Creating Immunization Champions

by

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Baccalaureate Degree in Nursing, 1988

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Abstract

This study explored the impact of a course design, within a core competency framework on sustainable change in immunization attitudes and behaviours in professional practice. The study involved both quantitative and qualitative methods using a two-phase quasi-experimental pre-test/post-test design. A non-randomised convenience sample was used. Quantitative results were analysed to a statistical significance of $<.05$. The qualitative results were analysed for salient themes. The findings of the study revealed that: learning occurred, knowledge was retained over time, and positive behaviours and practice impacts could be described. The results of this study support the development of continuing medical education opportunities that are competency-based and grounded in educational methods that support transformative learning.

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Chapter One: Introduction

Introduction

"The impact of immunization on the health of the world's people would be hard to exaggerate. With the exception of safe water, no other intervention, not even antibiotics, has had such a major effect on mortality reduction and population growth" (Plotkin & Plotkin, 2004, p. 1). Childhood immunization is one of the great success stories of public health and clinical medicine (Orenstein, Douglas, Rodewald, & Hinman, 2005). Vaccines have a major impact on disease prevention, they are safe and cost-effective, and they are crucial to public health by efficiently preventing sickness and death from infectious diseases. Additionally, the decision for vaccination helps protect individuals and communities from vaccine preventable diseases, which are at an all time low (Centers for Disease Control and Prevention, 2006a, 2006b; Public Health Agency of Canada, 2003; National Institute of Health, 2003; World Health Organization, 2006). The Canadian Institutes of Health Research (2003) reiterated that the success of immunization programs in preventing and even eliminating some diseases has led to the eventual devaluing of immunization programs.

Statement of the Problem

In Canada, and many other countries, the institution of routine childhood immunization programs has been effective in eradicating or substantially reducing the occurrence of vaccine preventable diseases. There is a generation of parents who have never seen measles, mumps, or polio, so their focus has shifted from the concern about disease, and the benefits of immunization, to a focus on the risks and possible side effects

of immunization. This said, physicians have an important role in advocacy for and delivery of immunization programs

There is documented evidence that physicians with positive attitudes about immunization who make recommendations for immunization in the context of regular patient care have an important role in influencing patient decision making to accept immunization (Armstrong, Berlin, Schwartz, Propert, & Ubel, 2001; Fiebach & Viscoli, 1991; Orenstein & Bernier, 1994; Zimmerman et al., 2003). Hinman and Orenstein (2007) identified that studies have indicated that paediatricians and family physicians are major advocates of immunization and are the most trusted source of information about immunization, both in their offices and in public policy settings. "As trusted information sources, health care providers have a vital role in the continued success of immunization programs" (Public Health Agency of Canada, 2006, p. 29). Gellin, Maibach, and Marcuse (2000) identified that 84.2% of respondents in a U.S national telephone survey identified a doctor as the most common source of information about immunizations. They went on to conclude that physicians have both "an important opportunity and a professional obligation to educate parents and to correct misconceptions … and have multiple opportunities over many years to reaffirm parents' correct beliefs and modify misconceptions" (p. 1101).

Conceptual Framework

This study is an in-depth look at one immunization education program designed for medical residents. With transformative learning theory as an underpinning, this study explores the usefulness of creative educational modalities, including: didactic lectures, problem-based learning scenarios, and other interactive approaches to create the

opportunity for transformative learning, which in turn could produce sustainable change in attitudes and behaviours in professional practice related to immunization. The Kirkpatrick (1994) framework provided the evaluation framework for the research.

Thesis Plan

This research is situated within the context of the 2007 Resident Vaccine Course through the Canadian Resident Vaccine Training Program, sponsored by the Canadian Paediatric Society (2008), which has historically used a combination of approaches to achieve transfer of learning as identified in the *Resident Vaccine Course Program, Course Description* (Canadian Paediatric Society [CPS], 2007; see also Appendix A of this report). The course, in the form of an intense two-day educational program, has been offered for six years, but course effectiveness in achieving program goals has not been formally evaluated.

The 2007 program added an additional dimension, the use of the *Immunization Competencies for Health Professionals*, (Public Health Agency of Canada 2008), as a framework for both the development and delivery of the curriculum. In preparation for the annual Resident Vaccine Course sponsored by the Canadian Paediatric Society (2007), I was invited to participate as a faculty member and stated that I was very interested in participating in the evaluation team to evaluate the effectiveness of the course in achieving the stated course goals. I held a lead role in the multidisciplinary course evaluation team and was responsible for developing the evaluation frame work and tools. The goal was to identify how this new approach to course delivery could be evaluated to determine if the goal of sustainable positive attitudes and behaviours towards immunization could be achieved.

A pre-test/post-test methodology was used with the Kirkpatrick's (1994) four levels of evaluation: Level 1: Reaction; Level 2: Learning; Level 3: Behaviour; and Level 4: Results, used as a framework for the evaluation. For this research, Kirkpatrick's Levels 1, 2, and 3 were used, the fourth level of evaluation was beyond the scope of this research.

The course evaluation team developed and implemented three levels of evaluation. The first level to identify "reaction" was a post-course evaluation to determine course satisfaction (i.e., Level 1 as cited in Kirkpatrick, 1994) completed in December 2007 (Connors, Henteleff, Halperin, Millet, & McNeil, 2007) as a means of identifying if course participants liked the course, if it had relevance to them and as a means to determining ways to improve future courses.

The second level of evaluation (i.e., Level 2: Learning as cited in Kirkpatrick, 1994) used a pre-test/post-test survey tool, the Resident Vaccine Course Survey Tool, Sections A-E (see Appendix B) and was administered in the first session of the first day of the course. The results served as a baseline to evaluate immediate knowledge transfer when it was administered again, post course, in the last session of the final day of the 2007 Resident Vaccine course. The pre-test/post-test survey also served to evaluate longer-term knowledge retention when it was administered six months later.

The third level of evaluation (i.e., Level 3: Behaviour as cited in Kirkpatrick, 1994) was assessed with the posing of open-ended questions to elicit feedback from the participants about their behaviour change as a result of attending the Resident Vaccine course. This evaluation was achieved with an additional section in the Resident Vaccine Course Online Survey Tool (see Appendix C) entitled *Section F: Post Course Impact.*

The outcome of this portion of the evaluation was to determine if the course was an effective educational modality in achieving knowledge transfer and enduring knowledge retention and behaviour change.

I took a lead in the development of the three survey tools that were implemented for the three levels of evaluation. Through the use of the Participant Course Satisfaction Evaluation Form (see Appendix D), course satisfaction results were identified as high amongst participants (Connors et al., 2007). The purpose of the satisfaction form was to identify participant satisfaction with the course format and to elicit feedback on the different aspects of the program, with a goal of being able to improve future courses. A pre-test/post-test methodology was used for evaluation purposes to determine if there were differences between pre-course and post-course knowledge, attitudes, and behaviours.

The key component of the study in which I was most interested was the evaluation of the longer-term impact of this course in relation to the participants' ongoing knowledge, attitudes, and behaviours within their professional practice. The implementation of the pre-test/post-test evaluation tool, six months post-course, was used as a measure of impact assessment to gauge whether or not providing the course created the environment for transformative learning that sustained knowledge and positive attitudes and behaviours in practice. That is: did the course design and methodology support or promote long-term change as demonstrated in practice behaviours and positive attitude towards immunization in professional practice?

The impact of the 2007 Resident Vaccine Course (CPS, 2007) was determined by comparing the immediate post-intervention survey (see Appendix B) results to the results

obtained in the post-intervention survey (see Appendix C) six months post course. This comparison served to evaluate the effectiveness of the Resident Vaccine Course in achieving knowledge transfer and longer-term retention of knowledge and positive attitudes, as well as self-described behaviour change, or outcome goals, of the attendees of the resident training course. The Level 3 evaluation (Behaviour, as cited in Kirkpatrick, 1994) builds on the level one and level two evaluations implemented by the course planners, as Kirkpatrick's model is a sequential model.

Limitations

Several limitations were identified while engaging in the research: the small study size, the use of a convenience sample, and in particular, the study design did not allow for the comparison of participant-specific results in Phase Two of the study, which compared scores at the time of course completion to scores achieved six months later. Another limitation is whether or not six months is sufficient elapsed time to determine knowledge and attitude retention over time. Finally, are self-reported knowledge acquisition and practice impacts a valid measure of to determine program impact?

Conclusion

This research indicated that the use of creative educational methods, using a competency-based framework created an environment for transformative learning that supported sustained positive attitudes and behaviours in professional practice.

Chapter Two: Review of the Literature

Introduction

For the purposes of this study, the literature review is limited to transformative learning, core competencies for immunization, the immunization knowledge, attitudes and behaviours of physicians, and the Kirkpatrick framework (1994). Literature was sourced primarily through EPSCO host and Pub Med seeking peer reviewed primary and secondary sources and informed by course readings and reference books. A description of the 2007 Resident Vaccine Course (CPS, 2007) is provided, as it is this course in which the research is situated. The literature review provides background information and sets the context for this research, to best inform the study and provide relevance enabling me to discuss findings in conjunction with the literature review.

Transformative Learning

Transformative learning theory (Mezirow, 1975, 1981, 1991, 2000; Magro, 2001) sets the foundation for the discussion about the role of adult education and immunization competencies (Public Health Agency of Canada, 2008) may have in supporting the development of practitioners' immunization knowledge and positive attitudes and behaviours. Transformation as a concept in adult education was first introduced by Mezirow in 1975 and has been accepted and has received much attention over the years (Cranton & King, 2003; Merriam & Caffarella, 1999; Taylor, 1998). "We make meaning of the world through our experiences" (Cranton & King, 2003, p. 32), and through self-reflection, as Mezirow says, we engage in discourse (Mezirow & Associates, 2000). New ideas and evidence from a variety of people help us with the reflective process (Cranton & King, 2003). Transformative learning takes place when this process leads us to open up

our frame of reference, discard a habit of mind, see alternatives, and thereby act differently in the world (Mezirow, as cited in Cranton & King, 2003).

Mezirow's theories (as cited in Foley, 2004) apply critical reflection on experience and context. It is within this context of reflection on experience that transformation can occur. Transformation is a "process of vigorous critical reflection which transforms our *meaning perspectives* to become more inclusive, differentiating, permeable, critically reflective and integrative of experience" (p. 62). Transformation offers an opportunity for action through critical reflection.

Mezirow (as cited in Magro, 2001) identifies the ten stages of transformation. These include:

> A disorienting dilemma;
> Self examination;
> A critical assessment of personally internalized role assumptions and a sense of alienation from traditional expectations;
> Relating one's discontent to similar experiences of others or to public issues – recognizing that one's problem is shared and not exclusively a private matter;
> Exploration of options for new roles, relationships and actions;
> Exploring options for new ways of acting. Planning a course of action;
> Acquisition of knowledge and skills for implementing one's plans;
> Provisional trying and testing of new roles;
> Building of competence and self confidence in new roles and relationships; [and]
> A reintegration into society, on the basis of conditions dictated by the new perspective. (p. 90)

Transformation can occur when people have the opportunity to identify their assumptions and reflect critically on them. Through interactions with others, new perspectives can be formed allowing for the opportunity for transformation of thought leading to the review and reviewing of new options for action through the integration of new knowledge.

Transformational learning processes are complex and are influenced through considerations and meanings that come from the learner (King & Wright, 2003). These

learnings are based on critical self-reflection on assumptions and critical discourse when the learner validates a judgment (Mezirow, 1991). Meaning about what we do comes when we ask the question "what happened here?" The opportunity for self-reflection arises, and this is when the opportunity for transformative learning can occur (Cranton & King, 2003). "Transformational learning provides a window into the process by which adult learners reconsider their values, beliefs, and assumptions" (King & Wright, 2003, p. 102).

Merriam and Caffarella (1999) have drawn from a number of authors, in addition to the work of Mezirow and Freire, and identified for us the key concepts of transformational learning, which are experience, critical reflection, and individual development. Foley (2004) attested to the effectiveness of a *practitioner-centred approach* for adult education. Moon (2001) identified there are four components that will help support the acceptance and outcome of education targeted to health professionals, which include the need to: (a) understand current practice, (b) be clear on the new information and how it relates to current understanding, (c) find a way to integrate the new learning and current practice, and (d) anticipate or imagine what the new practice will look like.

Current medical education practices capitalize on educational methods that promote transformative learning. The Resident Vaccine Course (CPS, 2007), like many programs in medical education and continuing medical education, uses problem-based learning (Rhem, 1998; Williams, 2001), which is a well-established educational method used in medical education and supports opportunities for critical reflection and practice (Mezirow, as cited in Foley, 2004). It is "an instructional strategy in which students

confront contextualized, ill-structured problems and strive to find meaningful solutions" (Rhem, 1998, ¶ 3). Problem-based learning fosters the development of knowledge and skills within a professional discipline, by utilizing authentic situations that have been encountered by professional practitioners as the initial stimulus for student learning (Williams, 2001).

The use of problem-based learning and educational patient rounds within a modified apprenticeship model offers daily practice in the 10 stages of transformation, as described by Mezirow (as cited in Magro, 2001). It offers the opportunity to be both learner and teacher at the same time. In the education of health professionals, the learning process usually begins with the acquisition of knowledge: an opportunity to critically reflect on the use of the knowledge in action within a context of a practice-based community. This kind of practice-based community is defined as a group who work together in similar patterns (Fenwick & Tennant, 2004). For me, this process is best described as an apprenticeship model, where problem-based learning methods can be applied.

As we seek ways to address the learning needs of the immunization practitioner, we must consider the best ways to manage the time-challenged practitioners who are geographically dispersed. It is also important to remember that "transformation is not the result of a single intervention or experience" (Feinstein, 2004, p. 110). For physicians, this provides a challenge; many work independently and lack communities of practice for knowledge sharing in which to keep the conversation going. Many opportunities must be pursued to offer a multifaceted approach to overcome the temporal and geographical challenges to meet the learning needs of practitioners.

Adult education is seen as being potentiated by the learner learning through craft, modeling on others, and reflecting on practice (Cranton & King, 2003). Health services through history have used an apprenticeship model for teaching and learning. As we move forward, it will be important to support the professional development of practitioners in the area of immunization competencies and that we build on the learning strengths of the practitioners to achieve the necessary transformation.

Immunization Competencies

"The *Immunization Competencies for Healthcare Providers* were developed to support the application of National Guidelines for Immunization Practices" (Public Health Agency of Canada, 2008, ¶ 1) and to assist health professionals to become exemplary immunization providers within their own scope of practice:

> The aim … is to promote safe and competent practices to achieve higher vaccine coverage rates…. The competencies range from knowledge of the scientific basis of immunization to essential immunization practices and contextual issues relevant to immunization.… it lays out the essential topics for effective immunization that are universal to a wide range of health professionals.
>
> These can be adapted and incorporated into all immunization training…. [and] As such, the immunization competencies provide the framework stakeholders can use to tailor education programs to the needs of health professionals based on their level of experience, practice setting, and degree of involvement with immunization.
>
> The desired result is an expanded and diverse set of immunization education resources to support a similarly diverse set of health professionals. (¶ 1–3, 7)

Wall (2006) stated that linking learning objectives to core competencies is relevant and is a requirement for workplace knowledge. Furthermore, it is important "when identifying workplace knowledge and skills specific to the position … [to also consider the importance of] creativity, innovation, communication, flexibility, resilience, leadership, service motivation and strategic thinking" (p. 6). These competencies can

serve educational and continuing education needs for providers in needs assessments and development of undergraduate and accredited continuing education and training.

Immunization Knowledge Attitudes and Behaviour of Practitioners

A literature search was conducted using a variety of search terms: health care provider, physician, nurse, pharmacist, attitude, behaviour and immunization. It was interesting to identify that the bulk of the articles were related to health care provider attitude towards being immunized themselves. Of the articles that could be found related to the impact of physician attitude on acceptance of immunization, current and key historical references were found. The evidence from the literature was quite clear that physicians have a definite role in patient acceptance of immunization (Armstrong et al., 2001; Fiebach & Viscoli, 1991; Orenstein & Bernier, 1994; Zimmerman et al., 2003). Hinman and Orenstein (2007). Barriers to patient immunization within the clinical setting do exist and physicians, beyond the patient-physician interaction, have leadership and educational roles related to immunization (Burns & Zimmerman, 2001; 2005; Kimmel, Burns, Wolfe, & Zimmerman, 2007).

Physician attitude towards immunization is crucial, as their recommendation for immunization has been clearly shown to be predictive of patient vaccination (Centers for Disease Control and Prevention, 1988; Kimmel et al., 2007; Nichol, MacDonald, & Hauge, 1996) and a determining factor for the patient accepting immunization (Gust et al., 2004). As Kohlhammer, Schnoor, Schwartz, Raspe, and Schafer (2007) identified in their literature review from multiple sources, "nearly all studies emphasized doctors' recommendations as key factor influencing vaccination" (p. 742).

It must be noted that although physicians are supportive of immunization there are practical barriers to immunization. Provider barriers to immunization have been identified in five main categories: economic factors, time to provide the service, ready access to immunization records, multiple injections and provider knowledge. Economic factors include low reimbursement rates, lack of provider funding, costs of vaccine and vaccine storage and handling challenges (Burns & Zimmerman, 2001; Deutchman, Brayden, Siegel, Beaty, & Crane, 2002; Johnson, Nichol, & Lipczynski, 2008; Kempe et al., 2007; Kimmel et al., 2007; Petousis-Harris, Goodyear-Smith, Turner, & Soe, 2004). Time factors include the time necessary to educate and convince clients about the benefits of immunization (Kempe et al., 2007; Petousis-Harris et al., 2004; Szilagyi et al., 2005), which is related to economic factors. Accessibility to current immunization records has been cited as a barrier to immunization: partly related to fragmentation of immunization services, provided by multiple providers, and lack of a unified or electronic immunization tracking system (Burns & Zimmerman, 2001; Deutchman et al., 2002). Provider reluctance to give multiple injections during single patient visit, to meet current vaccination schedules, has been noted as a barrier to immunization (Burns & Zimmerman, 2001; Deutchman et al., 2002; Kimmel et al., 2007). Finally, provider knowledge has been identified as a barrier to immunization. It has been identified that increasingly complex immunization schedules, new vaccines and multiple injections, lack of knowledge related to the recommendations, and methods for risks benefit communication present ongoing challenges for practitioners to remain up-to-date and confident (Burns & Zimmerman, 2001, 2005; Deutchman et al., 2002; Jelleyman & Ure, 2004; Johnson et al., 2008; MacDonald, Henderson, & Oates, 2004). The need for

ongoing continuing medical education and professional dialogue through training and literature has been identified as a way to address these concerns (Jelleyman & Ure, 2004).

Fundamental to the success of immunization programs is the attitude of the health provider, which is supported by a sustained knowledge base of relevant immunization knowledge and confidence with risk-benefit communication to support prescribed immunization schedules (Orenstein et al., 2005). The leadership role of the physician as it relates to immunization is an important one. They have a role in educating themselves, their peers, and their patients and families about the importance of immunization (Kimmel et al., 2007).

Kirkpatrick Framework

The Kirkpatrick (1994) framework provided the evaluation framework for the Resident Vaccine Course. The four-level evaluation framework developed by Kirkpatrick was originally developed in 1959-60. Re-edited versions have been published, but few changes have been made over time. The Kirkpatrick framework is simple and flexible, made up of four levels of evaluation; reaction, learning, behaviour and results.

> *Level 1: Reaction.* Frequently referred to as the *happy face* evaluation, this level measures participant reaction to and satisfaction with the program and the learning environment.
> *Level 2: Learning*. Changes in knowledge, skills, and /or attitudes constitute learning in the Kirkpatrick model Excluded from the level of evaluation is the application of the learning on-the-job.
> *Level 3: Behaviour.* This level determines whether changes in behaviour have occurred as result of the program.
> *Level 4: Results.* Level 4 looks at the final results that occurred because the participants attended the program. Results can be thought of as "the bottom line", the impact of the program. (McLean & Moss, 2003, p. 4)

Kirkpatrick (1994) stressed that it is important to have information on Levels 1 and 2 in order to interpret results of Level 3 evaluations. Specifically, if no behaviour

change occurs, it is useful to determine whether this is due to participant dissatisfaction with the program (Level 1), a failure to accomplish the learning objectives (Level 2), or whether the lack of change in behaviour is due to factors beyond the scope of the program (e.g., a lack of desire, opportunity, support, or rewards for changing behaviour). I have created a representation of the Kirkpatrick framework, based on my understanding of various works that focused on his framework (see Figure 1). The base being the largest section because it is at this level that most program evaluation occurs. With each successive level, evaluation is more challenging and, in turn, done less frequently.

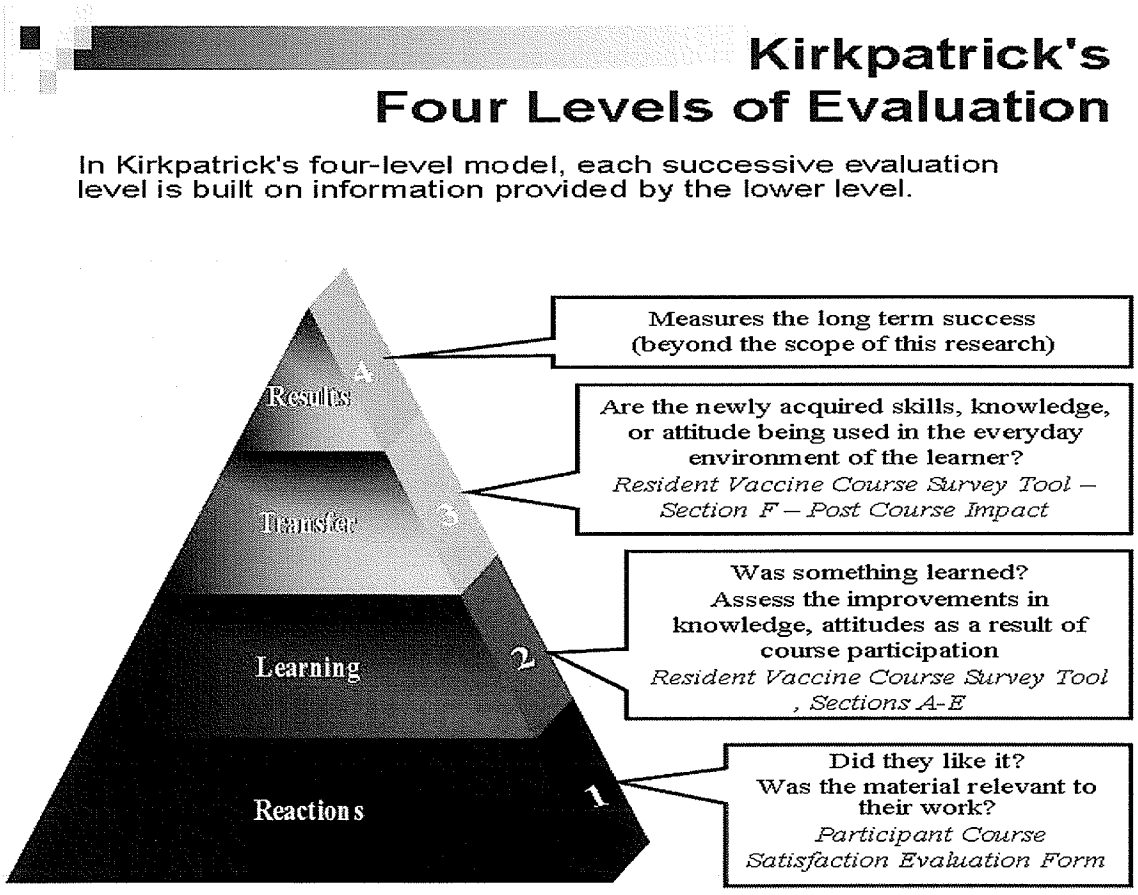

Figure 1. Kirkpatrick's four levels of evaluation

Resident's Vaccine Course 2007: Course Description

The course was designed to address several of the *Immunization Competencies for Health Professionals* (Public Health Agency of Canada, 2008) developed by the Professional Education Working Group of the Canadian Immunization Committee. These competencies, developed in consultation with a broad group of stakeholders involved in various aspects of immunization across Canada, represent the core knowledge and skills supporting exemplary immunization practices. By combining didactic lectures and small-group learning activities, using examples of real practice issues and "Hot Topics" in immunization in Canada today, the course aimed to assist physician trainees to develop the core competencies they need to effectively address those current immunization issues (McNeil & Grenier, 2007).

The Canadian Pediatric Society (2007) identified that the goals of the resident vaccine program are to:

> Help residents in becoming exemplary vaccine providers.
> Provide skill sets needed to be a vaccine advocate.
> Provide resources for continued self-learning.
> Foster interdisciplinary approaches and networking with health colleagues. (¶ 3)

Canadian Paediatrics Society has had a supportive and administrative role in all of the previous Canadian Resident Vaccine Training Programs.

Summary

The literature presented identifies the important role that health providers have in supporting the acceptance and delivery of immunizations. It additionally identifies the impact that provider knowledge gaps may have on the success of immunization programs. The literature offers explanation for the role of immunization competencies and the delivery of immunization education to support transformative learning.

Meaningful education for health professionals goes beyond the simple delivery of new information. It involves the whole learners—their values, belief and assumptions translated through how they see the world (Cranton & King, 2003). The opportunity for transformative learning opportunities has a primary role in supporting the achievement of sustained knowledge and positive attitudes and behaviour change over time.

Chapter Three: Method

Introduction

This chapter provides a description of the methodology used to explore the effectiveness of the Canadian Paediatric Society's 2007 Resident Vaccine Course. Recruitment of participants and ethical considerations are described. The process for the study design used a two-phase quasi-experimental pre-test/post test design to assess quantitative improvements in knowledge attitudes and beliefs with the addition of a qualitative section to assess post course behaviour change is also described. Finally, a description of the procedures used to collect and analyse the data is described.

Recruitment of Participants

The setting for this study was within the Canadian Paediatric Society's 2007 Resident Vaccine Course that was held in Montréal, Quebec, November 30-December 1, 2007 in Montréal, Quebec. The group that participated in this study were seventy-two medical residents (19 men and 53 women). The medical residents who participated in the resident vaccine course were identified through the program directors of the specialty program. The Canadian Associations of Interns and Residents Program identified the directors of the pediatric, community medicine, family medicine, and infectious diseases residency programs from across Canada. The directors were solicited via email communication from the Canadian Pediatric Society and were requested to identify two residents to attend the course. Invitations were distributed to these identified residents (see Appendix E). Therefore, attendance at the course came primarily from the following medical specialties: community medicine, family medicine, pediatrics, infectious

diseases-pediatrics, and infectious diseases-internal medicine. Funding for travel and accommodation was provided by the Canadian Pediatric Society.

Course Design

The 2007 Resident Vaccine Course (CPS, 2007), the 6th annual Canadian Resident Vaccine Training Program, was delivered using a combination of interactive teaching and learning modalities set within a framework of the newly articulated immunization competencies: competencies #3, 5, 6, 12, and 14 (see Appendix F: Course Objectives and Core Competencies) in an intense two-day, face-to-face educational program. Participants were provided with pre-reading materials for overall education, content to support a topic-specific debate, and topic-specific small group work (see: Appendix G: Resident Vaccine Course Pre-Reading Material). The Kirkpatrick (1994) evaluation framework, Levels 2 and 3, was used to provide a focus for the evaluation.

Evaluation Method

The evaluation method used was a two-phase, quasi experimental, pre-test/post-test design. Considerations for the use of this approach were based on the format in which the educational intervention occurred: a one-time educational intervention targeted towards a fairly narrow sector of the population. The research was implemented in two phases. In Figures 2 and 3, I have provided a pictorial diagram to describe the phases of this research.

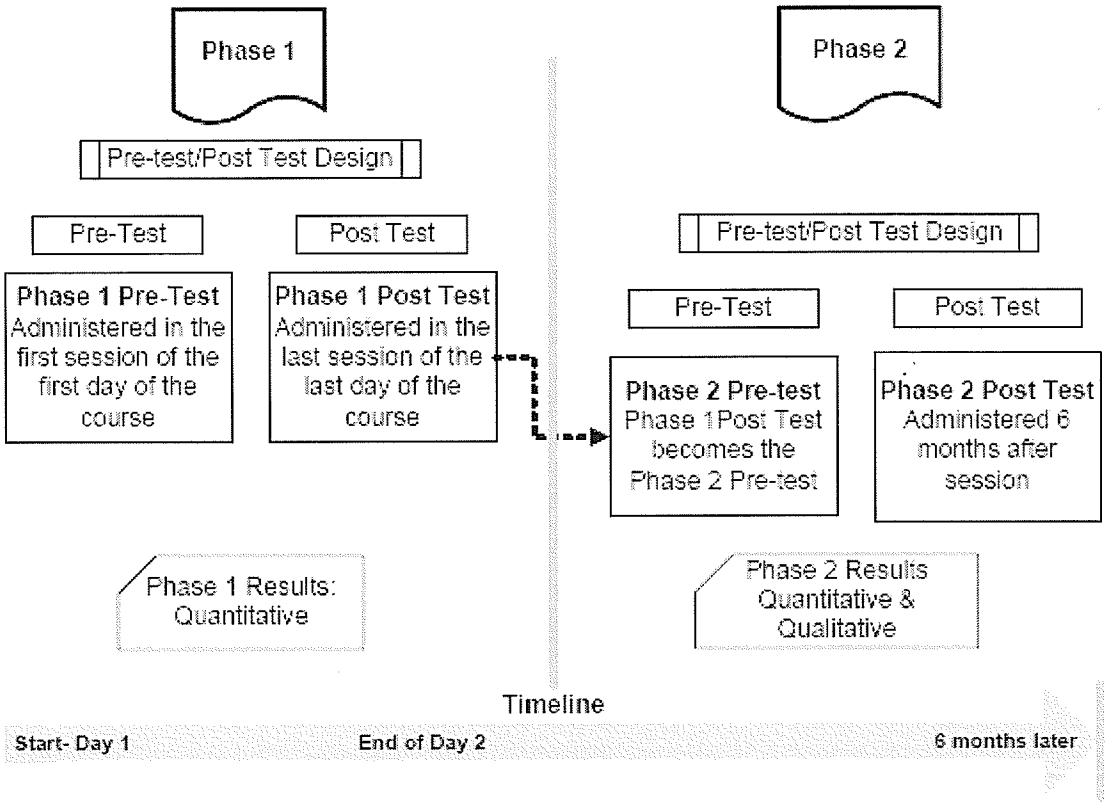

Figure 2. Research design Phase One and Phase Two

Phase 1			
Group (n=72)	Pre-test (paper survey 1)	Intervention (the course)	Post Test (paper survey 2)
A →	O_1 →	X_1 →	O_2

Phase 2			
Group (n= 19)	Pre-test (paper survey 2)	Intervention (6 months elapsed time)	Post Test (electronic survey)
A →	O_2 →	X_2 →	O_3

A = group O = observation X = Intervention

Figure 3. Two Phase pre-test/post-test design

Phase One was an equivalent groups pre-test/post-test design using a self-administered paper-based quantitative questionnaire completed by participants ($N = 72$) just prior to the commencement on day one of the course and at the end of the last session on day two of the course. This comparison was used to measure knowledge acquisition (Level 2: Knowledge as cited in Kirkpatrick, 1994) during the course. These medical residents would have been exposed to some of the course content as part of their undergraduate medical degrees, as part of their speciality programs, and additionally through assigned pre-course reading material, although we cannot assume that they had read all of the reading material prior to course attendance.

Phase Two was implemented six months later, using a pre-test/post-test non-equivalent design comparing the results of the Phase One post-test with the results of an anonymous mixed-method quantitative/qualitative web-based self-administered questionnaire post-test (see Appendix C) administered six months later. Twenty-one of the original seventy-two participants responded to the on-line survey. Participant responses were used to identify if enduring knowledge and positive attitudes (Kirkpatrick, 1994, Level 2) and qualitative self-reported results indicating behaviour change (Kirkpatrick, 1994, Level 3) were an outcome of attending the CPS 2007 Resident Vaccine Course.

At the time of the course, participants were advised that a post-intervention survey was planned and would be implemented in the spring of 2008. Participants were advised they should watch for the email invitation to participate, and they were encouraged to respond to the invitation when it came to them. An invitation email was sent by the Canadian Pediatric Society to participants inviting them to participate in the

post-session evaluation (see Appendix H). The invitation included the provision of a link to a secure server housed at the Canadian Centre for Vaccinology, where the electronic survey was situated (see Appendix C). Follow-up email reminders were sent two weeks and four weeks after the initial survey release. Participants completing the survey had the opportunity to print a self-addressed post card, which could be mailed back to the Canadian Center for Vaccinology to be included in a draw for a $100 gift certificate to a restaurant or merchant of the winner's choice. The study was approved by the University of Manitoba Education/Research Ethics Board on April 21, 2008. Additional ethics approval was sought and received from by the Capital Health Research Ethics Board, Centre for Clinical Research, Halifax Nova Scotia, on May 14, 2008, as the electronic survey was administered through the Canadian Center for Vaccinology. The survey was offered in English only.

Instrumentation

A survey tool was developed to assess knowledge, attitudes, and self-described behaviours related to immunization. The survey was developed following Dillman's (2000) principles of survey design. Questions to assess knowledge attitudes and self-described behaviours related to immunization were drawn from the literature from surveys which had been tested for reliability and validity (Grenier, Law, & Saad, 2005; Halperin, 2005; Johnston, Leung, Fielding, Tin, & Ho, 2003; McNeil, 2004) though reliability and validity were not specifically tested for this survey. Selected questions were drawn from these surveys to populate the pre-test and post test survey used for this study. A multi disciplinary subject matter expert group with expertise in immunization,

vaccinology, and medical education reviewed, selected questions and modified the survey tool prior to administration

This survey, the Resident Vaccine Survey (see Appendix B), was comprised of knowledge questions that were short-answer, matching, or fill-in-the-blank; and attitude/behaviour descriptives using five-point Likert scale questions. The survey was implemented to participants of the CPS 2007 Resident Vaccine Course immediately preceding the course and immediately post course. The Resident Vaccine Course Online Survey (see Appendix C) that was implemented in Phase Two was identical in content to the Resident Vaccine Survey (see Appendix B) administered in Phase One, with the addition of five open-ended questions regarding the impact the course had on their practice, behaviours and outcomes related to the fostering of continuing professional development of colleagues. The use of an electronic survey method was chosen to ensure timeliness in response and simplicity and ease of analysis.

Summary

The survey(s) were intended to identify changes in knowledge, positive attitudes, and indications of positive impacts to immunization related behaviour had occurred. The survey was implemented as a paper-based survey in Phase One and then as an electronic survey in Phase Two. The paper surveys were convenient to administer at the time of the course. As participants had demonstrated high levels of connection to electronic means of communication, as evidenced by the receipt of all invitations, notices, and pre-reading course material via email, it was reasonable to administer Phase Two of the survey electronically once the geographic disbursement of the course participants occurred post course. There is evidence for the use of both paper and electronic surveys for effective

measurement in continuing and medical education courses. Issues related to electronic survey methods will be explored in brief in the conclusion section.

Chapter Four: Results

Introduction

In this chapter the study findings are presented. The research methodology described in the chapter 3 was implemented in a phased approach to identify if the resident vaccine course had an impact on participant knowledge, attitudes, and behaviours related to immunization. Phase One was a quantitative equivalent groups pre-test/post-test design using a paper-based questionnaire administered just prior to the commencement of the course and at the end of the course. Phase Two occurred six months later in the form of a quantitative/qualitative survey, using a pre-test/post test non-equivalent design comparing the results of the Phase One post-test with the results of a web-based questionnaire administered six months later (see Figures 2 and 3). A review of selected participant demographics is presented. The quantitative portion of this research indicated a statistically significant improvement in knowledge and positive attitudes between pre-test and post test. Additionally there was maintenance of mean scores between immediate post-course results and results six months later. It was anticipated that there would be a drop off of score between the time of the course and six months later however unexpectedly, and of additional interest, was that the level of knowledge and positive attitudes had been retained over time, from the time of the course completion to the time of the time the electronic survey was administered six months later. This could possibly be attributed to the participants' interest and ongoing practice application of knowledge gained as a result of attending the Resident Vaccine Course. The qualitative findings indicate that participants' positive behaviour change may be attributable to attendance at the resident vaccine course. Finally, the position that the CPS

2007 Resident Vaccine Course holds for participants relative to other modes of immunization education is discussed.

Phase One: Quantitative Results

Phase One of the study involved seventy-two residents who completed the pre-test and post-test questionnaires at the time of the CPS 2007 Resident Vaccine Course. Nearly three quarters of participants were female (see Figure 4) and attendance was primarily from those enrolled in their second, fourth, and fifth year of medical specialty training.

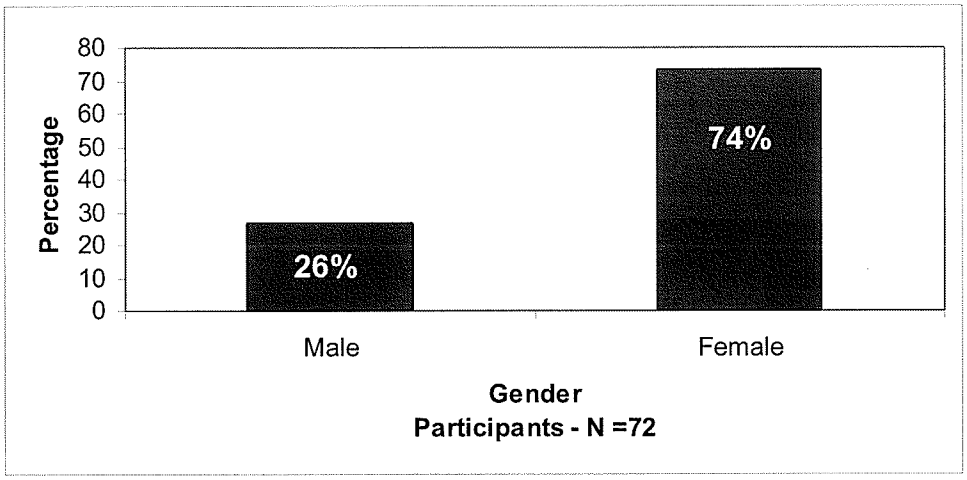

Figure 4. Phase One: Participants by gender

The program specialty of pediatrics had the largest participant representation (n= 22) followed by ID internal medicine (n =16); family medicine (n=13); community medicine (n=11) , ID pediatrics (n=6); and other (n=5) (see Figure 5).

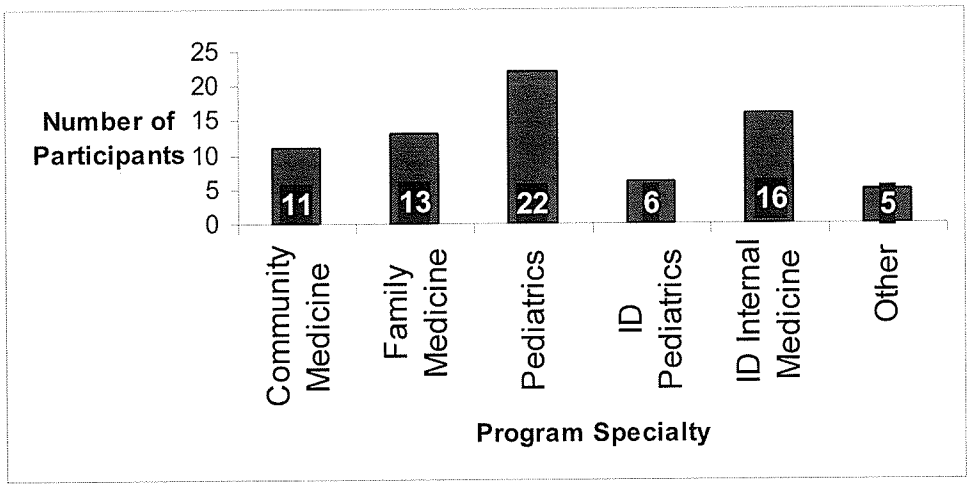

Figure 5. Phase One: Participants by program specialty

Quantitative results in Phase One come from the comparison of the pre-test results of Resident Vaccine Course Survey Tool (see Appendix B) when administered pre-course to the post-test scores achieved immediately post course. Scores were based on outcome scores comparing the total pre-test and total post-test scores. A paired sample *t*-test was conducted on the total scores, and results indicate that there was a significant difference between scores pre- and post-education session: *t* (-14.2); confidence interval -24 to -18; $p<.01$.

Table 1. *Phase One Quantitative Results*

			95% Confidence Interval of the Difference				
	Mean	Std Deviation	Lower	Upper	*t*	df	Sig.(2-tailed)
Score	-21.05	12.59	-24.00	-18.08	-14.18	71	.000

Phase Two: Quantitative Results

Phase Two of the study involved twenty-one residents who completed the Phase Two post test by means of an electronic survey (see Appendix C). Demographic data were based on result of the 21 participants who completed the electronic survey. More then eighty percent of participants were female (see Figure 6), with the program specialty of family medicine having the largest participant representation (n=11) followed by ID internal medicine (n=4); pediatrics (n=3); ID pediatrics (n=2); other (n=1) and no participants from community medicine (see Figure 7)

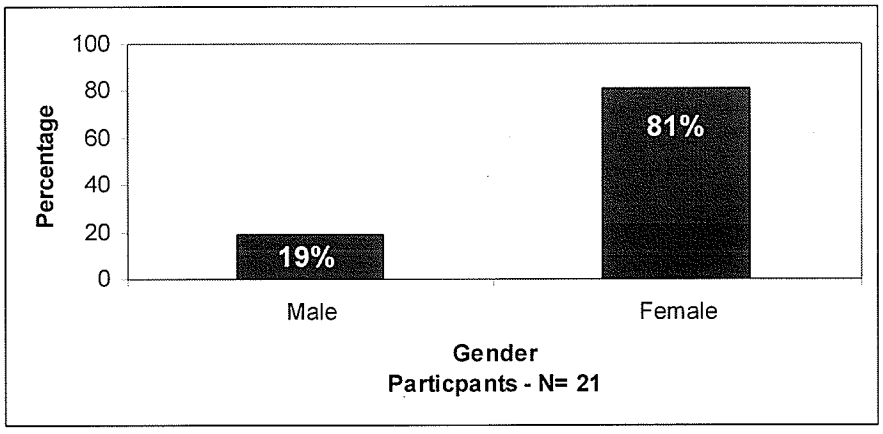

Figure 6. Phase Two: Participants by gender

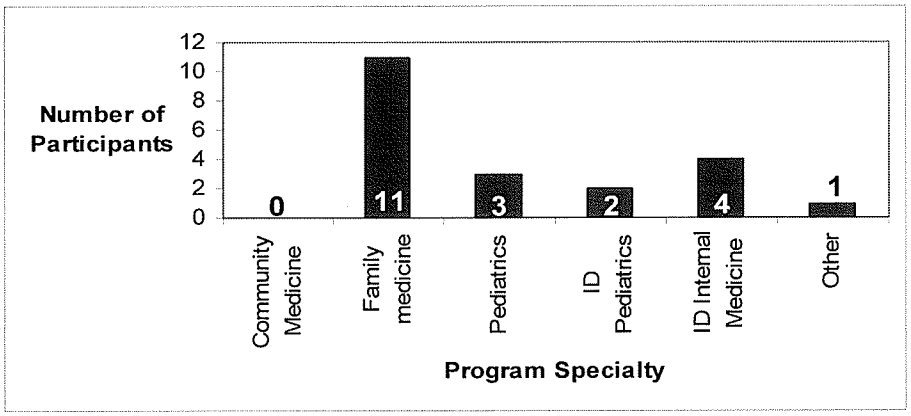

Figure 7. Phase Two: Participants by program speciality

It was hoped that there would be retention of knowledge acquired and positive attitudes attained and reflected in the post-education session results. Phase Two quantitative results were obtained by comparing the knowledge and attitude results of the Phase One post-test survey with the results from the electronic survey administered six months after the resident vaccine course. Due to two incomplete surveys, only nineteen of the completed surveys could be used for the comparison of knowledge and attitudes. A Kolmogrov-Smirrnov test (Green & Salkind, 2008) identified no difference in the variance between the two samples, so a one-sample *t*-test was used to determine statistical significance in the differences between the means of the independent samples of the total scores post test and the total scores late post test. The confidence intervals were high, which is likely related to the small sample size.

Table 2. *One-Sample t-Test Post-Test Electronic Survey Results*

		95% Confidence Interval of the Difference				
Total Scores	Mean Difference	Lower	Upper	*t*	df	Sig. (2-tailed)
Post-Test	159.21	156.91	161.51	138.04	71	.000
Late Post-Test	162.10	158.41	165.78	92.15	19	.000

Simple mean scores were calculated and compared pre-test, post-test, and late post-test to identify the effect of time on the retention of knowledge and attitudes. It was anticipated that there would be a drop off of score between the time of the course and six months later; there was actually a small increase in mean score (see Figure 8).

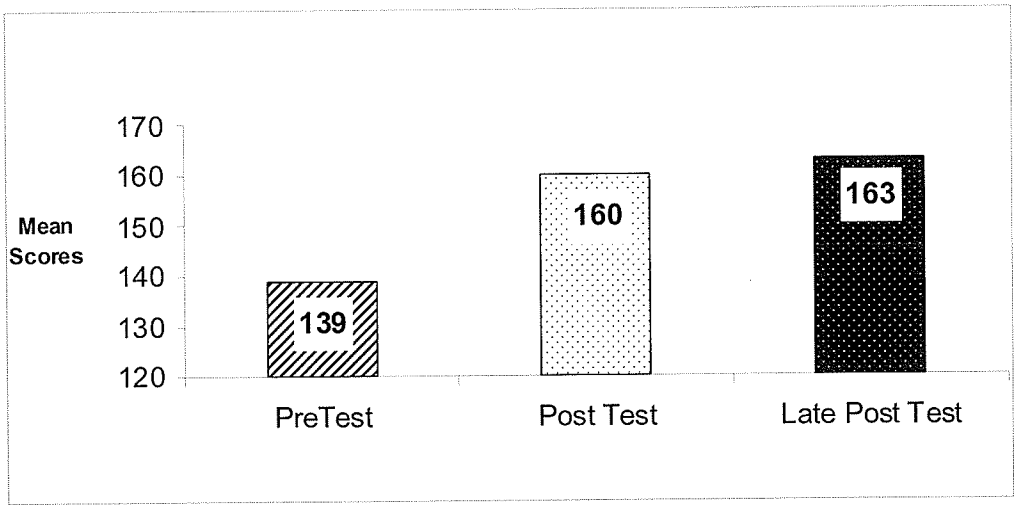

Figure 8. Improvements in mean score

Though the increase was not statistically significant, this result is an indication of maintenance of enduring knowledge and retention of positive attitudes.

Phase Two: Qualitative Results

The qualitative portion of the late post-test survey was intended to identify if longer-term behaviour change had occurred (Level 2: Knowledge and Level 3: Transfer as cited in Kirkpatrick, 1994) as a result of attending the CPS 2007 Resident Vaccine Course. Data analysis involved the summarizing of self-reported behaviour changes into themes. Six months after the education program, participants were asked to describe the impact of the CPS 2007 Resident Vaccine Course. In the Resident Vaccine Course On-Line Survey (see Appendix C), questions in Section F: Post Course Impact were used to elicit an indication of program impact and behaviour change. Seventy-five percent of respondents either agreed or strongly agreed that the resident vaccine course supported them to be able to inspire a shared vision with colleagues and model the way regarding positive attitudes and behaviours towards immunization.

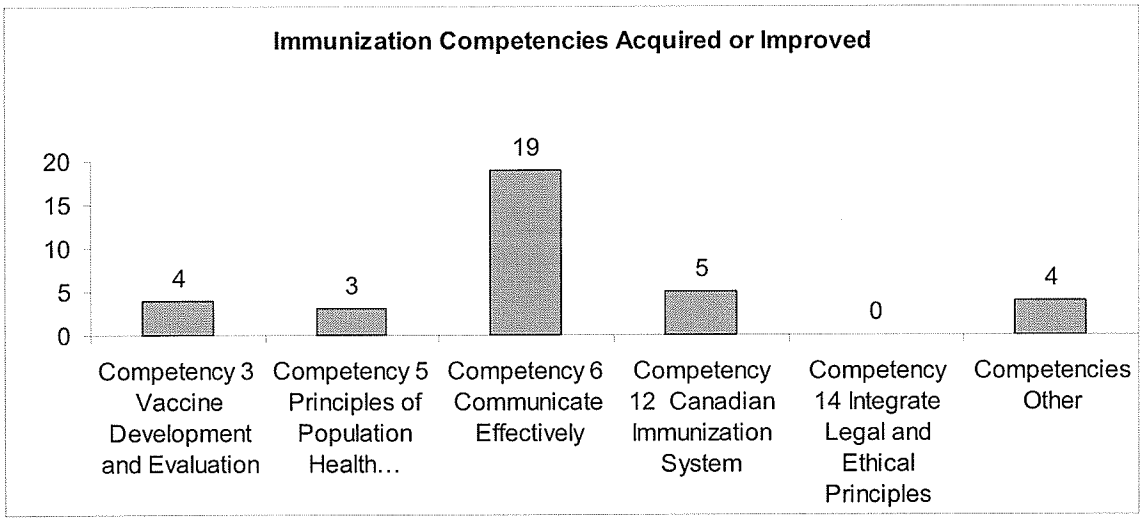

Figure 9. Phase Two results: Immunization competencies six months after the resident vaccine course

In the Phase Two results (see Figure 9), nineteen participants who completed the electronic survey provided 35 responses to the question regarding immunization competencies acquired or improved as a result of the CPS 2007 Resident Vaccine course Responses could be themed into four of the five competencies around which course curriculum had been developed. Responses clearly identified that, with the exception of competency #14—legal and ethical principles relevant to immunization practice, participants did acquire or learn more about core immunization competencies as intended from the curriculum design and could identify them six months after the program. Additionally, other competencies were also described, which could indicate learning from course material.

Seventeen survey respondents identified 33 practice impacts (see Figure 10). The qualitative analysis identified eight emergent themes. These themes included increases in: immunization awareness and knowledge, confidence in discussing immunization with clients; use of clinical opportunities to immunize; interest in policy decisions; interest in

policy decisions; vigilance about vaccine reminders; knowledge, acceptance, and issues of HPV vaccine; and feeling prepared to advocate immunization among colleagues.

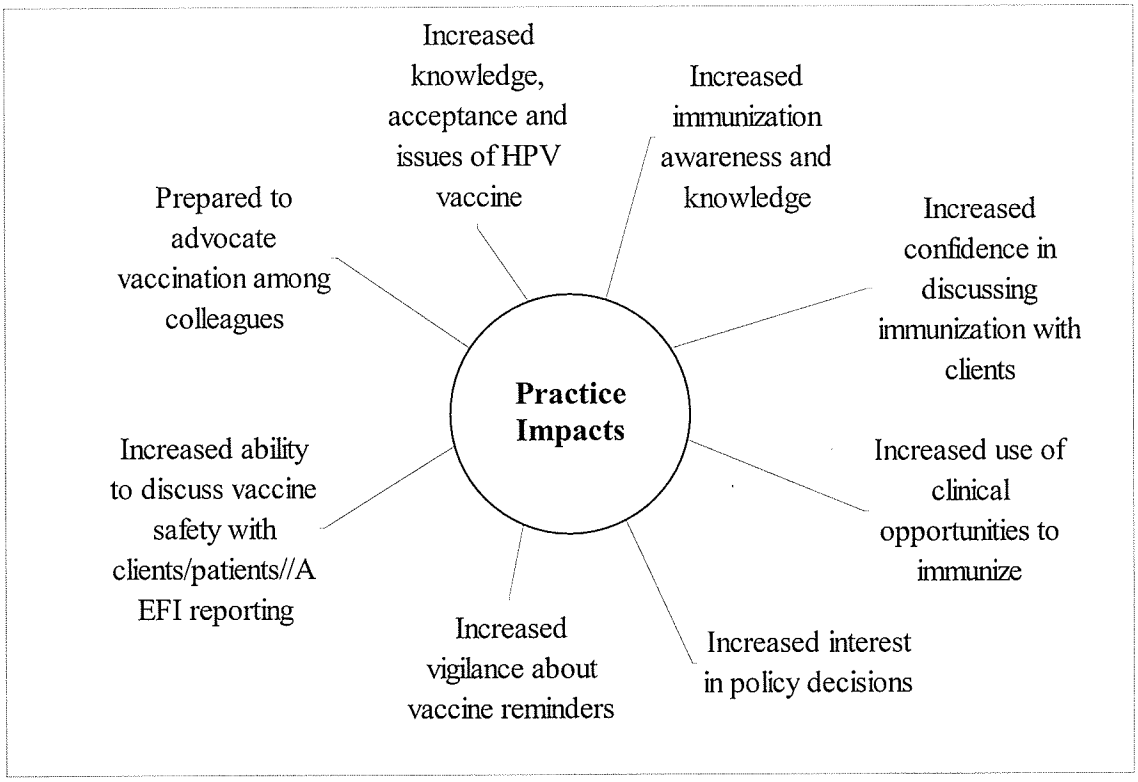

Figure 10. Practice impacts

The open-ended question that asked about participation in or facilitation of immunization-related activities to foster professional development of colleagues was an opportunity to self-report on transformative learning and provided evidence of Kirkpatrick's (1994) Level 3, where there is movement of knowledge acquired from self and moved out to others or reflected as applied learning back on the job. Thirteen respondents identified that, as an outcome of course participation, they were able to foster professional development (see Figure 11). The qualitative analysis identified the following emergent themes: immunization-related colleague support; participation in journal clubs and debates; presented or participated in teaching opportunities with

patients, students, and peers; presented at rounds (a practice in medical education where a health situation is discussed with background information and problem-solving for the purpose of learning at an individual and group level); and so forth.

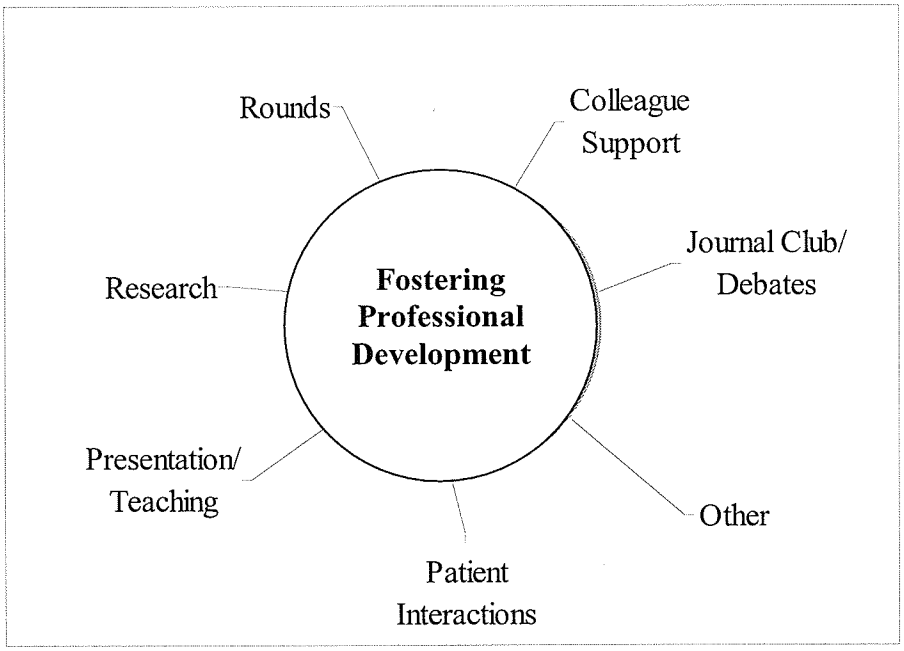

Figure 11. Fostering professional development

There was interest from the program planners to identify participant perception of their sources of immunization knowledge. Participants identified that a substantive amount of their vaccine knowledge came equally from their medical school/residency training program (36%), the resident vaccine course (33%), and from other sources (36%).

Discussion

The findings from the survey were interesting. In the six-month period between the completion of the course and the implementation of the electronic survey, participants retained knowledge and were able to identify both practice impacts and transfer of learning to colleagues. The result would have been stronger with a larger sample size.

Results of the qualitative analysis of the open-ended questions administered in the post-intervention electronic survey provide positive indication of the course impact.

Summary

I have presented the results of the surveys used to evaluate the effectiveness of the 2007 Resident Vaccine course in effecting the acquisition and enduring retention of immunization related knowledge and positive attitudes. Additionally the post-test survey administered six months later served to identify behaviour change as a result of attending the course. Finally, it was identified that the CPS 2007 Resident Vaccine Course provided an equal contribution to the immunization education of medical residents as compared to undergraduate medical education and medical specialty education.

Chapter Five: Conclusion and Recommendations

Introduction

This study sought to explore the effectiveness of the CPS 2007 Resident Vaccine Course as a means of achieving short-term knowledge gain and attitude improvements, as well as the longer-term goals of retention of knowledge and positive attitudes and behaviour change related to immunization. The results of the study indicate that, from course commencement and over a six-month period, participants were not only able to acquire knowledge and positive attitudes, but also the course had an impact on their practice and behaviour.

The results, obtained through the use of the study survey tool, indicated that there were improvements in knowledge and attitudes between the pre-and post-test, indicating that the educational session did have an immediate and measurable impact post course. A surprising outcome was maintenance of the mean scores between the post-test and the late post-test. This was not anticipated. This could indicate that the acquisition of new knowledge and positive attitudes followed by the application of knowledge in the work place supports a trajectory of learning that sustains the retention of knowledge and positive attitudes that was observed between the intervention and post-test administered six months later.

One of the concerns affecting analysis of the results of this research was the relatively low response rate to the late post-test electronic survey. However, a review of the literature identified that the 30% response rate to this survey was consistent with response rates to other electronic surveys targeted towards medical students. Paolo, Bonaminio, Gibson, Partridge, Partridge, and Kallail (2000) identified a 24% medical

student response to an electronic survey. Grava-Gubins and Scott (2008) identified that, even in the presence of shortened questionnaires, more contacts, enhancing marketing and follow-up, and the offer of financial incentive, response rates remained at 29.9%.

Notable, was the disproportionate gender difference of participants (male 26%, female 74%). To determine if this gender difference was usual or unusual, the Association of Faculties of Medicine of Canada was contacted regarding registrant gender by specialty program. Canadian Post-MD Education Registry data were provided, which identified enrollment by gender in medical specialty program registrants. The gender comparisons between the Resident Vaccine Course and Post-MD Trainees are presented in Figure 12. Gender distribution for the CPS 2007 Resident Vaccine Course; 74% female and 26% male is similarly disproportionate to that of the complete set of Post-MD trainees; 61% female and 39% male (adjusted to represent medical trainees in pediatrics, community medicine, family medicine, and pediatric infectious diseases and internal medicine infectious diseases).

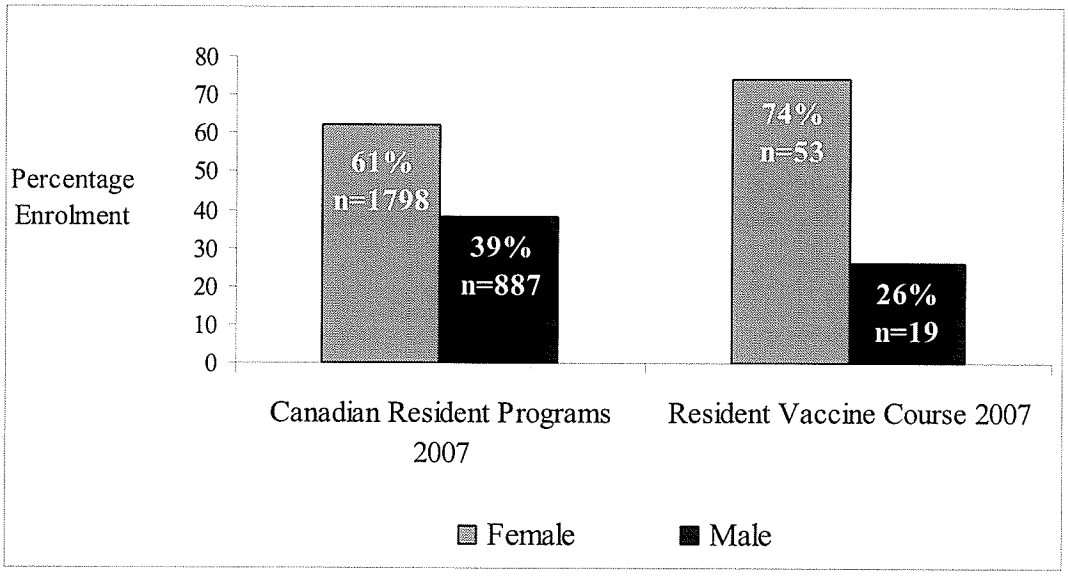

Figure 12. Percentage enrolment by gender

The post-test qualitative results obtained from the electronic survey administered six months post course indicated a willingness of participants to take the new knowledge and apply it in the practice setting. Participants were able to identify immunization competencies learned and practice impacts, as well as activities to foster professional development of colleagues.

The findings have limited generalizability because of low response rates and small sample sizes. The results do suggest, however, that the Resident Vaccine Course (CPS 2007), using problem-based learning built on a competency-based framework, can create an environment that promotes sustainable positive attitudes and behaviours towards immunization in professional practice.

The purpose of this research was to evaluate the CPS 2007 Resident Vaccine Course to identify if the mixed method learning environment, using curriculum based on the *Immunization Competencies for Health Professionals* (Public Health Agency of Canada, 2008) could achieve knowledge acquisition, sustained knowledge, and attitude retention, and most importantly, have an impact on practice. The outcomes of this research indicate that the Resident Vaccine Course (CPS, 2007) has contributed to an improvement in participant knowledge and attitudes about immunization. Research results also indicate that the knowledge and attitudes were sustained over time in the participants who completed the survey six months after the education session. Additionally, through self-report, participants were able to articulate activities that are indicators of practice impacts and behaviour change.

Challenges exist in measuring behaviour change. The Kirkpatrick (1994) framework offers guidance; but in the real practice world, level three evaluation requires

observation by a trained observer, which lies outside the scope of this research as well as outside the scope of much educational research, as control group conditions are so difficult to obtain (McLean & Moss, 2003). Can self-reported behaviour changes and self-reported practice impacts be used as a true measure of program success? Participants may have been able to state that the CPS 2007 Resident Vaccine Course had an impact on their professional practice. Participants have also been able to articulate specific examples, but absolute proof of the outcomes can not be proved or disproved. A cause-and-effect relationship can not be established between resident attendance at an immunization education course and an outcome of improved immunization. There does not exist, at the present time, any systematic way to measure provider effectiveness as measured by immunization rates. Additionally, immunization rates of the population and the degree to which an individual are "up-to-date" on their immunization is highly variable.

The limitations of these results include the small study size, the use of a convenience sample and in particular, the small group who participated in the electronic post-test survey six months after the course. Participant bias can not be ruled out related to selection process to attend the education session. There is a possibility that only those very keen on immunization completed the post-test electronic survey, which may have skewed the results. Additionally, there is no ability to rule out any changes or impacts that may have occurred between the completion of the resident vaccine course and when the post-test was administered. The study design did not allow me, as the researcher, to compare participant-specific results between the pre-test/post-test survey at the time of the education session to the post-test results obtained six months later. Is six months post-

intervention sufficient elapsed time to determine knowledge and attitude retention over time? Are self-reported knowledge acquisition and practice impacts a valid method of determining longer-term program impact and behaviour change?

Recommendations

Recommendations for further study fall into the areas of professional development and education in the medical field. Areas for further research include replication of similar research with a larger sample group that could be measured over time, through connected pre-test/post-test surveys, with a post-test implemented later to determine behaviour change. A greater focus on the measurement of behavioural change may shed light on the effectiveness of problem-based learning within a competency-based framework to achieve transformation. Another area for further research could be the impact of both gender and resident specialty on knowledge attitudes and behaviours towards immunization.

It would be of interest to identify if other competencies-based education programs directed to health care providers, delivered to encourage transformative learning, could achieve measurable impact well after the education session has been delivered. The cost of the Resident Vaccine Program (CPS, 2007), which brings a subset of medical residents together for an intense two-day education program, must be considered as time and resource intense and excludes many from the educational opportunity. The use of technology to overcome distance with creative curriculum design, including blended learning models, that promotes knowledge transfer and transformation and the used of web-based communities of practice could be explored further.

Conclusions

On the basis of the data collected and the findings of this study, the following conclusions can be made: learning occurred, knowledge was retained over time, and positive behaviours and practice impacts could be described by course participants. Therefore, this small study supports the assertion that competency-based education delivered in creative ways supports transformative learning.

Summary

The results of this study demonstrated that the use of creative educational methods, using a competency-based framework created an environment for transformative learning that supported sustained positive attitudes and behaviours in professional practice. Competency-based education, using problem-based learning with strategic use of technology could be used to achieve transformative learning. Challenges remain in the ability to measure the longer-term outcomes of participation in immunization education on improved immunization rates. However, the results of this study provide a good foundation or starting point for the development of continuing medical education opportunities that are competency-based and are grounded in educational methods that support transformative learning.

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Appendix A: Resident Vaccine Course Program, Course Description

2007 Residents Vaccine Course
Hot Topics in Immunization
November 30 and December 1, 2007
Marriott Château Champlain
Montreal, Quebec

Course Program

Co-Chairs: Drs. Shelly McNeil and Danielle Grenier

Course Objective: This course has been designed to address several of the "Core Competencies for Immunization Providers" developed by the Professional Education Working Group of the Canadian Immunization Committee. These competencies, developed in consultation with a broad group of stakeholders involved in various aspects of immunization across Canada, represent the core knowledge and skills supporting exemplary immunization practices. By combining didactic lectures and small-group learning activities and using examples of real practice issues and "hot topics" in immunization in Canada today, this course aims to assist physician trainees to develop the core competencies they need to effectively address current immunization issues.

At the end of this course, participants should:

- demonstrate an understanding of why knowledge regarding vaccine development and evaluation is relevant to daily practice;
- apply relevant principles of population health to practice and integrate into daily practice strategies for improving immunization rates;
- communicate effectively about immunization as relevant to their practice setting (s);
- demonstrate an understanding of the immunization system in Canada and its impact on their practice;
- integrate legal and ethical principles relevant to immunization practice.

Friday, November 30 *(Le Caf Conc)*	
1600-1645	Registration and reception
1645-1700	Welcome — *Shelly McNeil, MD*
1700-1830	Participant Debate (Facilitator: *Simon Dobson, MD*) Resolved: Current scientific evidence supports immediate implementation of school-based HPV immunization programs for adolescent girls Hot Topic: HPV Immunization
1830-1845	Q & A

Saturday, December 1 *(Le Caf Conc)*

0700-0800	Breakfast
0800-0845	Vaccine Risk Communication — *Noni MacDonald , MD* *Hot Topic: Vaccine Refusers*
0845-0900	Q & A
0900-0930	Vaccine Development and Evaluation and The Canadian Immunization System *David Scheifele, MD* *Hot Topic: Rotavirus vaccines (old and new)*
0930-0945	Q & A
0945-1015	Health break
1015-1145	Workshops (Hot Topics) *GROUP 1 (PURPLE): GBS/Conjugate quadrivalent meningoccal vaccine* *Brian Ward, MD* *GROUP 2 (RED): Maternal Immunization* *Beth Halperin, RN and Deborah Money, MD* *GROUP 3 (PINK): HPV catch-up programs* *Simon Dobson, MD* *GROUP 4 (ORANGE): Mandatory influenza vaccination for health care professionals?* *David Scheifele, MD* *GROUP 5 (BLUE): Pandemic influenza* *Alex Henteleff, RN and Theresa Tam, MD* *GROUP 6 (GREEN):* Autism/MMR *Noni MacDonald , MD* *GROUP 7 (YELLOW):* Hepatitis A *Scott Halperin, MD* *GROUP 8 (BLACK):* Immunization of hard to reach populations *Ian Gemmill, MD and Geneviève Petit, MD*

1200-1315	Lunch *(Restaurant: Samuel de Champlain)*
1315-1345	Population Health for Immunizers — *Geneviève Petit, MD* *Hot Topic: Measles and Mumps*
1345-1400	Q & A
1400-1500	Groups 1-4 presentations (Moderator: *Danielle Grenier, MD)* *5-minute presentation + 5-minute Q&A per group*
1500-1515	Health break
1520-1620	Groups 5-8 presentations continue (Moderator: *Shelly McNeil, MD)*
1620-1700	Ask the experts (panel discussion) (Moderator: *Danielle Grenier, MD*) *Alex Henteleff, RN, Noni MacDonald, MD, Geneviève Petit, MD, Shelly McNeil, MD and David Scheifele, MD*
1700-1705	Closing remarks — *Shelly McNeil, MD*
1705-1800	Reception and certificates

Posted: November 2007

Appendix B: Resident Vaccine Course Survey Tool

Survey Questions – Attendees of the 2007 Resident Vaccine Course

Participant – Course Evaluation

Thank you for taking the time to fill out this survey. The purpose of this survey is to measure the effectiveness of the 2007 Resident Vaccine course that you attended November 30-December 1, 2007 and, in part, to measure what you have learned in the course. Your feedback is very valuable to us.

Please answer truthfully (i.e. Do not tell us what you THINK we want to hear, rather tell us what YOU really believe) and complete all the questions.

All responses are strictly confidential, will only be seen by those analyzing the results and will not be used to personally evaluate the course attendees.

All individual identities will be masked and the analysis of the data will be blinded. Only the aggregate results will be used for publication.

SECTION A - DEMOGRAPHIC INFORMATION

1. ☐ Male ☐ Female

2. What residency program are you currently in?
   - ☐ Community Medicine
   - ☐ Family Medicine
   - ☐ Pediatrics
   - ☐ Infectious Diseases- Pediatrics
   - ☐ Infectious Diseases- Internal Medicine
   - ☐ Other, please specify: _____

3. What is your current year of residency?
   - ☐ 1st
   - ☐ 2nd
   - ☐ 3rd
   - ☐ 4th
   - ☐ 5th
   - ☐ Other, please specify: _____

SECTION B – GENERAL KNOWLEDGE

4. In lay terms, explain what is meant by the term "herd immunity" and give an example to illustrate it.

---

5. In Canada, immunization providers should report adverse events following immunization to: (Choose the most appropriate answer)

- ☐ the Vaccine Safety Division of the Public Health Agency of Canada
- ☐ local public health authorities
- ☐ the Vaccine Adverse Events Reporting System (VAERS)
- ☐ the Biologics and Genetics Therapies Directorate of Health Canada

6. List at least 4 elements of informed consent.

---

7. Match each organization with the most appropriate description of its function by inserting the letter corresponding to the appropriate description on the line beside each organization.

Biologics and Genetics Therapies Division _____

National Advisory Committee on Immunization _____

Canadian Immunization Committee _____

Provincial and Territorial Ministries of Health _____

A. Decides when a new public program will be implemented and in which target group(s).
B. Approves vaccines for sale in Canada.
C. Provides expert scientific review of new vaccines and issues recommendations for their use.
D. Makes recommendations for use of vaccines in publicly funded programs, taking into consideration economic and political factors.

8. Identify 3 effective strategies to increase immunization coverage in a population.

_____

9. In an outbreak, if there are more cases of disease in vaccinated individuals, does this mean that the vaccine is not effective? Give an example to illustrate your reasoning.

_____

10. List at least 4 elements of causality assessment.

_____

11. List 3 goals of the National Immunization Strategy.

_____

_____

_____

SECTION C - ATTITUDES

In this section, we would like to know how important you feel each statement is by marking an "X" in the appropriate box.

As a vaccine provider, how important is it to…	Not at all important	Somewhat important	Neither important nor unimportant	Somewhat important	Very important
12. Provide information to an individual or family about the benefits and risks of vaccine prior to vaccination?	☐	☐	☐	☐	☐
13. Know the requirements for reporting of adverse events following vaccination?	☐	☐	☐	☐	☐
14. Encourage all health care workers to be immunized annually with influenza vaccine?	☐	☐	☐	☐	☐
15. Continue to vaccinate even if some diseases have disappeared in Canada?	☐	☐	☐	☐	☐

In this section, please indicate your opinion about each statement by marking an "X" in the most appropriate box.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
16. All vaccines for which an individual is eligible should be given at each visit.	☐	☐	☐	☐	☐
17. At each visit, it is important to ask parents/patients about the prior occurrence of any vaccine associated adverse events.	☐	☐	☐	☐	☐
18. Media coverage regarding vaccines and chronic diseases has increased my concerns about the safety of vaccines.	☐	☐	☐	☐	☐
19. Adequate systems are in place for ensuring a vaccine is safe once marketed in Canada.	☐	☐	☐	☐	☐
20. The advice of a health care provider is an important factor affecting whether a person accepts immunization.	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
21. I understand the purpose and major goals of the National Immunization Strategy.	☐	☐	☐	☐	☐
22. Vaccines are adequately tested for safety prior to marketing.	☐	☐	☐	☐	☐
23. Vaccines produce more health benefits than health risks.	☐	☐	☐	☐	☐
24. I received adequate teaching about immunization during my training.	☐	☐	☐	☐	☐
25. Developing a comprehensive national vaccine registry is important.	☐	☐	☐	☐	☐
26. I feel confident in my ability to communicate information about vaccination benefits and risks to parents and patients.	☐	☐	☐	☐	☐
27. I can identify resources for ongoing education regarding vaccines and immunization programs.	☐	☐	☐	☐	☐
28. I have an understanding of both common and infrequent vaccine associated adverse events.	☐	☐	☐	☐	☐
29. I am interested in pursuing the field of immunization as part of my professional career.	☐	☐	☐	☐	☐
30. I understand how decision-making around immunization programs works in Canada.	☐	☐	☐	☐	☐
31. I feel prepared to discuss controversies surrounding immunization with my patients or their parents.	☐	☐	☐	☐	☐

For each of the following statements, please mark an "X" in the most appropriate box. If any of the actions are not applicable to your experience and/or practice, select "not applicable".

In my experience…	Never	Rarely	Sometimes	Frequently	Always	Not applicable
32. I use the Canadian Immunization Guide as a resource.	☐	☐	☐	☐	☐	☐
33. I discuss the disease against which the vaccine is designed to protect against at the immunization visits.	☐	☐	☐	☐	☐	☐
34. I discuss potential side effects of the vaccine at the immunization visits.	☐	☐	☐	☐	☐	☐
35. I report clinically significant averse events following vaccinations.	☐	☐	☐	☐	☐	☐
36. I receive an annual influenza immunization.	☐	☐	☐	☐	☐	☐
37. I recommend vaccines not yet funded by the government.	☐	☐	☐	☐	☐	☐
38. I advocate for immunization among my colleagues.	☐	☐	☐	☐	☐	☐
39. I use *Your Child's Best Shot* as a resource.	☐	☐	☐	☐	☐	☐
40. I am confident when responding to concerns from parents or patients who refuse immunization.	☐	☐	☐	☐	☐	☐

SECTION D – CORE COMPETENCIES FOR IMMUNIZATION PROVIDERS

Having read the *Core Competencies for Immunization Providers*, Please answer by an "X" in the appropriate box

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
41. I support the principles of the *Core Competencies for Immunization Providers*.	☐	☐	☐	☐	☐	☐
42. The *Core Competencies for Immunization Providers* is a useful framework for my practice in immunization.	☐	☐	☐	☐	☐	☐
43. The *Core Competencies for Immunization Providers* should be an integral part of the undergraduate medical curriculum.	☐	☐	☐	☐	☐	☐
44. From my personal observation and experience, core competencies for immunization are being practiced currently in my service area.	☐	☐	☐	☐	☐	☐
45. I have a clear understanding of the immunization core competencies.	☐	☐	☐	☐	☐	☐

SECTION E– SOURCES OF IMMUNIZATION KNOWLEDGE

46. If you compare your medical school and residency training regarding vaccines to what you have learned at the course;

47. What percentage of your total vaccine knowledge came from your medical school and residency training?

☐0-25 ☐26-50 ☐51-75 ☐76-100

48. What percentage of your total vaccine knowledge came from other sources?

☐0-25 ☐26-50 ☐51-75 ☐76-100

49. What other sources do you feel contributed to your vaccine knowledge?

_____

50. What percentage of your total vaccine knowledge came from this course?

☐0-25 ☐26-50 ☐51-75 ☐76-100

Appendix C: Resident Vaccine Course On-Line Survey

Survey Preamble
Information Letter/Consent Form

Survey website:
http://ccfv-survey.dal.ca/cgi-bin/rws3.pl?FORM=ResidentVaccine

Research Project Title: Immunization Core Competencies and Transformative Learning: Can knowledge and positive attitudes and behaviors be achieved and maintained over time.

Researcher(s): Alexandra Henteleff, Master's Student, University of Manitoba
Shelly McNeil, MD, Canadian Centre for Vaccinology, Dalhousie University

Sponsor: with the support and endorsement of:
Canadian Association for Immunization Research and Evaluation
Canadian Pediatric Society
Canadian Centre for Vaccinology, Dalhousie University

This information letter, a copy of which will be left online on this site or which you may now print a hard copy, for your records and reference is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask by contacting: xxxxx@#xxxxx.xx Please take the time to read this carefully and to understand any accompanying information.

1. This research will assist in evaluating the benefit and effect of the Canadian Residents Vaccine Training Program 2007 Residents Vaccine Course *Hot Topics in Immunization.* This program used transformative learning theory (and action to achieve learning) and problem based learning methods to achieve knowledge acquisition and positive attitudes and behaviors over time using the Core Competencies for Immunization Providers as a framework for curriculum development.
2. This research is being undertaken as a component of a Masters of Education program with the Faculty of Education at the University of Manitoba.
3. This research is needed to identify if the program as designed was successful in achieving the stated goals which are listed below.
    i. Help residents in becoming exemplary vaccine providers.
    ii. Provide skill sets needed to be a vaccine advocate.
    iii. Provide resources for continued self-learning.
    iv. Foster interdisciplinary approaches and networking with health colleagues.

4. This research is needed to inform improvements and identify the relative merits or recommendations for seeking ongoing or alternate funding to continue offering the course as designed and/or to make recommendations for improvement.
5. This survey will be conducted exclusively online. It is expected that the survey will take 15-20 minutes to complete.
6. No risk, greater than that which one might experience in the normal conduct of one's everyday life, is expected as a result of this research.
7. Your responses will be saved into a database, but no additional data will be obtained.
8. Any optional information you choose to submit (such as email address or name) will be securely stored according to University of Manitoba's standard procedures for handling data from learners. After six months, all data will be deleted.
9. Survey results will be posted online after the survey has been closed (date to be determined). A direct link to the survey results will be provided on this web page.
10. At the completion of the survey you will have the opportunity to have your name entered for a draw for a $100.00 gift certificate to a restaurant or merchant of the winner's choice. If you are interested in putting your name into the draw, you will complete a ballot at the end of the survey. This information will be put into a separate database that will not be linked to your survey answers. The draw will occur when survey collection is complete.

By clicking on the "I accept" button and completing this survey, you indicate that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. You may simply close your web browser window if you wish to exit the survey prior to completion. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Alexandra Henteleff
xxx-xxx-xxxx
xxxxxxx@xxxx.xxx

This research has been approved by the Education/Nursing Research Ethics Board, University of Manitoba and the QEII Health Sciences Centre Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the University of Manitoba Human Ethics Secretariat at xxx-xxx-xxxx, or e-mail xxxxx@xxxx.xx. Please print a copy of this consent form to keep for your records and reference.

[A "click button" will be provided for participants to confirm their consent and to continue with the survey]

Survey Questions – Attendees of the 2007 Resident Vaccine Course

Participant – Course Evaluation

Thank you for taking the time to fill out this survey. The purpose of this survey is to measure the effectiveness of the 2007 Resident Vaccine course that you attended November 30-December 1, 2007 and, in part, to measure what you have learned in the course. Your feedback is very valuable to us.

Please answer truthfully (i.e. Do not tell us what you THINK we want to hear, rather tell us what YOU really believe) and complete all the questions.

All responses are strictly confidential, will only be seen by those analyzing the results and will not be used to personally evaluate the course attendees.

All individual identities will be masked and the analysis of the data will be blinded. Only the aggregate results will be used for publication.

SECTION A - DEMOGRAPHIC INFORMATION

1. ☐ Male ☐ Female

2. What residency program are you currently in?
   - ☐ Community Medicine
   - ☐ Family Medicine
   - ☐ Pediatrics
   - ☐ Infectious Diseases- Pediatrics
   - ☐ Infectious Diseases- Internal Medicine
   - ☐ Other, please specify: _____

3. What is your current year of residency?
   - ☐ 1st
   - ☐ 2nd
   - ☐ 3rd
   - ☐ 4th
   - ☐ 5th
   - ☐ Other, please specify: _____

SECTION B – GENERAL KNOWLEDGE

4. In lay terms, explain what is meant by the term "herd immunity" and give an example to illustrate it.

5. In Canada, immunization providers should report adverse events following immunization to: (Choose the most appropriate answer)

- ☐ the Vaccine Safety Division of the Public Health Agency of Canada
- ☐ local public health authorities
- ☐ the Vaccine Adverse Events Reporting System (VAERS)
- ☐ the Biologics and Genetics Therapies Directorate of Health Canada

6. List at least 4 elements of informed consent.

---

7. Match each organization with the most appropriate description of its function by inserting the letter corresponding to the appropriate description on the line beside each organization.

Biologics and Genetics Therapies Division _____

National Advisory Committee on Immunization _____

Canadian Immunization Committee _____

Provincial and Territorial Ministries of Health _____

A. Decides when a new public program will be implemented and in which target group(s).
B. Approves vaccines for sale in Canada.
C. Provides expert scientific review of new vaccines and issues recommendations for their use.
D. Makes recommendations for use of vaccines in publicly funded programs, taking into consideration economic and political factors.

8. Identify 3 effective strategies to increase immunization coverage in a population.

_____

9. In an outbreak, if there are more cases of disease in vaccinated individuals, does this mean that the vaccine is not effective? Give an example to illustrate your reasoning.

_____

10. List at least 4 elements of causality assessment.

_____

11. List 3 goals of the National Immunization Strategy.

_____

_____

_____

SECTION C - ATTITUDES

In this section, we would like to know how important you feel each statement is by marking an "X" in the appropriate box.

As a vaccine provider, how important is it to…	Not at all important	Somewhat important	Neither important nor unimportant	Somewhat important	Very important
12. Provide information to an individual or family about the benefits and risks of vaccine prior to vaccination?	☐	☐	☐	☐	☐
13. Know the requirements for reporting of adverse events following vaccination?	☐	☐	☐	☐	☐
14. Encourage all health care workers to be immunized annually with influenza	☐	☐	☐	☐	☐
15. Continue to vaccinate even if some diseases have disappeared in Canada?	☐	☐	☐	☐	☐

In this section, please indicate your opinion about each statement by marking an "X" in the most appropriate box.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
16. All vaccines for which an individual is eligible should be given at each visit.	☐	☐	☐	☐	☐
17. At each visit, it is important to ask parents/patients about the prior occurrence of any vaccine associated adverse events.	☐	☐	☐	☐	☐
18. Media coverage regarding vaccines and chronic diseases has increased my concerns about the safety of vaccines.	☐	☐	☐	☐	☐
19. Adequate systems are in place for ensuring a vaccine is safe once marketed in Canada.	☐	☐	☐	☐	☐
20. The advice of a health care provider is an important factor affecting whether a person accepts immunization.	☐	☐	☐	☐	☐
21. I understand the purpose and major goals of the National Immunization Strategy.	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
22. Vaccines are adequately tested for safety prior to marketing.	☐	☐	☐	☐	☐
23. Vaccines produce more health benefits than health risks.	☐	☐	☐	☐	☐
24. I received adequate teaching about immunization during my training.	☐	☐	☐	☐	☐
25. Developing a comprehensive national vaccine registry is important.	☐	☐	☐	☐	☐
26. I feel confident in my ability to communicate information about vaccination benefits and risks to parents and patients.	☐	☐	☐	☐	☐
27. I can identify resources for ongoing education regarding vaccines and immunization programs.	☐	☐	☐	☐	☐
28. I have an understanding of both common and infrequent vaccine associated adverse events.	☐	☐	☐	☐	☐
29. I am interested in pursuing the field of immunization as part of my professional career.	☐	☐	☐	☐	☐
30. I understand how decision-making around immunization programs works in Canada.	☐	☐	☐	☐	☐
31. I feel prepared to discuss controversies surrounding immunization with my patients or their parents.	☐	☐	☐	☐	☐

For each of the following statements, please mark an "X" in the most appropriate box. If any of the actions are not applicable to your experience and/or practice, select "not applicable".

In my experience…	Never	Rarely	Sometimes	Frequently	Always	Not applicable
32. I use the Canadian Immunization Guide as a resource.	☐	☐	☐	☐	☐	☐
33. I discuss the disease against which the vaccine is designed to protect against at the immunization visits.	☐	☐	☐	☐	☐	☐
34. I discuss potential side effects of the vaccine at the immunization visits.	☐	☐	☐	☐	☐	☐
35. I report clinically significant averse events following vaccinations.	☐	☐	☐	☐	☐	☐
36. I receive an annual influenza immunization.	☐	☐	☐	☐	☐	☐
37. I recommend vaccines not yet funded by the government.	☐	☐	☐	☐	☐	☐
38. I advocate for immunization among my colleagues.	☐	☐	☐	☐	☐	☐
39. I use *Your Child's Best Shot* as a resource.	☐	☐	☐	☐	☐	☐
40. I am confident when responding to concerns from parents or patients who refuse immunization.	☐	☐	☐	☐	☐	☐

SECTION D – CORE COMPETENCIES FOR IMMUNIZATION PROVIDERS

Having read the *Core Competencies for Immunization Providers*, Please answer by an "X" in the appropriate box

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
41. I support the principles of the *Core Competencies for Immunization Providers*.	☐	☐	☐	☐	☐	☐
42. The *Core Competencies for Immunization Providers* is a useful framework for my practice in immunization.	☐	☐	☐	☐	☐	☐
43. The *Core Competencies for Immunization Providers* should be an integral part of the undergraduate medical curriculum.	☐	☐	☐	☐	☐	☐
44. From my personal observation and experience, core competencies for immunization are being practiced currently in my service area.	☐	☐	☐	☐	☐	☐
45. I have a clear understanding of the immunization core competencies.	☐	☐	☐	☐	☐	☐

SECTION E– SOURCES OF IMMUNIZATION KNOWLEDGE

46. If you compare your medical school and residency training regarding vaccines to what you have learned at the course;

47. What percentage of your total vaccine knowledge came from your medical school and residency training?

☐0-25 ☐26-50 ☐51-75 ☐76-100

48. What percentage of your total vaccine knowledge came from other sources?

☐0-25 ☐26-50 ☐51-75 ☐76-100

49. What other sources do you feel contributed to your vaccine knowledge?

_____

50. What percentage of your total vaccine knowledge came from this course?

☐0-25 ☐26-50 ☐51-75 ☐76-100

SECTION F – POST COURSE IMPACT

In this section, please indicate your opinion about each statement by marking an "X" in the most appropriate box.

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	I am better able to "inspire a shared vision" with my colleagues regarding positive attitudes and behaviors towards immunization.	☐	☐	☐	☐	☐
2.	I am better able to "model the way" with my colleagues regarding positive attitudes and behaviors towards immunization	☐	☐	☐	☐	☐

3. Please tell us about two *competencies* (or skills) that you have acquired or improved through the 2007 Resident Vaccine course? (Please limit to 25 words).

4. Please give us two examples of how the Canadian Residents Vaccine Training Program has impacted your practice. (Please limit to 25 words).

5. Please give two examples of immunization related activities that you have participated in or facilitated to foster continuing professional development of colleagues (Please limit to 25 words).

Appendix D: Participant Course Satisfaction Evaluation Form

2007 Residents Vaccine Course
Hot Topics in Immunization
November 30 and December 1, 2007, Montreal, Quebec

Thank you for taking the time to fill out this evaluation form. Your feedback will help us plan future events.

The information on this form is confidential.

SECTION A – DEMOGRAPHIC INFORMATION

1. ☐ Male ☐ Female
2. In which year of residency were you?
   - ☐ 1st
   - ☐ 2nd
   - ☐ 3rd
   - ☐ 4th
   - ☐ 5th
   - ☐ Other, please specify: _____

SECTION B – DEBATE AND LECTURES

Please check (✔) the response that best describes your opinion.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Strongly disagree
1. Friday Participant Debate	☐	☐	☐	☐	☐	☐
Comments						
2. Vaccine Risk Communization (Noni MacDonald, MD)	☐	☐	☐	☐	☐	☐
Comments						
3. Vaccine Development and Evaluation and The Canadian Immunization System (David Scheifele, MD)	☐	☐	☐	☐	☐	☐
Comments						
4. Population Health for Immunizers (Geneviève Petit, MD)	☐	☐	☐	☐	☐	☐
Comments						

SECTION C – WORKSHOPS

5. Please indicate which workshop that you attended:

☐ Workshop 1 – Purple - GBS/Conjugate quadrivalent meningoccal vaccine *(Brian Ward)*
☐ Workshop 2 – Red - Maternal Immunization *(Beth Halperin / Deborah Money)*
☐ Workshop 3 – Pink - HPV catch-up programs *(Simon Dobson)*
☐ Workshop 4 – Orange - Mandatory influenza vaccination for health care professionals? *(David Scheifele)*
☐ Workshop 5 – Blue - Pandemic influenza *(Theresa Tam / Alexandra Henteleff)*
☐ Workshop 6 – Green - Autism/MMR *(Noni MacDonald)*
☐ Workshop 7 – Yellow - Hepatitis A *(Scott Halperin)*
☐ Workshop 8 – Black - Immunization of hard to reach populations *(Ian Gemmill / Geneviève Petit)*

	Strongly disagree	Disa gree	Neither agree nor disagree	Agree	Strongly agree	Strongly disagree
6. Please rate the workshop you attended by marking with a check (✔) the response that best describes your opinion.	☐	☐	☐	☐	☐	☐
Comments						

SECTION D – GROUP PRESENTATIONS & EXPERT PANEL

7. Did the presentations improve your knowledge of the "hot topics" used as examples?	Yes ☐	No ☐				
Comments						
8. Did the presentations contribute to your overall knowledge as it pertains to the core competencies and course objectives?	Yes ☐	No ☐				
Comments						
9. Did the discussion improve your knowledge of the "hot topics" and other immunization issues?	Yes ☐	No ☐				
Comments						

SECTION E – PRE-COURSE ASSIGNEMENTS						
10. Did you find the pre-course readings helpful in preparation for the course, the debate and the workshop?	Yes ☐	No ☐				
Comments						

SECTION F – OVERALL COURSE COMMENTS						
Please consider each pair of statements and decide which most clearly reflects your view and check (✔) one box. The box closest to the statement indicates stronger agreement.						
11.	The course content was very relevant to my needs.	☐	☐	☐	☐	The course content was not at all relevant to my needs.
12.	The course has greatly improved my knowledge and understanding.	☐	☐	☐	☐	There has been no improvement to my knowledge and understanding.
13.	As a result of this course, it is very likely that I'll change my practice.	☐	☐	☐	☐	As a result of this course, it is very unlikely that I'll change my practice.
14.	The course objectives were met.	☐	☐	☐	☐	The course objectives were not met.
15.	The content was too advanced.	☐	☐	☐	☐	The content was too simple.
16.	The presenter(s) used an appropriate range of teaching methods.	☐	☐	☐	☐	The presenter(s) did not use an appropriate range of teaching methods.
17.	The presenter(s) made effective use of excellent visual and other aids.	☐	☐	☐	☐	The presenter(s) made ineffective use of poor visual and other aids.
18.	There should be more courses on this theme.	☐	☐	☐	☐	There have been sufficient courses on this theme.

19. **How would you describe your feelings about the course?**
In this section, please indicate your opinion about each statement by marking an "X" in the most appropriate box.

	Disagree	Neither agree nor disagree	Agree		Disagree	Neither agree nor disagree	Agree
...interesting	☐	☐	☐	*...more of this please*	☐	☐	☐
...essential	☐	☐	☐	*...confusing*	☐	☐	☐
...boring	☐	☐	☐	*...dull*	☐	☐	☐
...new	☐	☐	☐	*...valuable*	☐	☐	☐
...patronizing	☐	☐	☐	*...responded to needs*	☐	☐	☐
...useless	☐	☐	☐	*...informative*	☐	☐	☐

20. What, if anything, would your recommend the organizers revise, delete or add?

Comments

21. In your view, what was the most successful and/or useful aspect of the course?

Comments

22. Overall level of satisfaction with this course	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Strongly disagree
	☐	☐	☐	☐	☐	☐

Comments

23. What would be the best way to disseminate the information from this course to other residents?

☐ Run more courses (with registration fee)
☐ CD-Rom of materials
☐ Website with materials
☐ Special journal supplement
☐ Other, please specify: _____

SECTION G – COURSE SYLLABUS	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Strongly disagree
24. How helpful will the syllabus be as a future reference?	☐	☐	☐	☐	☐	☐
Comments						
25. Was there anything you felt should have been included in the course syllabus?						

SECTION H – APPLICATION PROCESS & VENUE	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Strongly disagree
26. Awareness of the course from Program Director	☐	☐	☐	☐	☐	☐
Comments						
27. Communication from the conference organizers	☐	☐	☐	☐	☐	☐
Comments						
28. Travel and hotel booking arrangements	☐	☐	☐	☐	☐	☐
Comments						
29. Marriott Château Champlain Hotel	☐	☐	☐	☐	☐	☐
Comments						

COMMENTS/SUGGESTIONS

Please hand this completed evaluation form into the registration desk. Thank you!

Appendix E: Invitation to Participate in Resident Vaccine Course

From: Chantal Pothier
Sent: April 27, 2007 11:32 AM
Subject: invitation to the Resident Vaccine Course #6 (PAEDs) - Deadline: May 14

Dear Program Directors:

CAIRE/CPS Canadian Resident Vaccine Program

2007 Course - Hot Topics in Immunization November 30th and December 1st, 2007, Marriott Château Champlain, Montreal

Once again, we invite program directors from across Canada to select a resident to attend our Canadian Residents Vaccine Training Program. Sixty-nine residents attended last year's course including trainees in community medicine, family medicine, paediatrics and infectious disease. All course participants were encouraged to share what they had learned with colleagues through a variety of mechanisms such as rounds presentations, workshops and distribution of resource materials. We would appreciate your feedback as to if and how this has occurred in your program setting.

We are pleased to provide you with the resident selection package for the 2007 Residents Vaccine Course, to be held November 30th and December 1st, 2007, in Montreal.

This course is a joint initiative of the Canadian Association for Immunization Research and Evaluation (CAIRE) and the Canadian Paediatric Society (CPS), and will focus on Hot Topics in Immunization. The course is supported through an unrestricted grant from GlaxoSmithKline. Healthy Generations is also pleased to provide a bursary to selected applicants to cover travel and accommodation expenses for this course.

We would like you to select TWO individuals from your program to participate in this course. These residents may have a pre-course assignment around a vaccine issue and will definitely have a post-meeting assignment to share what they have learned with their peers. It is our hope that you will select these individuals who have shown potential and interest in vaccine research.

Please note that we are sending a similar invitation to the "Paediatric ID training program director" at your centre. There are only TWO spots per university, which will be awarded on a first-come first-served basis. If more than two residents are nominated from your program, the first two applications received will be awarded the slots for your centre and the third will be placed on a waiting list. We recommend that you discuss this with the paediatric ID training program director at your university and together select the best candidates for this course.

To finalize your submission, please meet with your candidate, complete the attached selection form and return to the CPS Office by May 14, 2007. Please note that after this date, your spot will be released to individuals on a waiting list.

To be eligible, residents must be members of the Canadian Paediatric Society (CPS). As 90% of all Canadian paediatric residents are members of CPS, there is a good chance that the resident you select is already a member. However, if they are not members, they can join for $55 by completing the attached provisional membership form and returning it with the application. If you have any questions, please contact the CPS Membership Department at xxxxx@xxxx.xxor (xxx) xxx-xxxx ext. xxx.

A course program will be sent closer to the meeting date. It is our hope that residents will find this year's course as beneficial and informative as did last year's participants. If you have any questions, please contact the Chantal Pothier at (xxx) xxx-xxxx ext. xxx or by e-mail at xxxxx@xxxx.xx.

Sincerely,

Shelly McNeil, MD
CAIRE

Danielle Grenier, MD
CPS

<<Vaccine selection form.pdf>> <<main Application for Membership-2007.doc>> <<main Application for Membership 2007- french.doc>>

Chantal Pothier
Senior Conference and Event Planner

Planificatrice principale des congrès et activités Canadian Paediatric Society / Société canadienne de pédiatrie

[xxxxxxxxxxxxxxxxx]

Appendix F: Course Objectives and Core Competencies

2007 Residents Vaccine Course
Hot Topics in Immunization
November 30 and December 1, 2007
Montreal, Quebec

At the end of the course, participants will be able to:

- **Demonstrate an understanding of why knowledge regarding vaccine development and evaluation is relevant to daily practice.**

  Specifically, the participant should be able to:

  1) Describe, in general terms, what is known about a vaccine at the time it is approved for marketing in Canada.
  2) Describe what can be learned about vaccines after they are approved for marketing, via surveillance activities and more formal post marketing studies.

- **Apply relevant principles of population health to practice and integrate into daily practice strategies for improving immunization rates.**

  Specifically, the participant should be able to:

  1) Use specific examples to show how immunization is a population-based health strategy.
  2) Explain the concept of herd immunity (also called community immunity) in non scientific terms.
  3) Explain, using examples, why vaccine-preventable diseases return when immunization coverage decreases
  4) Explain how economic, educational and social factors impact immunization uptake.
  5) Explain how immunization registries can benefit not only individuals but also populations.
  6) Identify barriers to immunization uptake.
  7) Identify strategies to improve immunization coverage rates
  8) Present the case for the importance of having a highly immunized health professional work force
  9) Use a concrete example to counter the claim that vaccines are ineffective because not only do outbreaks of vaccine preventable disease occur among highly immunized populations but also, when they do, most of the cases have previously been immunized.

- **Communicate effectively about immunization as relevant to their practice setting.**

  Specifically the participant should be able to:

  1) List the components of the evidence-based decision making process.
  2) Explain the importance of risk perception for immunization decision-making.
  3) Assess client knowledge, attitudes, and beliefs regarding immunization and respond appropriately.
  4) Deliver clear, concise messages about the risks of vaccine-preventable diseases and the benefits/risks of vaccines.
  5) Provide appropriate evidence-based information and resources to clients regarding immunization and vaccines.
  6) Provide guidance to clients so they can correctly identify credible sources of information on immunization and vaccine

- **Demonstrate an understanding of the Immunization System in Canada and its impact on their practice.**

  Specifically, the participant should be able to:

  1) Describe how the national immunization strategy is relevant to practice.
  2) Distinguish between federal and provincial/territorial responsibilities as related to immunization programs in Canada
  3) Describe the process required to introduce a new vaccine in a province or territory.
  4) Explain the reasons for the variable immunization schedules among the provinces and territories.
  5) Locate the current immunization schedule for their province or territory.

- **Integrate legal and ethical principles relevant to immunization practice.**

  Specifically, the participant should be able to:

  1) Describe all the elements that constitute informed consent and informed refusal.
  2) Discuss the ethical issues arising from:
     - mandatory versus voluntary immunization
     - targeted versus universal immunization
     - the individual's right to refuse immunization
  3) Explain the rationale for publicly-funded versus unfunded immunization programs
  4) Discuss the responsibility of immunizers to inform patients regarding the availability of all recommended vaccines regardless of whether they are publicly funded.

Appendix G: Resident Vaccine Course Pre-Reading Material

Pre- Course Reading Materials for all attendees

- Access to the Seasonal Flu Vaccine , Heath Canada Publication, 2007
- Brisson, M., Van de Velde, N. & DeWals, P., & Boily, M. (2007). The potential cost-effectiveness of prophylactic human pappilomavirus vaccines in Canada. *Vaccine, 25*, 5399–5408.
- Brisson, M., Van de Velde, N., & DeWals, P. (2007). Estimating the number needed to vaccinate to prevent diseases and death related to human pappilomavirus infection. *CMAJ, 177*(5), 464–468.
- Final Report – National Immunization Strategy, PHAC publication. Retrieved November 15, 2007, from http://www.phac-aspc.gc.ca/publicat/nat_immunization_03/nat_imm_strat_print_e.html .
- Franco, E., & Ferenszy, A. (2007). Cervical cancer screening following the implementation of prophylactic human pappilomavirus vaccination. *Future Oncol, 3*(3), 319–327.
- Future II Study Group. (2007). Quadravalent vaccine against human pappilomavirus to prevent high-grade cervical lesions. *New EnglandJjournal of Medicine, 356*(19), 1915–1927. Downloaded from www.nejm.ors at THE HEALTH INITIATVE on September 12, 2007.
- Gulli, C. (2007, August 27). Our girls are not guinea pigs. *McLeans*, 38–42.
- HPV PATRICIA Study Group. (2007). Effficacy of prophylactic adjuvanted bivalent L1 virus-like-particle vaccine against infection with human pappilomavirus types 16 and 18 in young women: an interim analysis of a phase III double blind, randomise controlled trial. *Lancet, 369*, 2161–2170.
- Lippman, A., Melnychuk, R., Shimmin, C., & Boscoe, M. (2007). Human pappilomavirus, vaccines and women's health: questions and cautions. *CMAJ, 177*(5), 484–487.
- McDonald, N. (2007). Human pappilomavirus vaccine: Waiting for a miracle. *CMAJ, 177*(5), 433.

Workshop-Specific Pre-Course Reading Material

Workshop #1: GBS/Conjugate quadravalent meningococcal vaccine

- Ang, C., Jacobs, B., & Laman, J. (2004). The Guillan-Barre syndrome: A true case of molecular mimicry. *Trends in Immunology, 25*(2), 62–66.
- Canadian Communicable Diseases Report. (2007). National Advisory Committee on Immunization. *Statement on Conjugate Meningococcal Vaccine Serogroups A,C,Y and W135* (33) ACS-3, P 1-24.

- CDC Fact Sheet for Healthcare Professionals. *Guillain-Barre Syndrome Among persons who receive meningococcal conjugate vaccine.* Retrieved January 26, 2009, from http://www.kingcounty.gov/healthservices/health/communicable/providers/advisories/~/media/health/publichealth/documents/communicable/gbs_menactra.ashx.
- Cosi, V., & Versino, M. (2006). Guillain- Barre syndrome. *Nerol Sci, 27*, S47-S51.
- Wilson, J (2005). The immunobiology of Guillain-Barre syndromes. *Journal of the Peripheral Nervous System, 10*, 94-112.

Workshop #2: Maternal Immunization

- Brent, L. (2006). Risks and benefits of immunizing pregnant women: The risk of doing nothing. *Reproductive Toxicology, 21*, 383-389.
- Dodds, L., McNeil, S., Fell, D., Allen, V., Coombs, A., Scott, J. & MacDonlad, N. (2007). Impact of Influenza exposure on rates of hospital admissions and physician visits because o respiratory illness among pregnant women. *Canadian Medical Association Journal, 176*(4), 463-468.
- Eglund, J. (2003). Maternal immunization with inactivated influenza vaccine: rational and experience. *Vaccine, 21*, 3460-3464.
- Eglund, J. (2007). The influence of maternal immunization on infant immune responses. *Journal of Comparative Pathology, 137*, S16- S19.
- Erickson, L., De Wals, P., & Farand, L. (2005). An analytic framework for immunization programs in Canada. *Vaccine, 23*, 2470-2476.
- Halperin, B., MacKinnon-Cameron, D., & McNeil, S. (2006, March). *Survey of knowledge, attitudes and behaviour regarding influenza vaccination in pregnancy and childhood.* Abstract from International Conference on Women and Infectious Disease, Atlanta, Georgia.
- Healy, C., & Baker, C. (2007). Maternal immunization. *The Pediatric Infectious Disease Journal, 26*(10), 945-948.
- Kwong, J., Sambell, C., Johansen, H., Stukel, T., & Manuel, D. (2006). The effect of universal influenza immunization on vaccination rates in Ontario. *Health Reports, Statistics Canada, 17*(2), 31-40.
- Munoz, F., Greisinger, A., Wehmenen, O., Mouzoon, M., Hoyle, J., Smith, F., & Glezen, P. (2005). Safety of influenza vaccination during pregnancy. *American Journal of Obstetrics and Gynecology, 192,* 1098-1106.
- Naleway, A., Smith, W., & Mullooly, J. (2006). Delivering influenza vaccine to pregnant women. *Epidemiological Reviews, 28*, 47-53.
- National Advisory Committee on Immunization. (2007). Canadian communicable diseases report. *Statement on Influenza Vaccination for the 2007-2008 Season*, 33 (ACS-7), pp 1-38.
- Pool, V., & Iskander, J. (2006). Safety of influenza vaccination during pregnancy. *American Journal of Obstetrics and Gynecology, 194*, 1200-1205.

- Roberts, S., Hollier, L., Sheffield, J., Laibl, V., & Wendel, G. (2006). Cost effectiveness of universal influenza vaccination in a pregnant population. *Obstetrics & Gynecology*, *107*(6), 1323-1329.
- Steinhoff, M., Zaman, K., Roy, E., Arifeen, S., Rahman, M., Raqib, R., & Shahid, N. (2006, October). *Incidence of vaccine-preventable influenza in 0-5 month old infants.* Presentation summary from 44th Annual Meeting of the Infectious Diseases Society of America, Toronto, Ontario.
- Wallis, D., Chin, J. Sur, D., & Lee, M. (2006). Increasing rates of influenza immunization during pregnancy: A multisite interventional study. *Journal of the American Board of Family Medicine*, *19*(4), 346-349.

Workshop # 3: HPV catch-up programs

- Brisson, M. Van de Velde, N., De Wals, P., & Boily, M. (2007). Estimating the number to vaccinate to prevent diseases and death related to human papillomavirus infection. *Canadian Medical Association Journal,* 177(5), pp 464-468.
- Brisson, M. Van de Velde, N., De Wals, P., & Boily, M. (2007). The potential cost-effectiveness of prophylactic human papillomavirus vaccines in Canada. *Vaccine*, 25, 5399-5408.
- Franco, E., & Ferenczy, A. (2007). Cervical cancer screening following the implementation of prophylactic human papillomavirus vaccination. *Future Oncology*, *3*(3), 319–327.
- The FUTURE II Study Group. (2007). Quadrivalent vaccine against human papillomavirus to prevent high grade cervical lesions. *The New England Journal of Medicine, 356*(19), 1915–1927.
- Paavonen, J., Jenkins, D., Bosch, X., Naud, P., Salmeron, J., Wheeler, C., Chow, S., Apter, D., Kitchener, H., Castellsague, X., deCarvalho, P., Skinner, S., Harper, D., Hedrick, J., Jaisamrarn, U., Limson, G., Dionne, M., Quint, W., Spiessens, B., Peeters, P., Stryyf, F., Wieting, S., Lehtinen, M. & Dubin, G. (20007). Efficacy of a prophylactic adjuvanted bivalent L1 virus-like-particle vaccine against infection with human papillomavirus types 16 and 18 in young women: and interim analysis of a phase III double-blind, randomised controlled trial. *The Lancet*, 369, 2161-2170.

Workshop#4: Mandatory influenza immunization for health care professionals?

- Burls, A., Jordan, R., Barton, P., Olowokure, B., Wake, B., Albon, E., & Hawker, J. (2006). Vaccinating healthcare workers against influenza to protect the vulnerable—Is it a good use o healthcare resources? A systematic review of the evidence and an economic evaluation. *Vaccine 24*, 4214–4221.
- Lugo, R. (2007). Will carrots or sticks raise influenza immunization rates of health care personnel? *Association for Professionals in Infection Control and Epidemiology*, *35*(1), 1-6.

- National Foundation for Infectious Diseases. (2004). *Improving influenza vaccination rates in health care workers: Strategies to increase protection for workers and patients.*
- Poland, G., Tosh, P., & Jacobson, R. (2005). Requiring influenza vaccination for health care workers: seven truths we must accept. *Vaccine*, 23, 2251-2255.
- Scheifele, D., Duval, B., Russell, M., Warrington, R., DeSerres, G., Skowronski, D., Dionne, M., Kellner, J., Davies, D., & MacDonald, J. (2003). Ocular respiratory symptoms attributable to inactivated split cell influenza vaccine: Evidence from a controlled trial involving adults. *Clinical Infectious Diseases*, *36*, 850-857.
- Scheifle, D. (undated). *Vaccine development and the Canadian immunization system: A primer for new vaccine providers* [PowerPoint]. Vancouver, BC, Canada: Vaccine Evaluation Centre.
- Influenza Literature Search of Pub-Med – July-Aug 2007
  - Jefferson, T., Rivetti, D., Di Pietrabtonj, C, Rivetti, A., & Demecheli, N. (2007). Vaccine for preventing influenza in healthy adults. Abstract from *Cochrane Database Systematic Review*, 2: CD001269.
  - Nabeshima, S., Kashiwagi, K., Murata, M., Kanamoto, Y. Furusvo, N., & Havarshi, J. (2007). Antibody response to influenza vaccine in adults vaccinated with identical strains in consecutive years. Abstract from *Journal of Medical Microbiology*, *79*(3).
  - Targonki, P., Jacobson. R., & Poland, G. (2007). Immunosenescence : role and measurement of vaccine response among the elderly [Abstract]. *Vaccine*, *25*(16).
  - Vielendi, G., Laham, F., Monsalvo, A., Casellas, J., Israele, M., Polack, N., Kleeberger, S., & Polack, F. (2007). Cytokine profiles in the respiratory tract during primary infection with human metapneumovirus, respiratory syncytial virus, or influenza virus in infants [Abstract]. *Pediatrics*, *120*(2).

Workshop# 5: Pandemic Influenza

- Monto, A. (2006). Vaccines and antiviral drugs in pandemic preparedness, *Emerging Infectious Diseases*, *12*(1), 55-60 www.cdc.gov/ed.
- Health Canada Publication. (2007). *Access to seasonal flu vaccine in Canada: How the flu vaccine makes its way from the laboratory to the doctor's office.*
- The Canadian Pandemic Plan Annex D, PHAC Website http://www.phac-aspc.gc.ca/cpip-pclcpi/ann-d-eng.php downloaded Nov 15, 2007.
- ECDC Technical Report Expert Advisory Group on Human H5N1Vaccines, Public Health and Operational Questions, Stolkholm, 2007. European Centre for Disease Prevention and Control Publication.
- Kilbourne, E. (2006). Pandemics of the 20th Century. *Emerging Infectious Diseases*, *12*(1), 9-14. www.cdc.gov/ed.

Workshop #6: Autism and MMR

- Deer, B. (undated). MMR scare: the Andrew Wakefield Lancet paper which launched claims into medical research. *Sunday Times of London.*
  In response to:
  Wakefield, A., Murch, S., Anthony, A., Linnell, J., Malik, M., Berelowitz, Dhillon, A., Thomson, M., Harvey, P., Valentine, A., Davies, S. & Walker-Smith, J. (1998). Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *The Lancet, 351*(9103), 637-641.
- D'Souza,Y., Frombonne, E., & Ward, B. (2006). No evidence of persisteing measles virus in peripheral blood mononuclear cells from children with autism spectrum disorder. *Pediatrics, 118*, 1664-1675. Downloaded from wwww.pediatrics.org on November 7, 2007. Full article located at http://pediatrics.aappublications.org/cgi/content/full/118/4/1664.
- Infectious Disease and Immunization Committee, Canadian Pediatrics Society. (2007). Statement: Autistic spectrum disorder: No causal relationship with vaccines. *Pediatrics & Child Health, 12*(5), 393-395.
- Meldgaard Madsen, K., Hviid, A., Vestergaard, M., Schendel, D., Wohlfarht, J., Thoren, P., Olsen, J., & Melbye, M. (2002). A population-based study of meals, mumps, and rubella vaccination and autism. *The New England Journal of Medicine, 647*(19), 1477-1482. Retrieved September 14, 2007, from www.nejm.org.
- Muhle, R., Trentacote, S., & Rapin, I. (2004). The genetics of autism. *Pediatrics, 113*, e472-e486. Retrieved September 14, 2007, from www.pediatrics.org.

Workshop # 7: Hepatitis A

- Wasley, A., Fiore, A., & Bell, B. (2006). Hepatitis A in the era of vaccination. *Epidemiological Review, 28*, 101-111.
- Public Health Agency of Canada. (2006). Chapter – Hepatitis A Vaccine. In *Canadian immunization guide* (7th ed., pp. 179-188). Available from http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-hepa-eng.php.
- Centers for Disease Control and Prevention. (2006). Recommendations of the Advisory Committee on Immunization: Prevention of Hepatitis A through active or passive immunization, *Morbidity and Mortality Weekly Report, 55*, #RR7, 1-13.
- Bauch, C., Srinivasa Rao, A., Pham, B., Krahn, M., Gilca, V., Chen, M., & Trico, A. (2007). A dynamic model for assessing universal Hepatitis A vaccination in Canada. *Vaccine, 25*, 1719-1726.
- De Serres, G., Duval, B., Shadmani, R., Rouleau, I., Ouakki, M., Naus, M., & Ward, B. (2007). Population based survey of travel patterns among Canadians visiting hepatitis A–endemic countries. *International Society of Travel Medicine, 14*(4), 269-273.
- Duval, B., Gilca, V., Boulianne, N., Deceuninck, G., Rochette, L., & De Serres, G. (2005). Immunogenicity of two paediatric doses of monovalent hepatitis B or

combined hepatitis A and B vaccine in 8-10-year-old children. *Vaccine*, *23*, 4082-4087.

- Duval, B., De Serres, G., Ochnio, J., Scheifele, D., & Gilca, V. (2005). Nationwide Canadian study of hepatitis A antibody prevalence among children eight to thirteen years old. *The Pediatric Infectious Disease Journal*, *24*(6), 514-519.

Workshop #8: Immunization of hard to reach populations

- Baral, S., Sherman, S., Milson, P., & Beyer, C. (2007). Vaccine immunogenicity in injecting drug users: a systematic review. *Lancet Infectious Diseases*, *7*, 667-674.
- Carey, J., Perlman, D., Friedmann, P., Kaplan, W., Nugent, S., Deutscher, M., Masson, C., & Des Jarlais, D. (2005). Knowledge of hepatitis among active drug injectors at a syringe exchange program. *Journal of Substance Abuse Treatment*, 29, 47-53.
- Health Canada. (n.d.). *Hepatitis A Fact Sheet*. Now replaced by information found at the Public Health Agency of Canada Hepatitis A Information website. Available from: http://www.phac-aspc.gc.ca/hcai-iamss/bbp-pts/hepatitis/hep_a-eng.php.
- Health Canada. (n.d.). *Hepatitis B Fact Sheet*. Now replaced by information found at the Public Health Agency of Canada Hepatitis B Information website. Available from: http://www.phac-aspc.gc.ca/hcai-iamss/bbp-pts/hepatitis/hep_b-eng.php.
- Judd, A., Hickman, M., Hope, V., Sutton, A., Stimsom, G., Ramsay, M., Gill, O., & Parry, J. (2007). Twenty years of selective hepatitis B vaccination: Is hepatitis B declining among injecting drug users in England and Wales? *Journal of Viral Hepatitis*, *14*, 584-591.
- Kuo, I., Sherman, S., Thomas, D., & Strathdee, S. (2004). Hepatitis B virus infection and vaccination among young injection and non-injection dug users: missed opportunities to prevent infection. *Drug and Alcohol Dependence*, *73*, 69-78.
- Tjan, G., Gotz, H., Koek, A., de Zwart, O., Mertens, P., Coutino, R., & Bruisten, S. (2005). An outbreak of Hepatitis A among homeless drug users in Rotterdam, The Netherlands. *Journal of Medical Virology*, *77*, 360-366.

Appendix H: Email Invitation to Participate in Post-Intervention Survey

From: Chantal Pothier
Sent: May 23, 2008 7:58 AM
Subject: Resident Vaccine Course 3-month survey

Dear Participant of the 2007 Resident Vaccine Course,

The Canadian Resident Vaccine Training Program is a joint initiative of the Canadian Paediatric Society and the Canadian Association for Immunization Research and Evaluation. Both CAIRE and CPS have been involved in the creation of the core competencies and are positioned well to deliver training that will improve the skills of immunization providers across Canada. We hope that the Resident Vaccine Course 2007 has helped you increase your vaccine knowledge and encouraged you to be advocates for disease prevention and vaccination.

You are being invited to participate in an online survey designed to evaluate the benefit and effect of the Canadian Residents Vaccine Training Program 2007 (*Hot Topics in Immunization).* This portion of the evaluation of the course is being conducted to fulfill the research component of a Masters of Education program with the Faculty of Education at the University of Manitoba.

The survey will take approximately 15 minutes to complete. In appreciation for your time completing the survey you will be given the opportunity to enter your name into a draw for a $100 gift certificate to a merchant of the winner's choice.

For more information and to complete the survey, please click here: http://ccfv-survey.dal.ca/cgi-bin/rws3.pl?FORM=ResidentVaccine

The PASSWORD is: **resvac2007**

If by any chance this link doesn't work for you, please copy and paste it into Internet Explorer.

Thanking you in advance for participating in this study.

Shelly McNeil, MD Alexandra Henteleff, RN, BN

Chantal Pothier
Senior Conference and Event Planner
Planificatrice principale des congrès et activités
Canadian Paediatric Society / Société canadienne de pédiatrie
[xxxxx]
CPS Annual Conference / Congrès annuel de la SCP
Victoria: June 24-28, 2008 / du 24 au 28 juin 2008
Please consider the environment before printing this email
Devez-vous vraiment imprimer ce courriel ? Pensons à l'environnement ...

-----Original Message-----
From: Chantal Pothier [mailto:cpothier@cps.ca]
Sent: Tuesday, June 10, 2008 11:10 AM
Subject: Friendly reminder: Resident Vaccine Course 3-month survey

To those who haven't done so yet,

This is a gentle reminder to kindly complete the online survey (please see below for instructions)? Everyone's participation is vital for this survey as we are conducting to fulfill a research component of a Masters of Education program with the Faculty of Education at the University of Manitoba. We only need 15 minutes of your time.

To those who did, we THANK YOU.

Thanking you in advance for participating in this study.

Chantal

Appendix I: Ethics Approval and Amendment

APPROVAL CERTIFICATE

21 April 2008

TO: **Alexandra Henteleff** (Advisor K. Matheos)
Principal Investigator

FROM: **Stan Straw, Chair**
Education/Nursing Research Ethics Board (ENREB)

Re: **Protocol #E2008:041**
"Immunization Core Competencies and Transformative Learning"

Please be advised that your above-referenced protocol has received human ethics approval by the **Education/Nursing Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement. This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- if you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to Kathryn Bartmanovich, Research Grants & Contract Services (fax: xxx-xxxx), including the Sponsor name, before your account can be opened.

- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html) **in order to be in compliance with Tri-Council Guidelines.**

AMENDMENT APPROVAL

05 May 2008

TO: **Alexandra Henteleff**
Principal Investigator

FROM: **Stan Straw, Chair**
Education/Nursing Research Ethics Board (ENREB)

Re: **Protocol #E2008:041**
"Immunization Core Competencies and Transformative Learning"

This will acknowledge your e-mail dated April 28, 2008, requesting amendment to your above-noted protocol.

Approval is given for this amendment. Any further changes to the protocol must be reported to the Human Ethics Secretariat in advance of implementation.