Integration of a simulated interprofessional education activity in a diagnostic imaging program –

Attitudinal change and clinical experiences

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EXECUTIVE SUMMARY

Interprofessional education is a process in which students learn with, from and about one another to provide collaborative patient-centered care. When healthcare workers work collaboratively with the patient at the center of their care, evidence indicates improvements in several areas including access to care, patient health outcomes, provider job satisfaction and recruitment and lower rates of staff turnover.

This SOTL-funded project engaged Sonography students at NAIT and Radiology residents from the University of Alberta in an interprofessional simulation. The simulation scenario focused on delivering bad news of fetal death to the expectant parents. The simulation was designed to mimic a real life situation that occurs often in the Sonography profession. The intended learning outcome was for the students to become aware of interprofessional relationships and learn how to behave in an emotionally charged interprofessional setting.

This paper draws together the findings of a two phased study. The first phase sought to explore if there was a change in attitudes of Sonography students’ towards learning interprofessionally with the radiology residents. A second qualitative phase examined the students’ experiences of delivering bad news in their third clinical practicum setting, as well as the emergent themes for Sonography student experiences in an interprofessional setting.

Findings indicate that the interprofessional simulation positively affected the attitudes of the Sonography students in terms of learning with, from and about other healthcare workers. Qualitative data showed that they were eager to participate in more interprofessional simulations with Radiologists and other healthcare professionals.

The focus group interviews following the students’ third clinical practicum revealed the following themes:

1. Sonography students were confident in understanding their position within the ultrasound room, while the bad news is given, however they were still uncertain in their role in re-clarifying and providing additional information to the patient after the physician leaves.
2. Sonography students are unsure who their support systems are within a team context, should they require support after a stressful event such as a fetal demise.
3. Sonography students felt conflicted if they felt the bad news delivery was unprofessional or ineffective. The hierarchy of the medical professions, as well as being a student is a factor when deciding to use conflict resolution skills they have been taught.

An overall confidence and self-efficacy emerged following this interprofessional simulation, clarifying the finer details of a scenario where professionals work together in delivering bad news. After participation in the simulation the students placed an increased value on learning interprofessionally. The data derived from the research are useful starting points for other interprofessional simulations at our institution. The focus group data will also be valuable in creating interprofessional education learning outcomes and curriculum within an Outcomes Based Education context. These efforts will undoubtedly result in improved patient centered care and stronger interprofessional relations, both within the healthcare professions at NAIT as well as with the healthcare professions at other institutions.
INTRODUCTION AND LITERATURE REVIEW

The enculturation of students of health care programs occurs as a two-phase process. First students attend didactic sessions where foundational knowledge is acquired and the skills of their professions are practiced in a laboratory setting. Subsequently or sometimes conjointly a clinical practicum is offered, in which the student receives supervised hands-on experience with patients in preparation for their health care career. The clinical practicum session is invaluable in teaching students the knowledge, skills and abilities of their profession yet the process and time constraints of acquiring the skills in a competency based educational scheme can often lead to a focus on uniprofessional skills only. Once a student graduates however, they will learn that no single profession works in isolation. Instead, physicians, nurses, respiratory therapists, occupational therapists and other allied health professionals work as a team with the patient at the core. The traditional way of educating students in health care professions by employing a “silo” approach may lead to fragmented delivery of care and medical error (Institute of Medicine, 2007).

Interprofessional education (IPE) is a process in which students learn with, from and about one another to provide collaborative patient-centered care (CAIPE, 2002). When health care practitioners work collaboratively with the patient at the center of their care, evidence indicates improvements in several areas including access to care, patient health outcomes, provider job satisfaction and recruitment and lower rates of staff turnover (CHRSF, 2007). In 2002 “Building on Values: The Future of Health Care in Canada” (or commonly known as the Romanow Report) was released with recommendations for improving and sustaining Canada’s health care system. A key recommendation was “education programs should be changed to focus more on integrated, team-based approaches to meeting health care needs and service delivery.” It makes sense that
professions who are expected to work together, should learn together, in a collaborative team-based approach.

Interprofessional education and practice is not only supported at the national level, but has also been recommended globally and provincially. In 2010 the World Health Organization issued the Framework for Action on Interprofessional Education and Collaborative Practice, with recommendations to strengthen “fragmented” health care systems world-wide and address health human resource issues. The Government of Alberta (2010) also includes interprofessional collaboration and team work in its 5 year action plan. As it now being incorporated as a standard by accrediting bodies, it is clear that interprofessional education is not just a passing trend; rather it is a growing body of knowledge and practice which is focused on improving educational methods to focus on patient care and collaborative team work (AIPHE, 2010). The importance of this movement is to ensure that our health care systems worldwide can sustain the demands of our aging population and complex illnesses and provide a safe system for patients.

In 2005, the Romanow report and subsequent funding by Health Canada, spawned 20 projects on Interprofessional Education as part of the Interprofessional Education for Collaborative Patient Centered Practice (IEC-PCP) initiative, as well as many other smaller research projects. In reviewing the IEC-PCP projects, as well as completing a literature search of interprofessional education and the different health professions, it was noted that students involved in such initiatives mostly represent the fields of medicine, nursing, occupational therapy, respiratory therapy and pharmacy (CIHC, 2008). There have been very few initiatives or projects involving students from the professions of diagnostic imaging, even though these professions play a key role in patient diagnosis, treatment and care, as well as collaborative roles with other professions.
A first of its kind, this project engaged Sonography students at the Northern Alberta Institute of Technology (NAIT) in an interprofessional simulation with a scenario focused on delivering bad news with radiology residents. Sonography is a form of medical diagnostic imaging where sound waves create an image of internal body structures and structures of the fetus. Sonography students are trained to perform sonography to aid the radiologist (a physician who specializes in interpreting medical images) in determining a diagnosis.

Bad news has been defined as any news that drastically and negatively alters the patient’s view of his or her future (Buckman & Kason, 1992). The first phase of this study sought to explore if there was a change in attitudes of sonography students’ towards learning with the radiology residents. A second qualitative phase of the study looked at the students’ experiences of delivering bad news in their second clinical practicum setting, as well as the emergent themes for sonography student experiences in an interprofessional setting. The aim of this study was threefold. First, to inform the existing sonography learning outcomes in communication, teamwork and patient care, as well as bring forth evidence for new learning outcomes for the Outcomes Based Education model (Stiehl & Lewchuck, 2008). Secondly, to initiate interprofessional education and simulation at this institution by creating a starting point for inquiry on the learning processes that occurred between these two professions. Thirdly, to contribute to the literature about interprofessional, education and sonography.
**Conceptual Framework**

This study was guided by theoretical constructs which engage several different aspects of interprofessional education and learning theory. Employing a constructivist approach the study was designed to allow for the gathering of information about the experiences of the sonography students following the simulation experience to create new understanding of interprofessional education as it pertains to this case. The study was also influenced by Schon’s theory of reflective learning where the student is reflecting in-action during the simulation, and on-action following the simulation in the debrief, as well as how that learning is applied in the clinical setting (Schon, 1987). It is the “indeterminate zones of practice – uncertainty, uniqueness, and value conflict” (Schon, p.6) which push the student outside the boundaries of medical theory. They are then moved into a zone of awkwardness with another profession, which allows the identification of communication issues. These issues are identified in a facilitated manner, creating the opportunity for dialogue with each other for the betterment of the neophyte student and of the patient. These connections have been captured during the study by using a phenomenological approach to qualitative interviews. According to Schurtz (2011; as cited by Barber), phenomenology offers us the chance to understand the lived experience of the subject, in this case the student in a clinical practicum. These findings may transform our views of how we currently teach our students, into how we will teach our student in order to facilitate collaborative practice.

The theoretical concept of simulation was also incorporated into the study. Dawson (2006) defined medical simulation as “the creation of an educational environment in which learning occurs through the use of a device, mannequin, or team, without the presence of an actual
patient.” It may include the use of standardized patients, or actors who are trained to portray symptoms of illness and convey emotions which are often experienced by real patients.

This study was also influenced by the conceptual framework of Oandesen and D’Amour (2004) (see figure 1).

![Figure 1](image)

This framework details the systemic factors (macro), institutional factors (meso) and teaching factors which contribute to health professional learner outcomes in an educational context (see left side of graphic). The right side of the graphic refers to the systemic,
organizational and interactional factors which contribute to outcomes within the professional system. Interprofessional education is a complex, multifactorial task. The framework demonstrates the need for focus on specific areas of research on IPE, with research and evaluation dedicated to each sub-group. Operating from a micro perspective under the Educational System heading to enhance learner outcomes, this study will aid our understanding of the processes related to teaching and practicing collaboratively.

In keeping with the theory of Outcomes Based Education, which NAIT is currently employing in all of the Health Sciences programs, the question being asked is “what do we want the students to do out there, that we prepare them for in here?” Out there refers to the future job requirements of our graduates, while ‘in here’ refers to the education we offer our students. Our collective wish is for our students to work collaboratively in a health care team, using strong communication skills and problem solving strategies. We therefore need to engage the students at this level, rather than expect the students to acquire this knowledge tacitly. This study garners the attention to specific communication issues, and the skills needed to solve these issues in an interprofessional context, to the benefit of the learner and their future patients.

To gather this knowledge, my research questions were:

1. Following formal integration of IPE curriculum and simulation, is there a correlation with learners’ attitudes towards learning with other professions?
2. Following formal integration of IPE curriculum and simulation, how do learners apply their knowledge in the clinical setting?
3. What is the interprofessional dynamic and what are the issues in the clinical setting of revealing bad news in a fetal demise situation?
METHODS

Overall Design of Project

Following a mixed methods design, this study took place in two phases (see above). First students were asked to fill out a questionnaire as a pre-test. Then they participated in an Interprofessional Simulation, after which they filled out a post-test. A couple of months later a number of students participated in a focus group interview.

Methods Phase 1

Interprofessional Simulation:

A half-day interprofessional education simulation took place, consisting of one hour of instruction on interprofessional education comprised of a didactic lesson and a role clarification activity (appendix 2). Following the role clarification activity, the students were designated to a particular room to take part in the simulation (appendix 3). In total 5 simulations occurred simultaneously in one hour, over a 3 hour period for a total of 15 simulations.

Each room contained the same simulation.
One hour simulation = 20 minute simulation followed by 25 minute debrief
Each sonography simulation session lasted 45 minutes and was comprised of a 20 minute simulation followed by 25 minutes of debriefing by a trained facilitator. The ratio of students in each simulation was 2 sonography students to 1 radiology resident. Each session was facilitated by an instructor who had received training in simulation and debriefing.

The subject of the sonography simulation was delivering bad news in a fetal demise context. The simulation scenario included two standardized patients, a female who played the role of a woman in her 20th week of pregnancy, and her husband, who were both awaiting the “viewing” portion of the scan (which is a normal occurrence following an obstetrical scan). The sonography student was given an information package detailing the ultrasound findings of the 2nd trimester sonogram. The students were instructed to imagine that they had already performed an ultrasound on the patient. The package they received contained the findings of the ultrasound, which included an absent fetal heart rate, along with other fetal malformations (omphalocele and Spalding sign). The sonography student then presented the findings to the radiology resident, and they both proceeded into the room to give the news to the patient and her husband.

The resident delivered the news, and the patient reactions were scripted to be typical of an actual situation: shock, grief, anger, and profound sadness (for script see Appendix 4). The sonography student and resident worked together to assist the couple in their grief, provide answers to their questions, and conclude the session.

The 25 minute facilitated debrief following the simulation invited the students and residents to share information together about their experience in the simulation, discuss what each other’s perceived roles were, and give each other feedback on their “performance” (debrief guide, Appendix 5). Once all of the simulations and debriefing sessions were completed, all
groups reconvened in a classroom for a larger group debrief. All facilitators as well as two radiologists took part in the large group debrief. This debrief enabled the group to discuss some of the themes that emerged during the individual debriefing sessions such as role clarification, information provided to the patients, as well as the manner in which the bad news was given.

**Sample and Participants**

All sonography students who participated in the simulation were invited to participate in a research study. The participants recruited for the pre- and post test (RIPLS) were sonography students who attended the Northern Alberta Institute of Technology, in Edmonton, Alberta. These participants were in semester 1 of their second year (of a 2 ½ year program). This cohort included 29 students and all but 2 participated in the simulations. 17 students (of a possible 27) consented to participate in the pretest and post test however, 5 of the participants were excluded from the study, due to errors in reporting their research code (therefore the pre and post test could not be matched). All participants were female, between the ages of 19 - 29.

The participants completed the pre-test and post-test via computer and were identified only with unique research codes. Fifteen Radiology residents took part in the educational session and simulation, however they were excluded from the pre- and post-test. For each subscale we established whether there had been a change between the pre- and post-test by means of a paired t-test. Ethics review and approval was obtained by NAIT Institutional Research ethics committee.


Data Collection Phase 1

Readiness for Interprofessional Learning Scale

The Readiness for Interprofessional Learning Scale (RIPLS, see appendix 6) was selected to evaluate Sonography students’ attitudes towards learning with other health professions, in a pre and post test framework. The RIPLS is a validated tool used to assess student attitudes regarding interprofessional learning in an undergraduate setting. (Reid et al, 2005). Developed by Parsell and Bligh (1999) this 19 question scale reveals differences in perceptions and attitudes towards learning with, from, and about other professions. Originally comprised of 3 subscales, the 4 subscales created by McFadyen et al (2005) were adopted to improve reliability of the scale in this context. The four subscales are: Teamwork and collaboration, Negative professional identity, Positive professional identity and Roles and responsibility. The first subscale, Teamwork and Collaboration underscores the shared knowledge and attitudes towards teamwork and collaboration. The second and third subscales deal with Positive and Negative Professional Identity respectively. Professional identity is the beliefs and attitudes that are acquired during training. Professional boundaries are acquired as a part of professional identity. The fourth subscale is Roles and Responsibilities, which demonstrates the attitude towards professional role, scope of practice and hierarchical division in health care.

The RIPLS has been tested on its test and retest reliability (McFadyen et al, 2006) which showed that there was test / retest reliability on all but 2 questions. A 6 point Likert scale was used, however the original RIPLS uses a 5 point Likert scale. This was an unidentified error which occurred during the construction of the survey tool and was unintended. Cronbach’s alphas were calculated to establish the reliability of the scales (see Table 1). Cronbach’s alpha’s
were adequate for the first three subscales and comparable to other studies that used RIPLS (McFadyen et al, 2005; King, 2010). The reliability of subscale four was low, which is also consistent with other studies (McFadyen et al, 2005; King, 2010).

Table 1 Reliability of Scales

<table>
<thead>
<tr>
<th></th>
<th>Pre-test Cronbach’s alpha</th>
<th>Post-test Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS1 Teamwork &amp; Collaboration, items 1-9</td>
<td>.892</td>
<td>.916</td>
</tr>
<tr>
<td>SS2 Negative Professional Identity, Items 10-12</td>
<td>.725</td>
<td>.673</td>
</tr>
<tr>
<td>SS3 Positive Professional Identity, items 14-16</td>
<td>.763</td>
<td>.741</td>
</tr>
<tr>
<td>SS4 Roles &amp; Responsibilities, items 17-19</td>
<td>.535</td>
<td>.405</td>
</tr>
</tbody>
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**RESULTS PHASE 1**

Analysis of the RIPLS pre and post test data revealed a significant change in three of the four subscales following the interprofessional simulation. Paired t-tests revealed significant difference in the subscales of Teamwork and Collaboration, Negative Professional Identity and Positive Professional Identity (See Table 2). Mean scores of subscale 1, Teamwork and Collaboration changed from 5.34 to 5.63 (+/- .4) (p=0.031). Mean scores of subscale 2, Negative Professional Identity changed from 1.75 to 1.25 (+/- .55)(P=0.024). Mean scores of subscale 3, Positive Professional identity showed the greatest change from 4.81 – 5.47 (+/- .45)(p=0.000). Subscale 4, Roles and Responsibilities showed a negative change, from 2.50 – 2.30 (+/- .46) However, because this subscale is not sufficiently reliable this change score is hard to interpret. Even though measured in a small sample the pre and post test results suggest that the simulated event had a positive impact on students’ readiness for interprofessional learning.
Table 2. RIPLS Pre and Post test Mean Comparisons:

<table>
<thead>
<tr>
<th>RIPLS Factor</th>
<th>Pre-test Mean</th>
<th>Post-test Mean</th>
<th>Level of significance (paired t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS1 Teamwork &amp; Collaboration, items 1-9</td>
<td>5.34</td>
<td>5.63</td>
<td>*p = 0.031</td>
</tr>
<tr>
<td>SS2 Negative Professional Identity, Items 10-13</td>
<td>1.75</td>
<td>1.25</td>
<td>*p = 0.024</td>
</tr>
<tr>
<td>SS3 Positive Professional Identity, items 14-16</td>
<td>4.81</td>
<td>5.47</td>
<td>*p &lt; 0.000</td>
</tr>
<tr>
<td>SS4 Roles &amp; Responsibilities, items 17-19</td>
<td>2.50</td>
<td>2.30</td>
<td>P = .171</td>
</tr>
</tbody>
</table>

**METHODS PHASE 2 – FOCUS GROUP**

**Participants**

A focus group was conducted with a sample size of 4 students, four months following the interprofessional simulation. Students were recruited electronically (via email) and four students consented to participate.

**Data Collection**

The session was led by the researcher using pre-established interview questions (appendix 7). The interview was audio-taped and later transcribed verbatim. A phenomenological approach to data collection was used in which the questions were designed to elicit and share stories of the students’ experiences during their first three clinical practicum sessions, specifically in situations where bad news was delivered to obstetric patients. Questions were also included which engaged the students in discussions focusing on roles, interprofessional
conflict, the learning that occurred during the simulation, as well as other opportunities that they’d like to have for further interprofessional education sessions.

Data Analysis

The verbal transcript of the focus group session was analyzed according to the constant comparative method of grounded theory. As described by Bryant and Charmaz (2007), grounded theory is an inductive and emergent process used to generate new theory. Following the guidelines of these authors, open coding and memo taking was performed on the data while examining the data line by line to identify participants’ descriptions of their experiences, and their thoughts and feelings of such. Categories were identified, and coding continued until saturation occurred. As theory emerged, the literature was accessed to support the emergent theories.

RESULTS PHASE 2 – FOCUS GROUP

The analysis of the transcripts yielded 3 main themes and 2 sub-themes. The three main themes discovered were Role Clarification, Emotional Distress and Support, and Conflict and Power. Role clarification was further broken down into two sub-themes: providing additional support and familiarity, and repeating / re-clarifying information and confirming next steps.
Role Clarification

Described by Orchard et al (2005), role clarification is gaining both an understanding of all roles assumed by members of a disciplinary group as well as their knowledge in exercising these roles. All four participants felt that their experiences in fetal demise situations with real patients revealed the importance of role clarification to improve patient centered care in a scenario of delivering bad news. Role clarity was subdivided into 2 sub-themes: providing support and familiarity, repeating and re-explaining information, and confirming the next steps for the patient.

Providing additional support and familiarity

An important feature identified during the simulation in phase one, as well as the students’ practicum was the establishment of order of entry of personnel into the ultrasound room. Once the sonographer completes the scan, he or she reviews the images and history with the radiologist, and often both will return to deliver the news. Knowing who should enter the room first was significant to the sonography students, who learned that since they were already a familiar face they should enter the room first, and then introduce the radiologist.

“It [the simulation] clarified the finer details, if you should walk in first, or if they should”

“I had one rad say to me ‘I always want you to go in first, because they’ve seen your face for an hour. They know you. They don’t know me’”
Secondly, the students also identified that their position in the room as the news is delivered was also significant.

“I try to be behind the doctor and not crowd over them, but make sure that the patient is aware that you’re in the room. And sometimes if you stand by the machine they can see your face. If it’s just the doctor and they have no idea who it is, they’ll look towards you. I always try to make myself aware without getting intrusive.”

“That’s the hardest part for me. Where do I stand? Should I stand at the foot of the bed? In the corner? Next to the doctor? Over here? It’s very dependent I think, and it’s the hardest thing to learn…where to stand”

Thirdly, the students determined that they have a significant role in support and empathy to the patient, almost playing a counseling role.

“having a Kleenex box on hand, ready”
“we put ourselves in their shoes, how would we feel?”
“we make sure that they can drive home, or if there is someone with them”
“to know that we understand that this is a tough time for them and take some time to sit down and kind of absorb what has just happened”.

Repeating and re-explaining information and confirming next steps

Each of the participants agreed that it was the radiologist’s role to initially deliver the news, however they felt that they had a role in providing a follow-up explanation to the patient in regards to the initial information the radiologist provided.

“so they were both kind of just standing there looking so confused, and the doctor leaves the room, and the tech asks ‘Do you understand what he’s telling you?’, and both of them say ‘no’, and she had to re-explain everything”
The participants felt that the shock and sadness experienced by the patient, along with the medical jargon provided by the radiologist were often not conducive to understanding what had happened and what the next steps were. They felt however, that there were many uncertainties of this role, as they were not sure how much information they could provide, and were not even certain themselves of the patient’s next steps.

“Patients are going to have questions that you can’t answer because you aren’t a doctor, you don’t know the plan of action”.

“If we say the wrong thing, that liability is on us right? Doctors go to school for that, and for that reason I don’t think that we should cross that line at all.”

“They had a million questions that we couldn’t answer”

“or say there’s other contributing factors that we don’t know about. They [doctors] know the history. I know we look through their brief history but we don’t really look back as far as other doctors and understand why this [demise] is happening.”

Emotional distress and support

The patient reactions in each situation varied. The participants described these reactions as angry, calm, confused, anxious, upset, laughing, questioning, and subdued. Following the delivery of the news, the range of students’ reactions was varied as well. They described their own reactions as awkward, sad, sympathetic and stressful. One of the participants even cried after the patient had left.

“I cried. It was traumatizing”.

In another situation, the radiologist explained to the patient that the student would show an image of the embryo to the parent if she wished. The student felt unprepared for this role,
describing it as “scary”. The students also felt as if they were deceiving the patient from the moment they discover a fetal demise to the time when the bad news is delivered.

“It’s awkward when they’ll be asking you ‘so what do you see?’ and you tell them that you can’t say anything. And then you come back into the room and the doctor [delivers the news] and leaves and the patient feels that you knew the whole time. It’s really awkward”.

Even though it is a stressful situation, one student welcomed it and even felt that it was necessary.

“I feel like I always want to feel like that though, kind of stressed out. I don’t ever want to feel like ‘oh another fetal demise’. I don’t ever want to get over that feeling of feeling nervous, and feeling sorry”

Playing a part in such a stressful event requires that every medical professional have a support system. When asked “who on the team supports you?” the students’ answers were varied and showed a spectrum of support across their professional and personal lives.

“If the radiologist isn’t supporting us, there’s no one to support us.”

“I think that at some sites the radiologists do step in and support and make sure that everything is ok.”

“That day I had three [demises] in a row I felt so drained and didn’t want to be there anymore. That was a hard day... where do you get your support then? Other techs?”

“I think that your home people are your support system. Your family, parents.”

Conflict and Power

While revealing their stories of fetal demise situations, a theme of conflict emerged, along with issues of trust and power. In their descriptions of the bad news situations, most of the stories revealed that it was handled well by the radiologist.
“He was really good about it and explaining everything and told her that it wasn’t her fault and that there was nothing that she could do to prevent it…and asked if she had any questions. She was really calm about the whole situation and I think she felt like she had all the information that she needed and like the doctor really reassured her that it wasn’t her fault, and she really felt that so he did a really good job.”

When asked if they felt that the radiologist should always deliver the news to the patient before she leaves, some of the participants felt confident that the radiologist was receptive to the technologists’ requests.

“I think most of the radiologists that I know, wouldn’t expect us to [deliver the news]. They would set aside whatever else they’re doing because it’s really important.”

“They’re on your side. They understand. If you’re pressuring or insisting that they come in, there’s a good reason for it and they know that you wouldn’t be asking them to come in if there wasn’t a good reason.”

Based on their clinical experiences some of the participants perceived that the radiologist was not necessarily approachable, nor receptive to feedback of how they handled the situation of delivering news of a fetal demise.

“And the saddest part to me was that when they had left she [tech] said ‘this is what I do every day, because the doctors explain it the same way every time’. But the techs don’t go to tell the doctors that this isn’t working, the patients aren’t understanding what you’re telling them. So it’ll keep going on like that until one of the techs says something.”

“It sounds like that was how they’ve been doing it forever and no one ever gives their opinion of that it isn’t working, or do you know what I have to do when you leave the room every time? It didn’t feel like they were approachable.”

The participants stated the importance of giving feedback to the radiologist to improve patient care, however felt restricted by the hierarchy of their position as students, and that they didn’t want to cause any conflict for fear that they might not be able to secure a job in the future.
“So it’s hard as a student to get to the mentality that I can approach this radiologist or this tech because we don’t want to ruffle any feathers as students. Like I have a pretty good rapport with this radiologist I don’t know that I would still feel comfortable until I secure myself a job. “

The participants also stated that giving feedback was highly dependent on the radiologist they were working with, and was once again reflected in issues of trust and hierarchy. The discussion below illustrates this.

P4 – I think for certain ones I would go, just saying afterwards, “I had to go in and tell them everything because they didn’t understand, I don’t know if it’s the way they understood it or the way you said it.” I wouldn’t say ”you’re wrong!” I would try and like work around it.

P3 – Yah, it’s how you go about it

P4 – With some of them. With some of them I wouldn’t dare [suggest] changes.

M – Why is that?

P4 – Because they’ve been doing it forever and they’ll just go “what’s your point”? 

P3 – in the health care system I think doctors are on this pedestal, ... and they went to school for however many years, so like you don’t really question a lot of what they do. Or at least a lot of people are nervous to.

P2 – It’s not all radiologists. A lot of them are really understanding and really supportive, they’ll answer your questions and concerns. Some of them though, if you tell them one thing, you’re going to be in this huge argument with them because of one suggestion. Because they don’t see it that way.

P1 – Or they won’t trust you for the rest of your careers
DISCUSSION

The focus of this study was to determine if an interprofessional education module and simulation affects the attitudes of sonography students in terms of learning with, from and about one another. A second objective was to elicit the experiences of the sonography students, as had occurred during their second practicum prior to the focus group. It was hoped that this information would inform interprofessional education activities in the future.

The findings of this study were promising, that an interprofessional intervention positively affects the sonography students’ attitudes towards learning together with radiology residents. The data showed improvement of their attitudes on three of the four subscales which were Teamwork & Collaboration and Negative and Positive Professional Identity. The fourth subscale, Roles and Responsibilities was determined to be unreliable which is consistent with other studies (McFayden, 2006; King et al, 2011) and may be due to the lack of experience that the students have in their impending professional roles. An interesting finding was that the subscale which showed the greatest improvement was Positive Professional Identity. Professional socialization is an integral factor in the formation of professional identity. Gabe, Bury and Elston (2004) define professional socialization as:

the social processes through which individual students learn to become members of a professional occupation. These processes include formal and informal means of learning both codified knowledge and technical skills, and also more tacit knowledge and ‘craft’ skills, norms and values and ‘professional’ modes of conduct. (p. 168)

It could then be postulated that the social aspect of the interprofessional simulation, the debrief and self-reflection that followed caused a change in attitude as learning took place. By taking
part in this activity, the students found a greater value in learning with, from and about the radiology resident. This finding is also supported by the qualitative data from the focus group, in which the students were eager to take part in more simulations and interactions with other professions.

Gaining an understanding of each others’ roles and knowledge is integral to effective interprofessional communication (Orchard, 2005; Reeves et al, 2010). A major theme from the focus group data pertaining to role understanding applied to the patient’s perspective. Providing support and familiarity was deemed important, and the order of entry of personnel into the ultrasound room was central. This is supported in theories of health care management and proxemics, where health care workers must be aware of how people interact and convey messages through their own space (Preston, 2005). The professional entering the room should be the person with whom the patient already has a relationship with, followed by an introduction of the other professional. Communications between professionals in the presence of the patient should always include the patient and her support person, as other studies have found that not including the patient in discussions has a negative effect on the knowledge and understanding of the situation by the patient (Larsson et al, 2010; Van der Zalm & Byrne, 2006).

Repeating and re-explaining information as well as confirming next steps was a second sub-theme of role clarification that emerged from the data. The focus group participants revealed that the initial delivery of bad news isn’t necessarily heard or understood fully by the patient. This is in keeping with Jedlicka-Kohler et al (1996) who found that the experience of an immediate shock reaction was an obstacle in understanding and remembering information. The participants of this study were unsure of the boundaries of this aspect to their role, as they were uncertain to the amount of information that could be revealed, and felt that they were deceiving
the patients at times. Van der Zalm (2006) demonstrated that patients sensed that something was wrong even before it was communicated, and that some patients recognized that the sonographer was not able to provide a diagnosis or give any information. Simpson and Bor (2001) found that sonographers felt pressure given the time constraints and heavy workload and that this had an effect on how much information could be given as well as the amount of support provided. They felt that there should be clear, written guidelines outlining practical steps to take following a bad-news interview and that a team approach ultimately benefits the patient. McGinnes (2010) found that only 18% of sonographers had a procedure or policy in place for communicating bad news.

The findings in this study support that it would be beneficial for the students to receive interprofessional training with a focus on repeating and re-explaining information so that a protocol is in place, which would minimize these uncertainties. Additional research and interprofessional activities may reveal where the boundaries lie, however this may differ from institution to institution, or from radiologist to radiologist.

Providing support to an emotionally distressed patient is a role that all health care workers will assume at some point in their careers, and in the case of sonographers who perform obstetrical ultrasound, this may be a daily occurrence. Even though they felt it was a necessary component to their job, the participants were emotionally affected during their experiences. This is a similar finding to Simpson and Bor’s (2001) study in which 179 of 180 sonographers felt emotionally affected by giving bad news, suggestive of psychological distress. The focus of patient-centered care is for health care professionals to surround the patient as a team. Providing support is not only critical to the emotional health of the patient, but also to the emotional health of the team members. In this study the sonography students weren’t certain if they had the support from their coworkers or radiologists when they were experiencing emotional distress,
which was similar to Simpson and Bor’s (2001) findings where sonographers were the participants of the study. A lack of social support from co-workers has been associated with emotional exhaustion and depersonalization which are both associated with ‘stress of conscience’ or burnout (Glasberg et al, 2006). It may be therefore prudent to include a topic of support and support systems in the curriculum for both sonographers and radiologists.

While the experiences of the participants demonstrated an overall satisfaction with both the delivery of the bad news and the interprofessional relationships during the delivery of the news, a theme of conflict and power emerged. The participants felt that when they had an issue with how news had been delivered, they did not always feel that they could discuss it with the radiologist, for fear of losing future job opportunities or being ostracized if they had to work with that physician again. While power relations in health care have been researched in an interprofessional setting (Baker et al, 2011) the subjects have been graduates of their professions. The participants in this study were at a double disadvantage, in that not only might they view themselves in a lower position on the medical hierarchy, but they were students working with a physician which puts them in a difficult position. Educating the students on assertiveness and in dealing effectively with conflict may not necessarily transfer to the wanted behavior in this instance. The students may also not fully grasp the complexity of each situation and may perceive that a situation of bad news was not handled appropriately, due to their own inexperience with these situations. There may be a need for an interprofessional simulation to be designed with willing radiologists and sonography students, to maintain sociological fidelity as suggested by Sharma et al (2011). This would certainly challenge the participants to resolve conflicts such as these, especially when studied in the clinical setting with radiologist and student
followed by a debriefing. As demonstrated by Wakefield et al (2006) this may help establish trust in this relationship leading to better collaborative education and practice.

There were some limitations to this study which may have had an effect on the data. The sample size of the questionnaire and focus group was small and limited to female students early in their second year of the program. Secondly, the RIPLS questionnaire was delivered in an unintentionally modified form, with a 6 point Likert scale rather than a 5 point Likert scale as was created by Parsell and Bligh (1999). It is not known whether this could have affected the results. The students in the focus group were also known to the researcher, and therefore moderator bias may have occurred during the interview. The students may have also answered questions in a manner in which they felt the researcher wanted to hear, as they had a relationship with the researcher as part of the educational program. The researcher however attempted to create interview questions that were not leading in order to prevent moderator acceptance bias.
CONCLUSION

Incorporating interprofessional education lessons into an existing health care communications course is a growing movement, and while one can assume that if we install the curriculum in our courses, that naturally the students will engage in learning with, from and about one another. If our interventions aren’t done well, this may not be the case. (Reeves et al, 2008). We as educators should be concerning ourselves with the validity of our methods and pedagogy to ensure that learning is transferring into practice. But what precisely is it that we want our students to practice? The rationale and literature surrounding interprofessional education supports that students who learn with, from and about one another in well designed interprofessional programs will practice together collaboratively upon graduation, given the skills to do so (Reeves et al, 2008). This has been extensively studied in the fields of medicine, nursing, pharmacy, occupational therapy and social work. What we don’t know however is whether students in sonography programs are affected by such interventions, and we don’t have enough literature to understand the dynamic relationships between those professions that will work with sonography students.

This study showed that an interprofessional simulation positively affected the attitudes of sonography students in terms of learning with, from and radiologists. The data suggest that future interprofessional curricula might include proxemics in the curriculum, establishing role clarity of revealing information to the patient, and add the topic of support systems within the team context. IPE in a clinical setting with radiologists may also facilitate the development of a trusting relationship. Additional interprofessional simulations were also requested by the students to include nurses, cardiologists, obstetricians, geneticists, and physicians at different stages of residency. An overall confidence and self-efficacy emerged following this
interprofessional simulation, clarifying the finer details of a delivering bad news scenario and secondarily an interest to learn interprofessionally blossomed.

The interprofessional simulation and the data derived from the research are useful starting points for other interprofessional simulations at our institution. This study was designed with the simulation first and the focus group following it several months later. It may be useful to use a focus group interview to examine the issues that exist in an interprofessional relationship, and then design a simulation based on the data acquired. These efforts will undoubtedly result in improved patient centered care and stronger interprofessional relations.
Appendix 1

Interprofessional Education for Collaborative Patient-centred Practice: An Evolving Framework

Interprofessional Education to Enhance Learner Outcomes<br>Interdependent<br>Collaborative Practice to Enhance Patient Care Outcomes

Educational System (eg. Accreditation, institutional structures)<br>Teaching Factors (Micro)<br>Leadership/Resources<br>Learning context<br>Administrative processes<br>Faculty development

Systemic Factors (Macro)<br>Health Professional Learner Outcomes

Professional System (eg. Regulatory bodies, liability)<br>Organizational Factors (Macro)<br>Interpersonal Factors (Micro)<br>Governance<br>Sharing goals/Values

Patient Provider Organization System Outcomes

Government Policies: Federal/Provincial/Regional/Territorial (eg. education, health and social services)<br>Social & Cultural Values

Research to Inform & to Evaluate<br>• Understand the processes related to teaching & practicing collaboratively<br>• Measure outcomes/benchmarks with rigorous methodologies that are transparent<br>• Disseminate findings

D’Amour, Carelsean (2004)
Appendix 2: Role Clarification Activity

Sonography students and residents were arranged in small groups to discuss what was unique about each profession and what the commonalities were to each profession.
Appendix 3

**DMS400 IPE Activity Schedule**

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
<th>Room 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 – 9:45</td>
<td>Participant 1 Observer 1 Resident 1</td>
<td>Participant 2 Observer 2 Resident 2</td>
<td>Participant 3 Observer 3 Resident 3</td>
<td>Participant 4 Observer 4 Resident 4</td>
<td>Participant 5 Observer 5 Resident 5</td>
</tr>
<tr>
<td>9:50 – 10:35</td>
<td>Participant 6 Observer 6 Resident 6</td>
<td>Participant 7 Observer 7 Resident 7</td>
<td>Participant 8 Observer 8 Resident 8</td>
<td>Participant 9 Observer 9 Resident 9</td>
<td>Participant 10 Observer 10 Resident 10</td>
</tr>
<tr>
<td>11:30 – 12:00</td>
<td>Large group debrief</td>
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</tbody>
</table>

2 facilitators in each room
Appendix 4

Interprofessional Education Scenario – NAIT November 10, 2010

The purpose of this scenario is to explore and demonstrate the interprofessional relations between the sonographer and the radiologist. The context of this scenario is a 5-6 month pregnant patient and her husband who have come for a routine ultrasound. The sonographer has discovered that the fetus has perished. For this scenario, the patient will not be scanned. The student will use images to determine that the fetus has perished. The scenario begins with the premise that the patient has already been scanned and images have been taken. The patient therefore already has a rapport with the sonography student.

Preamble

The patient is in sonography room, lying on the bed. The patient will be wearing a hospital gown, but will need to have a pregnancy pillow or something of the sort which will make them look like they have a pregnant belly (about 5 – 6 months) under the gown.

The light is dim. The machine is on. There is a picture of a fetus on the screen. The husband is waiting in the waiting area, as he has been told that he will get to see the baby once the sonographer has finished taking her pictures and showing them to the radiologist. He complied with the directions.

The sonography student will glimpse in at the patient, to have a visual connection. The SP should lie still on her side, facing the machine with her hand on her belly. The student will know that the husband is in the waiting room. The student will be given the information that they have just scanned the patient, and have the images to review.

The sonography student will review the images (5 minutes) and will present the case to the radiology resident. The resident reviews the case. **One of two things may happen at this point**

1. The radiologist and the student return and the radiologist delivers the bad news
2. Only the student returns. She is not allowed to deliver the news, and will most likely have some directions for the patient on what is going to happen next. Please see the appendix for the scripts for each.
Scenario / script 1 – Radiologist comes in to deliver bad news:

Student- may or may not remember to get the husband. If she gets the husband, he can stand beside the stretcher.

Radiologist – will introduce himself /herself.

Both husband and patient look anxious.

Patient – will suspect that something is wrong, but will not get too excited yet. Might say something like “hello, I have been waiting for quite awhile. Is something wrong?”

Radiologist – will deliver the news that her baby is not alive.

Patient – Should become emotional. Start crying. (Radiologist or student will likely begin to comfort patient). Patient will begin to ask some questions:

- Are you sure?
- Why did this happen?
- Did I do something wrong, is it my fault?

Radiologist and student – will answer questions and continue to provide comfort

Husband – Becoming emotional and raised voice – “this can’t be happening. Why has this happened? She has been feeling the baby kicking all the time!”

Radiologist and student - will answer questions and continue to provide comfort

Patient – becomes hysterical. Crying and holding her belly saying things like “no, no, this can’t be happening. My baby, my baby”. This can go on for at least 5 minutes.

Husband – should look shocked / bewildered / confused / sad

The student and the radiologist will work at comforting the patient, and answering questions. If the radiologist leaves, the patient should continue to be upset for awhile, and the sonographer will likely take an approach to comfort both patient and husband. The patient and her husband will be told what is going to happen (the patient will be sent to see her obstetrician). The patient will eventually calm down and be ready to leave.

End of scenario
Scenario / script 2 – Radiologist does not come in to deliver bad news, only the student comes in:

Student- may or may not remember to get the husband. If she gets the husband, he can stand beside the stretcher.

Both husband and patient look anxious.

Patient – will suspect that something is wrong, but will not get too excited yet. Might say something like “hello, I have been waiting for quite awhile. Is something wrong?”

Student – will have to think about what to say to the patient. The student is not allowed to deliver the news, but they may do it anyway. If the student delivers the news, the scenario plays out as in script 1. If they do not deliver the news the following should happen:

Patient – (upset) “something is wrong, I know it. You have to tell me”

Student – will react by either telling or sticking to the protocol. If the student doesn’t tell the patient, the patient should continue to demand that she needs to know. The husband will support his wife with statements of needing to know as well.

The student may then go and get the radiologist.

Radiologist – will deliver the news that her baby is not alive.

Patient – must become emotional. Start crying. (Radiologist or student will likely begin to comfort patient). Patient will begin to ask some questions:

- Are you sure?
- Why did this happen?
- Did I do something wrong, is it my fault?

Radiologist and student – will answer questions and continue to provide comfort

Husband – Becoming emotional – “this can’t be happening. Why has this happened? She has been feeling the baby kicking all the time!”

Radiologist and student - will answer questions and continue to provide comfort

Patient – becomes hysterical. Crying and holding her belly saying things like “no, no, this can’t be happening. My baby, my baby”. This can go on for at least 5 minutes.

Husband – should look shocked / bewildered / confused / sad
The student and the radiologist will work at comforting the patient, and answering questions. If the radiologist leaves, the patient should continue to be upset for awhile, and the sonographer will likely take an approach to comfort both patient and husband. The patient and her husband will be told what is going to happen (the patient will be sent to see her obstetrician). The patient will eventually calm down and be ready to leave.

If at any time during either script, the student forgets to get the husband, the husband will hear his wife becoming upset, and will come in demanding to know what has happened.

The radiologist may choose to give the patient instructions to go to her obstetrician to receive the news. The scenario that the radiologist should receive is that the obstetrician is away for 2 weeks and his partner will be in surgery all day.
IPE ACTIVITY DEBRIEF QUESTIONS

The debrief that follows the simulation is a major opportunity for the students to learn. The following questions were devised by IHEP (Interprofessional Health Education Partnership, Health Sciences Research Commons, University of Alberta) and have been adapted to be used in this simulation. The questions below are useful at getting the students to open up and talk about the situation. Feel free to ad lib where you feel it would make sense.

1. What was that like for you?
2. Provide validation and positive remarks using behavior examples from the SIM regarding their teamwork and communication in the SIM.
3. What questions, confusions, or insights did the simulation bring up for you about each other’s roles?
4. Did you have a clear understanding of your own roles?
5. What verbal and nonverbal communications did you use with the patient and her husband that you felt may have contributed to helping them understand what had happened and what was going to happen?
6. What communications did you use that may have decreased their comfort levels?
7. To the patient: From your perspective, do you feel that you now have a comprehensive understanding of what has happened and what will take place in the future?
8. To the patient: Did this team do anything that helped you feel understood or supported?
9. To the husband: From your perspective, were your concerns addressed by the team?
10. To the student: Have you identified something today about your own communication style in teams that you would like to continue to use in the future, or something you would like to change? What will you take away from this experience?
Appendix 6  
**Readiness for Interprofessional Learning Pre Test**

**Readiness for Interprofessional Learning Scale (RIPLS)**

Please read each statement below, and indicate the degree to which you agree or disagree with the statement by selecting the number of the response that best expresses your feeling.

1=strongly disagree, 2= disagree, 3=somewhat disagree, 4=somewhat agree, 5=agree, 6=strongly agree

For each item, select the appropriate value.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Learning with other students will help me become a more effective member of the health care team.</td>
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<td>2 Patients would ultimately benefit if health care students worked together to solve patient problems.</td>
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<td>3 Shared learning with other health care students will increase my ability to understand clinical problems.</td>
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<td>4 Learning with other health care students before qualification / graduation would improve relationships after qualification / graduation.</td>
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<td>5 Communication skills should be learned with other health care students.</td>
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<td>6 Shared learning will help me to think positively about other professionals.</td>
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<td>7 For small group learning to work, students need to trust and respect each other.</td>
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<td>8 Team-working skills are essential for all health care workers to learn.</td>
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<td>9 Shared learning will help me to understand my own limitations.</td>
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<td>10 I don't want to waste my</td>
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<tr>
<td>11</td>
<td>It is not necessary for undergraduate health care students to learn together.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>12</td>
<td>Clinical problem solving skills can only be learned with students from my own department.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>13</td>
<td>Shared learning with other health care students will help me to communicate better with patients and other professionals.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>14</td>
<td>I would welcome the opportunity to work on small group projects with other health care students.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>15</td>
<td>Shared learning will help to clarify the nature of patient problems.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>16</td>
<td>Shared learning before qualification will help me become a better team worker.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>17</td>
<td>The function of nurses and therapists is mainly to provide support for doctors.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>18</td>
<td>I’m not sure what my professional role will be.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19</td>
<td>I have to acquire much more knowledge and skills than other health care students.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
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</table>
Appendix 7 – Focus group Interview Guide

1. Think for a moment about a “breaking bad news” experience that you have had. Write down some notes.
   
   - Where was your experience? (Clinical or hospital?)
   - Who was part of the team?
   - What was it like for you?
   - Who delivered the bad news?
   - Who was in the room?
   - Was the patient’s husband in the room?
   - What happened after the news was delivered?

2. In your experiences thus far, whose role is it to break the bad news?

3. What is the role of the “other” person / people in the room when the bad news is delivered?

4. Have you experienced any interprofessional tensions in these experiences? Please describe.

5. What happens after the radiologist leaves? What is your role?

6. What is your role in assisting the patient or husband? Is it only your role?

7. How did what you learned in your simulation in November help you in your clinical experiences?

8. At this point in your training, do you feel confident in your role in these experiences?
REFERENCES


*Center for Advancement of Interprofessional Education (CAIPE).* http://www.caipe.org.uk/about-us/defining-ipe/


King, S. (2011) Publication pending


