains were identified more readily by the research team. This may be because in Phase 2 and 3 participants were reflecting on actual prescribing decisions made rather than considering theoretical influences; their intentions and goals may have been more to the fore in their reflections. Participants' goals were

identified as being broader and longer-term, albeit that the episodes of care being considered were sometimes quite brief, whereas intentions generally referred to short term actions which participants felt were likely to help to achieve their goals for that patient or more generally.

#### 5.3.3.6 Intentions

Intentions were considered as participants' behaviours which contributed to the achievement of their own or their patients' goals. Again participants had their patients at the heart of their prescribing and intended to do their best for them. They described following evidence-based guidelines, trying to mitigate prescribing against the evidence and taking account of patients' intentions.

##### Patient benefit

Pharmacist 5 explained her intention to prescribe a complex combination of drugs requiring intensive monitoring which she felt would improve her patient's condition long term.

> "The metolazone if we, if we use that combined with the loop diuretic you get a very good diuresis but with her renal function I wasn't sure if I could just do that. And I wanted to give her the spironolactone 'cause she was Stage 3 [NYHA] and that would give her long term benefit."
> Pharmacist 5, primary care, female.

##### Following evidence-based guidelines

Pharmacist 3's prescribing in a specialist area was influenced by a very strict protocol which she intended to follow.

> "So again, as well as per protocol, if their levels drop before a certain, if the levels drop below a certain level and they're symptomatic you should initiate IV treatment so that's what I wanted to do."
> Pharmacist 3, secondary care, female.

### Providing reassurance

Nurse 4 is a nurse practitioner and was speaking on the phone to the mother of a child with an intermittent fever. Her intention was to reassure the mother but this proved difficult.

> "I was sussing out what the story was and deciding what to do next so, and it all sounded that she was well and I was trying to just advise the mum over the phone and say 'All is well' but she was insisting on being seen."
> Nurse 4, primary care, female.

### Trying to mitigate prescribing against the evidence

In her second reflection Nurse 4 outlined her decision to prescribe what she thought was an un-necessary antibiotic prescription in response to patient pressure. She wrote a delayed prescription and described how she intended it should be used.

> "And so I, as, you know, I'm not, I'm not used to doing it, but I did sort of consciously think 'Well, I know, I think people usually give it two days delayed' but because it was Sunday I thought I better do it for Saturday. I just, I just thought 'We'll have other issues if we, if they can't get it on the Sunday and there's hassles, you know, she'll be in complaining again.'"
> Nurse 4, primary care, female.

### Taking account of patients' intentions

Pharmacist 7 had to take into account his patient's intention not to follow his advice on appropriate travel medicines.

> "So the initial consultation highlighted the key recommendations and that formed part of the recommendation. When he then came back the second time, he had agreed to that part, but not to the other parts."
> Pharmacist 7, community pharmacy, male.

### 5.3.3.7 Goals

Participants were reflecting on discrete prescribing decisions made either within an episode of care or as part of on-going management of patients' long term conditions. Whichever was the case they expressed broad goals which influenced

their prescribing; these concerned achieving patient benefit, treating appropriately in the most appropriate setting and balancing evidence-based medicine and the patients' wishes.

### Patient benefit

Nurse 1 explained that some patients were reluctant to take medicines at all, even when they were indicated for serious conditions. She then explained how she took account of what she perceived as her patient's goal when making her prescribing decision.

> "We often have to encourage people to use drugs and we start with basic ones like paracetamol and ibuprofen and then we can build them up to the more controlled drugs but I had tried that with her in the past, just sort of saying 'Well maybe try taking the paracetamol', but she'd refused that."
> Nurse 1, primary care, female.

> "She just wanted to be on her own that weekend with the family. I think if I'd given her the option she would've put up with the pain rather than having a lot of interference over that weekend. So this was just, you know, trying to alleviate some of the pain and let her have her last weekend with her family."
> Nurse 1, primary care, female.

### Allow natural healing/ don't treat

Sometimes participants felt that 'no treatment' was the best treatment.

> "I think sometimes it's the whole bit about not prescribing something. So letting something just naturally heal itself and get on with it, you know, it's, I think it's probably the best bet."
> Nurse 1, primary care, female.

### Balance between evidence-based medicine and patients' wishes

Pharmacist 8 reflected on two opposing goals: those of evidence-based practice and of the patient.

> "We discussed the risks, you know, of why we try and control the risk reduction and why we try and control blood pressure, cholesterol, those

kind of things and I felt she understood and that, you know, she was cognitively aware and could make that informed decision that 'Actually I don't want to take anything further.'"
Pharmacist 8, primary care, female.

### Treat patient in most appropriate setting

As part of ensuring best care for their patients participants wanted to ensure that treatment would be provided in the most appropriate setting. Pharmacist 5 explained the rationale for her heart failure clinic.

"But the aim of the clinic is really to keep patients free of exacerbations but to keep them out of hospital, to try and treat them in the primary care setting, that's really the aim of our clinic, is to do what we can here."
Pharmacist 5, primary care, female.

Nurse 4 described her feelings on finding out that the child with intermittent fever whom she had assessed as not requiring antibiotics had then been taken to the out of hours service where she had been prescribed them.

"Annoyed. Yeah, it is annoying 'cause I think it encourages people to keep coming then, you know, if they, if they, if they think 'Oh, I'll get it at A&E' it means that, that it encourages, you know, further contacts at A&E 'cause, which is what we don't want, which is what we're all striving to avoid."
Nurse 4, primary care, female.

Only Nurse 5, discussing with a patient his desire to reduce his statin dose, appeared to have the goal of sticking to the formulary.

"Really just the, you know, the knowledge of the SIGN guidelines and the practice protocol, you know, that the lower cholesterol the better for cardiovascular, less clots, things like that, so, you know, telling him that."
Nurse 5, primary care, female.

Pharmacist 3, explaining her decision to discuss her prescribing decision with a medical colleague, described her personal goal.

> "To be totally honest, I wanted to cover myself because I had recognised that she needed intravenous treatment, or the protocol recommended intravenous treatment and if I didn't act on that and something happened to the patient I would be responsible for that so I went to someone senior to me to get advice."
> Pharmacist 3, secondary care, female.

#### 5.3.3.8 Memory, attention and decision processes

In these reflections participants described some of the thinking processes which informed their prescribing decision-making. As experienced practitioners they had a rich fund of memories of previous experiences on which to draw although one or two were aware that their memories might not always be reliable and described approaches taken to compensate for that. Participants paid attention to various and varied sources of information. Most described taking what seemed to be a careful, rigorous and step-wise approach in their decision processes although heuristics and played a part in familiar situations and again previous experience was important.

##### Memory

###### Remembering clinical information

Nurse 4, faced with a woman dying from a suspected opiate overdose, remembered essential information about using the antidote Narcan®.

> "And I remember, you know, the discussions, talks about Narcan® that it's very short lived when given IV and that, to always follow up with an IM dose. I don't know why I remember that. And I always carry two, I just carry two Narcan®. I suppose that's so that I'd remember to give the second dose."
> Nurse 4, primary care, female.

###### Unreliability of memory

Sometimes participants were less sure of the accuracy of their memories, as with Pharmacist 9, prescribing for a very young and premature infant.

"'Cause sometimes your brain tricks you and you're never sure whether you're making this up or whether you have seen this before. And I did think I had seen it before which is why I went to the [name of children's hospital] 'cause I knew it had come from them. If I wasn't making it up it had come from them, the whole liquid preparation. And when she said to me that it was for breastfeeding women it kind of all just made perfect sense really."
Pharmacist 9, primary care, female.

Pharmacist 2 prescribed in a nurse- and pharmacist-led ward but within the confines of a prescribing culture dictated by senior doctors. She described the difficulty of remembering Consultants' preferences and how she and colleagues managed this.

"It is quite tricky, it's remembering which Consultant likes what and which Consultant likes something else. We've actually got a chart up on the wall that tells us for somethings so that we remember."
Pharmacist 2, secondary care, female.

### Attention

Participants paid attention to and took account of a wide range of information when making prescribing decisions.

### Attending to patients' wishes

Information about the patient's wishes, however expressed, was important. Nurse 5 had a patient who was very keen to reduce the dose of his statin.

"I would've, yeah, I might've contemplated 'cause his cholesterol was so low, 3.2, but he was right in on it at the beginning before I had ever thought of it. I just said, you know, your cholesterol's 3.2, and he pounced on me, he pounced on me there and said, you know, about reducing it."
Nurse 5, primary care, female.

Pharmacist 8 described becoming more accepting of patients' wishes which contrasted with the recommendations of evidence-based guidelines.

> "So I am much more relaxed in, in a lot of circumstances, that if the patient is aware and they understand why we're suggesting it but they say 'Actually, no I don't want it.' It's their choice."
> Pharmacist 8, primary care, female.

Nurse 1 was influenced by her patient's suggestion of the rectal route of administration for an anti-inflammatory drug.

> "… when we came time to think about diclofenac I wouldn't normally have thought of suppository, it was her that gave me the idea."
> Nurse 1, primary care, female.

### Using available information

Nurse 1 described her thinking when trying to decide on the strength of suppository to prescribe, based on local availability and her perception of the patient's and family's best interest.

> "Actually I could just phone the pharmacist in [name of town] and see what they've got in stock. And I phoned and he said 'Oh I've got some but they're 100mgs' and I thought 'That's not a great dose but that's probably better than the family getting stressed out and spending all their last weekend going about trying to access a 75mg dose' so that was why she got the 100."
> Nurse 1, primary care, female.

Nurse 3 had some difficulty deciding how to respond to a request for strong pain killers from a new patient and was reassured when the patient produced a previously dispensed packet.

> "There was a label on the box that was recently dated and I thought 'Oh, you couldn't have got that without somebody sort of having provided it for him' so, yeah, I was happy enough."
> Nurse 3, primary care, male.

### Decision-making processes

Participants described some of their decision-making processed very clearly.

### Step-wise decision-making process

Nurse 1 had taken a step-wise approach to treating her patient's over-granulating tissue.

> "So that, that was why I decided, well you know, the first option of just leaving it well alone hadn't worked, the second option of, of using a mild cream, a mild honey ointment hadn't worked so now we were really bringing on the strong guns."
> Nurse 1, primary care, female.

Pharmacist 2 took great care when calculating the amount of magnesium to prescribe for an intravenous infusion.

> "I think just 'cause I hadn't done it before, it was the first time I'd prescribed the intravenous fluids I was triple, quadruple checking everything and obviously because there's a calculation involved as well of how much of magnesium to add to the bag."
> Pharmacist 3, secondary care, female.

### Heuristics

Sometimes decision-making was informed by heuristics rather than by the evidence.

> "'Cause generally we would say 'Right, it's most likely to be' 'cause of the type of wound it is, we would say 'It's most likely to be a skin commensals organism so it's most likely to be a staff or strep' so it'd be a flucloxacillin, vancomycin, that's what we, it'd be standard and usually most patients respond really well to it."
> Pharmacist 2, secondary care, female.

### Previous experience

Fortunately not all decisions were difficult to make; familiarity with prescribing the medicine in a different context or with the situation itself both facilitated the process. Pharmacist 4 is an experience community pharmacist as well as a prescriber.

> "So my idea is if I can sell it to you over the counter I fail to see why I can't prescribe it 'cause it's no different from counter prescribing."
> Pharmacist 4, primary care and community pharmacist.

Pharmacist 7 described one travel medicine consultation as very straightforward.

> "I'd been there before, in fact that patient, when they came and presented, they presented with a scenario that they had presented with several times previously."
> Pharmacist 7, community pharmacy, male.

#### 5.3.3.9 Environmental context and resources

The environmental context within which participants made their decisions was important. Participants worked in multi-disciplinary teams and sought advice from colleagues, especially GPs for those in primary care, using them as valued resources to augment and confirm their own decision-making in the event of uncertainty. There seemed to be less mention of referring to evidence-based guidelines and little mention of the Grampian Joint Formulary compared with Stage 1 interviews. Knowledge of such guidelines seemed tacit and participants rather described consulting more specialist guidance when needed. The setting for prescribing decision-making could be influential where this precluded access to important information; the location of pharmacies and their stock held could also influence the decisions made. In one case the patient's home setting was a key influence given a poor weather forecast.

##### Colleagues and other healthcare professionals

All participants worked in teams and colleagues, particularly GPs in primary care, were regarded as a valuable resource influencing some prescribing decision-making.

Some participants like Pharmacist 5 specifically described having a GP mentor while others did not, but all valued the input of medical and other colleagues.

> "Again, we've got a GP mentor and he's a cardiac GP, for the practice really, so he was aware of what I was doing with her. I mean, after she'd gone

[the patient], you know, I sometimes give updates, so I'd given an update. He agreed with what I'd done."
Pharmacist 5, primary care, female.

Nurse 5 sought help from a GP when trying to reassure a patient with a large but healthy post-operative wound on his neck.

"But he [the patient] said 'Well, maybe it's okay today but what if it's like this tomorrow or the next day? It means I've to come back.' And that was when I did speak to the GP about it just to hopefully back me up, which she did, and we discussed the possibility of a delayed script so it would, you know. Explained when to take it and if it did get more swollen or he felt unwell or pyrexial just to start taking before he actually came back to us."
Nurse 5, primary care, female.

Pharmacist 3 was uncertain whether her patient's deteriorating condition necessitated a return to hospital and asked a medical colleague for help.

"It was either gonna [*sic*] go two ways. The doctor would've phoned and made her come in or I, or they would've said it was okay for her to stay at home and then obviously I've discussed with someone senior who's taken responsibility for that care and we've made a joint decision that it's safe enough for her to stay at home. So that was the rationale for that."
Pharmacist 3, secondary care, female.

Pharmacist 4 consulted with a range of experts including other pharmacists through her membership of a professional organisation.

"I do have people I can talk to and I'm also in UKCPA [United Kingdom Clinical Pharmacy Association] so I know Consultant pharmacists down in England, they don't have that post in Scotland, who are respiratory consultants. So it's not the first time I've sent off an e-mail to them and said 'Any, any ideas?'"
Pharmacist 4, primary care and community pharmacy, female.

Nurse 2 had a specialist role and worked across several practices. She described the difference in her approach in a practice where she didn't normally work and in one where she did.

> "I spoke to the GP, because it's a practice that I don't normally work with I felt I should discuss it with the GP and he was absolutely fine, but, yes, I involved him in as well. As I say, because I don't know the practice and I didn't feel I could just barge in and say 'Well, I'm changing things', although he had asked us to see the lady, but I didn't want just to, just professional, etiquette and courtesy really."

*Doctoral student: and if it had been a practice where you were familiar with the doctors and so on, would you still have consulted them or would you just?*

> "I probably wouldn't, I would probably just have done it and then documented in the patient's notes that I had done that."
> Nurse 2, primary care, female.

Nurse 2 also consulted experts out with her own immediate sphere; for her the local hospice was a source of advice and support.

> "I mean if, if I had been really troubled by it and thought 'Do you know, I can't do this on my own', I would've phoned [name of hospice] and spoken to the pharmacist there or [name of doctor] who's the, one of the palliative care Consultants there."
> Nurse 2, primary care, female.

### Evidence-based resources

Nurse 3 had prepared his own resource which he and his colleagues used during discussions with patients or their families about the need for antibiotics.

> "It [the Centor criteria for predicting bacterial infection in acute sore throats] is in the Clinical Knowledge Summary thing that we use quite a bit so I made a poster to put on the wall just so we can, 'cause quite often parents will argue till they're blue in the face that they need something so we can say 'Well, you know, that's what we work from.'"
> Nurse 3, primary care, male.

[Clinical Knowledge Summary is an online resource prepared by the National Institute for Health and Care Excellence for primary care healthcare professionals.]

More specialist evidence-based resources were used to inform certain prescribing decisions. Pharmacist 9, prescribing Gaviscon® liquid for a very young and premature infant, used specialist local guidance.

> "I do think I contacted other sources and was able to contact a specialist, which effectively is what the pharmacist at the [name of children's hospital] is, and there was, there is NHS Grampian guidance on the use of this product because it's the protocol that they use in [name of children's hospital]. Yes, I take a bit more personal responsibility when I'm prescribing an unlicensed medicine but there is evidence for its more common use in that specialist area and with the backing of a specialist and written guidance in NHS Grampian I felt more comfortable with it."
> Pharmacist 9, primary care, female.

Pharmacist 3, prescribing for a patient receiving chemotherapy whose magnesium level was falling, appreciated having clear guidance to inform her prescribing decision.

> "So again, as well as per protocol, if their levels drop below a certain, if the levels drop below a certain level and they're symptomatic you should initiate IV treatment so that's what I wanted to do."
> Pharmacist 3, secondary care, female.

### Availability of laboratory tests

Nurse 5 described the laboratory test data which she took into account when consulting with her patient wishing to reduce the dose of his statin.

> "They [blood lipid levels] get done a week or two beforehand so that we've got the results, the full blood count, U and E's, LFTs, lipids and glucose, fasting glucose, so we have all the results for the clinic so we can speak about them then and relate them to medication and symptoms."
> Nurse 5, primary care, female.

### Availability of medicines from pharmacies

Some participants described being influenced in their prescribing by what they knew of the likely availability of specific medicines through pharmacies. Nurse 2 made her selection of a buccal analgesic in this way.

> "…actually the Actiq® lozenge I think, I'm sure I prescribed that one because that's the one that [name of hospital] has in their pharmacy… and, you know, [name of village], it was going to already be the next day before they could get it anyway."
> Nurse 2, primary care, female.

### Practice setting and physical environment

The patient for whom Pharmacist 3 was prescribing was judged well enough to have her magnesium infusion in the out-patient setting; this influenced the prescribing decision.

> "That's the protocol, so, magnesium, the slower you give it the better results you get 'cause you get better uptake, so the, ideally it's over 12, 10 hours, but you can give it a lot quicker. So just to do with timing of the day unit, when it was open, we decided on 8 hours and that's the longest we were able to give it to her over for the time that we were open."
> Pharmacist 3, secondary care, female.

Pharmacist 4, working as a community pharmacist and dealing with a second request for an emergency supply of salbutamol inhaler, also felt that her decision was influenced by her practice setting.

> "It's more difficult in the shop 'cause you don't have a lot of background information and he wasn't one of our patients so we didn't have a PMR on him, apart from this emergency prescription that we'd done two days earlier, which was a bit of a giveaway I have to say."
> Pharmacist 4, primary care and community pharmacy, female.

The weather and the location of the patient's home were less-obvious but important influences on the decision Nurse 1 made to prescribe diclofenac suppositories in preference to administering analgesics via a syringe driver. The patient was a farmer's wife and lived a long way up in the hills.

> "And we'd had discussions because we knew that particular weekend that there was snow forecast and that's always a bit of a worry, you know, when you've got any patients but particularly those in the out-lying regions, you know. 'Can I physically get to the end of your road?'"
> Nurse 1, primary care, female.

#### 5.3.3.10 Social influences

Social influences and particularly the influence of patients and sometimes their families were important. Participant's reflections suggested that as far as possible, and as far as they judged appropriate, patients' ideas, concerns and expectations about their condition were addressed carefully. Sometimes the ideas and concerns of family members and their expectations for antibiotics were problematic and resulted in possibly inappropriate (delayed) prescribing of antibiotics. Participants reporting this were concerned about possible short and long-term consequences for the patient and others.

##### Colleagues

Nurse 1 described feeling under pressure from her colleagues and consequently the patient, when treating an over-granulating wound at the site of a PEG feeding tube.

> "There was a bit of influence I think on me because my staff nurse was so concerned as well, she was. I did feel a bit of pressure from her, thinking 'You know, she's really expecting me to do something now' and because she'd gone and got me and put me in front of the patient the patient was almost expecting something a wee bit stronger as well."
> Nurse 1, primary care, female.

Pharmacist 2 was concerned about her medical colleague's likely response to the antibiotic prescribing decision she wanted to make. She was aware too of a hierarchy which made it difficult for her to challenge her colleague's attitude.

> "Because I felt that … that the Reg, one of the, well particularly one of the Registrars, I thought they might come along and change or disapprove of one of the treatment choices. So, yes, I was left with a choice of two, but I

almost felt I wasn't left with a choice because I didn't feel I could go down one route because of what other people thought about it."
Pharmacist 2, secondary care, female.

"I always feel that if it's a Registrar whose, whose influence, or who's making the decision it should be someone on the same grade or above if you're wanting to try and influence them to come round to. But obviously if you go to two or three Registrars and they all say no, they don't agree with you twice then it's kind of right."
Pharmacist 2, secondary care, female.

Nurse 2, prescribing in a specialist area, was often asked for advice by others including GPs.

"Often he, you know, particularly this GP'll say 'I just want to see if you've got any suggestions, if we can, you know, if we can make things any better for this person, or if you would change anything.'"
Nurse 2, primary care, female.

Pharmacist 9 had also considered her colleagues' feelings and patient pressure but in a different way. She issued what she considered an unnecessary prescription for an antibiotic in response to the behaviour of a patient's wife towards practice staff, and reflected on her feelings afterwards.

"But the practice manager after seeing the wife, I think she'd had a really hard time with the wife and had sort of commented to me that she'd said 'I'll pay for the antibiotics', you know, jokingly, but yeah, she'd had a difficult time with her."
Pharmacist 9, primary care, female.

"Perhaps I'm weak, perhaps I should've just, you know, done the education bit but I, I don't know, it's so. It's difficult enough educating people when they haven't got fixed ideas about things but when you've got them and they've got a fixed idea it's really hard. And we're up against it all day long, you know, we, we really, it's, it's something that's just constant all day and it is hard keeping it up."

Pharmacist 9, primary care, female.

### The patient and patient's family

The social influence of the patient was a strong influence on participants' decision-making and all put the patient at the centre of their prescribing. Nurse 2 prescribed taking account of her patient's desire not to be overly sedated.

> "She's a very happy, smiley lady, lovely woman, and her family and her friends meant a great deal to her, so while she also wanted to be pain free she didn't want to be knocked out all the time because she still wanted to be able to interact with her visitors."
> Nurse 2, primary care, female.

Pharmacist 7 felt that educating his patient about the health risks of various behaviours was important.

> "So we had a conversation about the kind of activities he might be involved in which would increase his risk and once he understood, in plain English, what to do and not to do, he was able to make a, a, well, what I thought was a, a value judgement."
> Pharmacist 7, community pharmacy, male.

Pharmacist 8 listened to her patient's priorities and respected them.

> "She was very strong in her views and didn't, I guess if I had pushed and if it was something critical to her health I, she may have been persuaded but I didn't feel, I didn't feel the need, or the desire, to push her into taking something that she clearly wasn't happy to take."
> Pharmacist 8, primary care, female.

Patients' family members could also contribute to influencing participants' prescribing decision-making. Nurse 2 described the input of her patient's husband.

> "Yes, her husband was present during the visit and he, he, he was adding wee bits on and you know, he was saying, you know, it was quite a

distressing side effect for her, if indeed that's, it was the Oramorph® causing it, seemed to be in relation to her having taken it that her mouth became very, very dry so she would drink…"
Nurse 2, primary care, female.

Nurse 4 dealing with a dying woman described the difficulties of trying to meet the needs of the patient and her son.

"And he was sort of pacing around shouting and saying 'Oh, she's not been well for ages and something's got to be done', you know, so there was, it was kind of dealing with him and dealing with her at the same time."
Nurse 4, primary care, female.

#### 5.3.3.11 Emotion

Participants included and discussed the emotions they felt during the incidents of care they chose for reflection. Participants worried about the possible impact of some of their prescribing decisions on patients and felt uncomfortable about others. On the other hand they felt their prescribing roles allowed them to make a difference to patients' lives and found this satisfying and rewarding, if sometimes emotionally challenging.

##### Feeling worried

Pharmacist 2 worried about the impact on the patient of her preferred choice of antibiotic; she also worried about the un-licensed status of what she suspected she would prescribe instead.

"What my worry was, if I prescribed it and the, the wound wasn't responding as quickly as maybe the registrar wanted it to, possibly because he had it in the back of his mind he didn't like the antibiotic, I wouldn't want him to jump in quickly and change the antibiotic and not give it the time to work because of his sort of negative connotations for the antibiotic and then you end up with a patient who's getting chopping and changing treatment and ends up in hospital longer … The only slight concern I had [about prescribing cotrimoxazole] was that, obviously, cotrimoxazole is unlicensed in the UK."

Pharmacist 2, secondary care, female.

Pharmacist 3 had prescribed an oral magnesium supplement and her patient had gone home, then Pharmacist 3 learned that the patient's magnesium level was falling.

> "And then by the time the results came back she'd gone home so it was like 'Oh my God.' Diff, you know, it was difficult, like what I said, I wanted her to come back straight away because symptomatic, drop, levels are dropping. I was worried she was going to become maybe clinically unwell."
> Pharmacist 3, secondary care, female.

Pharmacist 4, having refused to make an emergency supply of a salbutamol inhaler, worried about the consequences.

> "I did actually worry about it a wee bit afterwards, I was fully expecting a phone call from some irate GP chappy to say 'What on earth were you thinking of?' you know, etc, but no, nothing ever happened so I was right."
> Pharmacist 4, primary care and community pharmacy, female.

### Feeling uncomfortable

Nurse 4 described how her emotional state at the end of a long week influenced the decision she made to prescribe a delayed antibiotic in response to pressure from the wife of a patient. She also described her feelings afterwards.

> "Yeah, I just, I think I just felt so battered that week with other things that had gone on, I thought 'I don't think we can handle the wife just causing hassle' so I thought probably the best way would be a delayed script."
> Nurse 4, primary care, female.

> "I didn't like doing it. I, you know when you've decided somebody doesn't need something it's, it's annoying to have to give it but, sometimes in this job you can't do the right thing. It's just, you know, if you don't give,

> something happens and then, you know, you're made to feel guilty and if you do give it, you know, it's, you can't, you can't do the right thing sometimes."
> Nurse 4, primary care, female.

Pharmacist 5 described how her inability to prescribe electronically impacted on her sense of whether or not she was actually prescribing.

> "Aye, but sometimes you know they're coming to sit in and they're very obviously with the clinic and then you're handwriting and they're like 'Why are you not printing it?' We can't really, so I don't know, it's really frustrating. … I probably wouldn't really [consider it as prescribing], probably wouldn't, although I've done all the background work. I probably wouldn't because it hasn't got my signature on it, so I probably wouldn't, no, no. It's a shame."
> Pharmacist 5, primary care, female.

### Feeling satisfaction

Nurse 1 described her satisfaction at having the ability to prescribe in a difficult situation.

> "So I think I really appreciated being able to prescribe exactly what we thought would be a good idea at the time and it worked really well."
> Nurse 1, primary care, female.

Pharmacist 8 felt satisfied after agreeing with her patient to stop the patient's antihypertensive drug.

> "I felt quite happy as well because I knew it, it was what the patient wanted. Yeah, and I felt it was a, it was a good outcome all round. I know her blood pressure wasn't at the magic number but in looking at the patient as a whole and holistically, I think it was, it was a good outcome."
> Pharmacist 8, primary care, female.

Pharmacist 5 was also satisfied with the outcome of her prescribing for her patient with heart failure.

> "If you get a bit of fluid off and combine with the spironolactone often we'll find they're more comfortable and they're not wakening up breathless. Yeah, so that was what happened in this case which was rewarding."
> Pharmacist 5, primary care, female.

#### Feeling empathy and sadness

Nurse 2 described being able to relate to the fears of her patient with breathlessness.

> "I suppose just, I felt empathy toward her because I do understand how frightening it is."
> Nurse 2, primary care, female.

Nurse 1 became upset when describing the circumstances of the patient for whom she prescribed diclofenac suppositories.

> "Yeah, just because she'd had such a rough week. She'd had a horrible emotional week where, I mean she, you know, as I sort of said she was a very practical, down to earth sort of lady and we didn't do a lot of tears [laughs]. She'd be laughing now if she could see me sitting crying about her."
> Nurse 1, primary care, female.

### 5.3.3.12 Behavioural regulation

Participants appeared to have reflected very carefully on the noteworthy prescribing decisions they had made. Some described aspects of self-monitoring and action planning, for example in connection with staying within areas of self-assessed competence, minimising prescribing of antibiotics and seeking additional training to support prescribing decision-making.

#### Staying within competence

Pharmacist 5 explained her reluctance to prescribe warfarin for her Eastern European patient.

> "I'm always very cautious to make sure you don't prescribe out with the comfortable competence area."

Pharmacist 5, primary care, female.

### Minimising prescribing of antibiotics

Nurse 4 described the impact of antimicrobial stewardship policies on her prescribing and that of her colleagues.

> "Trying to educate health care professionals to avoid giving antimicrobials and I think, you know, our prescribing as a practice here is low and we, you know, we're very, very conscious of it here but it's not the same everywhere."
> Nurse 4, primary care, female.

### Reflection

Finally, Pharmacist 2 reflected on her experience of being influenced by the opinions of a more senior colleague.

> "It's really made me think about how, you know, how I take on other people's perceptions of what you should and shouldn't prescribe and, and making sure that, I suppose in this scenario I could take this on board and make a, still make a valid treatment choice for the patient but there may be situations where you can't and to make sure you don't allow that to essentially influence your prescribing choice in a negative way so that you're, you're not, doing what's best and what's most evidence-based and that'll give the patient the best benefit."
> Pharmacist 2, secondary care, female.

### 5.3.3.13 Multi-disciplinary working

All participants practised within multi-disciplinary teams and within a wider multi-disciplinary context. Team dynamics were important and generally participants described working with colleagues and others in a collaborative and positive way. Participants described the influence of pharmacists, nursing colleagues and ancillary help to support their prescribing decision-making.

Pharmacist 5 listed the colleagues in her practice who had been directly involved with the care of her patient with advanced heart failure; this is included as an

illustration of one aspect of multi-disciplinary working, but it also appears within other themes.

> "Well the lead nurse also participates in the heart failure clinic, so she was involved in her care, and the GPs had seen her also. Now I'm trying to remember back, I'm sure she's also diabetic so the doctor that deals with that would've seen her. She had a few call outs from the surgery so there would've been a few different, different GPs and actually also the nurse practitioner had been out at her as well, and has been out since, yeah, so, yeah, quite a few people would be seeing her."
> Pharmacist 5, primary care, female.

Members of the multi-disciplinary team were valued for the support they provided to participants who were making difficult prescribing decisions. This could be information on therapeutic choices, where pharmacists played a key role, ancillary support or ensuring a team-based approach to treatment.

### Advice from pharmacists

Nurse 3 was treating a child with a sore throat caused by a bacterial infection; the child had been prescribed and been allergic to the first and second line antibiotic treatment. Nurse 3 was uncertain what to prescribe for the child and described seeking help from the practice pharmacist.

> "So that obviously presented quite a challenge for where we went next cause the formulary doesn't really offer an alternative after that [second line therapy]. So it involved a lot of digging through the BNF and, to be honest, I wasn't able to make a firm conclusion. I had to get the practice pharmacist to come and have a look at it with me."
> Nurse 3, primary care, male.

Pharmacist 9 similarly sought help from members of the wider team when considering a request to prescribe Gaviscon® sachets for a very young and premature infant.

"Yeah, phoned Drug Info or phoned [name of children's hospital] or phone the pharmacist that's a specialist in the area on the ward that they're in, yeah, quiet happily."
Pharmacist 9, primary care, female.

### Working with nurses

Pharmacist 3 described the importance of involving her nursing colleagues in her decision to prescribe intravenous magnesium supplementation for a patient experiencing a side effect of chemotherapy. Pharmacist 5 similarly recognised the importance of a multi-disciplinary approach.

"It was just trying to engage with them as well and bring them into the, the process without my just saying 'This is what you have to do', you know. It should be, you know, collaborative and discussing with them too that they were happy giving it."
Pharmacist 3, secondary care, female.

"Even with the district [nurses] they're in the same building, yeah, and I think you have to have the cooperation of all the team. You can't just prescribe and hope for the best."
Pharmacist 5, primary care, female.

### Ancillary help

Other members of the multi-disciplinary team provided valued prescribing support by carrying out blood and other tests which would inform participants' prescribing decision-making.

"So again the phlebotomist could check. At the same she did fasting glucose, cholesterol, weight, she checked his U and Es [urea and electrolytes] as well for his kidney function and she's able as well to do the, the cardiovascular disease risk assessment 'cause it's on the computer, the ASSIGN score."
Pharmacist 9, primary care, female.
[ASSIGN is a cardio-vascular disease risk scoring system].

#### 5.3.3.14 Experience

Participants were all experienced practitioners and all but one experienced prescribers; some described using previous experience to inform their prescribing decision-making. Participants described the influence of clinical and practice experience and also described benefitting from the experience of others.

##### Experience of clinical condition

Pharmacist 9 described how her experience in treating gout gave her confidence when speaking to her patient about the condition.

> "I've looked at gout quite a lot actually 'cause again the clinic that I ran as a cardiovascular clinic, and gout and cardiovascular disease tend to run alongside so gout's an area I've kind of added onto my cardiovascular profile if you like. Because, because you see it a, a lot of the elderly people we have in sometimes present with gout as well so it's an area that I have looked at so, yeah. I was very confident to speak to him about it."
> Pharmacist 9, primary care, female.

Nurse 2 prescribes for patients receiving palliative care and explained how sometimes just having an effective remedy to hand is sufficient to help patients.

> "Often I find that just prescribing the lorazepam and them having that wee bottle in the house is enough to calm them down sufficiently that they don't actually ever use it."
> Nurse 2, primary care, female.

##### Practice experience

Pharmacist 4 is a very experienced prescriber and has run prescribing clinics since 2005. She found this experience helpful in giving her confidence to re-start tiotropium for a patient with COPD where this had been stopped the patient's GP.

> "So I am quite comfortable with that but then I've been around for a while so I suspect a lot of it's to do with my, my experience of dealing

with other healthcare professionals."
Pharmacist 4, primary care and community pharmacy, female.

Pharmacist 4 also used her experience when deciding whether or not to make an emergency supply of a salbutamol [bronchodilator] inhaler to the same patient two days after a previous supply.

"And if in doubt I would've given it, but no, no, that young lad, that particular young man, you've got to be joking. I've been around long enough to know a scam when I see one."
Pharmacist 4, primary care and community pharmacy, female.

#### Others' experiences

For Pharmacist 2, the influence of a medical colleague's previous experience with the antibiotic doxycycline was so strong that it dictated her selection of another antibiotic.

"He just doesn't like it. He feels that, it's doxycycline that he doesn't approve of, it's a bacteriostatic antibiotic, so he feels that if it's bacteriostatic it's not going to have as good effect as a bactericidal antibiotic and he has had previous experience of that particular antibiotic not working very well."
Pharmacist 2, secondary care, female.

### 5.3.3.15 Complexity

During analysis the complexity of the prescribing decisions chosen for reflections became apparent. This could be in relation to the patient's clinical condition or pharmacotherapy, an unclear or incomplete history, their social or other circumstances, their wider concerns behind the condition being treated, the availability of support from other members of the multi-disciplinary team and so on. Participants described making their prescribing decisions taking in to account this complexity. It is considered under the following headings:

- patient's clinical condition or pharmacotherapy
- unclear or incomplete history

- patients' wider concerns

### Patient's clinical condition or pharmacotherapy

Pharmacist 5 described the difficulty of balancing the risks and potential harm of medicines in a patient with advanced heart failure.

> "It's always a case of balance, giving the diuretics and getting them, trying to getting them towards symptom free and yet being aware of what the renal function is, but we can do, if the district nurses are willing, we can do like bloods say every three day and that's the kind of thing we do if we've got them on a high level of medication."
> Pharmacist 5, primary care, female.

Nurse 2 was treating a patient with vulval cancer who was experiencing very heavy bleeding. The patient was already taking an anti-coagulant for an unrelated condition and she and Nurse 2 were concerned about possibly dangerous overlap between therapies.

> "I was really trying to elicit from her what she saw as her main problems and I think physically the two things that really scared her were the fact that she bled and would she bleed to death. Would she start walking about one day and she would bleed so much she would die? But if we stopped her dalteparin [anticoagulant] which she was on, would she just drop dead like that because a blood clot moved? And she was very frightened of that."
> Nurse 2, primary care, female.

### Unclear or incomplete history

Pharmacist 5 was asked to see a temporary patient who was requesting warfarin. The patient couldn't speak English and even with the Language Line translation service it was almost impossible for Pharmacist 5 to make sense of the information gleaned from the patient. In the end Pharmacist 5 decided not to prescribe for the patient but to pass her on to a GP colleague.

> "She [the patient] couldn't tell me exactly the condition, maybe that was the problem with the translator as well, but they couldn't actually tell me

the condition that the doctor was treating, just that she'd had it at home and she was definitely on it, which I actually didn't believe, because of the INR, and the fact it'd been a gynae [*sic*] doctor that had given them. But she couldn't tell the background and I thought 'Has it been for post-operative or something?', but it was bizarre. It didn't fit the normal indications that we normally prescribe for."
Pharmacist 5, primary care, female.

#### Patients' wider concerns

Sometimes much more lay behind what appeared to be a relatively straightforward, discrete condition. Nurse 1 was treating over-granulation at a PEG tube insertion site and described the critical importance of this to the patient.

> "She came home to die basically and we did support her for 4 months, which was a massive undertaking for the team. So she already had a lot of anxieties about this PEG feed 'cause she kind of knew that if this wasn't working then the alternative was she was going to have to go back into hospital for her care. So I really didn't want to give her any more distress because it wasn't going to input much, you know, but in her eyes it was a problem with the feed and if she had problems with the feed then she wasn't going to be able to live at home independently."
> Nurse 1, primary care, female.

## 5.4 Discussion

### 5.4.1 Key findings

All but one of the Phase 1 participants recorded reflections on what they considered to be prescribing decisions noteworthy in relation to their practice (Phase 2) and were subsequently interviewed about them (Phase 3). Pharmacist 6 withdrew after Phase 1 due to pressure of work. Twenty four reflections were made in total; participants made one, two or three, ranging in duration from approximately 1 minute 12 seconds to 7 minutes 36 seconds. Some participants made multiple partial recordings meaning that accurate allocation of time for each reflection was impossible.

The prescribing decisions participants made and chose for reflection were informed by all the domains of the TDF except optimism and reinforcement; additional influences of multi-disciplinary working, experience and complexity were also evident. Participants chose to reflect mainly on what from their descriptions were complex prescribing decisions involving vulnerable patients, multiple morbidities, a lack of information and/ or the need for creative thinking to ensure the best outcome for the patient. Prescribing was not always in accordance with guidelines or usual practice.

### 5.4.2 Strengths and limitations

The study has several strengths.

#### 5.4.2.1 Study design

In Phase 2 participants recorded reflections on one, two or three prescribing decisions which they felt were noteworthy in some way in relation to their practice. They were given no further guidance on areas for reflection so as to minimise any possible influence from the doctoral student on the areas chosen (Sackett 1979). In Phase 3 participants were interviewed about their reflection/s by the doctoral student; an account of the development of the interview schedules is given earlier in this chapter. Every effort was made to remain true to the transcriptions and to be mindful of the TDF and other themes identified during analysis of Phase 1 transcripts.

#### 5.4.2.2 Breadth of areas chosen by participants for reflection

Reflections encompassed prescribing decisions made by pharmacist and nurse prescribers working in a range of practice settings and for a wide range of clinical conditions. They included patients from shortly after birth to those nearing the end of their lives. One reflection was on an acute life or death situation; others were concerned with prescribing for less serious acute conditions or with aspects of the management of long term conditions. In contrast to other studies using modified critical incident methods, participants were not asked to reflect on any particular type of prescribing decision. Interviews based on the reflections

similarly were very broad, with the focus on the entire reflection rather than any one aspect.

#### 5.4.2.3 Trustworthiness

Trustworthiness (Guba 1981, Shenton 2004) will be considered as a measure of quality in this qualitative research, followed by consideration of credibility/ trustworthiness checks developed specifically to assure the quality of research using modifications of Flanagan's critical incident technique (1954, Butterfield *et al.* 2005).

General aspects of study design which contribute to overall trustworthiness have been discussed in Chapter 2 (Table 2.10) and Chapter 4 and will not be considered again here. Specific aspects of Phase 2 and 3 which enhance trustworthiness are discussed below.

##### Credibility

Shenton (2004) asserts that to enhance credibility the research method selected should be well established and have been used in comparable research. As outlined in Chapter 2, although very loosely based on Flanagan's critical incident technique the methods used to gather data in Phase 2 and 3 were novel i.e. self-recorded reflections by NMPs on prescribing decisions which they felt were noteworthy in relation to their practice, and semi-structured interviews based on these reflections. None the less other studies have used various modifications of the critical incident technique to explore specified categories of prescribing decisions for example decisions engendering discomfort in participants (Bradley 1991, Bradley 1992a, Allery, Owen and Robling 1997, Lewis and Tully 2009, Lewis and Tully 2011, Bowes *et al*. 2012, Lewis *et al*. 2014, Maddox *et al.* 2016). Credibility was also enhanced by offering participants in Phase 1 the opportunity to participate in Phases 2 and 3; one participant declined, suggesting that those who participated wished actively to do so. Participants were encouraged to be honest and sometimes recorded reflections which did not necessarily show them in a good light. Iterative questioning was used; in contrast to the semi-structured interview schedule use throughout Phase 1 interviews, each Phase 3 interview schedule was developed directly from a Phase 2 reflection as well as the literature, the TDF and findings from Phase 1. Participants listened to their reflections immediately before each interview,

allowing member checking of their reflections and preparing them for the interview.

#### Transferability

To promote transferability it is important that sufficient detail and thick description are provided to allow the reader to decide on the transferability of findings to another setting. The combination of data from Phase 1 interviews, using a theoretically-derived interview schedule, with transcriptions of participants' reflections (above and Appendix 5.3) and data from interviews based on these provides contextualising details.

#### Dependability

Dependability and credibility are closely linked (Shenton 2004); to enhance dependability Shenton suggests the use of "overlapping methods" p.71 as has been done in this three phase study, as well as the provision of details of the research design and implementation, data gathering and "reflective appraisal" p.72.

#### Confirmability

In qualitative research confirmability is promoted by acknowledging and minimising bias. A reflexive approach (see Foreword and Chapter 2), detailed description of what was done and why, rigorous and explicit analysis and triangulation of data have all been incorporated into this study and contribute to confirmability of findings.

### 5.4.2.4 Credibility/ trustworthy checks in critical incident research

As in Chapter 2, Butterfield 2005 and colleagues have developed a series of credibility checks which enhance the robustness of critical incident-based research. Of these, the following were included in the design of Phases 2 and 3, again enhancing the credibility and trustworthiness of findings:

- interviewing participants after thematic categorisation of their of "critical incident" recording

- verbatim transcribing of recorded interviews

- duplicate analysis of a sample of data (in this case, all data)
- reviewing of tentative themes by relevant experts
- establishing theoretical agreement by reference to the literature

### Study limitations

Limitations in the design of Phase 1 of the study were considered in Chapter 4. Those relevant to Phases 2 and 3 will be considered here.

#### 5.4.2.5 Recruitment

All but one of the participants in Phase 1 took part in Phases 2 and 3, representing again a broad range of experiences and practice settings. Pharmacist 6 chose not to participate in Phases 2 and 3; she prescribes for substance misuse and it is possible that her prescribing decision-making might be subject to additional or different influences from those of participants.

#### 5.4.2.6 Participants' contributions

Participants recorded detailed reflections on prescribing decisions which they felt were noteworthy in some way. No other direction was given and no-one asked for clarification or about the suitability of their reflections, suggesting that all were clear and satisfied with what they had done. Some participants chose only to reflect on one prescribing decision, most on two and some on three prescribing decisions i.e. more than was requested. Reflections encompassed a wide range of issues. Again social desirability bias was possible (Sackett 1979) but again participants appeared to speak freely and honestly, at times revealing aspects of their behaviour which were not necessarily flattering.

### 5.4.3 Discussion in relation to the literature

As in Chapter 2, various modifications of Flanagan's critical incident study (Flanagan 1954) have been used to explore prescribing decision-making over the last 16 years (Bradley 1991, Bradley 1992a, Bradley 1992c, Allery, Owen and

Robling 1997, Prosser, Almond and Walley 2003, Prosser and Walley 2006, Lewis and Tully 2009, Lewis and Tully 2011, Lewis *et al*. 2014, Maddox *et al.* 2016). The TDF has also been used to explore prescribing decision making by medical prescribers (Duncan *et al.* 2012, Sargent *et al.* 2017). These studies used semi-structured and unstructured interviews and specified the focus of the incident, for example uncomfortable prescribing decisions, prescribing errors or delayed prescriptions for antibiotics. None left the choice of incident entirely to the participant.

Findings from Phase 3 interviews will be considered in relation to relevant research including that which used modifications of Flanagan's critical incident method and the TDF.

#### 5.4.3.1 Complexity

In Phase 1, complexity appeared as a sub-theme within the domains beliefs about capabilities and memory, attention and decision processes. In participants' Phase 2 reflections and Phase 3 interviews based on these complexity emerged as a strong theme. It is not known how participants selected the noteworthy prescribing decisions for reflection but there was great diversity among the decisions chosen, and several had elements of complexity. One participant chose to reflect on two prescribing decisions on travel medicine, one of which he described as being much more complex than the other. Throughout the study and in different ways, participants described putting the patient at the centre of their prescribing decision-making. Dutch GPs asserted that a patient-centred approach was particularly beneficial in managing multimorbidity but that "diagnostic and therapeutic complexities" were a barrier to this (Luijks et al. 2012 p.e509). A focus group study of patients' perceptions of pharmacist prescribing found that patients were generally positive about pharmacist prescribing but preferred a multi-disciplinary team approach, particularly in relation to complex conditions (McCann *et al.* 2012b).

Complexity is recognised as contributing to risks of medicines misadventure, particularly when combined, as it often is, with multimorbidity and polypharmacy (Scottish Government Model of Care Polypharmacy Working Group 2015). Nurse 4's encounter with a patient near death as a result of taking too many tablets inadvertently is a prime example of this.

In relation to complexity, evidence-based medicine has been criticised as sometimes not reflecting the realities of complex patient groups with multiple morbidities (Tumilty, Walker and Tumilty 2014, Dumbreck *et al.* 2015). The Competency Framework has been recommended as supporting prescribing for patients with long term conditions and complex polypharmacy (Picton, Loughrey and Webb 2016).

#### 5.4.3.2 Knowledge

Knowledge of the condition being treated, of medicines and of the patient were important influences on participants' prescribing decision-making. Little specific mention was made of knowledge of evidence-based guidelines but the step-wise approach described by some participants suggested a detailed knowledge of these. Where participants knew they lacked knowledge or felt the condition was out with their competence they referred the patient on, generally to a doctor, thus doing their best to ensure appropriate treatment. Some non-medical prescribers have described feeling under pressure from colleagues to prescribe for conditions out with their competence for example in clinical complexity (McCann *et al*. 2012a, Bowskill, Timmons and James 2013); better understanding of the role of non-medical prescriber among the multi-disciplinary teams was felt be helpful in dealing with this (Cousins and Donnell 2012).

Nurses 1 and 2 reflected on prescribing decisions which had been informed by their knowledge of a specific drug's pharmacology or pharmacokinetics. In contrast, other nurse non-medical prescribers have identified a lack of knowledge of pharmacology or therapeutics as problematic (Creedon *et al*. 2009) and have highlighted this as a deficiency in their university education (Creedon *et al*. 2009, Scrafton, McKinnon and Kane 2012, Abuzour, Lewis and Tully 2015, Abuzour, Lewis and Tully 2017). Others have identified a desire among nurse prescribers for continuing professional development in pharmacology (Courtenay and Gordon 2009, Weglicki and Reynolds 2015) and in prescribing–related legislation (Weglicki and Reynolds 2015).

Even where nurse prescribers asserted that they were knowledgeable and confident about commonly used medicines in their areas of practice they were found to lack appropriate pharmacological knowledge (Offredy, Kendall and Goodman 2008). In 2011 the Royal College of Physicians recommended

improved pharmacological education for all medical and nurse prescribers (Royal College of Physicians 2011).

Participants varied in their levels of knowledge of the patients they selected for reflection; this would be expected as some were responding to acute conditions while others were managing patients longer term. Knowledge of the patient will be discussed under the social role of the patient.

Prosser and Walley (2006) in a critical incident study identified four types of knowledge influencing hospital doctors' prescribing of new drugs: scientific knowledge, social knowledge, knowledge of the patient and experiential knowledge. These map well to the types of knowledge participants identified as influential i.e. of the condition, the medicines and the patient, particularly when the importance they ascribed to experience (considered later) is included. A recent systematic review of expertise development of pharmacist and nurse prescribers in the UK determined that "knowledge, skills and attitudes are an integral part of learning and prescribing within a complex social context" (Abuzour, Lewis and Tully 2017, p.10).

#### 5.4.3.3 Skills

Communication, calculation and clinical assessment skills influenced participants' prescribing decision-making; in one case a participant's skill in managing a complex, life threatening situation was key to a successful outcome.

##### Communication skills

"The consultation" is one of two domains in the prescribing competency framework for all prescribers (Royal Pharmaceutical Society 2016) and communication skills are recognised as key to an effective consultation. Communication skills are among the non-technical skills which it has been posited might reduce prescribing errors (Ross, Patey and Flin 2013, Dearden *et al.* 2015).

Participants gave details of their communication during the consultation in their reflections, sometimes including what appeared to be their original words. Only Pharmacist 2 reflected on any deficiency in her communication skills, when she reported considering taking additional training to help her to negotiate better

with a senior colleague about treatment options. Participants dealing with requests for unjustified antibiotics acknowledged their lack of success in dissuading the patient or family member from their quest, and found this frustrating. Patient demand for antibiotics is recognised as a challenging issue for prescribers and will be discussed under the social influence of the patient.

Concern has existed for some time about GPs' consultations skills; in the late 1990s misunderstandings were common (Britten *et al*. 2000) and it was found that GPs and their patients could be speaking a different language during consultations, with GPs using the "voice of medicine" while patients used the "voice of the life world" (Barry *et al.* 2001, p.487). More than a decade later, a systematic review found a similar disconnect in communication between GPs and parents seeking antibiotics for their children (Cabral *et al*. 2014).

A study among nurse prescribers in dermatology found that the nurse prescribers and doctors working with them felt that the nurses' communication style was different to that of doctors. Specialist dermatology nurses were felt to have the better consultation skills although the nurses were less good at involving patients in their prescribing decisions and giving information about side effects (Courtenay, Carey and Stenner 2009). By contrast participants in the present study reported providing information about medicines to their patients to promote shared decision making, including discussing mechanisms of action and side effects.

Riley and colleagues studied the extent to which GPs, pharmacist and nurse prescribers responded to patients' emotional cues and concerns in primary care consultations (Riley *et al.* 2013). They found that both nurse and pharmacist prescribers identified more of these than GPs, notwithstanding that pharmacists had much longer consultations, and responded in a supportive and positive way. Kaldijian (2010) asserts that clinical judgment which incorporates patients' goals and values is likely to improve clinical decision making. Participants in the present study described identifying and responding to patients' emotions and concerns about their conditions, particularly but not only in patients nearing the end of life. This will be considered further under social influence.

### Calculation skills

Pharmacist 3 described in detail the steps she took to ensure her calculations were correct when prescribing oral then intravenous magnesium supplementation for her patient. Knowledge-based mistakes including prescribing the wrong dose of a drug contributed to prescribing errors among junior doctors (Lewis *et al.* 2014); working in "error-producing conditions" such as busy wards contributed to their errors, demonstrating the importance of the environmental context.

### Clinical assessment skills

Some reflections included information about participants' clinical assessment skills. These are a core part of nurses' education and training and the ability to use these within prescribing has been found to contribute to professional satisfaction among nurse prescribers (Coull *et al*. 2013). Nonetheless there is a demand among nurse prescribers for continuing professional development opportunities in assessment and diagnostic skills (Creedon *et al.* 2015). Nurses 3 and 4, experienced nurse practitioners dealing with acute conditions, appeared to use an initial rapid assessment based on experience followed by a more in-depth deductive assessment when assessing their patients' need for antibiotics. Nurse 5 similarly was easily able to assess her patient's wound as quite normal, despite its dramatic appearance. This two stage assessment approach was identified among nurse prescribers and GPs in primary care dealing with respiratory tract infections (Horwood *et al.* 2016). Horwood and colleagues asserted that a stronger evidence-base and some additional training were needed to support these nurse prescribers and GPs in making appropriate decisions in the treatment of these conditions.

Finally Nurse 4 reflected on a critical situation where she had to draw on all her skills and experience to help her patient, demonstrating her expertise as a prescriber (Abuzour, Lewis and Tully 2017) and more generally as a clinician.

Some pharmacist participants felt they had appropriate physical assessment skills; Pharmacist 5 described herself being "pretty fast" in carrying out physical assessments in her patients. Other pharmacist participants relied on nursing colleagues for help with physical assessment and one described how his inability to understand laboratory test results could be a barrier to his prescribing.

Pharmacist prescribers in secondary care have been found to rely on doctors for diagnosis (Tonna *et al*. 2010) and physical examination of patients (Tonna *et al*. 2010, Abuzour, Lewis and Tully 2015); this may be appropriate to their roles in secondary care. Concern has been expressed about pharmacist prescribers' lack of clinical assessment skills (Latter *et al*. 2012); this is being addressed by the General Pharmaceutical Council in their requirements for Pharmacist Independent Prescribing courses (General Pharmaceutical Council 2017c) and by NHS Education for Scotland who offer a core clinical assessment skills course for pharmacists (NHS Education for Scotland 2017b).

#### 5.4.3.4 Social/ professional role and identity

Participants reflected on their roles as nurses and pharmacists, sometimes linking particular aspects of their knowledge to their role. Nurse 1 was a district nurse and thought that nurses excelled at sorting the "daft wee things", ascribing particular qualities to their knowledge. The knowledge of district nurses has been described in a doctoral thesis as "unique" (Bain 2015).

Participants very much valued their roles as independent prescribers and the benefits they felt this brought to their patients. At the same time they were aware of and sometimes concerned about the inherent additional responsibilities. Participants in this study felt that clear documentation was important in supporting and being able to defend prescribing decisions, particularly when it was felt these might be challenged; this is a key element of good prescribing governance (Royal Pharmaceutical Society 2016).

The two pharmacist participants working in secondary care were already accustomed to making prescribing recommendations to medical prescribers as part of their wider roles as hospital pharmacists. Pharmacist 3 articulated the difference between advising a doctor on writing a complicated fluid prescription and writing it as a prescriber herself, emphasising her unease in this new role. Medicines optimisation is a key role for many hospital pharmacists, involving identifying and addressing sub-optimal prescribing among other elements. Both the King's Fund *Medicines Optimisation. Making it safe and sound* (Duerden, Avery and Payne 2013) and the Scottish *Polypharmacy Guidance* (Scottish Government Model of Care Polypharmacy Working Group 2015) however

emphasise the responsibility of all healthcare professionals in medicines optimisation.

More pharmacist prescribers work in hospital than in primary care or community pharmacy (Phelps *et al*. 2014, NHS Education for Scotland 2017a) with most of their prescribing concerned with medicines reconciliation (Baqir *et al*. 2015). A lack of organisational support and lack of a clear role have been identified as reasons for non-prescribing by nurse and pharmacist prescribers (McIntosh *et al*. 2015). In 2013 around a quarter of all pharmacist prescribers were not prescribing at all and 40% of those who did so prescribed for five or fewer patients each week (Phelps *et al*. 2014). In Scotland in 2016, 48.8% of pharmacist prescribers were actively prescribing (NHS Education for Scotland 2017a). In a recent survey of pharmacists' perceptions of their roles "prescriber" was not mentioned at all (Elvey, Hassell and Hall 2013); it may be that one of the barriers to pharmacists implementing prescribing may be pharmacists themselves.

One small scale study of experienced district nurses who were independent prescribers found that while they valued the autonomy and consequent job satisfaction the role gave, they experienced increased work-related stress. They also felt undervalued in that their salaries had not risen to reflect their additional responsibilities (Downer and Shepherd 2010). Another small study among experienced nurse practitioner independent prescribers again found increased work-related stress levels among participants as well as enhanced feelings of autonomy and job satisfaction (Cousins and Donnell 2012).

#### 5.4.3.5 Beliefs about capabilities

Participants' reflections demonstrated that they felt themselves very capable when making prescribing decisions in familiar situations but sometimes less-so in the face of uncertainty. Where this was perceived to be particularly troubling participants would seek help from a colleague; this practice is reflected in the literature. Nurse prescribers working in the area of mental health conditions described themselves as deliberately cautious in their prescribing (Funnell, Minns and Reeves 2013) as did pharmacist prescribers in Northern Ireland (McCann *et*

*al*. 2012a) and all identified the importance of working within a multi-disciplinary team.

#### 5.4.3.6 Beliefs about consequences

The diagrammatic representation of Competency Framework for all prescribers has the patient at the centre (Royal Pharmaceutical Society 2016) and the central importance of consequences for the patient came out strongly in participants' reflections about the prescribing decisions they made. They used their knowledge of conditions, medicines, their patients, and their own previous experience to consider the likely consequences for their patients and seemed always to put them first.

Patients or their family members seeking antibiotics in the absence of clinical need did not necessarily agree with their prescribers' assessment of their health. On occasion participants issued delayed prescriptions for antibiotics in response to pressure for them and to prevent anticipated poor consequences of not prescribing them. Nurse 4 found herself writing a delayed antibiotic prescription in response to pressure from a patient's wife for the sake of her colleagues; they had had a difficult week and Nurse 4 anticipated further difficulties and unpleasant consequences for them if she refused. Nurse 5 did similarly when she prescribed antibiotics for a healthy wound, in anticipation of unpleasantness over the weekend. Hospital doctors have also been found to prescribe un-necessarily in response to pressure from the patient, family members or others, sometimes for the sake of maintaining harmony in their multi-disciplinary team (Lewis and Tully 2011). GPs, trainee GPs and nurse prescribers issued delayed prescriptions in response to clinical uncertainty and patient pressure (Peters *et al*. 2011b). They did this infrequently, preferring that the patient re-consult if symptoms did not resolve.

Clinical uncertainty was identified in a systematic review as an important influence on nurse prescribers' decisions whether or not to prescribe antibiotics (Ness *et al*. 2016). There was no clinical uncertainty in participants' reflections; one prescribed antibiotics in response to patient need and two in response to demands from patients' family members. This pressure will be considered further in social influence and multi-disciplinary team working.

In contrast to this study where participants put consequences for their patients at the core of their prescribing decision-making, possible consequences for the patients was only one sub-theme identified in a simulated recall exploration of junior doctors' decision-making in secondary care (Bull, Mattick and Postlethwaite 2013). These doctors had a number of differing and sometimes competing priorities and types of decisions to make. They were focused on caring for individual patients but were aware of the wider organisational context within which they worked, including the need to present themselves in a good light to superiors. Participants in this study made little mention of how others might perceive their prescribing decision-making.

#### 5.4.3.7 Goals and intentions

As described in Chapter 4, the research team found difficulty in differentiating between participants' goals and intensions during analysis of Phase 1 interviews. Others have found similar difficulty (Cane, O'Connor and Michie 2012) and goals and intentions have been re-assigned as the domains of the TDF have been developed over time (Michie *et al*. 2005, Cane, O'Connor and Michie 2012, Huijg *et al.* 2014a). This will be discussed further in Chapter 6.

In Phase 2 and 3 differences between participants' goals and intentions seemed clearer, allowing them to be considered separately. Participants were influenced by their goals, most broadly to benefit their patients; their intentions were identified as the ways in which they hoped to achieve their goals. Sometimes this involved complex clinical decision-making, sometimes strictly following a protocol and sometimes trying to mitigate the effects of an unnecessary delayed prescription for an antibiotic. Patients' wishes were always considered but were not always paramount.

There is a lack of research literature in prescribing which has used the TDF. One study looked at prescribing errors among junior doctors (Duncan *et al.* 2012); neither goals not intentions were identified as relevant. In another study, motivation and goals (Michie *et al*. 2005) were identified as influences on primary care practitioners' behaviour in relation to human papilloma vaccination but were considered less relevant. On the other hand goals and intentions were found to be likely influences on Australian GPs' behaviour in relation to writing

delayed antibiotic prescriptions (Sargent *et al*. 2017). Sargent and colleagues suggested that goals and intentions should be considered in interventions designed to increase delayed prescribing as a way to reduce the use of antibiotics.

#### 5.4.3.8 Memory, attention and decision processes

The prescribing decisions made by participants were often complex and influenced by their memories of previous experiences, by the availability and their use of relevant information and most of the time by a deliberate approach taken in their decision making, although heuristics were used on occasion. Memory, attention and decision processes were found to be relevant in Duncan and colleagues' investigation of prescribing errors among junior doctors and self-monitoring of prescribing was suggested as an intervention which might reduce errors (Duncan *et al*. 2012). None of the participants in this present study mentioned having made a prescribing error; their reflections evidenced rigorous approaches to making prescribing decisions, and the use of reflective practice.

Pharmacist prescribers in three hospitals in England were found to have a prescribing error rate of 0.3% (Baqir *et al.* 2015) in comparison with error rates of 5% in general practice across England (Avery *et al.* 2012) and a mean of 8.8% among hospital doctors, with trainee doctors significantly more likely to make prescribing errors than consultants (Ashcroft *et al.* 2015). Causes of trainee doctors' prescribing errors were multifactorial and included lack of knowledge and poor application of knowledge. Hierarchical medical teams and a perceived culture where instructions from more senior staff may be followed blindly also contributed to errors. Little appears to be known about prescribing error rates among nurse prescribers; an early evaluation of nurse and pharmacist independent prescribing found their prescribing to be safe and clinically appropriate (Latter *et al.* 2012) and a study of nurse prescribing in accident and emergency and sexual health departments found that 99.8% of prescriptions were clinically appropriate (Black 2012). A review of nurse prescribing of antibiotics in Scotland 2007 – 2013 found that their prescribing appeared to be improving in line with best practice (Ness *et al*. 2015). More recently nurse and pharmacist prescribers were found to be using patient-centred management strategies with patients consulting for respiratory tract

infections. The nurse and pharmacist prescribers met patient expectations except where patients reported expecting an antibiotic. Patient satisfaction levels with consultations were high (Courtenay *et al*. 2017)

#### 5.4.3.9 Environmental context and resources

The environmental context within which participants prescribed and the human and other resources they used to support their prescribing decision making were key influences on their prescribing decision-making. All worked in multi-disciplinary teams and colleagues, especially GPs for those prescribing in primary care, were a key source of advice and guidance, or perhaps just back-up in an attempt to resist patient pressure. More widely, help was also sought from experts outside participants' immediate teams.

Other non-medical prescribers are supported by medical and other colleagues. Integration of nurse prescribing into practice in primary and secondary care was found to require trust between nurses and doctors and between nurses and employers (Bowskill, Timmons and James 2013). Nurse prescribers' autonomy in this study varied across settings but all received support from doctors. Peer support and advice from doctors were found to influence primary care nurses prescribing for otitis media in children (Philp and Winfield 2010) and for respiratory tract infections within a no-antibiotic prescribing strategy (Rowbotham *et al*. 2012).

Whereas in Phase 1 participants spoke about evidence-based guidelines and particularly the local NHS Grampian Joint Formulary as frequently used resources, in Phases 2 and 3 there was much less mention of these influencing participants' prescribing decision-making. Instead participants described seeking help when required either from GPs for those in primary care or from relevant experts. One participant described the influence of the physical environment i.e. ward opening times on her prescribing of intravenous magnesium supplement. Another, asked to make a prescribing decision as a community pharmacist, felt the absence of what would have been relevant information due to her practice setting that day.

In the study of prescribing errors by junior doctors the environmental context within which they prescribed was found to be relevant to their making prescribing errors; elements included frequent interruptions, distractions and pressure of work (Duncan *et al*. 2012). One participant in the present study described the relentless pressure she felt under as contributing to her decision to issue a delayed antibiotic prescription in the absence of clinical need. Perhaps uniquely, Nurse 1's practice setting in a farmhouse up in the hills and a forecast for bad weather were identified as explicit influences on her prescribing decision-making.

#### 5.4.3.10 Social influences

In their reflections participants described the social influences of colleagues and of their patients and patients' families.

##### Colleagues

Some participants had a specific medical mentor but almost all valued the help and support of medical and other colleagues; Pharmacist 2 was the exception, feeling that her prescribing decision was dictated by a more senior medical colleague. Nurse 4's decision to prescribe antibiotics for the sake of her colleagues has already been discussed.

Peer support is generally felt to be helpful but is not always available. In a small scale study, district nurses working as independent prescribers identified frequent lack of organisational and peer support for their prescribing (Downer and Shepherd 2010). An interview-based study of influences on NMPs' prescribing decisions found that colleagues influenced their decisions about what to prescribe, although not their initial decision whether to (Maddox, Tully and Hall 2010). Peers were found to be influential in GPs' decisions to prescribe new drugs (Jacoby, Smith and Eccles 2003, Prosser, Almond and Walley 2003); and a peer feedback letter from the Chief Medical Officer in England to GPs prescribing high levels of antibiotics reduced their prescribing of these significantly (Hallsworth *et al.* 2016).

### Patients and their families

The social influence of patients or their families was important as was seen in Section 5.4.3.5 when participants prescribed antibiotics in response to patient or family pressure and to prevent bad consequences for their colleagues. Across Scotland, between 2007 – 20013 nurse independent prescribers issued 20% of all prescriptions for antibiotics in primary care and it is anticipated that this will increase (Ness *et al*. 2015). It is important that interventions are designed and delivered to promote antimicrobial stewardship to all prescribers and support them in making evidence-based decisions in this area.

Some participants' prescribing decision-making was influenced by their desire to allow their patients to enjoy limited remaining time with their family members. Participants were also influenced by their patients' wishes to reduce or stop certain medicines, and were happy to discuss this with them so as to reach a concordant agreement.

A synthesis of qualitative studies of medicines taking found that many patients were reluctant to take medicines, particularly for long term conditions (Pound *et al.* 2005). Older adults with polypharmacy have been found to have contrasting views about their medicines, with some again concerned about long-term use and side effects (Clyne *et al*. 2017). Shared decision-making as described by the two participants in this study has been found to facilitate de-prescribing (Jansen *et al*. 2016) and also to promote adherence (National Institute for Health and Care Excellence 2009). In practice, Courtenay and colleagues (2011) found that in dermatology clinics, nurse prescribers' provision of information and shared decision-making with patients contributed to increased concordance and clinic efficiency.

The medical hierarchy in the form of a Registrar with strong views on appropriate antibiotic choices dictated the prescribing decision made by Pharmacist 2 and led her to prescribe an off-formulary, unlicensed antibiotic for her patient. A systematic review of non-technical skills required by junior doctors to prescribe safely identified that challenging the prescribing of senior colleagues was "extremely difficult" (Dearden *et al*. 2015 p.1309). Foundation Year 1 doctors found the hierarchical structure of medical teams made asking for prescribing advice difficult, leading to feelings of discomfort and also to errors (Lewis *et al*.

2014). A TDF-based interview investigation of prescribing errors among trainee doctors found the domains of knowledge, social/ professional role and identity, social influences (including of senior staff) and environmental context and resources influential and suggested that interventions addressing these domains could be developed to improve prescribing (Duncan *et al*. 2012).

Bourne and colleagues identified medical staff acceptance of the role as one of the challenges facing pharmacist prescribers in secondary care, among also many opportunities (Bourne, Baqir and Onatade 2016).

#### 5.4.3.11 Emotion

Some participants in Phase 1 had acknowledged that emotion sometimes played a part in influencing their prescribing decision-making. In Phase 2 participants had chosen their own "noteworthy" prescribing decision on which to reflect and several had chosen ones with an emotional aspect. Despite an extensive literature search nothing was found linking emotion and prescribing decision-making.

#### 5.4.3.12 Behavioural regulation

Participants had been asked to reflect on a noteworthy prescribing decision they had made and within their reflections some described elements of behavioural regulation in relation to their prescribing. Reflective practice is a requirement for all nurses, pharmacists and AHPs (Nursing and Midwifery Council 2015, Health and Care Professions Council 2016, General Pharmaceutical Council 2017d) and indeed all healthcare professionals. The importance of reflection in improving prescribing practice is demonstrated by its inclusion in the Competency Framework for all prescribers; Competence 9.1 is "Reflects on own and others' prescribing practice, and acts upon feedback and discussion" (Royal Pharmaceutical Society 2016, p.14). A small scale study of nurse and pharmacist NMP students found that reflection on newly acquired knowledge in relation to previous knowledge and experience was helpful in contextualising what they learned and making it useful (Abuzour, Lewis and Tully 2015).

#### 5.4.3.13 Multi-disciplinary team working

All participants worked within multi-disciplinary teams and acknowledged and valued the support this provided. Participants described sharing patient care with colleagues, and seeking colleagues' advice and help when they felt this was needed. Some participants described talking through their prescribing decisions informally with GP colleagues even when they were confident in their prescribing decisions, perhaps as a courtesy or to re-assure themselves.

Adigwe and colleagues (2013, p.21) explored nurse and pharmacist prescribers' prescribing for chronic pain and found that they similarly valued the support of colleagues. Adigwe developed the theory "Safety and support within the prescribing environment" to describe this. A team approach to patient care may be particularly valuable in patients with complexity and multiple morbidities (McCann *et al*. 2012b) and colleagues were identified as a valuable source of continuous professional development by nursing and allied health professionals with responsibility for prescribing (Weglicki and Reynolds 2015).

Colleagues' input is not always useful. Nurse prescribers prescribing for self-limiting respiratory tract infections found GP colleagues generally helpful but one felt let down when a GP prescribed an antibiotic after the nurse had judged that it wasn't necessary (Rowbotham *et al*. 2012). A hospital-based study into the discomfort of an evidence-based prescribing decision found that some, particularly junior doctors, felt uncomfortable when their interpretation of the evidence and hence their prescribing decisions were not congruent with those of superiors (Lewis and Tully 2009). Pharmacist 2 would recognise this tension.

#### 5.4.3.14 Experience

Participants were all experienced health care professionals and most were experienced prescribers. Participants spoke about the benefit of their experience to their prescribing decision-making; that might be in relation to the patient's clinical condition or more generally. Pharmacist 2 described how the experience of another, more senior prescriber, influenced her prescribing; she also described reflecting on that experience and considering how she could learn from it.

GP and nurse prescribers found that experience in assessing severe respiratory tract infections in children enhanced their confidence in being able to identify seriously ill children who might then need antibiotics to treat their infection (Horwood *et al*. 2016). In a vignette study, GPs asked to consider prescribing for a child with long term conditions and a flu-like illness were influenced by their previous experience of managing sick children (Ashdown *et al*. 2016). Experience also informed the prescribing decision-making of nurse prescribers in selecting the most appropriate antimicrobial for their patients (Ness *et al.* 2016).

## 5.5 Summary

This chapter has reported Stage 2 Phases 2 and 3 of the programme of research, a qualitative, theoretically-driven exploration of influences on the prescribing decision-making of NMPs. Phase 2 captured participants' self-recorded reflections on prescribing decision/s they had made which they considered noteworthy in relation to their practice. In Phase 3 participants were interviewed about these reflections using a bespoke semi-structured interview schedule derived from their reflections, the TDF and the literature. Again robust research methods and governance enhanced the trustworthiness of findings.

Participants' prescribing decision-making was again influenced by most but not all of the domains of the TDF; there was some overlap and some linking between domains. Complexity in particular but also multi-disciplinary working and experience were also strong influences.

# Chapter 6 Discussion

## 6.1 Introduction

In this final chapter of the thesis the overall aims of the programme of research and of the constituent parts will be restated. Key findings will be summarised and consideration given to the strengths and limitations of the research programme. Findings will be interpreted in relation to the literature and the impact of the research considered. Areas for further research will then be identified. Finally, at the end of this programme of research conclusions from it will be drawn.

## 6.2 Aims of the programme of research

The overall aim of the programme of research was to explore influences on prescribing decision-making among NMPs. This was achieved in two stages: Stage 1, a systematic review of the literature and Stage 2, interviews with NMPs exploring influences on their prescribing decision-making in general and on specific prescribing decisions which they considered noteworthy in some way.

### 6.2.1 Stage 1: systematic review

(McIntosh *et al.* 2013, McIntosh *et al*. 2014, McIntosh *et al*. 2016b).
The aim of the systematic review was:

- to identify and characterise social and cognitive factors and perceived factors influencing the prescribing decision-making process among non-medical prescribers.

The objectives of the systematic review were:

- to determine the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK

- to report on the methodologies and methods used and quality of peer reviewed published studies in this area

### Key findings from Phase 1: systematic review

The systematic review identified only three small-scale studies, none of which focused directly on influences on NMPs' prescribing decision-making. Studies were carried out in primary care, mainly among NMPs (almost all nurse prescribers) treating acute conditions such as otitis media and upper respiratory tract infections, although one used scenarios to explore nurse prescribers' decision-making more broadly. Prescribing decision-making was perceived as challenging and complex, and evidence-based guidelines and experience felt to be helpful in navigating this complexity. Social and cognitive elements such as prescribers' previous experiences, perceived patient pressure for antibiotics, patients' socio-economic status and prescribers' knowledge or lack of knowledge of the patient were also influential. A team approach to prescribing was evident and peer support and encouragement from doctors was felt to be helpful in building participants' confidence.

All three studies took an interpretivist approach and used qualitative methods to explore NMPs' prescribing decision-making although none of the studies specifically considered the processes of prescribing decision-making. One study also included a quantitative, theoretically-derived element designed to explore participants' pharmacological knowledge. All studies were published within the last ten years and two since 2010 but all had methodological limitations.

### Recent literature

Since the systematic review was carried out two other studies have been identified which would have met the inclusion criteria; their findings are considered below.

Horwood and colleagues (2016) explored GPs' and nurse prescribers' prescribing decisions in consultations for children with respiratory tract infections. Prescribers based their decision on whether or not to prescribe on an initial quick examination of the child then detailed consideration. Apart from cases where they perceived an antibiotic was definitely needed, the GPs and nurse prescribers would sometimes prescribe antibiotics where there was prognostic uncertainty or

where the child had been presented several times with the same illness. On occasion they also prescribed antibiotics in response to time pressures, the approach of the weekend or to maintain their relationship with the child's parent. The prescribers used a range of techniques to manage requests for antibiotics they thought inappropriate including refusing to prescribe or issuing a delayed prescription.

Funnell, Minns and Reeves (2013) compared nurses' and doctors' prescribing habits in a mental health Trust in England. Nurses reported that they took a more cautious approach than their medical colleagues and only a few made independent prescribing decisions. Most followed the lead of the doctors and prescribed within narrow limits, for example titrating doses. Those who did prescribe independently found their experience influenced their prescribing decisions. Nurse prescribers asserted that they were more holistic and patient-centred in their approach than doctors and that they communicated well with patients and with other members of the multi-disciplinary team.

### 6.2.2 Stage 2 Phase 1: initial interviews with NMPs.

The aim of this phase of the research was:

- to explore participants' experiences and perceptions of influences on their prescribing decision-making and the impact of these influences

The objectives of this phase of the research were to explore:

- participants' in-depth descriptions of their experiences of making prescribing decisions

- their views and reflections of influences on the prescribing decisions they make

- their opinions on the impact of these influences on their prescribing decision-making

### Key findings from Stage 2 Phase 1: interviews with NMPs

Participants prescribed as members of multi-disciplinary teams and in a variety of settings across community pharmacy and primary and secondary care. They described prescribing decision-making as complex and often challenging with multiple and sometimes contradictory influences, and asserted that experience and team working helped them in their prescribing decision-making. Participants' prescribing decision-making was influenced by almost all of the domains of the TDF. They were aware of the additional responsibilities inherent in prescribing, employed a wide range of appropriate knowledge and skills and were determined to stay within their areas of competence. They referred frequently to using evidence-based resources, particularly the NHS Grampian Joint Formulary (NHS Grampian Medicines Management 2017) as well as national guidelines. Participants' previous experience influenced their prescribing decisions and they took a rigorous, step-wise approach when making these decisions.

Notwithstanding this, on occasion participants did prescribe out with evidence-based guidelines. Decisions to do so were not made lightly and were usually informed by the prescriber's perception based on experience that this would be in the patient's best interest. Some participants did however prescribe in response to social influences for example patient or family pressure.

## 6.2.3 Stage 2 Phases 2 and 3: participants' reflections and interviews based on these

Stage 2 Phases 2 and 3 of the study explored NMPs' reflections on noteworthy prescribing decisions. The aim of this phase of the research was:

- to explore participants' experiences and perceptions of influences on their prescribing decision-making **in relation to noteworthy prescribing decisions.**

The objectives were to explore:

- participants' in-depth descriptions of their experiences of making prescribing decisions

- their views and reflections of influences on the prescribing decisions they make

- their opinions on the impact of these influences on their prescribing decision-making

### Key findings from Stage 2 Phase 2 and Phase 3: participants' reflections and interviews based on these

Participants chose to reflect on a wide range of prescribing decisions, often made in response to acute situations but also when treating patients' long term conditions. Most decisions involved complexity, in relation to the patient's health or social circumstances, in relation to the multi-disciplinary team or to the participant's working environment and sometimes in relation to combinations of these. Some reflections were on decisions with the potential to cause inter-professional conflict; others were on more positive aspects of multi-disciplinary working. Some participants chose to reflect on the importance of clear communication and the need for/ availability of sufficient information on which to base prescribing decisions.

Several reflections were on prescribing decisions made as the patient was drawing to the end of their life. These in particular evidenced participants putting their patients at the heart of their prescribing, using their knowledge and understanding of the patients' wishes as well as of their conditions when prescribing at this critical time. Specific clinical knowledge seemed almost tacit; reflections were much more about participants' prescribing decision-making and the consequences than about the use of resources such as evidence-based guidelines to support this. Very often such decisions were particularly informed by participants' previous experience. Participants were mindful of their patients' ideas, concerns and expectations about their conditions and treatment; the expectations of family members were problematic when they demanded what participants perceived as unnecessary antibiotics.

## 6.3 Strengths and limitations of doctoral research

The programme of research has several strengths.

### 6.3.1 Originality

The systematic review carried out at the onset of the programme of research was registered with Prospero at the University of York (McIntosh *et al*. 2013) and the review subsequently published (McIntosh *et al.* 2014, McIntosh *et al*. 2016).

As far as is known the primary research in this study is the first to have used a theoretically driven, two stage design to extend the knowledge base in this area. Participants were asked first about influences on their prescribing decision-making in general then about specific prescribing decisions they considered noteworthy. The absence of any direction about the sort of decisions participants should choose for reflection is also novel. This allowed them freedom to reflect across a wide range of topics, from relatively routine consultations such as reducing the dose of simvastatin to a life-threatening medication related incident, and provided rich and varied data. Participants' reflections were played back to them immediately before they were interviewed about them; this element was included to refresh participants' memories about their reflections and thus reduce the impact of any recall bias (Bowling 2002).

### 6.3.2 Coherent study design

The study benefits from a strong and coherent design throughout (Sackett and Wennberg 1997). The need for primary research was identified after a systematic review of the literature on social and cognitive influences on NMP prescribing.

The transcendental phenomenological approach taken was appropriate given the over-arching aim of the primary research to explore influences on the phenomenon of prescribing decision-making by NMPs. A qualitative methodology facilitated in-depth exploration of these influences among a relatively small number of participants and within this, semi-structured interviews offered the opportunity for more openness than perhaps focus groups might have done.

Initial interviews explored general influences on participants' prescribing decision-making; their later reflections on specific prescribing decisions which they regarded as noteworthy in relation to their practice, and interviews based on these, enabled a more specific focus.

The use of the TDF in conjunction with the literature in planning the programme of research and in development of the semi-structured interview schedule for Stage 2 Phase 1 provided a strong, theoretically driven foundation likely to strengthen the research (Bradbury-Jones, Taylor and Herber 2014, Stewart and Klein 2016). Development of the interview schedule over a period of months was again informed by reference to the literature and the TDF, and by discussions with relevant stakeholders including the pharmacist prescribing and non-medical prescribing Leads for NHS Grampian. The schedule was reviewed by medical and non-medical experts in prescribing and in NMP education and was talked through as a sense check with practitioners whose professions and prescribing settings matched those of anticipated participants. Finally the interview schedule was piloted. This stepwise approach resulted in a robust schedule likely to elicit information which would answer research questions.

Again contributing to coherence, an initial coding framework for Stage 1 interviews was developed from the domains of the TDF and was augmented during analysis of transcripts. The framework supported rigorous data analysis and was used again in the analysis of Stage 3 interviews.

### 6.3.3 Trustworthiness

Various steps were taken to augment the trustworthiness of the study (see Tables 2.10 and 2.11).

- Credibility was enhanced by the use of an appropriate methodology and methods, a reflexive approach, knowledge of and attention to the background and culture of non-medical prescribing including previous research and the involvement of relevant experts in the study design

- Transferability was promoted by provision in this thesis of background contextualising data and detailed descriptions of what was done, while at the same time protecting the anonymity of participants

- Dependability was engendered by the use of overlapping methods and by inclusion of detailed descriptions within the thesis

- A reflexive and reflective approach including consideration of limitations, in-depth descriptions and the use of diagrams contributed towards confirmability of findings

The study design also incorporated the approaches to trustworthiness in critical incident studies developed by Butterfield and colleagues (2005) over more than 20 years' experience of research using this method.

### 6.3.4 Multi-disciplinary study

Recruitment to the study was multi-disciplinary and participants represented the professions prescribing as NMPs within NHS Grampian at the time of the study. Participants' practice settings were representative of those of other NMPs in NHS Grampian at the time of the study except that there were no participants who were nurse prescribers working in secondary care. Notwithstanding the possibility of social desirability bias, participants appeared to answer honestly, sometimes revealing things which cast them in a less than flattering light. They were also very generous with their time; only one withdrew from the study at the end of Phase 1 interviews due to pressure of work and in Phase 2 some recorded reflections on several prescribing decisions they had made.
Limitations of the study will be considered next.

### 6.3.5 Recruitment

Recruitment was difficult and slow despite endorsement of the study by the NHS Grampian pharmacist and non-medical prescribing Leads, a reminder e-mail and encouraging participants to recruit colleagues; this last approach resulted in an additional four participants. Data saturation appeared to have been reached but it is possible that inclusion of additional participants, particularly from other NMP

professions might have allowed additional themes to emerge and might have added to the transferability of findings. Given that there were only nurse and pharmacist prescribers within NHS Grampian at the time of the study, this would have necessitated contact with other Health Boards to identify which if any had NMPs other than nurses and pharmacists followed by purposive sampling and successful recruitment.

### 6.3.6 Study setting

The study was carried out in one Health Board area in Scotland; interviewing participants from a wider base might have generated additional data. No claims are made for generalisability but it is hoped that the steps taken to ensure trustworthiness and particularly the detail provided will promote transferability i.e. that others may find echoes of their own situations in the data and hence perhaps in the findings.

### 6.3.7 Bias

Bias is inherent in all research and is a threat to trustworthiness; the measures described to promote trustworthiness also minimise the potential for bias to impact on findings. A reflexive approach throughout the research programme was necessary (Barry *et al.* 1999, Bradbury-Jones, Taylor and Herber 2014); this is considered in Reflexivity and in the foreword to this thesis.

## 6.4 Interpretation of findings

Table 6.1 summarises the themes identified as influencing NMPs' prescribing decision-making in Stage 1, Stage 2 Phase 1 and Stage 2 Phase 3 of the programme of research

Table 6.1 Themes from Stage 1, Stage 2 Phase 1 and Stage 2 Phase 3 of the programme of research

| Stage 1 themes | Stage 2 Phase 1 themes | Stage 2 Phase 3 themes |
|---|---|---|
| Consultations and prescribing challenging and complex.<br>No evidence of pharmacological knowledge.<br>Familiarity with commonly prescribed drugs.<br>Evidence-based guidelines helpful but sometimes ignored.<br>External influences also apparent.<br>Experience helpful and sometimes prioritised over evidence-based guidelines.<br>Team approach generally beneficial | Knowledge<br>Skills<br>Social/ professional role and identity<br>Beliefs about capabilities<br>Beliefs about consequences<br>Goals and intentions<br>Memory, attention and decision processes<br>Environmental context and resources<br>Social influences<br>Emotion<br>Behavioural regulation<br>Experience<br>Multi-disciplinary working | Knowledge<br>Skills<br>Social/ professional role and identity<br>Beliefs about capabilities<br>Beliefs about consequences<br>Intentions<br>Goals<br>Memory, attention and decision processes<br>Environmental context and resources<br>Social influences<br>Emotion<br>Behavioural regulation<br>Experience<br>Multi-disciplinary working<br>Complexity |

As may be seen from Table 6.1, Stage 1 the systematic review identified several broad influences on NMPs' prescribing decision-making. Only one of the studies included was underpinned by any reference to theory and that only in one element, and findings from all three studies lack specificity. Use of the TDF throughout the design, implementation and analysis of Stage 2 Phase 1 and in the analysis of Phase 3 interviews allowed a much clearer and more detailed picture of influences to emerge.

Both Stage 2 phases showed that all the domains of the TDF except reinforcement and optimism were influential. Experience and multidisciplinary working emerged as additional influences in both phases, and complexity in Phase 3. Differentiation between participants' goals and intentions was unclear

in Phase 1 interviews. For Phase 2 participants were asked to reflect on specific prescribing decisions and their goals and intentions were clearer in subsequent Phase 3 interviews; this might have been because of the specific focus on one noteworthy prescribing decision. Complexity emerged as a strong theme in these Phase 3 interviews. Some of the prescribing decisions participants chose for reflection might be regarded as suboptimal for example deciding whether to prescribe antibiotics or which antibiotic to prescribe, in response to social pressure.

The benefit of the three phase approach may be seen by considering Pharmacist 2's reflection on deciding to prescribe an unlicensed, off-formulary antibiotic because of the over-riding social influence of her Registrar colleague. In her Phase 3 interview Pharmacist 2 explained how she and her colleagues had lists in their office of Consultants' and Registrars' preferences so that they could ensure they were followed. This was not mentioned at all during her 26 minute Stage 1 interview; perhaps this influence on prescribing is so pervasive as not to be noticed or remarked on. Pharmacist 2 went on to describe how she had reflected on the decision she made and on how she might seek help to change her approach in the future.

"Knowledge" similarly emerged differently as a theme in Phase 1 compared to Phase 3. As an example in Phase 1 participants referred to their prescribing decision-making being informed by knowledge of various evidence-based guidelines whereas in Phase 3 there was little specific mention of such guidelines.

Another example would be the theme of "experience" which emerged in both Phase 1 and Phase 3 interviews as an influence. In Phase 1 participants described how their prior experience enhanced their confidence as prescribers and informed their prescribing decision-making. In Phase 3, Nurse 4 described drawing on all her experience to help her assess and deal with a life-threatening medication-related situation and make a prescribing decision which saved her patient's life. No other reflection was as dramatic but several participants described situations where they used their previous experience both as prescribers and as practitioners in making prescribing decisions which addressed their patients' needs in complex and difficult situations.

Complexity was apparent in Phase 1 interviews within the themes "beliefs about consequences" and "memory, attention and decision processes" and was a common feature among many of the prescribing decisions participants chose for reflection in Phase 2. Complexity could be multifaceted and participants described taking a patient-centred approach when making prescribing decisions, taking all elements into account.

In a systematic review of GPs' perspectives on the management of patients with multimorbidity, Sinnott and colleagues (2013) found that organisation and fragmentation of healthcare, deficiencies in evidence-based guidelines, difficulties in ensuring patient-centred care and in achieving shared decision-making were particularly challenging. Luijks and colleagues (2012) similarly described the importance of patient-centeredness among Dutch GPs managing multimorbidity. The GPs described the importance of taking an individualised, integrated approach with shared decision-making. They were aware of the risks of polypharmacy and found this difficult to manage.

Participants in this study evidenced a strongly patient-centred approach, listening to and engaging with their patients so as to meet their needs. Fragmentation of care has been suggested as an unwanted consequence of changes in the delivery of healthcare (Smith 2010) but participants in this study identified multidisciplinary working as a key beneficial influence on their prescribing decision-making. Participants were very aware of their own competence and described involving colleagues and others in their prescribing decision-making, both in general and in their noteworthy decisions where complexity was sometimes an integral part. Several participants, pharmacists and nurses, described seeking the advice of pharmacists to inform their prescribing decision-making and pharmacists and nurses described working in partnership with nursing colleagues. The availability and support of the whole multi-disciplinary team was critical to Pharmacist 5’s ability to prescribe for her patient with heart failure in a way that enabled the patient to stay at home as she wished.

## 6.5 Application of findings

The TDF was used in Stage 2 of this programme of research to provide a theoretical understanding of participants’ experiences and perceptions of

influences on their prescribing decision-making, and the impact of these influences. The aim was not to alter prescribing decision-making behaviour through development of an intervention. However there was evidence that prescribing decision-making could on occasion be suboptimal and the use of the TDF allowed identification of influences on this behaviour.

In Phase 1, participants' knowledge of evidence-based guidelines emerged as a strong influence on their prescribing decision-making although on occasion they prioritised other elements over the dictates of evidence-based practice, where they perceived this was best for the patient. In Phase 3 interviews it became apparent that the social influence of the patient or family member, or indeed a colleague, could result in participants making suboptimal prescribing decisions. Implementation of evidence-based guidelines such as those on appropriate use of antibiotics is likely to improve healthcare but is difficult and may require complex interventions. The Medical Research Council recommends the use of an appropriate theoretical underpinning for development, implementation and evaluation of such interventions (Craig *et al*. 2008).

The TDF has been used in a number of behaviour change and implementation studies to identify determinants of the behaviour being studied (Francis, O'Connor and Curran 2012) including in implementation of clinical quality interventions (Lipworth, Taylor and Braithwaite 2013). It has also been used to understand adherence to evidence-based indicators of quality healthcare in primary care (Lawton *et al.* 2016) and in studies carried out across diverse clinical environments (Phillips *et al.* 2015). One additional domain, the trustworthiness of the organisation promoting the behaviour change, has been suggested (Phillips *et al*. 2015).

French and colleagues (2012) have developed theory-informed behaviour change interventions to promote the implementation of evidence into practice. They used a four step approach to map the behaviour being targeted to suitable behaviour change techniques which could then be used in addressing the behaviour. They give suggestions as to how this could be done. As an example, GPs may be influenced by their perceptions of patient expectations to treat them out with evidence-based guidelines. This barrier could be addressed by providing

patient handouts containing key information in plain English which GPs could use to augment their verbal advice. The steps in the approach are:

- identify the target for behaviour change
- use the TDF to identify barriers and facilitators to change
- select and use relevant behaviour change techniques to address these barriers and facilitators
- evaluate the success or otherwise of the intervention

In their work developing the behaviour change technique taxonomy Michie and colleagues (2015, p.94) recommended carrying out "behavioural diagnosis of the problem at hand" before attempting to develop behaviour change techniques. The present study provides new insights into influences on prescribing decisions made by NMPs, adding to the knowledge base. It also offers behavioural diagnosis at least among study participants and provides a theoretically driven foundation for further research.

## 6.6 Impact of the research

The Research Councils UK (2014) classifies the impact of research according to its academic, social and economic impact. Economic impact is not thought relevant and findings will be considered in relation to academic and societal impact.

### 6.6.1 Academic impact

#### Teaching

The doctoral student is School Lead for pharmacist prescribing and for non-medical prescribing and teaches cohorts of these students and V100 community nurse prescriber students throughout the year. She has already used findings to inform her teaching on prescribing decision-making, including using Phase 2 reflections to illustrate teaching points. As an example influences on Nurse 1's decision to prescribe suppositories for her patient were multi-factorial; this

provides an excellent example of a prescriber taking every piece of information she has into account for the benefit of her patient.

The doctoral student hopes to work with colleagues in the School of Nursing and Midwifery to develop, use and evaluate teaching materials which it is hoped will stimulate in-depth reflection and discussion among students on the university's pharmacist and non-medical prescribing courses around influences on prescribing decision-making.

Findings from this programme of research have already been presented at national conferences (McIntosh *et al*. 2014, McIntosh *et al.* 2017) and the systematic review has been published (McIntosh *et al*. 2016). Publication of this thesis and possibly additional papers reporting aspects of the study will hopefully inform education, training and practice more widely.

### 6.6.2 Social impact

Non-medical prescribers are integrated into all sectors of healthcare provision and make a vital contribution to patient care. It is important that influences on their prescribing decision-making are understood so that they may be supported to follow best practice. Other things being equal, prescribing according to evidence-based guidelines is likely to represent the best clinical care for most patients, notwithstanding the need for personalised and shared decision-making. Participants in this study were aware of and used local and national guidelines to inform their practice but on occasion chose to prescribe out with these. This may or not have been appropriate but may have broader societal consequences. As an example, sub-optimal or un-necessary prescribing of antibiotics has cost implications and potentially by adding to antimicrobial resistance may impact on present and future generations (Leibovici, Paul and Ezra 2012, World Health Organisation 2014, Armstrong *et al*. 2016). This and other research may be used to inform educational and other interventions designed to support prescribers and promote antimicrobial stewardship (National Institute for Health and Care Excellence 2017b).

One or two of participants' reflections had inter-professional aspects. In a review of reviews of behaviour change interventions and policies directed at primary

healthcare providers Chauhan and colleagues found that collaborative, team-based approaches were effective (Chauhan *et al*. 2017). Given that medical prescribers also prescribe sub-optimally on occasion (Cullinan *et al*. 2014) interventions designed to support prescribers may usefully be delivered through inter-professional educational events such as NHS Education for Scotland practice-based small group learning meetings (NHS Education for Scotland 2017c).

## 6.7 Future research

Healthcare provision in Scotland and in the rest of the UK is under relentless and increasing pressure. People are living longer but not necessarily healthier lives resulting in increased morbidity and multi-morbidity. Evidence-based treatment particularly in multi-morbidity can result in polypharmacy; whether appropriate or inappropriate this increases patients' risks of medicines misadventure. Prescribing is "the main approach to the treatment and prevention of disease in modern healthcare" (British Pharmacological Society 2010) and it is vital that prescribing decision-making promotes safe, clinically effective and cost effective pharmacotherapy aligned with the British Pharmacological Society's principles of good prescribing. Bradley's seminal work (1991, 1992a, 1992b and 1992c) identified that various types of prescribing decisions engendered discomfort among medical prescribers which might then influence their prescribing decision-making. Since then and despite the increasing primacy of evidence-based practice a wealth of research has demonstrated continuing areas of sub-optimal prescribing by doctors, often in the treatment of self-limiting respiratory tract infections. This present study and previous research suggests that NMPs are subject to some of the same influences as doctors, with sometimes similar consequences. More extensive research is needed into influences on prescribing decision-making by NMPs beyond this small scale, qualitative study. This will promote further clarification including on possible "hidden" influences and facilitate the development of educational interventions to support optimal prescribing decision-making by NMPs and others.

The way in which healthcare is delivered in the UK is changing, partly in response to demographic changes and to an on-going shortage of doctors in primary and secondary care. Multi-disciplinary working as experienced by

participants in this study is now the norm and healthcare professionals must ensure that their practice reflects this. Given the evidence of sub-optimal prescribing gathered over the last 25 years among medical and latterly non-medical prescribers it is important to develop, test and implement educational interventions designed to address some of the hidden influences on prescribing decision-making. As above, these interventions could be delivered to single professional or to multi-professional groups thereby promoting inter-professional exchange of ideas and experiences.

Details of possible extensions to the present study based on the above are given.

### 6.7.1 Proposal 1: Scotland or UK-wide survey of NMPs exploring influences on their prescribing; a mixed methods approach.

#### Stage 1

Most research using the TDF to study determinants of behaviour has used the interpretivist philosophy and qualitative methodology, most often using semi-structured interviews to gather data. Here the hope would be to survey a large number of NMPs across a wide geographical area so a positivist philosophy and quantitative methodology would be more appropriate. A cross sectional survey of NMPs either in Scotland or throughout the UK could be carried out by means of a postal and/or online questionnaire.

Sampling and recruitment of pharmacists in Scotland could be facilitated by NHS Education for Scotland who have a database of non-medical prescribers whom they have funded to do the training, in effect almost all NMPs in Scotland. No other such database exists and advice would be taken on the best way to identify and target other NMPs in Scotland and in the rest of the UK.

The aims of the research would be:

- to determine the key behavioural determinants of NMPs' prescribing decision-making
- to investigate NMPs' views and experiences of their university-based training course

The research would gather data on:

- participants' demographics
- their views on and experiences of influences on their prescribing decision-making in general
- their views on and experiences of influences on their prescribing decision-making where they considered this "noteworthy" in relation to their practice
- their opinions on the impact of these influences on their prescribing decision-making
- their views and experiences of their NMP university course
- how the NMP university course had prepared them to make prescribing decisions
- any suggested improvements to the course

A quantitative, questionnaire-based study would be developed from the literature and the 14 domains of the TDF, including studies which have used this method (Taylor *et al.* 2013, Taylor, Lawton and Conner 2013 and Huijg *et al.* 2014a). Huijg's paper includes a "generic" questionnaire which may be adapted for use in TDF-informed quantitative research. Data would be gathered using a combination of closed questions, Likert scale fixed choice response formats and open questions (Bowling 2002). Quantitative data would be analysed using descriptive and inferential analysis (Bowling 2002); this would allow description of the sample and again depending on response rates and any statistical significance might allow more general inferences to be made. The inclusion of questions about influences on prescribing decision-making in general and on noteworthy prescribing decisions might facilitate comparison of influences in these two different circumstances. Inclusion of open questions would capture richer, qualitative data which would be used to expand and augment quantitative results (Bowling 2002). Qualitative data would be analysed using a Framework Approach (Ritchie *et al*. 2014) developed from the literature including this study and the TDF.

The nation-wide survey would be likely to gather valuable data from a wide cross section of NMPs, allowing characterisation and possibly the generation of statistically significant data.

### Stage 2

The research could be extended using mixed methods. The second phase would use the interpretivism philosophy and a qualitative approach further to explore influences on NMPs' prescribing decision-making. Participants in the cross-sectional survey would be asked whether they would be willing to take part in telephone interviews again focusing on influences on their prescribing decision-making. If so, they would be directed to a study-specific website which would contain information about the study to allow them to complete an online consent and copyright form; they would also be asked to provide demographic and contact details.

A generic interview schedule would be designed based on the literature including this study and the TDF and focusing on influences on participants' prescribing decision-making. The schedule would be augmented with specific questions based on the participant's questionnaire responses.

Qualitative data from the questionnaire would again be analysed using a Framework Approach (Ritchie *et al.* 2014) developed from the literature including this study and the TDF.

This second stage of the research would provide additional rich data on influences on prescribing decision-making by NMPs. Overall, the study would provide valuable information on the key behavioural determinants of NMPs' prescribing decision-making and on their views and experiences of their university-based training course which could be used to inform education, training and practice.

## 6.7.2 Proposal 2: an educational intervention

The doctoral student and colleagues teaching on RGU's pharmacist prescribing and non-medical prescribing courses could work together to develop, implement and evaluate an educational intervention based on three or four of participants' Stage 2 Phase 2 reflections. The aim of the activity would be to encourage students' critical thinking about possible influences on prescribing decision-making.

Scenarios would be selected through discussions with colleagues teaching on the courses, and videos made of each scenario. These would be filmed in sections. Videos would show actors performing the selected scenarios and would stop just before the point where the prescriber made his or her decision. Students would view one scenario at a time and work in small groups to discuss what they had seen, possible influences on the prescriber and how they themselves might respond. This would be followed by a wider discussion facilitated by staff. The videoed scenario would then continue, showing the prescriber thinking aloud, then what he or she actually did. Again facilitated discussion would follow before the next scenario was shown.

The activity would be evaluated by asking students to provide feedback at the end using post-it notes and flip charts to create talking walls (Parsell, Gibbs and Bligh 1998). Headings would encourage recording of students' responses to the scenarios, their opinions as to the usefulness of the teaching activity and suggestions as to how the activity might be improved or augmented. Student feedback would be analysed using the Framework Approach (Ritchie *et al*. 2014) and used to inform development of this activity and others designed to enhance NMP students' awareness of and ability to manage, influences on their prescribing decision-making.

If scheduling allowed this activity would be delivered face to face and inter-professionally but it could also be used for face to face teaching of pharmacist prescriber students and non-medical prescriber students separately. It could also be prepared as an on-line activity with students encouraged to post their responses and engage with others at various points in an on-line discussion forum; this would allow inter-professional participation. Weglicki and colleagues found that on-line learning was less popular with non-medical prescribers in meeting their CPD needs (Weglicki and Reynolds 2015). Rather most welcomed face to face learning including informal debate as this allowed interaction with their peers.

## 6.8 Conclusions

At the end of this programme of research, what is now known and how does it fit with current guidance and policies on prescribing?

Participants in this study were nurse and pharmacist independent prescribers delivering healthcare for a wide range of patients across community pharmacy and primary and secondary care. The design of the study, underpinned by the use of the TDF, allowed a rigorous and trustworthy exploration of influences on their prescribing decision-making and identification of the determinants of this behaviour.

Participants were focused on doing their best for their patients and worked collaboratively with other healthcare professionals to achieve this. They had appropriate knowledge and skills to make prescribing decisions, took a rigorous, reflective approach, were clear about their professional roles and capabilities and determined only to prescribe within their areas of competence. Their prescribing decision-making was influenced by most of domains of the TDF and also by experience and multi-disciplinary working; the social roles of others including patients were sometimes particularly influential. Complexity was a feature and an influence in many of their prescribing decisions.

Reviewing findings from the study in relation to the British Pharmacological Society's *10 Principles of Good Prescribing* (British Pharmacological Society 2010), participants were practising according to these principles. They were almost always clear about the reasons for prescribing (excepting occasional antibiotic prescribing in response to patient or family demand, when none the less they might be clear although not satisfied). They took into account the patient's medication history and other factors before prescribing, in one case refusing to prescribe in the absence of sufficient information. Their prescribing decision-making was patient-centred and took account of patients' ideas, concerns and expectations. Their selection of medicines was almost always based on the evidence, most often on local guidance although again there were anomalies. Pharmacist prescribers were concerned about their inability to write prescriptions electronically although this is being addressed currently; one nurse prescriber described delaying her prescribing deliberately so that she could benefit from the functionality of her practice computer. Participants were aware of the need for careful monitoring and clear communication and documentation of their prescribing decisions. As prescribers and particularly perhaps as non-medical prescribers they were aware of their limitations and determined only to prescribe within their areas of competence.

The Scottish Government's *Prescription for Excellence* (2013) set out the ambition that by 2023 all patients in Scotland will have access to a clinical pharmacist independent prescriber. Pharmacist prescribing is thus embedded in Scottish Government plans for healthcare provisions and in practice. Prescribing by nursing is already embedded in practice and the NMC is consulting on their *2030 Vision for Nursing* (personal communication H. Bain).

In *Realistic Medicine* (Calderwood 2016) Scotland's Chief Medical Officer challenged doctors and by extension all healthcare professionals to take a personalised, patient centred approach, encouraging shared decision-making informed by evidence and reducing unnecessary variation in practice and outcomes. Participants in this study were meeting these challenges. They were determined to avoid patient harm and took a rigorous approach in making their prescribing decisions. Patient-centred prescribing decision-making included stopping medicines which patients no longer wanted or thought necessary, after a discussion of the attendant risks. By training and working as non-medical prescribers participants had already shown themselves dedicated to improvement and innovation in their practice.

Improvement is always possible and it is hoped that this research exploring influences on the prescribing decision-making of non-medical prescribers will contribute to improvements in education, training and practice and ultimately to patient care.

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# Appendices

## Appendix 2.1 Recruitment e-mail

Dear non-medical prescriber,

While there are increasing numbers of non-medical prescribers we know very little about how they make their prescribing decisions and the influences on this. We are researching prescribing decision-making by non-medical prescribers and are sending all non-medical prescribers in the NHS Grampian area an invitation to participate in our research. We hope that the findings from our research may help to improve education and training around prescribing decision-making and hence patient care. We would be very grateful if you would agree to take part in our research. This will be in three phases and you may choose whether to take part in one, two or all three phases. These will be:

Phase 1: a face to face interview focusing on influences on your prescribing decision-making
Phase 2: you will be asked to record your thoughts on one or two prescribing decisions you make over a four week period
Phase 3: a face to face interview based on the recording/s you make.

You will be offered an honorarium (£25 Marks & Spencer vouchers) as a 'thank you' for taking part.

It is hoped that Phase 1 interviews will start in September 2015; these will be held at a date, time and place convenient for you.

For further information, and to complete the on-line consent form if you wish to participate, please visit our study website

http://www.rgu.ac.uk/nmp-prescribing-decision-making

A short report on the research will be posted on the website and will be e-mailed to you along with a letter of thanks. We would really appreciate your help and look forward to hearing from you.

Kind regards,

Trudi McIntosh
Principal investigator, lecturer in Pharmacy Practice and PhD student
School of Pharmacy and Life Sciences
Robert Gordon University
Aberdeen
E-mail: t.mcintosh@rgu.ac.uk Phone 01224 262582

Scott Cunningham
Principal supervisor and Senior Lecturer
School of Pharmacy and Life Sciences
Robert Gordon University
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## Appendix 2.2 School of Pharmacy and Life Sciences initial ethics approval

School of Pharmacy and Life Sciences Research Ethics Committee
COMPLETED 4 September 2014

Research Project Title
An exploration of non-medical prescribers' experiences of and perspectives on influences on their prescribing decision-making, with a focus on social and cognitive influences.

Dear Trudi,
The School Research Ethics Committee recommends that there are no ethical issues with your project and you are able to proceed with your research and any further ethics applications.
Should there be any amendments to this project during the research we would advise you to check with the chair of the ethics committee as to whether a further review would be required.
We wish you well with your project.

Regards
Dr Lesley Diack
On behalf of the School Ethics Review Panel

## Appendix 2.3 School of Pharmacy and Life Sciences amendment ethics approval

Dear Trudi

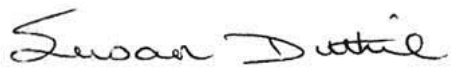
The School Research Ethics Committee has assessed your amended application and the decision is that there are no ethical issues with your project.

I can now confirm that you are able to proceed with your research and any further ethics applications.

Should there be any further amendments to this project during the research we would advise you to consult with the convener of the ethics committee as to whether a further ethical review would be required.

We wish you success with your project.

Regards



Convener of the School Ethics Review Panel

## Appendix 2.4 Opinion of the North of Scotland Research Ethics Committee

Received 13th August 2014

Dear Trudi

Thanks for getting back to me.

As you are recruiting NHS Staff, your research project does not come under the Remit of the NHS Ethics Committee and would not require approval from ourselves. It does however, require ethical review and I noted that you sent it to the School Ethics Committee.

If you have any further questions, please don't hesitate to contact me.

Kind regards

Rachel

Rachel Venables PhD
Scientific Officer
NRES Committees – North of Scotland
Summerfield House
2 Eday Road
Aberdeen
AB15 6RE

# Appendix 2.5 NHS Grampian Research and Development approval

**Research and Development**
Foresterhill House Annexe
Foresterhill
ABERDEEN
AB25 2ZB

Dr Scott Cunningham
Robert Gordon University
The Robert Gordon University
School of Pharmacy and Life Sciences
Riverside East, Garthdee
Aberdeen
AB10 7GJ

Date 23/07/2015
Project No 2015RG004

Enquiries to Lynn Massie
Extension 53846
Direct Line 01224 553846
Email grampian.randdpermissions@nhs.net

Dear Dr Cunningham

**Management Permission for Non-Commercial Research**

**STUDY TITLE:** An exploration of non-medical prescribers' experiences of and perspectives on influences on their prescribing decision-making, with a focus on social and cognitive influences.
**PROTOCOL NO:** Dated 5.9.14
**REC REF:** N/A

Thank you very much for sending all relevant documentation. I am pleased to confirm that the project is now registered with the NHS Grampian Research & Development Office. The project now has R & D Management Permission to proceed locally. This is based on the documents received from yourself and the relevant Approvals being in place.

All research with an NHS element is subject to the Research Governance Framework for Health and Community Care (2006, 2nd edition), and as Chief or Principal Investigator you should be fully committed to your responsibilities associated with this.

**R&D Permission is granted on condition that:**

1) **The R&D Office will be notified and any relevant documents forwarded to us if any of the following occur:**
   - **Any Serious Breaches in Grampian (Please forward to pharmaco@abdn.ac.uk).**
   - **A change of Principal Investigator in Grampian or Chief Investigator.**
   - **Any change to funding or any additional funding**

2) **The R&D Office will be notified when the study ends.**

3) **The Sponsor will notify all amendments to the relevant National Co-ordinating centre. For single centre studies, amendments should be notified to the R&D office directly.**

We hope the project goes well, and if you need any help or advice relating to your R&D Management Permission, please do not hesitate to contact the office.

Yours sincerely

**Susan Ridge**
**Non-Commercial Manager**

cc: Mrs Trudie McIntosh
Research Monitor

**Sponsor**: Robert Gordon University

# Appendix 2.6 NHS Grampian Research and Development extension approval

**Research and Development**
Foresterhill House Annexe
Foresterhill
ABERDEEN
AB25 2ZB

Dr Scott Cunningham
Robert Gordon University
The Robert Gordon University
School of Pharmacy and Life Sciences
Riverside East
Garthdee
Aberdeen
AB10 7GJ

Date 26/04/2016
Our Ref 2015RG004

Enquiries to Lynn Massie
Extension 53846
Direct Line 01224 553846
Email grampian.randdpermissions@nhs.net

Dear Dr Cunningham

**STUDY TITLE:** An exploration of non-medical prescribers' experiences of and perspectives on influences on their prescribing decision-making, with a focus on social and cognitive influences.
**PROTOCOL NO:** Dated 5.9.14
**REC REF:** N/A

**AMENDMENT** Re Extension

We are in receipt of a copy of the amendment to the above project relating to an extension to the study end to 30.06.16.

This letter is confirmation that this amendment does not alter local NHS Grampian R&D management permission of the project.

Yours sincerely

Susan Ridge
Non Commercial Manager

c.c. Mrs Trudi McIntosh
c.c. Jill Johnston, RGU

## Appendix 3.1 Systematic review protocol

**A systematic review of the social and cognitive influences on prescribing decision-making among non-medical prescribers**

*Trudi McIntosh, Scott Cunningham, Derek Stewart, Katrina Forbes-McKay, Dorothy McCaig*

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**Citation**

Trudi McIntosh, Scott Cunningham, Derek Stewart, Katrina Forbes-McKay, Dorothy McCaig. A systematic review of the social and cognitive influences on prescribing decision-making among non-medical prescribers. PROSPERO 2013:CRD42013004729 Available from http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42013004729

**Review question(s)**

What are the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK?
What are the methodologies and methods used, and quality of peer-reviewed published studies into the social and cognitive influences on prescribing decision-making among supplementary and independent non-medical prescribers in the UK?

**Searches**

Literature search strategy
The search strategy has been developed iteratively through discussion with the research team and with subject-specific librarians. In addition the search strategies of several key systematic reviews in the separate areas of prescribing decision-making and non-medical prescribing were examined and relevant elements incorporated.
Inclusion criteria:
• Studies including supplementary and independent non-medical prescribers practising in the UK.
• Studies focusing on the prescribing decision-making of these non-medical prescribers.
• Peer-reviewed published studies reporting primary research and data generated from secondary research such as systematic reviews and meta-analyses, should any be identified during the review process.
• All study designs.
• Papers published in English; since the focus is on studies carried out among participants in the UK this should not introduce publication bias.
• Studies undertaken from 2003 onwards (date of implementation of supplementary and independent non-medical prescribing in the UK).
Exclusion criteria
• Studies including data from prescribers other than supplementary and independent non-medical prescribers where data are not reported according to profession of prescriber.
• Studies focusing on the administration of medicines via Patient Group Directions.
• Letters, opinions, editorials, descriptions of clinical practice.

Databases
The following databases will be searched:
MEDLINE, PsycARTICLES, Cumulative Index to Nursing and Allied Health Literature (CINAHL), International Pharmaceutical Abstracts (IPA), Education Resources Information Centre (ERIC), The Cochrane Library, Google Scholar.
Search terms
Search terms including the following will be used to identify studies which explore social and cognitive influences on prescribing decision-making among non-medical prescribers:
• Prescib*
and
• Pharmacist* or nurse* or physiotherapist* or podiatrist* or radiographer* or optometrist*
and
• Influenc* or decision* or decid* or judge* or factor*.
Medical index subject headings (MESH terms) will also be used where appropriate.
Citation searching, author searching and RSS feeds will be used to expand the search. In addition, electronic current awareness alerts have been set up with NHS Evidence, Google Scholar and with the British Library ('Zetoc' alerts).

**Link to search strategy**
http://www.crd.york.ac.uk/PROSPEROFILES/4729_STRATEGY_20130507.pdf

**Types of study to be included**
There will be no restrictions on the study designs; methodologies will include but not be limited to studies taking a phenomenological approach.

**Condition or domain being studied**
Non-medical prescribing is a relatively recent development in healthcare which allows non-medical healthcare professionals, mainly nurses and pharmacists but also others to prescribe for their patients. Prescribing decision-making can be complex and challenging; a scoping literature review identified a number of influences on medical prescribing decision-making but little appears to be known about this process in non-medical prescribers.
This systematic review looking at social and cognitive influences on prescribing decision-making among non-medical prescribers will inform the development of a programme of doctoral study exploring non-medical prescribers' experiences of and perspectives on 'non-clinical' influences on their prescribing decisions. The findings and subsequent programme of study will also contribute to the education, training and practice of non-medical prescribers. Non-medical prescribing has developed according to different models across the world reflecting the very different healthcare systems; given this variation in practice this review will focus only on supplementary and independent non-medical prescribing in the UK.

**Participants/ population**
Included: supplementary and independent non-medical prescribers in the UK; these encompass pharmacist, nurse, physiotherapist, podiatrist, diagnostic radiographer and optometrist prescribers.

Excluded: prescribing by supplementary and independent non-medical prescribers using patient group directions; prescribing by community nurse practitioners.

**Intervention(s), exposure(s)**

Prescribing decision-making

A scoping literature search recently undertaken revealed that most research thus far has been carried out among medical prescribers in primary care, where indeed most prescribing occurs. General practitioners' prescribing behaviour was first surveyed in 1949 (Dunlop 1952); since that time a wealth of research has been carried out. In 1992 Bradley published a study on 'uncomfortable prescribing decisions' among GPs in England and showed that their decisions were based on a variety of clinical and non-clinical factors including patient expectations, the doctor-patient relationship and the doctor's previous behaviour (Bradley 1992). GPs' discomfort around some of their prescribing decisions was multifactorial. Appropriate prescribing has been defined as a balance between the right technical properties, what patients want and the greater good (Cribb and Barber 1997). Decision-making around prescribing is complex and challenging; it is likely to be informed by a variety of influences including clinical guidelines but also including factors relating to social cognitive models of behaviour (Ogden 2007) and culture (Egede 2006).

The evidence regarding non-medical prescribing is limited and equivocal; non-medical prescribers assert that they adhere strictly to evidence-based practice yet this may not always be the case (Maddox 2011, Rowbotham et al. 2012). Non-medical prescribers come from a variety of professional backgrounds but unlike doctors, none comes from a tradition of paternalistic relationships with patients or from a position at the top of the healthcare hierarchy (Weiss and Fitzpatrick 1997, Weiss and Sutton 2009). It may be that their prescribing decisions are informed by different or additional influences to those of doctors and this is the proposed area of research.

This review will include prescribing decision-making by non-medical prescribers but will exclude the use of Patient Group Directions by these prescribers.

**Comparator(s)/ control**

None.

**Context**

Supplementary and independent non-medical prescribing in the UK.

Two models of non-medical prescribing will be included in this review: supplementary and independent prescribing; prescribing by community practitioner nurse prescribers will not be included. In 2011 there were 2,602 pharmacist prescribers in the UK (Hassell 2012) and in 2013, 26,763 nurse independent/supplementary nurse prescribers and 1,447 nurse independent prescribers (Nursing and Midwifery Council, personal communication, 25th March 2013)

Supplementary non-medical prescribers treat an already-diagnosed condition within the bounds of a patient-specific clinical management plan agreed by the patient, the supplementary prescriber and an independent prescriber ie a doctor or dentist (Department of Health 2002). Independent non-medical prescribers are responsible for the clinical management including prescribing of a patient's diagnosed or previously undiagnosed condition and may thus be responsible for diagnosis (Department of Health 2005); this has been a contentious issue, particularly among medical prescribers (Day 2005). At present in the UK suitably

qualified nurses, pharmacists and optometrists may practise as independent or supplementary prescribers while physiotherapists, diagnostic radiographers and podiatrists may practise as supplementary prescribers. There are plans to extend both the range and scope of non-medical prescribing still further.

**Outcome(s)**

**Primary outcomes**

Primary outcome: the identification and characterisation of social and cognitive factors and perceived factors that influence the prescribing decision-making process among non-medical prescribers.
Not applicable.

**Secondary outcomes**

Secondary outcomes: a better understanding of these factors and perceived factors will contribute to the education, training and practice of non-medical prescribers and facilitate more informed decision-making in a new and increasingly important area of prescribing. More informed prescribing decision-making will in turn lead to an improvement in patient care. A second secondary outcome will be the evaluation of the existing literature thereby adding to the body of knowledge in this area.
Not applicable.

**Data extraction, (selection and coding)**

Process for study selection
Duplicate studies retrieved from more than one database search will be removed. Study selection will then be a three stage process; reasons for exclusion will be documented at each stage. Decisions will be made independently by two members of the research team (the principal researcher plus one of three others); where there is disagreement this will be resolved by discussion and if necessary by consulting a third team member.
The selection process will be piloted on 50 studies and the results of the pilot discussed with the research team. Any adjustments deemed necessary will be made and the selection process re-started if necessary. A flow chart summarising the study selection process including reasons for inclusion/ exclusion will be prepared.
Stage 1: titles of all retrieved studies will be considered alongside inclusion and exclusion criteria. Studies which are clearly not relevant will be excluded, as will those which are relevant but which are excluded on the basis of inclusion and exclusion criteria. Where there is any doubt, studies will be included at this stage.
Stage 2: abstracts of retained studies will be accessed and their relevance assessed according to the inclusion and exclusion criteria. Again where there is any doubt, studies will be included.
Stage 3: full text of all studies retained at stage 2 above will be obtained and their relevance assessed according to the inclusion and exclusion criteria.
Data extraction
Electronic data extraction forms will be prepared based on the review questions and objectives and in consultation with research team members. Guidelines for their use will be prepared and the forms will be piloted before use. It is likely that fields will include:
• Study title and author/s, participants (professions and numbers), setting, study design, response rate if appropriate and outcome of significance to the review question and objectives.

• Qualitative data will be extracted from papers included in the review using the standardised data and conclusions.
Data extraction will be carried out by two members of the research team independently and results compared; where there is disagreement this will be resolved by discussion and if necessary by consulting a third team member.

**Risk of bias (quality) assessment**
Studies will be assessed using the relevant Critical Appraisal Skills Programme tool (CASP-UK, 2012) or the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist for cross-sectional studies (Institute of Social and Preventive Medicine 2009); all include clear guidelines for their use. Again, decisions will be made independently by two researchers; where there is disagreement this will be resolved by discussion and if necessary by consulting a third researcher.
No papers will be excluded on the basis of assessed quality; influences identified in this systematic review will inform further doctoral study.

**Strategy for data synthesis**
Analysis will depend on the data that are available but is likely to involve a form of narrative synthesis; the appropriate method will be determined by the studies included (Centre for Reviews and Dissemination 2009). First a descriptive summary of studies will be presented in table form supported by narrative description; qualitative and quantitative studies will be reported separately at this stage. The tables will include details of study type, setting, numbers of participants and their professions, phenomena of interest, findings and an indication of study quality.
Next studies will be grouped together according to elements derived from the review objectives. Analysis will identify themes across studies, comparing and contrasting them to allow synthesis of findings. Finally the review processes will be subjected to critical reflection (Centre for Reviews and Dissemination 2009) and recommendations made for future work.

**Analysis of subgroups or subsets**
None planned.

**Dissemination plans**
This review will form part of a programme of doctoral studies which it is hoped will inform education, training and practice of non-medical and perhaps medical prescribers. It is anticipated that the research will be written up and submitted for publication and it is also envisaged that the work will be disseminated via presentation at a suitable conference/s

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Dr Dorothy McCaig, None

**Anticipated or actual start date**
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**Stage of review**
Ongoing

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|---|---|---|
| Preliminary searches | Yes | No |
| Piloting of the study selection process | No | No |
| Formal screening of search results against eligibility criteria | No | No |
| Data extraction | No | No |
| Risk of bias (quality) assessment | No | No |
| Data analysis | No | No |

## Appendix 4.1 Participant information letter

**The research team**

**Ms Trudi McIntosh**
**Dr Scott Cunningham**
**Prof Derek Stewart**
**Dr Katrina Forbes-McKay**
**Dr Dorothy McCaig**
**Mrs Linda Harper**
**Ms Wendy Robertson**

# An exploration of prescribing decision-making by non-medical prescribers.

**Contact: Trudi McIntosh e-mail t.mcintosh@rgu.ac.uk or phone 01224 262582**
**or Scott Cunningham e-mail s.cunningham@rgu.ac.uk or phone 01224 262533**

**Dear participant [potential participant's name],**

You are invited to take part in a research study exploring prescribing decision-making by non-medical prescribers. Thank you for taking the time to read the following information carefully. It is important that you understand why the research is being done and what it will involve. Please ask if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part.

### What is the purpose of the study?

We are interested in how non-medical prescribers make prescribing decisions. In particular, we want to gain a better understanding of the influences on their prescribing decision-making.

### Why have I been chosen?

All non-medical prescribers employed by or contracted to NHS Grampian have been asked if they would like to take part in the study.

### Do I have to take part?

No. Participation in this study is voluntary and you may withdraw from it at any time. If you decide to take part we will offer you an honorarium (£25 in Marks and Spencer vouchers) in recognition of your contribution to the study.

### What will participation involve?

We will ask for your name, e-mail address and phone number and brief demographic details so that we may contact you about your participation. There are three phases to the research; if you agree to participate you may choose whether to participate in one, two or all three phases.

### Phase 1

In the first phase of the study, I will contact you to arrange a convenient date, time and place for me to come and interview you for no more than around 30 minutes. The interview will be audio recorded and will explore influences on your prescribing decision-making. At the end of the interview I will give you information about Phase 2 of the study.

## Phase 2

If you agree to take part in Phase 2 of the study I will give you a digital recording device and explain how to use it. I will ask you to record your reflections after two prescribing decisions you make over the following four weeks; you may choose what to record but should not include any patient-identifiable information. I will collect the recording device from you and give you information about Phase 3 of the study.

## Phase 3

If you agree to take part in Phase 3 of the study we will arrange a convenient date, time and place for me to come and interview you again for no more than about 40 minutes. We will listen to your recordings from Phase 2 and I will interview you about what you said. The interview will be audio recorded.

### Do I have to take part in all three phases of the study?

No, you may choose whether or not to take part in each phase and may withdraw from the study at any time. Taking part in the study will not change your relationship with Robert Gordon University or with NHS Grampian Health Board or any other Health Board.

### What are the possible benefits of taking part?

There is no direct benefit to you from participation in this study. However, it is hoped that findings will help to clarify prescribing decision-making by non-medical prescribers and may inform education and training to provide support for prescribing decision-making.

### Will my contribution to this study be kept confidential?

Yes.
Any information with implications for patient safety will be discussed with the research team.

### What will happen to the results of the research study?

We will send you a short report of the findings. The full findings of the study will form part of a PhD and may be published in a health care journal and presented at a conference.

### Who is organising and funding the research?

This project is organised and funded by a Robert Gordon University-led research team.

### Who has reviewed the study?

The wording of this information sheet and the consent form have been reviewed by members of the research team. The aims and objectives of the study have been reviewed by academic experts and approved by the Robert Gordon University Research Ethics Committee. The study has received NHS Research and Development approval.

### What next?

If you decide to take part in the research, please keep this information for future reference. Please then complete the consent and copyright form. I will contact you to arrange a convenient date, time and place for you to help us with the research.

**On behalf of the research team, thank you for your time and for reading this information. If you have further questions about this study please contact Trudi McIntosh on 01224 262582, e-mail t.mcintosh@rgu.ac.uk or Scott Cunningham on 01224 262533, e-mail s.cunningham@rgu.ac.uk .**

**Kind regards,**

**Trudi McIntosh**

## Appendix 4.2 Interview schedule

Interview schedule version 13

Trudi McIntosh, RGU. 22nd March 2015

Introduction

Thank you for agreeing to take part in this interview.
As you know I am interviewing you to find out about how you make prescribing decisions and what you think about when you're making them. As you will know from the information sheet and consent form, this interview is being audio recorded and I want to emphasise that what you say will be kept confidential. Please be aware however that if you choose to tell me something which has implications for patient safety this will be discussed with the research team including the NHS Grampian non-medical prescribing Leads. Are you still OK with that?

Interview questions

1) First, you've said you work as a [from demographic questionnaire]; please would you tell me a bit about the patient groups you prescribe for and the types of medicines you prescribe?

2) Can you talk me through how you decide whether or not to prescribe for a patient?

3) Once you've decided to prescribe something, can you talk me through how you decide what to prescribe?

4) How confident do you feel in your ability to make these decisions?
Prompt: can you tell me more about that?

5) I'd like to know about how easy you find it to make prescribing decisions. Does this vary sometimes? Please tell me more about this.

6) Do you feel you have the necessary knowledge to decide what to prescribe? What sort of knowledge do you draw on?

Prompts: pharmacological /clinical/ procedural knowledge, lab tests or interpretation of lab tests, anything else.

7) Do you feel you have the necessary skills to decide what to prescribe? What sort of skills do you use?
Prompts: communication skills, clinical assessment skills, anything else.

8) Have you had occasions where you became aware that there was a gap in your knowledge in relation to prescribing decision-making?
Can you tell me more about that?

9) What about a skills gap; have you ever been aware that you lacked a particular skill in relation to prescribing decision-making or weren't proficient in it?
How do you deal with any of these gaps during the consultation?
What about more generally?

10) Can you tell me a bit about the information sources you use whilst making a prescribing decision?

11) Are there things you might forget to consider when you're making a prescribing decision?
What about things that might distract you?

12) How does your expertise or experience both as a practitioner and as a prescriber influence your prescribing decision-making?

13) Are there resources or ways of working that might have an effect on the prescribing decisions you make?
Prompts: guidelines, local formularies, access to lab tests, ways of working eg single-handed vs team working, involving colleagues.

14) I'm interested in finding out about whether other people might influence you when you're making a prescribing decision.
Prompt: how might other people's opinions or practices or behaviour influence you when you're making a prescribing decision?

Prompts: colleagues, patients, patient's family, other healthcare professionals, all types of media
Of these, who or what is the most influential?
Why is this?

15) Is there anything about where you work which influences the prescribing decisions you make?
Prompts: things like facilities, local formularies or protocols, time available, staffing.

16) How, if at all, might your emotions influence your prescribing decision-making?
Prompts: worried, concerned etc.

We're coming to the end of the interview now.

17) Can you tell me about any possible consequences for the patient that might influence your prescribing decision-making?
What about from your own point of view; are there any possible consequences for you which might influence your prescribing decision-making?
Are there any possible consequences for others such as your colleagues or your employer that you might take into account?
Of these possible consequences, which do you think might be the most influential?

18) Before this interview, had you ever reflected on how you make prescribing decisions?

19) And finally, I wonder if you can let me have your thoughts around how prescribing fits with current and future roles for [participant's profession]?

Thank you for your participation.  Is there anything else you would like to add?

## Appendix 4.3 Standard operating procedure for interview

Standard operating procedure for interviews

E-mail the day before to confirm interview still suitable

Check directions and journey time to agreed location for interview

Prior to entering the building check both digital recorders are working

Meet participant according to arrangements made, introduce self and confirm participant's identity

Explain purpose of interview and my role, respond to any questions from participant

Read pre-amble, confirm that participant is happy to proceed

Switch on both recorders, start the interview and check throughout that recorders are still recording

At end of interview, switch off recorders, ask participant if s/he has any questions and thank participant

## Appendix 5.1 Instructions for participants using the digital recorder

**The research team**

**Ms Trudi McIntosh**
**Dr Scott Cunningham**
**Prof Derek Stewart**
**Dr Katrina Forbes-McKay**
**Dr Dorothy McCaig**
**Mrs Linda Harper**
**Ms Wendy Robertson**

# An exploration of prescribing decision-making by non-medical prescribers.

**Contact: Trudi McIntosh e-mail t.mcintosh@rgu.ac.uk or phone 01224 262582**
**or Scott Cunningham e-mail s.cunningham@rgu.ac.uk or phone 01224 262533**

Thank you for agreeing to take part in this study. In Phase 2 we would like you to record one or two short reflections on a prescribing decision you have made in the four weeks following your interview in Phase 1. Please remember not to include any names or other details which might allow identification of any patients, colleagues etc. Please also remember that any information with implications for patient safety will be discussed with the research team.

Using the voice recorder

Turning it on: while the voice recorder is turned off, slide the POWER/HOLD switch in the direction of the arrow. Then

Press the F1 (Home) button to display the (Home) screen.

Press the +/- >> or << button to select the microphone (record) then press the OK button.

The screen will show a list of folders with Folder A at the top. Press OK.

Point the built in microphone in the direction of the sound to record.

Press the REC button to start recording.

Press the STOP button when you want to stop recording.
To check the recording has worked:

Select the file to play and press the OK button to start playback.  Press the STOP button to stop playback.

Please switch off the recorder by sliding the POWER/HOLD switch in the direction of the arrow and holding it for at least half a second.

# Appendix 5.2 Specimen annotated interview transcripts used for Phase 3 interviews

## Nurse 2 Reflection on a prescribing decision

Nurse 2

Reflection on a prescribing decision

I was asked to see a 65 year old lady in a local community hospital who had been admitted from Aberdeen Royal Infirmary. Her biggest problems were that she had a recurrence of vulval cancer following surgery earlier this year and unfortunately she was experiencing fairly heavy bleeding when she tried to mobilise to go to the toilet or even indeed to move about at all. She was also experiencing a great deal of pain on movement and although she was on a slow release and also an immediate release opioid for her pain this wasn't covering her when she wanted to move about or when the nurses were having to move her about in the bed.

When I discussed the problems with the patient she did say that she was very frightened as she was already on Dalteparin because of a previously diagnosed DVT when she was in Aberdeen.

One of her big fears was that if the GPs stopped her Dalteparin she would die suddenly from movement of the blood clot. However she was also very distressed by the heavy bleeding that she experienced. Her other concern was that she didn't want to take

Continued

Commented [TM1]: By whom?

Commented [TM2]: Did you know the lady previously?

Commented [TM3]: She had other problems too?

Commented [TM4]: Who told you about these problems?

Commented [TM5]: How did you feel when you heard this?

Commented [TM6]: Who had prescribed these?

Commented [TM7]: Can you say a bit more about that?

Commented [TM8]: Can you tell me a bit about the discussion you had?

Commented [TM9]: Did you discus them with anyone else?

Commented [TM10]: How did you feel about this?

Commented [TM11R10]: What did you hope to achieve?

Commented [TM12]: Can you tell me how likely to happen you feel that is?

Was this a realistic fear?

Commented [TM13]: How did you feel when faced with her distress?

## Nurse 2 Reflection on a prescribing decision - continued over

too many doses of her breakthrough medication as she feared that this would make her too drowsy and unable to interact with her visitors and her family which is very important to this her.

Commented [TM14]: Had she had that experience before?

Following discussions and explanations to the lady I started her on some Tranexamic acid in order to reduce the amount of bleeding that she was experiencing. This would not in any way interfere with the action of the Dalteparin and so I prescribed 1.5g of Tranexamic acid for her to be administered 3 times daily. For her incident pain (as opposed to breakthrough pain) I felt that we might be able to manage this by using Actiq® lozenges which are given buccally and can be used when undertaking activities which are known to bring on discomfort and pain. These were commenced at 200 micrograms with a maximum of 4 doses in 24 hours and could be titrated up if required.

Commented [TM15]: Can you tell me a bit about these? Was there a structure to the discussions?

Commented [TM16]: How did you select this treatment?

Commented [TM17]: Where did you find this information?

Commented [TM18]: What sort of knowledge did you draw on when making this decision?

Had you had previous experience of this?

How confident did you feel in making this decision?

Commented [TM19]: Can you explain what this means?

Why did you feel they would be a good choice?

Commented [TM20]: By whom?

## Pharmacist 3 Reflection on a prescribing decision – see over

Pharmacist 3 reflection

So I had a patient who was admitted for treatment for ovarian cancer, metastatic ovarian cancer and one of the drugs that we were giving her can cause electrolyte imbalances so we checked her calcium and magnesium on pre-chemotherapy bloods and it showed she'd a low magnesium. It wasn't less than 0.5 so after discussing with the patient we decided that, well I decided, to prescribe oral supplementation for her.

**Commented [TM1]:** Did you know the patient?

**Commented [TM2]:** How common would this be?

**Commented [TM3]:** Can you explain what that means?

**Commented [TM4]:** Significance of this?

**Commented [TM5]:**
When you say "we decided, well I decided" – was anyone apart from you involved in the decision?

What did you base that decision on?

Knowledge? Skills?

How confident did you feel in making that decision?

How easy was it to make the decision?

She was quite worried, very anxious was this going to interrupt her chemo. Her husband was present also for the consultation so I was trying to explain to them that it was more than likely a side effect of the treatment we were giving her and that as long as we were able to correct the levels it wouldn't cause an interruption in, her cancer treatment. I had become aware recently that Magnaspartate® sachets, probably pronounced incorrectly, have become available in NHS Grampian for low magnesium, whereas prior to that we'd always used Maalox®, obviously that was an un-licensed use of, of Maalox® for that indication.

**Commented [TM6]:** What might be the consequence of that?

**Commented [TM7]:** Was he involved in the decision-making or just the patient?

**Commented [TM8]:** How did you do that?

**Commented [TM9]:** How did you become aware of that?

**Commented [TM10]:** Can you say a bit more about that?

I had to look up the correct dose of the sachets, obviously I'd never prescribed these before bearing in mind the MHRA guidance of always using a *licensed product* [emphasis] for a particular indication where possible, I thought it was important to prescribe this licensed product as opposed to the unlicensed Maalox®. So I ensured we had stock available,

**Commented [TM11]:** Where did you look?

**Commented [TM12]:** MHRA guidance; was there anything else that influenced you?

## Pharmacist 3 Reflection on a prescribing decision – continued over

I looked up the necessary resources, and prescribed an appropriate dose for the patient.

She attended two days later for another pre-chemotherapy review where we re-checked her levels. I again discussed with the patient at that time, she had been taking her sachets one twice a day. So after we checked the blood results I found that the magnesium had dropped further. So, the patient at this point had gone home. So, she had some sachets left so, after I'd seen her during the day she, she was becoming more anxious about it, and it's difficult because some of the signs and symptoms of low magnesium can be anxiety, tremor, lethargy. And this lady does have a lot of anxiety related to her treatment and her diagnosis, but she's also quite fatigued on treatment as well so it's trying to figure out what's disease and chemo-related and what's related to the low magnesium and they're probably all inter-twined and it's probably neither one that are causing the symptoms, probably a combination of all three.

The lady lived quite a distance away from the hospital and she wasn't able to come back in that evening as my preferred choice would be to give her an intravenous infusion because the levels were dropping and she was developing increasing symptoms.

I discussed with one of the senior medical staff and we decided to increase her oral supplementation, for that day, up to three sachets, and then she agreed, after discussion with the patient *and* the patient's husband, that she would attend the following day for an infusion.

She wasn't acutely unwell with it so we decided to admit her to the day unit where we usually give the chemo and give her a prolonged infusion of magnesium over eight hours.

**Commented [TM13]:** What were these? How did you know about them?

**Commented [TM14]:** Based on what? How easy was it to make this decision? Confidence?

**Commented [TM15]:** Is this usual practice?

**Commented [TM16]:** Can you tell me a bit more about your discussion

**Commented [TM17]:** Who? How long does this take?

**Commented [TM18]:** Why was this important?

**Commented [TM19]:** How did you become aware of that?

**Commented [TM20]:** What sort of knowledge or skills do you draw on when trying to do this?

How confident do you feel in your ability to 'un-tangle' all this?

**Commented [TM21]:** What do you base this judgement on?

**Commented [TM22]:** What did you hope that would achieve?

**Commented [TM23]:** Can you say what they were?

How did you feel about this?

**Commented [TM24]:** What did you hope for from this discussion?

**Commented [TM(25]:** Who agreed?

**Commented [TM26]:** The husband was involved in the decision too?

**Commented [TM27]:** If she had been acutely unwell?

**Commented [TM28]:** What did you draw on in making that decision?

You've said this meant "difficult prescribing decisions". Can you tell me first about the initial decision to give her a prolonged infusion of magnesium... How easy did you find it to decide what to do?

## Pharmacist 3 Reflection on a prescribing decision – continued over

Difficult prescribing decisions for me; I'm not usually involved in prescribing intravenous fluids, or intravenous supplementation for this indication, so I consulted the protocol, ensured I had the correct prescription, the correct fluid chart for the patient, worked out the dose, did a calculation, ensured I had the correct volumes of fluid, and prescribed it clearly and legibly on the fluid prescription chart.

**Commented [TM29]:** How did you feel when faced with making a decision like this?

**Commented [TM30]:** What does this mean?

**Commented [TM31]:** What did you draw on when doing this?

**Commented [TM32]:** Lots of things to consider?

Was anyone else involved in decision-making process and documentation?

You describe consulting the protocol; can you tell me a bit more about this?

What sort of knowledge / skills did you draw on?

How did you feel during this time?

The decision to prescribe this also involved liaising with the nursing staff as again this is not something that they would usually administer on a day to day base, basis. So it was ensuring that they were able to correctly calculate the volume of magnesium sulphate to add to the bag. So a, lot of you know, training, good communication between medical, pharmacy and the nursing staff.

**Commented [TM33]:** So new for them too? What difference did that make?

**Commented [TM34]:** Can you explain what this means?

Why was this important if you had written the prescription?

Is there any additional checking in circumstances like this?

**Commented [TM35]:** How was this done? Who provided the training?

**Commented [TM36]:** Verbal? Written? How?

Um, when the patient attended the following day for the intravenous infusion I just, just um, reassured her and explained to her the reason for giving, you know, the intravenous preparation, and just reassured her and her husband that it more than likely was due to the chemotherapy we were giving her, it is a known side effect, these electrical imbalances, electrolyte imbalances rather, um, and I, I prescribed, I was happy to prescribe, it was as per protocol, um, and I prescribed that infusion for her that day. Um, she then returned the following day and had a repeat blood sample and her magnesium had increased so the decision was made to put her back on oral supplements and again I did prescribe these oral

**Commented [TM37]:** How was she? How did you feel when you spoke to her?

**Commented [TM38]:** How did they respond?

**Commented [TM39]:** You say "Happy to prescribe" – how confident did you feel in this

**Commented [TM40]:** Who made the decision? Why?

Knowledge and skills?

**Commented [TM41]:** Magnaspartate® sachets?

**Commented [TM42]:** Can you tell me about any differences in how you felt when prescribing the two different products? Infusion vs sachets?

supplements for her again to continue, and ah, she then returned two days later for her chemotherapy which stayed on schedule and, um, her magnesium, albeit still low, it was rising slowly, but in, obviously rising in the right direction so we continued with the sachets and I'm, um, monitoring for this is on-going. So that was a complex prescribing process for me for this patient so I thought it was a good one to reflect on.

**Commented [TM43]:** What did you base your judgement on that it was rising in the right direction?

# Appendix 5.3 Participants' Stage 2 reflections

## Nurse 1 first reflection

Reflection on decision to over-treat, to treat over-granulation tissue. One of my staff nurses asked me to assess a PEG site which had dramatically over-granulated over a weekend. There had been previous over-granulation of tissue noted the week before and I had hoped it would rectify itself as this type of tissue often re-models itself without the need for treatment. However, a few days previously it had become more noticeable and I had prescribed some honey ointment as recommended in the Grampian wound formulary. I visited with my staff nurse and made a decision to change this now to a moderate corticosteroid cream which I prescribed.

On reflection: what I was trying to achieve and why did I intervene? I didn't want the site to develop further complications. I knew that the patient would be worried about any complications to her care through my past experience with her and I felt it would be better for her to have prompt treatment rather than adopting a 'wait and see' approach. I felt em, the staff nurse was expecting me to provide a solution to what appeared to be was a deterioration to the site. The honey dressing I had prescribed previously had been used effectively with another patient and initially I chose this because there were less side effects with the honey than with the steroid cream, however it obviously wasn't potent enough in this situation and so I felt I had to step up treatment.

The influencing factors to this, were that I've had past experience with over-granulated wounds. I checked with the BNF first and the guidance that I received on PEG site complications produced by the company who provide the feed to the patients and I discussed this also with my wider team who agreed with my actions.

On reflection as to what, how the experience would change my knowing, I think that I learned that some patients would benefit from stronger preparations for PEG site complications. My staff nurse was introduced to the concept of over-granulation tissue and some of the treatments that are available to treat them.

## Nurse 1 second reflection

Reflection on a decision to prescribe diclofenac suppositories for a palliative patient.

I had a patient with terminal GI cancer. She wasn't used to taking medication, she was quite naive with medication and she had previously had chemo so was still suffering the after-effects of having a metallic taste of everything in her mouth. She didn't really want a lot of pain killers although she was experiencing increased pain and really had asked for sort of anti-inflammatories because she had perceived this pain as inflammation coming from her tumours. She had previous experience of using suppositories for constipation, again she just seemed to prefer em using the, the rectal route to treat her constipation rather than trying anything orally. And I think with her advancing cancer that she'd really come off of med, come off managing to take very much by mouth at all. I went to see her em, and she was complaining of increased pain and I made the decision we should maybe try and use Voltarol® suppositories for her em, because this was a patient who was quite experienced in using suppositories, although not for, for pain. She did have 'just in case' medication in the house and she also had a bottle of Oramorph® which she, she hadn't even opened.

The alternatives were to set up a syringe driver. One of the, the influences on my prescribing for this that, we actually had a, quite a bad weekend of snow forecast and she lives in a very rural area so I was a bit concerned that if we were to set up a syringe driver, would we physically manage to be there to, you know, within 24 hours to fill this up?

She was opioid naive, as I, as I said earlier, so really wasn't appropriate to be thinking about giving her IM injections of, of controlled drugs. She'd had a quite a rough week, with a lot of emotional exhaustion and although she hadn't been eating much that week we, neither the patient or myself were unsure if this was actually coming up to her end of life care or whether she was just exhausted so I didn't want to rush in with a syringe driver either.

I prescribed a certain dosage, I, I did actually phone the chemist, just to see if they had this type of medication in stock because it's quite an unusual

medication to prescribe. He did have one however it wasn't the, the usual dose, I normally would have prescribed 75mg twice a day. He only had 100mg available so I made a decision to prescribe 100mg just once a day for her. It was an unusual prescription for me to write but it meant that the patient had her pain, had an option to, to try and control her own pain over the weekend, and it, it worked quite well, so that was.

## Nurse 2 first reflection

Prescribing case no. 1 involves a 69 year old lady who was diagnosed with pulmonary fibrosis in 2011. She has recently become more breathless and finds moving about at home more and more difficult because of this. Her first concern which she voiced to me was that her oxygen concentrator only went up to four litres of ox-, delivering four litres of oxygen to her and she was requiring this more and more frequently. So I reassured her that I would refer her on to the respiratory and oxygen therapy nurses who would then supply her with a concentrator which would supply a higher level of oxygen to her. She then went on to describe her breathlessness and the attacks that she had when she wanted to do such things as have a shower or get dressed, or even indeed just walk from one room to the other in the house. We talked about some non-pharmacological help that she [recording stopped and re-started]

…finds that tasks such as showering and getting dressed or even indeed moving from room to room in the house make it difficult for her to breathe and admitted to becoming a bit panicky when she became breathless. We discussed non-pharmacological ways of managing the breathlessness em, such as square breathing and relaxation, however she had already been given some Oramorph® solution from her GP to help with this and she said that while it did help she found that her mouth became very dry, em, with using the morphine.

Following discussion with the lady and her husband, em, we agreed that it would be a very good idea for her to change her Oramorph® solution to another opioid and in this case Oxynorm® solution to see if that would indeed help with the dry mouth problems that she was experiencing as it was quite upsetting for her and she was finding that she was drinking so much she ended up having to get up to the bathroom an awful lot during the night. So we wondered if possibly using a

different preparation would help this side effect for her. The other drugs that [recording stopped and re-started]

The other aspect of her breathlessness which was quite alarming for both her and her husband was that she felt quite anxious when she became breathless and although we talked about the likelihood of anything … [recording stopped and re-started]

In order to give her something which should alleviate that anxiety I prescribed [recording stopped and re-started] lorazepam 1mg tablets which can be halved as they're scored and advised her to use the half tablet, 500 micrograms, under her tongue to alleviate the breathlessness. It is a useful drug in that … [recording stopped and re-started]

sublingually when she felt that she became anxious. I have often found that just having the tablets in the house are sufficient for the patients not to be so anxious, but it also is a very useful drug for anxiety and breathlessness and as it has a shorter half-life than diazepam it tends not to make the patients quite as sleepy.

## Nurse 2 second reflection

Prescribing record number 2 relates to a 64 year old gentleman with pancreatic cancer. On one of my recent visits to this gentleman he described em, a colicky, windy type of pain in his abdomen. He's already on Oxycodone® for pain relief which is normally successful but these were bouts of discomfort rather than what appeared to be something that would respond to the Oxycodone®. After giving some consideration as to whether or not em, I should prescribe some Buscopan® Hyoscine butylbromide em, I decided against that since the side effects of, of dry mouth can be quite unpleasant and he was already burdened with quite a few symptoms for which he had to take medication. So after some due consideration I prescribed him some mebeverine hydrochloride and some peppermint oil in order to try and sooth the discomfort without giving him side effects because he was already having [missing – recording stopped and re-started]

…it is an antispasmodic and may have been helpful in this instance I was very aware of the potential side effects which include a dry mouth and I felt would

add to the burden of his problems. I therefore prescribed him some mebeverine hydrochloride em, in the hope that it would help a bit if it was indeed muscle spasm which was causing the colicky discomfort and also added in some peppermint oil em, to try and help reduce the flatulence that he was experiencing. [Recording stopped and re-started]
… some Colpermin® or peppermint oil to try and help with the discomfort as in my experience it does tend to help to reduce wind and windy pain.

## Nurse 3 first reflection

My first prescribing decision relates to a former RAF gentleman that came in. He was clutching some paperwork, he'd recently been discharged from the services and was looking to get some tapentadol, a strong opiate medication and not something we used very often, actually. However, the story went he'd actually turned up two days previously and saw the duty doctor, one of the GPs, who'd actually declined to prescribe him the tapentadol because she didn't feel it was line with our formulary and had given him some co-codamol, much lesser medication, and sent him on his way. However, he'd represented because – in his words – he was in agony, and unable to manage without this strong medication and was actually starting to feel a little but unwell. So he demanded to see somebody, and I got him.

So having a chat with this guy, he was very keen on getting this tapentadol but when I read the GP's notes she'd declined it because she couldn't find any evidence of him being on it since 2013. The thread to what she'd written was that I think there was a bit of a question mark over whether the gentleman was trying to seek drugs as opposed to manage his pain. However, after spending a bit more time with him and chatting away I could clearly see that this had been a long term problem. The paperwork he did have certainly mentioned some quite complex spinal neurological problems and pains that he'd had for many years. He'd been under several specialists and so on and so on. Now to be fair he didn't have an up-to-date prescription, but what he did have was a box and the dispensing label on the box was dated two months ago. When I worked out the quantity and the prescription and what have you it all worked out almost to the day of what he'd been taken. So I came to the conclusion that this guy is supposed to be on this medication.

Not really knowing what tapentadol was, really, to be honest, not something I'd worked with, but when I looked it up it certainly didn't seem to be a good idea to be stopping it suddenly like that. So I had to kind of make a decision at that point as to whether he was going to get a supply of this or not, and it was really difficult as the doctor had already effectively said no, I found it quite hard to go against that. So trying to not to think about what she'd said, the doctor, and make an independent assessment. On balance, I thought, he's got conditions that aren't going to clear up, so he's still in pain, he'd been prescribed it within the last two months, and I thought the safest thing to do was to issue the gentleman with exactly enough tablets to take him up to a point where I could get him in to see a different GP. So I booked the appointment myself there and then, and worked out that he could have, I think it was 12 tablets or something in between now and then. I typed up a story for the GP who was going to be seeing him and attempted to request some more records from the RAF, which proved to be a little bit tricky but they are on the way. Now interestingly, when the next GP saw him, the drugs were added to the repeat and he was allowed to continue on them.

I think what I found interesting and particularly challenging about that was that he'd already been seen by a doctor and the gentleman wasn't happy with what the doctor had said. Obviously it came back to me, and you don't really feel, as a non-medical prescribing, like going against what the GP had said however I had to do what I thought was right at the time; the gentleman was sore, he was starting to feel unwell because he didn't have, I presume, he was experiencing some form of withdrawal, and I decided rightly or wrongly to prescribe it. It's not something I would normally prescribe, but I did. I looked it up, found it in the BNF and I feel confident enough in what I did; however it's not something that after assessing someone I would ever recommend or arrive at that conclusion of prescribing that medication had he not already been on it. I think really I just had to make the best use of what I had and do what I thought was the right thing to do at the time; and there was an out strategy, it wasn't just added to his repeat, I wasn't confident to do that. I just literally gave him enough to see him through until another GP appointment. And I now believe things are much more stable, and he's carrying on.

So yeah, quite an unusual one, controlled drug, not really very much information, a drug we're not particularly familiar with and the doctor had already said "No" so it had a few different bits to it for me, but I think we got there in the end and I feel happy with the decision that I made, albeit a little difficult. I had in my mind, how am I going to defend this when I'm speaking to the doctor next time? But actually she was quite good and understood that I'd made a different assessment to her. Perhaps by this time the gentleman had explained himself a bit better, had a bit more information, I don't know. So that was my first decision and I hope that was of some use.

## Nurse 3 second reflection

The next decision I have relates to a six year old girl who had been seen by one of our practitioners here for a query tonsillitis. At that point it wasn't felt to be infected so she was sent away with simple measures, ibuprofen and paracetamol. She was then, I think, presented to the out of hours service the following night for a worsening of symptoms and they'd commenced her on penicillin v which had unfortunately caused a bit of a reaction, and that's how I came into contact with her. It was quite a straightforward hypersensitivity, you know. A bit of a prickly rash, vomiting, diarrhoea, you know, not too unusual. So we just decided to stop the penicillin and I went to the second one in the formulary and changed to erythromycin because. She was still symptomatic and she definitely needed some treatment so that's, that's what I did. However, next morning, back again. The erythromycin had caused a similar reaction, different enough for us to be satisfied that it wasn't a continuation of anything else, it was related to the erythromycin.

So that obviously presented quite a challenge for where we went next, 'cause the formulary doesn't really offer an alternative after that. So it involved, involved a lot of digging through the BNF and to be honest, I wasn't able to make a firm conclusion. I had to go and get the practice pharmacist to come and have a look at it with me. And again her first recommendation was "Does the kid still need to be treated?" to which "Yes" was the answer. Therefore we after a lot of deliberation and looking settled for clarithromycin because that was felt to be, you know, the next nearest alternative. It presented quite a challenge of

management really because again clarithromycin was not something I would have been prescribing routinely due to our formulary not advocating its use particularly, and also it was difficult because I haven't come across too many people that are either allergic or over-sensitive to the first and second line treatments. So she ended up with something quite sort of unusual I would say, for a sore throat. And this had to be accompanied by a reasonably good write-up as to why, you know, this drug was used, and it really was, you know, a case of doing the least harm. I had to weigh up, well, what's going to cause the most harm, you know, giving the clarithromycin with the associated kind of, you know, side effects and potential resistance and all the things we hear about from the microbiologists, or not treating the child. And I felt that on balance the child was more likely to become unwell from not being treated, and that's why we used the clarithromycin. But I think that without the support of the pharmacist I would have found that one quite a difficult one to manage.

## Nurse 4 first reflection

Hello, and I'm going to tell you about a case of a female child, two years and six months old who I did not prescribe for. Mum phoned in on the morning of the 13th of May and told the receptionist that the child was feverish and lethargic. When I phoned mum back to triage the call, Mum said that she was eating and drinking well, did have a fever but it wasn't all the time, it was responding to paracetamol and ibuprofen but that she was very concerned about it because she was going to be working all weekend and she wanted her treated. So she was insisting on being seen so she came in in the afternoon, and the child was really well looking when she came in, running around the surgery, growling and pretending to be a lion. She was apyrexial, she had a clean tongue, runny nose, no cervical lymph nodes, her ears looked fine, heart rate was 120 and her chest was clear. She had a patch of eczema on the back of her neck and some flaky skin but other than that, looked really well. Her throat looked a bit red and her tonsils were sort of enlarged but there was no sign of any pus or anything and as I say she was running around and looking well. So I just gave mum some reassurance really, told her to continue the treatment that she'd been doing, so treating the fever when it arose, plenty of fluids, vitamin C drinks and things and gave really a worsening statement to come back if there were any further problems.

The next day, in the evening, mum phoned NHS 24. NHHS 24 sent a 999 ambulance out for the child, and the child was seen in A&E … (I'm just looking to see what happened) So there were a few yellow spots at the back of the throat, the child was less active than she had been and…. I don't have the A&E notes but she was admitted to the paediatric ward with a 3 day history of coryza, reduced appetite and one day history of lethargy and high temperatures despite regular paracetamol. She was taking fluids but not food. On arrival in the ward, her obs were normal, she was alternating between being sleepy and miserable and alert and playing well. Tonsils were enlarged with an exudate present and throat swabs were taken. She was not dehydrated and was taking oral fluids well on the ward.

Mum's main concern was that she would not be able to give [name of child] any antipyretics overnight as her last dose on the day was due in the early evening. She had reportedly been told that [name of child] was not allowed ibuprofen by a respiratory specialist; however, [name of doctor] advised that there would be no problem giving her ibuprofen as she had previously been given it with no issues in her admission in November last year. [Name of child] remained settled and apyrexial on the ward with a good oral intake and she was discharged home with open access to the ward.

It says in the letter that she was advised to continue the antibiotics that A&E had started so she must have had antibiotics at some point – it's not clear to me how that happened. There was a throat swab taken in A&E on that day. Anyway, the child was discharged the next day and then she came in to the practice I think, after that, and saw my colleague… No, she spoke to somebody on the phone, that was right, and the throat swab had come back with just normal flora, so no requirement for any treatment. I think the child was on erythromycin at the time and my colleague had said that this wasn't required as the throat swab was clear. So that was an interesting, one, you know, after already being advised and seen in the practice that all of that happened afterwards.

## Nurse 4 second reflection

I've got another patient I'm going to tell you about – I don't know whether this is of interest to you or not but I thought it was an unusual one which you may want

to include. A lady called [patient's name] who is 65, she's got quite a long history; predominantly osteoporosis, type 2 diabetes, and more recently multiple myeloma. It's a lady who I know quite well. We had a call-out from the son on the 24th of March this year, and the story was that she was sick and lethargic and the son wanted her seen at home. It didn't sound like a particularly urgent visit, so I spent a bit of time in the surgery doing some other triage work before I went out to visit her. Anyway on arrival at the house, the son opened the door, and I could hear him shouting at his mum as I opened that door to me. The son was quite angry when I got there, saying, "I don't know how we're supposed to cope with this, I mean this has been going on for ages and she's not well, something should be done about it" but behind him when he was speaking I could see that his mother was lying on the sofa looking really really ill.

By this time I was in the house, and I asked, "How long has she been like this?" and he said, "Oh, ages, weeks, months". By this time I was shaking [patient's name] and saying, "[patient's name], it's [Nurse 4's name] here, can you open your eyes?" And she was unconscious! So I said to the son, "Well how long has she been unconscious like this?" I don't think he had realised that she was actually unconscious. So I said to him, "I'm going to get an ambulance and you can tell me what's been happening once I've done that." So I called an emergency ambulance, meanwhile I was trying to think what to do. I was trying to get her over onto her side because she had a big string of drool hanging from her mouth and she was really only opening her eyes to painful stimuli, she wasn't really responding other than that at all.

So while we were trying to figure out what had been happening, the son said that she'd had some IV bisphosphonates in the day leading up to this as part of her treatment, and he said she's always a bit confused after the bisphosphonate treatment. While he was telling me that he suddenly realised that she'd emptied her Dosette® box for the day – so she'd potentially had quite a lot of morphine, she was on Oxycontin® 60mg of modified release twice a day as well as levothyroxine, fluoxetine, omeprazole, simvastatin, paracetamol, diazepam and gabapentin. So he thought she'd possibly taken a whole day of medication. So I was sort of standing there, thinking what to do, and I thought it's not a situation I've ever come across before. Her pupils were small, but not pin-point, so I thought perhaps I could have been dealing with morphine toxicity but I didn't

know for sure. In my bag I actually had some Narcan®, so I got an IV line in and I gave her 400micrograms of Narcan® IV, having never used it before. But she responded to that, she opened her eyes and sat up within a minute and started trying to vomit, but she was nevertheless much more alert. So one thing that I remembered about Narcan® was that you should always follow it up with an IM dose because it is short-lived when it's given IV. So I gave her another 400 micrograms IM. By which time the ambulance had arrived, and the ambulance crew took her out to the ambulance and I was speaking to the family. I then went out to my car but the ambulance was still there, so I went in the back of the ambulance to see what was going on. She was still looking very very poorly, but more alert than she had been, and the crew were wondering whether she could possibly have sepsis. So I said that's certainly possible, so she went off to [name of hospital] and I went on and finished my morning work.

I got called into [name of town] later on so on the way to that call I went in to [name of hospital] to see [name of patient] in A&E. She was sat up on the trolley looking really well, and knew me instantly when I walked in and was talking to me. Obviously the emergency had sort of passed by this time, she had responded really well to the Narcan® and we'd been correct that she had had a morphine toxicity. So that was an interesting one for me because I'd never ever come across that before and it was a fluke, in a way, that I'd been carrying Narcan around with me for ten years and never ever used it. So after thinking I might stop carrying it I've decided to continue!

## Nurse 4 third reflection

Hi Trudi, it's [name of nurse] here again – I think you should come and do a week with us here, you'd see all sorts of stuff! I'm going to tell you about another case, just in case the other two weren't what you wanted. This is a story about a chap who was 58, the consultation happened last Friday on top of a week of us having a pretty difficult time in the surgery here, particularly with patients complaining, storming in, speaking to the practice manager because they didn't get what they wanted and all sorts of things. So we were pretty frazzled by the end of last week, when a woman came in and demanded to see the practice manager – this was first thing in the morning. She spoke to the practice manager who said she wanted to know how to manipulate our system so

that she would get her husband an appointment with [name of doctor]. Anyway, the practice manager explained that [name of doctor] was fully booked, it was his last day before he was going on holiday so there was no chance of seeing him, but if it was an urgent thing she could be seen by one of the emergency team. Anyway, the wife was ranting on an saying that he would definitely need antibiotics because he'd got a problem with his chest, he'd been in hospital with his chest before and he would definitely need antibiotics and she wouldn't be happy if he didn't get them.

The chap duly came in and was seen by me. As I say, he was 58, well-looking guy. He had a history of asthma and osteoarthritis, oesophagitis and dyspepsia. He appeared well, he had a bit of a cough which had started a week ago, he was saying that he was worried it would go into his chest because he'd been in hospital with pneumonia before. He had no sore throat, occasional sputum; he looked well, had a bit of a hoarse voice, his temperature was 37, pulse was 80 bpm, $SpO_2$ wasn't working I've noted down, but his chest sounded clear. I reassured him about his current situation and I gave him a delayed script, really just because we felt that we couldn't cope with the wife complaining again. I suspect he probably went home and took it straight away, but I hope that's interesting for you!

## Nurse 5 first reflection

A 70-year-old male patient attended my cardiovascular clinic for his annual review. He had a CABG three years ago for angina symptoms. Since his surgery he has had no angina or breathlessness and leads a fairly active life with a good diet. His lipids are checked annually and have always been fine, with his cholesterol fairly low. The latest reading was 3.2 [mmol/L]. At the clinic, he asked if he could reduce the dose of his statin as he is not keen to take them with all the bad press they get. He was taking atorvastatin 40mg daily. After discussion about the benefits of statins with CV disease, I agreed to patient pressure to reduce the dose to atorvastatin 20mg daily, as his blood results were okay. I explained the guidelines of ischaemic heart disease and practice protocol, I stressed his lipids should be rechecked in 6 months to ensure his bloods are still okay on the lower dose. He agreed to do this.

## Nurse 5 second reflection

A 65-year-old male patient attended 4 days post-op of removal of a Warthin's tumour from his right salivary gland. As his wife thought it was more swollen around the wound, they thought it was probably infected. On examination there was no inflammation or discharge from the wound. He was apyrexial and not feeling unwell. It did not appear swollen at all. As he was very concerned that the wound may get more swollen and painful, I agreed to a delayed script for flucloxacillin 500mg four times a day, only to be taken if he became unwell; if the swelling did get worse; inflamed or if there was a discharge from the wound. I also checked with a GP who checked the wound and agreed with my decision.

## Pharmacist 2 reflection

[My] reflection is a prescription that was left up to me to, to decide what to prescribe for a patient who had a leg wound infection after having a bypass graft. The patient was penicillin allergic so we had started them on vancomycin which was originally my choice as well, empirically, and then we got some sensitivities back from a wound swab, we were going to switch him to oral. Obviously the penicillin allergy played a huge part in the choice of antibiotics but I was sort of left with a choice of two or three antibiotics as oral options and I found myself being put off prescribing one particular antibiotic even though it would have been a, a totally valid treatment choice because one of our registrars really doesn't like it.

And it seemed very strange to me to, to avoid prescribing something because someone else doesn't like it.  But, I, I didn't really want to prescribe it for it then not to work because of being influenced by his views, but also, I kind of felt that I didn't want to prescribe it because I didn't then want one of the senior medical staff to come round and disprove *[sic]* of my choice or, potentially not feel comfortable with the way the patient was being treated.

So in the end, went with co-trimoxazole which was a completely valid treatment choice but potentially an antibiotic which leaves the patient open to more side effects, than doxycycline, which was the other option but the sternal wound

infection, not sternal, the leg wound infection responded really well to the antibiotics and both the registrar and consultant are very pleased with how the patient has progressed.

## Pharmacist 4 first reflection

A few days ago I saw a COPD patient who was referred to me for his annual review and didn't seem to be doing terribly well. We went over his medication and I discovered that his tiotropium had been stopped by the GP after I had seen his for his review the previous year when I had put him *on* [emphasis] to tiotropium.

He was one of those patients that's probably had quite severe COPD for a number of years but had never been to the doctor to ask about it or had always just ignored it. So that's why it was kind of a late onset tiotropium and his condition was quite bad, so he certainly needed to be on it and the GP had asked him "How are you getting on with it? Is it doing you any good?" and he'd said "Well, I don't really know doctor I haven't noticed much difference." Ah, so the GP decided to stop it well of course the real reason he hadn't noticed much difference [half-laughing] is that he's really got quite severe COPD so he's not a miracle worker. So then you're stuck with the, dilemma, do you put him back on that particular medication because you know that's the correct medication he ought to be on, due to the guideline, custom and practice, experience etc and you know that long-term that particular drug will be good for him and will certainly help to maintain his lung function, or do you stick with what the doctor has decided because after all he is the GP.

So, needless to say because of my experience and knowledge on, in this particular disease I completely ignored what the doctor'd decided [laughs] and I put the man back on the tiotropium having explained to him at some length why I was doing that and the necessity of being on this and the good that it would do him et cetera, et cetera, et cetera.

So, I think that this can often be a, an awkward situation for a non-medical prescriber, because we tend to think of the GP as the final decision-maker, unless the patient's obviously getting referred to a consultant. And, it can be a

bit difficult, and I do think you have to have a certain amount of *confidence* [emphasis] to be able to make that decision, and decide for yourself, as opposed to re-referring back to the GP for another decision or, e-mailing the GP or discussing it with the GP. Had I been in the same building as the GP I might well then have had a discussion with him, but as it was, I was conducting the clinic in the shop and the patient came from a surgery that was some considerable distance away. And quite frankly I didn't really see the point in it, I just felt that the GP had made that decision, based on what the patient had said, without really thinking about the implications, or the guidelines that were available. And perhaps, doesn't know as much about COPD as I do.
So I went ahead and I prescribed it and explained all that to the patient, and he's quite happy and I'm living in hope, and I did document that in the journal, for the computer, so that if anybody else came across this they would see why I'd made those decisions.

## Pharmacist 4 second reflection

A second situation, arose just a few days ago. It was actually in the community pharmacy and I had a patient who came rushing in and decided that he needed another salbutamol inhaler, which we had given him two days previously as emergency supply.
[Sound of knocking].
Sorry, I got interrupted there. So to start again, a couple of days ago I had a patient who came in to the shop and wanted a salbutamol inhaler, and I discovered that we'd already given him a supply two days previously as an emergency supply, probably on the Thursday evening because the surgery was shut and he said he had finished it over the two days. So needless to say I was somewhat horrified. He was standing there looking at me and appeared to be perfectly normal, wasn't breathless, wheezing, anything like that, did not appear to be going *blue* [emphasis] by any stretch of the imagination so I said no, and if he wanted something else he would have to see a GP and he could dial 111 [NHS Grampian out of hours number].

So you're left with that situation, and it has happened to me before, where a patient is *insisting* [emphasis] on having a drug, particularly an inhaler, which is a very difficult situation to find yourself in, it's not like giving somebody a

painkiller, and you feel, should I give them the inhaler, because I'm worried that they might have an attack, or, do I not give them the inhaler because I feel that they're abusing the situation. And if you look in any computer at a surgery, you will always find people that over-use reliever inhalers, and their blue inhaler, generally speaking. And this is really difficult to quantify and difficult to make decisions. You, one part of you is well aware that the patient is abusing the situation, is over-using a medication, has not been for a review or check-up. On the other side of the coin is, should you withhold a medication that could save their life, should they have an acute attack. And I think this is quite hard for *every* [emphasis] prescriber, let alone a non-medical prescriber.

Now, if that had been a different pharmacist speaking to that patient they might well have felt obliged to give the inhaler, based on the fact that it was a Saturday, there was no GP open, and the, there was the *potential* [emphasis] for that patient to become quite seriously ill, without the inhaler. I think I had the huge advantage of obviously having quite a bit of experience. I could tell just by listening to him that he was not in any acute distress. He wasn't gasping for breath, he wasn't wheezing, there was no obvious signs and apparently he was actually at his work and nipped out in his lunch hour. So I suspect that his overuse of the salbutamol is more of a psychological panic situation rather than a genuine asthma attack.

So I didn't give it to him and I gave him the telephone number for the NHS24 should he feel the need. And I suspect he may well have gone to another pharmacy and spun a different story and got an emergency supply.

He will get caught out eventually of course, because we always fax through the prescriptions that we've given as emergency supply and eventually, *hopefully* [emphasis] the surgery will start to notice that this is becoming a bit of a pattern.

And again I think that very much comes down to experience, assessing a patient, knowing when to prescribe, when not to prescribe, and refusing medication is sometimes just as important as actually prescribing it, depending on the particular situation that you find yourself in. And certainly there is always the NHS24 out of hours service, should there be an emergency. But in, in general

that can be quite difficult and I do think that prescribers are sometimes put under pressure by patients "Could you just give me this while you're there?" and you have to be so careful that you're only prescribing within your own competency. So, that is a bit of a dilemma. I made a particular decision, based on the circumstances and my assessment of that patient. And I have enough confidence in myself, but I could quite understand that somebody, without that background, would find that a difficult option, and might well either have decided to given, give a prescription, or perhaps a phone GMeds [NHS Grampian out of hours service] and got a doctor's opinion.

## Pharmacist 5 first reflection

The first one would be an Eastern European patient who was slotted in to my anti-coag *[sic]* clinic. I found that she had no English and we had to use the, the Language Line. She produced a box of warfarin with some left in it, em, but she had poor English and even on the Language Line we couldn't actually establish what the definite indication for the warfarin was.

I'd had no choice but to see her because I do the clinic so I had gone ahead and done her INR which was 1, which would indicate to me that she actually wasn't taking the warfarin, although she insisted that she was and the warfarin had been prescribed in her own country for her.

I should say that she was a temporary patient, em temporary resident, and so we had to go ahead. Because I wasn't clear on the indication, I didn't prescribe the warfarin on this, on this occasion. To me she, it wasn't clear that she was actually taking the warfarin herself so could I trust the information? She was a very poor historian and even from Language Line I wasn't getting the information I was looking for, just that she had been on it for some time from her own doctor.

I was in a real dilemma, thinking back, because if I didn't prescribe the warfarin and it was for something like AF then I was putting this patient at risk of a stroke by non-prescribing, however if I did prescribe and I, I didn't know the indication then I wasn't em, doing my job properly. I have a duty of care to the patient but

only if I'm comfortable and I know the medication is definitely indicated and safe for the patient.

The patient did have some tablets left so I did her an INR. She told me she took one a day so I increased the dose and then I, I referred her to the, the GP.

Reflecting back, I had possibly inconvenienced the patient because I didn't prescribe more warfarin but I did prescribe a new dose for her so I maybe didn't, fulfil what she was looking for. However, this patient is still with us, she was here for a month so she is still presenting and we're asking her to give us some details from her own doctor and to get something sent across and we're actually still waiting for this. So I have recently said that I am not comfortable to provide the prescription for warfarin but I, I have been under pressure to do her INRs and then pass the, the details through to the prescription team and the doctor signs the warfarin. So not ideal, but I think that this is the safest way that I can look after this patient until we have a bit more detail on her. So the reason I prescribed was to reduce her risks but also very tentatively. I only prescribed a dose, but I didn't actually give her a prescription.

## Pharmacist 5 third reflection

My third reflection is quite a simple one within my BP clinic this week and this was a patient, with hypertension only, no other co-morbidities, and I've seen them on a few occasions and I've gradually added in and titrated up medication following CVD risk and lifestyle discussions. The patient is now on three anti-hypertensives plus a statin and aspirin.

I saw this patient very recently and I've been seeing this patient for over a year. I was running, reflecting back, I was, I, I didn't actually, I saw this patient and assessed them but I didn't actually prescribe as far as giving them a piece of paper, a prescription. The reason I, I didn't, I was very comfortable to do so, because I had assessed the patient, done the lifestyle, the BP, examined the ECG, I'd examined and reviewed her recent bloods, but the reason I didn't do this was because we still don't have the electronic prescribing facility in our clinics. The doctors and the prescribing nurses do but not the prescribing pharmacist, myself. So, I was running late and reflecting back that would be one

of the reasons as well. I was running late in the clinic and the, to hand write five items after having done all the documentation and the consultation is, is quite impossible really within the ten minute appointment. So on this occasion I did as I often have to do. I just pass through to the prescription team. I run off a re-order slip and pass it through and the prescription team do the prescription and of course the doctor signs it because it's on their number. It's not possible to do an electronic prescription on my number.

So, reflecting back it's a real disappointment that we don't have the facility, something like 12 years down the line, and it's, it's a shame. Maybe not quite as much as 12, but certainly ten or eleven anyway. This would really help us in the clinic and would allow me to be much more professional and allow the patient not to be inconvenienced to have to go back to the pharmacy but could leave with the prescription every single time.

Reflecting back, if it had just been one item I would have done the prescription of course, as I had been doing as I titrated up her meds, but now she was requiring her statin and aspirin and three items so the time to write out two paper prescriptions with the five items on it is just so cumbersome. So at the moment the only way I can run on time sometimes is to pass it through to my colleagues.

## Pharmacist 7 first reflection

This is [name of pharmacist] from [name of pharmacy] reflecting on a prescribing decision made today. This was a very, simple scenario that we had, a patient whose work involves them being abroad for repeated visits, and they are in an area of the world where malaria is prevalent. The prescribing decision, was, a essentially repeat prescribing because we have, have that same conversation several times. The whole process was very simple, very automatic, in so far as this was a scenario I was comfortable with and I really felt as if this was a, a normal extension of my every day practice.

The reasons for that I guess were the fact that I had previously done the research to identify safety and appropriate treatment so there was very little clinical need to, to re-visit any of those issues. Simply it was a case of checking

with the patient his duration, confirming with him his usage, ensuring he was using the treatment appropriately and getting a very simple and quick agreement with the patient as to what his needs were and how to progress. So the prescribing follows very simply, essentially in line with any prescribing that I would be involved in with regard to patient care where the patient presents and requires me to advise on treatment. The fact that I was supplying a prescription only medicine was almost superficial. The, the, I guess that comes down to where I am in terms of my comfort zone, so this was a very comfortable process today, and felt as if this was a good, normal extension of my normal pharmaceutical practice.

## Pharmacist 7 second reflection

This was a, a relatively complex patient that I was dealing with, where the initial discussions over his care had been made in conjunction with one of the nursing team from his GP practice. After some discussion the, the nurse had been in touch with myself and passed information to me asking if I would take up follow on care from her initial consultation. The patient had a complex travel programme and this was not set in stone, so he still had some variables built in to the itinerary. What that does create is a degree of uncertainty within the prescribing so what I had to do was, was take a fair bit of time just to explore the levels of risk that the patient felt that he would be putting himself into and I then had to try and gauge his, his feeling with regard to how the risk could be minimised. So for example some of the potential concerns that we had over his travel plans were things which were dictated largely by his behaviour, things that he wasn't able to verbalise, or he maybe didn't know, for example with regard to Hepatitis B where his behaviour was, was critical to his risk. The difficulty I have there is I feel that I need to act to provide the safest possible options for him but at the same time ultimately it is his decision over his care.

So I'd felt a little bit uncomfortable because he was quite non-committal for example with regard to his Hep B plans but yet was much more enthusiastic about Japanese encephalitis having explored the risks with regard to a stay in Thailand. So there were, there was a real mix of feelings within the, the discussions that we had. Part of, of what I was doing I felt very comfortable with, very secure with. I felt that the patient was making a good decision based

on safety, and I was happy to support that and prescribe accordingly. Other elements of his, of the plan I felt less comfortable with, in so far as he was choosing not to take additional vaccinations and my preference would have been that he had, purely on the basis that once I had exercised my duty I would have known that, that he was a safe as he possibly could be.

So the, the challenge I had was that in that that fairly complex situation in which he was protecting himself against one nasty and not against another, and I struggle with that dichotomy, where he's, he seems to be making decisions that don't follow the rational guidance that I had given him. Ultimately of course I've got to accept the, the decision of the patient, we have to agree a level of concordance and, and we were able, as I say after a significant discussion, to agree a plan and he has been willing to comply with that and seems now quite happy with where we're going and what we're doing.

So, yeah, quite a tricky one. One that on reflection I feel that I was able to give the best advice and ultimately the patient had to take the advice on board and accept the treatment or reject the treatment based on the best advice that was available to them. One thing I was keen to do was to give him some thinking time, which we did, and I felt that that was really important, because sitting down and having lots of information thrown at you, just all within a half hour slot can be quite daunting, can be difficult to take in. So the discussions were followed up, just to ensure that he was happy with the, the plan, and I, that gave me a bit more, a bit more security, I guess, in my decision making and I felt a bit more comfortable with that, despite the, that, that he had thought about it but hadn't changed his mind, he was only going to follow part of the vaccination programme. So a bit more challenging and certainly one that, that made me reflect but I think the key thing that I took from it, and my learning, was to ensure the patient was given adequate time, and in this case he had time to reflect, he had time to think things through and if he had chosen to discuss the, the scenario with anyone else he might have wanted to, so that, that was a positive for me. So yeah, good learning and overall, comfortable with the outcome.

## Pharmacist 8 reflection

During my hypertension clinic this afternoon one of my patients was a 76 year old female currently taking atenolol 25mg and ramipril 10mg for hypertension. Actually was on a number of other medications including azathioprine, prednisolone, aspirin, alendronic acid and Calceos® tablets from memory.

During the consultation, she informed me that she *hadn't* [emphasis] been taking her alendronic acid or Calceos® and had also stopped taking simvastatin, having had an illness where she just felt she was taking too many tablets. Blood pressure today was just over QOF target at 155/88 and through the conversation previously regarding number of tablets, I had a chat with the lady and *my* [emphasis] thoughts were that we would *not* [emphasis] be looking to increase her antihypertensive medication given her current thoughts on tablet taking. Added to that the impact that she had previously tried amlodipine and felodipine as well as doxazocin with adverse effects, thereby limiting the options that we had anyway; also currently taking furosemide for oedema so difficult to then add in any further antihypertensive.

Patient was actually quite happy with this thought and I think quite relieved that I had said I was not going to increase her antihypertensives, and we agreed that this was the best course of action in this case was, was *not* [emphasis] to prescribe any further medication.

## Pharmacist 9 first reflection

My first reflection is on a paediatric prescription that I was requested to do. The request came in from the parent, having been discharged from the [name of children's hospital] in [name of city]. Her child was born at 31 weeks + 4 [days] and they were now presenting looking for a prescription at 1 month and 3 weeks. The prescription request was for Gaviscon® liquid, which is a very unusual prescription to be giving a child of that age.  Obviously we are used to seeing Gaviscon® sachets used for reflux in children, and I checked the BNF and did remember previously querying quite a few years ago with the pharmacist in [name of hospital] so I decided to phone the pharmacist in [name of hospital]

just to confirm what was happening here with Gaviscon® liquid. They were able to confirm that it was their preferred formulation of choice when babies were predominantly being breastfed and weren't already using a bottle when they had reflux. So, based on that and looking at the BNF for children I was able to quite happily prescribe Gaviscon® liquid to this infant.

## Pharmacist 9 second reflection

This case was a 35 year old gentleman requesting a prescription for allopurinol that had been given by the doctor for gout. On looking at his record and speaking to him, I realised that he hadn't had his urate levels checked since commencing his allopurinol. He was currently on a dose of 100mg once a day, and it wasn't clear that he was actually taking it regularly although he was requesting his non-steroidals for the treatment of his acute attacks.

Anyway, I spoke to him on the phone and obviously discussed all the risk factors for gout and arranged for him to increase his dose, as he was still symptomatic on the 100mg a day despite taking it regularly and using naproxen as well. He increased his dose and we arranged for his urate levels to be checked one month later. I also arranged for his risk factors to be assessed, so for him to have some bloods done for fasting glucose, his cholesterol levels so we could do his cardiovascular risk factors, his blood pressure and weight. He was already addressing some of these issues, including his alcohol intake and I was quite happy to prescribe the higher dose of allopurinol for him. I made sure that he had an appointment to come in and that he was clear what he was doing. I also printed out a leaflet for him about gout and the risk factors and treating it and taking his medication regularly. He seemed really happy with the advice that he was given. Anyway that's my second reflection; quite happy to prescribe the allopurinol.