Histories of chest pain: history of the presenting complaint as recorded by different health care providers of patients presenting to a rural hospital with suspected acute myocardial infarction.

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Abstract

This thesis investigates how different health professionals record the history of the presenting complaint of patients with suspected acute myocardial infarction admitted to a rural hospital.

Different health professionals, each with their own ways of working and communicating, co-operate in diverse teams that ideally have more to offer the patient than individual professionals working alone. This includes the taking and recording of the patient’s history. This account should not be regarded as merely a way of copying a component of a clinical encounter, but as part of a sophisticated tool to guide and organise patient care.

This is a case study conducted by a participant observer. A range of qualitative research analysis methods for document analysis are used to analyse what is written in patients’ clinical records by general practitioners, ambulance officers, hospital nurses, and rural hospital doctors, about their presenting complaint.

Of 347 patients admitted to the hospital in 2011 who had a Troponin I blood test ordered, the clinical characteristics recorded of 50 are compared, and 10 of these are selected for more in-depth analysis. The 10 records are analysed in terms of style, vocabulary, abbreviations, what gets recorded, what gets repeated, what gets added, what gets deleted, and what gets modified. Three of the 10 records are analysed to explore how the individual records are constructed.

The clinical record emerges an incremental, multi-authored, multi-layered, intertextual account, being co-produced by a range of health providers, using information from a variety of sources. The different health providers, at different stages, and using their different voices, interact to record the history of the presenting complaint.

In addition, the clinical record can be seen as a way of telling the patient’s story, like a novel where the central narrative is explored from the perspectives of different characters or commentators. The record is a carefully constructed document, whose chief purpose is to develop a shared understanding of the patient’s progress and the care that needs to be provided.
Good documentation is equated with good care. It is important for practising clinicians to understand how the clinical record is constructed, as an organised interdisciplinary process, and how it is used in care. Furthermore, with a move to electronic health records, it is essential that those responsible for their introduction have a similar understanding of the nature of clinical records.
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I hope that I have done my bit to help bridge these different worlds.

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Chapter One: Introduction

This study examines the clinical records created by a range of providers for patients admitted to a rural hospital. Why is a study of history-taking important? What was recorded, and why? Is it a fair summary of the patient’s experience? How does the clinical record compare with more creative forms of writing – stage-plays, poetry, song lyrics, short stories, novels? How does it affect patient care?

The question I am addressing is this: how do different health professionals record the history of the presenting complaint of patients with suspected acute myocardial infarction (AMI) admitted to a rural hospital? This question I at first found merely interesting. In fact, it turned out to be more important than I realised, as it afforded useful insights into the ways that health care providers work together. People writing into clinical records would be better informed if they had a more complete understanding of this process and its implications.

To begin, I conducted an extensive literature review, which closely followed the areas of interest suggested by the research question: the rural setting (which is the context for the study); different health professionals and the ways they work together; clinical histories and diagnosis; clinical records; and suspected acute myocardial infarction. The review process and its findings, are described in the Literature Review and Suspected Acute Myocardial Infarction chapters, but I shall summarise the main points below.

Rural hospitals are increasingly recognised as a distinct and important part of the health care system. Different health professionals co-operate in diverse teams that ideally have more to offer the patient than individual professionals working alone. Taking and recording a history is important. There have been significant insights into this process, especially those published in the general practice literature.

Clinical records have developed over time to meet a variety of purposes, including as a legal document, and are continuing to develop, particularly with the introduction of electronic health records. Hospitals have tended to adopt a standard format for records. They should not be regarded as a mere copy of a series of clinical encounters, but as a sophisticated tool to guide and organise patient care. I make further mention of
electronic health records, and how their successful introduction has required an understanding of how clinical records are used in practice.

There is an extensive literature on the topic of AMI, much of it potentially relevant to this study, in that it helps describe the knowledge and behaviour of clinicians and patients, and may (or may not) help explain some of what is recorded in the notes. In summarising the information available, I shall focus on elements that relate to history, diagnosis, and ambulance use (all of which turned out to be relevant to the interactions in the clinical records).

As one of the doctors at the rural hospital in New Zealand where the data for the study were collected, I can be described as a participant observer, with my own perspective on what is recorded by other health professionals. For this reason, a Context section, included in the Methodology chapter, describes more of my personal and professional background, along with information about the hospital, and how I conceived the idea for the study. The implications are explained further in section 4.2.

In addition, this project has also been about my own journey. This is a story about an old dog learning new tricks – of the transition from experienced clinician to novice qualitative researcher. I knew that somewhere out there just beyond my comfort zone there existed a world of words and stories and ideas, and that an exploration of this world could add interest and understanding to my work as a clinician, and to the work of those around me.

My ideas about methodology developed as I undertook my literature review, as I discussed different approaches with my supervisors, and as I gathered clinical material for the study. I initially somewhat naively imagined that it would be possible to discover quantifiable differences between different health professionals in terms of what was recorded in the notes, and that this would somehow reveal important differences in the ways that members of the various professions worked together. This turned out to be impossible.

For these reasons, I have included a section in the Methodology chapter on “Methodological Framework” that describes my journey. I briefly discuss the relative merits of quantitative and qualitative methods, and why I opted for a more qualitative approach. This was at first a difficult choice for me. An esteemed colleague, whose
opinion I usually respect, warned me that “if you don’t put numbers in it, nobody will take any notice”. I needed to work through this mindset until I could convince myself that qualitative methods were simply the best available tools to answer my research question. I describe the wide range of qualitative approaches that informed my research, and the methodology that I ended up employing to answer my research question. In the end, this gave me a much deeper understanding of the part that clinical records play in the ways that different health care providers work together.

To undertake the research, I studied the records of 50 of the patients admitted to the hospital in 2011 who had a Troponin I (TNI) test, a sensitive blood test for heart muscle damage, explained further in 3.4. I used this as a way of identifying patients who might be suspected of having an acute myocardial infarction (AMI). The process is described in the “Methods” section of the Methodology Chapter. I used my knowledge and experience as a clinician at the hospital, and adapted the methods of range of qualitative techniques - described in section 4.2 - to analyse what was recorded and to gain insights into the ways the records were constructed.

Some of what is written is likely to be unintelligible to a non-clinician. I have added, a list of abbreviations, a description of the conventions used, and a glossary, all located in the appendices.

The findings are grouped into “Clinical Description”, “Numerical Description” and “Detailed Qualitative Analysis”. It was difficult to assign recorded items of history into quantifiable items within a template derived from standard clinical texts, and no quantifiable differences were found between providers. Detailed analysis was conducted on the records for 10 of the patients, looking at Style, Vocabulary, Abbreviations, and items that were repeated, deleted, or modified. Three of the records were analysed in greater detail to illustrate how the different providers work together to construct the records. The findings were enlightening – I came looking for differences and discovered a high level of cooperation. All of this is described in more detail in the Findings chapter.

Central to history-taking, and to the presentation of research, is the concept of narrative. At the heart of clinical practice is the consultation - a patient telling a health care provider a story. The patient, it is recognised, has an important story to tell, often
employing metaphor to get the point across.

The recording of the patient’s history has many parallels with other forms of story-telling. The different providers have their own versions of the story to write. In describing the research, I need to employ narrative myself in my analysis and discussion. These aspects are explored more fully in the Discussion of Findings chapter, which focuses on the importance of narrative, its relationship to medical practice, and particularly on its relevance to clinical records.

After more than forty years in clinical practice, I have learnt a lot from this project about the rural setting, different health professionals, taking histories, clinical records, and acute myocardial infarction. I want to pass this on. I conclude with some comments on how the findings of this study might be relevant to clinicians and researchers, addressing questions about the nature and purpose of clinical records, and making recommendations for practice and for further research.
Chapter Two: Literature Review

In this chapter, I will first outline how I conducted a comprehensive literature review, then consider the rural context for the study, introduce the key players, review the links between history, diagnosis and communication, and discuss the development and nature of clinical records. The information I obtained about suspected acute myocardial infarction, which is no doubt an important factor in the various clinicians recording what they did, but is arguably less directly relevant to the research question, is presented as a separate chapter.

2.1. Method of Literature Review

I conducted a structured literature review for these terms: “clinical”, “doctor”, “general practitioner”, “rural”, “hospital”, “nurse”, “ambulance”, “prehospital”, “paramedic”, “interdisciplinary”, “interprofessional” “notes”, “records”, “documentation”, “language”, “communication”, “presenting complaint”, “chest pain”, “ischaemic heart disease” and “myocardial infarction”, and (importantly) combinations of these terms; searching in Google Scholar, Scopus, Medline, CINALH and Psych Info.

Both old and new versions of standard texts on medicine, nursing, general practice, prehospital care and communication, were consulted – in some cases the older versions proved more useful, and were arguably more appropriate for some of the providers being studied. For example, I obtained from both older and younger nurses copies of the nursing textbooks that they used at the time of their training.

A secondary search was made of relevant references from all of the above sources. Further references were suggested by my supervisors or were known to me from previous related studies. The available references were triaged as essential, potentially useful, or mainly irrelevant. I tried to identify gaps in the literature: places where I was unable to find useful information or where there appeared to be a deficiency in what had been researched.

Even with this wide search strategy, there was a preponderance of medically orientated articles. There were very few articles about the ambulance service, and those that I
found tended to be written by doctors. The term “records” produced very few articles relating to nursing, but the term “documentation” yielded more information. The search term “history” produced many articles describing events in the past, which, while interesting, were largely irrelevant to the present study. Other articles that were discarded as irrelevant included studies of interventions that were specific to particular services, or were about specific investigations or clinical interventions. Some potentially relevant articles were unavailable. Some were available only in abstract but some of these were included if they helped to explain or support some general finding.

2.2. The Rural Setting

“New Zealand’s rural population is spread thinly over a terrain that is not vast but is rugged” (Nixon, Blattner, Williamson, McHugh, & Reid, 2017) p.5.

This study examines the clinical records created by a range of providers for patients admitted to a single rural hospital. Because of the unique features of rural practice, and rural providers, it is necessary to give some background about the setting in which the study is located. It may also be necessary to clear up any misconceptions about the nature of rural practice.

2.2.1. Rural Practice

There are significant differences between urban and rural general practice in New Zealand. In rural areas, there are more patients per doctor, more overseas graduates, and more Māori and deprived patients. Compared with urban services, fees are lower, staff hours are longer, and a greater range of services are offered. Fewer laboratory tests are ordered, fewer prescriptions written and there are fewer patient follow-ups. More patients with injuries are seen (Hider, Lay-Yee, & Davis, 2007).

Rurality in New Zealand medical practice is poorly defined (Fearnley, Lawrenson, & Nixon, 2016). The RNZCGP uses either members' self-identification, or the Ministry of Health approved rural ranking scale. The latter highlights the fact that rurality is a spectrum, and scores GPs from 0 to 100 based on factors such as distance from a major
hospital and on-call duties. A GP with a score over 35 is considered rural (RNZCGP, 2006).

The number of rural GPs in New Zealand has remained static for many years (Reid, 2006). The rural healthcare workforce is ageing (Nixon & Blattner, 2007) and an increasing number of New Zealand GPs are working part-time (Raymont, Lay-Yee, Pearson, & Davis, 2005). Addressing the resulting shortage is a complex educational and political process (Geyman, Hart, Norris, Coombs, & Lishner, 2000). "The trend of younger doctors wanting to work part-time, in group practices, and not own their practice, has significant implications for the rural workforce shortage - especially as older, predominantly male rural GPs retire" (Janes, Cormack, & Dowell, 2004).

Restructuring is required to attract more women into rural practice (Janes, Elley, & Dowell, 2004).

The New Zealand Ministry of Health has given some assistance towards supporting rural practice, including efforts to promote recruitment and retention of doctors, and creating some capacity for rurally based medical education (London, 2004). Working conditions and adequate training for rural practice are seen as more important than income in attracting and retaining rural doctors (London, 2002). The negative aspects - including heavy workloads, frequent on-call, inability to get time off, feeling undervalued and underpaid - need to be addressed, but also balanced against the positive aspects - such as forming strong relationships with patients and the community, and practising the full spectrum of general practice (Janes & Dowell, 2004).

Rural nurses face similar issues (Goodyear-Smith & Janes, 2008), and similar concerns about demographic change (Schofield, Page, Lyle, & Walker, 2006). Nurses make up a proportionately larger part of the health care workforce in rural as compared with urban areas (Francis & Mills, 2011). Nurses with rural connections have higher levels of satisfaction than those who do not (Molinari & Monserud, 2008). Recruitment and retention efforts need to be coupled with educational initiatives (Kenny & Duckett, 2003), including education for rural hospital practice (O'Malley & Fearnley, 2007).

In relation to ambulance services, rural health services in New Zealand have traditionally relied on volunteer ambulance officers (Stirling, 2007), though there is a move towards more highly trained paramedics to improve patient care and help fill gaps
in other services (Blacker, Pearson, & Walker, 2009). Again, appropriate training helps with competence and confidence for the role (Fahey, Walker, & Lennox, 2014).

### 2.2.2 Rural Hospitals

Most GPs in New Zealand work exclusively outside of hospitals. It is possible for urban GPs to visit their patients in hospital, but this probably occurs less frequently than previously. GPs have traditionally ventured into the hospital setting to provide antenatal care for some of their patients, but in New Zealand this has become vanishingly rare (Simmers, 2006).

In contrast, about half of New Zealand's rural GPs work in rural hospitals as well as in their own practices (Nixon & Blattner, 2007), typically in the smaller hospitals with a catchment population of less than 10,000 people (Williamson, Gormley, Dovey, & Farry, 2010). Depending on definition, there are around 44 rural hospitals, serving approximately 10% of New Zealand's population, and staffed by about 120 rural hospital doctors (Nixon & Blattner, 2007). Half of these doctors are rural GPs; the other half are full-time medical officers, who contribute around 80% of the total number of medical hours worked (because the GPs are part-time) (Nixon & Blattner, 2007). Until recently, up to a third of these positions were vacant - more than half of the medical offices were leaving within two years (Nixon & Blattner, 2007), although this situation is currently improving (Lawrenson, Reid, Nixon, & Laurenson, 2016).

Rural hospitals provide care for a wide range of clinical conditions (Hall, Owings, & Shinogle, 2006). There is considerable variation between rural hospitals in terms of the services provided (RNZCGP). Rural hospitals do not have the condition-specific volumes to support specialist staff, so they rely on generalists, who deal with specific conditions on an intermittent and infrequent basis (Muscovice, Wholey, Klinger, & Knott, 2004). Nurses working in US rural hospitals report feeling uncomfortable when assisting in emergency procedures because of their lack of regular experience (Ross & Bell, 2009). Rural hospitals also have a limited range of specialised equipment (Muscovice et al., 2004). For example, in a New Zealand survey, only 50% of hospitals had on-site laboratory services and 39% had a 24 hour radiographer (Williamson et al., 2010).
The requirement in rural hospitals for health care workers to function across a broader generalist scope is not unique to doctors - nurses (Hegney, McCarthy, Rogers-Clark, & Gorman, 2002), physiotherapists (Williams, D'Amore, & McMeeken, 2007), occupational therapists (Mills & Millsteed, 2002), radiographers (Smith & Jones, 2007), and laboratory scientists (Sparer, 1997) have similar issues to deal with.

The role of rural hospitals is poorly understood by outsiders, including health service planners (Murdoch, 2007). Their existence has traditionally been threatened (Ira Muscovice & Rosenblatt, 1985), and various New Zealand communities have resisted rural hospital closure with differing success (Barnett & Barnett, 2003). Rural hospitals that are well adapted to the culture and needs of local communities can add to the positive effects of a health service on the experience of living in a rural area (Kearns, 1991). To maintain viability, rural hospitals have needed to determine how they fit into the wider health care system (Ira Muscovice & Rosenblatt, 1985). Though outcomes between rural and urban hospitals are difficult to compare, (James, Li, & Ward, 2007) rural hospitals can achieve similar outcomes to larger centres (Williamson, Gormley, & Farry, 2006) particularly when working in close collaboration with base-hospital specialists (Fearnley, McLean, Wilkins, Restiaux, & Nixon, 2002). "Rural hospitals play a major role in ensuring the provision of health services in rural areas ... are very sensitive to public policies ... are being forced to shift their emphasis ... to providing a more diversified set of services through linkages with other institutions and provider groups” (Ira Muscovice & Stensland, 2002).

2.2.3. Conclusion

The health professionals in this study, who have produced the clinical records, are working in an environment that is both challenging and poorly resourced. To introduce the metaphor of a stage-play, which will be used to open the next section: whereas an urban hospital can be thought of as an elaborate big-budget production, a rural hospital might be compared with a community theatre providing an essential local service with a small cast and limited resources. Rural health care providers are regularly required to perform in wide-ranging and overlapping roles. The training requirements for this task are unique and until recently have been poorly recognised.
2.3. **Dramatis Personae**

"Nurses and physicians have a great deal to learn from each other." (McWhinney & Freeman, 2009) p.388.

This thesis examines the written interactions between four main characters in the drama: the ambulance officer; the rural general practitioner; the rural hospital doctor and the hospital nurse. Between them - like Vladimir and Estragon (and Lucky and Puzzo) (Beckett, 1955) - they are describing a fifth character, the patient, whose voice is never directly heard. There are also some minor characters - the patient's relatives, general practice staff, other carers, allied health professionals, auditors, researchers, etc. - who are involved in a series of subplots.

I shall first describe the historical background of each of the four different health professionals. Then I will summarise what is known about the language they use and the ways they communicate, including through the written record. I shall finish with some theoretical and practical ideas about how the professions might better collaborate.

### 2.3.1. Health Care Professions

#### a. Ambulance Staff

Ambulance systems of transfer developed during the Napoleonic and Crimean wars and the American War of Independence (Haller, 1990), though Specialised wagons to move the sick had been used in England since at least 900CE (Wright-St. Clair, 1977). The first city ambulance service was developed by a hospital in New York in 1866 (Haller, 1990). The St John Ambulance Association, established in England in 1877, set up a transport system for sick and injured people as part of its first aid and charitable activities (Haller, 1990; Wright-St. Clair, 1977). In New Zealand, the first volunteer fire and ambulance brigade was started in Dunedin in 1887 (Wright-St. Clair, 1977). Wellington has its own District Free Ambulance Service, but nationwide St John operate 70% of the new Zealand ambulance fleet (Wright-St. Clair, 1977). St John are the service bringing patients to the hospital being studied. The service is currently
challenged by increasing demand and a continued reliance on volunteers (Al-Shaqsi, 2010).

b. Nurses

Before the 19th Century, nursing was a menial job, in which “proper persons” were not interested. Nurses worked as servants (Helmstadter & Godden, 2011). Initial attempts at training were through religious and charitable organisations. Nursing schools were established alongside medical schools in London in the 1800s. Traditionally, doctors have always taken the leading roles but have relied on nurses to provide effective care (Helmstadter & Godden, 2011). Registration for nurses in New Zealand began in 1901 (O’Connor, 2010). As in other countries, nurses initially worked mainly in hospitals, under the control of doctors, with a focus on end-of-life care rather than curative services (O’Connor, 2010).

Nursing is now the largest sector in the health care workforce (Gage & Hornblow, 2007). The role of nursing has evolved over time and now focuses on “situated caring” (Farrell & Dempsey, 2011) p.5. With changes in regulation and training, and increasing specialisation, there have been moves towards nursing being a more professional body, with a greater focus on nursing-specific knowledge and research (Gage & Hornblow, 2007).

c. General Practitioners

Before World War II, most doctors were general practitioners. They practised from their own homes and dealt with both serious and trivial ailments. Specialists tended to be concentrated in large towns and were associated with large hospitals. (Passmore & Robson, 1974) p.1.1.

These days, GPs provide "community-oriented, comprehensive primary care" (RNZCGP), which "continues over time [and] is anticipatory as well as responsive" To provide this care, they must be "appropriately qualified" and have particular knowledge and skills". The care provided by GP's "is not limited by the age, sex, race, religion, or social circumstances of patients, nor by their physical or mental states".
Generalism as an idea is experiencing something of a resurgence. The 2013 RNZCGP conference (RNZCGP) took generalism as its overarching theme. Health policy makers (Petersdorf, 1998), general practitioners (Heath & Sweeny, 2005), surgeons (Loefler, 2000), internal physicians (Turnberg, 2000), and nurses (Pearson, 2003) are all expressing a desire to resist increasing specialisation and move back to a more generalist scope.

d. Rural Hospital Doctors

Rural hospital doctors have “broad based specific skills” (Nixon & Blattner) p.401. In 2008, the Medical Council of New Zealand recognised Rural Hospital Medicine as a new scope of practice and approved a registrar training programme (Nixon & Blattner), which has a strong academic component (Nixon et al., 2017). There has also been an experiential pathway for doctors with experience in rural hospital medicine to gain fellowship (Dawson & Nixon, 2008). The NZDHRM sits within the RNZCGP (RNZCGP).

The 2010 paper by Williamson et al. (Williamson et al., 2010) p.27 sums up the current position: “Rural hospital practice is in its infancy in terms of development as a recognised branch of medical practice … Clearly, medical and other healthcare staff working in rural hospitals need a broad range of knowledge and skills which straddle many different disciplines of medicine to allow them to provide these services. These skills cover a broader spectrum than those required for any one of the traditional medical specialties, even general practice.”

2.3.2. Professional Languages

People have their own unique ways of using language (Brook, 1979). Professional groups also have their own varieties of language, which are different from the language used by the same people in other contexts (Trudgill, 1983). The term “register” can be used to describe the vocabulary of a particular occupational group (Holmes, 2013).
Language choice when interacting with others is complex. Doctors in one study reported that they use mainly medical language when speaking to other health professionals, and everyday language when speaking to patients, though nurses or patients in the same study did not agree. Patients attempt to use more medical language when talking to doctors, which is noticed by nurses but not by doctors (Bourhis, Roth, & MacQueen, 1989). Doctors, nurses and patients differ in their understanding of the meaning of common medical terms (Hadlow & Pitts, 1991).

Abbreviations have been the subject of several studies. Abbreviations in general are poorly understood, and many of those used by nurses, for example at nursing reports, can be unintelligible to outsiders (Wolf, 1989). Abbreviations are a feature of professional language that may or may not be shared with other people or groups (Sinha, McDermott, Srinivas, & Houghton, 2011). Abbreviations commonly used by either nurses or doctors are poorly understood by the other discipline (McMahan, Hoffman & McGee, 1994).

**a. Ambulance Language**

Ambulance staff, as mentioned in 2.3.1.d, are the usually the first health care providers to see the patient, and are often volunteers. They often work in a stressful environment, and are often required to struggle to get their point across to multiple other people. The language paramedics use with each other, and with other emergency response personnel such as the police, has been characterised as “black humour” (Charman, 2013), typically as a response to stressful situations (Rowe & Regehr, 2010). Communication between ambulance staff and other health care providers can be impaired by the lack of a “shared cognitive picture” (Owen, Hemmings, & Brown, 2009) p.102. This will be discussed further, later in this section, under “handovers”.

**b. Nursing Language**

Nursing, as mentioned in 2.3.1.d is the largest sector in the health care work force. Nurses have their own language. There may not always be a shared understanding of terminology between nurses and other professions (Voyer, Cole, McCusker, St-Jacques, & Laplante, 2008). The language used by nurses at the change of shift report is
described as an "in-group" language characterised by a mixture of technical terms, abbreviations and slang, which would be unintelligible to outsiders, such as members of the public, or even other health care professionals (Wolf, 1989). Nursing language does share some features with other clinical languages, as well as features of the language of patients (Casey & Hoy, 1997).

There has been international interest in standardising nursing language (Casey & Hoy, 1997). It has been suggested that the development of standardised nursing languages for the description of nursing care plans has the potential to help deal with complex hospital systems (Casey & Hoy, 1997). Standardised nursing terminology is believed to have benefits for patients the profession, and health care organisations. Much of the terminology has been developed by nurse educators who teach the nursing process (Lundberg, Brokel, & Bulechek, 2008). Appropriately styled clinical records, which include the nursing component of a patient's plan of care, can be used to facilitate clinical care and interprofessional practice (Keenan & Yakel, 2005). Some nurses are concerned however that standardised language risks losing an understanding of the complexity of what they do (Clancy, Delaney, Morrison, & Gunn, 2006).

Documentation is important to evaluate the contribution of nurses to clinical care but is not always accurate or complete, tending to focus on patient assessments rather than nursing activities or patient outcomes (Kim & Park, 2005). In one Swedish study (Ehnfors & Smedby, 1993), for example, a minority of nursing records contained a nursing diagnosis or a nursing care plan.

c. Medical Language

Medicine has its own system of understanding clinical practice, derived from medical science, and reflected in medical language (Nowlan, 1993). Research on the language of professional socialisation has contrasted the pejorative terms used by doctors to describe patients to each other with the humanitarian values usually associated with medical care (Anspach, 1988).

Features of doctors’ language include depersonalisation, use of the passive voice, and emphasising the subjective nature of the patient’s (Anspach, 1988). Doctors do not always concur on the meaning of the words they use (Herbert, 2009). Written
communication, apart from facilitating patient care, can be used to express specialty identity or to negotiate intergroup conflict (Hewett, Watson, Gallois, Ward, & Leggett, 2009). Communication with patients from ethnic minorities, especially those who do not speak the same language as the doctor, is generally poor, and this is likely to exacerbate existing disparities (Ferguson & Candib, 2002).

2.3.3. Interprofessional Interaction

   a. Communication

Communication is seen as the hallmark of professional practice (Apker, Propp, Zabava Ford, & Hofmeister, 2006). Effective communication between doctors and nurses should be clear, precise, verifiable, calm and supportive under stress, respectful, authentic, and take a collaborative approach to problem solving (Robinson, Gordon, Slimmer, & Yudkowsky, 2010).

Health care providers typically spend most of their time in communication with others, usually from their own professional group. Most of this is verbal rather than written. The written record is likely to reflect only a small portion of communications between health professionals. Interruptions are a frequent source of poor quality communication. Errors do occur because of poor communication within and between professional groups (Alvarez & Coiera, 2006). Much of the verbal communication between members of an interdisciplinary team is complementary to that which takes place in formal team meetings (Ellingson, 2003).

A retrospective chart review in New York comparing documentation by different doctors and nurses (Zeleznik, 2003) found that documentation was incomplete and sometimes inconsistent, though differences were detected between senior and junior staff rather than between disciplines. Abbreviations in general are poorly understood. Abbreviations commonly used by either nurses or doctors are poorly understood by the other discipline (McMahan, Hoffman, & McGee, 1994).

Kumar and Clark, in their standard textbook for medical students, express concern
about communication between diverse health care professionals. "Problems” they say “occur when people have differing opinions about treatment, which are not resolved. Hierarchies make it harder for people to speak up. This can be dangerous if, for example, a nurse or junior doctor feels unable to point out an error, offer information or ask a question” (Kumar & Clark, 2012). p. 12

Doctors are aware of the potential for misinterpretations and misunderstandings between different medical specialties, and this can inhibit sharing of information (Kane & Luz, 2009).

Physicians comment that nurses do not document the type and detail of information that they would expect to see recorded. They would like to see more narrative, especially for unusual events, rather than completion of checklists. They may feel they are missing information from nurses that they require to make good medical decisions (Green & Thomas, 2008).

Communication can improve in spite of professional differences (Milligan, Gilroy, Katz, Rodan, & Subramanian, 1999). Standardised documentation systems have been developed to reflect interdisciplinary planning of care (Davidson, Egbert, Merchant, Padgette, & Rankine, 2004). These may require staff to rely on information collected by other disciplines (Brunt, Gifford, & Hart, 1999). Documentation can improve using agreed guidelines and interdisciplinary meetings (Ross, 1991).

A retrospective notes review of 150 cardiac arrests on a medical ward in a Chicago hospital, investigating physician and nurse response to any warning signs and symptoms (Franklin & Mathew, 1994) demonstrates that just writing in the notes is not enough. In 99 of the patients, a physician or nurse recorded a deterioration in the patient's condition in the six hours prior to the cardiac arrest. In 25 cases the nurse did not notify a physician. In 42 cases a house officer did not notify a consultant. Documentation is considered as “a way of communication” (Alkouri, AlKhatib, & Kawafhah, 2016) p.102. Clearly, from the above example, it should not be the only way.
b. Handovers

An important aspect of interdisciplinary communication is handover of patient care. A literature review of handover from ambulance to ED staff showed that important information may be missed during handover. Structured handovers that include both verbal and written information, and multidisciplinary education that enhances teamwork, may lead to improved handover of information (Bost, Crilly, Wallis, Patterson, & Chaboyer, 2010). Ratzan (1994) characterises the type of clinical presentation that occurs at the handover as a ritual formula, that differs between disciplines, and has its origins in traditional oral poetry. Ambulance personnel typically have to repeat their verbal handover to multiple people. Hospital staff often ask the patient for the same information - doctors especially seem more interested in making their own impression rather than listening to the handover from the paramedics - which is perceived as a lack of trust (Bost, Crilly, Patterson, & Chaboyer, 2012). Handover is often brief. Nurses would often want to know, from the ambulance, information about the situation the patient came from and their level of function at the time (Bruce & Suserud, 2005).

Comparison of ambulance and ED records can show discrepancies between the ambulance and hospital records, including the timing of significant events, nature of pre-existing medical conditions, regular medications, allergies, and medications given by the ambulance (Murray, Crouch, & Ainsworth-Smith, 2012).

2.3.4. Professional Cultures

Members of professions have shared knowledge, skills, attitudes, and values that are usually not shared with others. This is reflected in their education. Professional cultures have developed partly to advantage their own members. Their development has traditionally been influenced by gender and social class issues. The barriers created by interprofessional rivalries may make it difficult but not impossible for different health professionals to work together to provide improved patient care (Hall, 2005).

The literature over the years has been dominated by the relationship between doctors and nurses, with nurses insisting that their role change from "handmaiden" to
"collaborator" (McMahan et al., 1994). A better understanding of the complexities involved is likely to be developed by taking an interpretive approach that considers each profession's perspectives on clinical care (McMahan et al., 1994).

Historically the relationship between the medical and nursing professions can be seen to reflect the hierarchical nature of society, dominated by conflicts based on power, gender, and social class (McMahan et al., 1994). Physicians were involved in and controlled the early development of the nursing profession, at the same time retaining their own power as sanctioned healers amongst the health professions by standardising the medical curriculum and health care regulations. Medicine was characterised as curing disease by scientific methods, as opposed to a nursing perspective including sociological and psychological considerations. The relationship between doctors and other professions, as well as patients, became one of "institutionalised subservience". Doctors were trained to take "independent action", nurses to "follow orders". Consumers tended to believe that nurses acted on behalf of the physician.

Communication between health professionals has been hampered in the past by the retention of traditional roles, where doctors appear to be in charge and nurses are expected to be subservient. Doctors and nurses traditionally related to each other in ways that preserved these roles and avoided open disagreement (Stein, 1967). Over time the relationship has become “more mutually interdependent” (Stein, Watts, & Howell, 1990). Doctor-nurse relationships are historically based on gender roles (Sweet & Norman, 1995). However, the appearance of male nurses and female doctors has made the old stereotypes more difficult to sustain (Gjerberg & Kjolsrod, 2011).

Handling disagreement has been inherently difficult (McMahan et al., 1994). Though relationships are generally positive, disagreements are common. Disagreement by nurses can be grouped into: general plans of care; specific instructions; and patient disposition. Disagreement by doctors is typically about what they see as inappropriate requests from nurses (though nurses perceive these same situations as doctors not responding to patients’ needs for care) (Prescott & Bowen, 1985). Doctors and nurses can disagree about the extent to which nurses and patients are involved collaboratively in decisions about patient care (Ferrand et al., 2003), and about what information has been given to patients (Moret, Rochedereux, Chevalier, Lombrail, & Gasquet, 2008).
Collaboration, while seen as important, is also challenging (McMahan et al., 1994). Schofield and Amodeo (Faulkner Schofield & Amodeo, 1999), in their review of 138 articles (from 2200 abstracts available at the time) on the attributes of interdisciplinary teams, felt that the research in this area had been of poor quality. Articles were rejected because the reviewers did not believe they described truly collaborative teams, the terms were poorly defined, or the value of teams was assumed rather than evaluated. The studies evaluated tended to focus on problems rather than successes and on process rather than outcome.

Allied health professionals, while comfortable working with each other, have found that doctors tend to dominate in health care settings (Molyneux, 2001).

Efforts at improvement have focused on communication and on understanding of each other’s roles. Nurses and doctors may be required to collaborate in emergency situations or over longer periods of time to achieve better patient outcomes. True collaboration requires a two-way exchange between equal partners, understanding of and respect for the other's profession, negotiation, intentional team-building, wise management of conflict, avoidance of negative behaviours, and appropriate facility design (Lindeke & Sieckert, 2005).

Sweet and Norman (1995) summarise the challenge thus: "The disciplines of nursing and medicine are expected to work in unusually close proximity to one another, not just practising side by side but interacting with one another to achieve a common good: the health and well-being of patients." p. 166.

Davies (2000) similarly points out that "there's more to collaboration than simply working side by side". Collaboration between professions is important to outcomes, as a diverse team of people working together can achieve more than a more homogeneous group. Trust and communication become important. Some of the continuing difficulties are attributed to different traditions of training: doctors have been taught to be knowledgeable, independent and self-reliant; nursing traditionally has been hierarchical and has emphasised the importance of compliance.

The production of the clinical record, as will become clear in later chapters, is an important part of collaboration. “Combining the information obtained by the physician and the nurse in one health history encourages collaboration between members of the
healthcare team who share in the collection and interpretation of the data” (Farrell & Dempsey, 2011) p.74

O’Leary et al. (1991) conducted a study by doctors and nurses on a hospital ward in New York to see if interdisciplinary rounds reduced the incidence of adverse events. Doctors and nurses, they point out do not always agree on plans of care and nurses especially rate the collaboration between the two disciplines as poor. Interdisciplinary rounds were introduced in one of two units in the hospital. The incidence of adverse events fell from 7.9 events per 100 patient days historically to 7.2 in the non-intervention unit and 3.9 in the unit that had introduced interdisciplinary ward rounds. The authors saw this as a practical example of a beneficial effect of collaboration between disciplines. Barden and Falise (Falise, 2007) also restarted interdisciplinary rounds in a 480 bed non-teaching hospital in Florida. Nurses especially were initially resistant. The rounds once they were introduced were believed by the authors (two nurses) to have improved interdisciplinary communication, attitudes towards other professions, and patient care.

Pathways are another mechanism that has been used to try to increase the adoption of evidence-based interventions in interdisciplinary clinical care. However, they are often not used in practice. Kinsman et al. (Kinsman, James, & Ham, 2004) measured the use of a clinical pathway for acute myocardial infarction (AMI) in an Australian hospital for before and after an interdisciplinary collaborative approach to implementation of the pathway. Documented use of a pathway for AMI for this group increased over the time of the study, which the authors attribute to an interdisciplinary collaborative implementation. The authors point out that the increased documentation does not necessarily mean a change in clinical practice.

2.3.5. Conclusion

The records in this study are produced by four different health care providers: ambulance officers, GPs, nurses, and rural hospital doctors. These professional groups have different histories, different training, different ways of working, and different ways of communicating. True collaboration between the groups is to some extent impaired by a lack of shared understanding. One of the ways that the different groups can be seen to co-operate is through the production of the clinical record, which will be
described in the Findings chapter and examined in the Discussion of Findings and Conclusions for Clinicians and Researchers chapters.

2.4 History Diagnosis and Communication

"Diagnosis depends on three methods, the taking of the patient's history, his physical examination, and laboratory investigations. All three are important, but in a hypothetical situation, if an experienced doctor were allowed one method only, his choice would be history-taking" (Passmore & Robson, 1974) p.1.3.

The history of the presenting complaint, which is the aspect of the clinical record being examined in this study, depends on taking a history from the patient. This in turn relies on effective communication. Both history and communication, including through the written record, are related to diagnosis and management, as will become clear from the literature. These links, along with the central importance of the patient narrative, will be elaborated on further in the Discussion of Findings and Conclusions for Clinicians and Researchers chapters.

2.4.1. History-Taking

Gathering a careful and complete history is the first step in caring for a patient (Brunner & Suddarth, 1982). “The history of the present health concern or illness is the single most important factor in helping the healthcare team to arrive at a diagnosis or determine the person’s needs” (Farrell & Dempsey, 2011) p.75. Traditionally, the patient history suggests diagnoses which subsequent physical and laboratory examinations confirm or deny and often make more exact (Passmore & Robson, 1974). A landmark study by Hampton and others examined the relative importance of history, examination, and investigations. Doctors working in a medical outpatients’ clinic wrote down the probable diagnosis for 80 patients after reading the referral letter and taking a history. Only seven diagnoses needed to be changed after examining the patient, and seven after reviewing investigation results (Hampton, Harrison, Mitchell, Prichard, & Seymour, 1975).
Clinical care involves a personal relationship between patient and health care provider. Both the diagnosis and treatment of a disease are influenced by the success or failure of this relationship (Passmore & Robson, 1974). In many cases, particularly for patients with psychological or social concerns, taking a good history is also an important part of treatment. People feel better having had the opportunity to tell their story (Passmore & Robson, 1974). The patient history will give clues as to the patients’ knowledge about their own health, and their expectations of the health care being sought (Brunner & Suddarth, 1982). Time spent early in the relationship gathering detailed information about what the patient knows, thinks, and feels about his or her problems will save time and may prevent errors and misunderstandings later (Brunner & Suddarth, 1982).

Gathering data about the patient, starting with the patient’s history as elicited in an interview, according to a standard nursing text, is the first step in the process of defining problems. The history, in final written form, may be supplemented by information from the patient's hospital record, conversations with other care givers, or other health care providers (Brunner & Suddarth, 1982).

All members of the healthcare team, using their unique skills and knowledge, contribute to obtaining and recording the history. The data obtained by nurses complements the information obtained by other members of the health care team and “focuses on nursing’s unique concerns for the patient” (Farrell & Dempsey, 2011) p.73. The 1971 textbook on clinical method that I used as a medical student (Naish & Read, 1971) advises "The form of your questions … should follow a standard pattern … to be remembered as standard 'hat pegs' on which the history and perhaps the diagnosis hang. … Failure to ask these questions may mean that vital information is missed" p.6. As an example, the standard questions for the symptom of pain relate to: site, radiation, type, time of onset, provoking factors, relieving factors, accompaniments, and whether the pain is continuous or intermittent (Naish & Read, 1971). Ambulance services use the mnemonic OPQRS - onset, provocation, palliation, quality, radiation, region, severity, scale, and timing (Rittenberger, Beck, & Paris, 2005).

A thorough and accurate assessments of a patient's problems or conditions depends on the completeness and accuracy of the data collected (Brunner & Suddarth, 1982). It may be helpful to elaborate on the description of the chief complaint, particularly a
symptom or problem that may be a clue to future diagnosis, and clarify its relationship to other symptoms and events (Brunner & Suddarth, 1982). The record goes on from the presenting complaint to logically present, from the patients’ point of view, any health problems; past medical history; family health history; and a profile of the patients’ personal social life and well-being (Brunner & Suddarth, 1982).

### 2.4.2 Diagnosis

Diagnosis means different things to different professions. Much of what is written about diagnosis is derived from the standard medical model. But other professions, with their different perspectives on patient care, have important contributions to make to the process. An awareness of this diversity of approach is a necessary part of understanding the ways that different professions work and communicate, as has been described in section 2.3, and ultimately what gets recorded in the records, as will be described in section 2.5, and will be presented and analysed in chapter five.

Ideas about diagnosis may seem to have changed little over the decades. While doing a locum in Vanuatu, the newest book I could find in the medical library was Richard Gordon’s “Doctor in the House”, based on his medical training in the 1940s, mentioned again in 2.5.4. and 6.4.

> Diagnosis is simple observation and applied logic – detection in fact. A matter of searching for clues, igniting a suspicion and knowing where to look (Gordon, 1952) p.50.

In fact, diagnosis in the real world is much more complex. I will summarise some of this complexity in this subsection.

Nursing diagnoses may be poorly understood by other professions. Even the idea of nurses and ambulance officers being able to make diagnoses is controversial for some clinicians. In 1971, only half of Canadian Family Physician readers who responded to the question "is a nurse capable of making diagnoses?" answered "yes" (King & Jones, 1971). Two nursing professors, commenting on these responses (King & Jones, 1971), write "The value the physician places on the particular acts of diagnosis and
prescription ... evoke the strongest feelings of professional possessiveness”. The authors clarify the nature of nursing assessment. Nursing diagnosis is an important part of patient assessment. Medical diagnosis may or may not define nursing needs. The goal of both professions should be excellent patient care, and this is best achieved by working collegially and valuing each other’s contribution.

The literature on diagnosis by ambulance staff has concentrated on physical examination, as for stroke recognition (Harbison et al., 2003), or interpreting the results of prehospital investigations such as electrocardiograms (van't Hof et al., 2006) or troponins (Sørensen et al., 2011).

The concept of what constitutes diagnoses is likely to be different for nurses, ambulance officers and nurses, just as, as concluded in 6.5, are clinical records, because diagnoses are used by different professions for different purposes.

The standard medical approach to the patient has been useful. It has provided, at least for doctors, a common language for a unified the clinical approach. Among other benefits, it has provided physicians with a clear method of taking and recording the patient’s history, and a carefully structured template with which to arrive at a diagnosis (Silverman, Kurtz, & Draper, 2005). However, it has created some problems with the complexities of patient care in the real world, with an increasing understanding of how and why doctors take histories, and the sophisticated processes that experienced clinicians go through in order to formulate diagnoses.

As Silverman further points out: “For many years, we have known of the overriding importance of history taking to diagnosis … Yet the way that many doctors have been taught to take a history in medical school can lead to inaccuracy and inefficiency. Traditional questioning methods do not encourage comprehensive history taking or effective hypothesis generation … much of the information required to understand our patients’ problems remains hidden … doctors [use] a remarkably uniform style despite differences in the problems presented to them or in their patients’ behaviour … [a] premature focus on medical problems [leads] to a an over-narrow approach to hypothesis generation” (Silverman et al., 2005) p.57.
Fraser, in his GP-oriented book on clinical method, although he agrees that "history taking is the key to diagnosis in the consultation" (Fraser, 1992) (p.40), describes how the general practice consultation is now understood as a more complex process, directed by the needs of the patient at the time. He quotes Dixon (1986) when he writes "It makes no sense to ask a lot of history questions that will make no difference to the outcome of the consultation".

“Making a diagnosis” Fraser (1992) reminds us “is a complex process and involves far more than merely amassing clinical information” (p.36). General practitioners (GPs) typically use three stages in diagnosis: hypotheses generated by doctor or patient, refinement, and final definition (Heneghan et al., 2009). “In a large proportion of cases, the history suggests the diagnosis which subsequent physical and laboratory examinations confirm and often make more exact.” (Passmore & Robson, 1974) p. 1.3.

Card and Good (1974) describe the process in mathematical terms:

Doctors [make] diagnoses and decisions using private programmes, based on their individual training and experience ... The patient appears to the doctor as a set of symptoms, signs and laboratory reports … It is, in principle, possible to make a diagnosis by assigning the whole set of indicants that have been elicited to a class with a certain probability, and diagnoses have been calculated in this way. However, this is not how a doctor proceeds; he [sic] acts sequentially. Given certain evidence from the patient, he formulates a further question or carries out some examination. As a result of this question or examination, fresh evidence alters the set of probabilities and the process is further repeated (Card & Good, 1974). p.60.13.

More experienced physicians develop increasingly sophisticated approaches to clinical reasoning, particularly for more complex clinical problems (Elstein & Schwarz, 2002). Generally, a number of diagnostic hypotheses are generated early in the course of the interview, and these then drive the questions that the doctor asks as the interview proceeds. With increased subject expertise, clinicians develop schemata to deal with particular clinical problems with which they have become familiar, or learn to recognise patterns of the way that specific illnesses present. These methods depend on skilled interviewing, and maintaining an open patient-centred method of information
gathering, so as not to move prematurely to incorrect conclusions (Silverman et al., 2005).

Kassirer (1983) advocates for this more iterative approach and suggests that it be more consciously taught to medical students by experienced practitioners. Engel from the late 1970s argued for a shift in focus to a model of medicine (Engel, 1977), clinical care (Engel, 1980) and medical education (Engel, 1982), that moved from a narrow biomedical focus to incorporate psychological and social elements. Cassell argued that insights could be gained by a better understanding of patients’ experiences of suffering (Cassell, 1998). These ideas were incorporated into the 1980s into a more patient-centred approach (Weston, Brown, & Stewart, 1989).

Diagnosis, then, involves bringing together different perspectives on the patient's problem, including the perspectives of other professions, and that of the patient. This in turn relies on communication.

2.4.3. Communication

History taking is based on good communication and is the most fundamental skill in general practice. Communication skills are essential to obtaining a good history and can also be an important aspect of therapy – patients whose histories are listened to carefully and recorded accurately will not only feel better but are likely to get more appropriate care. History taking requires a disciplined approach. A meticulous history of pain and other symptoms is the key to diagnosis (Murtagh & Rosenblatt, 2015). Understanding the techniques of interviewing is also basic to collecting accurate data in the patient history and to establishing the basis for a working relationship with the patient (Brunner & Suddartha, 1982). “History-taking involves more than simple questions and answers. It entails listening to the patient and trying to understand his way of life, hopes and fears” (Passmore & Robson, 1974) p. 1.3.

A communication process for effectively gathering information involves: encouraging the patient to tell their story from when the problem first started using their own words; questioning, moving from open to closed questions; listening attentively, allowing the
patient to complete statements without interruption, and leaving time for the patient to think before answering questions, or go on after pauses; facilitating the patient’s responses both verbally and non-verbally; picking up on and responding to the patient’s verbal and non-verbal cues; clarifying the patient’s statements when necessary; establishing the times and sequence of events; summarising to check on understanding; and using appropriate language (Silverman et al., 2005). "For identifying information ... careful interviewing of the patient or his ‘care person’ will provide most of the information. The patient's hospital or clinical record may also be a valuable source." (Brunner & Suddarth, 1982), p. 13.

In gathering information to explore the patient’s problems, providers should encourage the patient to tell the story of a problem from when it first started to the present using their own words (Silverman et al., 2005). There is a need to “allow the patient to describe his own problems and expectations with little or no direction from the interviewer ... his feelings about his symptoms ... and concerns in his own words … writing down what the patients says.” (Brunner & Suddarth, 1982) p. 13. Speech unfortunately can be an inadequate medium for expressing thoughts and feelings (Fry, 1977). Patients, in addition, are likely to modify their usual language when speaking to the doctor or other provider (Holmes, 2013). Written language, in turn, even a record of a statement or conversation, may be different from speech (Watts, 1989). It is helpful when writing in the records to use quotation marks to identify the patient’s own words (Brunner & Suddarth, 1982).

“How we ask questions plays a central role in the quality and quantity of the information that we obtain … [Doctors] exert considerable control over the interview … by the nature of [their] questions and responses [doctors] [often unconsciously] impose certain limits on the patient’s freedom to elaborate.” (Silverman et al., 2005) p.71. "Skill in interviewing will affect both the accuracy of the information elicited and the quality of the relationship established with the patient. The purpose of the interview is to encourage the exchange of information between the patient and the nurse. The patient must feel that his words are understood and that his concerns are being listened to and dealt with sensitively.” (Brunner & Suddarth, 1982) p.13.

Beckman and Frankel (1984) found that only 23% of patients in an internal medicine clinic were given the opportunity to describe their presenting complaint without
interruption. In most of these cases, the patient was never given an opportunity to conclude their opening statement, meaning that relevant information was potentially lost. Maguire et al. (Maguire, Booth, Elliot, & Jones, 1996) found that more than half of health professionals tested prior to a communication workshop were unable to identify more than 60% of their patients’ main concerns. Specialists have been found to ignore patients’ complaints about pain unless it is the type of pain that can be treated within their particular specialty (Rogers & Todd, 2000).

Even senior medical students are often unable to discover patients’ main problems, clarify the nature of problems, or explore how problems affect patients’ daily lives (Maguire & Rutter, 1976). Students’ history taking and diagnosis does improve with targeted training (Evans, Stanley, Mestrovic, & Rose, 1991), such as role-plays using actors as simulated patients to play out the drama of the real-life clinical interaction (Krüger, Pickworth, Munro, & Lotriet, 2005).

When obtaining histories, health care providers must be aware of their nonverbal communication, as well as that of the patient, the patient’s educational and cultural background, language proficiency, and any disabilities or impairments (Farrell & Dempsey, 2011). Communication with patients from ethnic minorities, especially those who do not speak the language of the provider, is generally poor; this is likely to exacerbate existing disparities (Ferguson & Candib, 2002).

An Australian textbook for nursing students describes an ideal process: “During the interview, the nurse conveys sensitivity to the cultural background and religious practices of the patient. This removes barriers to communication that may result if the interview is based on the nurse’s personal frame of reference. Patients from different cultural and ethnic groups may have different ways of describing symptoms such as pain and may engage in different health practices before seeking formal medical attention” (Farrell & Dempsey) p.670.

2.4.4. Relevance to Records

There is a further problem, according to Silverman, in the ways that students interpret what they are taught about taking and recording a patient history. Students may confuse
the content of the traditional medical history, as recorded in the notes, with the process of medical interviewing. There is a classic format in which students are taught to present their findings or record information in the case records. This is different from the way in which they should obtain the information from the patient. Patients should be allowed to tell their own story in their own way (Silverman et al., 2005).

2.4.5. Conclusion

Clinical care is contingent on a relationship between clinicians and patients. Central to the relationship are the arts of history-taking and communication. The nature and quality of the relationship, and the degree of understanding of how these are related to clinical care, are likely to be reflected in the clinical record.

2.5. Records from the Clinic

"Good records are fundamental to good patient care. They are also one of the means by which a physician enlarges and deepens his or her own experience." (McWhinney & Freeman, 2009) p. 375.

Throughout this thesis, I shall use the term "clinical record", in preference to alternative terms such as "medical record", "patient record" or "health record", some of which are arguably less inclusive. The term "clinical" is also congruent with the highly relevant and perhaps best known work of Michel Foucault (Foucault, 1997), generally translated as The Birth of the Clinic, which provides us with some important insights into understanding the ways that knowledge about the patient can be manipulated and constructed in modern hospital practice (Gastaldo & Holmes, 1999). Foucault describes a uniquely clinical way of perceiving the human body that both distorts and perpetuates power relationships in clinical settings (Samson, 1999).

Records are “essential for the continuity of care of patients” (Stacey, 2017) p.21. They summarise the details of each patient contact, including relevant history, examination findings, investigations, differential diagnoses, information shared with the patient, and treatments given (Stacey, 2017). The records are the way in which the story of the
patient’s care can be told. This study concentrates on examining what is recorded, by the different providers, in relation to the history of the patient’s presenting complaint.

I shall briefly describe how clinical records have been developed over time for use by different categories of health care providers, then concentrate on explaining new insights into how clinical records can be used as a tool for patient care. I shall finish this section with a discussion of electronic health records and how a more complete understanding of written communication in hospitals has been required for their successful implementation.

2.5.1. Development

General descriptions of disease and treatment date back to ancient China (Wong & Wu, 1932) and Egypt (Aboelsoud, 2010). A individual patient consultation is recorded from China in 540 BCE (Gwei-Djen & Needham, 1976). Galen, a Greek physician who lived from about 130 to 210 CE, wrote, in famously bad handwriting, many accounts of patients and their treatments (Nutton, 2012). Written records on their own provide an incomplete description of ancient medical practice; most of the original accounts have been destroyed, and we rely mainly on the interpretation and documentation of other later commentators to make sense of what took place (Nutton, 2012).

As medicine became more complex, individual patients came to have their own notes, with entries by different health care providers. The record became a focus for quality measures, management control of clinical care, and a legal document (Berg & Harterink, 2004). Brotherhood in 1913 collected together records from various hospitals that he regarded as providers of good clinical care. The ideal standardised format that he described (Brotherhood, 1913) is consistent with the structure of modern paper-based clinical records.

Weed in 1968 (Weed, 1968) developed the concept of "problem-orientated medical records". He was also an advocate for interdisciplinary care and electronic health records. His ideas seemed to be firmly grounded in principles of good patient care, were better at describing complex problems in an organised fashion that included the patient's perspective, and had the potential to improve continuity, quality and integration of care (Einstein, 1973). Weed however never expected the new system to
fix all problems - a good system of keeping records is only a small part of a good system of care (Einstein, 1973).

Clinical records traditionally had sections for different categories of health professional, each arranged chronologically. The doctor started with an admission note and ideally had an overview of other contributions to "direct care". In big hospitals, this was the task of junior medical staff who conducted "chart rounds" but this activity became devalued by an emphasis on more technical aspects of medicine assuming a higher priority. Also different and narrower priorities were created by subspecialisation and residents' notes came to focus on "paraclinical" items such as the results of investigations (Einstein, 1973).

The "new" problem oriented medical records could more accurately be described as "problem-structured". They had the risks of listing problems out of context and fragmenting care. An example is the listing of laboratory findings in isolation from the clinical problem they were designed to investigate. Other disadvantages were a non-standardised taxonomy of problems, the potential for duplication, and the omission of important patient information (e.g. the reason for seeking care in the first place) not classifiable as a "problem" (Einstein, 1973).

The acronym SOAP - subjective, objective, assessment, plan - was introduced by Weed as part of the problem oriented medical record (Weed, 1968). Similar language is used by a standard nursing text: “The patient history is always subjective information” (Brunner & Suddarth, 1982) p.10. “SOAP” has been criticised by later commentators (Donnelly, 1992), who recommend that the acronym not be used. The terms chosen tend to devalue the patient's experience. "Labelling what the patient says as 'subjective' and what physicians and laboratories find as 'objective' tends to minimize the reality of the patient's world and exaggerate the reality of the physician's" (Donnelly, 1992), p.483. This is highly relevant to the way the patient’s story is told, and will be examined further in the Discussion of Findings chapter. The SOAP acronym is most suitable for consultations with people with single problems, and is not ideal for modern hospital practice where patients typically have multiple problems (Blair & Smith, 2012).
There have been calls (Donnelly, 1988) for a change to a more narrative-based approach, to better express the patient' experience, and to apply theories of literary interpretation, in order to better understand the context (Gogel & Terry, 1987) and to discover deeper meaning (Carter, 1986). This interpretative approach has a long tradition in medicine but has been overtaken by the apparent greater certainty of biomedical approaches, and a “subculture that … appears to be dominated by a complex system for quantifying and controlling health” (Daniel, 1986) p.195. A hermeneutical or interpretative approach, as in literature, increases our understanding of the complexities and uncertainties of human experience (Daniel, 1986). Gogel and Terry provide a framework for interpretation (Gogel & Terry, 1987) that, along with other literary parallels, will be expanded upon in the Discussion of Findings chapter.

2.5.2. Purposes

The multiple viewpoints expressed in the clinical record play an important role in recording and directing the course of patient care (Poirier & Brauner, 1990). Doctors record only a small amount of the information given by the patients. They condense what patients say, and make their own interpretation of it (Langewitz, Loeb, Nübling, & Hunziker, 2009).

An obvious purpose of clinical records is to describe relevant history and examination findings, and to document patient care (Kumar & Clark, 2012) – to produce “an accurate account of what has occurred and when it occurred” (Alkouri et al., 2016). Health care organisations will usually have their own policies as to what is recorded (Ioanna, 2007). Moran et al. call for greater standardisation. "A theoretical framework should be developed that addresses which types of medical data are considered significant regardless of the clinical circumstances” (Moran, Wiser, Nanda, & Gross, 1988) p.865.

Nurses can spend over 20% of their time on documentation (Clancy et al., 2006). Lippincott’s standard nursing text recommends that data collection should be well organised, thorough, and unbiased. Information gathered must be recorded so that it has meaning for members of the health care team and can guide patient assessment and care. It is important to keep in mind the purpose of recording the information and the audience for whom it is intended. The record must present the information about the
patient as completely, concisely, and accurately as possible, without unnecessary
duplication of material or redundancy, to make it easier to read carefully (Brunner &
Suddarth, 1982).

The patient's record, they say, is a “legal document” (Brunner & Suddarth, 1982). The
information in the records belongs not to the clinicians but to the patients (Wiljer et al.,
2008). Clinical records can be accessed by patients, and can be used as evidence in
court (Owen, 2005). Porter is concerned in a study of ambulance documentation that
incomplete records by ambulance staff “may lead in turn to clinical risk and a risk of
litigation if things go wrong” (Porter et al., 2008) p.292. Harris, writing for the Medical
Defence Union, tells us that “poor records suggest an inadequate standard of care and in
a negligence action may make all the difference between what is defensible and what is
not” (Harris, 1992) p.17.

Bellamy, also on behalf of the Medical Defence Union, expands on the requirements of
clinical records for legal purposes. Not all her advice is relevant to the presenting
complaint - the focus of this thesis - , for example advice relating to records of
operations or procedures, or the advice that copies be kept of letters about the patient
sent elsewhere. Among the other criteria she lists are that all records be dated and
timed, signed, legible, and unaltered (Bellamy, 1994).

The general question that the Medical Defence Union want doctors to consider is: if the
record was presented to one of their solicitors, “what opinion do you think we would
form about the standard of your patient care?” (Bellamy, 1994) p.25. An important
component of consultation competence is making an "accurate, legible and appropriate
record of every doctor-patient contact” (Fraser, 1992) p.30. These medico legal
concerns might be seen as less of a concern in New Zealand, because of the availability
to the patient of no-fault compensation through the Accident Compensation
Commission for treatment injury, but health professionals remain accountable for the
standard of their care (Bismark & Paterson, 2006).

Hospital records can also be used as a method for assessing physician competence
(Payne, 1971). Good documentation is equated with good care (Ehnfors & Smedby,
1993). Medical students are taught that clinical records “are vital in providing best
care” (Kumar & Clark, 2012) p.12. Family physicians are reminded that “good records
are fundamental to good patient care” (McWhinney & Freeman, 2009) p.375. A study
of ambulance documentation acknowledges that “the completion of clinical documentation is generally associated with good quality care, though the benefits may be indirect” (Porter et al., 2008) p.292. Fraser, in his standard text on clinical method for general practice (Fraser, 1992) p.30, states that a component of consultation competence is making an "accurate, legible and appropriate record of every doctor-patient contact".

Clinical records can be used for epidemiological research as well as for patient care. Archived medical records at the Mayo Clinic, for example, have been extensively used for purposes such as determining disease prevalence and for case control studies (Kurland & Molgaard, 1981). Patient groups have been understandably concerned about access to their personal information; patients should be informed that information about them may be used for research (Melton, 1997). Review of records made for clinical purposes is not always reliable for research (Thomas, Studdert, & Brennen, 2002). By focusing on what is needed to provide good clinical care, the medical and nursing records can appear incomplete and inadequate when reviewed for research purposes (Berg & Goorman, 1999). Consideration should also be given to the recording, storage and retrieval of data for research (Tange, Hasman, Robbe, & Schouten, 1997).

There have been moves towards patients having greater access to and an opportunity to contribute to their medical records (Fischbach, Sionelo-Bayog, & Delbanco, 1980), and towards patient held records (Ko, Turner, Jones, & Hill, 2010).

2.5.3. Content

Kumar and Clark (Kumar & Clark, 2012) in their textbook for medical students, emphasise the importance of clinical records:

Good records are the responsibility of everyone in the healthcare team … they are vital in providing best care, reducing error and ensuring patient safety.

They spell out both the content and quality that is expected in medical records:

Records should include: relevant clinical … information - history and examination; relevant findings, … ; diagnosis including uncertainties;
investigations arranged; test results; correspondence ... ; decisions made; information given to patients; consent; drugs or other treatments prescribed; and follow-up and referral. Criteria for good records include [that they are]: clear, accurate, legible and contemporaneous; dated and signed with printed name; written in pen (if not electronic); first hand; original - never altered (using a signed, dated additional note alongside any mistake); and kept secure” p.12.

Moran and her co-authors (Moran et al., 1988) call for greater standardisation. "Further study is required" they say "to gain insight into factors associated with less-complete chart documentation ..." p.864. They recommend the development of a theoretical framework that describes which clinical information is considered significant in all situations.

Cunningham and Wilson question the relevance of aspects of this traditional approach for modern general practice. The traditional medical model of the consultation, which they say, "is found around the world in the hospital record", embodies what they call a "linear" approach. The standard format covers the presenting complaint, past medical history, family history and so on, but may leave out other information about the encounter that is relevant for the patient or doctor (Wilson & Cunningham, 2013).

Several studies have concentrated on nursing documentation. Nursing records appear to be an incomplete and selective record of activity When looking at consistency between nursing records and observed nursing care, only 40% of activities are documented. Non-documentation is more likely when nurses are busy, and for educational as compared with physical tasks (De Marinis et al., 2010). Nurses document patient assessments much better than activities; except for the performance of tasks initiated by doctors (Kim & Park, 2005). Nursing entries, as compared with a nursing process model, contain a mixture of narrative and problem oriented entries, information about patient status and nursing interventions, but it is unusual to include a nursing diagnosis, or nursing care plan (Ehnfors & Smedby, 1993).

Nursing records are considered important to document nursing care, to express nursing knowledge, and for quality assurance (Ehnfors & Smedby, 1993). Nurses in one study in Iowa (Clancy et al., 2006) spent 13 to 28% of their work time doing documentation. Good documentation is equated with good care (Ehnfors & Smedby, 1993). Authors are critical of instances when entries in the patient record appeared to have been copied
from the doctors, or where entries were made as reminders of patient management requirements or tasks for the physicians (Ehnfors & Smedby, 1993). Some wonder if the quality of the information might be improved by using a predesigned form, but items recorded by nurses tend to be different from the items on the form (Ehnfors & Smedby, 1993). Others believe that the development of standardised nursing languages for the description of nursing care plans has the potential to help deal with some of the complexity (Clancy et al., 2006). Hospitals have tried to streamline compliance with the documentation process usually by adopting an interdisciplinary approach (Fernandez & Spragley, 2004).

There appears to be very little published information on documentation by ambulance staff, and none could be found that relates to New Zealand. In up to 80% of ambulance calls in the United Kingdom that do not result in transport to hospital, clinical documentation is not completed at all. Paramedics interviewed about this issue while attending a training day in Middlesbrough could describe few positive reasons for documentation. They were aware of the need to "cover their backs" but felt that this was more easily achieved by no documentation rather than incomplete forms. Documentation when it was completed was felt to accurately reflect the care provided. The paramedics often had difficulty completing documentation because of uncooperative, intoxicated or large numbers of patients. They were divided about the need for documenting calls to patients who fell but appeared to be uninjured. (Porter et al., 2008).

A study from Pittsburgh (Rittenberger et al., 2005) reviewed written records of 75 patients from each of four ambulance centres in who had been attended because of chest pain. The care provided was compared with the ambulance services' own protocols. Documentation of history was variable. All four services used the OPQRST criteria - onset, provocation, palliation, quality, radiation, region, severity, scale, and timing. Important items such as pain severity were recorded less than half the time. Specific examination items such as lung sounds were more often recorded. Treatment was also variable, though here may be a variation between what is done and what is recorded (Rittenberger et al., 2005).
2.5.4. Accuracy of Records

Speculation on the accuracy of clinical records, and on its relevance, is not new. Gordon’s “Doctor in the House” includes a fictionalised description of some patients reading their records:

For the first half-hour the patient amused himself by reading carefully through his folder of confidential notes, comparing in his mind what the doctors had written about him with what they told him to his face. After a while this became boring, so he read the morning paper (Gordon, 1952) p.107.

In some ways, not much has changed. The clinical record is not in fact a good summary of the patient's experience (DeVon, Ryan, & Zerwic, 2004). Information from patient questionnaires (Harlow & Linet, 1989), patient recall of significant medical events (Barr, Tonkin, Welborn, & Shaw, 2009; Tilley et al., 1985), tape-recordings of consultations (Romm & Putnam, 1981; Zuckerman, Starfield, Hochreiter, & Kovasznay, 1975), surveys of GPs (Kehoe, Wu, Leske, & Chylack, 1984), administration databases (Preen, Holman, Lawrence, Baynham, & Semmens, 2004), discharge diagnoses (Demlo, Campbell, & Spaght Brown, 1978), direct observation (Voyer et al., 2008), videotapes (Moran et al., 1988), and structured interviews (Beers, Munekata, & Storrie, 1990; DeVon et al., 2004; Langewitz et al., 2009; Payne, 1971), have all been shown to correlate poorly with the information in clinical records.

Clinicians tend to record those symptoms that support their diagnosis and leave out those that they perceive as less relevant (DeVon et al., 2004). Doctors record only a small amount of the information given by patients, condense what patients say, and make their own interpretation of it (Langewitz et al., 2009). The format of presenting information in the case records is different from the format in which it is obtained from the patient (Silverman et al., 2005). Nursing records are an incomplete and selective record of activity, especially when nurses are busy (De Marinis et al., 2010). Ambulance documentation of history and treatments is variable and often brief (Rittenberger et al., 2005).

Clinical records may leave out information that is important to the patient (Strange, Zyzansky, & Smith, 1998). Patients are less likely to report medical information such as hospitalisation and investigations (Harlow & Linet, 1989; Tilley et al., 1985).
Conditions that affect the patient's daily function, such as arthritis (Kehoe et al., 1984) or back pain (Skinner, Lincoln, & Kazis, 2005), are mentioned by patients but are less likely to be recorded by doctors. Psychosocial issues were even less likely to be recorded (Moran et al., 1988). Doctors are more likely to record more severe illnesses (Moran et al., 1988).

The poor accuracy of medication documentation has been a focus of several researchers who are concerned about patient safety. Around half of patients in most studies have at least one medication error (Ehnfors & Smedby, 1993). Complex medication regimes are less completely documented (Moran et al., 1988). Comparing the medication history in the clinical record against structured interviews with the patients, which includes over-the-counter medications, reveals even more errors. Researchers are concerned that the recorded medication history cannot be relied upon for research or clinical use (Beers et al., 1990).

In one study (Zuckerman et al., 1975) the patients, for reasons that were not examined, were more likely in a subsequent interview to recall and understand specific items if these items had been written by the doctor in their record. "The medical record," as the authors say, "is clearly an important feature of the structure of medical care."

Of relevance to acute myocardial infarction (AMI), in one study comparing clinical record with patient self-report (Pakhomov, Jacobsen, Chute, & Roger, 2008), only 74% of patients mentioning chest pain had it recorded in their clinical notes. 22% of patients who were listed as having chest pain in the clinical record did not mention it themselves. Patients in another study (DeVon et al., 2004) who did have AMI were likely to have chest pain recorded if this one was one of their symptoms, but fatigue, which was the second commonest symptom described by patients, was hardly ever recorded by their doctors. The authors conclude, "Clinicians may be recording those symptoms that support the AMI diagnosis and not those perceived to be less relevant. Findings suggest that the medical record is an inaccurate and inadequate source of information about patients' actual experience of AMI symptoms" (DeVon et al., 2004, p. 547).

Patients' self-reports of significant recent cardiovascular events, but not of more minor events, compare well with clinical records review and discharge diagnoses (Barr et al., 2009). Discharge diagnoses themselves do not always agree with clinical records.
review. The primary diagnosis is usually present but secondary diagnoses and co-
morbidities may not be. Data such as admission and discharge dates, age and sex do
tend to be accurate (Demlo et al., 1978).

2.5.5. Consistency

Pain recording in one study varied more between patients than between providers: those
patients with more severe pain or who were given opiates were more likely to have
their pain score recorded. Nurses in this study were more likely than doctors to record
the pain score after treatment, but not on presentation (Eder, Sloan, & Todd, 2003). By
comparison, a review of the charts of patients admitted with skin ulcers, found
differences between senior and junior staff rather than between disciplines (Zeleznik,
2003). A study of ambulance records found that documentation of history was variable
and incomplete as compared with guidelines (Rittenberger et al., 2005) but did not
compare the ambulance records with medical or nursing records.

DeVon et al, in their study of the clinical records of patients with AMI, found no
difference between the descriptions of doctors and nurses, although both differed from
the patients (DeVon et al., 2004). Gupta et al., as part of a larger study of the presenting
complaint of patients presenting to an urban ED with AMI, compared the records of
hospital staff. They concluded: “Comparison of the presenting complaint, as re-corded
in the database, the handwritten note of the triage nurse, and the handwritten note of the
physician, revealed perfect agreement in 75 randomly selected charts, which were
independently reviewed by 2 of the authors” (Gupta, Tabas, & Kohn, 2002).

2.5.6. Interdisciplinary Records

Several attempts have been made to update and improve interdisciplinary records. A
comprehensive intervention is described by Brunt et al. (Brunt et al., 1999). A team
made up of a range of health professionals from different departments updated the
documentation systems in two hospitals in Ohio “to achieve more complete and concise
interdisciplinary charting”. The intervention followed the patient through their contact
with the hospital. Different disciplines had previously kept their own records, rarely
referred to each other's notes and, as the care became more complex, ended up with a
bulky unusable document. The team emphasised elimination of duplication - "one time and one place only". The modifications introduced were a big change for some staff, particularly relying on information collected by other disciplines. Involvement of senior clinicians was critical. Evaluation was incomplete at the time of publication. The study was not strictly comparable to the New Zealand situation because of the volume of information previously collected, e.g. there were 13.6 pages of information per patient day in hospital and allergies were recorded in 16 places.

A few studies have compared documentation by doctors and nurses. Eder et al. (2003) studied the record of patients presenting with pain to an Emergency Department in Chicago. Only 23% had their pain score recorded before and 19% after treatment. Patients with more severe pain or who were given opiates were more likely to have their pain score recorded. Nurses were more likely to record the pain score after treatment. DeVon et al (2004), as mentioned, in their study of the clinical records of patients with AMI, found no difference between doctors and nurses. A review of the charts of patients admitted with skin ulcers, found more differences between senior and junior staff rather than between disciplines (Zeleznik, 2003).

Research on communication between hospital and primary care has focused on written discharge documentation, although telephone communication can also be important (Hollins, Vetch, & Hays, 2000). Communication of relevant information at discharge is an important part of patient care. GPs are frequently unhappy with letters that are late, are in a difficult format, or don't contain the information they want (Kripalani et al., 2007).

Clinical records, apart from facilitating patient care, can be used to express specialty identity and to negotiate intergroup conflict (Hewett et al., 2009). Studies of medical discourse, such as case presentations, labelled as "highly conventionalised linguistic rituals", describe the pejorative terms used by doctors to describe patients to each other (contrasting it with the humanitarian values usually associated with medical care), depersonalisation, use of the passive voice (except where technology is used as the agent), and emphasis on the subjective nature of the patient's experience (Anspach, 1988).

Studies of the dissemination of research findings and other new medical knowledge through spoken and written means, including conferences, journals and other
publications, and new information-sharing technologies (57) have also addressed the topic of medical discourse. Their conclusion, which also has implications for clinical settings, is that "The construction of knowledge is both an individual and a social task" (57) (p.649).

2.5.7. Function

Berg (Berg & Bowker, 1997; Berg & Goorman, 1999; Berg & Harterink, 2004) draws together much of the material about how records function in practice. Clinical records he suggests (Berg & Goorman, 1999) should not be considered as merely a copy or representation of an event. In fact, records play an active constitutive role in medical practice. They transform the social interactions that are part of clinical care through processes of reading and writing. In one clinical example, he describes how an oncologist summarises and paraphrases information from a patient to transform it into a medical document that can be used to describe the patient’s clinical condition and to make decisions about her care. In another example, the team caring for a patient interact to produce a document that can be used to organise and direct team care, but also reveal much about the relationships between team members. Berg and Bowker (1997) explain how clinical records play an important role in constructing the history and geography of the patient’s “body” (an abstraction based on that described by Foucault) and the political “body” of the organisation. There are multiple players and voices contributing to these constructions.

Clinical records, as Berg points out, play a key part in patient care (Berg & Goorman, 1999). The multiple viewpoints expressed in the clinical record have an important role in recording and directing the course of care (Poirier & Brauner, 1990). The clinical record transforms care from a personal activity to a social process (Jana, Tarja, & Tom, 2004). It can be seen as an artefact that mediates between the ideas of the institution and the needs of the patient (Berg & Harterink, 2004). It acts as an external memory – a tool to help us think. This can be as simple as writing a list of things to do, or of the patient’s symptoms (Jana et al., 2004).

“The medical record is much more than a static storage and retrieval device … Medical records are, in fact, conceptual systems that order reality in ways that can enhance, restrict or distort the depiction of that reality” (Donnelly, 1992), p.483. This
understanding also implies a political dimension (Berg & Harterink, 2004). Clinical records can be seen in one of two ways: as strengthening the importance of individuals, by attempting to describe their unique characteristics; or as depersonalising them by describing them as populations of people or as collections of body parts.

Jana et al. elaborate on the ways that we use artefacts as mediators of distributed social cognition (Jana et al., 2004). It is being increasingly recognised that humans use external tools as well as internal mental processes in cognition. An understanding of information sharing beyond the level of the individual, including the ways that information is represented, transformed, and propagated, is required to understand the concept of “distributed cognition”. The authors carried out a case study in a Swedish children’s hospital. The clinical record was seen to be used for multiple purposes beyond its obvious function of sharing information about patients. It acted as an external memory, for communication between staff at different times and in different categories (effectively transforming it from a personal to an interpersonal record), and as a visible signal of patients needing to be seen. The clinical record acts as a tool that helps transform care from a personal activity to a social process that can only be understood by looking at its function at this level.

2.5.8. The Record as Text

Modern society places increased importance on the principle of documentation (Wolff, 2004). Texts are essential to the existence of organisations. They mediate, regulate, authorise and co-ordinate the actions of individuals. The study of texts can expand our understanding of institutions (Smith, 2001). “The organization of text through patterns and structures … makes it possible … to take those texts, unpick them, and show how they work” (Parker, 2004) p.310.

To make sense of the ways that the records are constructed, it is possible to adapt some of the ideas and methods of conversation analysis (Goodwin & Heritage, 1990), which has been used to analyse spoken conversation in workplaces (Rawls, 2008), including in health care settings (Maynard & Heritage, 2005).
One example is Garfinkel’s pioneering ethnomethodological study: good organizational reasons for “bad” clinic records (Garfinkel & Bittner, 1967), which draws together many of the preceding themes:

When any case folder [medical record] was read as an actuarial record its contents fell so far short of accuracy as to leave us puzzled as to why “poor records” as poor as these should nevertheless be so assiduously kept. On the other hand, when folder documents were regarded as unformulated terms of a potential therapeutic contract, i.e. as documents assembled in the folder in open anticipation of some occasion when the terms of a therapeutic contract might have to be formulated from them, the assiduousness with which folders were kept, even though their contents were extremely uneven in quantity and quality, began to “make sense.

Conversation analysis reveals that conversations are socially organised, doing more than just exchanging information. It examines language as social action, that can be taken as systematically organised, can be analysed, and helps to make sense of the “messiness” of everyday speech (Wooffitt, 2005). Participants in a conversation show an awareness of both meaning and context (Heritage, 2005). Institutions rely on people, through their interactions, to make shared sense of events (Heritage, 2001). “Actors succeed through the sequential progression of interaction to display their understandings of its constituent events … thus making possible the achievement of a shared interactional world” (Taylor & Cameron, 1987) p.104.

The potential for adapting conversation analysis and related methodologies will be discussed further in the Methodological Framework section.

2.5.9. Electronic Records

Clinical care, like most areas of life, has witnessed an increasing use of information and communication technology. The idea of computerising clinical records is not new. Weed, in 1968, was writing “it will be necessary to develop a more organized approach to the medical record … and a more positive attitude about the computer in medicine” (Weed, 1968) p.652. In the 1970s, when computers were in the early stages of
development, doctors saw them as a way of storing administrative and clinical information about patients for clinical care and research.

Card and Good in 1974, when computers were in the early stages of development, wrote the following insightful piece, anticipating some of complexities likely to be involved in developing electronic records:

The amount of information used nowadays in the investigation of a patient may be enormous, and its sheer bulk presents a formidable problem in storage. The use of computers for medical records has been considered carefully. The idea that the essential details of any patient could be readily obtained from some central computer file is attractive. While the technical problems are of a high order, the most difficult and important is the analysis of the place of records in the logical structure of the kind of medical practice that has been outlined. It may be asked how the theory of rationality can be applied to the task of medical record keeping, where the concern is with clinical records required for the care of patients. Records also contain administrative data about patients, i.e. the diagnosis, surgical operation, length of time spent in hospital, etc. Such data are readily encoded and transferred to magnetic tape. The problem lies in knowing how much clinical data should be retained. Many doctors feel that all data from a patient should be recorded and kept since it may be useful when the patient next has an illness. Medical records also provide information of potential value for research. In general these two aims are incompatible.” (Card & Good, 1974) p.60.19.

Although in more than 40 years much about the nature of electronic recording, clinical records, and clinical care, has changed, many of the issues are still the same.

The emergence of electronic health records, when all previous records have been on paper, can be seen to have changed our understanding of the way things are, as have Kant’s “black swans” (before their discovery, all known swans were white) (Nassim, 2007). Computers have transformed clinical practice, and have forced us to re-evaluate out theoretical constructs of the nature of clinical records and clinical practice.

This includes, however, a need to re-evaluate our understanding of the purposes and applications of paper-based records. There are some important similarities between
paper-based and electronic record systems. The adoption of electronic medical records requires an understanding of the way that records are structured and used (Nygren & Henriksson, 1992). Fitzpatrick (2000) argues that clinical records, either paper or electronic, should be viewed as working documents. There is no single record – more a collection of related documents with different authors, intended audiences, intended life-spans, locations, and purposes.

In a later paper, Fitzpatrick uses observation and interviews to describe and interpret the nature of clinical records in a large metropolitan Australian hospital (Fitzpatrick, 2004). Paper records, she points out, have traditionally been conceptualised as a passive retrospective information repository and acknowledged as a poor tool for facilitating patient care. A more modern and complete conception of paper records, she believes, is required to develop electronic health records that support clinical practice.

Information technology systems as implemented in health care settings often overlook people and organisational factors (Bossen, 2007). The developers of computerised systems need to understand and consider the complexity of healthcare (Poon et al., 2006). Medical records are partly an attempt to display complex information in a form that can be used to assist decision making. They should reflect clinicians’ ways of working, such as explaining unique patient factors, or justifying reasons for deviating from a standard practice, rather than require clinicians to adapt to the computer’s constraints (Nygren & Henriksson, 1992). Narrative is important to clinicians and patients. The recording of the patient’s story, rather than merely storing and retrieving data, is important to facilitate communication between health care providers (Tange et al., 1997).

Electronic health records document different information from that in paper-based records. They may contain more information but are less patient-centred (Shachak & Reis, 2009). Doctors who are good at using computers put more information than others (Shachak & Reis, 2009). One Korean hospital found that fewer (but longer) words were used to describe the presenting complaint in electronic record. The volume of information was the same (Boo, Noh, Kim, & Kim, 2012). It is hard to extrapolate from this study as Korean is structured differently from English and other languages (Pinker, 2003). It does suggest however that the language used in electronic medical records is likely to be different from paper-based records.
Nowlan, an epidemiologist interested in medical terminology, describes how the logic of computers can be adapted to interpret medical semantics “Medicine” he says “has a highly developed, structured, and widely shared system of understanding, that is derived from medical science, embodied in clinical practice, and reflected in medical language. This does not mean that medicine is an entirely rational and well understood discipline. This is far from the truth.” (Nowlan, 1993) p.16.

Berg and Bowker (1997) make the case for a nursing contribution and language that is different from the dominant medical model. Some academic nurses would like to see the selection of a standardized terminology, developed by nurse educators who teach the nursing process, that reveals and measures the contribution of nursing to patient care (Lundberg et al., 2008). A survey of physicians, in contrast, drew comments that nurses, entering into the computer what they thought was useful, or required, did not document the type and detail of information that the physicians would have expected (Green & Thomas, 2008).

Consideration should also be given to the recording, storage and retrieval of data for research (Tange et al., 1997). An example is a multicentre internet tracking registry of 15608 patients with a suspected acute coronary syndrome (Lindsell et al., 2006). People introducing electronic records should be conversant with the nature of clinical records if they expect to use the information within them for an expanded range of roles (Berg & Goorman, 1999).

2.5.10. Conclusion

Clinical records are not simply a copy of an event, but have developed over time into a sophisticated tool that can be used to guide and organise patient care. This function is likely to be improved with the development of interdisciplinary and electronic health records. The study of clinical records can allow insights into the ways that care is provided and organised by a clinical team. The Findings chapter will examine how the records in this study function in practice and the Discussion of Findings and Conclusion for Clinicians and Researchers chapters will examine further how the nature of clinical records is related to the process of patient care.
"The presenting problem of chest pain is common yet very threatening to both patient and doctor because the underlying cause in many instances is particularly lethal" (Murtagh & Rosenblatt, 2015). p.432.

AMI is an important clinical condition. There is a vast amount of available information published on myocardial infarction, which comes up in even the most selective literature search. Much of it is potentially relevant to this study in that it helps explain, through a clinical lens, why different providers caring for patients with suspected AMI recorded what they did. This is not a clinical study of AMI, which would be outside the scope of the research. AMI is used merely as an exemplar.

I shall summarise what is known about suspected AMI, starting with historical descriptions, and definitions. I shall then go over the usual clinical features, concentrating on the history of the presenting complaint, and the Troponin I (TNI) test that I am using to identify patients for this study. Finally, I shall present what is known about patients seeking help for suspected AMI, particularly the decision to use an ambulance, as most patients or their doctors made in this study.

3.1. Historical Descriptions

In 1768, William Heberden, an English physician, and “a careful observer of a range of medical conditions” (Jay, 2000), published a medical description of a series of cases with a condition he labelled “angina pectoris”:

"They who are afflicted with it, are seized while they are walking ... with a painful and most disagreeable sensation in the breast, which seems as if it would
extinguish life, if it were to increase or continue; but the moment they stand still, all this uneasiness vanishes" (Heberden, 1772, cited in Silverman, 1987).

There had been earlier non-medical descriptions of chest pain in English (Kahn & Mehta, 2002), and much earlier medical descriptions from Ancient Greece (Lenfant, 2010). Heberden appears not to have linked the chest pains he described with the coronary arteries, or even the heart (Herrick, 1942). It is now recognised that angina arises from the heart and is related to insufficient blood supply to cardiac muscle, a condition which we refer to as “ischaemia” (Burns, 1809).

Myocardial infarction has come to be seen as a modern disease (Thompson et al., 2013) linked with lifestyle (Yusuf et al., 2004) or psychological factors (Spittle & James, 1977). Evidence of coronary artery obstruction however has been found in several ancient populations (Thompson et al., 2013), including Egyptian mummies (David, Kershaw, & Heagerty, 2010) and a frozen human who died more than 5000 years ago in what is now Austria (Murphy et al., 2003).

3.2. Definitions

Heberden was describing what we would now regard as “stable angina”, occurring with exertion (Kumar & Clark, 2012). Angina can be regarded as stable when it is not a new symptom and when there is no change in the frequency or severity of attacks (Kumar & Clark, 2012). "Unstable angina” refers to pain of recent onset, or a deterioration in previous stable angina with symptoms frequently occurring at rest (Kumar & Clark, 2012).

Unstable angina is one of the “acute coronary syndromes” (ACS), which also includes AMI. AMI implies recent cardiac muscle damage. AMI is further classified as the generally more severe “ST elevation myocardial infarction (STEMI)” or “non-ST elevation myocardial infarction” (NSTEMI)” depending on the changes if any to the ST segment of the electrocardiograph (ECG) (Kumar & Clark, 2012).

The standard laboratory test for the diagnosis of AMI is the measurement in the blood of cardiac troponins (Keller et al., 2009). In the latest definition of AMI, history remains important but is no longer an essential component of the diagnosis (Thygesen et al., 2012). The diagnosis of AMI requires a Troponin rise (or sudden death before
this occurs) and one of: symptoms of ischaemia; ST changes, new left bundle branch block or Q waves (also on ECG); an occluding thrombus on angiography (a contrast X-ray of the coronary arteries using cardiac catheterisation); or new regional wall abnormalities on imaging (Thygesen et al., 2012).

3.3. Chest Pain and AMI

Ischaemic heart disease remains the leading cause of death in New Zealand (Health, 2014). In the United States (US) there are 865,000 AMIs per year. 20% of men and 30% of women having AMI will die within a year (Krumholz et al., 2006). There is also a financial cost. A Swedish study determined the mean cost to the hospital of patients attending the emergency department (ED) with chest pain as 3216 US dollars (Forberg, Henriksen, Edenbrandt, & Ekelund, 2006).

Chest pain, the primary feature of ischaemic heart disease, is common in the general population. Few people will suspect that they have any serious problem and almost all have nothing in particular wrong with their heart (Eslick, Jones, & Talley, 2003). Chest pain is not always related to myocardial ischaemia (Farrell & Dempsey, 2011) p. 672. Most chest pain is managed in primary care. History, at least in primary care, is the main tool in diagnosis (Svarvasdottir, Jonasson, Gudmundsson, & Fjeldsted, 1996).

Most chest pain is not associated with heart disease. 5.6 million patients visit US Emergency Departments (EDs) annually with chest pain (Goldman & Kirtane, 2003). Of patients presenting to EDs in the US (Kohn, Kwan, Gupta, & Tabas, 2005) and England (S. Goodacre, 2005), 0.1 to 0.5% have AMI. A new diagnosis of AMI in primary care is rare. Of 26,620 consultations with 59 general practitioners (GPs) in Switzerland, only four of the patients had AMI (Verdon et al., 2008). Most chest pain is not associated with heart disease (Lenfant, 2010). About half of patients admitted from ED with suspected acute coronary syndrome are eventually diagnosed with a non-cardiac condition (Magid, Rumsfeld, & Masoudi, 2004).

To add further confusion, a large number of patients with AMI, up to half in some studies, present without pain (Gupta et al., 2002), and these patients have a higher mortality (Coronado, Pope, Griffith, Beshansky, & Selker, 2004).
GP and ED services can be seen as complementary (Moll van Charante, van Steenwijk-Opdam, & Bindels, 2007). Both in fact spend a minority of their time seeing conditions that doctors would classify as emergencies (Giesen, 2006). Serious cardiovascular disease, and hospital admissions, amongst ED patients, are more common in GP referred than self-referred patients and most common in patients brought in by ambulance (Buntinx et al., 2001).

Rural and urban populations may be different in the ways they present with acute chest pain. A Swedish study (Karlson et al., 2000) found that urban patients presented more often to hospital, were less likely to have previous heart disease, were less likely to be diagnosed with heart disease, were more often sent home, and were less likely to be prescribed medications. The mortality in the two groups was similar (Karlson et al., 2000).

In an earlier audit of AMI in the rural hospital studied for this thesis, 196 patients with confirmed AMI were treated from 1995–1999. 140 of the patients were managed within and discharged from the rural hospital, 11 patients died in hospital. 45 were transferred to base hospital. A further four patients died within 30 days and another 11 within one year (Fearnley et al., 2002).

3.4. **Clinical History**

As McWhinney reminds us in his standard textbook of family medicine, (McWhinney & Freeman, 2009) "The history alone [is] enormously effective in assessing the probability of coronary disease." (p. 179).

Julian, a leading cardiologist, in a 1974 medical text (Julian, Kitchin, Montgomery, & Bouch, 1974), describes the symptoms of ischaemic heart disease in some detail:

Discomfort ... behind the sternum ... may radiate to the neck, the lower jaw, the shoulders and the arms as far as the hands, especially on the left side ... patients ... liken the unpleasant sensation to a heavy pressure on the chest or to a tight band drawn around it ... the words 'gripping', 'tightness', heaviness', 'pressure' are commonly used, whilst it is sometimes said to be 'like indigestion'. It ... may

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be called 'sharp' by those who equate sharpness with severity. Characteristically ...
... is provoked by exercise and relieved by rest. ... It is especially produced by
exercise taken in the cold or after a meal … The pain of myocardial infarction ...
is usually much more severe. ... Symptoms liable to accompany the pain are
extreme weakness, nausea and occasionally vomiting ... In many patients,
breathlessness accompanies or follows the onset of the pain. In some it may
dominate the picture and the history of pain is elicited only on direct
questioning. Syncope may occur at the time of acute infarction (Julian, Kitchin,
Montgomery, & Bouch, 1974) p.16.2-16.4.

Kumar and Clark, in a more current medical textbook (Kumar & Clark, 2012), give a
briefer description of the chest pain of angina, which they say is generally described as
'heavy', 'tight' or 'gripping', typically central and retrosternal, may radiate to the jaw and
or arms, or both, and can range from a mild ache to a severe pain. They add that it can
provok e sweating and fear, and may be associated with breathlessness. Classical
angina, of the type described by Heberden, is provoked by physical exertion, especially
after meals and in cold, windy weather or by anger or excitement. It is relieved (usually
within a few minutes) by rest or glyceryl trinitrate (a medicine that improves blood
flow through the coronary arteries). Occasionally, it disappears with continued exertion
(Kumar & Clark, 2012). Since Heberden’s time, chest pain, similar to the pain of
angina, has also been recognized as the most common clinical manifestation of acute
myocardial infarction (Coronado et al., 2004).

Murtagh, in the 2015 edition of his general practice textbook (Murtagh & Rosenblatt,
2015), advises, for patients with suspected ischaemic heart disease "the pain should be
analysed into its usual characteristics: site and radiation, quality, intensity, duration,
onset and offset, precipitating and relieving factors and associated symptoms" (p.434).
Farrell and Dempsey similarly recommend that assessment of the patient with chest
pain include details of severity, character, location, radiation, duration, precipitating

A common feature of the patient’s description is the use of metaphor (Jairath, 1999).
Patients employ metaphors to convey the quality, intensity and impact of their
symptoms (Jairath, 1999), as people do routinely in expressing other complex concepts
(Lakoff & Johnson, 1980). Health care providers may use different metaphors to
interpret the same illness (Harrington, 2012). Patients may have problems expressing the significance of their symptoms because of "lack of congruence between the clinician’s and patient’s frames of experience" (Jairath, 1999) p.283.

Cardiovascular symptoms, apart from pain, include shortness of breath, oedema, palpitations, fatigue and dizziness (Farrell & Dempsey, 2011) p.672. A 1995 position statement from the American College of Emergency Physicians on the approach to the stable patient with non-traumatic chest pain or discomfort (American College of Emergency Physicians, 1995) recognises this reality, and includes comprehensive recommendations on the taking and recording of history that go beyond the history of the presenting complaint:

Solicit and record a history that includes: character of pain - onset, severity, quality, location, radiation, frequency, duration, similarity to or differences from previous episodes, precipitating or mitigating factors; relationship to exertion stress respiration or movement, response to therapy; associated symptoms ... pre-existing cardiac conditions, hyperlipidaemia, medications, allergies, previous surgery, relevant diagnostic studies ... review of nursing assessment and prehospital care; previous ECGs; and previous medical records (Physicians, 1995).

There are disparities in the treatment of chest pain between patients of different ages, genders, and ethnic groups. Poor communication is again likely to be a factor because of the central importance of history in making a diagnosis and selecting appropriate investigations (Farmer & Higginson, 2006). In one study of an ED in an ethnically diverse area of London (Farmer, Roter, & Higginson, 2006), the doctors extensively used leading questions, interrupted patients, and ignored much of what patients said, tried to control the interview, and failed to establish rapport. These features were more marked when the patient spoke English as a second language.

There are differences in the way that male and female patients present symptoms of acute coronary syndromes (Milner, Vaccarino, Arnold, Funk, & Goldberg, 2004). Women, older patients and patients with diabetes or heart failure are less likely to report pain (Coronado et al., 2004). This may lead to delayed diagnosis and treatment and a higher mortality (Canto, Schlipak, Rogers, Malmgren, & Frederick, 2000). Older patients are less likely to report arm pain or vomiting (R. Goldberg et al., 2000).
Women and men are different in the way they describe the nature and significance of their pain, and the ways they are interpreted by health professionals (Vodopiutz et al., 2002). Women are more likely to report back, neck and jaw pain, and nausea (R. Goldberg et al., 2000). Many women have prodromal symptoms, which tend to be ignored. Chest symptoms may be poorly localised and not described as "pain" (though they tended to be recorded as pain by health professionals). (Albarran, Clarke, & Crawford, 2007)

In summary, and of relevance to this study, the way that an older rural woman presents with the symptoms of AMI, may be different from another person, for example a young urban-based man.

3.5. Investigations

Guidelines from the British National Institute for Health and Care Excellence (NICE) advise that stable angina can be diagnosed on history alone. ECG and troponins are recommended for people with suspected (based on the patient’s history) acute coronary syndromes. Further investigations may be appropriate, but as a commentary on the guidelines points out “These guidelines may recommend fewer investigations than currently conducted in usual clinical practice” (Skinner, Smeeth, Kendall, Adams, & Timmis, 2010).

Troponins, which are used as a means of finding patients for this study, have become the standard laboratory tests for diagnosis of AMI (Keller et al., 2009). Troponins are found in all muscle, but the cardiac forms are immunologically distinct. They were first discovered in 1963. Both Troponin T (TNT) and Troponin I (TNI) are elevated in AMI and related conditions. (Mew & Priestley, 2008). Along with history and other clinical features they are useful in diagnosis (Keller et al., 2009) and prognosis (Ohman et al., 1996) of AMI.

Exercise ECG (Blattner et al., 2014), echocardiography (Sapia et al., 1991), exercise echocardiography (Marwick, Nemec, Pashkow, Stewart, & Ernesco, 1992), computed tomography (CT) (Wallis, Manghat, & Hamilton, 2012) in selected patients (Hoffmann et al., 2009), and nuclear scanning (Varetto, Cantalouo, Altieri, & Orlandi, 1993), can be used in diagnosis. Angiography is appropriate if there is a high likelihood of
ischaemic heart disease or if intervention is being considered (Skinner, Smeeth, Kendall, Adams, & Timmis, 2010).

3.6. Diagnosis

Typical symptoms of AMI are chest discomfort, sweating, dyspnoea and lightheadedness, but few patients with AMI have all of these symptoms (Ryan et al., 2007). Reasons identified for incorrect diagnoses include atypical or obscure presentation of AMI (Zarling, Sexton, & Milnor, 1983), and failure to consider AMI as a possibility (Barraclough et al., 2013). About 2% of AMI patients presenting to ED are misdiagnosed (Magid et al., 2004).

ECG is the single most important investigation for AMI, but ECGs are often normal in people with myocardial ischaemia (Lee & Goldman, 2000). Blood tests such as troponins are a good predictor of risk (Goldman & Kirtane, 2003) but are non-specific for patients with undifferentiated presentations (Lee & Goldman, 2000). They are insensitive in the early stages of AMI (Lee & Goldman, 2000) and to exclude the diagnosis of AMI must be repeated if negative (Goldman & Kirtane, 2003). There are elements of the chest pain history that are associated with increased or decreased likelihoods of a diagnosis of AMI. None of them however can identify a group of patients that can be safely discharged without further diagnostic testing (Swap & Nagurney, 2005).

Numerous diagnostic scores have been developed and trialled to try to predict outcomes in patients with symptoms of possible AMI admitted to hospital (Goldberg et al., 2009), (Pollack, Sites, Shofer, Sease, & Hollander, 2006), (Body et al., 2010), presenting to ED (Ramsay, Podogrodzka, McClure, & Fox, 2006), (Hess et al., 2012), (Than et al., 2011), (Speake, Teece, & Mackway-Jones, 2003), (Miller et al., 2004), calling an ambulance (Svensson, Issson, Axelsson, Nordlander, & Herlitz, 2003) or presenting to GPs (Goodacre, Angelini, Arnold, Revill, & Morris, 2003), (Haasenritter et al., 2012). Outcomes include: the need for immediate assessment in ED (Speake et al., 2003); need for further investigation (Hess et al., 2012); likelihood of coronary heart disease (Haasenritter et al., 2012), ACS (Goodacre et al., 2003; Ramsay et al., 2006) or AMI (Ramsay et al., 2006), (Hess et al., 2012), (Svensson et al., 2003); length
of hospital stay (Ramsay et al., 2006); a subsequent event (Miller et al., 2004); and mortality (Ramsay et al., 2006), (Pollack et al., 2006), (Than et al., 2011).

Clinical items included are: male sex (Goodacre et al., 2003; Pollack et al., 2006), (Miller et al., 2004); age (Goodacre et al., 2003; Miller et al., 2004) over 50 (Hess et al., 2012), or 65 (Goldberg et al., 2009), or 55 for men and 65 for women (Haasenritter et al., 2012); previous coronary artery disease (Goldberg et al., 2009), (Pollack et al., 2006), (Hess et al., 2012), (Miller et al., 2004), (Haasenritter et al., 2012); current or previous smoking (Goodacre et al., 2003); diabetes (Miller et al., 2004); three or more risk factors for ischaemic heart disease (Goldberg et al., 2009); use of aspirin (Goldberg et al., 2009); angina events in the preceding 24 hours (Goldberg et al., 2009); central chest pain, right arm or bilateral arm pain (Body et al., 2010; Goodacre et al., 2003); indigestion or burning type pain (Goodacre et al., 2003); pain typical for acute coronary syndrome (Hess et al., 2012), (Speake et al., 2003); the patient assumes a cardiac origin of pain (Haasenritter et al., 2012); pain worse with exercise (Haasenritter et al., 2012); sweating (Speake et al., 2003) (Body et al., 2010); nausea (Speake et al., 2003); vomiting (Body et al., 2010); a shorter time after the onset of symptoms for the ambulance to attend the patient (Svensson et al., 2003); pain not reproducible by palpation (Haasenritter et al., 2012); ST changes on ECG (Goldberg et al., 2009), (Svensson et al., 2003) not known to be old (Hess et al., 2012); elevated Troponin (Goldberg et al., 2009), (Svensson et al., 2003) on arrival or at six hours (Hess et al., 2012).

Scores with multiple elements that include aspects of history seem to be more predictive of outcome (Ramsay et al., 2006). These scores combined with Troponin testing have become better at ruling in or ruling out AMI than the clinical judgement alone of ED physicians (Body, Cook, Burrows, Carley, & Lewis, 2014).

3.7. Management

Once AMI is suspected, further investigations and management then depend on history and examination findings (American College of Physicians, 1995).

Since the 1960s, the care in hospital of patients with suspected AMI has been concentrated in coronary care units (CCUs) (Desmond Julian, 1987) to manage cardiac
arrhythmias (Desmond Julian, Valentine, & Miller, 1964) and provide cardiopulmonary resuscitation (De Bard, 1980) and defibrillation (Beck, Weckesser, & Barry, 1956) where needed. The CCUs became the theatre in which the drama of AMI is played out. This approach did not result in the expected overall improvement in mortality (Julian, 2001), with at least one study showing that selected patients did as well at home (Mather et al., 1976). Mortality has improved with the widespread adoption of measures to unblock the coronary artery such as surgical revascularisation (Greason & Schaff, 2011), thrombolysis (the injection of medications to dissolve the fibrin component of the clot) (Ridker, Marder, & Hennekens, 1993), percutaneous coronary intervention (using a cardiac catheter to unblock the artery) (Keeley, Boura, & Grines, 2003) or (increasingly) both (Cantor et al., 2009). Direct admission to coronary care can improve the timely administration of thrombolysis for patients with STEMI (Wilmhurst, Purchase, Webb, Jowett, & Quinn, 2000).

Mortality from AMI declined through the 1970s, probably mainly because of better prevention, but without a reduction in in-hospital mortality (Gheorghiade et al., 1996). Several effective therapies were introduced in the late 1980s. In-hospital mortality then declined during the 1990s (Gheorghiade et al., 1996), which was best accounted for by increased use of beta blockers, angioplasty and thrombolysis (Gheorghiade et al., 1996).

Chest pain units have been developed in urban hospitals to care for patients who have chest pain but are at lower risk of ACS. This is intended to avoid two problems: overcrowding of coronary care units with patients (up to 80%) who do not have ACS; and the discharge from ED of patients who do have AMI, and have a high mortality if discharged without diagnosis (Siebens et al., 2007).

African American patients are less likely than other Americans to have urgent investigations (López, Wilper, Cervantes, Betancourt, & Green, 2010) or treatments (Johnson, Lee, Cook, Rouan, & Goldman, 1993). Similar disparities have been noted for Maori and Pasifika patients in New Zealand, in spite of higher morbidity and mortality rates from coronary artery disease (Tukuitonga & Bindman, 2002).

Women tend to have atypical symptoms and longer prehospital delays (Ottesen, Dixen, Torp-Pedersen, & Køber, 2004). There are geographical variations in prehospital delay (Goldberg et al., 2009). Living rurally can be a barrier to accessing health care.
Patients with STEMI tend to present more quickly than those with NSTEMI or unstable angina (Goldberg et al., 2009).

3.8. Ambulance Use

“The patient’s ability to recognise cardiac symptoms and to know what to do when they occur is essential for effective self-care management” (Farrell & Dempsey, 2011) p.670.

Patients with chest pain can seem surprisingly reluctant to call an ambulance, as shown by studies in Britain (Horne, James, Petrie, Weinman, & Vincent, 2000; Leslie, Urie, Hooper, & Morrison, 2000), the United States (Becker, Larsen, & Eisenberg, 1996; Rucker, Edwards, Burstin, O’Neil, & Brennan; Svenson, 2000; Weiner, Wu, Bhatti, & Goetz, 2009), Australia (Hitchcock, Rossouw, McCoubrie, & Meek, 2003; Ingarfield, Jacobs, Jelinek, & Mountain, 2005; Kerr, Holden, Smith, Kelly, & Bunker, 2006; Lozzi, Carstensen, Rasmussen, & Nelson, 2005), Sweden (Ahl, Nyström, & Jansson, 2006; Johansson, Stromberg, & Swahn, 2004; Thuresson et al., 2008) of survivors of AMI (Ingarfield et al., 2005; Kerr et al., 2006; Thuresson et al., 2008; W, A, J, & C, 2000), ACS (Johansson et al., 2004), of general attendees to ED (Rucker et al.), patients attending hospital with chest pain (Hitchcock et al., 2003; Weiner et al., 2009) or with “symptoms suggestive of AMI (Lozzi et al., 2005), and patients with cardiac symptoms who either died or were admitted to hospital (Becker et al., 1996). In these studies, 21 to 60% had called an ambulance (Svenson, 2000; Thuresson et al., 2008; W et al., 2000; Weiner et al., 2009). 55 % had called a GP first (W et al., 2000). 44% who called their GP said they were advised not to come by ambulance (Kerr et al., 2006).

People view calling an ambulance as a major decision. Most hesitate and try initially to manage on their own (Ahl et al., 2006). They believe they are not sick enough (Johansson et al., 2004; Svenson, 2000), the symptoms are not serious (Yusuf et al., 2004), or will go away (Horne, James, Petrie, Weinman, & Vincent, 2000). Older (Ahl et al., 2006; Weiner et al., 2009) and poorer (Svenson, 2000) patients are more likely to call an ambulance, as are patients who have had previous AMI, have knowledge of AMI symptoms (Thuresson et al., 2008), live far from the hospital (Kerr et al., 2006), have more severe symptoms (Ahl et al., 2006; Svenson, 2000), have associated symptoms (Thuresson et al., 2008), or symptoms typical of AMI (Kerr et al., 2006).
Patients are more likely to call an ambulance at the weekend (Kerr et al., 2006). Availability of a primary care doctor is not predictive of ambulance use (Rucker et al.). A number of systems issues have been identified as possible factors contributing to underuse of emergency services (Govindarajan & Schull, 2003). Transport rates in one study were higher in poorer communities and for older individuals (Ohshige, 2008). There is also the possibility of overuse – in one Irish study, 7.4% of ambulance calls were judged as "not indicated" by Emergency Department (ED) doctors (Little & Barton, 1998).

Only 25% call for help within one hour (Horne, James, Petrie, Weinman, & Vincent, 2000) and 40% take more than four hours (Wu et al., 2000). Delay in presentation is more likely for older patients and those with diabetes or previous AMI, possibly because these patients do not always present with typical symptoms (Pattenden, Watt, Lewin, & Stanford, 2002). Older patients, female patients, and patients from lower socioeconomic status neighbourhoods also have to wait longer for an ambulance and take longer to get to hospital (Govindarajan & Schull, 2003). Patients who have symptoms out-of-hours, or who see a GP first, tend to present later to hospital (Ingarfield et al., 2005). Delay is not likely to be caused by unfamiliarity with symptoms, as previous ischaemic heart disease is actually associated with increased delay (Mumford, Warr, Owen, & Fraser, 1999). Interviews of patients who were admitted to hospital with a second AMI suggest that previous negative experience of the health service may sometimes be a factor (Pattenden et al., 2002).

Most authors recommend further education (Dracup et al., 1997; Johansson et al., 2004) for patients to recognise symptoms of AMI and call an ambulance to transport them directly to hospital for thrombolysis and other emergency treatments (W Leslie et al., 2000). The patient's point of view, however, should be taken into account when professionals are deciding when resource use is inappropriate (Ahl et al., 2006). Patients or their GPs are presumably making the decision that patients at higher risk are being transported by ambulance. Some believe that self-transport will be faster (Johansson et al., 2004). The fact that knowledge of AMI symptoms increased use of emergency services has implications for educational initiatives (Thuresson et al., 2008).
Paramedics can be as least accurate as junior ED doctors at interpreting ECGs showing features of ischaemic heart disease (Whitbread, Leah, Bell, & Coats, 2002), diagnosing AMI (Bright & Pocock, 2002), and diagnosing arrhythmias (White et al., 1973). In one very old study the presence of a doctor on ambulance transfers of patients with suspected AMI to hospital made no difference to mortality (Hampton, Dowling, & Nicholas, 1977). Paramedics are not always in agreement with ED doctors as to determining which patients need to come to hospital by ambulance (Pointer et al., 2001) and which ones could safely use alternative transport (Hauswald, 2002). Their compliance with guidelines may be incomplete (Figgis, Slevin, & Cunningham, 2010).

Patients who choose to come to hospital by ambulance have access to defibrillation if required (Thuresson et al., 2008). Survival from out-of-hospital cardiac arrest is rare (Wilma Leslie, Fitzpatrick, Morrison, & Watt, 1996) but is more likely if the event is witnessed by pre-hospital providers (O’Keeffe, Nicholl, Turner, & Goodacre, 2010).

Delay in presentation is associated with further delays in revascularisation (Saczyński et al., 2008). Patients who require thrombolysis in hospital receive it earlier if they come by ambulance (Hitchcock et al., 2003). The benefits of thrombolysis are time-dependent and in some localities can be administered by pre-hospital providers (Keeling, Hughes, Price, Shaw, & Barton, 2003), mainly paramedics (Kowalenko, Kereiakes, & Gibler, 1992), but also nurses (Foster, Dufendach, Barkdoll, & Mitchell, 1994), and GPs (Fearnley et al., 2002), sometimes including transmission of ECGs to hospital-based consultants (Keeling et al., 2003). Time to thrombolysis is greatly improved compared with hospital-based services (Foster et al., 1994). And mortality is improved even after adjustment for co-morbidities (Bjorklund, 2005). Community thrombolysis has been successfully trialled in New Zealand rural communities (White, 2001), including in Central Otago (for patients coming to the study hospital from a town just over one hour away) (Fearnley et al., 2002), and in Coromandel (Nunn, Lennane, Marriott, & Wilson, 2001).

3.9. Conclusion

AMI is an important but (outside of hospital) relatively uncommon clinical condition. It has a well-described typical presentation, that is not always present in individual patients or identifiable patient groups. Diagnosis can be difficult and relies on a
combination of history and investigations. The central drama of an AMI event can be played out in several settings. Patients can present in different ways and to different parts of the health service. These features are likely to be reflected in what is recorded by the various providers in the clinical record, as will be described in the Findings chapter.
Chapter Four: Methodology and Methods

4.1. Context for the Study

As this is a case study, conducted by myself as a participant observer - terms that will be more fully explained below under Methodological Framework - it is essential in this section to present some information about the context. This will include how the idea for the study was developed, my personal and professional background, and information about the hospital where the study took place, as well as a detailed description of communication between the different providers about patients admitted to the hospital, and how it is recorded.

4.1.1. Background to the Study

The idea for this study came from a fifth-year medical student on a clinical attachment to the study hospital, who pointed out that, in our clinical records, different health care providers write different descriptions of the same clinical events. I had not previously been aware of this, but found it interesting. I developed the idea of studying this phenomenon as part of a research methods paper in Dunedin, and with my supervisors in Wellington. This process will be described in 4.3.

I chose to focus on a single clinical presentation: suspected acute myocardial infarction (AMI). This is an important condition, relatively common (at least in hospital practice), has a well-described typical history that is important in making the diagnosis, and can be inferred from a clinician requesting a Troponin I blood test. The relevant clinical details will be summarised in 2.6.

4.1.2. Personal Background

As a participant observer involved in qualitative data analysis, it is important for me to give some background about myself.

I graduated MBChB in 1976. I also hold a PGDipObst, a BA (majoring in Education but with papers in other undergraduate subjects), a PGDipRPHP, PGDipGP,
FRNZCGP and FDRHMNZ (meaning I am vocationally registered in General Practice and Rural Hospital Medicine). Since 2000 I have worked as a rural hospital doctor at Dunstan Hospital, with locum work in Cromwell, Queenstown, Oamaru, Port Vila, and on Espiritu Santo. Prior to that I worked for six years as an academic GP in Auckland and before that for 11 years as a GP and rural hospital doctor in Vanuatu, the Maniototo and rural Northland. I have also worked as a clinical senior lecturer convening papers for the PGDipRPHP, and as a Fellowship assessor for FRNZCGP and FDRHMNZ.

I have been involved in a range of research and publications on: capitation funding for a general practice; the use of interpreters by GPs; academic general practices in Australia; the use of guidelines by GPs; screening for depression in general practice; patient transfers from rural hospitals; and the experiences of New Zealand rural hospital doctors in the Cook Islands. I have also published four papers and a number of short stories describing aspects of my clinical experience.

4.1.3. The Setting

The setting for the study cannot be anonymous, as the specific context is important, and it is impossible to hide my own identity as a participant observer, as this would reduce the validity of my own comments on the findings. It will not be possible for readers to identify individual patients or staff. I shall describe the hospital in this Context section, mention it in relevant parts of my Acknowledgement, and where reporting from the occasional paper that has studied some aspect of care at the hospital; I will not refer to the hospital by name so as not to draw attention to the specific location.

The setting is a 24-bed hospital serving the 25,000 people living in a rural area of New Zealand, which includes a large proportion of retired people and has a high prevalence of ischaemic heart disease (Blattner et al., 2014). The population is older and contains proportionately fewer Māori than the rest of New Zealand (StatisticsNewZealand, 2013). There is a variable number of visitors and seasonal workers. The hospital provides mainly inpatient services, employing generalist medical and nursing staff. There is a visiting cardiology clinic - the nearest specialist cardiology unit is 200km away.
General practice services, including many services that would normally be available in emergency departments in larger centres, are provided in four of the surrounding towns. Ambulance services are provided by St John, who rely heavily on volunteers especially at busy times and after-hours. Helicopter retrieval to the base hospital is available for some patients.

### 4.1.4. Records at the Study Site

Patients are generally first seen by a general practitioner, who may then phone a doctor at the hospital to request admission. A handwritten record is kept of this conversation. This note is passed to nursing and administration staff, and is available to the admitting hospital doctor to refer back to when seeing the patient but, as with other informal written documents, does not form part of the official clinical record, is often not retained in the notes, and is therefore not part of the current study. The patient is also given a referral letter that they bring to the hospital. This is usually produced by the GP from the patient record on the practice computer system but may be hand-written if the patient is seen away from the practice. This official referral letter is retained in the notes and is the document used in this study as the GP’s record of the presentation.

Patients who call an ambulance will generally be assessed by a GP but may be brought directly to the hospital with the agreement of the hospital doctor. The ambulance staff, who may be volunteers, fill out a standardised patient form that in 2011 was handwritten. Patients who consult a GP with suspected AMI will usually be transported to the hospital by ambulance. On arrival, there is a verbal handover from the ambulance staff to hospital nurses and sometimes to doctors. The patient is assessed by a nurse, who again handwrites on a standard form. The hospital doctor may see the patient with, or after, the nurse and may write or type an assessment.

Notes for individual patients are kept in interdisciplinary paper-based records; these include the referral letters from the GPs ambulance patient report forms, nursing admission assessment forms and the admission note from the rural hospital doctors. All categories of health care professional have access to whatever has been written earlier. Records of previous hospital admissions and outpatient appointments for that patient are also available. The rest of the clinical record includes progress notes from
individuals in the multi-disciplinary team – nurses, doctors, physiotherapists, etc. – and the results of investigations. There is other written communication, notably the sheet produced about the patients for nurse handovers, that is discarded when the population of patients on the ward changes, does not form part of the permanent record, and is not included in this study.

There is considerable undocumented verbal communication between providers. Formal communication includes the phone calls from GPs to hospital doctors, handovers from ambulance to hospital staff, shift handovers between nurses and hospital doctors, and weekly multidisciplinary team meetings between nursing, medical, and allied health staff. Information about patients and their care is also shared informally around the ward and sometimes on joint ward rounds.

Elements of the context described above will become apparent throughout the study.

4.2. Methodological Framework

Deep Thought … the second greatest computer in the Universe … [took] seven and a half million years … to come up with … the Answer to the Great Question … of Life, the Universe and Everything … ‘[The answer] is forty-two’, said Deep Thought, with infinite majesty and calm … ‘Forty-two … That quite definitely is the answer. I think the problem, to be quite honest with you, is that you’ve never actually known what the question is’ (Adams, 1979) p.127-136.

In this section, different theoretical perspectives that underpin the study will be considered. First, concepts of qualitative and quantitative research will be compared. Next, the ideas of naturalistic enquiry, participant observer, case study, and community of practice, will be introduced. A range of qualitative research analysis methods for document analysis will be described, with explanation of how they are relevant to this study of clinical records. Finally, hermeneutical approaches to the study of literary narrative, as used in the Discussion of Findings chapter, will be explained.

The project, as outlined in the Introduction chapter, aimed to use a mix of numerical description and qualitative analysis, but qualitative approaches turned out to be more appropriate. Rigid distinctions between qualitative and quantitative methods are
recognised as unhelpful (Bradley, Curry, & Devers, 2007). A number of studies attempt to integrate qualitative and quantitative methods (Kelle & Erzberger, 2004). Qualitative and quantitative techniques can be used together to cancel out each other’s weaknesses (Guthrie, 2010) or to deepen any insights gained from the research (Sandelowski, 2000). “In qualitative research, the tyranny of numbers is abandoned for the enigma of words” (Jones, 2004) p.98.

Qualitative researchers have ideas as to how the research question will be explored, but should be open to modification of both the question and methods as data emerges. There is an iterative relationship between data collection and analysis (Britten, Jones, Murphy, & Stacy, 1995). In qualitative research, data collection and analysis tend to proceed together and it is somewhat artificial to separate them (Gioia, Corley, & Hamilton, 2012). There is no one best way to conduct data analysis, but it generally begins in the early stages of data collection and continues throughout the study (Bradley et al., 2007). The collected data can provide a descriptive record of the research, but cannot provide explanations, which the researcher then derives from the data by sifting and interpretation (Pope, Ziebland, & Mays, 2000).

The project could be characterised as “naturalistic enquiry”, which attempts a detailed description of phenomena in real settings. This methodological approach accepts that there are multiple possible points of view and that the researcher’s ideas and background will be central to the interpretation of exactly what is observed and how it is described (Norris & Walker, 2005). I have been able use my knowledge and experience as a clinician at the hospital, as described in the Context section, to help address the research question. As such, I can be described as a “participant observer” (Bogdewic & Jamison, 1994). Observers and interpreters of the world in which they participate, as I have been in this study, are an inextricable part of it, less able to step outside their own experience to obtain an independent view. It is always possible for there to be different, equally valid accounts from other perspectives (Maxwell, 2002).

The project, by focusing on an aspect of care in a single hospital, can be described as a “case study” (Stake, 2005). Case studies are used to examine phenomena in real-life contexts (Honey, 2010). It is convenient to study the context with which I am most familiar. The different providers co-operating in the care of patients admitted to the
hospital with suspected AMI can also be referred to as a “community of practice” (Eckert, 2006). These ideas will be expanded on in the Discussion chapter.

My fundamental research methodology however, while incorporating aspects of the descriptions above, is document analysis (Wolff, 2004). This study exemplifies the value of documents – in this case the hospital records – to gather insights about the work of an organisation. Documents can be used to examine the values, beliefs, attitudes and behaviours of the people who produced them and how they construct and interpret their own realities (Stanfield & Katerndahl, 1994). It is possible from documents to construct a subjective narrative of those who produced the documents, but not necessarily of those whom they may be describing, who cannot usually be directly and independently observed by the researcher (Stanfield & Katerndahl, 1994).

Documents and artefacts can help in understanding the relationship between a setting, individuals, and the construction of meaning. A document may be read within its own frame of meaning, or sometimes more usefully for the meaning it may have outside that frame of reference (Bogdewic & Jamison, 1994). To interpret records it is necessary to pay attention to who created them and for what purpose, and be alert to the possible problems of incomplete information and even fraud (Stanfield & Katerndahl, 1994).

After documents are collected, investigators develop a system of searching for patterns in the materials (Stanfield & Katerndahl, 1994). Content analysis is one such approach, commonly used for research on human documents (Stanfield & Katerndahl, 1994). It is sometimes described as “quantitative analysis of qualitative data” (Hsieh & Shannon, 2005). It is unlikely to produce coded data that can be compared meaningfully using statistics (Hsieh & Shannon, 2005). It is possible to start with a predetermined framework but not necessary to remain within that framework (Vaismoradi, Turunen, & Bondas, 2013). The development of a code structure may start with concepts already well known from the relevant literature (Bradley et al., 2007).

I employ template analysis (King, 2012), and content analysis (Hsieh & Shannon, 2005), situated within a framework analysis method (Gale, Heath, Cameron, Rashid, & Redwood, 2013) to examine the content of what was in the records, and who had written what. To examine how the content was expressed, and to gain insights into the ways the records are constructed by multiple parties, I used, under the direction of my supervisors, elements of discourse analysis – “the study of language in use” (Gee,
My theoretical framing of the study was also influenced by conversation analysis (Maynard & Heritage, 2005), as described under 2.5.8. - the interaction between providers in the notes, although in fact it is in writing and produced in an asynchronous mode, is somewhat akin to a “conversation” that is spoken and produced sequentially.

There is a family of slightly differing related approaches. One is thematic analysis, which looks for patterns in qualitative data, though the themes are usually derived from the data rather than starting with a theoretical framework (Clarke & Braun, 2014). Another approach is template analysis, which typically starts with a relatively structured approach to analysis of data but can be adapted as more information becomes available (King, 2012). I was encouraged to use this approach in my own study by the following remark from King:

“Template analysis works very well in studies that seek to examine the perspective of different groups within an organizational context – for example, different professionals working in a collaborative setting” (King, 2012) p.447.

The framework method, used for the management and analysis of qualitative data, sits within the same broad family of analysis methods. It originated in large scale social policy research but is increasingly used in medical and health research, especially by multi-disciplinary health research. The framework method is most commonly used for analysis of semi-structured interview transcripts, but can be adapted for other types of textual data, such as documents (Gale et al., 2013).

Thematic analysis or template analysis (although I did start with a template for my attempts at numerical description) turned out to be less appropriate, as the material did not fit neatly into the themes derived from textbook description. The sample size was much smaller than would normally be used in framework analysis. Ideas from all the above methods, as described above, helped to inform my analysis.

Analysis aims to identify commonalities and differences within individual pieces of data, before focusing on relationships between different parts of the data (Gale et al., 2013) (e.g. interviews, or as in this case, a single patient’s set of records). A vital first stage of data analysis is becoming familiar with the whole text. Data are then collected into a framework using codes, using either a deductive or inductive approach. In the
deductive approach, themes are pre-selected, based on the literature, previous theory, or the specifics of the research question; in the inductive approach, themes are developed from the data through unrestricted coding, followed by refinement of themes. In many cases, a combined approach is appropriate when there are some specific issues to explore, but there may also be unexpected aspects of the ways participants describe or interpret their experience.

I initially employed template analysis (King, 2012) and content analysis (Hsieh & Shannon, 2005), situated within a framework analysis method (Gale, Heath, Cameron, Rashid, & Redwood, 2013), to examine the content of what was in the records, and who had written what. Thematic analysis or template analysis (although I did start with a template for my attempts at numerical description) turned out to be less productive than I had anticipated, as the material did not fit neatly into the themes derived from textbook description. The sample size was much smaller than would normally be used in framework analysis. Ideas from all the above methods, as described above, helped to inform my analysis.

To examine how the content was expressed, and to gain insights into the ways the records are constructed by multiple parties, I also used (under the direction of my supervisors) elements of discourse analysis – “the study of language in use” (Gee, 2014, p.8). My theoretical framing of the study was also influenced by conversation analysis (Maynard & Heritage, 2005), as described under 2.5.8. – the interaction between providers in the notes, although in fact it is written and produced in an asynchronous mode, is somewhat akin to a “conversation” that is spoken and produced sequentially.

In order to examine the ways that the records are constructed, as mentioned above, I have thus adapted some of the ideas and methods of conversation analysis, and applied some of the same principles – of analysing the records produced by different providers as parts of a socially organised workplace interaction – to written text.

The study of texts can expand our understanding of institutions, and texts are essential to the existence of organisations. They mediate, regulate, authorise and co-ordinate the actions of individuals (Smith, 2001).
According to Garfinkel, a pioneer of ethnomethodology, which is closely related to conversation analysis, the ways that individuals work together to produce order in an organisation are likely to be taken for granted by insiders and not obvious to outsiders (Rawls, 2008). Researchers are likely to have an intuitive understanding of the ways that conversations are organised, but must make an effort to work out the formal mechanisms that make interpretation of the sequences meaningful (Bergmann, 2004). Heritage, a prominent researcher applying conversation analysis to health care settings, writes:

“A large proportion of interaction involves the conveying of information. In this process persons continually position themselves with respect to the epistemic order: what they know relative to others, what they are entitled to know, and what they are entitled to describe or communicate (Heritage, 2009) p.309.

This for me resonated with the observable ways that health care providers seem to an extent to fashion what they record to position themselves relative to others when writing in the clinical records.

A different approach to the material, explored more fully in the Discussion chapter, is to use a hermeneutical approach, as used in the study of literature. This is a way of examining the narrative aspects of the clinical record. Although there have been recent publications on the links between clinical practice and literary interpretation, these have concentrated on philosophical (Svenaeus, 2000) or ethical (Nelson, 2014) concerns. I have chosen instead to use a group of older papers (Daniel, 1986; Gogel & Terry, 1987; Poirier & Brauner, 1990), introduced in 2.5.1., that predate the widespread use of electronic records, and make it easier to structure practical comparisons with the records being studied.

Having outlined the theoretical aspects of the methodology employed, I will concentrate in the next session on describing the methods used in the study.
4.3. Method

4.3.1. Development

The conception of the idea for this study – to examine the records produced by different health care providers for the same clinical event - is described in 4.1.1. It was developed into a research project at a postgraduate research methods paper at Otago University in 2012. Further reflection on the questions to be asked, and the relative merits of qualitative and quantitative research methods that might be applied, suggested that a mixed method would be most appropriate.

Two highly suitable supervisors were identified from the Department of General Practice and Primary Care at the University of Otago Wellington: Sue Pullon, a Professor of General Practice with an interest in interdisciplinary research and teaching; and Maria Stubbe, a sociolinguist with extensive research experience in workplace and health care settings.

Ethics approval - approval number H15/040 - and written permission from the General Manager at the hospital to be studied, were obtained. Māori consultation was successfully undertaken. The research proposal was discussed with the Clinical Director and Clinical Nursing Leader, the Central Otago General Practice Liaison Group, the Regional Manager of St John Ambulance, and informally with other doctors and nurses at the hospital.

A comprehensive literature review was undertaken, as discussed in 2.1.

Two forms were designed to use to collect data: one to collect information about each patient (Appendix 5), and one to collect the information that had been written in the clinical record by four categories of health care providers: general practitioners (GPs); ambulance officers (AOs); rural hospital doctors (HDs); and rural hospital nurses (NSs) (Appendix 6). The forms had been developed from standard questions in relevant clinical texts (Brunner & Suddarth, 1982; Kumar & Clark, 2012; Murtagh & Rosenblatt, 2015; Naish & Read, 1971) and had been modified after discussion with staff and students teaching and attending the research methods paper.
A list was obtained from Southern Community Laboratories of patients who had recently had a Troponin I requested at the hospital. A pilot study was conducted of the first 10 of these patients. The findings of this study were presented to the other doctors at the hospital, which resulted in minor modifications to the forms. Later the proposed project, with the same data, which was characterised as a “sneak peek”, was presented to researchers at a meeting in Cromwell, and another in the Wellington Department. Feedback from these meetings led to further modifications in the proposed method, mainly an emphasis on more qualitative analysis.

### 4.3.2. Data Collection

In 2011, there were 1575 admissions to the hospital, including short-stay admissions but excluding ED presentations. Of these patients, 347 who had a TNI level tested were identified from a further list provided by Southern Community Laboratories. Some were tested more than once (if there was more than one level, the highest level on the first admission during that year was used to select the event being studied). As I work at the hospital, and have access to the notes, this could be described as a “convenience sample” (Bouma, 1993). 2011 was chosen as it was the last full year prior to having the idea for the study and discussing it with other providers.

One patient was excluded from the study as he was a close relative. The first 50 patients by consecutive National Health Index (NHI) number were selected for further study. This was not strictly a random sample, as younger patients and non-residents are not as likely to have NHI numbers starting with A or B. It is not large enough for statistical analysis, but gave enough patients to trial the proposed method.

Data about each patient, and the information recorded by the general practitioner, ambulance officer, rural hospital doctor, and rural hospital nurse, about the presenting complaint, were collected. All patients had been admitted to hospital and had information recorded by more than one category of provider. The data from the 50 patients were gathered into a table, following the format of the predesigned forms.

It was difficult from the records to assign items to categories within the template. This does raise some problems with interpretation, as it important for validity that a variable
adequately reflect the concept it is designed to describe (Bouma, 1993). It was difficult to decide which items formed part of the history of the presenting complaint. Sometimes, for example, items of past medical history would be found under this heading, or statements from the patient about their presenting complaint would be recorded as part of the physical examination. The categories themselves, although described in textbooks as if they are discrete items, are unclear. Associated symptoms, although interesting in terms of what gets recorded by different providers, are especially difficult to categorise. They are frequently mentioned but may at times be unrelated or may have been present for some time before the main presenting symptoms developed.

Written information relating to the presenting complaint (as judged by me) was gathered from the different sections of the clinical records. In some cases, I had to make an informed judgement as to where within the table an item belonged.

My two supervisors, both experienced qualitative researchers, visited my workplace and checked my notes against five of the physical sets of records, aiming for a degree of inter-rater reliability. While concepts such as validity and reliability are of controversial importance in qualitative research (Maxwell, 2002), I was mindful of a warning from Morse et al.: “Without rigor, research is worthless, becomes fiction, and loses its utility” (Morse, Barrett, Mayan, Olson, & Spiers, 2008) p.14.

4.3.3. Analysis

A descriptive analysis was conducted looking for systematic differences or inconsistencies. The results are presented in 5.2. There appeared to be no major discrepancies between providers as to matters of fact, which is consistent with reports in the literature. Also, direct comparison between providers was difficult because there were differences as to the amount of information recorded, and some used predesigned formats and some used free text, making meaningful comparison difficult. However, there was richer material for study in the verbatim text available. I decided to concentrate on a smaller selection of patient records, analysing more closely subtle differences between providers in the ways that the clinical details are described and information is recorded.
Five records were selected for deeper analysis: one patient with chest pain and NSTEMI, one with chest pain and STEMI, two with chest pain and no AMI and one with no chest pain and no AMI. This was a purposive sample, suitable for more detailed qualitative analysis. As explained by Patton in his textbook on qualitative methods, “The logic and power of purposive sampling lies in selecting information rich cases for in depth study” (Patton, 1990) p.169.

All five patients had been seen by GP, hospital nurse and hospital doctor, and four had been transported by ambulance. All patients appeared to have been seen in the sequence: GP; ambulance (except for one); hospital nurse; hospital doctor. I ensured that the one Māori patient from the available 50 was included (as Māori in New Zealand in general receive poorer treatment and may not be included in relevant research (Tukuitonga & Bindman, 2002)).

I started by carefully reading each of the records. The completeness of the information for qualitative analysis was double-checked by going back to the selected records before doing the analysis. I checked that there were no elements of data missing such as progress notes or a section on the form (filled out by nurses) about pain, and that I had completely transcribed any information possibly relating to the presenting complaint. In some instances, these were contained in an unlikely section of the record, frequently in the ambulance records in the examination findings, sometimes in the past medical history, medications given, or social history, and occasionally in the progress notes. Examples of this will be described in the Findings chapter and examined further in the Discussion chapter.

 Entire phrases and sentences, including adjectives and adverbs, were transcribed. I kept all abbreviations as written and did not correct any spelling or grammatical errors. I looked for any clues as to in what sequence the different providers had seen the patient, to capture a sense of progression where available. I also looked for indications as to the source of the information e.g. “from the patient” or “as noted by the doctor”. I was aware that there may have been informal written notes or verbal communication between providers that were not evident in the record.

Any comments that did not relate to the presenting complaint were removed from the analysis. The objective of doing so was to further reduce the data to “all the stuff I am
going to look at”. In some cases, I had to make an informed judgement as a clinician as to where within the table an item belonged.

When considering the recorded history of the complaint, “history” was initially defined as “something the patient or caregiver could have told a clinician” or “what the clinician heard the patient saying” or “not what the clinician observes” (i.e. not “objective” findings). A wider definition - needed to include information that could have come from an earlier provider or previous records as part of the natural sequential development of the record of the patient’s story - is “not something the clinicians have clearly observed themselves”. Anything that was not about the episode of illness relating to the current presentation was ruled out. All the rest – past medical history, smoking status, etc. – though clearly relevant to the patient’s clinical condition, was regarded as context. What was most important was to apply this definition consistently to each of the selected patients.

A schema was developed for analysing the selected records that would confine my analysis to the history of the presenting complaint and would highlight any differences between providers. This included a thematic analysis of what each provider had recorded and a form of conversation analysis concentrating on features of the language used. I summarised and analysed the notes for each patient separately. Synthesis between patients was left till later.

The project was presented to the medical officers at the hospital. They were asked to review the schema for one of the selected patients looking for: clues as to the sequence in which the notes were written; clues as to the source of the information e.g. patient, carer, other professional; different words for the same thing; changes in tense; changes in the history over time; information that is left out; new symptoms; symptoms that disappear; emphasis on symptoms that support a particular diagnosis; emphasis on symptoms that support a particular treatment; and discrepancies.

The other doctors found it difficult to do this exercise based only on the information in the notes, without bringing in elements of context. They did mention several important points. The same patient, they pointed out, will give a different answer to the same question at different times and to different providers – most people had had the experience of a patient telling a more “accurate” history when repeating themselves to a consultant. Providers when recording the history will “tell a story that fits the
diagnosis”. The story changes over time; providers can get “mentally railroaded” if they go on the history as previously recorded. Also, they believed, a lawyer will read the record differently from a provider or patient – to get an accurate record we could have “like police cameras” to record conversations for medico-legal purposes.

Of my five original patients, three had been seen by the same general practitioner, one had not been transported by ambulance, but had otherwise been seen by different providers. I included a further five patients, including one who had not been seen by a general practitioner, another who had not been transported by ambulance, and one who had presented to the hospital and had records from the hospital nurse and hospital doctor only. This gave a total of 10 patients for detailed analysis.

Finally, three of the 10 patients were selected to further analyse the way that the clinical record is sequentially constructed, the entry from each provider building on what had gone before, developing a clearer picture of what had happened to the patient – a theme that was emerging strongly from analysis and from the literature. Each of these three patients had presented with chest pain, and had notes recorded by four providers, none of whom was involved in the care of the other patients.

It is difficult and probably inaccurate in qualitative research to separate sampling, data collection and analysis, which tend to proceed concurrently (Gioia et al., 2012). However, it is interesting to consider how the sample reduced from 347 patients with a TNI tested, to 50 to produce a manageable number, then 10 for detailed analysis, then 2 to illustrate the sequential construction of the records, then one further patient was included to better illustrate how the construction of the records is relevant to practising clinicians, as will be discussed in the Conclusions for Clinicians and Researchers chapter. These successive phases can be presented graphically.
The individual patients and providers were identified using codes and numbers that were derived from the 50 patients in the initial numerical description. I am assuming, based mainly on my own experience, that the usual order of writing the notes is GP, AO, NS, then HD. There are a few clues in the records as to this being the usual sequence. Three patients who were not seen by, or did not have records from, one or more of the four providers, included for comparison. The material I had collected was analysed in terms of style, vocabulary, abbreviations, additions, deletions, modifications, and sequential construction. I shall present the results of this process, including further comments on the methods used, in the next chapter on “Findings”.
Chapter Five: Findings

As mentioned in the “Method” section of the Methodology chapter, in 2011, there were 347 patients who had a TNI level tested at the hospital. There were 25 males and 25 females. The ages ranged from 40 to 94 with a mean of 72. Ethnicity was in general poorly recorded: only one was identified as Māori; 12 as “NZ European” or “Pakeha”; 34 patients were described as “New Zealander” or “NZer” or “NZ” or “Kiwi”; and three had no ethnicity recorded at all.

5.1. Clinical Description

Of the 50 patients, 25 had chest pain (or some equivalent such as aching or tightness) recorded by at least one provider as one of their presenting symptoms. For those without chest pain, the commonest main presenting symptom was dyspnoea. For some patients, other symptoms often associated with AMI, such as vomiting, syncope, tiredness and epigastric pain were recorded. For others, it was unclear from the presenting symptoms why a TNI had been requested.

Table 1: Symptoms that may have led to a TNI being requested.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest Pain</td>
<td>25</td>
</tr>
<tr>
<td>Epigastric Pain</td>
<td>1</td>
</tr>
<tr>
<td>Abdominal Pain</td>
<td>1</td>
</tr>
<tr>
<td>Vomiting</td>
<td>1</td>
</tr>
<tr>
<td>Dyspnoea</td>
<td>6</td>
</tr>
<tr>
<td>Syncope</td>
<td>4</td>
</tr>
<tr>
<td>Tiredness</td>
<td>2</td>
</tr>
<tr>
<td>Palpitations</td>
<td>4</td>
</tr>
<tr>
<td>Confusion</td>
<td>3</td>
</tr>
<tr>
<td>Unwellness</td>
<td>1</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>1</td>
</tr>
<tr>
<td>Dystonia</td>
<td>1</td>
</tr>
</tbody>
</table>
The discharge diagnosis was determined from the administrative discharge code and checked against the medical discharge letter where available. Six patients were diagnosed with AMI – one STEMI and five NSTEMIs. Five others were thought to have angina – two stable and three unstable. The others were diagnosed with a variety of cardiac and non-cardiac conditions. The commonest diagnoses were arrhythmias and non-cardiac chest pain.

Table 2: Discharge Diagnoses.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEMI</td>
<td>1</td>
</tr>
<tr>
<td>NSTEMI</td>
<td>5</td>
</tr>
<tr>
<td>Unstable Angina</td>
<td>3</td>
</tr>
<tr>
<td>Stable Angina</td>
<td>2</td>
</tr>
<tr>
<td>Non-Cardiac Chest Pain</td>
<td>7</td>
</tr>
<tr>
<td>Arrhythmia</td>
<td>8</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>2</td>
</tr>
<tr>
<td>Syncope</td>
<td>4</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>1</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>2</td>
</tr>
<tr>
<td>Obstructive Airways Disease</td>
<td>2</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>1</td>
</tr>
<tr>
<td>Pleural Effusion</td>
<td>1</td>
</tr>
<tr>
<td>Hyperventilation</td>
<td>1</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>1</td>
</tr>
<tr>
<td>Renal Calculus</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>Over-Sedated</td>
<td>1</td>
</tr>
<tr>
<td>Hypokalaemia</td>
<td>1</td>
</tr>
<tr>
<td>Febrile Illness</td>
<td>1</td>
</tr>
<tr>
<td>Diabetic Nephropathy</td>
<td>1</td>
</tr>
<tr>
<td>Dystonia</td>
<td>1</td>
</tr>
<tr>
<td>Rehabilitation from Bleeding</td>
<td>1</td>
</tr>
</tbody>
</table>
The patients presenting without chest pain who had a TNI measured were on average older, more likely to be female, slightly more likely to have diabetes, and marginally more likely to have had previous ischaemic heart disease, all of which, as described in 3.3, are known risk factors for having an AMI not presenting with chest pain. In this study, all patients who turned out to have AMI had chest pain recorded as a presenting symptom by at least one of the four providers.

Table 3: Patients with and without Chest Pain.

<table>
<thead>
<tr>
<th></th>
<th>Chest Pain</th>
<th>No Chest Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Mean Age</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Previous IHD</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>AMI</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

26 of the 50 patients, including the one patient with STEMI and two of the five patients with NSTEMI, were alive when the notes were studied five years after these events.

5.2. Numerical description

I started with the idea that I could do a numerical description of the 50 patients using a mix of content analysis and template analysis. My template was derived from standard medical, nursing, and prehospital texts: location; radiation; character; severity; onset; duration; precipitating factors; relieving factors; and associated symptoms. This data collection form is reproduced in Appendix Five.

It was difficult from the records to assign items to categories within the template. This was one aspect that did raise some problems with interpretation using qualitative methods, as it would have been important for validity that a variable adequately reflect the concept it is designed to describe (Bouma, 1993). It was unclear which items formed part of the history of the presenting complaint. The categories themselves, although described in textbooks as if they are discrete items (Naish & Read, 1971), are
unclear. One provider may describe pain as in the chest and throat, but others as in the chest radiating to the throat. One provider may record it as precipitated by walking, another as occurring while walking, and another as being so severe as to prevent walking. Associated symptoms, although interesting in terms of what gets recorded by different providers, are especially difficult to categorise. They are frequently mentioned but may at times be unrelated or may have been present for some time before the pain developed.

All providers would record apparently unrelated items of past history or examination findings alongside the details of the presenting complaint. GPs and hospital doctors added this information under their own headings. Ambulance offices and nurses added these items in response to questions on the forms such as “Chief Complaint” or “Reason for Admission” or even “Describe Pain in Patient’s Own Words”. In contrast, relieving factors, which are an aspect of the presenting complaint that I wanted to include, might be found on the ambulance form under an unrelated category such as “Drugs/Interventions”. These issues relating to form-filling are mentioned in the section below on “Style” and are discussed in more detail under “The Record in Practice” in the Discussion chapter.

I found that the template, which was based on “typical” symptoms of AMI including pain, could only be usefully applied to patients who presented with chest pain. Further, meaningful comparisons of what was recorded by different providers were most appropriate when all four types of provider were involved in producing the record. Numerical description is therefore confined to the 16 patients who presented with chest pain and had a GP, ambulance officer, hospital nurse and hospital doctor all documenting their symptoms. The results from these patients are displayed below.

Table 4: Patients with chest pain and records from all four providers.

<table>
<thead>
<tr>
<th></th>
<th>GP</th>
<th>Ambulance</th>
<th>Hospital Nurse</th>
<th>Hospital Doctor</th>
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The location of the pain (usually chest, arm, or throat) was the most frequently described symptom. Next were a variety of associated symptoms. The character of the pain, and the onset but not the duration (which was mentioned infrequently, and not mentioned at all by ambulance officers or nurses), were relatively frequently recorded. A minority of patients had mention of radiation or severity.

GPs were the most likely to record precipitating and relieving factors, and associated symptoms. Ambulance officers were the most likely to record severity. Nurses recorded the fewest symptoms overall and were the least likely to record location, radiation, character, onset, and precipitating factors. Hospital doctors recorded the most symptoms overall, and were the most likely to record location, radiation, character, onset, and duration, but were the least likely to record severity or relieving factors.

Differences may relate to the training of the providers, to the sequence in which they see the patient, to the task or role they perform in the patient’s care, or simply to the fact that the GP and hospital doctors are writing on a blank page whereas hospital nurses and ambulance officers are responding to questions on a form. Obviously, the numbers are very small.

The absence of obvious differences at this level of analysis is consistent with the few studies that have compared documentation between doctors and nurses, for a range of conditions, including AMI, as described in 2.5.5.

As mentioned in 4.3.3, there appeared to be no major discrepancies between providers as to matters of fact, which is consistent with reports in the literature. Also, direct comparison between providers was difficult because there were differences as to the amount of information recorded, and some used predesigned formats and some used

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free text, making meaningful comparison difficult. In response to these limitations, I decided at an early stage to look more carefully at a smaller number of records using rigorous qualitative methods. The results and analysis of this are reported in the next section.

5.3. Detailed Qualitative Analysis

This section describes the data from the 10 records chosen for qualitative analysis. Clinical details and numbers from template analysis are included in the 50 patients discussed above. Issues arising from analysis of the records are further developed in the Discussion of Findings chapter.

I shall start with some comments about coding and sequence. Then I shall describe the style and vocabulary of the different participants, and their use of abbreviations. Next, I shall analyse what is recorded in terms of repetitions additions, deletions, and modifications as compared with other providers. Finally, I shall concentrate on three of the records to show how the record is constructed.

5.3.1. Coding and Sequence

The individual patients are coded as PT1 to PT46; the individual providers are coded as GP1 to GP9, AO1 to AO20, NS1 to NS18, and HD1 to HD10. These codes and numbers were derived from the 50 patients to whom the template was applied for the initial numerical description.

In this chapter, as mentioned under Conventions in Appendix Eight, the words recorded in the provider records are underlined to distinguish them from other text.

The different health professionals are constructing the clinical record in sequence. I am assuming, based mainly on my own experience of working as a doctor in the hospital, and as a general practitioner in the area, that the usual order of writing the notes, though not necessarily of seeing the patients, is general practitioner (GP), ambulance officer (AO), hospital nurse (NS), then hospital doctor (HD).
There are also a few clues in the records themselves as to this being the actual sequence, mainly in the form of tense markers and temporal words. AO1 describes PT7 as already assessed by … medical centre (although GP9 does mention they went to the ambulance centre). PT12 is described by AO2, at the time of writing the notes, as having been assessed by duty GP. GP4 records that PT41 was transported into medical centre [by ambulance], but AO16 records, clearly writing after PT41 has been seen by GP4, Dr gave ECG and Pt prone on Surgery Bed … Being given morphine by GP.

Some of the nurses had written in the notes in more than one place and at different times, as evidenced in the later entries by references to interceding events or documentation by others. For PT9, NS9 first writes on the “Nursing Admission Assessment” form. Then there is a second entry by NS9 in the “Clinical Progress Notes” that relates to the history of the presenting complaint but clearly follows the entry from HD3. NS9 records that PT9 has been admitted as per doctor’s notes, repeats the items self presentation and R)UQ pain from the previous nursing history, and adds the information that the patient is much more comfortable after 4mg IV morphine. Similarly, for PT10, NS10 (not in the “Nursing Admission Assessment” but later in the “Clinical Progress notes”), after a record has been added by HD6, describes PT10 as S/B Dr above.

I included for comparison three patients who were not seen by, or did not have records from, one or more of the four providers: PT4, PT9 and PT11, who as the nurses’ records confirm had come by private vehicle, so has no ambulance record; one patient, PT10, who does not appear to have been seen by a GP; and one patient, PT9, whom NS9 and HD3 both described as a self-presentation to the hospital, so has no records from either a GP or AO.

5.3.2. Style

GPs tends to write or type in a more narrative style. Nurses use a more abbreviated style. For example, NS4 for PT4 records Reports CP/ (L) arm pain comes + goes. So do ambulance officers, with one notable exception - AO1, who for PT3 uses no abbreviations except Pt for patient, and writes out (and capitalises) the symbol ? as Query. Hospital doctors wrote or typed in full sentences but with several words
abbreviated. Examples are HD5 using Angio for angiography and sten for stenosis, and HD10 using heli for helicopter. These features seem to pertain in general to the different types of health professional, as well as to the individuals. Both the ambulance officers and nurses are responding to predetermined questions on a form, but do not always follow the set format.

5.3.3. Vocabulary

There are likely to be differences in vocabulary between participants, as explained under Professional Languages in section 2.3.2. The records in the 10 chosen cases were written by six GPs, five AOs, seven NSs and nine HDs. Several of them were involved in the care of more than one of the patients.

Because of the chosen topic for this research – histories of patients with suspected AMI - terms for certain body parts, and normal or abnormal body sensations or functions, are obviously going to occur commonly. For example, for PT7 and PT12, all four providers use chest, and for PT12 all four also use arm. For PT12 all four providers use pain and for PT46 all four use wheeze.

Names for certain medical conditions, investigations and treatments are to be expected. Both GP1 and HD1 describe PT1 having angina. All four providers for PT12 (in relation to allergies) mention anaesthetics. GPH and HDF describe PT11 having angiography. All four providers describe PT12 being given GTN.

Some terms used are part of the clinical register. As would be expected, terms describing body parts, body functions, medical conditions, investigations and treatments, and components of the health care system occur commonly. There are some differences between providers in choice of vocabulary. Occasionally less “clinical” language that appear to have been used by the patient are chosen. NS9, for example, writes that PT 41 hopes heart will be OK.

The language used is also likely to reflect the settings – general practices, ambulances, and a rural hospital. The language used, particularly to describe people or components of the system is appropriate for these places. GP7 describes PT7 as a casual patient and
being loaded into an ambulance. NS10 refers to PT10 as an acute admission. Both GP3 and HD4 refer to PT3’s discharge from hospital.

For PT12, sweating from GPI is modified to diaphoretic by AO2. This also occurs for PT7, whom GP7 describes as sweaty. AO1 as diaphoretic, and NS7 as perspiring. The word “diaphoretic”, in my experience a favourite of ambulance staff, is also used by another AO for PT12. PT9 and PT11 were both seen by NS9, who describes them as mobilising, a word also used by AO1 for PT3 but not by other providers, instead of the less clinical term “walking”. AO16 records that PT41 has hx of … cardiac but NS9, documenting the patient’s “key concerns about admission” prefers the less clinical expression hopes heart will be OK.

There are few examples of the use of metaphor, supposed to be used commonly by patients to describe their symptoms (Jairath, 1999). HD1 does write, presumably recording something like the words used by the patient, that PT1’s pain feels like central bruise. HD1 also appropriates a metaphor from musical description to describe PT1’s symptoms as crescendo angina, a term commonly used by doctors to describe chest pain that is getting worse, but probably unlikely to be used by patients. Other patients may be using metaphors to describe their symptoms that are not recorded by health professionals, who are likely to use their own more “clinical” terms (Pakhomov et al., 2008).

Variations on the word “complaint”, used in the title of this thesis as “Histories of the Presenting Complaint”, and in the records by all categories of health care professionals, are themselves a product of the health care setting. As Donnelly pointed out in 1986 (Donnelly, 1986) p.83, “Patients are complainers, not worriers”. It is used on the ambulance Patient report forms - as “Chief Complaint” - but not on the Nursing Admission Assessment forms. For the individual patients, HD5 describes PT7 as complaining, and HD8 says PT41 started to complain. The term is abbreviated by HD1 for PT1 to HxPC, by AO1 for PT7 as C/O, by HD3 for PT9 to P/C, and by HD6 for PT11 to HPC. Denies, in the weak sense of “doesn’t complain of”, is used by NS1 for PT1, HD6 for PT10, and GP4 for PT41.

1 This reminds me of the expression, thought to have originated from Victorian etiquette guides: “Ladies glow; men perspire; horses sweat” (Alleyne, 2010).
5.3.4. Abbreviations and Symbols

Abbreviations are especially interesting in the records, and they are used frequently, as we have seen in 4.3.2. The abbreviations used by nurses, and in general by ambulance officers, contrast with the doctors’ more narrative styles. Some abbreviations, such as GP for general practitioner, used by GP7 and HD5 for PT7, have become part of the normal spoken language. In clinical settings, when a word is used frequently by health providers it seems to become routinely abbreviated (e.g. saturations to sats).

One mysterious abbreviation in this data, by NS1 for PT1, appears to be walked in granddaughter, though it is partly illegible. The nurse who wrote this no longer works at the hospital, but my asking others to interpret it revealed an interesting variation (an example of the extension and confusion of meaning generated by an iterative approach). One doctor thought it meant “walked in with granddaughter and doctor”; another thought “walked in with granddaughter at doctor”. One nurse read it as “walked in with granddaughter no doctor”; another nurse as “walked in with granddaughter (a doctor)”. One of my supervisors read it as “walked in with granddaughter to doctor”. GP1 records that PT1 was seen with daughter (later corrected to granddaughter). There is no evidence elsewhere in the notes to confirm or deny any of the other possible interpretations.

The abbreviations used by nurses, and in general by ambulance officers, contrast with the doctors’ more narrative styles. For example, NS4’s description of PT4’s presentation, under the headings “Reason for Admission / Initial Observations of Patient” and “Relevant Past History:”, consists almost entirely of abbreviations – tacy, BBB, ↑, SOB, CP, [L in circle], IHD, CABG, PCI, NH Lymphoma and HT. This contrasts with GPD’s more narrative style – He has been much more ill over the past 24 hours and when questioned states he had chest pain and left arm pain yesterday. NS4, under the heading “Does the patient have any key concerns about admission?” later adds Thinks he has Recurrence of Lymphoma, but the overall impression is of the nurse for PT4 being “like a technician”, and one who is too busy to describe a close interaction with the patient. The image created, by the nurse having to respond to questions on a form, rather than being free to express their particular concerns, is
interestingly different from the usual public stereotype of nurses as concerned caring professionals who are close to the patient.

Providers may use abbreviations for several reasons. The most obvious is that they are simply easier to write - abbreviations, such as “SOB”, are generally easier to write or type than the corresponding full words, such as “short of breath”. This is suggested in the table of angiography findings for PT11: for the LAD, HD6 starts by hand-writing stenosis but for the Cx and RCA, abbreviates this to sten. Sometimes words that are typed in full by one provider are abbreviated when handwritten on a form by another: for PT46, oxygen and saturation typed by GP4 are abbreviated to O2 and sats by AO20.

It is useful to differentiate between abbreviations and symbols. Symbols, such as “Φ”, compared with words, may be easier to write, but not necessarily to type. GP4’s referral letter for PT46, which is typed, does include a few abbreviations – JVD, IV and 2L. AO20, hand-writing on a form, abbreviates some of the same words – oxygen to O2, saturation to sats – and uses other abbreviated words such as Pt, med, diff and min, but also uses symbols such as ?, +, ↑ and @. For the same patient, NS13, also hand-writing on a form, uses SOB, +, ↓ and R. HD4, on a typed admission note, uses PC, SOB, HxPC, GP, NP, and = (the last example is one symbol that is easy to type as it is present on the keyboard).

Providers can also use abbreviations as a mark of professional identity, either as a health care provider in general or as a member of a particular discipline (Zeleznik, 2003). An example may be NS9 choosing to describe the location of PT9’s pain as in the RUQ, usually meaning [right upper quadrant] and later (when asked to “describe pain in patient’s own words (aching, stabbing, etc.)”) the less standard abbreviation (in my experience) R)UQ, meaning right upper quadrant, to describe the location of the pain. This contrasts, both in style and in fact, with HD3’s narrative report for the same patient that the pain is in the right lower back/flank.

A common abbreviation in these records is SOB for [short(ness) of breath], which is used by NS4 and HD2 for PT4, by HD3 for PT9, by AO5 and HD6 for PT10, by HD8 for PT12, and by NS13 and HD4 for PT46, but not by any of the GPs. Another is ?, for [possible], which is used by GP1 and HD4 for PT1, HDC3 for PT3 and AO5 for PT10, but not by any of the nurses, though in my experience the term “query” is used commonly by nurses in speech. For PT3, AO1 writes the expression out in full (and
capitalises it) as **Query**. The only abbreviation used by all four types of providers for these ten patients seems to be the letter L or R (sometimes in brackets or in a circle or grouped with other letters) to indicate a side of the body, used by NS4 and HD2 for PT4, GP7 for PT7, NS9 for PT9, AO5 for PT10, NS10 for PT12, and NS18 for PT46.

The symbol \( \Phi \) (the Greek letter Phi, taken from the context to mean “no” – AO5 describes PT10 as having \( \Phi \) chest pain) is used by AOs – AO5 for PT10 and AO2 for PT12, but not by other providers (except maybe by NS1 for PT1). Two nurses, NS4 for PT4 and NS9 for PT 11, are the only ones who abbreviate [chest pain] to \( \text{CP} \). This happens to be different from the list of standard abbreviations kept in the nurses’ office at the hospital. C/P is chest pain; CP is supposed to be cerebral palsy (Nursing Services Manager, 2016). This suggests that the abbreviations relevant to suspected cardiac presentations are a subgroup of health care provider abbreviations in general. Only HDs use the names of the coronary arteries – HD6 for PT11 and HD10 for PT41. [Left anterior descending artery] is abbreviated to \( \text{LAD} \), and [right coronary artery] to \( \text{RCA} \) the same forms as is used in the speech I hear doctors using around the ward; [circumflex] is abbreviated to \( \text{Cx} \), which in my experience is different from the usual spoken form, which is “circumflex”.

An interesting abbreviation, used by HD1 for PT1, but also used by health professionals in speech, is “Ca” for “cancer”, identified by Donnelly 30 years ago as a commonly used euphemism in American teaching hospitals (Donnelly, 1986), as if to avoid using the full word for this nasty group of conditions.

### 5.3.5. Construction of the Record

To make sense of the ways that the records are constructed, I have adapted some of the ideas and methods of conversation analysis, as described in 2.5.8.

I shall describe the 10 chosen records in general, in terms of what gets recorded, what gets added, what gets deleted, and what gets modified. Then I will examine three records in more detail as practical examples of how the records are constructed.
a. What Gets Recorded

The records start with the first provider describing events in the past, present or future that relate to the presenting complaint. Most of the record of the presenting complaint will refer to recent or present symptoms, though this may change before the patient has their history recorded by the next provider in the sequence: GP7 wrote that PT7 felt slightly nauseated and now (changing from past to present tense) feels hot and sweaty; AO5 describes PT10 (at the time) as lying in the garden; NS9 finds a different way of indicating the current nature of PT9’s symptoms, without specifying the present tense, as Pain in back → RUQ, Acute. For PT41, the tense changes from past to present continuous: was vacant from GP4 is changed by HD10 to goes vague, probably indicating that this is a common symptom when PT41 is about to have a seizure.

The first record is typically but not always from the GP. PT9 was a self-presentation, so has his initial history recorded by NS9. PT 10 was brought in directly by ambulance so has her initial history recorded by AO5.

Special importance is often placed on information from the patient in the notes, as the patient might be considered to be the ultimate authority on their own history. GP3 for PT3 mentions the history I have obtained from [the patient], she noted, [she] doesn’t volunteer any other specific symptoms and [the patient] also mentioned. GP4 repeatedly states for PT46 that he mentioned … [he] persisted in mentioning this … [he] denied … [he] admitted.

Parts of the history may be attributed to family or carers, as GP3 records caregiver called to say for a part of the history that PT3 was unable to give, as she was confused, and some of the history for the same patient AO1 describes as according to caregiver. Similarly, GP4 records wife states to give some information about PT46 around the time he was having a seizure. Interestingly, NS9 and AO5, who are not doctors, do not make this kind of attribution when they are the first providers to record the presenting complaints of PT9 and PT10.

Some of what is recorded may describe events in the past, but still be relevant to the presenting complaint: GP1 reports that PT1 had an angiogram approx 4 years ago; NS9 that PT9 had an MI with stents 3 yrs ago.
Some of what is recorded may refer to future expectations: GP9 indicates that PT12 needs admission. GP4 suggests for PT46 I think you will be able to xray … and perform thoracocentesis to treat if needed. AO1 records that PT3 is being referred to Dunstan Hospital for further assessment. HD5 refers PT7 to Dunedin Hospital, writing thank you for accepting for transfer tonight.

b. What Gets Repeated

Key words are repeated by other providers. For PT7, what seem to be the key words from GP7, chest and arm, are repeated by AO1, NS7 and HD5. AO1 repeats central and heavy, and NS7 repeats heavy and pain. For PT9, NS9 and HD3, the first providers to see the patient, both record the story of the self-presentation while travelling from Alexandra to Wanaka. Both also use the words back and pain. PT10 is first seen by the ambulance. Gardening and tiredness are repeated by NS10 and HD6. Unable to get up is repeated by NS10 and Φ chest pain Φ SOB repeated (as Denies … Chest / SOB) by HD6.

Usually people are not just gratuitously repeating information but are doing so for a reason. Repetition of what others say, to some extent, demonstrates the interactional nature of the document. At the same time, it is known from conversation analysis that people are oriented to not repeating old news, and will be looking to put down new information (Heritage, 2011). Providers are likely to experience a tension between agreement, safety-netting, and avoiding redundancy.

The record for PT46 contains an example where AO20 appears to directly copy what is written by GP4, rather than obtain the same information from the patient. GP4 writes that PT46 presented a week ago with bronchitis and due to his poor health I treated him aggressively with Augmentin. My interpretation of this is that GP4 is justifying the use of an antibiotic, which would not necessarily be indicated for bronchitis, for this patient. AO20, without the same experience of making medical decisions in general practice, then having to justify them, faithfully records was treated with Augmentin (aggressively), seemingly, in my interpretation, misinterpreting the adverb aggressively to mean the manner in which the antibiotics were given rather than the reasons for choosing this particular treatment.
The hospital doctors tend to pick up on statements from the GP that the other providers do not record. An example is the fact that PT3’s symptoms date from a recent discharge from hospital. Another is PT7’s previous investigation for similar symptoms. The information from GP9 that PT12 was unable to walk round supermarket and had to sit down is deleted by AO2 and NS10 but repeated by HD6. This phenomenon may occur because the GP and HD are both doctors, or because the HDs in their clinical task are orienting towards information about the presenting complaint from the first person who saw the patient.

c. What Gets Added

Some addition is to be expected. Items may be added as symptoms develop, as new information becomes available, or as later providers emphasise different aspects of care. This is an important part of providers co-operating to construct the clinical record. However, care needs to be taken in interpreting additions. New information has not necessarily been discovered by the provider who first records it. There is a verbal handover from GP to HD, from GP to AO, from AO to NS, and constant verbal communication between NS and HD and with the patient, most of which is not recorded. PT41 is escorted by GP4, who will therefore be giving verbal information to AO16, NS9 and HD10, before, during and after the time they write their records.

For PT1, NS1 adds denies any pain at present; for PT3, AO1 adds patient now much improved. Both simply indicate a change in the patient’s symptoms over time. In contrast, for PT4, HD2 adds [chest pain] – on exertion … After cutting bushes yesterday – similar to angina … longstanding hx. of IHD and had a stent placed in 2008 by [a cardiologist], seemingly having obtained information about previous significant ischaemic heart disease that does not appear in the letter from GP4.

HD6, for PT11, adds mainly information about investigations, including detailed information about angiography performed the year before in another part of the country (under HPC - taken by me to mean “history of presenting complaint”). GP8 indicated in the referral letter that this information was to follow separately. For the same patient, NS9 records presents via private vehicle, twice. It is a question on the form, but the nurse apart from ticking private vehicle in this box also records it under “Reason for Admission / Initial Observations of Patient”. It is new information, as the trip has
occurred after GP8 wrote the letter, but there is no indication from GP8 that this was the intention. Possible reasons for the nurse’s emphasis on the mode of transport will be discussed below under “modifications”.

d. What Gets Deleted

Other information is left out, presumably because it is not important or not considered relevant by later providers. Some information that is already known is not stated again. I can assume that the bits of information that are repeated are regarded as ones that are particularly important to record, but can only speculate as to why. Deletions may mean that information is not read, ignored, is no longer relevant, or is contradicted. Information that no longer appears in the notes may also have been left out by the patient. Patients may leave things out from their own story as they assume that what they have already said to one provider will be passed on to others.

The fact that PT7 is a casual patient, registered at [another practice] appears to be important to GP7 but not to the other providers, who leave it out. The information from GP1 that PT1 has been discussed by phone is already known to GP1 and HD1 and doesn’t need to be stated again. Angiography is mentioned by GP1 and HD1 but presumably is not considered relevant by NS1 to the nurse’s task at hand. Nor are the details about the frequency, severity and location of recent pain. NS1 does add that the PT1 denies any pain at present and that [the current pain] is 0, but this information is not repeated by HD1.

For PT11, the information about a recent TNI rise recorded by GP8, which seems from GP8’s referral letter to be a major reason for admission, and has also been discussed with HD7, is not mentioned again by NS9 and HD7 in the notes. HD7 summarises the detailed information about chest pain from GP8 and NS9 as ↑ chest discomfort and concentrates on the previous angiography findings.

Typically, the HD picks up on statements from the GP that the other providers do not record. An example is the fact that PT3’s symptoms date from a recent discharge from hospital. Another is PT7’s previous investigation for similar symptoms. AE16 and HD10 repeat the history from GP4 that PT41 has had a seizure, but NS9 doesn’t mention it. The information from GP9 that PT12 was unable to walk round supermarket
and had to sit down is deleted by AO2 and NS10 but repeated by HD6. This phenomenon may occur because the GP and HD are both doctors, or because the HDs in their clinical task are orienting towards information about the presenting complaint from the first person who saw the patient.

Sometimes information from the ambulance officers is left out by others, or contradicted. An example is PT10, who has been attended by another ambulance but not by a GP. All the information recorded by AO5 pointing towards a possible TIA is left out on the “Nursing Admission Assessment by NS10, later adding unable to get up by self during gardening in the “Progress Notes” after the patient has been seen by HD6. HD6 leaves out the bits from AO5 about sudden onset and nausea. HD6 does pick up on the statements from AO5 about headache and left-sided weakness but seems to contradict them: AO5’s headache present and no strength or sensation L) leg are modified by HD6 to headache no worse today and Power is generally and mildly reduced in all limb movement. Symmetrically. This is consistent with the literature on ambulance handovers, which suggests that verbal information from ambulance staff is often also ignored or discounted by hospital providers (Bost et al., 2010). Another possible interpretation will be discussed below under Modifications.

e. What Gets Modified

There are modifications, including corrections, errors, changes in location or over time, and changes in style or vocabulary. Modifications are perhaps the best way of illustrating what happens in the record as the patient is seen by different providers over time, and to infer how the different professionals interpret their roles. It is possible to make some inferences as to function, to try to answer the question “Why did people record what they did?”

One record is physically changed: the typed note for PT1 from GP1 is corrected from seen with daughter to seen with grand-daughter in what appears to be the hand-writing of NS1.

Some “modifications” may simply be errors. HD3, under P/C: describes PT9 as presenting with left flank / lower back pain, but later under HxPC: as having right lower back / flank pain (i.e. on the other side of the body). Both are different from
NS9’s variously abbreviated observations of pain in back → RUQ and rear R)UQ [pain]. The pain may have moved from the upper to lower abdomen (or the patient’s description of it may have changed) between seeing the nurse and seeing the doctor, but there is still a discrepancy within HD3’s record as to which side of the patient’s body the pain was on.

Some modifications will occur because of the passage of time or change in location. An obvious example is PT7. GP7 says he has had his symptoms for 1 hr; NS7 says for 2 hours. The patient has presumably taken about an hour to get to the hospital. For PT10, lying in garden, from AO5 is modified by NS10 to lying on scoop stretcher. The patient is still lying down but is now in a different place and under different circumstances.

Later providers have modified GP3’s non-specific comments about PT3. GP3’s was quite confused is changed by NS3 to unsure where she was; GP3’s has “lost” yesterday is changed by AO1 to could not recall events of the past 24 hours. The information about the PT3’s bowel problems is expanded. GP3 records she has had loose bowel motions since her discharge from hospital which is unusual for her; NS3 that she had large bowel motion yesterday. HD3 expands the nurse’s description to very large motion yesterday but perhaps reduces the impact of the GPs description by recording had apparently had looser bowel motions than usual since discharge from [another hospital].

A similar example is PT9. NS9’s description of the patient travelling is made more specific by HD3’s term driving. NS9’s has felt unwell is expanded by HD3 to episodic dizziness and feeling as if going to faint, postural at times but can come on at any time, 1–2 × day. For PT4, HB4 reduces NS4’s addition of ↑ SOB to just SOB, and modifies NS4’s addition of noticed leg oedema (presumably after also examining the patient) to the more specific swollen non-pitting oedema to thighs.

Other modifications are mainly in style. For PT4, chest pain and left arm pain from GP4 is modified to the abbreviated form CP / (L) arm pain by NS4. GPG’s L arm for PT7 is modified to left arm by AO1 and NS7 and left sided arm by HD5. For PT10, AO5’s Φ chest pain Φ SOB is modified by HD6 to denies … chest pain/ SOB. For PT11, GP8’s description of some atypical chest pain over the past 2/12 is modified by HD7 to over last 2 mths ↑ chest discomfort.
Some of the variations in style will be because of the different ways in which the different providers produce their records. For PT12, GP9, who according to AOB is the on-call GP (so will not have access to an electronic list of current medications to import into the document) types given GTN, which relieved pain, also given aspirin and later generally well, no medications. AO2, answering questions on a form, records under “MEDICATIONS” none, then under “Drugs/Interventions” GTN very good effect and Solprin. NS10, filling out a different form, under “Reason for Admission / Initial Observations of Patient” records GTN relieved pain by ambo and “Current Medications” records usually no medication. HD3 handwrites, on an otherwise blank sheet of letterhead paper, given GTN – pain went away quickly and Meds nil. All the providers mention an allergy to anaesthetics, but surprisingly NS10 is the only one to mention a possible allergy to GTN, a medication that all the providers mention the patient having been given prior to this admission.

Some modifications appear to indicate subtle disagreements between providers. GP4, AO16 and HD10 all mention PT41 having a seizure, but differ in their description of exactly where this event occurred. GP4 simply says in car; AO16 says in car on the way in; HD10 says in car once arrived in GP car park. NS9 doesn’t mention it at all. AO16 may be expressing the facts slightly differently in this case to support a belief that PT41 should have come to the GP in an ambulance.

Similarly, as mentioned under “additions” NS9 records twice that PT9 presented via private vehicle. There is no indication from GP8 that this was the intention. The nurse’s emphasis on the mode of transport may be intended as a veiled criticism, as it would be usual for a patient with chest pain to come to the hospital by ambulance.

These decisions about mode of transport are a key theme in the literature on patient presentation with symptoms suggestive of AMI (Johansson et al., 2004). An unusual example in this study is PT12. Went to ambulance station from GP9 is modified to drove to ambulance station by HD8. NS10 doesn’t mention it. Perhaps most surprisingly, there is nothing in the record from AO2, who is perhaps the provider most likely to understand the reasons for this rather unorthodox method of accessing the ambulance service.

Disagreements are not only about transport. The modifications for PT46 are interesting in that they perhaps illustrate some subtle disagreements between providers about the
diagnosis. GP4 describes orthopnoea, which is not mentioned by AO20 or NS18 and is modified by HD18 to the non-medical term difficult lying flat breathing. The peripheral oedema described by GP4 is not noted by AO20 or NS18 and is described by HD4 as ankle oedema not too severe. Both orthopnoea and peripheral oedema, in a medical sense, signify heart failure, a possibility that HD4 seems to dismiss. The later providers also seem less convinced over the continuing response to ventolin. GP4 says improved with ventolin; AO20 says given ventolin for wheeze initially improving; NS18 says ventolin since 4th July (with no mention of improvement); and HD4 says started on ventolin inhaler ... improved over next 2 days. Finally, HD4 comes up with a completely different interpretation of the history of the presenting complaint, suggesting a cardiac rather than a respiratory cause: from [the patient] when he describes wheezing = tight across both sides of lower chest.

Another example of disagreement about diagnosis is PT10. As mentioned above under Deletions, all the information from AO5 suggesting a TIA is ignored by NS10 and contradicted by GP6.

5.3.6. Construction of Three Single Records

The records typically start with the GP setting the scene, giving relevant information, including symptoms reported by the patient or carer, and emphasising the reasons for coming to hospital. The AO briefly summarises the history from the patient, records any interventions, using a form but often adding other items such as examination findings as part of the history of the presenting complaint. The NS record is usually brief, with limited information about the presenting symptoms, updating the status of the patient, sometimes prompted by questions on the form. The HD starts with the history from the GP, sometimes with subtle differences, emphasising items that are important to diagnosis and management at the in-hospital stage of care.

Importantly, no one player has all the information, or even records all the information they have available to them, and may use or leave out information from others. This can be represented as a Venn diagram.
Alternatively, as new information is added over time, and older information discarded as less relevant or perhaps inaccurate, the clinical record can be conceptualised as a stepwise construction.

a. PT41

PT 41 is a 68-year-old NZ European / Pakeha male. He has a seizure in the car on his way to the GP. He complains of throat and chest pain. The GP performs an ECG that shows a STEMI. He is ambulanced to the hospital accompanied by the GP. He has ongoing pain. He is assessed by the nurse and hospital doctor. The diagnosis is “STEMI”.

The scene is set, in the narrative style typical of GP4, of a patient scheduled for repeat medications and labs but whose wife was concerned that he would have a seizure, presenting having a generalised seizure in the car. GP4 then concentrates on information from the patient - he mentioned his throat was sore and persisted in mentioning this, initially denied any chest pain, then admitted to mild chest pain. GP4
makes it clear that the information about the throat pain was volunteered by the patient, but GP4 has asked further questions about chest pain and has obtained a positive response. GP4 in addition has ordered an ECG demonstrating an inferior myocardial infarction. This is a clearly described indication for sending the patient to the hospital. GP4’s job is done.

AO1 starts with the hx of epilepsy + cardiac and recent stent, repeats (more briefly) pt due for bloods today @ surgery, then states that the seizure in the car was on the way, which is slightly more detailed than GPD’s description, and interestingly different, as discussed under Modifications, from GPD’s statement that the seizure was once [PT41] arrived in [the] GP carpark. AO1 then briefly summarises the history from the patient, then records Dr gave ECG and found patient having Inferior Infarct, an unexpectedly strong choice of verbs, perhaps underlining the perceived combined power of the doctor and the ECG machine to make a diagnosis.

NS9’s entry in relation to history is typically brief. The details of the symptoms have already been recorded by GP4, summarised by AO1, and will be repeated by HD10. NS9 does clarify their understanding their interpretation of the significance of the throat pain, as a symptom of cardiac ischaemia, by twice describing it as chest pain going up to throat and ↑throat. NS9 is then the first person to record the severity of the pain, as 8/10, partly because this is an answer to the question on the form, and presumably because they are then going to give pain relief and record its effectiveness.

HD10 starts with the history of epilepsy, the previous STEMI (it is mentioned by GP4 but not as part of the history of the presenting complaint) and required interventions, again summarises the patient’s symptoms on the current occasion, then concludes that they represent a similar presentation to [the] previous MI. The diagnosis of STEMI has been made from the ECG; there is no need to repeat supporting information such as typical associated symptoms. HD10 is the first provider to record the time of onset of the patient’s sore throat and chest pain as approximately 10am. HD10 needs this information to decide if the patient has arrived in time to benefit from thrombolysis.
b. PT12

PT 12 is a 66-year-old NZer female. She wakes with chest, neck, left shoulder and left arm pain, and associated sweating. She experiences similar symptoms throughout the day and eventually takes herself to the ambulance station. She is assessed by the GP who refers her by ambulance to the hospital. She is assessed there by the nurse and hospital doctor. She has no pain on arrival. The diagnosis is “chest tightness and pain”.

Similarly, for PT12, GP9 starts at the beginning, when the patient woke [at] 2am. There is some specific description of the patient’s symptoms: pain left shoulder neck and arm and tightness of the chest, sweating profusely, felt very tired, and chest tightness and arm pain recurred. There is also some general information about the patient’s activities: unable to walk round supermarket, had to sit down, and went to ambulance station. GP9 adds a [suspected] diagnosis of MI and a plan of needs admission.

AO2 paraphrases GP9’s description of the symptoms (or perhaps elicits them again from the patient) and adds some examination findings (which also appear in the doctors’ records but not as part of the “chief complaint”). AO2 adds that the patient has been very short of breath, nauseous and ankles have been swollen. The pain in arm, but not the tightness in chest, is quantified as 7/10. There is some mention of temporary relief from GTN.

NS10 confirms that GTN from ambo has relieved [the] pain, and adds the unlikely information about an allergy to GTN (which others ignore), but makes only brief mention of the presenting symptoms. NS10 makes no mention of shortness of breath, nausea, or ankle swelling.

HD4 repeats most of the history from GP9 (or records the patient’s retelling of them), using mostly the same words – chest, pain, arm, neck, walking … supermarket, very tired, had to … sit down, relieved, GTN. There are some subtle differences: the chest symptoms are described as pain, not tightness, and the arm pain is described as radiating. HD4 repeats AO2’s description of SOB, and expands on it, but does not mention nausea or ankle swelling. HD4 adds some information about previous investigations.
c. PT46

PT46 is a 60-year-old man who presents to the GP with “wheeze”, but this is reinterpreted by the HD as “tightness”. PT46 is discharged with a diagnosis of non-ST elevation myocardial infarction (NSTEMI).

There is a referral letter from GP4, written in a narrative style, but including some key elements – wheeze, orthopnoea, and suspected pleural effusion. These same elements are noted by other providers, but there are some important variations that demonstrate a different and ultimately improved understanding of their significance.

GP4 writes that PT46 had some wheeze which improved with ventolin. AO20 confirms that PT46 was given ventolin for wheeze, but is less definite about the response to treatment, recording that it was initially improving. NS18 doesn’t mention wheeze, instead summarising the symptoms as SOB, and documents that PT4 has been having ventolin since 4th July but is not improving. HD4 tells a completely different story, which is clearly attributed as from [patient] – when he describes wheezing = tight across both sides of lower chest. PT46, as described by HD4, was started on … ventolin inhaler, improved over next 2 days however got worse again.

According to GP4, PT46 does have orthopnoea, which would tend to signify left ventricular failure, a serious complication of poor heart function, where fluid collects in the lungs when the patient lies down. AO20 adds the information that PT46 was lying on bed in med centre head elevated and has pulmonary oedema on auscultation, which is consistent with GP4’s findings. NS18 doesn’t mention any positional problems with breathing. HD4 does start with a less clinical description of difficult lying flat due breathing feel like he is suffocating, but then adds orthopnoea – several pillows but prefer to be bolt upright, agreeing with GP4’s assessment.

The letter from GP4 contains the statement that PT46 has developed a pleural effusion clinically on the right. GP4 is then less definite, later saying there are clinical findings suggesting a pleural effusion and I … wonder if there is a pneumonic effusion (which would be caused by an underlying pneumonia). AO20’s recorded findings of pulmonary oedema worse ↑ (L) and NS18’s recorded “reason for admission” of ↓ lung sounds on R) side, are consistent with GP4’s findings, though it is not clear if NS18’s findings in particular are from his or her own examination or from what GP4 has
already written. HD4 makes no mention, in recording the history of the presenting complaint, of a possible pleural effusion.

These comparisons are important in understanding the process of history, examination, investigations, diagnosis, and treatment, and the relationships between them as evidenced by the records. GP4 believes that PT46 has had [a] chest infection (as recorded by AO20) and “has failed treatment”. GP4 also believes that PT46 has developed a pleural effusion. Both ideas are continued to some extent by AO20 and NS18. The implication, as clearly stated in the letter from GP4, is that PT46 needs to come to hospital for an X-ray and thoracocentesis (draining the fluid from around the lung).

To come to a different diagnosis, HD4 must reinterpret the history, relabel the wheeze as tightness (as attributed to the patient), accept the label of orthopnoea but attribute it to a different cause, and ignore the examination findings suggesting pleural effusion recorded by the other providers. HD4 would also have had available the results of the X-ray suggested by GP4 that would be helpful to exclude a pleural effusion, and the elevated Troponin I that would be necessary (by definition) to make the diagnosis of NSTEMI.

5.3.7. Conclusion

Differences may relate to the training of the providers, to the sequence in which they see the patient, to the task or role they perform in the patient’s care, or simply to the fact that the GP and hospital doctors are writing on a blank page whereas hospital nurses and ambulance officers are responding to questions on a form. Obviously, the numbers are very small.

The clinical record represents an incremental, multi-authored, multi-layered, intertextual account, being co-produced by a range of health providers, using information from the patient, family, carers, other providers, and from other records. The language used is as expected for a range of health care providers recording the histories of patients with suspected AMIs in a range of health care settings, and is appropriate for the process in which each plays a different part. The various health providers, at different stages, and using their different voices, interact to record the
history of the presenting complaint. The reasons they do it the way they do will be further examined in the Discussion of Findings Chapter.
Chapter Six: Discussion of Findings

Dear Sir or Madam, will you read my book?  
It took me years to write, will you take a look?  

There are two ways I can think of to escape the confines and conventions of hospital medicine. One is to do qualitative research on obscure language-based topics. The other is to explore more imaginative ways to present and interpret the range of experiences that patients bring to us and our colleagues. In this discussion, I shall allow myself a limited opportunity to do both.

The question I am addressing is: how do different health professionals record the histories of the presenting complaint of patients with suspected acute myocardial infarction admitted to the hospital in which I work?

To elaborate on this question, and on what is presented in the Findings chapter, it is helpful to go back to some ideas uncovered in the Literature Review chapter, particularly the Records from the Clinic section. I shall explore some of the parallels between clinical histories and narrative, making comparisons with other forms of narrative such as literature. The discussion will be based on both older published papers and relevant new initiatives. I shall go on to link this discussion with ideas on how the record functions in practice, and make some further observations on electronic health records as they relate to the overall functions of clinical records in the health service.

6.1. Narrative

Central to the recording of the history of the presenting complaint is the idea of narrative – of telling the patient’s story. Narrative is increasingly recognised as an important aspect of medical practice (Charon, 2008). Frank, for example, lists some typical narrative patterns – restitution, chaos and quest narratives – that patients may use to describe their lives, and their experience of illness and treatment (Frank, 2013).
Narrative is also becoming a valuable new approach for research (Greenhalgh & Hurwitz, 1999).

Rutherford, in his recent book about genetics, suggests that an attraction to narrative is part of being human: “Humans love telling stories. We’re a species that craves narrative, and more specifically, narrative satisfaction – explanation, a way of making sense of things, and the ineffable complexities of being human – beginnings, middles and ends” (Rutherford, 2016) p.10. “Storytelling is as old as humanity itself” (Gilbert, Loxley, Seymour-Ure, Walisiewicz, & Westhorp, 2016) p.12. “The telling of stories” is perhaps the most distinctive of human activities” (Corballis, 2017) p.56.

It is important for these purposes to distinguish between the noun “narrative” – “a spoken or written account of connected events in order of happening” and the adjective “narrative” – “in the form of, or concerned with, narration” (Deverson & Kennedy, 2005). Even the highly-abbreviated entries of NS4 and AO20, though definitely not written in a narrative style, could be described as “narratives” in this latter sense.

Donnelly, an American physician, has called for a transformation of the clinical record, which he characterises as a “chronicle’, listing mainly physical events that happened, emphasising the doctor’s reality, into more of a “story”, which would include more of the patient’s thoughts and feelings (Donnelly, 1988).

E.M. Forster, the British novelist, tells us that “a story”, which he defines as “a narrative of events arranged in their time sequence”, is “the basis of a novel”. He characterises it as “a very primitive feature” that “can only have one merit: that of making the audience want to know what happens next”. He distinguishes it from “plot”, which, he says, explains the connections between people and events, and implies causality (Forster, 1927).

Carter (Carter, 1986) speculates on the form the patient history might take if recorded by a short story writer. Both medical and literary approaches, he points out, are abstractions, but with different styles, purposes, and intended audiences. Both medical and literary approaches involve explanation of events, but using the conventions of the respective professions. There are some common features: an attempt to represent; an attempt to interpret; and, in Carter’s view, an attempt to bring about some form of healing (Carter, 1986).
6.1.1. Representation

Carter also refers to representation as “mimesis” or “imitation”. Medical representations he characterises as “increasingly technological” (Carter, 1986) p.144. In the patient records studied this is certainly true of PT11, whose GP admits him to hospital based mainly on his TNI result, and where HD5’s record of the “HPC” (taken by me to mean “history of presenting complaint”) consists almost entirely of previous angiography findings. Other examples are PT41, where the AO record concentrates on the ECG findings, and PT4, whose “reasons for admission”, as recorded by NS4, start with “tacy – BBB” (tachycardia and bundle branch block).

A short story writer, Carter suggests, compared with a physician, is more free to render the story, or even change the events that the patient and carers have experienced, to evoke an emotional response in the reader (Carter, 1986). Writers, and journalists, are fond of the quotation, popularly attributed to Mark Twain: “Never let the facts get in the way of a good story” (Obsession Literary Magazine, 2012).

Standard clinical texts, in contrast, call for an accurate representation of the facts. Nurses are encouraged to “present the information about the patient as completely, concisely and accurately as possible” (Brunner & Suddarth, 1982). Medical students are advised that medical records should be “clear, accurate, legible and contemporaneous” (Kumar & Clark, 2012).

The evidence suggests that in practice this is far from what happens. As discussed in the Literature Review chapter under “Records from the Clinic”, the clinical record is not always a good summary of the patient's experience (DeVon et al., 2004). Records are likely to leave out information that is important to the patient (Strange et al., 1998), including in studies of the records of patients with chest pain (Pakhomov et al., 2008).

Some of the entries in the clinical records in this study could not be described as “clear” or “legible”. An example, noted in the Findings chapter, is the abbreviation by NS1 describing the symptoms of PT1, which appears to read as “walked in ĺ granddaughter Φ Dr”. Some of the entries are not strictly contemporaneous – NS9 goes back and adds information about the presenting complaint in the “Progress Notes” after PT9 has been
seen by HD3. The typed note from GP1 about PT1 is physically changed. Some of the entries are not “complete” - AO2, for example, leaves out the important information that PT12 drove herself to the ambulance station with a suspected AMI.

Without the comparisons of direct observation, audio and video tapes, and exit interviews, that other researchers have used, accuracy of the notes, in the present study, is more difficult to determine. But this was not the aim of the study. Certainly, there are inconsistencies and contradictions. PT9 is variously described as having left lower back, right flank, and right upper quadrant pain. Not all can be correct. NS10’s assertion that PT12 is allergic to GTN, is ignored and contradicted by the other providers, and by clinical events, as is AO5’s conclusion that PT10’s symptoms are consistent with a TIA.

Silverman, in his textbook on communicating with patients, encourages us to allow the patient to tell the story using their own words. Importantly, this may not then be the same as the format we use to present our findings or record information in the case notes (Silverman et al., 2005). There are a couple of examples in this study, as described under Findings, of GPs attributing information to, or directly quoting from, patients or carers – GP3 for PT3 and GP4 for PT46. But there are other reasons for choosing to do so: specifically, that PT3 was confused, and unable to give the whole history herself; and for PT46 there was disagreement between providers as to the meaning and significance of what he had said.

We know that the rich metaphors that patients use to describe the symptoms of suspected AMI are unlikely to be recorded by health care providers (Jairath, 1999). There was only one instance of such a description recorded in these notes, as described under Findings - PT1’s description of his symptoms, recorded by HD1, as “like a central bruise”. I have found that I make this kind of decision myself, to not record exactly what the patient said: recently an elderly Dutch patient (not included in this current study) described to me his symptoms as “like a bullock sitting on my chest”; I duly recorded this as “chest heaviness”, leaving out any reference to the “bullock”, which was a more entertaining and probably more accurate description of his symptoms, but less likely to be included in a clinical record.
The fact that the record is not an accurate imitation of the patient’s story is portrayed as a fault (De Marinis et al., 2010), or as a quality issue (Meurier, 1998), particularly in the nursing literature (Kim & Park, 2005). And it can be a fault, for example, when the details of treatments given are recorded incorrectly, or something goes wrong and the clinical record turns out to be an inadequate or inaccurate representation of events. More commonly it is a misconception of the way that records work, as Fitzpatrick and Berg make clear. Fitzpatrick tells us that plans by institutions to introduce electronic health records “carry with them an implicit conceptualisation of the ‘record as passive information archives’” (Fitzpatrick, 2000) p.1. They are not (as she goes on to demonstrate in a case study of the practical use of paper records, revealing the complexity of clinical records “at work”). Similarly, Berg observes that clinical records are “commonly perceived as merely representing ‘what has taken place’” (Berg, 1996) p.499. They do not (as he goes on to explain in a series of publications, giving a wider understanding of the purpose and function of clinical records). I shall return to these ideas later in this chapter.

6.1.2. Interpretation

The second common feature of medical and literary accounts that Carter describes is interpretation, which he also refers to by the more literary term of “hermeneutics”. The interpretation starts with the patient’s views and, in the clinical account moves towards diagnosis (Carter, 1986). It is a useful concept in general practice to describe the complex sharing of views that goes on between patient and doctor. As McWhinney and Freeman explain in their standard textbook of family medicine, "hermeneutic enquiry is intersubjective (McWhinney & Freeman, 2009) p.79".

Svenaeus, expanding on a doctoral thesis, draws many parallels between the philosophy of medicine and literary interpretation (Svenaeus, 2000). Nelson, with some reservations, applies narrative interpretation to medical ethics (Nelson, 2014). “Literature and Medicine” has emerged as an important new area for teaching doctors (Jones, 2013).

Daniel, another advocate for applying literary practices to clinical care, comments that “the subculture which we find in hospitals … appears to be dominated by a complex
system for quantifying and controlling health”. But, he argues, “the science and art of interpretation lies at the heart of medical practice” (Daniel, 1986) p.196.

Poirier and Brauner, in another older paper, apply literary theory and methodology to the analysis of a single clinical case (Poirier & Brauner, 1990). The clinical record, they point out, serves many purposes, as a managerial, historic, and legal document. They take the idea of interpretation to what was, at the time, a new level: the record “viewed as an interpretive ‘text’ … can itself become the object of interpretation” (Poirier & Brauner, 1990) p.29. They do this by examining the records of a single patient, and it is what I am attempting to do, by analysing the records of different health care providers, in this thesis.

Gogel and Terry, two American physicians mentioned in 2.5.1 and towards the end of 4.2, also emphasise the importance of interpretation. They describe how “a model is beginning to emerge which stresses interpretation as a primary activity of clinical medicine” (Gogel & Terry, 1987) p.206. They make some comparisons with literary interpretation. They go on to list ten “guidelines for interpretation” that are applicable to clinical situations, and which are a useful framework for interpreting the material in this study. These are: a focus on the particular; the overwhelming importance of context; the flexible use of different techniques; prejudgement; the consequences of an interpretation can affect the learning process; no interpretation is final; there are multiple possible interpretations; interpretation often involves a process of trying to reconcile possible competing subtexts; an interpretation is validated through open discourse in a community of persons with many shared values and beliefs; and the best way to learn how to interpret particulars is through an apprenticeship (Gogel & Terry, 1987) p.213.

I shall use these ten guidelines, employing the numbers used by Gogel and Terry in their paper, as a template to examine how the interpretation of the records in this study can analogous to the interpretation of literature.

1. A focus on the particular. No two works of literature, or patients, or clinical situations, can be exactly alike.

Patients, like literary characters, are people; in fact, they are real people, with individual characteristics that include, but are not limited to, their clinical histories. “A medical
fact”, say Gogel and Terry, “isn’t a fact without a clinician reading into it a coherent story, in a particular way … of the actual patient at hand” (Gogel & Terry, 1987) p.211. An example could be an elderly patient, with vague symptoms, being tested for suspected AMI, as happens to PT3, because older patients when they do have AMI are likely to present without chest pain (Coronado et al., 2004).

2. The overwhelming importance of context.

This can include clinical or patient factors, of which there are many examples in this study: PT1 has had previous abnormal angiography; PT3 has recently been in hospital; PT4 has had a lymphoma; PT7, for his GP, is a casual patient; PT9 arrives at the hospital without having seen a GP or called an ambulance, with symptoms not suggestive of cardiac disease, but is found to have had a previous AMI; PT11 has recently moved to the area from another part of the country; PT41 has had a recent STEMI and helicopter retrieval.

The study has its own context. It was conducted using the records held in a rural hospital. This is obviously a different context from the cardiology ward of a large tertiary hospital. The contexts described in the records are even more wide-ranging: the patient’s homes; general practices (which can be up to an hour from the hospital); in the back of ambulances, staffed usually by volunteers; and in different locations within the hospital. The relation between the different contexts is evocatively described for PT10, who is recorded as “lying in the garden” and (later in the hospital) “covered in leaves + grass”.

There are likely to be other features of the clinical records in this study that are unique to the hospital being examined, or are characteristic of rural locations. There was an emphasis on geography, as for PT9, who was described as “travelling from Alexandra → Wanaka”. Furthermore, I do know from my own knowledge of the area that at least two of the 347 people admitted feature as both patients and providers – something that is perhaps less likely to happen in a city hospital. It would probably also be unusual in a city in 2011 for a GP to travel to the hospital with a patient in the ambulance, as GP4 does with PT41.

3. The flexible use of different techniques.
The technique to be used, Gogel and Terry explain, will depend on the material at hand, the type of interpretation to be made, and the decisions to be made. PT1 is known to have ischaemic heart disease, but the significance of her recent symptoms depends on a detailed history. PT7 presents with undifferentiated cardiac and neurological symptoms; NS7, incorporating psychosocial elements into the history, includes the possibly important information that his “wife has just left him”. GP8 admits PT11 to hospital because of a TNI result. PT41’s diagnosis of STEMI, though he can give a good history once he recovers from his seizure, is made on the ECG.

4. Prejudgement. A clinician taking a history is always thinking of possible diagnoses, which can be useful in focusing further questioning.

An example is PT10. AO5 effectively starts with a diagnosis, listing the “Chief Complaint” as “collapse ? cause ? TIA”. There are some general items under “History” - Pt working in garden. Sudden onset tiredness and nausea. Pt lay down. – then under a separate written sub-heading - O/E (taken by me to mean “on examination) - an item of history - headache present - , and some examination findings - “No sensation in (L) leg, limited strength in both arms. No strength or sensation L) leg” -. relating to a possible TIA.

Even more interesting, because it demonstrates the interaction between the different providers, NS10 completely ignores AO5’s suggestion that PT10 may have had a TIA, even when writing in the progress notes, after PT10 has been assessed by the hospital doctor. HD6 goes further, and actively refutes the significance of AO5’ findings, writing that the headache is “no worse today” and that “power is generally and mildly reduced in all limb movement”, adding, in case there is any remaining concern about left-sided weakness, at least by the time the patient is assessed in the hospital, “Symmetrically”. NS10 and HD6 are literally “telling a different story” from AO5.

5. The consequences of an interpretation can affect the reasoning process.

Often, in this series of cases, the consequence will be admission to hospital. GP9 shows this clearly for PT12. Many of the clinical features listed in the referral letter – “pain left shoulder neck and arm and tightness of the chest sweating profusely … felt very tired … chest tightness and arm pain recurred … given GTN which relieved pain” – are typical symptoms of myocardial ischaemia. It is interesting that AO2 and NS10 leave much of this out. AO2 specifically comments that there is no chest pain (but does
mention tightness as an examination finding, and confirms that PT12 has “pain in arm”. AO2 agrees that PT12 is “diaphoretic” (sweating), but adds that the patient is anxious, nauseous, and pale. NS10 similarly emphasises what symptoms the patient does not have – “No pain at moment … No pain in chest … Tightness across top of chest.”

There is no consequence on any interpretation of this for AO2 or NS10 – the patient has already been “assessed by duty GP and referred to [the] Hospital”. GP9, in contrast, has a clear decision to make, which is easy, based on a story typical of myocardial ischaemia – “Diagnosis ? MI. Plan: needs admission”.

6. No interpretation is final.

“Provisionality” say Gogel and Terry “is the philosophical basis for constant humility” (Gogel & Terry, 1987) p.212. I went looking for this quality in the records, but as far as I could discover in what was recorded about the history of the presenting complaint, I couldn’t find it. No doubt if I looked at a more complete record of the patients’ care, including differential diagnoses, and options for treatment, it would be more evident.

7. There are multiple possible interpretations.

The authors are careful to point out that this “does not imply pure relativism … some interpretations are better than others” (Gogel & Terry, 1987) p.212. They also say though that all interpretations are valid. This seems particularly relevant in a multidisciplinary team. An example would be PT10, already mentioned above to examine the effect of prejudgements on interpretation. HD6 dismisses the suggestion from AO5 that the patient has had a TIA, mainly based on not being able to replicate the examination findings. But AO5’s interpretation is also valid, especially as the neurological deficits resulting from a TIA are, by definition, transient, and one might expect them to have disappeared by the time PT10 arrives at the hospital.

8. Interpretation often involves a process of trying to reconcile possible competing subtexts.

History, examination, and the results of investigations, can seem inconsistent with each other. In modern hospital practice, investigation findings seem to trump the others. PT1 has coronary artery disease because of her previous angiography findings; PT11 has had an AMI because of her TNI rise; PT41 has had a STEMI because of his ECG. It happens to be that in these cases the other clinical features point to the same diagnoses,
but even if the related symptoms were not typical, the interpretations based on the technical findings would win out.

9. An interpretation is validated through open discourse in a community of persons with many shared values and beliefs.

This multiplicity of views is highlighted in the titles of two key references: one of Berg’s publications – “The multiple bodies of the medical record” (Berg & Bowker, 1997); and Poirier and Brauner’s paper – “The voices of the medical record” (Poirier & Brauner, 1990).

The group of health care practitioners working together in the rural hospital to produce the clinical record can be described as “A community of practice - a collection of people who engage in an ongoing basis in some common endeavour” (Eckert, 2006) p.683. By working jointly, and by a commitment to shared understanding, such a community develops its own ways of doing things. People in a community of practice develop their own sense about the enterprise they are engaged in, their own participation in the enterprise, their orientation to other communities of practice and to the world around them in general. Over time they develop a style – including a linguistic style – that embodies these interpretations.

The provision of clinical care by a team working together using the clinical record as a tool can also be described as an example of “distributed social cognition”, an important new way of looking at clinical care, now that we work in teams, supported by information technology. Health care has become too complex for single clinicians relying on their own memories and abilities to provide good care. "The construction of knowledge is both an individual and a social task" (Anspach, 1988) p.649.

Rambusch et al. describe a case study in a paediatric hospital where “the contents of a patient’s records”, as well as assisting with the process of clinical care, “transform intrapersonal knowledge into interpersonal knowledge shared by several people” (Jana et al., 2004) p.4.

10. The best way to learn how to interpret particulars is through an apprenticeship.

This seems to be true, and important, but is not something that is likely to be discovered from analysis of the records.
6.1.3. Praxis

The clinical record needs to go further than description and interpretation, just as clinical care needs to go beyond history and examination and diagnosis.

Carter’s third common feature – healing (Carter, 1986) – may seem too lofty an ambition to apply to a single clinical encounter, or a single work of literature. He does admit that it is a “final goal”. Daniel suggests a process that seems more realistic. It involves three levels: observation, judgement, and praxis (Daniel, 1986). In clinical terms, we might know them as “history and examination”, “diagnosis” and “treatment”.

The first level, which Daniel also calls the “objective” or “literal” level, is like Carter’s first feature of “representation”. It regards the patient as an object of observation. The second level, which he also calls the “subjective” or “personal” level, involves a degree of judgement, of trying to find meaning. It is analogous to Carter’s second feature of “interpretation” (Daniel, 1986).

Daniel’s third level, of “praxis”, involves practical judgement. It looks forward to the future, and to some implied action. It is “what physician and patient do with the interpreted meanings … the idea that interpretation of the text ought to have some application” (Daniel, 1986) p. 205 and 206. Treatment decisions, Carter points out, are likely to be made according to the information already gathered and recorded. There is also ideally an involvement of the patient in all stages of the process: in reflecting on the history, formulating the diagnosis, and looking ahead to treatment and prognosis (Carter, 1986).

The integral and changing relationship between representation, interpretation, and praxis, is well illustrated by PT46. GP4 has one rendering of the story: “He does have orthopnoea … returned a few days later and had some wheeze … clinical findings suggesting pleural effusion … I think you will be able to … perform thoracocentesis”.

This is not the same as PT46’s discharge diagnosis of NSTEMI. To make this altered diagnosis, and initiate appropriate treatment, HD4 needs to go back and represent the patient’s story differently. The clinical term “orthopnoea” is changed to the less specific
“difficult lying flat due [to] breathing”. Then, HD4, makes a “correction” to the narrative, which is clearly attributed to the patient: “When he describes wheezing = tight across both side of lower chest”.

It could also be considered, given the pre-eminence of technical information, that HD4 is able to refute GP4’s diagnosis of a pleural effusion by further examination and a chest X-ray, and HD4’s diagnosis of a NSTEMI is confirmed by a TNI rise.

Another example, from the same GP, is PT41. This time there is agreement, from the start, about what needs to be done: the patient, following a STEMI, needs thrombolysis. After the interesting but confusing information about a planned trip to the doctor, then a seizure, GP4 concludes with “chest pain … ECG … IMI”. AO16 “transported” the patient to “[The study hospital] for thrombolising [sic]”. NS9 helps transfer the patient to a bed, records the pain level, and kindly records the patient’s key concerns about the admission – “hopes heart will be OK”. HD10 notes the time that the symptoms started, which is important to know if the patient has arrived in time to benefit from thrombolysis, then presumably gets on with treatment.

6.2. The form and function of the records

Clinical records, as Berg points out, perform an active constitutive role in medical practice (Berg & Goorman, 1999). The multiple viewpoints expressed in the clinical record play an important role in recording and directing the course of patient care (Poirier & Brauner, 1990). The patient’s story can be thought of as a “first draft” that is edited by each of the providers into a form that suits their own purposes. Each of the characters has their own perspective, their own voice, their own priorities, and their own version of the story.

Clinical records over time have become more complex, and at the same time have come to adopt a more standardised format (Berg & Harterink, 2004). Most providers over time have adopted something like the “SOAP” format developed by Weed (Weed, 1968). The records in this study did tend to follow this format. However, because this study has concentrated on recording the history of the presenting complaint, mainly the “subjective” items – the symptoms that may have been reported by the patient - have been described.
As described in 2.5.1., there have been calls for a change to a more narrative approach (Donnelly, 1988). This is more evident in the GP referral letters, and to a lesser extent in the HD admission records, which are written or typed onto a blank page. The AOs and nurses, who are constrained by having to fill out predesigned forms, are writing in a more abbreviated form.

Increasing use is being made of computerised records (Fitzpatrick, 2004). In the GP records, which are the ones in this study making most use of computerised information, the history of the presenting complaint is usually typed in a narrative style, but the existing information about the patient in the GP computer record is often utilised to add records of previous relevant consultations, items of past history, or lists of regular medications. In hospital, introduction of computerised records requires an understanding of current paper records and how they support clinical practice (Fitzpatrick, 2000).

In this study, there are potentially important items of information – the phone call to HD1 about PT1 recorded by GP1; the angiography for PT11 that GP8 records was “to follow”, summarised in the record by HD5 (without mentioning it was obtained from GP8) – that do not appear elsewhere in the records, and would not have a place in an overly formalised records system.

Hospitals have tried to streamline compliance with the documentation process usually by adopting an interdisciplinary approach (Fernandez & Spragley, 2004). As described by Berg, using an example from an intensive care unit, the team caring for a patient interact to produce a document that can be used to organise and direct team care, but also reveal much about the relationships between team members (Berg & Goorman, 1999). An example from this study would be PT41, whose records clearly document the different roles their authors have taken in caring for him after his STEMI.

The written record is likely to reflect only a small portion of communications between health professionals (Alvarez & Coiera, 2006). This is exemplified in GP8’s referral letter for PT11, which reads “thanks for seeing … as discussed”. This earlier telephone discussion is unlikely to have been recorded and kept in the notes. Unrecorded verbal communication also happens within the hospital. Studies of early warning systems demonstrate that just writing in the notes is not enough to ensure that important messages are received (Franklin & Mathew, 1994). Structured handovers from
ambulance to ED staff that include both verbal and written material may lead to improved transfer of information (Bost et al., 2010).

6.3. The Record in Practice

Berg (Berg, 1996) extends these ideas based on a series of case studies of the way the clinical record is used in practice. He draws on sociological understandings of representation to show that the record of events is more than just a copy. It plays an active constitutive role in what takes place. By rendering patients’ histories in a particular way, it enters into the process of clinical decision making. It “forms an integral part of the process of transforming a patient's problem into a manageable problem” (Berg, 1996) p.504. By writing down an organised selection of the plethora of information available, a clinician actively transforms the information into a resource that can be used to help in decision making. The records are a summary, even an abstraction, which “reduces the complexity of the tasks on hand” (Berg, 1996) p.507.

The records also play a key role in organising clinical activities, for example by making lists. The way the records are organised and structured can reflect the hierarchical structure of the health care setting, for example by confining nurses and junior medical staff to observations and administrative tasks but allowing senior medical staff to make diagnoses and initiate treatments. The physicians typically use unstructured forms, which “affirms their position as the ‘central actor’ in the structuring of the patient’s trajectory” (Berg, 1996) p.512.

Berg noticed a “continuous toing-and-froing between nurses, registrars and senior physicians” (Berg, 1996) p.514 within the records. This would be common, in my experience, between the different categories of staff around the ward. It is clear from the records in the current study that the different health professionals are not providing health care on their own.

GP1 records that PT1 has been “discussed by phone”. AO1 writes that PT3 “was seen by GP”. AO1 again writes that PT7 “has been assessed by [a named] medical centre” and HD5 repeats that “he saw his GP today”. GP9 records that PT12 “went to [the] ambulance station”; AO2 in turn writes that PT12 was “assessed by [the] duty GP’ and “referred to [named] hospital”; NS10 records that her pain has been relieved by GTN
given by “the ambo”. Even for PT9, who is a self presentation”, and therefore has no record from the GP or AO, there is reference to another provider: HD3 notes that he “has seen his GP yesterday”.

AO16’s records for PT41, who came to the hospital in the ambulance accompanied by GP4, concentrate on documenting the findings and actions of the GP. They say that the “Dr gave” PT41 an “ECG” and “found [the] patient having Inferior Infarct”, then that the patient was “given morphine by GP”, then “has had all appropriate meds”, and finally a “12 lead taken @ surgery so monitoring only nec during transport”, making it clear that a routine investigation was not going to be repeated when it had already been done by the GP, who “travelled with us”. NS9 also documents that PT41 was “escorted by [GP4]. HD10 notes that PT41 was “observed at [the] medical centre” but doesn’t mention any of the investigations or treatments initiated by GP4.

There are a couple of instances of providers referring to notes written by others; both are nurse entries referring to notes written by doctors. NS9 records very little detail on the Nursing Admission form, but later in the Progress Notes writes “admitted as per doctor’s notes”. NS10 notes that PT10 has been “S/B Dr above”.

There are some examples of discrepancies between providers that are explained by referring to what others have recorded. GP4, for example, writes that PT46 “had some wheeze”, which is repeated by AO20, but HD4 contradicts this by writing for the same patient “when he describes wheeze = tight across both sides of the lower chest”.

Clinicians in practice tend to resist the constraints imposed by forms. Berg noticed many omissions, alterations, and additions, to the carefully designed temperature charts and other forms (Berg, 1996). This is clear in the records in the current study. Both the GPs and hospital doctors (at the time) were writing or typing onto a blank template. The nurses and ambulance officers were filling out a form with predetermined headings. There are many instances however where people deviated from the pre-set format. For PT3, AO1’s comments under “History” include “passed the FAST test with no noticeable deficits”, which is an examination finding. For PT11, NS9’s entry under “Reason for Admission / Initial Observations of Patient” start with “Presents via private vehicle”.
In another paper, with Goorman, focusing on electronic health records (Berg & Goorman, 1999), Berg comments further on the incomplete nature of some records. He uses the example of a nurse in an intensive care unit, completing an admission for a routine post-operative patient, opting not to fill out some items on the form, that relate to sicker patients. He comments, echoing Carter’s comparison with short story writing, that “the empty entries around the fields ‘rhythm’ and ‘murmurs’ transform the meaning of the entries in these fields much like a new event in a story can bring a new meaning to its evolving plot” (Berg & Goorman, 1999) p.54.

As mentioned in 2.5.9., Fitzpatrick, in a case study, examined the many forms of written documentation in an Australian hospital. She found that there were many pieces of paper in addition to what she called the “archival” record: (Fitzpatrick, 2004).

Clinicians use a diverse collection of documents and forms. Some of these pieces of paper are kept with the patient or distributed around the ward but end up in the traditional archival record. Others, such as sheets for handovers or relating to bed state, but containing information including staff’s personal opinions about patients, might not. The nurses, as they do at the hospital in which I work, had pieces of paper with patient information that they brought to shift handovers. The physiotherapists had their own notebook; the pharmacy and stroke management team had their own service-specific forms. These items did not usually make their way into the archival record. Records intended to be kept in the archival record tended to be more formal. Some forms e.g. for stroke patients, were service specific. Some entries in the record e.g. on ward rounds, seem designed to construct as well as record care. Forms used for one purpose were adapted to another e.g. information about where a drug was located was added to the medication prescribing form (Fitzpatrick, 2004).

The same would apply to much of the written information at our hospital, including the record of the initial phone call usually made from the GP to the HD. As Garfinkel puts it “informal practices exist which are known about by everyone, that as a matter of course contradict officially depicted and openly acknowledged practices (Garfinkel & Bittner, 1967) p.48.

The components of the working record have different authors, different intended audiences, different intended lifespans, different home locations, and different
purposes. The archival record to an extent captures the essence of events and processes, as they relate to the patient, but the other pieces of paper play their part in the practical ways that clinicians organise and record their own roles in the delivery of care (Fitzpatrick, 2004).

Berg emphasises that this flexibility is “not a symptom of improper use” (Berg, 1996) p.514. Rather, he argues, “the continuous working around and re-interpreting the record’s contents allows the record to function – to distribute and collect, and thereby transform, the very work of those who bring it alive” (Berg, 1996) p.115.

Garfinkel also believed that the records he studied were put together the way they were for “good reasons”. They are “assembled … by some clinic member, to construct a potential or past course of transactions between the clinic and a patient … frequently in the interests of justifying an actual or potential course of actions” (Garfinkel & Bittner, 1967) p.52. When read by someone who understands the context, they will not only be understood but be put to good use.

The record, Berg finds, can be something of an idealised representation of events. Uncertainties and disagreements tend to be glossed over or left out. “Entries in the record are often explicitly intended to create a post hoc document of the completeness and rationality of the actions undertaken (Berg, 1996) p.518.

6.4. Clinicians and Stories

To return to the idea of narrative, there is not a rigid distinction between the worlds of clinical care and literature, as Carter acknowledges in his fanciful comparison of a short story and a clinical record (Carter, 1986). There are doctors who write stories for general readers. Some, such as Oliver Sacks (Sacks, 1998) publish popular accounts of patients and treatments, an example being. The man who mistook his wife for a hat (Sacks, 2009). Others, including Anton Chekhov (Puustinen, 2000) and William Somerset Maugham (Maugham, 1992), have written fictional stories informed by their own experiences as doctors. John Keats, also a doctor, wrote some of the greatest English poetry (Keats, 1895). Richard Gordon wrote entertaining fictionalised accounts loosely based on his own medical training and experience in the “doctor in the house”
series of books (Gordon, 1952). Excerpts relevant to diagnosis and records are quoted in 2.4.2. and 2.5.4.

An example of a New Zealand initiative echoing the work on narrative of Charon (2008) mentioned at the beginning of section 6.1 is the Medicine Stories Project, a small website whose goal is to collect and distribute the stories of doctors and their patients. The language we might use to describe our subjective experiences in medicine, the editors argue, “somehow seems a casualty of learning to speak in a way that … does not value the local and … pretends an objectivity it does not really possess”. Medicine, they believe, “at least in part”, is a storytelling profession, and subjective approaches, such as narrative, can be as effective as more objective approaches, at pointing towards illness, and what to do about it. The scientific method, they admit, is a valuable tool to extend what we know about the body, its illnesses, and the treatments for these illnesses. The language of science, in many ways, has become the language of medicine. But medicine, they contend, is also an old art form. Bodies, illnesses, treatments, and doctors all “have a plot”. Often untangling and interpreting these plots can shed light on a person’s situation, as well reveal a way forward to treatments that might be required (The Medicine Stories Project).

Nurses are also encouraged to write from their knowledge and perspective for professional publication. As Stepanski points out: “Successful nursing professionals already have what it takes to write for publication … strong oral and written communication skills … [and the] ability to communicate ideas clearly and persuasively to a variety of audiences (Stepanski, 2002) p.134. Skillman-Hull managed to “discover and describe aesthetic aspects of human care”, by interviewing nurse-artists, including writers (Skillman-Hull, 1994).

There are potential ethical problems with this type of activity, that are not confined to the obvious issues around confidentiality, or of personal or cultural appropriation. Emphasising the subjective nature of the patient’s account, in literature as in the clinical notes (Donnelly, 1992), can have the unintended consequence of trivialising the patient’s experience, as compared with more “objective” doctor-centred or technical information. Interpreting the patient’s story for our own purposes requires a degree of “narrative humility” (Shapiro, 2011) p.71.
The literary community can be equally critical of perceived ethical transgressions. Thomas Shakespeare, a disability-rights activist, accusing Oliver Sacks of exploiting the people he wrote about, memorably described him as “the man who mistook his patients for a literary career” (Cowles, 2015).

Patients too of course can write about their experiences of illnesses and treatments, and some do. Perhaps the best-known examples are from patients who happen to publish their stories in the medical literature, such as Norman Cousins (Cousins, 1976), but there are many others. Some authors advocate that patients be involved in producing their own clinical records (Fischbach et al., 1980).

6.5. Conclusion

Although there are many parallels between literature and clinical records, they are not the same thing. Clinical records are produced in a different way – typically by a team. They have different intended audiences. They have different associated ethical issues. Most importantly, they have different purposes. Clinical records are not designed to entertain, or to tell a story merely to find out “what happens next”.

It is important to understand, for its purpose of facilitating clinical care, that the record is not merely a description of events. Each piece of information recorded by each health care provider is part of a carefully constructed document, that can be used for multiple purposes. The most important of these is to co-operate in describing, interpreting, and determining the best course of action, in the unique way that clinicians refer to as history and examination, diagnosis, and treatment.
Chapter Seven: Conclusions for Clinicians and Researchers

“Good records are the responsibility of everyone in the healthcare team … they are vital in providing best care, reducing error and ensuring patient safety” (Kumar & Clark, 2012).

And now, to conclude this thesis, something for clinicians. I want to pass on what I have learnt from this project, as an experienced clinician, about histories, clinical records, the rural setting, different health professionals, and acute myocardial infarction. There are also some lessons about research. Most of this thesis – the literature review, methodology, findings, and discussion - has been written from the point-of-view of the researcher. I have surveyed the literature; I have adapted a range of mainly qualitative methods to analyse the records of patients at the hospital, and presented the findings; I have discussed how the clinical records are related to other forms of narrative. This conclusion will concentrate on the relevance of the study to practising clinicians, as well as to researchers.

Why do we write notes? What is the process we are engaged in? How has it changed and how is it changing? What does it mean for interdisciplinary care? What does it mean for patients? I will address these questions about the nature and purpose of clinical records, and make recommendations for practice and for further research.

As described in 2.5., good documentation is equated with good care. There are a number of suggested reasons why clinical records might be considered important: they function as “a legal document”; they provide an account to document patient care; they can be used for epidemiological research; and they can be used by a team of health care professionals to help to organise care.

The clinical record, as made clear in 2.5.4., is not merely a description of events. In fact, multiple studies have shown that it is a poor description of the patient’s experience. This should not be interpreted as a sign of poor care - rather, the record is an appropriate tool to make sense of the complexities of modern interprofessional care. It is a carefully constructed document, that can be used for multiple purposes, mainly to co-operate in describing, interpreting, and determining the best course of action.

The record I describe in 5.3.7. as an incremental, multi-authored, multi-layered, intertextual account, being co-produced by a range of health providers, using
information from the patient, family, carers, other providers, and from other records. The various providers, interact to record the history of the presenting complaint. The record displays information about this interaction as well as information about the patient.

The professional groups involved can be seen to co-operate, among other practices, through the production of the record. The record in part reflects the nature and quality of the relationship between clinicians and patients. It has developed over time into a sophisticated tool that can be used to guide and organise patient care, and continues to develop with the advent of electronic health records. The study of clinical records also allows insights into the ways that care is provided and organised by a clinical team.

Good care is the result of an organised interdisciplinary process that is centred on patients and their needs. The clinical record is an important tool in this process. It is critical, for optimal care, that health professionals, when they write in the notes, have an informed understanding of the part that the record plays in the process - of caring for the patient - in which we are all engaged.

Clinical care, like most areas of life, has witnessed an increasing use of information and communication technology. Computers are routinely used in New Zealand general practices. They are less commonly used in hospital, where the doctors and nurses are not usually sitting at a desk, with a computer on it, when consulting with the patient. This obstacle is disappearing as computers become more mobile. Many New Zealand hospitals still use paper for day-to-day patient clinical records, as the hospital in this study did in 2011, with the computer used as a way of sourcing or sending additional information that is not contained in the paper record.

Although it seems that everybody is moving, or has moved, to electronic health records, a study of paper records remains highly relevant. When transitioning to electronic records there are features of clinical records in general that it is important not to lose sight of. The development of electronic medical records, as discussed in 2.5.9., requires an understanding of the way that records are structured and used, especially if they are used to support clinical practice. The adoption of electronic health records requires a more modern and complete conception of the clinical record as a working document.
For example, in 2016, a new electronic record is being rolled out nationwide for St John ambulances. Instead of hand-writing on a form, ambulance officers (AOs) are required to answer questions on a customised tablet computer, which they often start doing after they have handed over the patient. If time allows, the AO can print off the electronically generated form for the receiving staff at the general practice or hospital, but often they are too busy, and instead leave a code that others can use to access the information. This change seems designed for the St John central office to have information about who is transported, but seems to be of doubtful benefit for the receiving medical and nursing staff, or for the patient.

At a late stage in the writing-up of my thesis, one of the registrars asked me the searching question: has it changed your practice? I answered that it has certainly changed the way I think about my practice. It may have changed the way I write my notes, which is the reason I went back to 2011, so that this effect if present would not influence my results. Doing the study has changed the way I read the notes written by others. I like to get the perspectives of other staff on patient care e.g. reading the night nurse’s report before seeing a patient on the morning ward round. I am perhaps more careful than previously to listen to and document the histories of patients with suspected AMI, as well as incorporating elements of what others have written

The focus on a single hospital could be perceived as a limitation. It is not possible to know if the findings are applicable to bigger hospitals in urban settings, or even to other rural hospitals. The results do however tend to concur with the findings in the available literature. The clinicians who have produced the records in this study, are working in an environment that is both challenging and poorly resourced. My supervisors, from reading the patients’ stories, could detect a local rural flavour of which I, as a participant observer, was largely unaware. A researcher less familiar with the hospital might come up with different, but arguably less valid, results. It would also be possible to conduct similar studies in other hospitals or other health care settings.

Similarly, the choice of a single clinical condition, specifically chosen because the suspicion of acute myocardial infarction is likely to result in patients being seen, and records being produced, by a range of health care providers, may limit the applicability of the findings to the records of patients with other conditions. Further insights might be gained by researching conditions where professional roles are likely to be more
differentiated, such as the skills sets required in trauma care, or where there may be varying opinions between providers on the nature of the patient’s condition, such as in chronic regional pain.

The study was limited to the history of the presenting complaint. This is appropriate for acute myocardial infarction, where the history of the presenting complaint is such an important part of making the diagnosis. Further understanding of the process of interdisciplinary care, and the part the records play in developing plans for management, might be gained by researching the later parts of the clinical record that relate to continuing care. An example might be the rehabilitation of a patient with stroke.

Some clinicians can also become researchers. I have proven this, to some extent, by doing this project at a late stage in my own career. This is a case study – an exploration of records at a single rural hospital. Similar methodologies could be applied to a variety of health care issues and questions across a broad range of settings. An understanding of the relevant research methodology, including qualitative approaches, is a useful addition to a considered examination of the work we do.

So, in conclusion, what have I learned? Why does it matter? I started with an interesting observation from a medical student on the differing nature of interdisciplinary clinical records at our hospital. I have examined this phenomenon carefully, properly supervised, conducting an extensive literature search, and using appropriate methods. I have ended up with important new insights derived from the way that different health professionals work together to construct interdisciplinary records relating to the presenting complaint of a single clinical condition. As I have explained above, this information is highly relevant to practising clinicians.
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Appendix One

Health Research Ethics Committee Approval

Assoc. Prof. S Pullon
Department of Primary Health Care and General Practice (Wgnt)
Faculty of Medicine
University of Otago, Wellington

5 May 2015

Dear Assoc. Prof. Pullon,

I am again writing to you concerning your proposal entitled "Histories of Chest Pain", Ethics Committee reference number H15/040.

Thank you for your letter of 4th May 2015 addressing the issues raised by the Committee.

On the basis of this response, I am pleased to confirm that the proposal now has full ethical approval to proceed.

The standard conditions of approval for all human research projects reviewed and approved by the Committee are the following:

Conduct the research project strictly in accordance with the research proposal submitted and granted ethics approval, including any amendments required to be made to the proposal by the Human Research Ethics Committee.

Inform the Human Research Ethics Committee immediately of anything which may warrant review of ethics approval of the research project, including: serious or unexpected adverse effects on participants; unforeseen events that might affect continued ethical acceptability of the project; and a written report about these matters must be submitted to the Academic Committees Office by no later than the next working day after recognition of an adverse occurrence/event. Please note that in cases of adverse events an incident report should also be made to the Health and Safety Office:

http://www.otago.ac.nz/healthandsafety/index.html

Advise the Committee in writing as soon as practicable if the research project is discontinued.

Make no change to the project as approved in its entirety by the Committee, including any wording in any document approved as part of the project, without prior written approval of the Committee for any change. If you are applying for an amendment to your approved research, please email your request to the Academic Committees Office:

gary.witte@otago.ac.nz
jo.farrondo.diaz@otago.ac.nz

Approval is for up to three years from the date of this letter. If this project has not been completed within three years from the date of this letter, re-approval or an extension of approval must be requested. If the nature, consent, location, procedures or personnel of your approved application change, please advise me in writing.

Yours sincerely,

[Signature]

Mr Gary Witte
Manager, Academic Committees
Tel: 479 8256
Email: gary.witte@otago.ac.nz

c.c. Assoc. Prof. S R H Pullon Department of Primary Health Care and General Practice (Wgnt)
Appendix Two

Ngāi Tahu Research Consultation Committee Approval

Tuesday, 21 April 2015.

Associate Professor Susan Pullon,
Wellington School of Medicine,
WSM&HS.

Tēnā Koe Associate Professor Susan Pullon,

Histories of patients with suspected acute myocardial infarction as recorded by different health professionals. This retrospective, notes-review study will examine the written clinical records of a group of 200-300 patients presenting to a New Zealand rural hospital with symptoms of a likely acute myocardial infarction as recorded by general practitioners (GPs), ambulance officers, hospital nurses and hospital doctors.

The Ngāi Tahu Research Consultation Committee (the committee) met on Tuesday, 21 April 2015 to discuss your research proposition.

By way of introduction, this response from The Committee is provided as part of the Memorandum of Understanding between Te Rūnanga o Ngāi Tahu and the University. In the statement of principles of the memorandum it states “Ngāi Tahu acknowledges that the consultation process outline in this policy provides no power of veto by Ngāi Tahu to research undertaken at the University of Otago”. As such, this response is not “approval” or “mandate” for the research, rather it is a mandated response from a Ngāi Tahu appointed committee. This process is part of a number of requirements for researchers to undertake and does not cover other issues relating to ethics, including methodology they are separate requirements with other committees, for example the Human Ethics Committee, etc.

Within the context of the Policy for Research Consultation with Māori, the Committee base consultation on that defined by Justice McGechan:

“Consultation does not mean negotiation or agreement. It means: setting out a proposal not fully decided upon; adequately informing a party about relevant information upon which the proposal is based; listening to what the others have to say with an open mind (in that there is room to be persuaded against the proposal); undertaking that task in a genuine and not cosmetic manner. Reaching a decision that may or may not alter the original proposal.”

The Committee considers the research to be of importance to Māori health.

. The Committee recommends recording ethnicity where available.

The Committee suggests dissemination of the research findings to Māori health organisations regarding this study.
We wish you every success in your research and the committee also requests a copy of the research findings.

This letter of suggestion, recommendation and advice is current for an 18 month period from Tuesday, 21 April 2015 to 21 October 2016.

Nāhaku noa, nā

Mark Brunton
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Appendix Three

St John Ambulance Patient Report Form
Appendix Four

Nursing Admission Assessment Form

NURSING ADMISSION ASSESSMENT

(to be completed within 4 hours of admission)

Is patient’s stay on the ward ACC related? □ Yes □ No  ACC Number:

If ACC related please notify reception as we have a short window of time to claim for patient’s stay on ward. Please note if patient has an accident on ward – ACC45 needs to be completed and given to reception.

Presentation:  □ Ambulance  □ Mobilised to bed with assistance
□ Mobilised to bed independently □ Private Vehicle

Reason for Admission / Initial Observations of Patient

Relevant Past History:

PERIPHERAL IV CATHETER

Insertion Site: ________________________________
Catheter Gauge: ___________________ Date: ____________ Time: ____________
Inserted by: ________________________________ Date removed: ____________

Baseline Obs:

Recordings:  P = __________________ BP = __________________ SpO2 = ________ RR = ________
Temp = °C Wt = Kg

☐ Baseline observations recorded on Observation Chart

ADMISSION ASSESSMENT AND RISK SCREENING

to be completed by the nurse admitting the patient

Yes  No

General  □  □ Does the patient have any key concerns about admission?
□  □ Nok notified?

Neurological / Mental Function

☐  □ Is the patient alert and orientated?
☐  □ Sleep problems?
☐  □ Memory problems?
☐  □ Disorientated
☐  □ Hearing problems?
☐  □ Sight problems?

☐  □ Patient has difficulty communicating? (Speech, language?)
☐  □ Patient has difficulty swallowing?
☐  □ Are there any recent changes or concerns regarding the patient’s balance?

Author: Charge Nurse
Authorized by: Nursing Practice Committee
Updated: 2017
Page 1 of 4
<table>
<thead>
<tr>
<th><strong>Pain/Comfort</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current pain (0 = no pain, 10 = worst imaginable)</td>
<td>Describe pain in patient's own words (aching, stabbing etc.)</td>
<td></td>
</tr>
<tr>
<td>Site of pain? Any radiation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How long has the patient had pain? Where did it start and in what setting does it occur?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain management / pre admission?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain management is ineffective?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain is the reason for admission?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Respiratory</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there evidence of increased work of breathing?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>GI / GU</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient take laxatives?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have bowel problems?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have urinary problems?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Skin</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient have fragile skin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have a wound?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nutrition</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient’s fluid / nutrition state look adequate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a special diet plan that needs to be implemented from the medical notes, eg NBM?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mobility</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there any recent changes or concerns regarding the patient’s level of mobility?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Falls Risk</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls Risk Assessment Completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walks only with help of one / two people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair / bed bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight-bearing status</td>
<td>Full</td>
<td>Partial</td>
</tr>
<tr>
<td>Baseline mobility altered</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Emotional / Social</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the patient’s current living situation (dependants, spouse, own home)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

We are concerned about family violence and the impact it has on your health. Therefore we routinely ask all clients / patients entering our service about violence in their home.

Do you feel safe at home and/or in your current relationship? | Yes | No (If a disclosure is made, refer to Family Violence Guidelines and complete the appropriate Risk Assessment Screening form) | Completed |

---

Patient currently receives formal home-based supports? (eg. personal cares, domestic assistance)?

Patient usually requires assistance with ADL’s? (includes self care and domestic tasks)

Does the patient’s present condition prevent them from carrying out their daily activities safely? (If yes, complete referral to Occupational Therapist)

If the patient is ACC eligible, do they require ACC supports to be arranged post discharge? (If yes, complete referral to Occupational Therapist)

Are the district nurses visiting currently? If yes, why?

Special Cultural Needs:

Special Spiritual Needs:
### Current Medications

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergies</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Self Medicated?</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Type of pack?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- If yes, complete allergy sticker including reaction

**Did the patient bring own medications?**  
☐ Yes  ☐ No  ☐ Don’t stored: ☐ Yes

**Did the patient bring any herbal medicines-supplements?**  
☐ Yes  ☐ No  ☐ What?

**Usual Pharmacy:**

### Personal Possessions

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>☐</td>
<td>☐</td>
<td>Items kept by patient</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Valuables in safe</td>
<td>☐</td>
<td>☐</td>
<td>Footwear</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Valuables form completed</td>
<td>☐</td>
<td>☐</td>
<td>Dentures / Partial</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Valuables given to family</td>
<td>☐</td>
<td>☐</td>
<td>Spectacles</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>Hearing aid(s)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>Walking Stick</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>Walking Frame</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Patient / Client Orientation

- Call Bell
- Bathroom / Shower
- Visiting Hours
- Meal Time
- Lounge / TV
- Other

### Paediatric

**0-12 years**

**Current diet:**

**Immunisation History:**

☐ Yes  ☐ No  Is the child reaching developmental milestones?  
☐ Yes  ☐ No  (If No, discuss with MO is referring to Child Development Services)

**Nurse Assessor:**

**Name:**

**Signature:**

**Date:**

**Time:**

### Paediatric Admissions:

- We hereby consent to Health Care Professionals carrying out (after appropriate explanation) whatever minor procedures and practices as may be necessary during the routine treatment of our child. Some of these practices are considered restraint according to NZS8134.2.2.2008, e.g., holding an arm for blood tests or intravenous access.

**Parent/Child:**

**Nurse/Doctor:**

**Date:**

**Reason:**

**Signature:**

### Referrals

<table>
<thead>
<tr>
<th>Date</th>
<th>Reason</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Restraint and use of Bed Rails as an Enabler

The use of bed rails are considered to be restraint according to NZS8134.2.2.2008. There are situations however, whereby these are required to facilitate movement in bed.

**If we understand that bed rails may be used for the reason above throughout my episode of care and consent to their use:**

**Client:**

**Date:**

**Nurse/Doctor:**

**Date:**

**Reason:**

**Signature:**

### Author:

**Charge Nurse**

**Updated:** July 2017

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Appendix Five
Demographic Data Collection Form

Study Patient Number

NHI

Age

Sex

Ethnicity

Admission Date

Known IHD?

Diabetes?

Highest TNI

Diagnosis
# Appendix Six

## Clinical Data Collection Form

<table>
<thead>
<tr>
<th>Study Patient Number</th>
<th>NHI</th>
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<tbody>
<tr>
<td>Provider Type</td>
<td>Provider Code</td>
</tr>
<tr>
<td>Pain Location</td>
<td>Radiation</td>
</tr>
<tr>
<td>Character</td>
<td>Severity</td>
</tr>
<tr>
<td>Onset</td>
<td>Duration</td>
</tr>
<tr>
<td>Precipitating Factors</td>
<td>Relieving Factors</td>
</tr>
<tr>
<td>Associated Features</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix Seven

**List of Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A + O</td>
<td>Alert and orientated</td>
</tr>
<tr>
<td>ACS</td>
<td>Acute coronary syndrome</td>
</tr>
<tr>
<td>Angio</td>
<td>Angiography</td>
</tr>
<tr>
<td>Angiog</td>
<td>Angiography</td>
</tr>
<tr>
<td>AO</td>
<td>Ambulance officer</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute myocardial infarct(ion)</td>
</tr>
<tr>
<td>BBB</td>
<td>Bundle branch block</td>
</tr>
<tr>
<td>BGL</td>
<td>Blood glucose level</td>
</tr>
<tr>
<td>BCE</td>
<td>Before common era</td>
</tr>
<tr>
<td>Ca</td>
<td>Cancer</td>
</tr>
<tr>
<td>CABG</td>
<td>Coronary artery bypass graft</td>
</tr>
<tr>
<td>CE</td>
<td>Common era</td>
</tr>
<tr>
<td>c/o</td>
<td>Complaining of</td>
</tr>
<tr>
<td>C/O</td>
<td>Complaining of</td>
</tr>
<tr>
<td>CP</td>
<td>Chest pain</td>
</tr>
<tr>
<td>CT</td>
<td>Computed tomography</td>
</tr>
<tr>
<td>CVA</td>
<td>Cerebrovascular accident</td>
</tr>
<tr>
<td>Cx</td>
<td>Circumflex (artery)</td>
</tr>
<tr>
<td>DM</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>DPH</td>
<td>Dunedin Public Hospital</td>
</tr>
<tr>
<td>Dr</td>
<td>Doctor</td>
</tr>
<tr>
<td>DRHMANZ</td>
<td>Division of Rural Hospital Medicine of New Zealand</td>
</tr>
<tr>
<td>ECG</td>
<td>Electrocardiograph</td>
</tr>
<tr>
<td>ED</td>
<td>Emergency Department</td>
</tr>
<tr>
<td>ETT</td>
<td>Exercise tolerance test</td>
</tr>
<tr>
<td>F</td>
<td>Female</td>
</tr>
<tr>
<td>FAST</td>
<td>Face, Arm, Speech, Time (a screening test for stroke)</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>GTN</td>
<td>Glycerine trinitrate</td>
</tr>
<tr>
<td>HD</td>
<td>Hospital doctor</td>
</tr>
<tr>
<td>Heli</td>
<td>Helicopter</td>
</tr>
<tr>
<td>Hx</td>
<td>History</td>
</tr>
<tr>
<td>HxPC</td>
<td>History of presenting complaint</td>
</tr>
<tr>
<td>IHD</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous(ly)</td>
</tr>
<tr>
<td>(L)</td>
<td>Left</td>
</tr>
<tr>
<td>LAD</td>
<td>Left anterior descending (artery)</td>
</tr>
<tr>
<td>LOC</td>
<td>Loss of consciousness</td>
</tr>
<tr>
<td>M</td>
<td>Male</td>
</tr>
<tr>
<td>MI</td>
<td>Myocardial infarct(ion)</td>
</tr>
<tr>
<td>NHL</td>
<td>Non-Hodgkin’s lymphoma</td>
</tr>
<tr>
<td>NS</td>
<td>Nurse</td>
</tr>
<tr>
<td>NSTEMI</td>
<td>Non-ST elevation myocardial infarct</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>NZ</td>
<td>New Zealand</td>
</tr>
<tr>
<td>O/A</td>
<td>On admission / On arrival</td>
</tr>
<tr>
<td>OE</td>
<td>On examination</td>
</tr>
<tr>
<td>O/E</td>
<td>On examination</td>
</tr>
<tr>
<td>Palp</td>
<td>Palpation</td>
</tr>
<tr>
<td>PC</td>
<td>Presenting complaint</td>
</tr>
<tr>
<td>PMH</td>
<td>Past medical history</td>
</tr>
<tr>
<td>PMHx</td>
<td>Past medical history</td>
</tr>
<tr>
<td>PND</td>
<td>Paroxysmal nocturnal dyspnoea</td>
</tr>
<tr>
<td>Pt</td>
<td>Patient</td>
</tr>
<tr>
<td>PT</td>
<td>Patient (for coding)</td>
</tr>
<tr>
<td>(R)</td>
<td>Right</td>
</tr>
<tr>
<td>RCA</td>
<td>Right coronary artery</td>
</tr>
<tr>
<td>RNZCGP</td>
<td>Royal New Zealand College of General Practitioners</td>
</tr>
<tr>
<td>RUQ</td>
<td>Right upper quadrant</td>
</tr>
<tr>
<td>S/B</td>
<td>Seen by</td>
</tr>
<tr>
<td>SL</td>
<td>Sublingual</td>
</tr>
<tr>
<td>SOAP</td>
<td>Subjective, Objective, Assessment, Plan</td>
</tr>
<tr>
<td>SOB</td>
<td>Short(ness) of breath</td>
</tr>
<tr>
<td>STEMI</td>
<td>ST elevation myocardial infarct</td>
</tr>
<tr>
<td>Sx’s</td>
<td>Symptoms</td>
</tr>
<tr>
<td>Tachy</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Tacy</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>TIA</td>
<td>Transient ischaemic attack</td>
</tr>
<tr>
<td>TNI</td>
<td>Troponin I</td>
</tr>
<tr>
<td>TNT</td>
<td>Troponin T</td>
</tr>
<tr>
<td>Tx</td>
<td>Transfer(ed)</td>
</tr>
<tr>
<td>WOB</td>
<td>Work of breathing</td>
</tr>
<tr>
<td>2/52</td>
<td>Two weeks</td>
</tr>
<tr>
<td>3/6</td>
<td>Three months</td>
</tr>
<tr>
<td>3/7</td>
<td>Three days</td>
</tr>
</tbody>
</table>
Appendix Eight

Conventions

In the Findings Chapter, words recorded by providers are underlined. In other Chapters, they appear “in quotation marks”. Quotations from the literature are written “in quotation marks” followed by a reference and a page number. Implied words are placed in [square brackets], as are substituted terms such as [patient] for the name of a patient. Spelling and grammar errors found in the records are left unchanged. Where this creates any chance of misunderstanding, they are identified by the expression [sic]. Terms that can be abbreviated, when written for the first time in each Chapter will be written in full, e.g. acute myocardial infarction, with the abbreviation (AMI) in brackets, then the abbreviation will be used. There is also a List of Abbreviations, Appendix Seven, and a Glossary, Appendix Nine.
Appendix Nine

Glossary

Acute coronary syndrome (ACS)
New onset of unstable angina, NSTEMI or STEMI (see below).

Acute myocardial infarction (AMI)
Myocardial infarction (see below) that is of recent onset.

Angina (angina pectoris)
The pain or tightness in the chest typically experienced by people with ischaemic heart disease (see below).

Angiography
Insertion of a catheter to allow infusion of contrast that shows the interior of arteries on X-ray.

Arrhythmia
An irregular heartbeat.

Bundle branch block (BBB)
A block of part of the electrical conducting system of the heart.

Cardiac catheterisation
Insertion of a catheter to allow infusion of contrast that shows the heart, including the coronary arteries (see below) on X-ray.

Coronary artery
An artery that supplies blood to the heart muscle.

Coronary artery bypass graft (CABG)
A graft (usually from a leg vein) used to bypass an obstructed coronary artery (see above).

Cerebrovascular accident (CVA)
Damage to a part of the brain related to its blood supply, commonly called a “stroke”.

Defibrillation
The use of an electric shock to treat arrhythmias (see above).

Diaphoresis
Sweating to an unusual degree as a sign of illness.

Dyspnoea
Difficult or laboured breathing.
Echocardiography (ECHO)
Using reflected sound waves to form an image of the heart structures.

Electrocardiogram (ECG)
A machine that records the electrical activity of the heart.

Exercise tolerance test (ETT)
An investigation using exercise to see what happens to the ECG (see above) at increased heart rates.

Glycerine trinitrate (GTN)
A medicine that opens coronary arteries (see above) and improves blood supply to heart muscle.

Ischaemic heart disease (IHD)
Inadequate blood supply to heart muscle.

Lymphoma
A cancer of the lymph organs.

Mastectomy
Surgical removal of a breast.

Mediastinitis
Inflammation of the structures in the middle of the chest.

Myocardial infarction (MI)
Damage to heart muscle.

Non-ST elevation myocardial infarction (NSTEMI)
Myocardial infarction (see above) that does not result in elevation of the ST segments of the ECG (see above).

Oedema
Swelling due to excess fluid.

Orthopnoea
Difficulty breathing lying flat.

Pericarditis
Inflammation around the heart.

Pleural effusion
Fluid between the lung and the chest wall.

Pneumothorax
Air between the lung and the chest wall.

Pulmonary embolus
A clot in the arteries of the lung.

ST elevation myocardial infarction (STEMI)
Myocardial infarction (see above) that results in elevation of the ST segments of the ECG (see above).

Stent
A plastic pipe used to bypass an obstruction.

Tachycardia
An abnormally rapid heart rate.

Thoracocentesis
A procedure to drain a pleural effusion (see above).

Thrombolysis
Injection of a medicine to break up clots.

Transient ischaemic attack (TIA)
A transient disruption of blood supply to a part of the brain.

Troponin (TNI or TNT)
A chemical released from damaged heart muscle.

Unstable angina
Angina (see above) that occurs at rest or is not relieved by rest.