Changing attitudes? Interprofessional training for doctors and nurses.

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Summary

Interprofessional practice and effective teamwork are required for optimal patient care in today's complex healthcare environments (World Health Organisation, 2010). The effectiveness of interprofessional educational activities in achieving changes in practitioners' skills and attitudes in this area is not conclusively demonstrated (Hammick, 2000; Mattick & Bligh, 2003; Reeves, Zwarenstein, Goldman, Barr, Freeth, Hammick, & Koppel, 2008; Zwarenstein, Atkins, Barr, Hammick, Koppel, & Reeves, 1999).

Interprofessional education sessions for medical interns were run in 2011. These involved small group role-play and mannequin based simulation scenarios with orthopaedic nurses followed by a facilitated group debriefing with an experienced clinician and educator after each one. The aim of this research was to measure the impact on staff attitudes about interprofessional practice, and changes in their interprofessional practice, particularly with respect to collaborative care, in response to this interprofessional educational intervention.

The research was conducted in two phases using a mixed method approach, comprised of both quantitative and qualitative components. Phase one collected Likert scale data using the Readiness for Interprofessional Learning Survey (RIPLS) questionnaire (Latrobe Community Health Service, 2009). The RIPLS questionnaire is an internationally recognised survey tool, which has been validated for use in the postgraduate context (Reid, Bruce, Allstaff, & McLernon, 2006). The RIPLS statements are collected into 3 main groups or sub-scales: teamwork and collaboration, professional identity, and roles and responsibilities. The initial quantitative data set investigated attitudes in these three sub-scales immediately prior to and then again following the education session, to evaluate whether participation in the education session changed participants' responses to the RIPLS questions. There were 76 responses in total for phase one. Phase two collected qualitative data by interviewing individual participants six months following the education session. A series of questions

attempted to elicit any perceived or real impact on workplace behaviour that resulted following the interprofessional education session.

This study found significant improvements in the phase one data set in attitudes for the sub-scales for teamwork and collaboration and professional identity, ($p<0.001$) and roles and responsibilities ($p<0.01$) in the post intervention responses when compared to the pre-workshop responses using the RIPLS tool. These findings were further supported by the phase two interview data, which demonstrated positive feedback in the long term in areas of teamwork and collaboration, and suggested that participants felt that there had been a positive impact in these workplace behaviours since the intervention. Contact theory and reflective practice are considered in the discussion to further understand these findings.

In conclusion, these small group interprofessional teaching sessions for hospital clinicians resulted in a positive change in attitudes to teamwork and collaboration, professional identity and roles and responsibilities, as measured using the RIPLS questionnaire. There was also evidence of a positive impact on collaborative practice, including communication skills, and awareness of roles and their importance at the six month follow up interview. As the areas in which these improvements were found are so important in our health care environment, it is recommended that similar sessions be continued in the hospital to keep improving teamwork and collaborative care, and thus ultimately improve safe patient care. There may also be similar benefits in other hospitals or different health care settings.

Declaration of authorship

I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature.....Date.....

Chapter 1: Introduction

Interprofessional practice and effective teamwork are required for optimal patient care in today's complex healthcare environments (Hall & Weaver, 2001; World Health Organisation, 2010). 'Shared care' between the hospital and community health care is becoming more common. Hospital admissions tend to be shorter, with earlier discharge back to a primary care setting. Additionally, there are often many health professionals (medical, nursing and allied health) involved in any patient's care, both in and out of the hospital environment. It is therefore increasingly important in both the busy multi-professional hospital system and in community-based primary care that health professionals communicate well with each other, within and between those systems, and collaborate in caring for their patients (Thistlethwaite & Moran, 2010).

In the interprofessional literature, a team has been defined as two or more health professionals with a common goal, specific adaptable roles, and who perform interdependent tasks (Baker, Salas, King, Battles, & Barach, 2005). The concept of working together in teams made up of different professions has been called interprofessional practice. Interprofessional practice has been described as having respect for all others, an awareness of shared and unique practice (or roles) and a patient focus (Hammick, Olckers, & Campion-Smith, 2009). An interprofessional team is described as one with members from different professional backgrounds, working collaboratively (Hammick, Olckers, & Campion-Smith, 2009).

Teamwork has been defined as behaviours that facilitate effective team member interaction (Beaubien & Baker, 2004). Teamwork is known to be critical for ensuring patient safety (Baker, Salas, King, Battles, & Barach, 2005; World Health Organisation, 2010). Characteristics of high functioning teams include shared vision, shared responsibility, information sharing, knowledge of personal roles as well as those of others in the team, and flexible role boundaries (Hammick, Olckers, & Campion-Smith, 2009). Team skills that have been shown to be important include communicating, asserting leadership, feedback between members, and re-evaluation (Baker, Salas, King, Battles, &

Barach, 2005). Despite the knowledge that teamwork and collaborative care are important, in the hospital teaching environment there is little formal teaching to address these issues, when compared to teaching content. For example, the content regarding the management of chest pain is covered in great detail in both medical and nursing education, although there is little time dedicated to teaching staff how to collaborate regarding this management between professions. It is perhaps assumed that teamwork and collaboration behaviours will be modelled in the workplace, and learned whilst working. In 2011 as Director of Clinical Training, it was decided to address this issue for junior medical staff.

Although health practitioners from different professions are expected to work alongside each other, and in a complementary way, there has traditionally been little shared education, either in undergraduate or postgraduate domains. Health professionals are taught in professional "silos" and often remain mostly within these during their practising life (Hall & Weaver, 2001; McKimm, Sheehan, Poole, Barrow, Dockerty, Wilkinson, & Wearn, 2010). The formation of these silos comes about, in part, through differences in the educational ethos between professions, which developed early last century. Gilbert (2008) discussed the changes in medical teaching that occurred following the Flexner report in 1910. Flexner (1910), amongst others, recommended that medical practitioners should practice in a more scientific manner. Gilbert (2008) argues that, although the necessary change to increased academic rigour was a positive step, it is often at the expense of a more patient-centred approach. The result of this change in the medical approach to patient care, is that professions are often in conflict due to differences in their approach to patients (Gilbert, 2008).

Interprofessional education has been associated with improved teamwork, and to a lesser degree with improved patient outcomes (Hammick, Freeth, Koppel, Reeves, & Barr, 2007). The Centre for Advancement of Interprofessional Education (CAIPE) defines the term interprofessional education broadly as that which "occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care", and includes all levels of learning, both undergraduate and postgraduate (Centre for the Advancement of

Interprofessional Education, 2002). This differs from multi-professional education, where health professionals learn together, or side-by-side, but without necessarily learning 'about' and 'from' each other to improve collaboration and quality of care (Mattick & Bligh, 2003). This understanding of interprofessional education helped plan the structure of the educational sessions for this study so that participants in the sessions interacted with each other, and learned from each other and about each other's roles.

Many of the patient complaints, or clinical errors that the principal researcher has followed up in the role of an Emergency Physician have been due to breakdowns in communication as part of team functioning or collaborative care. These sometimes occur between doctors, but more often occur between doctors and nurses. The lack of a common language in describing assessment and management of patients is known to lead to poor interprofessional communication and collaboration, and thus has a negative impact on patient care (Hall, 2005).

It is believed that these interprofessional communication problems, in part, result from contrasts in education between different health professions. Individuals from different professions learn both from specific education programs and from socialisation within professional groups to develop their own cognitive map (knowledge base underlying a particular profession) which is then incorporated into the culture of that profession (Hall, 2005). Although there has been an increased focus on these ideas during the last decade, these are not new concepts. In the mid-1970s, Petrie (1976)demonstrated the importance of recognising the different cognitive maps between professions and how these need to be shared to allow an understanding of others' points of view. An example of these differing cognitive maps is in communication training, where nurses and doctors are taught to communicate in quite different ways. Nurses are taught to be very descriptive and narrative in presenting cases, whereas doctors are taught to be succinct, and to get to the point quickly (Leonard, Graham, & Bonacum, 2004). The different focus during the training of these different professional groups contributes to the different language used

by doctors and nurses, and often results in poor interprofessional communication.

Professions, as well as having different styles of learning and patterns of thinking, also have different constructions of reality (Bligh, 1980). Bligh (1980) goes on to discuss the sub-cultures of different professions, and how these lead to conformity within professions, and the formation of different values. Although the professions are approaching similar background information regarding disease processes, the differing points of view and culture developed within each profession leads to very different philosophical approaches to patient care. These different philosophical approaches increase understanding within professions only, which can lead to miscommunication and misunderstandings between professions (Bligh, 1980). Interprofessional education is an educational approach, which may overcome this problem in the workplace by helping health professionals understand each other's point of view.

Patient outcomes in complex environments are determined by the way teams function and communicate under pressure (Wachter, 2004). Health professionals often do not understand the differing roles between the many health professions, and this creates confusion about the contribution each profession can offer a particular patient. Although they are expected to work together in teams, health professionals may not realise the strengths or weaknesses of members of other professions, and may not have trained together to respond to specific clinical situations (Kohn, Corrigan, & Donaldson, 2000). This reduced awareness of others' roles is a major barrier to the ideal of interprofessional practice. It particularly creates difficulties in 'episodes of care' involving multiple health professionals, and in situations that are time pressured (Kohn, Corrigan, & Donaldson, 2000). Communication problems between health professionals, especially in pressured situations, compromise patient outcomes. Communication failures have been shown to be responsible for the majority of patient adverse events (Donchin, Gopher, Olin, Badihi, Biesky, Sprung, Pizov, & Cotev, 1995; Leonard, Graham, & Bonacum, 2004).

Interprofessional practice is known to improve patient care and safety, and decreases patient complications, as outlined in a framework for action on interprofessional education and collaborative practice (World Health Organisation, 2010). This same framework states that interprofessional education has been shown to have a positive effect on collaborative practice. It was also noted, however, that there is little evidence regarding how this education should be delivered, and in what circumstances it is useful. The approach of simply having students or professionals from different professional groups in a room and learning simultaneously has not been shown to be helpful (World Health Organisation, 2010). Bligh and Parsell (1999) agreed with this viewpoint, and suggested that simply putting people together in the same room does not ensure that 'effective' learning will occur.

The importance of functional interprofessional teams in ensuring good patient care and decreasing patient errors has been well documented (Baker, Salas, King, Battles, & Barach, 2005; Harden, 1998; Kohn, Corrigan, & Donaldson, 2000; Reeves, Zwarenstein, Goldman, Barr, Freeth, Hammick, & Koppel, 2008). The development of well-functioning interprofessional teams requires good teamwork. Learning about and adopting behaviours that improve interaction between team members results in improved quality of patient care. As discussed previously, provision of care in the healthcare community is now necessarily a team effort. These teams may be more coherent in rural, or other smaller communities where team members work with each other and know each other well when compared to those in larger institutes (Hays, 2008).

Teamwork competencies can be divided into 3 main groups: knowledge (factual information), skills (for example, communication which often requires practice and feedback), and attitudes (mental states that influence behaviour) (Beaubien & Baker, 2004). Ideally, an interprofessional education intervention will improve one or all of these areas. Teaching factual information may involve shared communication training to help adopt a shared language (Leonard, Graham, & Bonacum, 2004) and change attitudes towards other health professionals (Parsell & Bligh, 1999).

The principal researcher has two positions at the hospital where the research was undertaken. One of these roles is the Director of Clinical Training, which is a role responsible for the orientation, education and advocacy of interns (postgraduate year one doctors) and other junior doctors within the hospital. The other role is as a Senior Staff Specialist (Emergency Physician) in the Emergency Department. Teamwork is an integral part of the everyday work in the Emergency Department. Throughout a shift, communication occurs continually both between doctors, nurses and other health professionals, and between health professionals and patients and their families. Problems in communication may result in patient complaints, and sometimes result in clinical errors. Because of this an interest was developed in interprofessional communication and teamwork, and ways in which to improve this. As an Emergency Physician, the principal researcher has been a facilitator in simulation training sessions for emergency nurses and doctors for many years, and has performed a similar function in junior doctor training sessions for private organisations.

As Director of Clinical Training, the principal researcher continually highlights to junior staff the importance of teamwork, and effective communication within the hospital system. This focus derives from the known benefits to patient safety and improved patient outcomes as previously discussed. These aspects of practice are also part of the Australian Curriculum Training Framework for Junior Doctors (Graham, Gleason, Keogh, Paltridge, Rogers, Walton, Paola, Singh, & McGrath, 2007), and are part of the assessment tool used for intern assessment. Teamwork and communication skills are thus an important training consideration during the interns' orientation week, and are an important component of many educational activities throughout their time at the hospital. It was proposed to adapt an existing interprofessional education session for emergency staff (which used team based simulated scenarios for doctors and nurses) to make it more specific for interns. It was hypothesised that this approach would help to consolidate and improve the teamwork and communication attributes of these junior doctors.

In the training sessions, the aim was to improve the interns' knowledge, (by teaching clinical content), skills (such as communication, by observation and feedback), and attitudes (by facilitated discussion around teamwork, and roles and responsibilities). The educational sessions were planned so that participants were doctors in their first year who were matched with nurses with varying degrees of hospital experience, some with over 30 years of clinical experience. It was anticipated that having nursing participants with a large amount of "real world" clinical experience would be useful in demonstrating to junior doctors the importance of past experience, and differing skills the nurses possess. It was anticipated that this would help break down interprofessional barriers and improve communication and collaborative care in the workplace. The past experiences of the nurses and doctors from previous good and poor team interactions, and past communication episodes, were used as a discussion point throughout the sessions. This was accomplished during the feedback sessions by encouraging discussion between the nursing and medical participants so they were better able to understand their differing professional points of view. A better understanding of the differing roles and responsibilities of the participants, and a heightened awareness of their own professional identities, was important. In addition, some clinical content not specifically related to teamwork and collaboration was discussed during the debrief sessions, (for example, the cardiac arrest algorithm was written up on a whiteboard and discussed in detail for group feedback in every session).

For the 2011 intern curriculum, a planned educational activity was developed with clear objectives, which primarily aimed to improve interprofessional practice in areas such as teamwork and collaboration. It was considered valuable and important to research and evaluate the success of achieving these desired outcomes, because it was thought such research based evidence on simulation based interprofessional education would contribute to the body of knowledge and evidence supporting interprofessional education. This body of evidence is currently still under-represented in the literature, particularly in the postgraduate cohort (Mattick and Bligh 2006).

To guide evaluation of the planned sessions, and to plan the research, a focussed literature review was undertaken. The main aims here were to understand the background behind interprofessional education, to seek information regarding the improvement of teamwork, including communication and collaborative practice, and to investigate prior studies in this area. The literature review also examined tools used in evaluation of interprofessional education, in an attempt to find a previously validated survey that could be used for the data collection.

This chapter has provided a background to interprofessional practice and its importance in patient management. Interprofessional practice relies on teamwork, and collaboration between health professionals, including good communication. These skills are often not taught, and it has been suggested that interprofessional education may be a good way to help improve teamwork and communication, amongst other skills, in the workplace. The role of Director of Clinical Training allowed the introduction of interprofessional education sessions, and it was proposed to collect research data following the sessions to investigate their effectiveness. The rationale for this study was an attempt to improve teamwork and collaborative practice in the workplace, and to use interprofessional education as a means to accomplish this. It was hypothesised that this would help to improve the teamwork and communication skills of these junior doctors, and lead to improved interprofessional practice.

Chapter Two will examine the literature on interprofessional education, and summarise the background information. It will then discuss the three core objectives of interprofessional practice and education in more detail; teamwork and collaboration, knowledge of roles and responsibilities and communication. Furthermore, the chapter will include a review of different teaching approaches that have been used in interprofessional education, and the utility of these. Following this, the importance of facilitation skills in delivering the planned sessions, and a summary of some of the potential barriers to interprofessional education will be discussed. The chapter will conclude with a summary of evaluation methods in interprofessional education, and an explanation given for the choices used in this study. The research aims are then to investigate:

1. attitudinal change following a single educational intervention in the areas of teamwork and collaboration, professional identity and roles and responsibilities, as measured by the RIPLS Questionnaire, and then
2. whether this intervention had any longer term impact on clinical practice and interprofessional relationships by direct questioning at a later date.

The third chapter will present the methods of this educational research activity. It will begin with an outline of the interprofessional education learning activity that was used, including participants, scenario design and rationale behind the design methods chosen. It then discusses the mixed method research approach used, and ethical approval and considerations. The setting will be explained as well as a description of the data collection and management techniques, and data analysis approaches.

The results are presented in Chapter Four in 2 sections. First, the phase one quantitative results are shown in tabular and figure form, showing the pre and post data compared for both nurses and doctors, as well as across time. The phase two qualitative data is then presented separately under each question that was asked of participants, and again compares across different professions.

The Discussion section will first explain the aim of the study in relation to results, and outline the ways in which the educational intervention attempted to address this. It will summarise the educational intervention including the learning objectives, and relevant results. It will then go on to discuss the research aims and findings in the context of both the educational intervention, and the literature. Limitations of the current study will be considered and explained. Research conclusions will be drawn from these points, and the summary of the thesis will follow.

Chapter 2: Literature review

The purpose of this review is to examine the literature on interprofessional education, particularly as it pertains to developing positive attitudes towards interprofessional learning and practice. It will examine the general literature on interprofessional education, investigating different teaching approaches in interprofessional education, research instruments used in interprofessional education studies, and more specific research focussing on or utilising the RIPLS questionnaire. It will also examine literature on interprofessional education teaching and facilitation, and culture, change and professionalism in interprofessional education.

A comprehensive literature review of published articles and grey literature was undertaken in 2011 and 2012. This was conducted using the online databases Medline, PubMed, Google, and Cinahl, and using the following Keywords: "interprofessional" or "multi-professional" "education" or "learning", "teamwork", "communication", "collaboration", "roles" and "professionalism" and limited to studies published in English. From these, articles were downloaded in abstract form initially, to enable a decision regarding their ongoing consideration for this review. These abstracts were then read to ascertain their relevance to interprofessional education, focusing particularly on interprofessional education teaching approaches, development and use of the RIPLS questionnaire, and teamwork and communication in healthcare training. When their abstracts appeared relevant to this research, the full text of articles was downloaded. These were read in their entirety to ensure scholarly approach, and confirm relevance to the study question. A total of 61 relevant articles were found and have been included in this literature review.

Background

In 2010, the World Health Organisation (WHO) published the Framework for Action on Interprofessional Education and Collaborative Practice (World Health Organisation, 2010). Key messages from this publication included an acknowledgment that there was sufficient evidence to show that interprofessional education enables effective collaborative practice, which in

turn strengthens health systems and improves health outcomes. They found evidence that collaborative practice decreased length of hospital stay, patient complications, staff turnover, clinical errors, and mortality rates (World Health Organisation, 2010). However, systematic reviews of research related to interprofessional education did not demonstrate that outcomes related to interprofessional education and its value are able to be robustly evaluated and proven (World Health Organisation, 2010).

In a review of the literature in 2001, it was found that there was a paucity of information to demonstrate whether health professionals were able to acquire interdisciplinary team skills without formal training (Hall & Weaver, 2001). Two main categories of issues or barriers relating to interdisciplinary education and teamwork were found; one was the system of education and training, and the other was the content of this education (Hall & Weaver, 2001). System issues that were found to be important included availability of interdisciplinary education, the timing of this interdisciplinary education (whether it occurs during initial training, or once individuals are secure in their own profession), the need for different teaching methods and faculty development, and both institutional support and support from individuals. Content issues included understanding of others' roles, communication skills, conflict resolution skills, and leadership skills (Hall & Weaver, 2001).

A review of the interprofessional literature by Thistlethwaite and Moran (2010) examined the learning outcomes for interprofessional education. They noted that evaluation outcomes of studies were often described as changes in attitudes or behaviours (Thistlethwaite & Moran, 2010). The learning outcomes that were synthesized from their literature review are summarised in Table 1. The first three of these learning outcomes from Table 1 will now be explored in detail.

Table 1: Tabulated findings of the themes and subthemes of learning outcomes described by Thistlethwaite and Moran (2010)

Outcome/Theme	Subthemes
Teamwork & collaboration	Knowledge of and skills for (including common goals) Positive attitudes for collaboration Cooperation and accountability
Roles/ Responsibilities	Knowledge and understanding of the differing roles and expertise of health professionals Similarities and differences within these Understanding role boundaries Challenging misconceptions regarding roles
Communication	Communicate with other professionals Negotiation and conflict resolution Ability to express opinions, and to listen to others Shared decision making Awareness of differences in professionals' language
Learning/reflection	Learning through peer support Reflect critically on own place in a team
The patient	Recognition of patient needs Patients central role in their care
Ethics/attitudes	Acknowledge views and ideas of other professionals Respect Tolerate differences, misunderstandings and shortcomings in other professionals.

Teamwork and collaboration

Health professionals need to learn to work well with colleagues in their team based service (Parsell & Bligh, 1999). Interprofessional education has been described as learning together to promote collaborative practice (Hammick, 2000), and where two or more professions learn from and about each other to improve collaboration (Centre for the Advancement of Interprofessional

Education, 2002). Improvement in collaborative practice is the defining difference when comparing interprofessional education to multi-professional education (where members of two professions learn side by side) (Mattick & Bligh, 2003). Important elements of collaborative practice include teamwork, power sharing and distributed leadership (Greenfield, Nugus, Travaglia, & Braithwaite, 2011). Collaboration between professions has been shown to improve teamwork, and reduce error rates (Morey, Simon, Jay, Wears, Salisbury, Dukes, & Berns, 2002).

The interprofessional team has been described as one where the members work closely together and communicate frequently to optimise patient care (Hall & Weaver, 2001). More effective teamwork and communication then contributes to better patient care, through improved efficiency and a holistic approach to managing patient care in a collaborative manner (Parsell & Bligh, 1999). Formal teamwork training has been shown to reduce clinical error rates, with one study showing a reduction in errors from 30.9% to 4.4% in the intervention group ($p=0.039$) (Morey, Simon, Jay, Wears, Salisbury, Dukes, & Berns, 2002). Patient outcomes have also been determined by how well teams function under pressure, with positive outcomes related to positive team functioning (Wachter, 2004).

In a systematic review of the literature D'Amour et al (2004) described determinants for collaborative practice. Table 2 lists the findings from their work.

Table 2 Key determinants for collaborative practice (D'amour, Beaulieu, San Martin Rodriguez, & Ferrada-Videla, 2004)

Shared behaviours that are required
• Knowledge of each other's roles • Good communication including negotiation skills • A willingness to work together • Trust related to self-competence and confidence in others abilities • Mutual respect

Roles and Responsibilities

Within any team, members usually are either assigned, or assume, different roles. In a health care team, there is often a team leader, and also those in team member roles (Hammick, Olckers, & Campion-Smith, 2009). One of the defining qualities of a successful team is that each of the members take on a necessary role (such as team leader) that allows the team to function (Hammick, Olckers, & Campion-Smith, 2009). Recognising the need to relinquish a role to allow good team functioning is important (Hammick, Olckers, & Campion-Smith, 2009), and distributive leadership and power sharing have also been noted as important in collaborative practice (Greenfield, Nugus, Travaglia, & Braithwaite, 2011).

Often members of a health care team have preconceived ideas about their own roles in a team, and may have a poor understanding of the roles of others (Hall & Weaver, 2001). This may lead to conflict within the team, under-utilisation of team members (if their competencies or roles are not understood by others), and resentment of team members who feel they are not fully appreciated, leading to ineffective teamwork (Hall & Weaver, 2001). Reducing both ignorance and prejudices about others' roles is an important aim of interprofessional education (Parsell & Bligh, 1999). This will result in participants recognising and valuing the differences which exist in the range of knowledge and practice between professions (McPherson, Headrick, & Moss, 2001) and can change attitudes that contribute to stereotypical roles and prejudices, and stereotypical views about each other (Parsell & Bligh, 1999). It can also promote recognition of the overlap and blurring of professional boundaries which occurs during discussions around roles and responsibilities (Parsell & Bligh, 1999).

The attitudes, beliefs and understandings that an individual has developed regarding their profession, and their perception of how they picture themselves, are often present even before their training has commenced, and is then developed further through undergraduate training, and continues into the workplace (Oandasan & Reeves, 2005b). For example, nursing students have

been found to perceive themselves as having lower status, and felt their profession was less prestigious than medicine (Reeves, 2000). This power differential, whether real or perceived, has the potential to affect safe clinical care in practice, with those of "lesser" status feeling unable or unwilling to speak up, particularly in crisis situations. Patient safety issues may result when communication barriers prevent vital information being discussed freely.

Communication

Effective communication is known to be paramount for safe clinical care (Leonard, Graham, & Bonacum, 2004) and is an important teamwork skill (Baker, Salas, King, Battles, & Barach, 2005). Errors in communication cause the great majority of adverse effects in patients, and are often due to differences in communication styles between doctors and nurses (Leonard, Graham, & Bonacum, 2004). One of the important goals of interprofessional education is to improve communication skills (McPherson, Headrick, & Moss, 2001). Adoption of communication tools, and learning to understand and appreciate the differences in communication between professions have been found to be important (Lewis, 2011). Lack of assertiveness by nurses when asking for a doctor review of a patient has been identified as a major factor in adverse events, particularly if the traditional hierarchical structure with nurses being deferential towards doctors occurs (Leonard, Graham, & Bonacum, 2004). This is consistent with issues raised with the power differential and its effects on communication, and subsequent patient safety, discussed above in roles and responsibilities. A significant number of errors in clinical practice in the intensive care unit have been found to be due to problems of communication between doctors and nurses (Donchin, Gopher, Olin, Badihi, Biesky, Sprung, Pizov, & Cotev, 1995).

Studies have provided good evidence to support that improving interprofessional teamwork and communication will improve patient safety (Leonard, Graham, & Bonacum, 2004; Lewis, 2011). However, there is little information about how best to make these improvements, or what teaching approach may be helpful. There have been many different approaches to teaching, all of which hope to achieve positive outcomes, namely gains in

communication and teamwork and a breaking down of traditional hierarchies, leading to improved collaborative practice.

Having now explored the three primary learning outcomes of interprofessional education (as described in Table 1), attention is now turned to how best to teach in order to enable achievement of these learning outcomes.

Teaching Approaches in Interprofessional Education

In recent years there has been an increasing amount of literature on different teaching approaches that have been have been used for interprofessional education. These teaching modalities include problem based learning, e-learning, didactic lectures, interactive lectures, role-play and simulation training. A study comparing four pedagogical methods of teamwork training (didactic, interactive didactic, role-play and simulation) found that participants in all groups showed significant improvement in teamwork knowledge and attitudes, with all modalities showing a similar improvement (Hobgood, Sherwood, Frush, Hollar, Maynard, Foster, Sawning, Woodyard, Durham, Wright, & Taekman, 2010). Their single post intervention teamwork assessment, using four different teamwork evaluations, concluded that the modality was unimportant, as all participants showed an improvement in both attitudes to, and knowledge of, teamwork behaviours. However, the lack of longitudinal follow up of the study participants meant that there was no data regarding longer-term effects of the intervention. Another limitation in this study was that participants were undergraduates. A postgraduate cohort with prior workplace experience may have showed differing results, due to the postgraduate cohort requiring their interprofessional education to have more applicability to the workplace.

There is some agreement in the literature regarding problem-based learning as being a useful teaching mode to apply to interprofessional education (Dahlgren, 2009; Thompson, 2010). Dahlgren (2009) compared interprofessional education problem-based learning and found differences in terms of outcomes: learning about others, from others, or together with others. The four characteristics of problem-based learning proposed by Dahlgren (2009) are

shared ownership of the learning task, contextualisation of the core concepts, interactive learning environment and thematizing learning. Thompson (2010) found that interprofessional problem-based learning sessions improved attitudes of participants towards other professional groups. Characteristic features of problem-based learning and interprofessional education have been compared to identify commonalities with the comparison from the four points noted above for interprofessional education. These are sharing the focus on the patient, relevant learning in clinical settings, working together to negotiate a common basis for action, and evaluating quality of care (Dahlgren, 2009). Although Dahlgren proposes that the tenets of problem-based learning match well to those of interprofessional education, he does not offer any evidence to support this hypothesis.

Thompson (2010) conducted a literature review to investigate the support for combining interprofessional education with problem-based learning. It was fund that collaboration between interprofessional education and problem-based learning was most useful in areas of the curriculum which are relevant to all learners, and to occur in small group teaching sessions with interactive, reflective and experiential learning. Thompson (2010) also identified case based learning, as a variant of problem-based learning, as being most relevant for interprofessional education using clinically based topics and a team approach to these. Thompson (2010) suggested that this is where interprofessional education could make a real difference to teamwork, ultimately improving patient management. It was acknowledged however that there was little data to support improved acquisition of knowledge and skills, although there was some evidence of a positive change in attitudes to teamwork and communication. Solomon, Salvatori et al (2003 p 408) similarly wrote that relevant case based teaching was most effective in interprofessional education claiming:

> *"In problem-based learning, discussion centered on actual cases leads to definition of learning objectives and group-driven information gathering. The sharing of information and the discussion and debate that occurs*

through the small-group tutorial process promotes understanding of roles and teamwork".

Simulation in interprofessional education has been shown to provide students with active, experiential learning that may make these activities more relevant to them (Baker, Pulling, McGraw, Dagnone, Hopkins-Ross, & Medves, 2008). Relevance to the learner is important both in terms of the educational experience (Knowles, Holton, & Swanson, 2005) and also in terms of ensuring the participants' appreciation of the value of the training sessions. Simulation and standardized patients have been grouped together in the literature as providing scenarios with simulated tasks, for training of health care teams (Baker, Salas, King, Battles, & Barach, 2005). It would seem that combining role-play or simulation training with case based learning as above would be an effective way of proceeding with interprofessional education. This provides the opportunity to combine case based experiences, which are relevant to the workplace, with a small group tutorial process which encourages interprofessional discussion during the debrief process. This provided the basis of the education sessions that were held as part of this study.

High fidelity simulation teamwork training for emergency department staff has been shown to improve team behaviour in the workplace (Shapiro, Morey, Small, Langford, Kaylor, Jagminas, Suner, Salisbury, Simon, & Jay, 2004). The simulated environment allows educators to replicate scenarios that mirror those commonly occurring in the workplace, as well as allowing practice opportunities for participants in less commonly seen and/or high risk presentations or situations. The development of high-fidelity simulators has allowed replication of an environment very similar to the workplace. Beaubien and Baker (2004) noted that it is often assumed this degree of fidelity is necessary for authentic learning. However, Beaubien and Baker (2004) attest that lower fidelity simulation learning for training teamwork skills is useful, and often overlooked. Examples given included using case studies and role-plays to train knowledge and attitudes for teamwork, and part-task trainers to learn teamwork related skills (Beaubien & Baker, 2004). They noted that there were no studies directly comparing different types of simulation training, and the

effectiveness of each. The importance of psychological fidelity, the degree in which the trainee believes that the simulation is real, was noted to be the most important factor in any given simulation event (Beaubien & Baker, 2004).

Student learning in a simulated interprofessional ward environment has been studied, and is now used more widely following early studies demonstrating efficacy (Freeth, Reeves, Goreham, Parker, Haynes, & Pearson, 2001; Ker, Mole, & Bradley, 2003). Both these studies used undergraduate cohorts of medical and nursing students. However, there is little written in the literature, regarding effects of learning in this type of environment with postgraduate participants. Interprofessional education based on ward simulations was believed to assist development of competence and confidence in interprofessional relationships for future clinical practice (Ker, Mole, & Bradley, 2003).

It has been suggested that interprofessional care may be improved by focusing simulation based interprofessional education on shared leadership (Kenaszchuk, MacMillan, van Soeren, & Reeves, 2011). Using simulation in interprofessional education to improve collaborative care has also been found to be helpful (Baker, Pulling, McGraw, Dagnone, Hopkins-Ross, & Medves, 2008), although participants in this study were only assessed following simulation. Although this study cohort included a small percentage of qualified doctors, there was still a majority of undergraduates in the cohort, and no postgraduate nurses were included.

E-learning has also been investigated as an option in interprofessional education (Solomon, Baptiste, Hall, Luke, Orchard, Rukholm, Carter, King, & Damiani-Taraba, 2010; Walsh, 2007; Williams & Lakhani, 2010). A study of undergraduates comparing e-learning with face-to-face case based interprofessional education showed a higher satisfaction with face-to-face sessions across all professions; medicine, nursing, pharmacy and social work when compared with e-learning (Curran, Sharpe, Forristall, & Flynn, 2008). These negative responses regarding e-learning have also been shown by other investigators (Macdonald, Stodel, & Chambers, 2008). It was found however,

that participants appreciated the flexibility and convenience of the e-learning method of teaching, and recognised they would need to become more familiar with it to gain the most value from it. It seems that learning to deal with the new technology aspects of e-learning may be the major hurdle for both participants and educators alike (Williams & Lakhani, 2010). Difficulties caused by educators needing to become familiar with development of online teaching resources, and the importance of good information technology support for these novice e-learning users has been acknowledged (Williams & Lakhani, 2010).

Not all e-learning resources used have been specifically tailored for professional groups. Interdisciplinary online learning tools have been used successfully, with online modules designed for one profession learner group completed by learners of another professional group (Walsh, 2007). Students' perceptions of this interprofessional online education were found to be generally positive (Walsh, 2007). Feedback regarding education about communication strategies, problem solving together, and clarification of roles were noted by participants as being useful learning points (Solomon, Baptiste, Hall, Luke, Orchard, Rukholm, Carter, King, & Damiani-Taraba, 2010). In this study however, completion rate for the modules and follow up was only 64 out of 156 original participants. This means that selection bias may have occurred, where those students with positive viewpoints who were enjoying the educational experience were most likely to have completed the modules and provided feedback. It also only measured the perceptions of whether the students felt this to be a useful learning modality, and not whether this translated to being useful in a practice application. One of the benefits of e-learning modules is that many of these do not require a trained facilitator to continually engage learners. Interprofessional education in a small group session however, requires a facilitator with experience in this area.

Teaching interprofessional education facilitation skills

The term 'facilitator' is used more commonly in the interprofessional literature, rather than tutor or teacher, as it describes the role more precisely, and will be used throughout this thesis. Facilitators, particularly with respect to interprofessional education, guide, instigate and motivate the students to learn;

they direct or manage the learning process, rather than being the source of the learning (Lewis, 2011). The role of the interprofessional facilitator is known to be very important (Parsell & Bligh, 1998).

Until recently there was little information regarding the skills required for facilitating interprofessional education, or how to obtain these skills (Anderson, Cox, & Thorpe, 2009). Three main problems have been identified in regard to learning to be an interprofessional facilitator; lack of familiarity with the interprofessional milieu compared to a well-known profession, the diversity of student groups, and perceived necessity for teaching qualifications (Anderson, Cox, & Thorpe, 2009). There remains some scepticism regarding interprofessional education by educators within the health system, particularly amongst those who have taught only in their own field for many years. This professional "silo" mentality can be ameliorated, and research into assisting development of interprofessional educators, from those unfamiliar with interprofessional education, has been performed (Anderson, Thorpe, & Hammick, 2011). They found that a single, quality exposure to an interprofessional education activity made a positive change. By interviewing educators prior to, and after, their novel interprofessional education experience, their attitudes toward the modality were assessed (Anderson, Thorpe, & Hammick, 2011). Their method required pairing of the novice facilitator with an experienced facilitator to help ensure a positive learning experience. All educator attendees had some reservations prior to the teaching sessions, and all were more positive following them (Anderson, Thorpe, & Hammick, 2011).

The importance of facilitator training for interprofessional education had been highlighted by several studies (Anderson, Cox, & Thorpe, 2009; Anderson, Thorpe, & Hammick, 2011; Freeman, Wright, & Lindqvist, 2010). In an editorial in 1999, Bligh and Parsell spoke of the importance of planned interprofessional education, and the sensitivity, trust and respect necessary from educators to ensure goals are met (Bligh & Parsell, 1999). Teaching or modelling these attributes may also be a useful outcome from the pairing of the novice facilitator with an experienced one, as discussed above. It has been acknowledged that this is a time consuming process, and that facilitators benefit from additional

support in both teaching material and time whilst learning this new set of skills (Freeman, Wright, & Lindqvist, 2010). While Freeman et al.'s (2010) discussion of facilitator training was based on knowledge of adult learning principles, the training program had not been validated. The training program for facilitators that was developed was complex, and consisted of eight main components. The fifth component of the eight described the interprofessional education facilitator's role, including the skills required. Table 3 summarises the key aspects of the role and skills of the interprofessional facilitator.

Table 3. The role and the skills required of the Interprofessional education facilitator (Freeman, Wright, & Lindqvist, 2010 p. 381).

The role of the IPL facilitator is to:
• promote the benefits of interprofessional learning for teamwork and patient care • provide direction and focus towards the learning objectives without making decisions for the group • encourage interaction and collaboration • foster the knowledge and skills necessary for good interprofessional team working, such as mutual respect and flexibility • provide encouragement and support throughout the programme.
The skills required to be an IPL facilitator are to:
• be professionally neutral • motivate, encourage and support the process of IPL • listen actively • understand and respond to group dynamics • encourage diplomacy • encourage diversity • be flexible • chair a meeting • observe, reflect and summarise

Interprofessional education is considered a valid mechanism for improving communication and interprofessional practice (Reeves, Zwarenstein, Goldman, Barr, Freeth, Hammick, & Koppel, 2008). Carpenter and Dickinson (2011) suggest that contact alone with learners from other health professions will not necessarily change understanding or behaviour. They did not mention however, whether facilitated education regarding roles and responsibilities as part of an interprofessional education session would be helpful. Apart from the challenges inherent in sourcing, and training facilitators for interprofessional education sessions, other barriers to this training exist.

Known barriers and limitations to interprofessional education

Barriers to interprofessional education such as preconceived negative thoughts, power hierarchies, organisational issues such as time and support, and varied learner needs have been discussed in the literature. Although interprofessional education may offer opportunities to influence attitudes amongst learners, this can only occur where the faculty involved in this teaching does not bring their preconceived negative attitudes to negatively impact on this teaching (Oandasan & Reeves, 2005b). Faculty may also carry negative attitudes into interprofessional education sessions, and be unwilling to change these, or learn different ways of training (Parsell & Bligh, 1998).

In a recent review of interprofessional education programs, interprofessional education has also been found to reinforce conventional power hierarchies (Baker, Egan-Lee, Martimianakis, & Reeves, 2011). Kuper and Whitehead (2012) also challenged the notion of interprofessional education being useful for collaborative practice, calling it an effective strategy for maintaining physician privilege. They suggested that physicians might use interprofessional education as a means to increase the power of their own profession, and maintain hierarchies.

Morrison (2004) highlighted the barriers to interprofessional education in an editorial commenting on a paper discussing barriers to interprofessional education. She cited the difficulties in interprofessional education, including matching timetabling, the need for champions, and lack of institutional support. She also commented on the paucity of evidence supporting or refuting interprofessional education effectiveness (Morrison, 2004). Morrison (2004) noted that studies with negative findings, not just those with positive findings, need to be presented for publication to help improve the evidence base surrounding interprofessional education, and help researchers to know which approaches have been shown not to be useful. Other barriers to interprofessional education outlined by Thompson (2010) include differing learner needs, sacrificing one learner group's needs for another, and difficulty of measuring efficacy or outcomes (Thompson, 2010).

Timing of interprofessional education has also been scrutinised, and it may be useful to provide interventions in interprofessional early in the training of health professionals. Hall (2005) suggests that providing interventions early in professional training or careers to promote interprofessional teamwork may help to prevent formation of professional silos. There have been some studies in support of this; shared learning (learning with other health professionals) as undergraduates has been shown to improve participants' ability to develop a more collaborative professional identity in a year-long follow up (Morison & Jenkins, 2007).

There are discussions in the literature of the link between professionalism and interprofessional care. Interprofessional professionalism is described as working across professions to support co-ordination in collaborative care (Holtman, Frost, Hammer, McGuinn, & Nunez, 2011). The emphasis here is on promoting professionalism which includes collaboration and communication between professions (Holtman, Frost, Hammer, McGuinn, & Nunez, 2011). The communication problems associated with traditional hierarchies as discussed previously may then improve.

Having interprofessional education occur in a setting relevant to practice has also been discussed in the literature. It has been shown that interprofessional education needs to occur in authentic clinical settings for this education to be relevant and transferable to the workplace, and that the lack of this authenticity has been one of the limitations of many current approaches (Henderson, O'Keefe, & Alexander, 2010).

Having now explored the evidence of effective teaching approaches for interprofessional education as well as some of the known barriers, consideration will be given to how best to evaluate learning in order to assess achievement of learning outcomes.

Evaluation of interprofessional education interventions

A Cochrane review of the literature found that there was no evidence for the effectiveness of interprofessional education in improved patient outcomes

(Reeves, Zwarenstein, Goldman, Barr, Freeth, Hammick, & Koppel, 2008). However, they went on to discuss that not having found evidence of effectiveness was not the same as finding ineffectiveness (Reeves, Zwarenstein, Goldman, Barr, Freeth, Hammick, & Koppel, 2008). Since then, there have been many more published studies regarding the evaluation of interprofessional education and attempts to show its usefulness. It has been shown that interprofessional education may help make improvements in teamwork and communication skills that transfer to clinical practice, but no definite data support this (Simmons, Oandasan, Soklaradis, Esdaile, Barker, Kwan, Leszcz, Lowe, Moaveni, Richardson, Silver, Sinclair, Tassone, & Wagner, 2011). A lack of evidence supporting this transfer of knowledge to change working practices was noted in one study (Parsell, Spalding, & Bligh, 1998). Other research suggests that team functioning can be shown to improve following an interprofessional education program (Watts, Lindqvist, Pearce, Drachler, & Richardson, 2007).

The evaluation of an interprofessional education session may occur through both qualitative and quantitative means. Quantitative data involves the collection of numerical data, and the analysis of this by statistical means (Hurley, R., & J, 2011). Qualitative research involves collecting textual responses to questions, which can then be compiled into a narrative report, allowing an exploration of context as well as allowing quotations from participants to be used (Hurley, R., & J, 2011). Qualitative evaluation data differ widely between studies, and questions used are generally in the form of open text about the education activity or its anticipated application in practice. Systematic reviews of interprofessional education research have shown value in varied research methods (Reeves, Zwarenstein, Goldman, Barr, Freeth, Koppel, & Hammick, 2010).

Over the last decade there have been many different quantitative tools used in an attempt to measure the effectiveness of interprofessional education. Only some of these have been validated, and most do not have a high degree of agreed reliability. Many of these tools measure individual's perceptions, rather than any agreed outcomes. A review of the most common measures used in

quantitative evaluation found eight evaluation tools, which had some supporting evidence. Of these, only two were considered to have had adequate time spent on development, and to have sound psychometric properties (Thannhauser, Russell-Mayhew, & Scott, 2010). These two evaluation tools were the Interdisciplinary Education Perception Scale (IEPS) and the Readiness for Interprofessional Learning Scale (RIPLS) (Luecht, Madsen, Taugher, & Petterson, 1990; McFadyen, Maclaren, & Webster, 2007; Parsell & Bligh, 1999).

The IEPS instrument was developed with an original sample population of 143 undergraduates from four different professions (occupational therapy, medical records, speech pathology and therapeutic recreation) (Luecht, Madsen, Taugher, & Petterson, 1990). Although it was considered to have high internal consistency, this was the only aspect of its reliability that was reported (McFadyen, Maclaren, & Webster, 2007). Four sub-scales were discussed: Competency and Autonomy, Perceived Need for Cooperation, Perception of Actual Cooperation, and Understanding Others' Value (Luecht, Madsen, Taugher, & Petterson, 1990).

The RIPLS questionnaire was developed by Parsell and Bligh (Parsell & Bligh, 1999) almost 10 years following IEPS. It involved eight different health professions, which included both nursing and medical representation. Although it was initially validated for use in undergraduate populations, it has since been validated in postgraduate populations as well (Reid, Bruce, Allstaff, & McLernon, 2006). It examines attitudes towards interprofessional learning. The questions in the RIPLS survey are grouped into three main areas, described as sub-scales. These sub-scales are team-work and collaboration, professional identity, and roles and responsibilities (Parsell & Bligh, 1999).

Since their development and validation the RIPLS has been more widely applied than the IEPS for research studies. Furthermore, the RIPLS has been reported as being used more often in postgraduate populations in the literature, compared with the IEPS questionnaire (Thannhauser, Russell-Mayhew, & Scott, 2010). The following section provides a more detailed exploration of the RIPLS questionnaire as a potential research tool.

The RIPLS Questionnaire

The RIPLS questionnaire was developed by Parsell and Bligh (1999). Their main objective at the time was to develop a tool that could be used to assess the attitudes or 'readiness' of health care students towards 'shared learning', meaning learning with students from other health disciplines. They believed that exploring the attitudes and perceptions of participants was important in assessing an interprofessional education event (Parsell and Bligh 1999). Their premise was that by changing negative attitudes towards other professions, an improvement could be shown to occur in the development of team working skills and collaboration. This would be due to the attitudinal change both in addressing existing prejudices, and in increasing the understanding of others' roles. The importance of attitudinal change has also been discussed by other researchers (Greenfield, Nugus, Travaglia, & Braithwaite, 2011).

Parsell and Bligh (1999) examined a cohort of 120 undergraduate health students, from eight different professions (medicine, dentistry, physiotherapy, nursing, occupational therapy, orthoptics, and both therapy and diagnostic radiography). They were all in their second year, and there were equal numbers of students from each profession. The 19 statements used for the tested version of the RIPLS scale were derived from a large number of initial statements. These were subjected to further study in order to improve the internal consistency, and the alpha coefficient improved from 0.59 to 0.81 (Parsell & Bligh, 1999). This process occurred by the gradually removing statements which were found to be less consistent, 26 in total. The remaining statements were then divided into 3 groups of factors, or sub-scales. A further five statements were removed with insufficient factor loading, or repetitive loading, which left a 3 factor scale with 19 statements. The internal consistency (alpha co-efficient) at this stage was found to be 0.9 (Parsell & Bligh, 1999). The sub-scales used were: teamwork and collaboration; professional identity; and roles and responsibilities. An interpretation of the sub-scales was also included in their results. In the final RIPLS scale, the professional identity sub-scale includes the conflict which arises between development of the profession specific cognitive

maps described by Petrie (1976) and the necessity for team based health care (Parsell & Bligh, 1999).

Parsell & Bligh's initial pilot study conducted in 1997 and published in 1999, involved a relatively small number of students. Their follow-up study was published in 1998, and involved 914 students(Parsell, Stewart, & Bligh, 1998). The RIPLS questionnaire in the first developed form was used in both these study cohorts, however it was designed around undergraduate health students, so its applicability for a postgraduate cohort was not known at that time.

The RIPLS questionnaire underwent modification and further development during 2004-5, which aimed to strengthen the sub-scale of roles and responsibilities. A modified version of the RIPLS questionnaire was developed and validated for a postgraduate cohort (Reid, Bruce, Allstaff, & McLernon, 2006). Twenty-three questions were divided into 3 factors: teamwork and collaboration, sense of professional identity, and patient-centredness. The internal consistency found at validation was 0.76 (Reid, Bruce, Allstaff, & McLernon, 2006). A significant difference was found in the mean factor scores for medical staff (general practitioners) when compared with nursing staff in both teamwork and collaboration, and in sense of professional identity. In both these areas, nurses scored higher than doctors, which indicated a more positive attitude towards interprofessional learning (Reid, Bruce, Allstaff, & McLernon, 2006). Their study population numbered 821 health care professionals, which was less than the original validation population (Parsell, Stewart, & Bligh, 1998), and had a lower return rate (68.3% cf 89%) (Reid, Bruce, Allstaff, & McLernon, 2006) .

Since its development, the RIPLS survey has been used by many researchers in adding to the evaluation of interprofessional education training activities (McFadyen, Webster, Maclaren, & O'Neill, 2010; Solomon, 2011; Williams, Boyle, Brightwell, McCall, Munro, O'Meara, & Webb, 2013). It has the benefit of being validated in both undergraduate and postgraduate populations, and it is relatively quick to administer. The RIPLS survey was used as part of a mixed-method evaluation of interprofessional training in resuscitation, where it was

administered both pre and post intervention, and also three to four months later (Bradley, Cooper, & Duncan, 2009). Interestingly, their findings showed improvement in the pre- and post- test scores, with a return to baseline when the survey was administered later. This contrasted with the delayed qualitative data they collected where the groups from the intervention showed more positive attitudes (measured via focus groups) towards interprofessional education than a control group (Bradley, Cooper, & Duncan, 2009).

Some researchers have used a combination of the RIPLS and the IEPS surveys in other populations, such as paramedics in Australia, and across multiple universities (Likert, 1932; Williams, Boyle, Brightwell, McCall, Munro, O'Meara, & Webb, 2013). Whilst both tools were used, there was much more robust discussion around the findings from the RIPLS part of this research when compared to the results of the IEPS from this same study (Williams, Boyle, Brightwell, McCall, Munro, O'Meara, & Webb, 2013). The depth and breadth of findings from the RIPLS tool were more relevant than the IEPS.

The RIPLS survey has been used in multiple studies, however not all of these have further assessed reliability in those populations, and the majority of studies using RIPLS have used undergraduate populations (McFadyen, Webster, & Maclaren, 2006). When the RIPLS survey was used in a Swedish study population the sub-scales of professional identity and roles and responsibilities were found to be less reliable, and subject to cross-cultural differences (Lauffs, Ponzer, Saboonchi, Lonka, Hylin, & Mattiasson, 2008). This was thought to be due to mainly cultural differences, as well as minor translation differences (Lauffs, Ponzer, Saboonchi, Lonka, Hylin, & Mattiasson, 2008). When used in Australia, this was not found to be the case (McKenzie, 2013).

Despite the large body of evidence that shows that teamwork and collaboration are essential in our health care environment, there is little evidence to demonstrate that our attempts to improve these things are successful. As recently as 2007, one author wrote of the lack of interprofessional education in Australia as compared with peer countries (Stone, 2007). While it could be expected that effective interprofessional education, especially that focusing on

improved teamwork and collaboration as learning objectives, would result in improved attitudes of participants, and ultimately in improvements of these attributes in the workplace, there is little definite evidence that this is the case. Proving this to be true has remained a difficult task for researchers, with most studies evaluating the effects of interprofessional education being carried out in an undergraduate cohort. Studies also suggest that if there is an attitudinal change as a result of interventions, this is unlikely to be sustained over time (Bradley, Cooper, & Duncan, 2009).

Chapter 2 summary

In summary, there is a growing body of evidence to demonstrate that improving the areas of teamwork and collaborative practice improves health care outcomes. Studies have been performed to investigate how to improve these behaviours in the workplace, but there is still a paucity of robust evidence to validate the implementation of education programs to improve these areas. There are several different evaluation tools available to measure possible change in attitudes and behaviours. The RIPLS evaluation tool was chosen for use in this study, because it was felt to be the most valid existing instrument to use in this study population to evaluate possible changes in attitudes towards teamwork and collaborative practice, and understanding of roles and professional identity. The RIPLS version used was chosen as it had previously been utilised in a postgraduate Australian cohort, and the content also aligned more closely with the learning objectives from the session than the RIPLS version validated for postgraduate study. A recognised limitation of the RIPLS is its inability to determine if the training was effective in changing practice, so the addition of delayed qualitative data collection was thought to be important for this study.

This research sought to measure the immediate attitudinal change of a group of employees using the RIPLS tool following an interprofessional education session, and also to investigate the longer term perceived effects on work place practice within the study group.

The research hypothesis was that adapting an existing team based simulation education session specifically for interns would help to consolidate and improve teamwork and collaborative practice.

In order to address the hypothesis, the specific research aims are to investigate:

a) attitudinal change following a single educational intervention in the areas of teamwork and collaboration, professional identity and roles and responsibilities, as measured by the RIPLS questionnaire, and then
b) whether this intervention had any longer term impact on clinical practice and interprofessional relationships by direct questioning at a later date.

The following chapter will outline the educational activity that was developed and implemented, as well as the research method and approach to assess the short and long term outcomes of this intervention.

Chapter 3: Method and approach

As demonstrated in the literature review, there is evidence that effective teamwork and collaborative practice can improve patient outcomes, and that interprofessional education may help improve teamwork and collaborative practice. There is also evidence that changing attitudes to existing cultures and power imbalances between health professionals may be helpful to promote collaborative practice and teamwork. In order to address these needs in junior doctors (postgraduate year one doctors) in a regional hospital, interprofessional simulation education sessions were held as a component of their employment conditions and pre-registration training year. The learning aims of the interprofessional education sessions were:

1) to improve teamwork and collaboration,
2) to increase knowledge of other health professionals' roles, and professional identity and
3) to increase knowledge around content and system issues (such as hospital emergency response teams).

An additional intended learning outcome was to assist the interprofessional education facilitation skills of the medical registrar.

The sessions were mandatory, as all interns were required to attend at least one session during their intern year. As interprofessional education requires members from more than one profession, orthopaedic ward nurses were also invited to participate. The sessions involved two doctors and two nurses attending each time. The attendees at each session interacted with role-play patients and a SimMan® mannequin, using clinical scenarios in a simulated ward environment. Each scenario was followed by a facilitated debrief session.

Whilst simulation sessions focusing on teamwork and communication skills training had been performed with emergency department staff over several years prior to this study, this was a new initiative for this hospital's intern program. These were the first role-play and simulation-based education sessions run specifically for first year doctors to include nurses. The sessions

involved teaching interns (first year doctors) and ward based nursing staff together in small group sessions.

The purpose of the research was to analyse the outcomes from this new educational activity, and determine the effect of an interprofessional education session on the attitudes of participants, around teamwork and collaborative practice, and their own and other professions roles, as well as their attitudes towards interprofessional learning. It also further aimed to examine whether the educational activity had any impact on participants work practices in the weeks and months following the sessions. This research investigated the learning outcomes related to attitudes towards interprofessional education. Evaluating a change in attitudes was thought to be important, as changing attitudes to interprofessional collaboration has been cited as a key to improving health care (Greenfield, Nugus, Travaglia, & Braithwaite, 2011). The change in attitudes was measured with the RIPLS survey. The questions in the RIPLS survey are grouped into three main areas, described as sub-scales. These sub-scales are; team-work and collaboration (questions 1-9), professional identity (questions 10-17), and roles and responsibilities (questions 18-19).

This chapter will first detail the educational intervention, describing the interprofessional educational activities and the rationale for the decisions made. Following this, the research approach including participant selection, data collection, data management and analysis will be explained, along with discussion of the ethical issues.

Interprofessional Education Learning Activity

The educational approach chosen was that of small group role-play and simulation sessions, with only four attendees in each session, two doctors and two nurses. There were several advantages from having a small number of attendees. With a smaller number of staff missing from work areas, few sessions were cancelled due to poor attendance, and there was also little disruption to ward activities. If larger numbers had been necessary for the education sessions to proceed, it is likely more would have been cancelled due to lack of staff availability in busy service times. In addition, a small group allows greater

individual participation and input from all attendees, and thus has been shown to be helpful in promoting understanding of roles and teamwork (Solomon, Salvatori, & Guenter, 2003).

Some consideration was given to e-learning modules as an adjunct to learning, with this being completed prior to workshop attendance, as a blended model of delivery, as has been used in previous studies. (Curran, Sharpe, Forristall, & Flynn, 2008). This was not possible due to time constraints in developing the modules and nursing attendees not able to be scheduled in advance.

The education sessions comprised an introductory discussion of aims followed by two role-play scenarios and then two simulation-based scenarios. These methods of interprofessional education were chosen due to the necessity of small group teaching to fit in with ward staffing demands, and to allow more authentic learning through experiential means. The combination of simulated role-play patients and a high fidelity SimMan® mannequin scenario was chosen to simulate ward patients that may be seen in the workplace, and tailor the learning experience to make it more relevant to attendees (Baker, Pulling, McGraw, Dagnone, Hopkins-Ross, & Medves, 2008). The learning aims of the sessions (improving teamwork and collaborative practice, discussion around clinical content and hospital systems, and knowledge of roles and responsibilities) were discussed both at the beginning of the sessions, and summarised at the end of each session.

As this was an interprofessional education activity primarily for the interns, at least one other profession than the medical cohort was required. Nurses were chosen as the second profession for the study as they are the profession in the ward environment that junior doctors are most likely to interact with, as well as providing the largest pool of possible attendees. There were 30 interns (post graduate year one doctors) and approximately 30 nurses from the orthopaedic ward. The orthopaedic ward was chosen as that ward has a very stable nursing population (and thus many experienced nurses) and the nurse unit manager was a strong supporter of the interprofessional training program. It also has a high number of calls to review patients in a ward call situation, which meant

that the nurses had prior experiences to draw on which helped both during the scenarios, but also allowed a greater depth of discussion during the debriefing sessions. A small group of only two doctors and two nurses were invited to attend each two and a half hour session, as small groups have been shown to be more effective in interprofessional education (Reeves, 2000) due to greater input and participation as noted above (Solomon, Salvatori, & Guenter, 2003). It was also felt important to have equal numbers from each profession to ensure group balance, and prevent potential domination from a larger professional group (Funnell, 1992).

All interns from the 2011 cohort were required as a component of their employment contract to attend at least one interprofessional education session, and some were scheduled for, and attended, a second session. Most of the orthopaedic nurses from the ward were able to attend at least one session, with some attending a second time. Nurses were chosen from one ward only, to increase the chance of attendees already knowing each other, which was thought to assist in fostering discussion around teamwork and communication, and other aspects of collaborative practice during the session, as well as alleviating some performance anxiety. Alleviating anxiety and helping create a safe learning environment was felt to be very important, especially when discussing teamwork and communication during the debriefing after each scenario. This is known as good educational practice (Dent & Harden, 2013). Including nursing attendees from one ward environment only also allowed scenarios to be tailored to this specific work place.

Timetabling for both doctors and nurses was done on a convenience basis, according to who was most available to attend on a particular day. Nurses were scheduled for attendance at about the time of their afternoon handover, and were rostered for attendance by the nurse unit manager of their ward. The doctors were randomly assigned to attend, there was no selection of specific individuals on particular days, and all interns who attended a second session did so, on a convenience basis.

Written permission was obtained from both the Director of Nursing of the Hospital, as well as the Nurse Unit Manager of the orthopaedic ward to allow release of nurses to attend these sessions. This was important in having senior nurses aware of the existence and importance of the sessions, and to gain their assistance in scheduling nurses to attend. Both the Director of Nursing and Nurse Unit Manager were highly supportive of the educational value of the sessions, and agreeable to the nurses taking part. Junior doctors were scheduled to attend these sessions from the Medical Education Unit as part of their ongoing education and professional development.

Four different scenarios were used during each session, so each nurse and doctor was an active participant in two, and was able to watch two others. The Medical Education Registrar at the beginning of the project wrote the scenarios that were used during the interprofessional education sessions. They involved a role-play patient or simulation mannequin first being seen and assessed by a nurse, who was prompted to call for medical input. A situation like this occurs commonly in the workplace when junior doctors work a ward call shift. They are responsible for covering multiple wards to review patients who may be unwell or deteriorating. Such patients are usually seen first by a nurse, and then may require medical intervention. The scenarios were thus scripted to be similar to every day workplace practice.

The scenario content or patient clinical conditions were designed based on actual ward call cases (those patients who have become unwell, or those whose clinical condition has deteriorated). These were chosen by looking at the lists documented from ward call doctors working on the orthopaedic ward from the preceding weeks. The cases chosen involved common and important clinical scenarios, to ensure that the clinical content in the education sessions was relevant and useful. The major finding in a review of interprofessional education in the UK was that interprofessional education must be contextualised – that is, relevant to the setting and staff involved (Stew, 2005). Cases were also chosen which involved co-operation between the doctor and nurse for best patient outcomes. Choosing and developing the scenarios in this way also greatly increased the relevance of the interprofessional education

training to “real life”. Eight scenarios in total were developed, so that those who attended a second session did not repeat the same cases.

Each educational session began with an introductory talk, where facilitators and attendees introduced themselves to each other. The attendees were then asked to speak about a positive experience they had had as a member of a team dealing with a patient. The reasons why this experience had been positive were then discussed as a group, and this led in each session to attendees talking through types of behaviours and communication that lead to improved teamwork and collaborative practice, resulting in improved patient care. This was a helpful way of leading into the learning aims for the session.

These learning aims (improve teamwork and collaboration, increase knowledge of other health professionals’ roles, and professional identity and increase knowledge around content and system issues such as hospital emergency response teams) were based on common learning objectives found in a review of the literature on interprofessional education (Thistlethwaite & Moran, 2010). The importance of this introduction, and discussion of session aims, especially pertaining to interprofessional education, has been discussed in the literature (D'Eon, 2005). The focus on teamwork and collaborative practice, including communication skills, and an exploration of different roles, and what each profession could offer, was made very explicitly to the attendees, to help focus their attention on these areas.

Following this, attendees were reassured that there would be no assessment of their performance involved, and that the scenarios were purely offered as an educational experience. This was felt to be crucial to allow attendees to feel confident in attending sessions, and not feel judged in any way. Adult learners require the creation of a non-threatening learning environment where students feel safe to express themselves (Knowles, Holton, & Swanson, 2005), and relates to the good educational practice cited above (Dent & Harden, 2013). Attendees were encouraged to act in their usual roles, and to be comfortable in making mistakes, as there would be no adverse patient outcomes. They were also further reassured that any mistakes that occurred could be discussed within the

group purely as a learning opportunity with no negative repercussions, either from a patient safety or an individual assessment viewpoint.

Each of the initial scenarios comprised a nurse and doctor team involved in a scenario where they managed a role-play patient, with the other two attendees in the session acting as observers via a live feed video. The live feed enabled those attendees not actively involved in the scenario to remotely observe the interaction between the health care professionals and the role-play patient and then be able to participate fully in the debrief session. In this way, observer feedback was given on aspects that are often not noticed by those involved in the scenario. The two role-play actors used were medical education officers employed within the medical education unit. The same actors were used throughout each of the sessions that were conducted. The actors were given scripted background information regarding their character, and information including scripted answers to questions, and instructions on how to respond to different participant questions and reactions. For example, when presenting as an elderly patient with dementia, the actor was prompted to keep asking for her husband until a participant in the scenario specifically addressed this request. After that, the actor became more relaxed, and was more helpful in responding to further questions. The role-play patients were also given instructions in how to simulate patient deterioration during the scenario, for example, becoming progressively more confused, and less communicative. In designing the educational sessions, such cases were felt to be very important in providing relevant learning, and increasing real world context (Parsell, 1998). It has been suggested that gradually increasing the complexity of cases is also helpful in allowing learners to build on their successes and gain confidence (D'Eon, 2005). This suggestion was followed by having the simulated patients becoming gradually more unwell throughout each of the sessions, and ending with a full resuscitation based case.

All of the sessions were held in a custom fitted room designed to simulate a hospital room complete with a hospital trolley. Where possible, the equipment available was the same as that used in the wards. Hospital observation sheets

and charts with medication sheets and clinical notes were also used. As much as possible, the goal was to enable an authentic learning experience.

The two role-play scenarios (one of each doctor/nurse pair) were completed first during each teaching session. After a ten minute break, a familiarisation session with the SimMan® mannequin was undertaken. This was to enable the development of environmental, equipment and psychological fidelity, with the latter being the most important (Beaubien & Baker, 2004). The familiarisation process involved introducing the attendees to the mannequin, and demonstrating his functions, as well as beginning the process of creating a "real" learning environment. Creating a relevant learning experience has been shown to be important in designing interprofessional education (Oandasan & Reeves, 2005a). Attendees were encouraged to speak to the mannequin (who we set up as a male and called Harry, during the familiarisation) by having the doctor who was controlling SimMan® talking to them, asking questions, interacting with them, and encouraging them to examine him for his examination findings (for example listening for breath sounds, or feeling for a pulse). The aim at this stage was to encourage attendees to think of SimMan® as being a real patient (Harry), and then to interact with him as they would any other patient. Having the person who ran the computer controlling the mannequin verbally interact with the attendees, and asking them questions to encourage attendees to talk with him, or examine him accomplished this. This was also the opportunity for attendees to familiarise themselves with the room and equipment, and the drugs available. To make the scenarios as real as possible, the defibrillator used was the same model as those in the clinical areas of the hospital, which was felt to be very important in training during the resuscitation scenarios. Other equipment in the room was similarly authentic. A further two scenarios using SimMan® followed, with a debrief session following each of these.

Each scenario was followed immediately by a facilitated debrief session which involved all nursing and medical attendees, and both facilitators (the principal researcher as the Director of Clinical Training, and the Medical Education Registrar). The actors were not involved during the debrief session. The debrief sessions were a crucial part of the educational activity, and ran for a longer time

period than the scenarios themselves. On average, scenarios ran for 5-10 minutes, and debrief sessions for 10-20 minutes. The debrief sessions encouraged discussion between attendees regarding their roles, and highlighted aspects of teamwork and collaborative practice, rather than only considering medical or nursing content. It also encouraged reflection, and it was hoped this would help develop reflective skills in attendees, as this is known to be important in practice (Oandasan & Reeves, 2005a). The principal researcher was the main facilitator, and has significant experience in this area. As the sessions progressed however, a second facilitator who was employed as the Medical Education Registrar had the opportunity to learn about the role, and the skills involved in facilitation, and became more involved in this process. The importance of pairing a novice facilitator with a more experienced one in the debrief situation has been reported previously (Anderson, Thorpe, & Hammick, 2011).

Having the role-play patients for the first two scenarios allowed the debrief sessions to have more focus on communication, both with the patient, and between the doctor and nurse. This included aspects such as the content and delivery of the phone call from the nurse to the doctor asking for medical attendance, as well as the team response to patient deterioration. Discussion around phone communication was an important part in three of the four scenarios in each session. During the debrief, the attendees at the session were encouraged to discuss between themselves the importance of phone communication, and explain to each other their requirements for this form of communication, and the reasons for these. These phone calls were all from a nurse to a doctor, and nurses were encouraged to use the SBAR (Situation, Background, Assessment and Recommendation) mnemonic (Haig, Sutton, & Whittington, 2006) to convey the information to the doctors. SBAR is a mnemonic tool, which has been developed to improve communication between clinicians, to improve safe clinical handover (Haig, Sutton, & Whittington, 2006). It reminds people to introduce themselves, and then convey information about the patient situation, background, assessment and recommendation (Haig, Sutton, & Whittington, 2006).

The debrief sessions for all scenarios involved discussions about medical and nursing roles, using probing questions to encourage discussion by attendees. The debrief sessions for the mannequin-based scenarios focussed more on aspects of teamwork, including leadership, in unstable patients and arrest situations, and included a discussion around calling for assistance, and the hospital emergency responses. An area of the curriculum relevant to all learners, and thus used in our final case in each session was Advanced Life Support (ALS) training, which was applicable to both doctors and nurses. This also required a high level of teamwork and communication. This made for interesting discussion around leadership during the debrief session after the scenario. This included discussing who was the most appropriate person to assume the role of the team leader, which led on to the importance of collaborative practice in the health care environment. This was a helpful starting point for a discussion around roles, and responsibilities, and what each member could contribute to a team situation.

An important part of the intervention involved the training of a secondary facilitator who had no previous experience in either simulation training or interprofessional education. The Medical Education Registrar who performed this role was completing a Graduate Certificate in Clinical Education at the time, as part of the role within the Medical Education Unit at the Hospital. That individual had attended a one-week training course in simulation teaching sessions, which included running scenarios and the use of SimMan®, as well as training in debriefing following scenarios. To assist in the development of facilitation skills in this person, opportunities were taken prior to, during, and following the training sessions in assisting them with developing their educational role.

The facilitator training was done in two ways. Firstly, this was through an apprentice model (Marckmann, 2001) learning of having seen similar sessions and observed previous interactions by the primary researcher during these, which allowed the Medical Education Registrar to use similar feedback techniques with later groups. Secondly this was achieved by direct teaching around the concepts provided by the primary researcher prior to the debrief

occurring. Following each session, debriefing of the session was held with the researcher and Medical Education Registrar, and this often also involved the role-play actors. Debriefing of the session after the participants had left, allowed a discussion of any issues that had occurred, such as technical issues with sound equipment, and also included a discussion around participants, and feedback for the actors. Although this was a relatively time consuming part of the sessions, (duration varied from 10-30 minutes) they had been highlighted previously as being important both in developing future educational personnel, and improving future sessions (Freeman, Wright, & Lindqvist, 2010) as well as discussing the useful learning outcomes that had occurred, and how these could be improved for later groups.

The research question and approach

The primary question guiding this research is:

> What attitudinal changes occur as a result of attending a single interprofessional education session and are there any long term impacts on clinical practice?

As discussed previously, various methods have been developed to measure the effects of interprofessional education. A review of interprofessional education effectiveness recommended the use of both qualitative and quantitative means of evaluation (Reeves, Zwarenstein, Goldman, Barr, Freeth, Koppel, & Hammick, 2010). In accordance with these findings, the research design chosen for this study was a two phase mixed methods approach comprised of both quantitative and qualitative components to enable the study question to be investigated more fully, making use of the benefits of both methods. This enabled the collection of mixed data (both numerical and text) and additional types of analysis (both statistical and text analysis). A mixed method approach to research in health sciences has been described as combining the flexibility and depth of analysis that is possible to achieve with qualitative research, with the objectivity of quantitative research (McKenzie, 2013). The advantages of this mixed research method include increasing the strength of the research, allowing the research question to be answered from differing perspectives, and

contribute to confirmation of data accuracy by comparing results from the two methods.

Ethics

Ethics approval was obtained through the Flinders University Social and Behavioural Research Ethics Committee in Adelaide, South Australia (approval number 5213) and the Darling Downs –West Moreton Health Service District Human Research Ethics Committee in Toowoomba, Queensland (approval number HREC/11/QTDD/11). A number of ethical queries arose requiring further information to be provided, and some changes to the proposed research design were required; which will be explained below.

Informed individual consent was required for this study. An information sheet (Appendix A) and consent form (Appendix B) were provided to all potential participants. These were comprised of an introduction to the researchers and study purpose, and an invitation to participate including completion of a survey prior to and following the session, as well as to answer some further questions at a later time following the sessions. The information sheet also included a declaration of potential benefits and risks of participating in the study. Other than the time involved for completion of the questionnaire and/or interview, there was not expected to be any significant risk to participants.

All participants were reassured that confidentiality applied to both the education sessions themselves, and the data collected for research purposes only. They were also made aware that the data would be collated and stored in a de-identified manner to assure confidentiality. The information sheet explained the voluntary nature of participation in the study. The potential participants were made aware that they were able to attend the education session regardless of whether they participated in the study. Contact names and phone numbers of the two ethics committees that had given permission for the study were included at the end of the information sheet, and participants were made aware of these.

In addition to the information sheet and consent form, a verbal explanation of the research was given to the doctors and nurses who attended the education sessions. As the principal researcher was the Director of Clinical Training at the study hospital during the study dates, to reduce the risk of coercion, the Medical Education Registrar who was assisting in running the sessions performed this verbal explanation. The Medical Education Registrar explained the study purpose during phase one, and stressed again the voluntary nature of participation, and that declining the offer of participation in the research did not preclude their participation in the education session. The follow up questions of phase two by qualitative means at six months later was also described to participants, and again it was stressed that this would be entirely voluntary. Furthermore, the participants were made aware that follow up would be conducted by a medical educator not otherwise involved in the study, and all information collected would be done in a de-identified manner to ensure their confidentiality and anonymity.

Specific ethical considerations where clarification was sought included detail around the starting date, data collection, coding to allow matching of data and storage of this data, and information around the letter of introduction and amendments to this. One committee required an explanation of the necessity for a consent form, which was required by one ethics committee but not the other. The most important ethical consideration was clarification of a potential conflict of interest.

The potential conflict of interest arose where the Principal Researcher was the Director of Clinical Training of the medical participants in the study and it was felt that a degree of coercion would exist to participate in the study. However it was explained that this position has no managerial responsibility of the participants and neither supervises clinical practice nor assesses the participant's workplace performance. The position of Director of Clinical Training is one of junior doctor advocate, and training support. Given this role clarification the principal researcher was confident there was little or no potential for conflict of interest. However to ameliorate this risk, the letter of introduction, consent and research questionnaires were distributed and

collected by the Medical Education Registrar. The voluntary nature of the study was also stressed to all attendees at the education session.

Phase One

The research question involved an evaluation of changes in attitudes of participants to interprofessional education, and also sought to identify any perceived impact this had on their practice. The quantitative Readiness for Interprofessional Learning Scale (RIPLS) Questionnaire (Appendix C) was considered the most appropriate for this purpose, as the attitudes assessed in the three broad areas of questions, or sub-scales, in this survey mapped closely to the learning objectives of the education session. Questions 1-9 related to teamwork and collaboration; Questions 10-17 relate to professional identity; and Questions 18-19 relate to roles and responsibilities (for RIPLS questions, please see Appendix C). The version of the RIPLS survey (Latrobe Community Health Service, 2009) used mapped most closely to the aims of the sessions, and had previously been used in a postgraduate population in Australia. These learning objectives were focussed on teamwork and collaborative practice, including communication, and roles and responsibilities, including professional identity. The ability to evaluate attitudinal change with regard to these points made it a very useful initial evaluation tool. Furthermore, given the time restrictions with the education sessions, the initial quantitative survey was required to be a quick and efficient method to gather data around the participant attitudes prior to and following the session. It was important to have a time efficient way to measure this, both to minimise the time away from the workplace for participants and also to maximise the time available for the education session itself. In addition, this RIPLS Questionnaire was chosen as it had been previously validated whereas other evaluation tools such as the Interdisciplinary Education Perception Scale (IEPS) had been used mainly in undergraduate cohorts (McFadyen, Maclaren, & Webster, 2007).

In order to determine whether there were any changes in attitude as a result of the session, consenting participants were asked to complete the RIPLS Questionnaire twice; immediately prior to and immediately following the session. There are 19 questions in total in the RIPLS survey used in this

research. The questions in the RIPLS survey are grouped into three main areas, or sub-scales. These sub-scales are team-work and collaboration, professional identity, and roles and responsibilities (Parsell & Bligh, 1999). There are multiple questions within each sub-scale, and each is assessed by means of a five point Likert scale.

Phase Two

The second phase of the study was a longitudinal follow up of attendees, which occurred six months following the education sessions. A qualitative semi-structured interview was chosen for this phase of the study to identify if there were any longer term effects resulting from the education session. The interviews were conducted by a doctor with experience in health education and evaluation. To control for bias, this person was not otherwise involved in the study.

The design of the interview questions was based on open questions asking any perceived impact on interprofessional attitudes and practices following the session. This method was chosen because it enabled a more in depth exploration of the participant's knowledge, and their perceptions of any workplace changes that had occurred in their practice since the education session. The qualitative data collection was performed six months following each session to allow some time in the workplace after the session. The interviews were conducted to ascertain whether there was any lasting impact on attendee's work practices. The interview involved asking a series of questions of each participant, either in person, or over the phone. The purpose of this was to collect information about any long term or ongoing effects of the session, and any perceived effect on participant practice. The initial opening questions asked in this phase of the study were:

1. Could you tell me what impact, if any, attending the interprofessional learning sessions has had on your clinical practice? Please give an example.

2. Could you tell me what impact, if any, attending these interprofessional learning sessions has had on your interprofessional relationships? Please give an example.
3. Please tell me about the most useful aspect of these interprofessional learning sessions?
4. Please tell me about the least useful aspect of these interprofessional learning sessions?

The questions were particularly designed to elicit any changes in workplace behaviour as a result of attendance at the earlier sessions. These were open questions so that participants could answer without prompting or being reminded of the learning objectives of the education session. The first question aimed to elicit without prompting, any perceived changes to practice following the session, and the second question aimed to specifically ask about interprofessional relationships, but again without prompting for teamwork and collaborative practice, or roles, responsibilities or professional identity.

The interviewer contacted participants by telephone or in person and asked if they would answer some questions regarding the interprofessional education session they had previously attended. Participants were contacted at the workplace, as personal contact details such as names and telephone numbers, had not been collected during this study. Participants were recorded as either a doctor or nurse by the interviewer, but not identified in any other way. After an initial opening question, the interviewer drew out information regarding teamwork, collaboration and roles and professional identity, by asking about impact on interprofessional relationships since attending the session. No audio recording was made of these interviews; data was collected as field notes of the conversation. The data was then provided to the principal researcher in a de-identified form, marked only with profession (medical or nursing).

Setting

The study was conducted at the Medical Education Unit of a regional Australian hospital. This is a 200 bed regional hospital in Queensland, Australia with a broad range of patient demographics. It is the regional referral centre for

twenty smaller hospitals within the region. It is similar in size, and staff and patient demographics, to other large regional hospitals within Australia. It has a low reliance on locum staff, with no locum staff in the junior doctor cohort, and a stable nursing workforce. As a result there was a stable base of participants who could participate in the educational activity as well as be followed up relatively easily for the phase two qualitative data collection.

Data Collection and Management

Interprofessional education sessions were conducted between May and August of 2011 in the Medical Education Unit. The sessions were held during the middle of the year, which allowed the junior doctors to have a period of time to settle into their new roles and familiarise themselves with the workplace prior to their attendance, whilst giving time for any changes in their behaviours or attitudes to be implemented into their clinical practice. The sessions were scheduled between 1pm - 3.30pm on Tuesday and Wednesday afternoons. This timing allowed easier attendance for nursing staff as it was during their shift changeover period. This time also assisted in allowing junior doctor attendance, as most of their tasks following morning ward rounds had been completed by this time. Tuesdays and Wednesdays are also allocated to other junior doctor education sessions on a regular basis, so junior doctor supervisors were aware that they may be required for teaching purposes.

Nineteen educational sessions were run in total. Following the verbal and written invitation to participate in the research project, the phase one research RIPLS questionnaires were distributed and collected by the Medical Education Registrar to ameliorate any possible conflict of interest. All attendants at the educational sessions provided written informed consent to participate in the research, which allowed 100% data capture for the quantitative phase of the research. The qualitative data was collected in the form of brief hand written notations and quotations during the interviews. No audio recording occurred.

All data, both quantitative and qualitative, was de-identified and stored in an ethically appropriate manner on a password protected computer. Completed RIPLS questionnaires were collected at the end of each session, and data from

these was entered onto a Microsoft Excel spreadsheet by secretarial staff following the education sessions. All pre and post intervention data was matched for each participant using a unique participant code. Once entered into the Microsoft Excel spreadsheet, the paper copy surveys were kept securely in a locked filing cabinet as per ethics requirements, and no longer referred to in hard copy. No demographic data was collected except for profession (nurse or doctor) in either phase of the research. Phase two data in the form of field notes were collated and stored in a de-identified manner in a Microsoft Word document. The paper copy field notes were similarly kept securely in a locked filing cabinet as per ethics requirements, and no longer referred to in hard copy.

Data Analysis

Phase One

The RIPLS questions are divided into 3 main groups or sub scales of response variables. Questions 1-9 related to teamwork and collaboration; Questions 10-17 were about professional identity; and Questions 18-19 were about roles and responsibilities.

A statistician was employed to analyse the quantitative data. They were provided with the raw data obtained from the RIPLS questionnaire that had been entered onto an Microsoft Excel spread sheet as paired data from each attendee. Each of the questions on the RIPLS is rated on a five point Likert scale (Likert, 1932). Each question could be answered by one of five descriptive categories, which were "strongly agree" (1), "agree" (2), "neither agree or disagree" (3), "disagree" (4), and "strongly disagree" (5). Each descriptive answer was then treated as a number 1-5, missing data would be recorded as 99. Prior to statistical analysis of the data, rescaling of some of the questions was required. Questions 10-12 and 18 were reverse coded items (negative statements/questions). This meant that these were reverse coded and were rescaled as follows:

(maximum score +1) -original score

The questionnaire was performed immediately before and after a group training activity. Each question thus generated both pre-test and post-test data (1-5 on the Likert scale) and was entered as a paired data on the Microsoft Excel spread sheet.

The raw data provided to the statistician was checked and edited before being transferred and analysed in STATA Version 13.0 (StataCorp 2012). Means and standard deviation were calculated for continuous interprofessional learning and practice scores. Mixed effect linear regression models were applied in STATA using the *xtmixed* command to fit linear mixed models of response variable(s) (Rabe-Hesketh & Skrondal, 2008). A maximum likelihood estimation procedure was used to compare the significant differences of interprofessional

learning and practice scores between pre and post intervention time and also between the two groups. The baseline information was adjusted for insertion into the linear mixed model. In particular, the models determined the treatment effects over time (adjusted mean change of scores between pre and post intervention in the nursing and medicine groups) and interaction effect (adjusted mean change between doctors' and nurses' scores at post intervention on adjustment of baseline (pre) measurements).

The within-subject factor was the outcome of interest (i.e. interprofessional learning and practice scores), and the between-subject factor was group (nurses vs doctors), with a random intercept for individuals to account for repeated measurements. The two sided tests were performed for all analysis and the level of significance was set at $p < 0.05$.

Phase Two

The qualitative data collected via individual structured interviews was documented in note form. It was then separated into the four core questions, and differing professions (doctors and nurses) for content analysis. This involved examining the data specifically looking for commonalities in responses from the participants. The data was separated into profession specific responses prior to this, as potential differences between the two groups of health professionals involved in this study and differing perspectives is one of the strengths of qualitative research (Hurley, R., & J, 2011). We aimed to see if the doctors and nurses varied in their interview responses.

The principal researcher undertook the descriptive content analysis manually. This entailed reading all of the responses in their entirety and then coding the different responses, with the most common items mentioned by respondents noted first, until all data had been included from each documented comment. Thus patterns of the most frequent replies became apparent (McKenzie, 2013), as did similarities and differences between the participants. Initial common themes around the learning objectives became apparent early on, as well as categories of similar concepts.

The outcomes of the two phases were also considered as they relate to one another, as there is a close link between the data evaluated using the RIPLS questionnaire, and the data collected in phase two. This is likely due to both methods of evaluation being closely related to the learning objectives (improving teamwork and collaborative practice, clinical content and hospital systems, and knowledge of roles and responsibilities), which were discussed at each session. The RIPLS questionnaire does not assess changes in content and systems, but two of the sub-scales assessed the participants' changed attitudes in respect to the other learning objectives. It was hoped that open questions regarding the impact of the sessions on their clinical practice, and the most useful part of the sessions, would give answers related to all the intended learning objectives. This would then lead to the RIPLS analysis being able to be compared to the qualitative data obtained.

Chapter 3 summary

Small group education sessions were held for medical interns and nurses in a regional Queensland hospital, with the aim of improving knowledge, skills and attitudes towards teamwork and collaborative care, including communication and knowledge around roles and responsibilities. The short and long term outcomes of these sessions were researched using a mixed method approach. Phase one collected data using the RIPLS questionnaire before and after each session, which then measured attitudinal change in participants. Phase two collected interview data six months following the sessions, which sought to assess changes to work practices.

Results from both the quantitative and qualitative evaluation will be presented in the following chapter.

Chapter 4: Results

The demographic data collected about participants in both phase one and phase two of the data collection was only profession based – that is, whether they were a nurse or doctor. Given the sampling strategy used for attendance at the education sessions, all the nursing staff who attended were based in the orthopaedic ward, and all doctors were from the 2011 intern cohort at the hospital. There were nineteen sessions held in total, with four attendees at each session. Some individuals attended more than one session, and there were 30 participating doctors, and 30 participating nurses in the total of seventy-six attendances.

Phase One

The RIPLS Questionnaire was completed by all participants in the study (N = 60) both immediately prior to, and following, the interprofessional education session. There was thus 100% response rate, and from this there were no missing data resulting in a complete data set for phase one. As four of the RIPLS statements are reverse coded (negative statements) and required rescaling prior to data analysis, the raw RIPLS data cannot be considered in total. Once the necessary RIPLS statements have been rescaled, for the questionnaire used, the lower an individual's RIPLS score, the more indicative it is of a positive attitude or 'readiness' of health professionals towards interprofessional learning. Thus a decrease in RIPLS scores is indicative of an improvement in attitudes towards interprofessional education. For the remainder of this results section, only the mean RIPLS scores will be considered across groups (doctors and nurses).

Mean RIPLS scores in the post intervention data were lower than the pre intervention baseline data for both total RIPLS scores, and for all scores in the three RIPLS sub-scales across both the medical and nursing disciplines (Table 4). This shows, that regardless of whether the participant was a doctor or nurse, the participant attitudes as measured by the RIPLS survey, improved following the intervention.

For both the total RIPLS scores, and for each of the three sub-scales, the means for doctors were higher than those for nurses both pre and post intervention. The only exception was the pre intervention score of the roles and responsibilities sub-scale, where they were equal to nurses (Table 4). This meant that the nurses demonstrated more positive attitudes or 'readiness' towards interprofessional learning than the doctors did, for the two sub-scales of teamwork and collaboration, and professional identity. Doctors and nurses pre intervention scores for the third sub-scale of roles and responsibilities were the same.

Table 4. Mean (SD) of the RIPLS score and its three sub-scales (Teamwork and Collaboration, Professional Identity and Role and Responsibilities) between pre and post intervention time across two disciplines (n=38 doctors and n=38 nurses)

		Mean (SD)	
	Time	Medicine (n=38)	Nursing (n=38)
Total RIPLS scores	Pre	35.7 (7.8)	32.1 (6.8)
	Post	30.5 (8.0)	27.0 (4.9)
Sub-scales			
Teamwork and collaboration	Pre	15.1 (4.3)	12.6 (3.8)
	Post	12.7 (4.1)	10.4 (2.5)
Professional identity	Pre	14.9 (4.0)	14.0 (3.3)
	Post	12.5 (4.2)	11.7 (3.1)
Role and responsibilities	Pre	5.6 (1.1)	5.6 (1.2)
	Post	5.3 (1.1)	4.9 (1.3)

Table 5 summarises the data collected from the pre and post intervention RIPLS surveys and shows that the intervention significantly improved these scores. For the sub-scale of teamwork and collaboration, the *p* value was <0.001 for both doctors and nurses. Similarly, improvement in professional identity scores for both doctors and nurses showed a *p* value of <0.001. The change in the roles and responsibilities sub-scale was significant for doctors with a *p* value of 0.046, but showed more significance for nurses with a *p* value of <0.01. These figures demonstrate an improvement in attitudes of both nurses and doctors following the session, as measured by the RIPLS questionnaire in all three sub-scales.

Table 5. A mixed effects linear regression model predicting time effects for RIPLS scores between pre and post intervention time across two disciplines (n=38 doctors and n=38 nurses)

		Predicted Marginal Mean Change (95% CI)			
	Time	Medicine (n=38)	Significance (*p* value)	Nursing (n=38)	Significance (*p* value)
Total RIPLS scores	Pre	-	-	-	-
	Post	-5.21 (-6.77-(-3.64))	<0.001	-5.06 (-6.62-(-3.49))	<0.001
Sub-scales					
Teamwork and collaboration	Pre	-	-	-	-
	Post	-2.49 (-3.44-(-1.54))	<0.001	-2.14 (-3.44-(-1.20))	<0.001
Professional identity	Pre	-	-	-	-
	Post	-2.37 (-3.27-(-1.47))	<0.001	-2.34 (-3.24-(-1.44))	<0.001
Role and responsibilities	Pre	-	-	-	-
	Post	-0.36 (-0.72-(-0.01))	0.046	-0.56 (-0.91-(-0.20))	<0.01

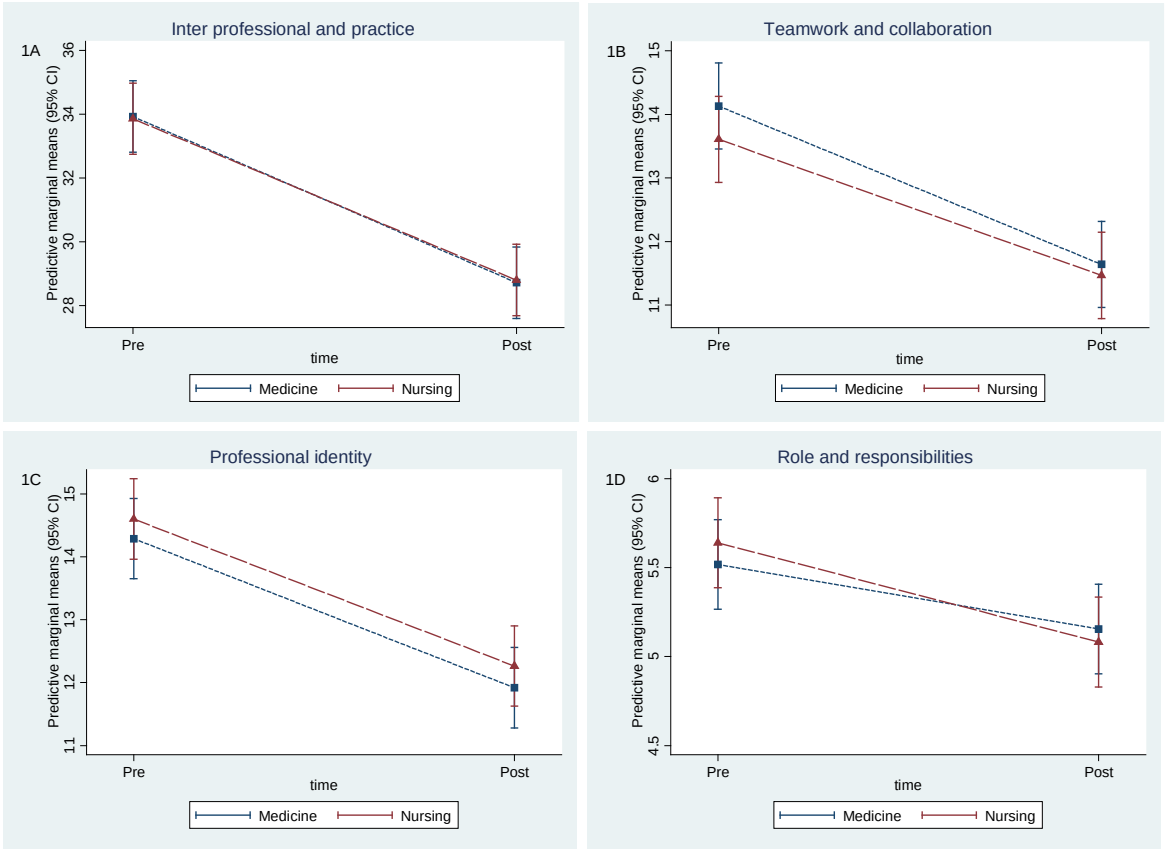
Table 6 summarises the data from the RIPLS survey by profession, and compares predicted marginal mean data between nurses and doctors. There was no significant difference between doctors and nurses, across all three sub-scales.

Table 6. A mixed effects linear regression model predicting group effects for inter professional learning and practice scores between pre and post intervention time across two disciplines (n=38 doctors and n=38 nurses)

		Predicted Marginal Mean Difference (95% CI)	
	Time	Medicine vs Nursing	Significance (*p* value)
Total RIPLS scores	Pre	-	
	Post	0.15 (-2.06-2.36)	0.90
Sub-scales			
Teamwork and collaboration	Pre	-	
	Post	0.35 (-0.99-1.69)	0.61
Professional identity	Pre	-	
	Post	0.03 (-1.24-1.31)	0.96
Role and responsibilities	Pre	-	
	Post	-0.20 (-0.70-0.31)	0.45

The RIPLS pre and post survey data is also presented graphically in Figure 1, which shows first the total RIPLS score, followed by the 3 subscales, with comparison between pre and post intervention changes for doctors and nurses.

Figure 1. Predictive marginal means for (1A) RIPLS scores and its three domains (1B) Team work and collaboration (1C) Professional identity and (1D) Roles and responsibility between pre and post intervention time across two disciplines (n=38 doctors and n=38 nurses)



Phase Two

A doctor with experience in health education and evaluation was responsible for contacting and interviewing participants for phase two of the study. This doctor had no other contact with study participants, and thus had no conflict of interest. To avoid any selection bias attempts were made to contact all phase one participants and not a pre-selected sub group. There was no intent to collect data from participants with strong feelings (either negative or positive), but rather seek the responses from all phase one participants. The doctor collecting the data worked only part time, and attempted to contact participants whilst working day shifts in the hospital. This doctor was able to make contact with 50% (n=30) of the individuals from phase one. All individuals contactable agreed to participate in phase two (100% response rate). Responses were able to be captured from 14 of the 30 nurses and 16 of the 30 doctors. This was a 46% and 53% response rate from the original phase one cohorts respectively. The inability to contact all phase one participants was due to staff being on leave, working shift work (on night or evening shifts), or working in other hospitals. In keeping with the ethics approval, personal details of participants were not collated and therefore not able to be used to follow up participants for phase two.

As described in the methods section, the questions for the semi-structured interview in phase two were as follows:

1. Could you tell me what impact, if any, attending these interprofessional learning sessions has had on your clinical practice? Please give an example.
2. Could you tell me what impact, if any, attending these interprofessional learning sessions has had on your interprofessional relationships? Please give an example.
3. Please tell me about the most useful aspect of these interprofessional learning sessions?
4. Please tell me about the least useful aspect of these interprofessional learning sessions?

A summary of the numbers of responses to each question is shown in Table 7. As demonstrated in the table, despite the use of open questions without prompts to the key learning outcomes there is overlap and repetition of responses across each of the questions, which demonstrate awareness and achievement of the key learning outcomes.

The data from each question will now be presented separately, as there is value in considering each individual questions responses, in the context of the question rather than as a whole data set. This is in keeping with a content analysis approach (Elo & Kyng, 2008). The questions aimed to see if any of the initial learning objectives from the sessions were mentioned by participants as having improved, without being prompted by the interviewer. As presented in the methods chapter, the learning objectives for the session were:

1) to improve teamwork and collaboration,
2) to increase knowledge of other health professionals' roles, and professional identity and
3) to increase knowledge around content and system issues (such as hospital emergency response teams).

By presenting the content analysis of the responses for each individual question, it is possible to see the key concepts that respondents identified. Only the second question, which asked about interprofessional relationships, gave any form of prompt to the learning objectives of the educational sessions. It is therefore noteworthy that responses to this first question regarding what impact the educational session had on their clinical practice, included aspects of teamwork and collaboration, including communication, and roles and professional identity. This is a very positive finding for the objectives of the education sessions.

Table 7. Overview of the key concepts evident in the content analysis of the phase two interviews by question and across disciplines (n=16 doctors and n=14 nurses)

	Nurses n=14	**Doctors n=16**
Question 1: Impact on practice	Yes = 13 No = 1	Yes = 15 No = 1
Communication: - Phone communication - Awareness of communication needs - Development of effective communication - Importance of communication	(Total 12) 4 3 3 2	(Total 10) 2 3 2 3
Roles: - Role definition and delineation - Roles of others	(Total 8) 4 4	(Total 2) 1 1
Clinical content	0	4
Teamwork	0	5
Systems/environment	1	2
Question 2: Impact on Interprofessional relationships	Yes = 13 No = 1	Yes = 13 No = 3
Positive impact on interprofessional relationships	4	4
Improved interprofessional communication	5	2
Reminder about relationships and their importance	3	3
Improved confidence	4	0
Improved understanding of roles	1	6
Question 3: Most useful aspects of session		
Learning about teamwork	4	3
Role-playing scenarios	3	7
Seeing other perspectives/roles	1	5
Communication	3	0
Controlled environment and debriefing	3	3
Watching others	1	1
Clinical information	1	1
Question 4: Least useful aspects of session		
None	11	7
Presentation style and duration: - Too short/few sessions/hard to attend - Superficial/overacted	 1 0	 4 4
Personal insecurities	0	1
Prop Problems	2	0
Research Questionnaires	0	1
Watching others	0	1

Question One: Impact on clinical practice

Participants were first asked what impact, if any, that attending the interprofessional education session had had on their clinical practice, and asked to give an example. Of the total replies, one nurse and one doctor said there had been no impact on their practice. Two doctor participants reported that there had been no change, but then articulated they experienced changes in thought processes rather than their own practice. Examples of this include *"None – but I have more insight into what nursing staff do before calling"* (D5) and *"Not yet- not attended any emergencies yet; being able to practice relevant scenarios without stress, doing training with staff that had previously had emergency situation"* (D13). These responses were then coded as positive responses to this question, rather than "none".

The respondents who acknowledged the interprofessional education session had had an impact on their practice all reported positive outcomes. The general concepts when the raw qualitative data was examined for areas of commonality in responses to this first question were around: communication, role definitions, clinical knowledge, teamwork, systems and confidence. Each of these areas will now be considered separately.

Communication

Communication was the most common response in answers relating to the impact on clinical practice. This was mentioned in the majority of answers from both doctors and nurses. Due to the large number responses involving communication, four main subthemes, or more detailed areas of communication were identified; phone communication, awareness of communication needs of other health professionals, development of effective communication and the importance of communication.

Phone Communication

During the interprofessional education sessions, three of the four scenarios involved a phone call from the nurse to the doctor. This phone call occurred after the nurse first assessed the role-play patient, or SimMan®, and had decided that they required medical assistance. The nurse therefore needed to

explain the situation to the doctor, as well as the action that they wished the doctor to perform (in most cases to review the patient). The phone calls from nurses to doctors were always discussed at the debrief session, and observers to the session (the other nurse and doctor present) were often asked to give their opinions of the phone communication. This questioning during the debrief session was phrased to encourage the session attendees to report the positive aspects of the phone call. The nurse who had been present in the scenario, and made the phone call was then prompted to explain what they were thinking when they made the phone call, and how they conveyed this information to the doctor.

Phase two findings show that nursing participants perceived that their phone communication with doctors had changed since the interprofessional education teaching session. In particular, participants suggested they were more aware of the importance of having information ready for telephone calls: *"practise communication, phone conversations particularly. Have information ready"* (N1) and *"communication over the phone, changed what information given"* (N13). Other comments that indicated being more prepared for the phone call were: *"Made aware of when making call to have information ready"* (N6) and *"prepared better"* (N14).

Two doctors stated they had a raised awareness of the importance of effective phone communication, especially when being asked to review a patient. One comment included: *"When contacted, take time to ask questions"* (D14) demonstrating their awareness of needing to ask for clarification over the phone, particularly to allow them to triage their ward call responsibilities. This raised awareness of phone communication was a positive outcome of the interprofessional education session. Doctors also answered that they were more aware of the what nurses had done prior to making this call, since they had seen this during scenarios *"On ward call, aware of thought processes behind being asked to do something"* (D14). One also noted that they had *"More insight into what nursing staff do before calling"* (D5).

Awareness of communication needs of other health professionals

The awareness of what other health professionals need in terms of communication, and patient information especially, was another key communication area, with equal numbers of doctors (3) and nurses (3) citing this as having impacted on their practice since the education session.

Nurses reported that following the interprofessional education session they had *"better communication with doctors, more awareness of what doctor needs"* (N3) and were *"better at communicating what doctor needs to hear- timely, accurate"* (N2). This was helpful in demonstrating that they were now considering not just what information they thought was important but also what may be needed from a different health professional's perspective, when relaying clinical information to doctors. One participant stated the importance of *"What information each holds"* (N4), acknowledging the differing and important information required by the different professions; whether clinical knowledge or that gained from patients or family.

Doctors replied positively about communication needs, saying "*It made me think about communication – who am I talking to? What are they asking for? What can they offer?"* (D3) and another stated they had a *"better understanding of nurses' perspectives"* (D7). This understanding of the importance of communication, and the changes in communication between health professionals is a positive step towards improving workplace relations and communication, and thereby patient care. These comments suggest there was an improvement in consideration of the different communication needs of differing health professionals, and perhaps improved information transfer as a result. One doctor noted this gave them a more holistic viewpoint *"gave appreciation for other perspectives – broader view of scenario"* (D15).

Development of effective communication

Nurses spoke of the importance of developing good communication skills, and commented that these methods of communicating need to be effective. They perceived that following from the interprofessional learning sessions they were more conscious of their communication, stating they were *"more clear about*

what's going on" (N10) and the sessions attended *"helped to develop communication one on one with doctors"* (N3). This perception of breaking down of barriers between professions to ensure good communication was a very positive result. One nurse noted that the impact on their practice was *"confidence in approaching doctors"* (N11). Developing confidence to approach medical staff is vital to effective communication. There is the potential to improve communication between professions by increasing the knowledge and skills, and thus the confidence of participants during interprofessional interactions.

Regarding the development of effective communication following the interprofessional learning sessions, doctors said the positive impact for them had been *"trying to ensure others know plans, and listening to others"* (D9) which also relates to teamwork, and *"improving communication with different staff types"* (D4). These comments reflect the knowledge of the necessity of good interprofessional communication and in their trying to improve this, since attending the interprofessional education session. This suggested a change in their communication style in the workplace, and a desire to improve.

Importance of communication

An increased understanding of the importance of communication between healthcare professionals in clinical practice was identified by both nursing and medical attendees. Comments reflecting this were made by nurses, such as *"communication is important between medical and nursing staff"* (N9) and *"made me reflect how to communicate effectively and timely"* (N8). Thinking about good communication as a reflective process following the interprofessional learning session highlights its importance and is a favourable outcome.

Doctors said they were *"more aware how important communication is"* (D9), *"more mindful of communication"* (D14) and one noted they were already cognizant of the importance of communication saying *"I'm already aware how they feel…importance of communication"* (D10). These replies showed variability in their assumed confidence in communication skills when compared to the nurse attendees, with most doctors happy that they were previously competent,

but saying that they had been reminded of the importance of these skills during the interprofessional education session.

Roles

The next most common response to the question of impact on practice involved responses around roles in the workplace. The two main areas, which were identified from the answers to this question, were role definitions and delineations, and an improvement in information and understanding about the roles of others.

Role definitions

Nurses spoke of *"understanding different roles and how to liaise"* (N11) and said they were more likely to *"realise what others do"* (N12) as a result of the sessions. These were the areas that are likely to have impacted on their clinical practice, in having a better understanding of what doctors do, and how to talk with them (specifically, what content they would like to hear, and why). There was a certain amount of crossover here with communication; for example a nurse said they had *"better communication with doctor, more awareness of what doctor needs"* (N2). This is a good example of first realising the difference in roles, which requires different information, and then recognising the importance of communicating the information required to a different health professional. The single doctor who spoke about this said *"better role definition"(*D7).

Information around roles of others

Doctors believed they had a *"better understanding of nurses' perspectives*" (D7) following the interprofessional education sessions. They also said that sessions *"gave appreciation for other perspectives – broader view of scenario"* (D7). These positive responses demonstrated that the attending doctors had improved their understanding of nurses' roles, and their ability to consider other health professionals' perspectives in patient care. A similar view was obtained from one nurse who commented *"looks at other side"* (N12) showing the interprofessional learning sessions enabled her to be able to recognise doctor's viewpoints, and perhaps be closer to understanding this viewpoint. The

improvement in communication mentioned previously by one nurse was due to "*more awareness of what doctor needs*" (N2).

Teamwork

Five doctors articulated a change in specific teamwork knowledge or functioning as an impact of the interprofessional learning sessions, although many aspects of teamwork were mentioned in other replies from both doctors and nurses (for example around communication and roles), all of which impact on team functioning. One doctor said that the interprofessional education session *"gave me a better idea of how to utilise nursing staff in an emergency situation"* (D16). Role allocation was part of the debrief for the final scenario in each session, which involved a patient in cardiac arrest and required the Advanced Life Support algorithm to be followed. A doctor noted that they were now *"better able to delegate"* (D7) as a consequence of the simulation training. These teamwork communication skills were also described by a doctor as *"trying to ensure others know plans and listening to others"* (D9) as a summary of how they thought changes in communication was the greatest impact on their practice.

Clinical content

The next most common theme from the question of impact on clinical practice was around clinical content and its impact on clinical practice. However, it is noteworthy that only doctors provided this response. Four doctors responded with answers indicating clinical content has impacted on their practice. This means for doctors this was the third highest scoring aspect in terms of impact on clinical practice. This is interesting as it demonstrated the importance of doctors' perception of their knowledge.

Four of these replies were positive in regards to perceived impact, and one noted a negative personal impact. Doctors were able to articulate that the clinical scenarios were useful in improving their knowledge base and reasoning skills. They thought the interprofessional education scenarios had given them *"useful practice in emergency situations"* (D1), were *"educational for emergency cases"* (D10) and a doctor felt the scenarios had *"improved clinical reasoning*

because it was practice" (D2). The one negative response to this first question noted the impact was recognising personal knowledge deficits, stating *"Read up on ECGs – felt really crap following experience – embarrassed, self-judged, questioned knowledge base"* (D11). This participant had provided positive responses to the teamwork and collaboration aspects of the training sessions but seemed to feel that their personal lack of core knowledge (ECG interpretation) was the most significant memory of the training. Whilst this is a negative memory for the individual, it is a positive outcome for the intent of the education session and improving patient safety, promoting self-reflection on performance and awareness of personal limitations.

Systems/Environment

Training participants awareness of the hospital emergency system (the "Code Blue" call) was an important component of every interprofessional learning session. One nursing participant spoke of an increased awareness of the hospital emergency system during the follow up interview, responding; *"Be more aware. Call code"* (N5). This was the 'take home' message from the third scenario that was run during every session. In this scenario, once the doctor was also in the room, having been called by the nurse, the simulation coordinator would quickly make the SimMan® mannequins clinical condition deteriorate to the point where 'Code Blue' criteria were met. The scenario ended after this call was made, and the following debrief centred on the criteria for calling a 'Code Blue', reasons why doctors and nurses may be unwilling to call, and the response after an emergency call is made. All participants were encouraged to call, with the facilitators continually impressing upon them; *"If in doubt, call a Code Blue"* during the debriefing from the last two scenarios. Although this was only mentioned by one nurse participant in response to the question regarding impact on their clinical practice, this is still an important learning outcome. An emergency call is a relatively uncommon event, so it would be unusual to have many of the participants having been involved in this situation between the sessions and the follow up questions.

Whilst not explicit to the calling a code, knowledge of these systems and the environment was also felt to be potentially useful by two of the doctors. One

doctor said *"Not yet- not attended any emergencies yet; being able to practice relevant scenarios without stress, doing training with staff that had previously had emergency situation"* (D13), and the other *"did before ortho and ward call and have not yet been put in that environment"* (D6). Although these two doctors had yet to see an impact on their clinical practice, they recognise the potential for this to occur particularly in relation to emergency situations.

Question Two: Impact on interprofessional relationships

Participants were next questioned regarding any impact attending the sessions may have had specifically on their interprofessional relationships. One nursing attendee had already spoken of these in their answer to the previous question, and did not add further comments. The doctor participant who, in question 1, denied any impact on their clinical practice following the sessions (D8) said there had also been no impact on their interprofessional relationships. Two further doctors said felt little impact on their interprofessional relationships, stating *"none really as already doing the job"* (D2) and *"already doing ok"* (D14) in reply to this question. Of the remaining responses to this question there were many responses displaying a positive influence, and common impacts included improved communication, reminder about relationships and their importance, improved confidence and improved understanding of roles.

Positive impact on interprofessional relationships

The most prevalent response to the question of the impact of the interprofessional session to relationships was generic positive comments. Equal numbers of nursing (4) and medical (4) participants clearly articulated that the interprofessional education sessions had a positive impact on their interprofessional relationships. Nurses made comments such as *"Improved. Noticed difference overall"* (N14) and *"Yes, positive influence"* (N2). Medical comments included *"beneficial"* (D4), *"positive impact"* (D10) and *"improve; practice in situation"* (D13).

Interprofessional Communication

Again communication was shown to be a significant impact from the education session. Both nursing and medical participants spoke about changes in their

communication in the workplace being the biggest impact on their interprofessional relationships since the sessions. One nurse explained that she had used the information gained in the interprofessional education sessions to teach other nurses *"to have the same communication skills"* (N1). Content in what is communicated to others was again noted as important; both in asking for information *"say what you need to know"* (N12) and also in giving appropriate information *"give more information – communicate better"* (N7). This improvement in interprofessional communication was also articulated by a nurse who said that following the intervention they *"talked better with the resident on the ward"* (N14). Another nurse said the major impact was to not make assumptions when talking to junior doctors; *"it illustrated that communication needs to be improved - you don't know what they know"* (N9). The understanding of different roles and viewpoints was also mentioned by a doctor who said they had *"improved communication, for example an understanding of when they are worried about patient"* (D15), with regard to nurses calling about a deteriorating patient who requires medical input. Another said "*it made me think about communication*" (D3). This doctor also went on to talk about improved understanding of roles, which will be discussed below.

Reminder about relationships and their importance

Three nurses and four doctors described how the sessions had impacted attendees by being a reminder about the necessity of good relationships, and the need to improve interprofessional relationships. Nurses said the sessions *"enhanced relationships between doctor and nurse"* (N4) and were *"more of a reminder across the board"* (N8). Doctors on the whole said the session was more a reminder than new material *"always been conscious of team play"* (D12) and *"already had good relationship"* (D9) with nurses. Doctors also spoke of their relationships with nurses and impact of this as *"beneficial but probably no change, already rely on nurses"* (D11). Although these participants did not feel that the sessions had provided new skills that impacted greatly on their work practice, they did articulate that they were useful in providing a timely reminder of the importance of interprofessional relationships.

Improved confidence

Four nurses stated they had increased confidence in their interprofessional relationships since attending the education sessions. One nurse stated that it was *"easier to approach doctors. Could be nervous at times - more confident now"* (N3). Another said they felt they were *"made more assertive"* (N5) and another reply was that a nursing participant was *"more confident and assertive when talking to other staff"* (N13). One nurse felt the sessions increased her confidence, but led her to also teach other registered nurses and student nurses to foster this attitude change *"don't be nervous of doctors"* (N1). It was a very heartening result to see nurses articulating their perceived improved confidence in their interaction with doctors and other professionals, which they attributed to attendance at the sessions. None of the doctors, in contrast, mentioned improved confidence as a positive outcome for their interprofessional relationships from attending the sessions.

Improved understanding of roles

The final category of responses to the question regarding the perceived impact on interprofessional relationships in the workplace following the sessions was again that of improved understanding of roles and responsibilities. Six doctors and one nurse provided responses which fit this category. The single nursing comment around this related to role equity *"all on same level – no one is better"* (N11). This contrasted with the feelings expressed by the six doctors who found changes in role understanding to be the biggest impact for them. They spoke of increased regard for nurses and the nursing role following the sessions. Doctors said sessions *"made me more aware of thought processes and what they do"* (D5), that they had a *"more positive regard for nurses and what they do"* (D7). One doctor said sessions had impacted by allowing them to see *"perspective of nurses (as critical and important)"* (D6) and another said they had *"previously not tuned into their role"* (D7). From the education session they could see nurses as an *"important/critical role and part of team"* (D6). Another said *"It made me think about communication – who am I talking to? What are they asking for? What can they offer?"* (D3). This same doctor then noted the sessions were *"useful for ward call and rural"* (D3). Increased knowledge regarding nursing and medical roles

were also mentioned with *"better understanding of roles of different team members"* (D1) and *"knowing appropriate definition of roles"* (D4). These doctors articulated both an improved understanding of the nursing role following the sessions, and also an improvement in their regard for the nurses and their role.

Question Three: Most useful aspect of the sessions

In an effort to get a more global understanding of the value of the interprofessional education session, the 'most useful aspect' was investigated by direct questioning. Responses noted as most useful included: learning about teamwork, role-playing scenarios, seeing other perspectives/roles, communication, controlled environment and debriefing, watching others and clinical information (Advanced Life Support/patient assessment).

Learning about teamwork

Responses around teamwork were mentioned as the most useful aspect of the session by seven participants. Replies made by nurses included *"working as a team with doctors and other nurses"* (N1) and *"doctors and nurses working together – what is important to both parties"* (N9). The importance of the interprofessional training aspect was also highlighted *"mixed professions – done so many nursing training"* (N14) as one nurse commented on the difference with this session as opposed to the single profession education sessions that they had attended in the past. Another nurse said "*Loved getting to know doctors, not intimidating, breaking down barriers, work beside doctor. Thanks"* (N8). A doctor noted the session was helpful in *"providing information to be a better team player and consider management beyond patient and staff"* (D15). *"Having different staff types"* (D4) was thought to be helpful. One also responded *"you are not by yourself"* (D10) and during the scenarios doctors also articulated an understanding of the assistance that nurses could bring them, and the reassurance this gave them.

Role-playing scenarios

The role-play and SimMan® scenarios themselves were thought to be the most useful aspect of the sessions by ten participants. Nurses mentioned *"training and practice in different scenarios"* (N6) and *"using dummies – realistic"* (N10). A

doctor also responded that the *"scenarios were spontaneous"* (D6). Doctors found that the content of the sessions was relevant; including *"simulations of common ward call scenarios"* (D8) which were useful in their applicability to the workplace. Furthermore, the *"practice of scenarios not normally handled alone"* (D2) was useful, in learning together with the nurses present as well. Other responses to this question included *"Simulation"* (D13) and *"practice at clinical scenarios"* (D11). This shows many participants valued the authenticity of the scenarios and the well-simulated educational environment in which they were conducted.

Seeing other perspectives

The opportunity to see others' perspectives, and learn about roles was thought to be most useful by five of the doctors, and one of the nurses. The doctors reported that they were *"more aware of roles"* (D9) and had a *"better understanding of the roles of different team members"* (D1). They also appreciated *"knowing what nurses do before calling"* (D5) which directly linked back to the phone communication at the beginning of each scenario, and talked about *"recognising different experiences of nurses"* (D11). The continuing articulation of the improved understanding and regard for the roles of nurses within the health care team was a very positive result. A doctor responded that they found useful *"running through emergency scenario with nurse and see what they do"* (D9) to better understand their different roles. One nurse respondent noted seeing *"other perspectives"* (N12) as the most useful aspect of the sessions.

Communication

Three nurses again mentioned communication as the most useful learning outcome, although this was not mentioned by any of the doctors for this question. The nurses responded the most useful outcome was *"effective communication"* (N2), *"communication"* (N7) and *"talking to doctors – have information ready"* (N5). This re-iterated the importance of the teaching around phone communication and handover during the sessions, as presented in earlier question responses. Improving the phone handovers and communication

around patient care was felt to be a very positive outcome, and it would be hoped this would result in improved patient care.

Controlled environment and debriefing

The controlled and safe learning environment was thought to be most useful by three doctors and three nurses. A doctor said *"It was good being put on the spot in a safe environment"* (D3) and another mentioned they had been *"able to learn but know the patient is safe"* (D14). One doctor participant said, *"The debriefing session was good feedback"* (D7). One nurse said *"not intimidating"* (N8), and also related this to improved teamwork as mentioned above. Two nurses (N 14 and N11) simply said the *"controlled environment".*

Watching others

Watching others was thought to be the most useful part from one nurse and one doctor participant. The nurse articulated this as: *"watching others and learning from that as well"* (N3). The doctor simply said *"watching each other" (D12).*

Clinical Content

One nurse and one doctor in their responses to this question mentioned clinical content as the most useful part of the sessions. The nurse specifically mentioned advanced life support content teaching which was covered in all debrief sessions, and in particular the Advanced Life Support algorithm *"going though ALS, dissecting each step"* (N13) and the doctor responded *"practicing emergency assessment of a patient"* (D16). These are similar to some of the responses from question 1, however from different respondents.

Question Four: Least useful aspect of the sessions

The last question asked of participants was their opinion of the least useful aspect of the sessions. The majority of respondents (18/30) felt that there was no aspect of the interprofessional education session that was not useful, and as such, the overall response to this question was very positive. Nearly all of the nursing participants (11/13) answered "nothing" to this question, whilst in contrast, only five of the doctor participants said "nothing" (D1, 7, 9, 13, 16). Two doctors responded further by saying the sessions: *"were good"* (D2) and *"I*

thought it was all useful" (D3). As these two doctors made positive comments, even though they were answering a negative question, this made a total of almost half of the doctor (7/15) participants who felt there to be no aspect of the interprofessional education session that was not useful, and thus had no suggestions for improvement. The remaining doctors made constructive comments, some quite detailed, regarding what they perceived to be the least useful aspect of the sessions.

Session timing

Two attendees commented on insufficient exposure *"only four scenarios"* (D6) and *"insufficient sessions"* (D15) implying they would have liked more. These again were taken as relatively positive responses to the question, where the least useful aspect was thought to be not enough sessions. A nurse described the least useful aspect to the sessions was that scenarios were *"too short"* (N11), which likewise was taken as a positive response to the intent of the sessions. Time restraints were also noted by two doctors, with both time to attend *"trying to get time to do it"* (D10) and time during the session *"feedback session – needed more detail and time"* (D12) being mentioned.

Session presentation style

Some of the doctors responded negatively to the presentation style of the interprofessional education sessions. Such responses included *"A little bit superficial, as we know it's not real life, easy to be complacent"* (D5) and *"plays out differently with a larger number of players"* (D6) referring to the group of two participants in each scenario, as opposed to larger numbers in some clinical situations. Other, more constructive comments included *"Some scenarios over the top-pantomime"* (D14) and *"working with dummy/actor"* (D12) noted as the least useful aspects, which reflect on the running of the scenarios and role-play patient acting.

Personal insecurities

There was one specific comment made in answer to this question, which reflected the personal insecurities of a participant. The lack of clinical knowledge that they perceived they displayed during the scenarios was a least

valuable aspect. They stated *"It made me question my own ability"* (D11). However, such an outcome is potentially beneficial for lifelong learning, and the participant in their answer to Question 1 identified this as the most useful aspect of the session, as they were prompted to – *"read up on ECG"* (D11).

Observation

Whilst described as beneficial by N3 and D12 in the previous question seeking most useful aspects, "*Watching other people do it"* (D8) was thought to be least useful by one doctor.

Prop failure

Two of the nurses commented that they had difficulty phoning the doctor during the scenarios: *"phone call to doctors -couldn't use phone"* (N1). A mobile phone was used, as there was no internal phone connection available in the room used for the scenarios. The use of the usual landline handset would have been advantageous, but was not possible. After realising that the use of this technology was difficult for some of the attendees, written instructions were provided with the phone in the room for subsequent participants, and consequently no further negative responses to this prop were received.

Research questionnaires

Despite being clearly advised that the research component of the education sessions was voluntary, one doctor described the least useful part of the interprofessional education session was filling in the RIPLS *"questionnaires"* (D4).

Chapter 4 summary

In summary, the phase one results demonstrated that participant attitudes as measured by the RIPLS evaluation tool, were significantly improved after the interprofessional education session when comparing pre and post intervention data. This was across both the whole data set, and with each of the three sub-scales (teamwork and collaboration, professional identity and roles and responsibilities). P values for the first two sub-scales were <0.001 for both

doctors and nurses, and were 0.046 for doctors and <0.01 for nurses for the roles and responsibilities sub-scale.

Phase two data were gathered between three and six months following the sessions using structured interviews. Analysis of this data showed that the education sessions had achieved their aim of highlighting the importance of teamwork, and collaborative practice. Most participants described their perception of the impact on clinical practice to have been in the areas of communication, teamwork and collaboration, and roles and responsibilities, which were some of the intended learning outcomes.

The results from both the phase one and phase two data analysis related well to the learning objectives of the educational intervention. These learning objectives were improving teamwork and collaborative practice, clinical content and hospital systems, and knowledge of roles and responsibilities. The RIPLS questionnaire explicitly investigated attitudinal change towards two of these (teamwork and collaborative practice, and roles and responsibilities) and the phase one analysis demonstrated a significant improvement in both. The phase two results showed that all of these areas were considered by participants as having impacted positively on their clinical practice or were considered to have been the most useful aspect, on unprompted questioning. It is very positive that both evaluation methods showed this improvement, and that the two separate methods of evaluation, also separated in time, had consistent results.

These results will now be considered with reference to the existing literature and outcomes from the study explained in further detail. Limitations to the study and areas for further research will then be considered.

Chapter 5: Discussion

The aim of this research study was to measure the change in attitudes towards interprofessional learning, and impacts on collaborative practice of interns and nurses resulting from an interprofessional educational intervention. This was undertaken with the aim of improving patient safety and thus improving patient outcomes. Improved collaborative practice has been shown to improve patient outcomes in our complex health environments (Morey, Simon, Jay, Wears, Salisbury, Dukes, & Berns, 2002; Wachter, 2004). Whilst interprofessional education has been suggested to be a valid way of improving this teamwork and collaborative practice (Reeves, Zwarenstein, Goldman, Barr, Freeth, Koppel, & Hammick, 2010), the interprofessional education sessions were anticipated to be an appropriate activity to provide health professionals with the requisite knowledge and skills to promote collaborative practice and teamwork.

This thesis has described the learning intervention aims and objectives, detailed the education process, and presented the related research to answer the specific research question and aims. This chapter will first discuss the outcomes in relation to the intervention aims and objectives, and will then address the findings of the formal research component.

Interprofessional education session outcomes

Interprofessional education sessions developed for first year doctors were run in 2011. In order to create interprofessional education experiences, nurses from the orthopaedic ward were invited to participate. Two doctors and two nurses were sought to attend each of the 19 sessions, as an equal mix of professionals is important in interactive learning (Funnell, 1992). This balance of professions was achieved in all sessions. These small group sizes were believed to be most useful for this type of education, as most interprofessional education initiatives report small groups being the optimum for learning (Bligh, 1980; Reeves, 2000), and also for helping promote reflective practice (Mann, Gordon, & MacLeod, 2009). The sessions involved role-play and mannequin based simulation scenarios, with facilitated group debriefing by an experienced clinician and educator after each scenario. In keeping with best practice, every effort was

made to ensure a relevant learning experience for all participants to enhance learner outcomes (Baker, Salas, King, Battles, & Barach, 2005; Oandasan & Reeves, 2005a).

The learning aims of the interprofessional education sessions were:

1) to improve teamwork and collaboration,
2) to increase knowledge of other health professionals' roles, and professional identity and
3) to increase knowledge around content and system issues (such as hospital emergency response teams).

Communication was not an intended specific learning objective of the sessions, because it was considered to be an integral part of teamwork and collaboration. Communication was an assumed concept within teamwork and collaboration as it is known as one of the important determinants of collaborative practice (D'amour, Beaulieu, San Martin Rodriguez, & Ferrada-Videla, 2004). Although communication was not measured directly by either RIPLS data, or by direct questioning during phase two, it was discussed by many participants during phase two data collection.

An additional intended outcome of this intervention was the training of the Medical Education Registrar in a new role, as they became increasingly more involved in the debrief process. The important role of the facilitator in the process of ensuring effective interprofessional education is well recognised (Lewis, 2011). The skills required to fulfil this role have been outlined in Table 3, and these skills were discussed with the registrar at regular intervals as the sessions progressed. The Medical Education Registrar gradually attained these skills and developed the confidence to manage group situations, including some difficult situations. Over time they became more involved in discussions around communication, and other less content driven teaching concepts, including diplomacy, management of group dynamics, reflection and summary. This was a positive outcome of the education sessions.

There are other general interprofessional education learning objectives identified in Table 1 (Thistlethwaite & Moran, 2010) which were not specifically

targeted in this educational intervention or research aim, but which may have impacted on participants. These include reflective learning in a team and respect and tolerance for other health professionals. Reflective learning as a team occurred with the debrief session after each scenario, and this debrief was the thought to be the most useful aspect of the sessions by both nurses and doctors in the phase two follow up. These findings can be considered with respect to the theory of reflective practice, first theorised by Schon (1983) and further discussed with respect to health professionals following this (Kinsella, 2010; Mann, Gordon, & MacLeod, 2009; Taylor, 2010). Reflection allows practitioners to examine their clinical reasoning strategies, by analysing what they were thinking and feeling during an experience to help understand this, or gain a new perspective, leading to improved practice (Epstein & Hundert, 2002; Taylor, 2010). Schon (1983) theorised that learning is achieved by reflecting on experience, either as it occurs (reflection–in-action) or afterwards (reflection-on-action), and also recognised the artistry of practice. Simulation debriefing, if performed well by a facilitator with skills training in the areas outlined in Table 3, can then prompt, or guide this reflection-on-action, and help encourage reflective practice, and enable planning for different approaches to the situation in the future (Dannefer 2004). Reflection occurs in debrief sessions as participants are encouraged to return to the experience, consider what they were feeling or thinking at the time, and then re-evaluate this (Dannefer 2004). During the sessions performed in our study this occurred, as attendees were encouraged to verbalise these thoughts, and discuss them amongst the group. The art or wisdom required to deal with some of the complex decisions made in patient care was also discussed. These are highlighted by (Kinsella, 2010) as being important complementary ideas to scientific and technical knowledge.

There was considerable emphasis placed on the development of a safe learning environment during the education sessions. Respect and tolerance for other health professionals was also a positive outcome from these sessions, with doctors having a “more positive regard for nurses and what they do.” Creating a safe learning environment was felt to be very important in developing and planning the sessions, as it is known to be one of the basic prerequisites for

adult learning (Knowles, Holton, & Swanson, 2005). Interprofessional education facilitation skills, such as those outlined in Table 3 were used to create this environment.

Participants were reassured in the introduction to the session about the confidentiality of session content and outcomes, and also reassured that there would be no assessment of their performance, nor any negative feedback provided to their work areas. It was pleasing to note that six of the participants (3 doctors and 3 nurses) in phase two said they felt that the safe learning environment was the most useful part of the education session. Specific answers from participants included mentioning of the sessions not being intimidating, and being a controlled environment summed up both the feelings of being allowed to make mistakes, as well as being comfortable in doing so. Their comments provide evidence that a safe learning environment was achieved from the perspective of those participants.

In summary, the education sessions were anticipated to improve collaborative practice amongst the participants, by making them more aware of each other's roles, more aware of key determinants for collaborative practice, and having a shared understanding of how to work together within a hospital system. It was hoped that improving these behaviours would then would then enhance teamwork, and thus reduce error rates in the clinical work environment (Morey, Simon, Jay, Wears, Salisbury, Dukes, & Berns, 2002). Whist we did not gather evidence of actual practice changes, the phase two data was suggestive of positive improvement of teamwork.

Research Outcomes

This research was performed by a mixed method approach, which is becoming increasingly important in health science research, as the benefits of the objective quantitative, and more flexible qualitative approaches are combined (McKenzie, 2013). The primary question guiding this research was:

What attitudinal changes occur as a result of attending a single interprofessional education session and are there any long term impacts on clinical practice?

Phase one collected quantitative data using the RIPLS questionnaire. RIPLS is a reliable and validated tool to measure individual's attitudes and perceptions of readiness for interprofessional learning. The three sub-scales of the RIPLS are: teamwork and collaboration, professional identity, and roles and responsibilities. Phase two collected qualitative data from individual participants three to six months following the education session, by semi-structured individual interviews. A series of questions at this time attempted to elicit any perceived or real impact on workplace behaviour that resulted following the education session.

Findings from the study indicate that participant attitudes on interprofessional learning and practice as measured using the RIPLS questionnaire, improved following the intervention. There were positive changes measured in both the medical and nursing cohort when analysing the quantitative data, which included the areas of teamwork and collaborative care, professional identity, and roles and responsibilities, on the day of the intervention. Delayed qualitative data also indicated positive outcomes three to six months following the teaching session, with some participants reporting improved work performance, predominantly in the areas of teamwork and collaborative care, with a particular focus on improved communication.

Changing attitudes towards interprofessional education, as demonstrated by the lower mean scores in the post intervention data set, is useful in showing that participants thought differently following the sessions than they had prior to them. Attitudinal change has been found to be difficult to achieve, but an important positive outcome for interprofessional practice (Greenfield, Nugus, Travaglia, & Braithwaite, 2011). This research finding of decreased post intervention scores in all of the three sub-scales (teamwork and collaboration, professional identity and roles and responsibilities) suggest a positive change in attitudes towards learning with other health professionals, and to work

together as a team. This was measured immediately following the educational intervention, and is similar to findings from other investigators that have used the RIPLS questionnaire (Bradley, Cooper, & Duncan, 2009; Solomon, 2011).

There was no difference found in the change in mean RIPLS scores between nursing and medical participants with the different sub-scales measured. This was despite the nurses having lower pre intervention mean scores than doctors in two of the sub-scales. This means that the change in attitude measured by the pre and post intervention survey was similar between doctors and nurses. Bradley et al (2009) have also noted improved attitudes as shown by a change in mean RIPLS post-course scores in a group comprising second year medical and nursing students. It was suggested that these results implied a degree of breaking down professional role delineations, and also a greater willingness to work together (Bradley, Cooper, & Duncan, 2009). However, they believed this effect to be quite short lived; disappearing by two to three months when measured again using the RIPLS questionnaire (Bradley, Cooper, & Duncan, 2009).

The nurses in this study had lower pre intervention mean scores than doctors, in two of the sub-scales, teamwork and collaboration and roles and responsibilities, thus showing a more positive attitude prior to the education sessions. These are similar to the findings of Reid et al (2006) when the RIPLS was validated for the postgraduate context. Reid et al (2006) found that mean scores for doctors (all qualified general practitioners) demonstrated a much less positive attitude in areas of both teamwork and collaboration, and sense of professional identity, than the nurses in their cohort (Reid, Bruce, Allstaff, & McLernon, 2006). The more positive attitudes shown in pre-survey data from nurses, as compared to doctors, was thus not surprising.

Changes in the central themes of teamwork and collaboration, professional identity, and roles and responsibilities were measured initially with the RIPLS questionnaire in phase one. In the phase two data, participants spoke unprompted about all the stated learning aims from our sessions. They also mentioned all of the key determinants of collaborative practice described by

D'Amour et al. (2004) (knowledge of each other's roles, communication, willingness to work together, trust related to self-competence and confidence in others abilities and mutual respect) in their answers to the phase two questions. This is important in showing that the intended aim of improving collaborative practice was articulated by participants in their replies. If their perception was that these behaviours had improved, there may then have been a resulting improvement in patient care.

The phase two findings are encouraging, as they suggest that the sessions have had a positive longer-term impact on perceptions, and perhaps also the clinical practices of attendees. These interviews were performed six months, following the interprofessional education sessions. At this time all of the learning aims of the sessions (improving teamwork and collaboration, and knowledge of roles and responsibilities) were spoken of by participants, even in response to the first question, which did not prompt specifically for any of these aims. It is likely that some of the success of this intervention is due in part to the contextualised nature of the training, as this has been shown previously to be the most important predictor for success (Stew, 2005). This was achieved through having the scenarios taken from "real world" examples of patient interactions from the study hospital, and having systems and processes during the scenarios as close as practical to those that occur in the wards.

Five features of co-operative learning, which help in promoting and improving teamwork, have been discussed in the literature. (D'Eon, 2005). These are described as; positive interdependence (common goals), face-to-face purposeful interaction, individual accountability (each person taking some responsibility), learning interpersonal skills, and group reflection (D'Eon, 2005). Each of these were present in the education sessions, and are likely to have improved team behaviours in the attendees, and prompted them to remember these improvements when questioned. These five elements are also known to be important for the functioning of interprofessional teams in the workplace (Lewis, Tucker, Tsao, Canaan, Bryant, Talbot, King, & Flythe, 1997). Simulation has the potential to have particular benefits to teamwork training, including use of scenarios relevant to work experience, opportunities for cross-role

understanding, and facilitation of reflection (Gaba, 2006), and the use of this modality in the education sessions would also have contributed to the positive outcomes found.

This sustained perceived improvement in the perceptions of the participants in this research is in contrast to Bradley et al.'s (2009) findings, which showed effects were short lived following an interprofessional education intervention. This may be due to several factors. Firstly, participants in Bradley et al's (2009) study were second year medical and nursing students, who returned presumably to their professional educational silos following the intervention. This contrasts to the findings of this research where participants returned to the workplace and were able to interact with members of different professions, and perhaps utilise some of the skills they had learnt. One nursing participant mentioned that they had been "*teaching other registered nurses or student nurses to have the same communication skills*" since the sessions, which certainly meant they had continued think about, and even pass on what they had learnt. This has been discussed in the literature with respect to reflection being demonstrated in practicing professionals, both to help make sense of complex situations, and enable learning from experience (Mann, Gordon, & MacLeod, 2009). In this case it is likely that the nurse involved is continually reflecting on actions and outcomes from the interprofessional learning sessions, and this is driving her to educate her peers. Secondly, having a postgraduate study cohort may also have meant that the real life past experiences that participants could draw on in debrief discussions may have enabled more long term learning to be achieved. It is thought that authentic learning experiences, such as those associated with learning at a postgraduate level, may enable a higher degree of reflection-on-action (Mann, Gordon, & MacLeod, 2009). This evidence of likely reflective practice as a result of the teaching sessions is a pleasing outcome for the interprofessional health care team.

The phase two findings are important in demonstrating that some of the ideas conveyed during sessions were cited as having had a positive impact on the participants work practices. Participants described information around others roles and responsibilities, aspects of working as a team, collaborative care, and

especially the importance of communication in their phase two responses. Improvement in communication and teamwork is known to improve many health care outcomes, such as patient complications and clinical errors (World Health Organisation, 2010). The measured and inferred findings of both phase one and phase two of this study are suggestive of a potential improvement to patient health care outcomes.

Improved communication and an awareness of the importance of communication was the most common response noted in the phase two findings. Effective communication is known to be paramount in safe patient care (Leonard, Graham, & Bonacum, 2004), so reports from the nurse participants that they were able to better communicate with doctors, and had more awareness of what doctors needed to hear, were important and positive outcomes. The nurses' responses were helpful in demonstrating that they were now considering not just what information they thought was important from their own perspective, but also what may be needed from a different health professional's perspective, when relaying clinical information. This increased awareness to consider other professional's needs improved both phone communication, and face-to-face encounters. This improvement is particularly important when considering that communication errors which cause adverse events in patient care, are often due to differences in communication styles between doctors and nurses (Leonard, Graham, & Bonacum, 2004). Lack of assertiveness in nurses asking for medical review of a patient has also shown to be a major risk for adverse clinical outcomes (Lewis, 2011). It is noteworthy that there was a positive change following the education sessions with nurses reporting that they felt it was easier to approach doctors, they felt less nervous, or even that they felt more confident and assertive when communicating with doctors. One nurse also spoke about having spent time in educating other nurses not to be "nervous of doctors" since attending the session.

Similarly, doctor respondents noted that they had an improved understanding of nurses' perspectives, and thought more about the information nurses need when a patient is being discussed. Positive changes in attitudes towards other professional groups and communication between health professionals are a

positive step towards improving collaborative practice and in turn, patient care. These changes in attitudes towards others can be considered with regard to contact theory.

During the 1930s and 1940s, the developing field of social psychology began to take an interest in intergroup contact, particularly with reference to racial conflict (Pettigrew, Tropp, Wagner, & Christ, 2011). It was found that increasing contact between individuals from differing groups helped to improve attitudes towards others, and decrease conflict (Pettigrew, Tropp, Wagner, & Christ, 2011). Allport (1990) first proposed the "contact hypothesis" in 1954, which stated that although bringing groups together would reduce hostility between them, four conditions would also have to be met, as contact alone was not sufficient to bring about a change in attitudes, and decrease conflict (Allport, 1990). These four conditions were that each group in the contact situation required equal status, common goals, intergroup co-operation and authority support (Allport, 1990; Pettigrew, 1998). The two different professional groups in our study cohort were doctors and nurses. Each of the conditions above were met during the interprofessional education sessions (as the contact situation) performed at the hospital; the importance of each of the health care team members in contributing to patient care was re-iterated throughout, the common goal of patient care was present, co-operation and teamwork including communication was required in each scenario, and there was institutional support as well as direct manager support for the sessions.

A recent meta-analysis of intergroup research supported Allport's (1990) four conditions listed above as being positive predictors of improving intergroup relations (Pettigrew & Tropp, 2006). Intergroup friendship has been found to be particularly important in facilitating positive outcomes, and major mediators of this positive effect are likely to be reduced anxiety and increased empathy (Hewstone, 2003; Pettigrew, Tropp, Wagner, & Christ, 2011). Four nurses in our study cohort mentioned decreased anxiety in their interactions with doctors following the session, which suggests that this positive effect had occurred, and they were more confident in contacting doctors. Appropriate use of assertion is known to be a key factor in patient safety, and is particularly important in

communication from a doctor to a nurse (Leonard, Graham, & Bonacum, 2004). This study therefore, demonstrates the usefulness of interprofessional education in order to improve intergroup communication.

The importance of the Allport (1990) conditions in intergroup contact has also been studied in interprofessional education literature (Hean & Dickinson, 2005; Mohaupt, van Soeren, Andrusyszyn, MacMillan, Devlin-Cop, & Reeves, 2012). The congruence of the aims of interprofessional education in reducing prejudice between professional groups, and contact hypothesis as a theory to help in understanding and improving intergroup behaviours has been highlighted (Hean & Dickinson, 2005). It has been suggested that planning interprofessional education simulation sessions by utilising the conditions conducive to positive intergroup contact can improve outcomes in interprofessional collaboration (Mohaupt, van Soeren, Andrusyszyn, MacMillan, Devlin-Cop, & Reeves, 2012). The positive outcomes from this intervention are likely due in part to fulfilment of these conditions of contact theory.

Allport's (1990) contact hypothesis did not specify whether the improvement in intergroup relations could be generalised to other situations, or other outgroup members (Pettigrew, 1998). In a more recent meta-analysis however, it was shown that intergroup contact effects usually generalise beyond the immediate participants (Pettigrew & Tropp, 2006). In this research, as mentioned above, one nurse explicitly spoke of educating other nurses not to be "*nervous of doctors*" since attending the session, showing that further improvement amongst nursing attitudes towards doctors can occur in the wider nursing cohort following interprofessional education sessions, and not just in session participants. It has been suggested that emphasising group differences (in this case, roles of doctors and nurses) may be helpful in ensuring that attitudinal change is transferred to the wider group following the contact situation (Hewstone, Rubin, & Willis, 2002).

Effective phone communication was thought to be an important aspect of collaborative practice in the hospital environment, particularly when a nurse requests a medical review of a patient. A number of nursing and medical

participants believed a change in their phone communication to be the biggest impact that the session had on their practice. Nurses prepared more for these conversations with doctors, and had information ready that they knew doctors would need. Doctors were more aware of what nursing staff had already done prior to calling them, and had a better understanding of what they may be thinking. This was a very positive outcome from the session.

Learning about the roles of other health professionals to better understand their perspective was one of the learning outcomes from the sessions. The measurement of the impact of a positive change in this area was also a research aim in phase two, where changes to collaborative behaviours were assessed. In particular, having doctor participants recognise that they had a better understanding of the nursing perspective, was a positive result. They also recognised that they had an appreciation for alternative (nursing) perspectives, and recognised that this allowed a broader view of a clinical situation. Poor understanding of roles has been shown to lead to conflict and poor teamwork (Hall & Weaver, 2001), and a greater understanding of what each profession can bring to a clinical situation may help to improve this.

Some researchers believe that interprofessional education may in fact increase the divide between professions, rather than improve it, by using education sessions to promulgate existing doctor led hierarchies (Baker, Egan-Lee, Martimianakis, & Reeves, 2011; Kuper & Whitehead, 2012). This is the opposite effect to that postulated above when considering positive effects due to contact theory (Hean & Dickinson, 2005). Negative attitudinal outcomes did not seem to occur in either phase one or phase two. Comments from nurses in phase two spoke of their increased confidence in approaching doctors, and specifically regarding hierarchies that “no-one is better; all on one level”. Doctors, as discussed above, had more regard for nurses. This difference may have been due to the doctor participants being in their first year of clinical practice whilst the nurses had variable but often a much longer period of clinical experience. Having junior doctors and more experienced nurses probably helped to equalise the usual power relationships where there is a presumed medical leader in interprofessional practice. Throughout the sessions, the facilitator aimed to

allow the junior doctors to realise that the nurses possessed important knowledge and skills that they did not. This has been recognised previously as being an important outcome in interprofessional education, and in developing mutual respect (Lewis, 2011).

The final two scenarios involved SimMan® and were resuscitation scenarios. Previous research has suggested that resuscitation scenarios are often contextually important for both doctors and nurses, and thus effective in interprofessional education, because of the shared learning outcomes (Bradley, Cooper, & Duncan, 2009) which then also contributes to developing the Allport (1990) contact conditions. During these latter two scenarios, the nurse was often the participant to identify the situation, and either call the emergency team, or suggest to the medical participant that this may be necessary. This was often due to the nurse participant having encountered this situation during their clinical practice, and thus being familiar with the necessary response. Distributed leadership and power sharing has been shown to be an important element of collaborative practice (Greenfield, Nugus, Travaglia, & Braithwaite, 2011).

The qualitative data indicated that this knowledge of, and respect for, other health professionals' roles had continued following the sessions, as indicated by responses above. The knowledge of and respect for the roles of other health professionals as articulated by these participants suggested that they had achieved some of the important learning objectives from the educational intervention, as well as showing that they had taken on some of the behaviours required for collaborative care, which was one of the study aims.

One negative outcome of the education session related to a poor perception of their performance by one doctor. The self-judgement mentioned by the medical attendee who was disappointed in their lack of knowledge likely related to their high personal expectations in this content knowledge, and their self-perceived failure to meet them, despite having a high level of interpersonal skills in interprofessional communication and teamwork. This is likely to have impacted negatively on them improving the attitudes towards interprofessional

education, and development of teamwork and communication skills for this particular attendee, as they were more mindful of their perceived deficits in clinical knowledge than the positive learning outcomes in communication.

Several of the doctors mentioned clinical content when asked about the impact the session had had on their clinical practice. This was despite overt information at the beginning of the session about this being less of a focus during the session than teamwork skills. No nurses highlighted content as the biggest impact on their practice. It is interesting that for these few medical participants, their perspective was that the content that was taught during sessions was most important, rather than the communication, and teamwork skills. This focus on the scientific approach to learning likely has its basis in the teachings of Flexner, as discussed previously, and helps contribute to the different professional silos in which doctors and nurses work (Gilbert, 2008).

Limitations

As with all research there were a number of limitations to the findings of this study, and a number of research method decision points that could be improved. Identified limitations occurred in both phase one and two of the study.

Phase one, which included the quantitative data and its analysis, had several limitations. The number of participants was modest. A larger sample size is more likely to provide an accurate reflection of the total population, and so in general, larger study sizes provide more accurate study data (McKenzie, 2013). This study used the entire intern cohort from the hospital where it was held, so a larger sample size was not possible in this instance. However, collecting similar data from multiple cohorts of interns, either simultaneously in different venues, or prospectively across over year groups would improve generalizability.

In an effort to maintain confidentiality and anonymity the only participant information collected was their profession. Having a lack of any other demographic information other than profession was a limitation of this study,

for both phase one and two. Further demographic information that may have been useful to collect would have included years of clinical experience, other professional experience, and number of sessions attended (one or two) for all participants. Collecting this information may have assisted in allowing further analysis of the data, and allowed assessment of possible confounders. Nurses had varying years of experience in their profession, which may have influenced outcomes. All medical attendees were in their first year in the workplace as doctors, but some had previously worked in other professions. Previous exposure to workplace teamwork and communication for both doctors and nurses may have impacted on their responses to questions regarding these concepts. For both nursing and medical participants, the number of sessions they attended would also have been useful to record, as well as previous clinical work history. It is reasonable to posit that participants who attended more than one session may have had their responses to the second session influenced by the first, as they had already experienced the intervention; however there was only a small number in this category. Previous clinical experience may have had a marked effect on the interprofessional relationships during the sessions. One example of this would be a nurse with 20 years of clinical experience being more likely to lead a situation with a very junior doctor. Prior experience would also have likely impacted on behaviour with a junior doctor with a previous background as a paramedic perhaps being more likely to assume a lead role in a resuscitation case in which they had considerable past experience in assessment and management.

Phase two of the study had several sources for error and limitations. Firstly there was a lack of any demographic data apart from profession as discussed above. This affected the ability to compare on variables beyond profession. Secondly, there was a small response rate with only half of the phase one participants providing data in phase two. Although absolute participant numbers and their follow up are less important in qualitative data collection than quantitative research (McKenzie, 2013), this is still a limitation in this research, when we consider phase two data as a follow-up to phase one information collected. Half of the phase one participants could not be contacted

for follow up in phase two of the study due to several factors. Participant demographic data that would have enabled more complete follow up (such as names and personal phone numbers) was not collected due to the need for anonymity in the consent process required for ethical approval. Thus, contacting participants to perform the semi-structured interviews was made more difficult. The doctor who performed the interviews had only very limited time availability, as they were only present in the hospital for four hours once a week. This reduced their capacity to interview all of the study participants. There was difficulty in contacting participants to perform the semi-structured interviews. This was attributed to some participants working shift work, especially night shifts (mainly nursing staff) and doctors who had been transferred to work in country hospitals (outside of the regional hospital in which the study was conducted). If further research in this field were to be undertaken, it is recommend that contact details for participants be collected, which would enable more complete long term follow-up. The final and major limitation to phase two was the method used to collect the data. The interviewing doctor wrote down this qualitative data in note form as the participants answered the questions, rather than audio recording the interviews for later transcription. This meant that there was potential for nuances in answers to be lost, or possibly even answers being misquoted. Having these conversations recorded and transcribed would have been very beneficial to allow further and more in depth descriptive content analysis, using the exact words used by the participants. Despite these recognised limitations, there is still value in the findings to inform future provision of interprofessional education to improve collaborative teamwork and patient outcome.

Chapter 6: Conclusion

This study aimed to show an improvement in attitudes towards and practice of teamwork and collaborative practice between doctors and nurses, with the goal of improving patient care in a regional hospital. This aim was accomplished by performing small group interprofessional education sessions, which focussed on improving aspects of teamwork and collaborative practice.

Interprofessional education sessions comprising of small group role-play and simulation scenarios, with debriefing after each, were run in 2011 for medical interns and orthopaedic nurses. The research was conducted in two phases using a mixed method approach. Phase one collected quantitative data using the RIPLS questionnaire (Latrobe Community Health Service, 2009), which was collected prior to and following the session. Phase two collected qualitative data by interviewing individual participants three to six months following the education session. A series of questions attempted to elicit any perceived or real changes to teamwork and collaborative practice that may have occurred.

This study found significant improvements in the phase one data set in teamwork and collaboration, professional identity, and roles and responsibilities. These occurred in both the doctor and nurse groups, and were evidence of positive attitudinal change following the sessions. The phase two interview data also showed positive responses, in particular, more awareness of the importance of teamwork and collaborative practice, especially relating to communication. These data showed that most participants felt that there had been a positive impact in these workplace behaviours since the intervention. These improvements were partly due to reflective practice, particularly reflection-on-action occurring during the educational session in the debrief following each scenario.

The improvements in attitude shown by the phase one results, and changes to workplace behaviour found in phase two, are likely to have resulted in improved collaborative practice amongst participants, and may also have had further positive effects amongst other staff not present at sessions. These

findings have been discussed with reference to contact theory. The passing on of learned positive attitudes from the sessions to other health professionals adds to the knowledge linking interprofessional education to contact theory, and the generalisable nature of this.

In conclusion, small group interprofessional teaching sessions for hospital doctors and nurses resulted in positive changes in attitudes to teamwork and collaboration, professional identity and roles and responsibilities, as measured using the RIPLS questionnaire. There was also evidence of a positive impact on collaborative practice, including communication skills, and a greater awareness of roles (both of themselves and others) and their importance at the three to six month follow up interview. As the areas in which these improvements were found are so important in our health care environment, I would recommend similar sessions be held in our hospital to continue to improve teamwork and collaborative care, and thus ultimately improve safe patient care. There may also be similar benefits in other hospitals or different health care settings.

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Appendix A: Participant Information Sheet

Title Does participation in Interprofessional Education in small group teaching sessions change attitudes to and readiness for Interprofessional Learning and practice

Principal Investigator	**Dr Sheree Conroy**
Location	**Toowoomba Hospital**

Part I – What does my participation in the study involve?

1 Introduction

You are invited to take part in this study by completing a Readiness for Interprofessional Learning (RIPLS) questionnaire before and after the planned education session. Your participation in the education session confers your eligibility, however participation in this study is voluntary. This Participant Information Sheet and Consent Form tells you about the study. It explains what is involved to help you decide if you want to take part in the study. Please ask questions about anything that you do not understand or want to know more about.

2 What is the purpose of this research?

The principal aim is to investigate whether interprofessional education results in a change in attitudes to, and readiness for interprofessional learning as measured by the RIPLS Questionnaire. Interprofessional education is considered an effective way to improve teamwork, communication and collaboration in health care services.

This project is an important area for study as there is currently little interprofessional education occurring in this hospital, and whilst being introduced this year, needs to be evaluated for its benefits and worth. Topics covered for the actual education sessions have been chosen to highlight common clinical problems that occur at this hospital and it is hoped they will lead to improved communication and teamwork between doctors and nurses in ward situations in the future.

RIPLS is an internationally recognised and validated tool. Using the RIPLS will add to the evolving body of evidence about the value and benefits of interprofessional education. Furthermore, this project will assist Toowomba Hospital in designing and providing effective education and training for multidisciplinary staff.

3 Why have I been chosen?

All nurses and interns attending these education sessions are eligible to participate in this study.

4 Do I have to take part in the research?

It is up to you to decide whether or not to take part in this study. If you do decide to take part you will be given a Consent Form to sign along with a copy to keep. If you decide to take part you can change your mind later and withdraw from the study at any stage, for any reason.

5 Other relevant information (i.e. size of project, number of participants, organisations

This research project is only being conducted at Toowomba hospital. The 30 intern cohort and 40-50 ward nurses will be invited to participate.

It is expected that the data will be used towards a Masters thesis by research from Flinders University. The supervisors for this project are Dr Linda Sweet and Mrs Lyn Gun from Flinders University school of Medicine. They have a particular interest in medical and interprofessional education.

6 What will happen to me if I take part?

Participation involves filling in a pre and post session questionnaire which will take approximately 5 minutes to complete each time.

7 What do I have to do?

You are requested to sign the consent form and fill in the questionnaire prior to and following the education session.

8 What are the possible benefits of taking part?

Your participation will contribute to improving healthcare education and interprofessional learning. It is likely that being part of this project will not be of any direct benefit to you apart from reflecting on your attitudes towards interprofessional education

9 What are the risks of taking part?

It is likely that being part of this project will constitute a minor inconvenience to study participants. Time taken fill in questionnaire is brief.

10 What do I do if I wish to withdraw from the research?

Participation in any research project is voluntary. If you do not wish to take part you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at a later stage. If you wish to withdraw from this study please advise Dr Conroy.

11 What happens when the study ends?

It is not envisaged that follow up will be required. Results, once de-identified will be available for participant information if requested.

Part II – How is the study being conducted?

12 What will happen to information about me?
All information provided by you will be kept strictly confidential. All responses will be pooled for analysis. No names are required on the surveys but you will be allocated a study number to enable comparison of the before and after responses, and data will be stored as required by the ethical guidelines. By signing the consent form you consent to the study coordinator and relevant research staff collecting and using personal information you provide for the study project.

Any information obtained in connection with this study project that can identify you will remain confidential. The data will be immediately given to the researcher and will be stored and kept in a locked filing cabinet in a locked office during the time of the research. The data will not be able to be accessed by anyone other than the researcher. The hard copy data will be kept until it has been recorded digitally and collated in a totally de-identified form and will then hard copies will be destroyed. This will occur prior to March, 2012.

The results of this study will be used to guide improvement in interprofessional education in Toowoomba Hospital and be incorporated into Dr Conroy's thesis project. Furthermore the research will be considered for publication in peer review journals and presented at medical education conferences. Any report or publication from this study will not identify or contain your name.

13 What if something goes wrong?
If you suffer any distress or psychological injury as a result of this study, you should contact the study team as soon as possible, who will assist you in arranging appropriate treatment and support. As a staff member of Toowoomba Hospital you are able to avail the confidential counselling and support services available also.

14 Who is organising and funding the research? This study is being conducted by Dr Sheree Conroy. It is expected that the data will be used towards a Masters thesis by research from Flinders University. This research is unfunded.

15 Who has reviewed the study?
All research in Australia involving humans is reviewed by an independent group of people, called a Human Research Ethics Committee (HREC). This study has been reviewed and given approval by the Toowoomba HREC and the Flinders University's Social and Behavioural Ethics Committee.

16 Further information and who to contact[26,27]

Question	Who to contact	Phone / Facsimile
General questions or concerns during the study	Dr Sheree Conroy Principal Investigator	4616 6803
Questions about the way the research is being conducted	Kate Norman Co-ordinator HREC Toowoomba Hospital Approval No: HREC/11/QTDD/11	4616 5916 4616 5099
Questions about the way the research is being conducted	Andrea Mather Executive Officer Social and Behavioural Research Ethics Committee Flinders University Approval No: 5213	(08) 8201 3116
Questions regarding conduct of the study, student supervision and its use towards a university Masters degree.	Dr Linda Sweet Senior Lecturer School of Medicine Flinders University	(08) 8204 5017 0404 837665

Appendix B: Consent Form

PARTICIPANT CONSENT FORM

Title **Does participation in Interprofessional Education in small group teaching sessions change attitudes to and readiness for Interprofessional Learning and practice**

Location Toowoomba Hospital

Principal Investigator Dr Sheree Conroy

1. I have read the attached Participant Information Sheet outlining the nature and purpose of the research study and I understand what I am being asked to do.

2. I have discussed my participation in this study with the member of the study team named below. I have had the opportunity to ask questions and I am satisfied with the answers I have received.

3. I have been informed about the possible risks of taking part in this study.

4. I freely consent to participate in the research project as described in the attached Participant Information Sheet.

5. I understand that my participation is voluntary and that I am free to withdraw at any time during the study. There is no written consent required to withdraw.

Name of Participant	Signature of Participant	Date

Appendix C: RIPLS Questionnaire

Readiness for Interprofessional Learning Scale (RIPLS) Questionnaire

The purpose of this questionnaire is to examine the attitude of health and social care students and professionals towards interprofessional learning.

Your name: (develop your own 'personal code' by using the following formula):

First 3 letters from your first name: ☐ ☐ ☐ **Last 3 letters** from your last name: ☐ ☐ ☐

Year of birth: 19 ☐☐ **Your discipline**: _____ **Gender**: ☐M ☐F

Have you completed the RIPLS questionnaire before? ☐ Yes ☐ No

If you answered yes to the previous question please indicate how long ago you last completed the questionnaire:

☐ 1 – 3 months ☐ 3 – 6 months ☐ 6 – 12 months

☐ 1 – 2 years ☐ 2-3 years ☐ 3+ years

Have you had previous experience of interprofessional teaching? ☐ Yes ☐ No

If you answered yes to the previous question please give a very brief statement of what this IPE teaching was and any impact it may have had.

_____
_____
_____

Please complete the following questionnaire.

		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Learning with other students / professionals will make me a more effective member of a health and social care team					
2.	Patients would ultimately benefit if health and social care students / professionals worked together					
3.	Shared learning with other health and social care students students / professionals will increase my ability to understand clinical problems					
4.	Communications skills should be learned with other health and social care students students / professionals					
5.	Team-working skills are vital for all health and social care students students / professionals to learn					
6.	Shared learning will help me to understand my own professional limitations					
7.	Learning between health and social care students students before qualification and for professionals after qualification would improve working relationships after qualification / collaborative practice.					

		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
8.	Shared learning will help me think positively about other health and social care professionals					
9.	For small-group learning to work, students / professionals need to respect and trust each other					
10.	I don't want to waste time learning with other health and social care students / professionals					
11.	It is not necessary for undergraduate / postgraduate health and social care students / professionals to learn together					
12.	Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation					
13.	Shared learning with other health and social care professionals will help me to communicate better with patients and other professionals					
14.	I would welcome the opportunity to work on small group projects with other health and social care students / professionals					
15.	I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students / professionals					
16.	Shared learning and practice will help me clarify the nature of patients' or clients' problems					
17.	Shared learning before and after qualification will help me become a better team worker					
18.	I am not sure what my professional role will be / is					
19.	I have to acquire much more knowledge and skill than other students / professionals in my own faculty / organisation					

If you have any further comments regarding interprofessional education please enter them in the box below

Thank you for completing this survey. The data will provide us with an understanding of the influence of the Interprofessional Collaborative Practice program that we are facilitating or implementing. The original RIPLS survey has been adapted for use by Latrobe Community Health Service & the Health & Socialcare Interprofessional Network (HSIN), Victoria – August 2009.