

An Educational Intervention in Performance Enhancement:
What works and why?

By
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A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
In partial fulfillment of the requirements of the degree of
MASTER OF EDUCATION

Department of Educational Administration, Foundations & Psychology
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**An Educational Intervention in Performance Enhancement:
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**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of
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ABSTRACT

This thesis used a qualitative approach to explore the long-term cognitive and behavioural impact of medical residents' participation in an educational intervention in performance enhancement training (PET). The PET was designed to facilitate the development of skills, attitudes and behaviours which could enhance residents' abilities to acquire and apply knowledge while developing their expertise in the practice of medicine. The results identified that participation was intrinsically motivated; attracted by concepts of high performance and psychological skills training. The program components that resonated most strongly were the self-awareness created by the TAIS testing, the concepts of perspective and the process of group learning and facilitator expertise. The impacts positively affected their personal lives and performance, their relationships with friends, families and significant others, their relationships and attitudes towards their co-workers, bosses and students as well as their interactions with patients.

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The process of writing a thesis was probably one of my most difficult learning experiences. Developing the skills required to complete this thesis did not occur within a vacuum. The journey began with the encouragement I experienced as a result of successfully completing the Certificate in Adult Education program as well as the unwavering support from friends and colleagues. There were pivotal times in the process when progress seemed illusive, even impossible. It was during one of those times that my friend Rae Harwood used cutlery to create a pseudo-concept map creating a shining moment of clarity for me! My husband Merv and my son Brendan would also plod through pages of writing, giving me strategies for improvement. Our friends Abe and Kathy Bergen listened to my frustrations and helped me process ideas, always expressing their belief in my ability to be successful, even when that concept seemed very distant to me. My thesis advisor, Cheryl Kristjanson, had by far the most challenging job. During it all, she maintained an objective position, indicating where improvement was needed, assuming that I would meet the challenge. Although I was often frustrated with being challenged to the next higher level of achievement, I am thankful that I can take pride in how much I have learned and grown through this process. I do not believe that I could have achieved this without Cheryl's persistence and perseverance.

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PREFACE

This thesis evolved from a pre-existing research project created and delivered by The University of Manitoba Department of Medical Education, the Winnipeg Regional Health Authority and the University of Winnipeg. The research, titled, “The Utilization of High Performance Patient Simulations to Reduce Medical Error” was funded by the Canadian Patient Safety Institute (CPSI). It investigated the impacts of an educational intervention constructed on the principles of a performance enhancement training (PET) program for medical residents (see Appendix A for a more detailed description). The project used a mixed methods evaluation approach which provided an understanding of the intervention’s effect despite the small sample size ($n=16$). The quantitative results were collected immediately following the training and were unable to significantly discriminate between individual pre and post performances and between control and experimental group performances. All of the residents described the intervention as being positive but did not correlate specific impacts with their clinical performance. The researchers however, observed positive changes in the residents’ interactions with patients and peers in the post-simulations. However, there were no defined mechanisms in the study, for identifying or measuring these effects. Therefore, this thesis further explored the impact of the educational intervention of performance enhancement training (PET) program on the residents’ lives. This thesis explored the impact of the PET after a period of time (e.g., 18 months), thereby allowing residents the opportunity to adopt, adapt or discard skills that were taught in the performance enhancement training. The premise was that integration of these skills into their lives might provide evidence of integration of learning, to validate or refute the successfulness of the PET. A qualitative

approach was utilized to identify factors which contributed to positive, neutral and/or negative outcomes of the PET.

The thesis is organized as follows. The prologue is a brief synopsis of the “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research project. Chapter one is an introduction to the concepts which provided the rationale for the “The Utilization of High Performance Patient Simulations to Reduce Medical Error” project, and for this thesis. Chapter two presents the body of research in the literature that is related to this thesis. It is to be noted that there is no pre-existing body of research directly addressing performance enhancement training for medical residents, given its uniqueness to medical education. Therefore, the literature is derived from other disciplines, primarily psychology. Chapter three presents the qualitative methodological framework for the thesis. Chapter four presents the results and discussion. The data is organized using a researcher designed five component framework which describes the three major groups of factors related to the Performance Enhancement Training (environmental, motivating and program factors), the long-term behavioural impacts of the intervention and the resident’s recommendations for future performance enhancement training in medical education. Chapter five concludes the thesis with a discussion describing the implications of the research project for residents and their clinical practice. In addition, some suggested strategies for implementation of a performance enhancement training program for medical students and residents are presented as well as some recommendations for future research.

PROLOGUE

In the summer of 2006, the University of Manitoba received funding from the Canadian Patient Safety Institute (CPSI) to explore the outcomes of a performance enhancement training (PET) program for medical residents (See [Appendix A](#)) in the research project “The Utilization of High Performance Patient Simulations to Reduce Medical Error”. The goal was to determine whether residents who received the PET would demonstrate improvement in their performance as physicians. The research methodology used was an experimental design with a timed series, pre-test, post-test format (See Table 1). Each group consisted of six participants. (Prior to this research design, a pilot group of four individuals completed the intervention, the pre-test and one post-test.)

Table 1

“The Utilization of High Performance Patient Simulations to Reduce Medical Error”

Research Design 2007

Groups	Jan	Jan- Mar	Mar	Mar-June	June
Control	Pre-test	NO treatment	Post-Test 1	Performance Enhancement Training	Post-Test 2
Experimental	Pre-test	Performance Enhancement Training	Post-Test 1	NO treatment	Post-Test 2

The project utilized simulated clinical case scenarios with standardized patients as well as high-tech patient simulations to test performance pre- and post-intervention. Upon completion of the pre-test, all residents were randomly divided into two groups – a control group and an experimental group. The experimental group completed the Test of Attentional and Interpersonal Style (TAIS) which is a 144 item paper and pencil self-report questionnaire. The purpose of the TAIS test is to provide an assessment of cognitive factors (i.e., focus of attention/concentration) and individual communication styles that impact performance (Nideffer, 2004).

The basic premise of TAIS is that an individual's ability to concentrate is directly correlated with their level of performance (Nideffer, 2004). Concentration is conceptualized to vary along two dimensions, breadth and width (Nideffer, 2004). These two dimensions combine to form four concentration styles (See Figure 1) (Nideffer, 2004).

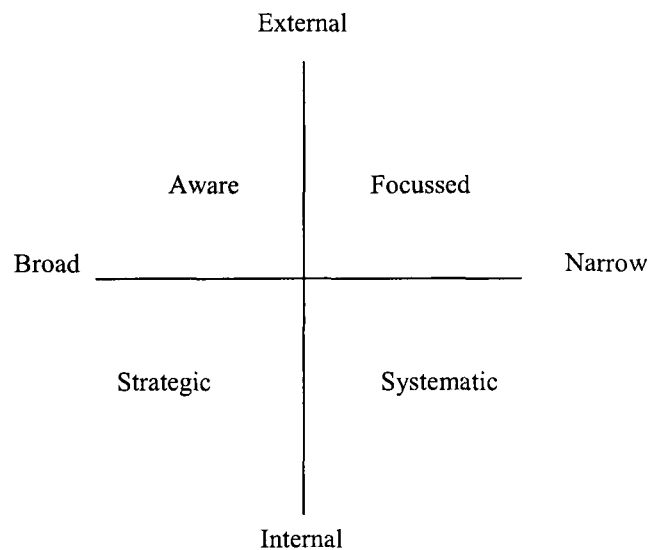


Figure 1. Concentration Styles

An individual has a dominant concentration style (Nideffer, 2004). If individuals are required to perform in situations which demand their particular concentration style

they will be successful, but if they are in situations which require another style this will require a re-adjustment in concentration (Nideffer, 2004). Most individuals are capable of making the relevant adjustments in concentration under most conditions (Nideffer, 2004). Sometimes, there are circumstances that significantly increase an individual's level of arousal requiring a re-adjustment in concentration. In this case, the individual who is capable of adapting to the requirements of the situation will demonstrate higher performance (Nideffer, 2004).

In addition, the TAIS provide an assessment of interpersonal characteristics which are aligned with the construct of concentration (Nideffer, 2004). The characteristics are listed as “preference for diversity, behavioural control, control, self-esteem, physical orientation, speed of decision making, extroversion, introversion, intellectual expressiveness (negative and positive affect), focus over time and performance under pressure” (Nideffer, 2004, TAIS Theory of Performance 2). The combination of variables is utilized to provide a description of an individual's tendency for performance, especially under stressful situations (Nideffer, 2004). In the “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research, the TAIS results were used to develop the individualized educational intervention (i.e., PET program) as well as for the development of relevant team building exercises for the experimental group. The control group received no intervention at this time.

The educational intervention was a PET program designed and provided by Botterill (Botterill, 2006), a Performance Enhancement Consultant from the University of Winnipeg. The training facilitated the residents' insight into their own personality characteristics, their focus of attention and their preferred method of coping with stressful

events. It assisted residents to refocus their personal and professional priorities allowing them to develop a renewed perspective on their professional and personal life, and assisted them to develop a greater self-awareness of their patterns of thinking. It provided residents with the performance and preparation strategies required to prepare for the demands of their profession. It encouraged the acknowledgement of variables within the culture of medical education and the health care system which provide barriers to high performance. The educational intervention also included performance enhancing strategies to adapt to, and minimize the impact of stressful internal and external factors on their performance. It also promoted the development of a perspective that would allow residents to perform from a mindset of approaching success. The educational intervention was delivered through workshops, presentations, discussions, video illustrations, psychological skill exercises, field challenges and performance planning. The instructional time spanned a period of six weeks.

Following the intervention both groups underwent the first post-test. The post-test simulations mirrored the pre-test simulations in structure which enabled the evaluations to be modelled on the framework of situation awareness. “Situation awareness (SA) refers to an individual’s perception and understanding of their dynamic environment” (Wright, Taekman, & Endsley, 2004, p. 65). This awareness and comprehension is important in making medical decisions that result in safe patient care. “An objective measure of SA may be more sensitive and diagnostic than traditional performance measures” (Wright et al, 2004, p. 65). The evaluation tool utilized the three levels of situation awareness-perception of the environment, comprehension of that perception and

actions based on the perception. The medical content of the cases was varied to control for previous learning. The level of medical complexity was equivalent between the cases.

Due to the enthusiasm about the PET from the residents in the experimental group, the control group was given the opportunity to receive the intervention. At this point, the control group then completed the TAIS test and received the intervention while the experimental group received no intervention. After the control group completed its intervention both groups underwent a second post-test.

The project's experimental design attempted to measure a change in demonstrated performance. Evaluation methodology was triangulated to include checklist rating scales, Likert rating scales and structured qualitative interviews. Evaluations were completed by physicians, a psychologist, and individuals from the Patient Advisory group. The checklist rating scale results showed no significant individual change pre and post performance and no significant change between the experimental and control groups. The majority of residents described the intervention as valuable in the qualitative interviews. Factors which may have contributed to the lack of effect include the low numbers of subjects ($n = 15$, one drop-out), the absence of consistent evaluators, the focus on measuring performance utilizing the model of situation awareness, the type and portrayal of case study, the inexperience with testing for situation awareness or any number of unknown factors.

What is known is that the PET was focussed on educating the residents about the psychological factors impacting performance. In order for the training to be effective the residents needed to make some behavioural changes. The Utilization of High Performance Patient Simulations to Reduce Medical Error” research attempted to

measure the end product (i.e., performance) without accounting for the time and the learning required for behavioural change to occur. In fact, it is unlikely that the process of behavioural change potentially initiated through a psychological PET program could be fully measured with the quantitative methodologies which were used. It seems that the project may have attempted to quantify subjective effects with objective evaluation strategies resulting in data that was not descriptive of the impact of the PET (Misch, 2002).

The process of change required for the learning and integration of new behavioural skill sets and the subsequent integration into professional practice could be more suitably evaluated qualitatively. A qualitative approach would explore the experiences, opinions, feelings and knowledge of the residents which would allow the researcher to understand the factors that make a PET for medical residents a valuable or ineffective addition to their education. It is the intent of this thesis to situate the educational intervention within a theoretical framework of resident performance and to explore the process of learning new behaviours that was initiated by the performance enhancement training.

CHAPTER 1 INTRODUCTION

Performance enhancement training is an educational intervention designed to facilitate the acquisition of psychological skill sets which enable learners to identify, recognize and develop the psychological skills necessary to support their profession-specific expertise (Botterill & Patrick, 2003; Botterill, 2006; Harmison, 2006; Orlick, 1980). Expertise is recognizable through peak or high performance. Characteristics of high performance include the demonstration of superior, reproducible performances of specific skill sets executed in a consistent, accurate, focused and efficient manner (Botkin, Rai Smith, & Quick, 1987; Ericsson, 2006; Krane & Williams, 2006; Orlick, 1980b; Raglin, 2001). The subjective experience of high performance, as defined by Krane and Williams (2006), is recognizable to the expert through “feelings of high self-confidence, expectations of success, being energized yet relaxed, being totally focussed on task and strongly determined as well as committed to the task at hand” (Harmison, 2006, p. 234).

Performance enhancement training for medical residents is a novel idea. This may be due in part, to the fact that “Performance Enhancement” is a term associated with athletes, not physicians. In sports, performance enhancement programs provide training in the psychological and adversity coping skills required for the individual athlete and/or team to produce high performances. These include assessments of personal strengths and weaknesses, individual goal setting activities, strategies for achieving and maintaining a healthy perspective, strategies for maintaining personal health habits, the development of strategies for arousal and stress management, and taking time for recovery (Botterill, 2006).

The outcome of performance enhancement training is not restricted to the demonstration of expertise as high performance. It is focussed rather on the process of moving the individual athlete/medical resident towards higher performance. Performance enhancement training requires learners to adapt, revise or change their current psychological behaviours associated with performance. For example, if individuals are primarily motivated by a fear of failure, the training would encourage them to adopt a perspective of approaching success. This change in perspective with its subsequent change in psychological behaviours surrounding arousal, stress, and personal health habits requires repeated practice over time before it can become integrated into the psychological skill set which would subsequently result in high performance.

The performance enhancement training process has been demonstrated to be an effective intervention in creating high performance athletes (Harmison, 2006). There are similarities between sports and medicine that predispose the researcher to believe that performance enhancement may be an effective intervention for residents. The development of physicians and athletes both require extensive physical and mental training. Both require performance under stressful environmental conditions. Both have an individual and a team component. In both situations competition is intense. Both require a commitment to the goal and an unrelenting concentration to master the tasks. The major difference is that poor performance in medicine is measured in human lives, not medals.

The researcher has not been able to identify any educational programs designed specifically for performance enhancement in medical residents. The training provided by medical education programs is designed to produce physician performances which will

result in safe patient care. Training occurs primarily in cognitive, affective and psychomotor skills not in psychological skills (Hager & Gonczi, 1996; 2006).

Determination of performance is based on competency which can be described in many ways. In this thesis, competence is defined as a construct which describes what a person knows and can do under ideal circumstances. It refers to a degree of capability, deemed sufficient in a particular activity (Hager et al., 1996; Heffron, Simpson, & Kochar, 2007; While, 1994). Graduation from medical school requires a minimum level of competency, such that is determined to result in safe patient care. In contrast, high performance is the manifestation of expertise.

“Expertise...refers to the characteristics, skills and knowledge that distinguish experts from novices and less experienced people...experts...are consistently able to exhibit superior performance for representative tasks in a domain” (Ericsson, 2006, p. 3). Currently, the knowledge about expertise is quite domain specific. But, there is shared knowledge in terms of teaching, learning methods and skill training techniques amongst domains (Ericsson, 2006). “There are sufficient similarities in the theoretical principles mediating the phenomena” of performance of expertise that the separate bits of knowledge can be combined to develop a richer understanding of expert performance that can be applied across domains (Ericsson, 2006, p. 9).

Overall, an expert is recognized by the consistent and reproducible demonstration of high performance. The development of expertise begins with the acquisition of discipline specific cognitive, affective, psychomotor knowledge and skills. It is developed through consistent and dedicated practice over time. It requires significant motivation and persistence. It also requires a supportive culture and the psychological

skill sets to deal with the inevitable distractions, personal psychological barriers and adversities common to professional practice.

Rationale for Performance Enhancement Training in Medicine

Medical residents appear to be good candidates for performance enhancement training as they already have a solid base of knowledge in their profession and several years of clinical experience. Yet, they are still considered students of the medical education system. Therefore, they are still privileged to receive additional training in their role as learners. They are motivated to perform their job at a high level because their performance impacts the safety of their patients and their own opportunities for residency placement. It is during residency training that medical residents are expected to begin the development of speciality specific expertise. In medicine, the assumption is made that the higher the level of physician performance, the fewer the errors, the safer the patient care. Much of the current interest in improving physician performance is consequently derived from patient safety research.

The United States and Canada have established agencies to assess the impact of physician performance on negative patient outcomes. Internationally, Germany, the Netherlands and the United Kingdom are also partners in the World Health Organization's "High 5s" project to improve patient safety (World Health Organization & Joint Commission International Center for Patient Safety, 2007). Two terms commonly used when referring to patient safety include "medical errors" and "adverse events". A medical error occurs when the physician's medical plan is not completed, or a wrong medical plan of care is used for the patient that contributes to permanent health deficits and/or untimely patient death (Kohn, Corrigan, & Donaldson, 2000). "Adverse events are

unintended injuries or complications that are caused by health care management, rather than by the patient's underlying disease. It can lead to death, disability at the time of discharge or prolonged hospital stays" (Baker et al., 2004, p. 1678). Studies indicate that approximately three to four percent of all hospital admissions result in some type of medical error and/or adverse event. Approximately 37%-51% of adverse events are determined to be "potentially preventable" (Baker, et al, 2004, p. 1678).

The cause of medical errors is highly complex, involving not only the health care providers, but also the system and the patients. Consequently, the Canadian Patient Safety Institute (CPSI) has developed seven core competencies of patient safety, one being the human factor (Canadian Patient Safety Institute, 2007). The human factor in patient safety is defined in terms of physician performance. Therefore, even though the improvement in physician performance may not result in a measurably direct correlation to an increase in overall patient outcomes, it is a significant contributing factor in patient safety. The desire to improve physician performance as a means to ultimately contributing to an improvement in patient safety is the motivator for the PET.

Rationale for Thesis

The medical residents who are the subjects for this thesis voluntarily participated in a performance enhancement training program as part of The Utilization of High Performance Patient Simulations to Reduce Medical Error research (Kreindler, 2008). Their voluntary participation seems to be a sign that there is a desire among some medical residents to improve their performance. Whether this is due to external pressures, intrinsic motivations, or some other factors is not currently known. What is known is that there were barriers to their participation which did not deter them from participating. This

suggests that there is a desire and perhaps a need for improving physician performance. The society at large is hugely concerned about patient safety and the contribution of medical errors to negative patient outcomes. It seems that anything that can be done to improve the development of expertise amongst physicians could have a positive effect not only for the physicians themselves, but for their patients, and subsequently for the larger society.

The Utilization of High Performance Patient Simulations to Reduce Medical Error research project (Kreindler, 2008) was not able to identify a statistically significant observable change in individual performance immediately following the performance enhancement training. Inherent in the concept of improving performance is the measurement of effects of learning. Measurement of a change in learning presents several challenges. Firstly, there is insurmountable difficulty in isolating factors that contribute to expert performance, and secondly there is the challenge of accounting for individual differences (Ericsson, 2006). Furthermore, any testing of individual differences in learning and skill acquisition pre and post performance will invariably result in a regression to the mean statistical phenomena, not a set of causal effects (Ackerman & Beier, 2006).

An alternate approach to measurement of change is one used by Ericsson and Smith (1991) as cited in Ericsson (2006). In this case, representative tasks which capture the essence of expert performance in a specific domain of expertise are utilized as a measurement tool. Once these tasks are identified and measured, they are used to compare the performance of experts with non-experts and to quantify the changes in performances of experts. This approach has resulted in findings which indicate that

recognized experts, by reputation or awards, are not always able to reliably demonstrate their superior performance in a testing situation. In addition, improvements or changes in performance are not automatic consequences of more experiences but rather occur in domains where aspiring experts engage in deliberate practice (Ericsson, 2006). Given the research on the measurement of the development and acquisition of expertise and the lack of measurable findings in the Canadian Patient Safety Research it seems that any identification of intervention effects might be most successful utilizing more qualitative methodologies.

It seems plausible that there could be an intervention effect of a PET program for the residents. Adoption of new behavioural skills sets and the subsequent integration into professional practice is expected to take dedicated practice over time. In order to determine whether this approach would have success for medical residents it seemed prudent to explore the factors that contributed to the residents' motivation to participate in the research, their retrospective initial responses to the program and the impact of the program in their lives over the past eighteen months since the completion of the PET.

This thesis situated the PET within a theoretical framework of expertise and high performance and explored the potential behavioural changes following performance enhancement training.

The research questions are:

1. What are the pre-disposing and motivating factors for participation in a performance enhancement educational intervention?
2. What factors caused the resident to contemplate behavioural change?
3. Why were they motivated to learn new skills?

4. How did the performance enhancement training impact the residents' personal life and professional practice?
5. What actions have the residents taken to adopt these new skill sets into their practice of medicine?
6. What factors have supported or thwarted this change in perspective and practice?
7. What are the implications for the individual physician, medical education, the health care system and the patient?

CHAPTER 2 LITERATURE REVIEW

Performance

Expertise and high performance have been significant fields of inquiry in psychology and sports psychology. The emphasis in the study of expertise has been on defining expertise, determining the factors that contribute to expertise, developing expertise and measuring the changes in expertise. However, there were aspects of expertise that cross different domains or disciplinary boundaries and can be applied to multiple domains. These included the belief that individuals must have a particular mental capacity which predisposed them to develop into experts; the belief that expertise is the application of everyday skill to experience; the belief that expertise is determined by the content and organization of knowledge; and the recognition that the development of expertise requires a supportive environment (Ericsson, 2006). Each of these factors was discussed individually.

The first aspect was one of individual differences in mental capacity. Ericsson (2006) described Galton's original premise in his famous book "*Hereditary Genius*" (1869/1979) that proposed that experts have a "general innate mental capacities that mediate the attainment of exceptional performance in most domains of expertise" (Ericsson, 2006, p. 10). Subsequent research has refuted that claim. In fact, it has been shown that "the demonstrated superiority of experts was limited to specific aspects related to a particular domain of expertise" (Ericsson, 2006, p. 10) that has not necessarily been transferrable to other domains. Expert performance was not determined by basic mental capacities; and the differences identified between experts and non-

experts nearly always reflected the skills developed as a result of training (Ericsson & Lehmann, 1996, p. 274).

The second aspect has been that expertise is perceived to be the application of everyday skill to experience (Ericsson, 2006). The assumption has been that the same learning mechanisms that account for everyday skills can be extended to the acquisition of expertise (Ericsson, 2006). The research indicated a complexity of relationships between mechanisms mediating memory and performance and those mediating representative performance and as such, there has been no clearly identified patterns of memory and performance although there were many relationships (Ericsson, 2006).

The third aspect was based on the Simon-Chase theory of expertise which has been focused on the content and organization of knowledge (Ericsson, 2006). An earlier theory postulated that expert skill was acquired through an accumulation of experience and increasingly complex chunks and pattern-action associations. It was also believed that the researchers could extract the accumulated knowledge and use it to train future individuals in a method that would take a shorter period of time to develop expertise (Ericsson, 2006). Interestingly, during that research process, it was found that children with extensive knowledge of a field displayed many of the same characteristics in knowledge representation as did adult experts (Chi, 2006; Ericsson, 2006). This then disputed the concept of an accumulation of experience over a long period of time as a requirement for the development of expertise (Chi, 2006; Ericsson, 2006). In other words, time spent, did not automatically result in the development of expertise. Rather, there was some structure or method of organizing of knowledge which characterized the expert. In the ongoing search to identify expert knowledge, Dreyfus and Dreyfus (1986) and Benner

(1984), as cited in Ericsson (2006) concluded that experts find it difficult or impossible to report verbally the contextually based intuitive actions which are represented in their expert performance. Additionally, “expert performers often continue to engage in deliberate practice in order to improve and that these performers have to actively retain and refine their mental representations for monitoring and controlling their performance” (Ericsson, 2006, p. 12). The conclusion has been that expertise is developed with deliberate practice, which improves over time.

A fourth aspect was that expertise has been described as an elite achievement resulting from superior learning environments. A significant study in this area was performed by Bloom (1985), as cited in Ericsson (2006), who identified that “...the availability of early instruction and support by family appeared to be necessary for attaining an international level of performance as an adult” (p. 13). In fact “...no one develops talent on his or her own, without the support, encouragement, advice, insight guidance, and goodwill of many others” (Sosniak, 2006, p. 290). Subsequent research focussed on the development of talent or expertise. The Development of Talent project (Bloom, 1985) as cited in Ericsson (2006), identified that the process of learning was integrated into the performers’ life and was formal and informal, structured and casual, as well as special and ordinary. It included affective and cognitive dimensions and it was “...predominately a matter of qualitative and evolutionary transformations” in the individual’s lives (Sosniak, 2006, p. 290).

The major principles of expertise, applicable to any performance enhancement training program have been described in the following statements.

1. Expertise is not a direct consequence of genetics.

2. Expertise is limited to representative tasks in a domain and is not transferrable to other tasks or other domains.
3. Expert performance is consistent and reproducible.
4. Expertise does not occur over time; rather it is developed through deliberate practice over time.
5. The development of expertise requires a supportive community of practice.

Sports Psychology

The concept of high performance or exceptional athletic performances in sport has been described using terms like peak experience, flow, in the zone, and others (Foreman, 2006; Harmison, 2006; Krane et al., 2006; Orlick, 1980; Raglin, 2001). It has also been described as a sense of complete calmness during an athletic performance. There is an absence of internal or external stressors. The body feels relaxed, muscles are loose and there is a suspended feeling of time (Garfield, 1984). High performance has not been found to be dependent on pre-existing personality or competency traits (Botkin et al., 1987; Eysenck, Nias, & Cox, 1982; Morgan, 1985). High performance has been used to describe consistent achievement of goals by optimal level performance (Harmison, 2006). Krane and Williams (2006) reviewed research that assessed athletes subjective experiences during peak performance, compared psychological characteristics of successful athletes and surveyed top athletes about characteristics required for peak performance (Harmison, 2006). Based on all of this information, Krane and Williams (2006) as cited in Harmison (2006), described the psychological profile associated with the peak performer as “embodying a sense of confidence, feeling in control, being focused on the task, feeling relaxed but having the energy to perform, and being

committed perform his best” (Harmison, p. 234). Over two or more decades of research into the core characteristics of the high performers, indications have been that they seemed to remain stable, despite the passage of time (See Table 2).

Table 2

Characteristics of High Performers

Garfield (1984)	Krane and Williams (2006)
Inner calmness	Energized, yet relaxed
Commitment to a valued goal	Determined and committed
Creative optimism	High self-confidence; expectations of success
Positive mental preparation	Positive attitudes
Active response to intuition	Feeling in control
Persistent concentration	Totally concentrated; Focus on task
Love and support	

(Table developed by author to compare findings of Garfield with Krane and Williams.)

Conversely, the poorer performances seemed to be associated with feelings of self-doubt, distractibility, poor concentration, over-focused on the outcome and inadequate or excessive arousal (Dalloway, 2007; Harmison, 2006; Krane et al., 2006). High performance, as a construct in sports, has been seen to be applicable to one’s personal life as well as one’s professional life (Botterill et al., 2003). There has been no evidence that medicine has looked to the field of sports for insight into expert performance although there are reports of utilizing the knowledge that has been developed through the safety research in aviation (Aggarwal, Undre, Moorthy, Vincent,

& Darzi, 2004; Goldman, 2007; DeLucia, Mather, Griswold, & Mitra, 2006; Helmreich, 2000; Zhang et al., 2002).

Aviation

The field of aviation demonstrated some distinct parallels to medicine. “Pilots, like physicians, are carefully selected, highly trained professionals. Both have been educated for high level performance in high risk environments, have been required to make decisions under pressure and have been constantly reminded that their mistakes may cost human life” (Wilf-Miron, Lewenhof, Benyamini, & Aviram, 2007, p. 35). Due to the current emphasis on patient safety, medicine has relied heavily on this field of research.

This concern for patient safety has been motivating researchers, policy makers, health care professionals and medical educators to look “outside the box” when attempting to find methods of improving physician performance. Much of the research in human performance in aviation has revolved around the human-machine interface, error reporting and the correction of system-wide contributions to human error (Goldman, 2007; Flin & Maran, 2004; Lyons, 2006; Wilf-Miron et al., 2007). This has been similar to the focus in patient safety, which views humans not as the cause of error but rather that human error is a symptom of challenges within the system that are connected to features of tools, tasks and the environment (Committee on Quality of Health Care in America, 2008; Dekker, 2003; Helmreich, 2000; Hoff, Pohl, & Bartfield, 2003; Morath & Turnbull, 2005; Reason, 1990). Despite the system focus, human errors have resulted from the physiological and psychological limitations of humans, such as fatigue, workload, fear, cognitive overload, poor interpersonal communications, imperfect

information processing and flawed decision making (Dekker, 2003; Helmreich, 2000). These psychological factors of human performance have not been primarily addressed in improving human performance in aviation but are the core of the performance enhancement training.

Medicine: Physician Performance

Physician performance, as a concept, was difficult to locate in the literature. Database searches using PubMed, PsychINFO, Allied and Complementary Medicine, Biological abstracts, General Science, and Social Sciences resulted in single factors of performance like anxiety management, concentration, self-confidence, and mental preparation. The majority of information specific to medicine has been focussed on competencies. One exception was the Department of Medicine, University of California, Davis, and School of Medicine. Doctors Mitchel, Srinivasin, West, Franks, Keenan, Henderson and Wilkes (2005) developed a theoretical model of physician performance based on the literature around factors affecting physician performance (Mitchell, West, Franks et al., 2005). (See Figure 2, p. 17).

As seen in figure 2, the model identified factors that affect physician performance and then grouped those factors into three major areas - medical education, the health care system and the individual physician state (Mitchell et al., 2005). The authors defined the relationship between the factors by using a conceptual model of input, process, and output. Input was defined as the physician's inner state which was influenced by both the medical education and health system infrastructures. Process was defined as the performance of the physician, in terms competencies, attitudes and habits. Output was defined as the effect of the physician's performance on the patients, the health care

system and the population. The model proposed that a physician adapts or changes some aspect of his/her practice as a direct result of a negative outcome (i.e., adverse event) of his/her performance (Mitchel et al, 2005).

This feedback loop of learning from experience subsequently improved performance. This was consistent with the common understanding that the experienced physician has made personal modifications, learned from experience, and as such was a higher performer (Epstein, 1999). As opposed to the experiential learning proposed by the University of California model, the “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research proposed that PET could facilitate physicians who practiced in a manner focused on performing at one’s best resulting in high performances resulting in higher efficiency and fewer errors. In the experiential learning model, performance improvement was dependent on negative patient outcomes. The PET provided training to prevent negative patient outcomes. For purposes of this thesis, the model was only utilized as a framework to organize ongoing research findings on factors impacting performance.

The two categories of factors impacting the individual physician state were described as the health care system and medical education. Given that the development of expertise required a supportive environment and supportive peers, the impact of a PET program could be affected by the challenges imposed by the health care system and medical education.

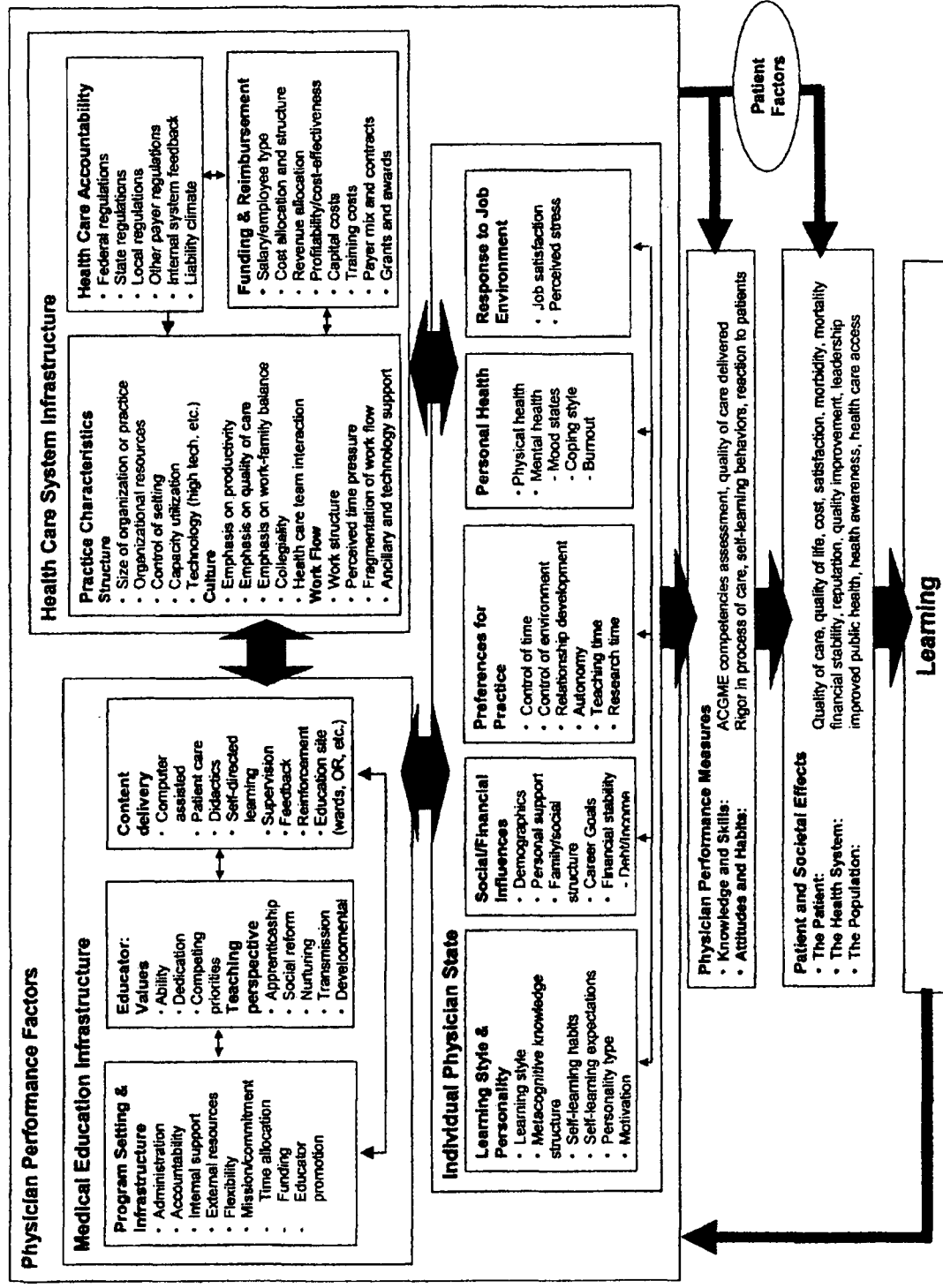


Figure 2. Physician Performance

Figure reprinted with permission. Originally printed in:

Mitchell, M., Srinivasan, M., West, D. C., Franks, P., Keenan, C., Henderson, M. et al. (2005). Factors affecting resident performance: Development of a theoretical model and a focused literature review. *Academic Medicine*, 80, 377.

Health Care System

Historically, medicine dates back to a time when the healing power of physicians was attributed to supernatural powers of witch doctors, medicine men and shaman (Beck, A., 2004; Flexner, 1910). There was a metaphysical component to their healing powers. Physicians were individuals gifted with powers, and trained as apprentices by equally gifted healers. Medical practice was an independent, unregulated business, their income derived from patient fees (Beck, A., 2004; Cooke, Irby, Sullivan, & Ludmerer, 2007; Flexner, 1910). The advent of the industrial age and the shift of emphasis from spiritual forces to a science based approach were associated with an increase in accountability of physicians demanded by the public (Beck, A., 2004; Cooke et al., 2007; Flexner, 1910). This resulted in the establishment of educational standards and medical schools to train physicians (Beck, A., 2004; Cooke et al., 2007; Flexner, 1910). However, independent practice with fees-for-service remained the economic model.

The political shift from private health care to publicly funded health care created a shift of power from the physician as independent businessman to the physician as employee (Parboosingh, 2005). The loss of economic control left many physicians with an adversarial attitude towards the health care system (Parboosingh, 2005). The perception was that the health care system imposes external controls which severely restricted physician's job performance (Puddester, 2004b). The workload was viewed as unreasonable and there was a perceived lack of resources, forcing physicians to treat diseases, not caring for patients (Puddester, 2004a). In many cases, it appeared that physicians viewed their performance as having an external locus of control (i.e., health care system). This attitude could have had an inhibiting effect on resident's responses to

training. If the perception was that change was a mandate from the government or the health care system, not for the individual physician, then motivation for change could be low.

Due to the patient safety initiatives there was a considerable amount of research and effort being focussed on system change but change is perceived to be slow. In medicine it can take between fifteen and twenty years for a new treatment to become common practice (Moffat, personal communication, 2007). It may be that it would take the better part of a resident's entire career to see generalized systemic change. Although the system and the physician's perception of the restraints imposed by the system may limit the effects of the PET it may have been possible to minimize these limitations. Just like athletes cannot change the environmental conditions on the day of their performance, they must learn to perform within the constraints of their environment. Addressing the challenges imposed by the health care system and developing strategies to enable residents to perform effectively and efficiently despite the imposed constraints was integral to any PET program.

Medical Education

A potentially even greater challenge was the unique culture within medicine, beginning with medical education. The goal of medical education has been to train physicians to contribute to society in such a way that they positively impact the well-being of all citizens (Flexner, 1910). The current educational curriculum has trained physicians to meet national competencies called the CanMEDS which include "...the Roles of Medical Expert (the central role), Communicator, Collaborator, Health Advocate, Manager, Scholar and Professional" (RCPSC, 2005). The University of

Manitoba medical education curriculum has been congruent with university accreditation standards. Despite the certified curriculum and the CanMEDS frameworks for physician's roles, medical education has been producing physicians who struggle with some of the key roles (Croskerry, 2005; Epstein, 2006; Farmer, Beard, Dauphinee, LaDuca, & Mann, 2002; Groopman, 2007; Leonard, Graham, & Bonacum, 2004). There was a concern that the inadequate training of physicians was preparing technicians, not humanistic, caring physicians and was potentially increasing the incidence of medical errors (Benbassat & Bauman, 2005; Berkow, 2002; Brennan & Leape, 1991; Misch, 2002; Novack et al., 1997; Yelder, 2004).

This began in medical school where the volume of knowledge expected to be learned during the first four years of medical training has been monumental (Puddester, 2004a). The volume of information has been so enormous, and the time to absorb it was so insufficient, that even the brightest medical student could not learn it all, resulting in significant information overload (Botterill, 2008). The expectations continued to mount with each additional year of training and in the background has been the historical myth that the "all knowing" physician will be infallible. So, the student tried harder and harder, motivated by the fear of failure (Botterill, 2008).

The exceedingly high expectations of individual performance were not only referenced against the historically derived norms, but also against the community of peers. The educational climate has been highly competitive, so that nothing but excellence has been perceived to be acceptable (Canadian Association of Interns and Residents, 1998; Cohen & Patten, 2005; Williams, 1997). This resulted in excessive demands being placed on residents resulting in high levels of insecurity, inadequacy and

a prevailing fear of failure (Canadian Association of Interns and Residents, 1998; Cohen et al., 2005). Making a slip, lapse or mistake could have often resulted in harassment, an increased work load, and loss of respect (Canadian Association of Interns and Residents, 1998; Singh et al., 2006). In fact, clinical supervisors have often managed their medical students and residents with intimidation and harassment that resulted in additional, uncontrollable stress (Canadian Association of Interns and Residents, 1998). The residents identified that the primary motivational strategy has been the fear of failure (Botterill, 2007). Furthermore, the residents have been so acculturated to this form of motivation, that they experienced difficulty understanding motivation in any other way (Botterill, 2007). The most dramatic portrayal of medical culture has been that of an abusive family (McKegney, 1989; Singh et al., 2006). There has been silence about the intimidation and harassment and the treatment has been passed on to the succeeding generation of students (McKegney, 1989; Singh et al., 2006).

In addition to the emotional stressors, the clinical working conditions of working thirty-six consecutive hours caused significant sleep deprivation and fatigue resulting in an extended overload of personal resources (Barger et al., 2006; Botterill, 2007; Szklo-Coxe, 2006). The residents' coping strategies have created a culture of denial that pervades medical training, creating residents who denied their feelings of being overwhelmed, stressed, fatigued or uninformed (Canadian Association of Interns and Residents, 1998; Cohen et al., 2005; Williams, 1997). This denial of feelings may have impacted the performance enhancement program that asks residents to identify these feelings and develop strategies to deal with them. But, it could also have been a strength

of the research given that most residents are generally highly motivated to improve their performance despite their adverse working conditions (Mukherjee, 2002).

Individual Physician Performance State

In order to situate the understandings of performance in the University of California theoretical model of physician performance, the reader must gain an understanding of the current perspective on physician performance. Performance in medicine has been generally viewed in terms of competencies in cognitive, psychomotor and affective behaviour.

Firstly, it has been clearly understood that physicians must have a solid cognitive knowledge base to practice medicine. It has been this knowledge that provides the basis for decisions about diagnosis and treatment. One of the most common medical errors has been cognitive, which occurs most commonly in the development of a diagnosis (Croskerry, 2000; Croskerry, 2003; Croskerry, 2005; Epstein, 1999; Goodell, Cao, & Schwaitzberg, 2006; Groopman, 2007). Groopman's (2007) book, "How Doctors Think" has popularized a concept presented by Croskerry (2000, 2003, 2005), Epstein (1999), and Goodell (2006) that doctors used heuristics in their thinking to assist them in making diagnoses more quickly which generally contributed to positive performance. Unfortunately, the use of heuristics also predisposed them to cognitive errors in diagnosis (Croskerry, 2000; Croskerry, 2003; Croskerry, 2005; Epstein, 1999; Goodell et al., 2006; Groopman, 2007). Although Croskerry (2003) has developed an extensive list of cognitive errors in medicine there has been no clear method of measuring the incidence, type and occurrence of cognitive errors. This has been likely due in part, to the fact that cognitive errors are covert and therefore not readily obvious to the observer (Endsley,

2000). The recommendation for decreasing cognitive errors has been that physicians develop a self-awareness of their thinking and self-monitor potential cognitive errors (Croskerry, 2003; Groopman, 2007). In addition, given that many physicians are not questioning their own thinking, it has been in the patient's best interest to question the physician (Groopman, 2007). Interestingly, the logic still seemed to perpetuate the myth that trying harder will eliminate cognitive errors when in fact the process has been much more complex than the single factor of self-awareness.

Secondly, in addition to having the knowledge required for practice, the physician has been expected to perform psychomotor skills with ease and accuracy. The prevailing practice in medicine has been to "see one, do one, teach one", meaning that medical students observed a procedure for the first time, the next time they attempted it and finally they taught it to a fellow student. This approach has had the potential to put the patient at risk as the student's first attempt has been often on a real patient. Medical Education has recognized that practice in psychomotor skills improved the quality of a physician's performance. Medical education has been gradually incorporating more psychomotor skills practice utilizing standardized patients or human simulators. The simulators allowed students to practice invasive techniques that cannot be practiced on standardized patients. The emphasis on psychomotor skill training with simulation has been gaining momentum, so much so, that many universities have been building simulation centres that could provide high fidelity simulations to train and test psychomotor skills. The research in simulation has been supported by the results of the aviation industry, where there has been a direct correlation between psychomotor training

with simulation and increased performance measured by a decreased incidence of pilot error (Aggarwal, Undre, Moorthy, Vincent, & Darzi, 2004; Goldman, 2007).

Thirdly, the physician's performance must have included a strong affective component to be effective. The impact of verbal and non-verbal behaviour on interpersonal communication has a significant impact on the physician/patient relationship with patients (Entwistle, 2007; Leonard et al.; 2004 Yelder, 2004).

Communication issues have been the most common cause of adverse events (Canadian Patient Safety Institute, 2007). Departments of Medical Education provide training in communication and test for interpersonal communication skills during OSCEs (objective structured clinical examination). This has not adequately addressed the variety of individual physician factors of performance. There has been a growing recognition within the medical education community of the need to recapture the art of medicine, to increase the humanistic aspect of the physician, to increase personal self-awareness for the good of the patient and the physician (Epstein, 2003; Kern et al., 2005; Longhurst, 1988; Marcus, 1999; Novack, Epstein, & Paulsen, 1999; Shapiro, Rucker, & Robitshek, 2006). Recently, the University of California Irvine Medical Center developed a third and fourth year elective-The Art of Doctoring. This elective focused on the development of self-reflection, modification of personal attitudes and behaviours, increasing altruism, empathy and compassion, a sustained commitment to patient care and personal well-being (Shapiro et al., 2006). The initial evaluations were positive (Shapiro et al., 2006).

Education has been ongoing in the cognitive, psychomotor and affective domains of physician performance within the medical education curriculum. Competence in cognitive, psychomotor and affective skills has been measured against national

professional standards (i.e., CanMeds) (Miller, 1990; Mitchell et al., 2005; While, 1994). Competence in most medical schools has been graded on a pass/fail system (Hughes, Golman, & Patterson, 1983). The pass/fail (P/F) and honor/pass/fail (H/P/F) systems had been widely adopted for a variety of reasons. One was the distrust in a number grades' ability to discriminate between various levels of performance (Gonnella, Erdmann, & Hojat, 2004). The focus on grades was perceived to foster a spirit of unproductive competition as opposed to one of collaborative inquiry. By using a P/F system Phillips (1965) as cited in Weller (1983) believed that the students' focus would be shifted from being motivated by the extrinsic rewards of grades to the intrinsic rewards of learning. The students themselves identified that the grade system was more stressful than the P/F system (Weller, 1983). It has been believed that the stress created by the grading system inhibited the learning process (Weller, 1983).

The current system requires that medical students meet a minimum level of competency to pass. There has been no process to discriminate between the student who narrowly passes and the student who excels. The research on grading has focussed on using grades or P/F as a predictor for future academic performance, not for current performance. It has been reported that medical students from a P/F system perform worse on national examinations (Suddick & Kelly, 1981; Weller, 1983). In another study, it was identified that surgical residents who graduated from schools with a P/F grading system accounted for 82% of those ranking below the fifteenth percentile of surgical residents (Rohe, et al, 2006). Studies have not identified a significant relationship between grades and physician performance in medical practice (Rohe et al., 2006; Taylor & Albo, 1993; Wightman, 1999). More recently, Gonnella's (2004) study demonstrated a strong

relationship between numerical grades in first year basic science courses and student performance during and after medical school. Gonnella (2004) identified that the P/F system does not identify those students in need of remedial education as there has been no discrimination in quality of performance. Therefore, it has been possible for minimally competent students to graduate from medical school, providing minimally competent medical care. As practicing physicians, they have been resistant to changing their behaviours to move beyond competency to expertise. This has been despite the continuing medical education opportunities which are available to them (Smith, 2000).

The intent of the PET was to provide additional support to assist physicians to reach beyond competency, to high performance. Mitchell's (2005) review article on physician performance indicated that no studies were available that either related patient care errors to resident performance, or related residents' learning style preferences, self-reflection or personal preferences for practice to physician performance (Mitchell et al., 2005). They identified a shortage of literature relating health system variables and individual physician states to residents' performance (Mitchell et al., 2005). Consequently, this thesis used performance enhancement training in sport. Sports psychology has studied performance for many decades and offered some insights into understanding performance and in training to improve performance.

Performance Enhancement Training

Performance Enhancement Training (PET) has been the term given to a training program designed to improve performance in athletes. According to Garfield (1984) athletes required the structure of a training program to prevent them from wasting time trying strategies that are not effective (Garfield, 1984). Performance Enhancement

Training programs focused on enhancing performance by providing training in the psychological factors impacting performance, such as goal setting, mental imagery, and stress management. In sports, these programs have been designed and delivered by Performance Enhancement Consultants or Sports Psychologists. This thesis has chosen to use a model of psychological preparation required for expert or peak performance to gain an understanding of performance enhancement training. The model was originally developed by Hardy, Jones and Gould (1996) and has been modified by Harmison (2006) (See Figure 3).

As seen in Figure 3, Harmison's (2006) model depicts the ideal performance state. Expert performance has been described as the peak of a pinnacle created by the synergy of three major categories of attributes and skills. The model also clearly identified that all of these factors were operational within the context of a specific physical, social, organizational and psychological environment which served to support or create challenges for the development of expert performance.

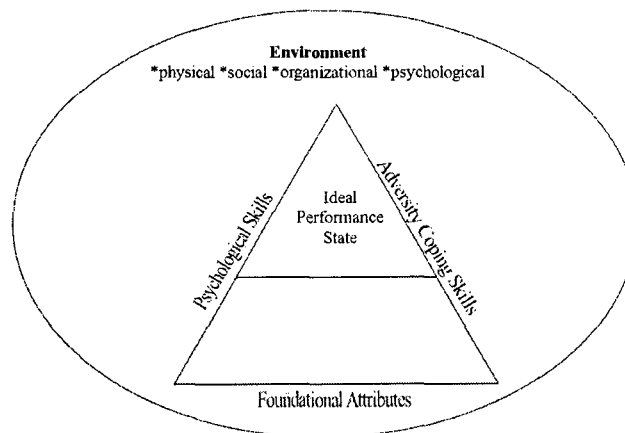


Figure 3. Peak Performance

Reprinted with permission from the American Psychological Association. Original figure in *Peak Performance in Sport: Identifying ideal performance states and developing athletes' psychological skills* (p. 235) by Robert Harmison who modified the model from *Understanding psychological preparation for sport: Theory and practice of peak performance* (p. 240) by L. Hardy, G. Jones and D. Gould (1996).

This model allowed the reader to view the multitude of factors impacting performance as a coherent whole. The concepts have not been unique to sports and seemed to be applicable to performance in any field. The concepts in this model have been applied to the PET provided to the medical residents in the “The Utilization of High Performance Patient Simulations to Reduce Medical Error” project.

Environment

The concept of environment, physically, socially, organizationally and psychologically, has been perceived to envelope the individual and all of the psychological factors that impact his/her performance (Harmison, 2006). This correlated with the model of physician performance which viewed the health care system and the medical education system as having a direct and overarching impact on performance (Mitchell et al, 2005). Physical, social, and organizational factors impacted ideal performance states (Hardy, Hall, & Hardy, 2005). Research has documented that social factors (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998), and organizational factors (Woodman & Hardy, 2001) have all been perceived to be sources of stress that could interfere with an athlete’s ability to achieve a high performance state (Harmison, 2006). In medicine, the social and organizational cultures of health care and medical education have been described as unique and provide distinct challenges. These have previously been discussed within the context of the medical education and health care system infrastructures in the model of Physician Performance (See Figure 2, p. 33).

The culture of a clinical residency has been unique. Entry into a clinical residency program has been challenging for medical students. All medical students, upon graduating with their medical degree, have been required to complete a two year

residency program. There have been limited numbers of available positions and application must be made on-line through a national data base called the Canadian Resident Matching Service (CaRMS). Unfortunately, due to the competition, some residents have been placed in a speciality which was not of their choosing. The competitiveness that accompanies this selection created an environment in which residents felt that they must perform at their maximum all of the time. This self and/or system imposed pressure caused residents to deny any feelings associated with less than excellent performance, such as being “overwhelmed, stressed, fatigued or uniformed” (Canadian Association of Interns and Residents, 1998, p. 1). The “happy doc” study, a study of residents and interns, indicated that 23% of residents acknowledged suffering from an emotional or mental health problem during their residency (Cohen et al., 2005). The stress of the program has been so significant that a full 22% would not pursue medicine if they knew the nature of the program before they started (Cohen et al., 2005). Despite the ambivalence towards their chosen profession, the resident has invested considerable time and expense into his/her education. The financial debt has been a strong motivator to complete the program (Cohen et al., 2005)

Another significant factor in the environment, determined by both medical education and the health care system, has been the long hours of work (CAIR, 1998). Historically, residents were hired by the hospital and “resided” in the hospital. In exchange for their modest accommodations, meals and education they were expected to be available to work twenty four hours/day seven days a week, three hundred and sixty five days a year. Currently, residents no longer live at the hospital and they have been paid a small salary. However, they have still been expected to work long hours. In many

hospitals the maximum stated hours/shift has been twenty-eight hours but this has been often extended to thirty-six hours. Many residents have worked a one-in-three call but more and more hospitals are moving to a one-in-four call. It translated into approximately one hundred hours of work/week. (Canadian Association of Interns and Residents, 1998) The program director made the schedule and residents worked the schedule as written. This same program director also evaluated the residents' performance, which has been a significant factor in the residents' ability to graduate. The stress of long hours, overwork and fear of failure contributed significantly to the resident's capacity for peak performance.

In addition to residents' clinical placement and their long hours of patient care another factor which impacted performance has been the expectation to participate in the academic activities of their universities by teaching and supervising medical students. Residents have received no formal training in pedagogy and have not been financially remunerated for their service. This has been perceived to be part of the professions commitment to mentorship (Canadian Association of Interns and Residents, 1998).

Another factor has been the strict hierarchy that exists in medicine. Each position (i.e., clinical director, resident, and medical student) carries with it specific roles and responsibilities creating a hierarchy which provides barriers to a collaborative or team approach to medicine. Additionally, communication tended to be paternalistic with the superior dictating jobs to the junior (Canadian Association of Interns and Residents, 1998). This has resulted in significant issues of intimidation and harassment in the workplace. The "happy doc" study reported that "more than half (53%) of participants reported that they had experienced intimidation and harassment on more than one

occasion during their training (Cohen et al., 2005). Groups identified as being responsible for intimidation and harassment included “staff physicians (39%), residents from other programs (25%), nursing staff (54%) and patients (45%)” (Cohen et al., 2005). The most common basis for “intimidation and harassment was gender (18%)” (Cohen et al., 2005). Medscape documented medical students’ blog entries on verbally abusive treatment received by residents (Singh et al., 2006). The results have been an overwhelmingly consistent experience by doctors, nationally and internationally, documenting abusive treatment of residents by attending physicians (Singh et al., 2006).

This has been the environment in which the residents are required to perform. Botterill (2007) identified the challenges of sleep deprivation and fatigue as well as motivation by “fear of failure” as significant cultural and environmental challenges for the residents participating in the PET. These factors have had a significant and negative impact on all other factors of performance. They have been in direct opposition to one of the overriding principles of the development of expertise, which has been the need for a supportive environment and community.

Foundational Attributes

The remaining components of the model described specific psychological factors which impacted performance. The first of these was what Harmison (2006) terms foundational attributes. These are described as the personality and dispositional attributes which make up the individual. They included personality traits, motivational orientations, and philosophical beliefs (Harmison, 2006).

Personality traits

Personality traits have been described as individual characteristics that are unique to each person. The individual was born with these characteristics which caused him/her to perceive the world in a certain way and pre-disposes him/her to react or behave in a particular manner, with predictable regularity (Eysenck et al., 1982; Raglin, 2001).

Research into the relationship between personality and successful performance in sport has not definitively isolated any specific personality traits which would have predisposed individuals to greater success although there have been correlations which suggested a positive relationship between some personality traits and successful performance (Eysenck et al., 1982; Raglin, 2001).

Lievens (2002) utilized the Five Factor Model of Personality to identify personality traits typical of medical students (Lievens, Coetsier, De Fruyt, & De Maeseneer, 2002). The five-factor model listed the personality dimensions of “Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism” (Lievens et al, p. 1050). The five dimensions are held to be a complete description of personality (Acton, 2001). Medical students scored highest on measures for extraversion and agreeableness (Lievens et al., 2002). Various studies demonstrated correlations between personality and performance during medical training (Lievens et al., 2002; Manuel, Borges, & Gerzina, 2005; Murden, Galloway, Reid, & Colwill J.M., 1978) (See Table 3, next page).

Table 3

Personality Characteristics

OCEAN (Lievens, et al, p. 1050)	Medical Students	Performance
Openness to experience	Average Scores	
Conscientiousness (competence, order, dutifulness, achievement striving, self-discipline and deliberation)	Average Scores	During pre-clinical years: positive correlation to academic performance (Lievens et al., 2002)
Extraversion (Interpersonal skill: warmth, gregariousness, assertiveness, activity, excitement seeking and positive emotions –relates to frequency of social interactions)	High Scores (note: medical students dropping out have higher scores in gregariousness and excitement seeking)	During second year: Strong correlation with clinical skills of data collection and communication (Manuel et al., 2005)
Agreeableness (Interpersonal skill: trust, straightforwardness, altruism, compliance, modesty and tender- mindedness – relates to quality of interpersonal behaviour)	High Scores	Residency: Strong correlation with recommendations for residency and student's level of agreeableness (Murden et al., 1978)
Neuroticism		

(Table developed by author to compare the five factor model of performance, personality characteristics of residents and medical student performance as organized by personality)

Research linked extraversion to success in athletic performance and also demonstrated correlations between extraversion and successful performance (Raglin, 2001). There has been some evidence that an extrovert's perception of effort has been correlated with actual exercise load. Extraverts chose positive coping strategies focusing on the source of stress and social support networks (Raglin, 2001). The ability to work hard, cope positively with stressors and ignore the discomforts associated with physical training all contributed to successful performance.

Motivational orientation

The second foundational attribute which impacted performance was motivation. Motivation, as a theoretical concept, has been used to describe why people engage in particular behaviours at particular times (Beck, R., 2004). It also described the variability in behaviours (Beck, R., 2004). The premise has been that the individual approached goals or engaged in activities which had desirable outcomes and avoided activities with aversive outcomes (Beck, R., 2004). The two major approaches to motivational theory have been regulatory and purposive (Beck, R., 2004).

Firstly, the regulatory approach to motivation emphasized the internal or biological factors which create motivation. According to Maslow failure to meet the basic physiological needs, like food, shelter and rest, almost always prevented meeting other needs such as the need for safety, love, etc. (Maslow, 1987). In medicine, residents worked extended periods of time, often without rest and/or nutritional breaks. Often, in medicine, the career goals superseded the regulatory needs (Canadian Association of

Interns and Residents, 1998). The individual may be tired or hungry but the motivation to reach the goal superseded the physiological motivating factors. According to Maslow (1987) once the physiological needs are met, other higher needs emerge and once those are met even higher needs emerge.

Secondly, the culture of medicine seemed to indicate that the persistent motivation has been purposive, in that residents are motivated to complete the educational requirements to obtain their medical degree. The variables which determined the strength of motivation include aversion (i.e., fear of failure, stress, etc.) and desire (i.e., need for achievement, hope for success, etc.) (Beck, R., 2004). Individuals generally worked to minimize aversive outcomes and maximize desirable outcomes. But, motives tended to be hierarchical, that the need that was more persistent took precedence even if it was more aversive than desirable (Beck, R., 2004; Maslow, 1987). In medicine, students must be highly motivated to pursue acceptance in a medical education program as the majority of students who apply are not accepted. Once accepted, the educational program has been challenging, leaving little time for family or personal pursuits. The motivation of residents has been most often fuelled by aversive variables such as the fear of failure.

The PET program was an extracurricular activity which offered residents the opportunity to become engaged in a learning experience that promised to nurture their development as “high performance physicians”. There were no extrinsic rewards for participation. In fact, the system created significant barriers to participation such as difficulty obtaining time away from clinical practice to participate in PET, as well as perceived lack of peer support and physical distance. Performance enhancement training initially attempted to assist residents to gain an awareness of the factors which motivate

them. The training subsequently focused on nurturing the positive motivational factors taking into consideration the importance of, and strategies for, meeting the basic lower levels of physiological needs.

Beliefs and values

The third foundational attribute was beliefs and values. Both of these have been related to motivation. An individual's belief in his/her abilities to perform or succeed at learning a specific task, despite obstacles and hardships expends whatever energy is required to accomplish the task. This has been called self-efficacy (Bandura, 1986; Jeffreys & Smoldaka, 1999). People who believe that they have the capacity to achieve a certain goal have been more likely to be successful in meeting their goal (Bandura, 1989). Self-efficacy has had a motivating impact and can be taught (Bandura, 1989). If people believed they have the capacity to meet a goal they persisted in exerting considerable effort to achieve the goal, even in the face of persistent obstacles (Bandura, 1986).

Inherent in goal development has been the presence of personal values. Some values which are common to individuals applying to medicine included a desire to help people (including caring, compassion, support, and service), the desire to be respected (e.g., socially, professionally by peers and by patients), indispensability (including components of control, power, and technical expertise), quality of life, job security and for the involvement with science e.g., basic knowledge, research, diagnosis and treatment (McManus, Livingston, & Katona, 2006; Wright, Scott, Woloschuk, & Brenneis, 2004). There does not seem to be any research on physicians' values upon completion of medical school suffice it to say that at least one quarter of physicians would not choose medicine as their profession, if they were to choose again (Cohen et al., 2005).

Psychological and Adversity Coping Skills and Strategies

The remaining two groups of psychological factors impacting performance have been the individual's psychological and adversity coping skills and strategies. These mental skills have the potential to be taught and learned (Dalloway, 2007; Garfield, 1984; Harmison, 2006). The enhanced mind/body state and the ability to control unproductive mental states resulted in an increased likelihood of peak performance (Krane & Williams, 2006). This required practice and changed behaviours. For example, where an unhealthy response to stress might have had a negative impact on performance, a positive method of stress reduction will result in a positive impact on performance.

There has been an agreement in the literature about a core group of mental skills that are essential for peak performance and are an integral component of any PET. They included goal setting, imagery, competition and refocusing plans, well-learned and automatic coping skills, thought control strategies, arousal management techniques, facilitative interpretations of anxiety, and attention control and refocusing skills (Harmison, 2006). Their efficacy has been demonstrated repeatedly and is well documented in the literature. A basic description of each skill with the reputed effects on performance has been presented here.

Goal setting

Goal setting has been regularly utilized by athletes. It allowed for the athlete to set self-directed goals, use self-reinforcement and positive self-thoughts to reach the end goal. Goal setting and developing strategies to meet the goals separates those who excel from those who wish to excel (Meyers, Whelan, & Murphy, 1996).

Mental imagery

Mental imagery, mental rehearsal, mental practice or cognitive enhancement are all terms that described the mental practice that allowed individuals to see themselves completing a successful performance (Bucher, 1989; Dalloway, 2007; Durand, Hall, & Haslam, 1997; Harrison & Jackson, 1994; Lesyk, 1999; Raglin, 2001; Rowe & Cooke, 1997). The evidence supported the beneficial consequences of imagining successful athletic performances as compared to the detrimental effects of imagining failure. Mental rehearsal of psychological coping skills allowed the individual to reduce potential anxiety by imagining real world scenarios and practicing their response to the scenario.

Focus of attention

Stress led to a change in focus of attention from external cues to a more internal self-focus which resulted in decreased performance (Driskell, Salas, & Johnston, 1999). The information overload created by stress led to a narrowing of attentional capacity (Nideffer, 2006). To reduce the negative effects of stress, attention was restricted to those cues most relevant to the task (Nideffer, 2006). The change in focus of attention to a more internal focus restricted the individual's ability to attend to important social cues such as other team members' requests or actions (Driskell et al., 1999).

Coping skills

Stress has been described as an inevitable component of performance. It had the capacity to impede an individual's ability to deliver peak performances. Sports psychologists have tried many ways to assist athletes to cope with the stressors that may have prevented their optimum performance state (Harmison, 2006). Adversity coping skills included skills like emotion-focused coping, realistic stress appraisal, social

support, developing perspective, learning to resonate, taking time for recovery, etc (Botterill & Patrick, 2003; Botterill, 2007).

Thought control strategies

The ability to develop positive psychological coping strategies required one to make the strategies work for him/her. Change did not occur instantaneously but with persistence one can be in self-control for greater and greater periods of time (Orlick, 1980a). The ability to maintain self-control was dependent on an individual's self-efficacy (Bandura, 1989).

An example in medicine has been the concept of "mindful practice" in which there was an ongoing sense of self-awareness or self-monitoring which allows for the examination of assumptions and resulting behaviours (Epstein & Borrell-Carrio, 2005). The mindful practitioner was self-reflective, examined his/her own biases in his/her practice of medicine therefore potentially having improved performance as measured by patient outcomes (Epstein, 2003). This was an example of behavioural change which took time to become assimilated into an individual's repertoire of coping skills.

Arousal management

An optimum level of arousal was seen to be essential for high performance (Landers, 1980; Mahoney & Meyers, 2007; Meyers et al., 1996). If arousal is moderate, and the number of task relevant cues is not excessive, the performance can be facilitated by arousal. If arousal gets too high, however, the individual has difficulty attending to task relevant cues. When individuals are functioning under conditions of high arousal they have become acutely aware of fearful stimuli. The stress created by the high level of arousal caused the physiological responses of fight or flight. What was most important is

the perspective of the individual. If the individual perceived the stressors to be dangerous it would have a negative effect on his/her performance. If the individual identified the key cues and processed the information in a non-threatening manner, the performance could be positive. Much of the research suggested that skilled performers have been more efficient processors of information, not because they can deal with more information, but because they have been able to pay attention to less information (Nideffer, 2004). This allowed them to focus and respond to the critical cues (Nideffer, 1995). A certain amount of arousal and perhaps even anxiety has been necessary for exceptional performance, it has been the individual's perception of that anxiety and his ability to manage it that was most directly related to his/her performance (Meyers et al., 1996).

Facilitative interpretations of anxiety

Anxiety has not been perceived to be an external event. An individual's perception of an event created anxiety (Orlick, 1980). The major irrational beliefs associated with anxiety included the belief that one must have love and approval from all significant people in one's life; that one must prove themselves to be thoroughly competent, adequate and achieving (Orlick, 1980). The most successful method of reducing anxiety has been for the individual to confront and change his/her irrational beliefs (Orlick, 1980). Self-talk, self-hypnosis and relaxation have been strategies that help to reduce anxiety (Hardy, Hall, & Hardy, 2005). Positive self-talk has been successfully used to focus attention and to combat performance anxiety (Araki & Mintah, 2006). Relaxation strategies like progressive muscle relaxation (PMR) assisted in the development of self-awareness. Once self-aware, the individual identified physical symptoms of stress. This method has been successful in decreasing anxiety resulting in

increased performance (Khasky & Smith, 1999). Self- hypnosis has been used to keep individuals relaxed, confident and focused which translates into better performance (Pates, Oliver, & Maynard, 2001).

Behavioural Change

The impact of any PET resided with the effects it had on the recipient's personal and professional life. The training was psychological; hence it was cognitive, and therefore largely unobserved. A PET required some significant changes in perspective, arousal and stress management, personal health habits and adjustment to coping styles. These are skills were not easily given to immediate adaptation by most individuals. It was possible that the role of a short-term, "stand alone" PET could initiate a process of behavioural change that would be more evident with the passage of time. Therefore, an exploration of the supporting literature on behavioural change provided direction for the exploration of this thesis.

No one single theory will likely describe all of the complexities of behavioural change. Therefore, the framework chosen for viewing behavioural change as a result of the PET intervention is a stage-based model called the Transtheoretical Model of Behavioural Change (See Figure 4, next page) (Prochaska & Velicer, 1997). This model was based on several assumptions.

Maintenance: Behaviour has changed for longer than six months and is integrated into the individual's skill sets.

Action: Behavioural change which lasts for at least six months.

Preparation: Taking active steps to collect information, talk to others, explores potential effects of change.

Contemplation: Serious consideration is given to changing. There is active exploration of possibilities for change

Pre-Contemplation: No intention to change or not aware that change is possible.

ENVIRONMENT

Social

Cultural

Ethical/Spiritual

Legal

Political

Resource

Personal Behaviour Change

Figure 4. Transtheoretical Model of Behavioural Change

(Prochaska et al., 1997)

Firstly, behavioural change is a process that occurred over time and moved through a sequence of stages. Secondly, stages were both stable and open to change. Thirdly, specific interventions should be applied at specific changes if progress through the changes is to occur. And fourthly, the environment was a significant factor in behavioural change (Prochaska et al., 1997).

The core constructs of this model have been described in the five stages of change. Behavioural change required progress through all five stages. The progress was not necessarily linear but rather cyclical in that it involved progress and periodic relapse. In successful change there was always movement towards the goal, despite relapses (Prochaska et al., 1997).

The five stages of change moved from a position where change was not considered possible to a final stage where the behavioural change has been incorporated into the individual's general behaviours.

1. Precontemplation - In this stage the individual had no intention to take any action within the following six months. The individual may not have realized that change is possible or even of interest to him/herself (Prochaska et al., 1997).
2. Contemplation - During this stage the individual contemplated a change within six months. Something prompted the individual to start thinking about change. This was the stage where the individual has some form of dissatisfaction or frustration with something in his/her life. There was the concern if someone changed they would lose their effectiveness, self-esteem or maybe even identity. Adapting poorly or failing to meet one's creative potential was easier than risking failure or losing self-esteem in the process (Prochaska & Di Clemente, 1992; Schein, 2006).
3. Preparation - The intent to action was immediate and action is taken within the following thirty days. This process included the gathering of information, finding out how to achieve the change, determining the skill required, talking to others, considering the impact of the change and who will be affected (Prochaska et al., 1997).
4. Action - The behaviour has sustained a change for six months or less. The individual has acted on the motivations for change, has made the changes, and has processed the new skills (Prochaska et al., 1997).

5. Maintenance - The individual has changed the behaviour for more than six months. The individual has practiced the new behaviour and has incorporated the behaviour into his/her repertoire of behaviours (Prochaska et al., 1997).

Behavioural change required an enabling or supportive environment. The model identified six environment aspects.

1. Social Features – This included the nature of personal relationships, expectations of class, position, age, gender and access to knowledge. This was highly relevant to residents who function within a hierarchal system.
2. Cultural Features – This included the behaviours and attitudes considered acceptable in given contexts. In this case it would include the cultural features of medical education and the health care system and how they impacted the potential behavioural change.
3. Ethical and Spiritual Features – This referred to the influence of personal and shared values and morals systems. The “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research used individual’s personal values and a strategy for personal goal development.
4. Legal Features – This included laws determining what people can do and activities to encourage the observance of those laws. In medicine this included the ethical boundaries that constrained a physician’s behaviour.
5. Political Features – This included the systems of governance that could be affected by the change or that would have a restricting or enhancing impact on the change. In some cases the residents made choices that were outside of the normal political process which had some immediate consequences.

6. Resource Features – This refers to the tools and supports required for the individual to change his/her behaviour.

The transtheoretical model of behaviour change provided a framework to view the behavioural changes that occurred in residents' lives during the course of the intervention. These would be considered initial movements towards long-term behavioural change. These initial acts of contemplation would not have had the time to become integrated into the resident's pattern of behaviour prior to the testing in "The Utilization of High Performance Patient Simulations to Reduce Medical Error" research project. If the PET triggered the process of behavioural change, then re-acquainting a researcher with the residents and listening to their stories, might identify the factors which impacted the behavioural change process. Exploring the journey with the residents may yield findings that could define an effective intervention for future medical students.

Summary

The supporting literature for this thesis has required a synthesis of evidence from multiple sources. The study of expertise across domains identifies that expertise was domain specific and is developed through dedicated practice over time (Ericsson, 2006). It has been demonstrated in reproducible and consistent performances which were observable and were experienced in specific psychological ways by the expert (Ericson, 2006). Lack of expert performance was linked to errors in both aviation and medicine (Dekker, 2003; Wilf-Miran et al, 2007). In both, the focus on improving performance was on the human-machine interface and on system wide contributions to errors (Dekker, 2003).

The research within medicine on physician performance indicated that physician error was inevitable and negative patient outcomes were the primary change agents (Mitchell et al, 2005). The factors which exerted barriers to high performance included the cultural issues of intimidation and harassment as well as the constraints which resulted from the health care system (Mitchell, 2005). The current solutions in medical education included strategies for teaching and assessing interpersonal communication skills using standardized patients as well as provided opportunities to learn psychomotor skills through high tech simulation. There was a move towards providing some educational interventions on empathy and mindfulness but these were primarily in the conceptual or pilot project stages (Epstein, 2003, Shapiro, 2006).

There was supportive evidence for the psychological interventions effectiveness with athletes. “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research project was able to observe some differences in resident’s

performances which were not measurable with the tools used (Kreindler, 2008). The evaluation process immediately followed the completion of the performance enhancement training.

This thesis contributed to the body of literature in performance enhancement and medical education in several ways. First, a discussion on the impact of a performance enhancement training on individuals other than athletes could have served to strengthen the literature in psychological skill training. Secondly, the innovative approach to impacting physician performance could have offered another approach for the patient safety researcher. Thirdly, it provided an additional educational approach for medical education by having identified the medical residents' motivations to improve performance and having isolated the most valuable components of a performance enhancement program which they identified as having a positive impact on their performance.

CHAPTER 3 METHODOLOGY

Research Design

This research explored the residents' perceived impact on their performance of the PET, 18 months after completion of the PET program. Discovering the nature of the impact required an understanding of what the residents knew, thought, and felt about their involvement with the PET program and its impact on their lives. Qualitative research was the selected approach for this research, given that qualitative methods allowed the researcher to discover what people think, know and do. This was done by observing people in their environments, interviewing them individually or in groups and analyzing documents which contain written data relevant to the question being studied (Patton, 2002). The opportunity to engage in a dialogue allowed for the potential for factors, not considered by the researcher, to be introduced by the research participants.

The nature of qualitative research was that it can be used both for fundamental research and applied research. The primary purpose of fundamental research was to develop and/or test theories which subsequently contribute to the body of knowledge on the topic being studied. This knowledge and the theories that were developed from it may inform action although this is not the primary function of fundamental research (Patton, 2002).

Applied qualitative research focused on how qualitative methodology could "... contribute to *useful* evaluation, *practical* problem solving, real-world decision making, action research, policy analysis, and organizational and community development" (Patton, 2002, p. 145). A form of applied qualitative research has been program evaluation. In this case the research data was collected through participants' stories and

is reported as the program's story. "Understanding the program and participants' stories is useful to the extent that they illuminate the processes and outcomes of the program for those who must make decisions about the program" (Patton, 2002, p. 10). The author of this research study utilized a form of applied qualitative research in evaluation, but not in the sense of specific program outcomes. A program evaluation focused on measuring whether a program met its goal and objectives is a summative evaluation. Rather, the focus in this thesis was on process. In addition to exploring outcomes, a focus on process examined the events leading to the outcome and the manner in which the events unfolded (Patton, 2002). Qualitative inquiry was ideal for studying process because it captured the interactions between participants acknowledging the individual experience. Perceptions were valued and the discussion and exploration of ideas and actions was fluid and dynamic which allowed for a depth of understanding not easily captured with another form of research (Patton, 2002).

A basic principle of qualitative research has been that the researcher studied the individuals in context of their real-world situations (Patton, 2002). This naturally resulted in data collection which included not only participant interviews but also researcher observations during fieldwork. In addition, given the importance of a supportive environment to the development of expertise, it seemed reasonable to engage in an ethnographic inquiry where the researcher participated in extensive fieldwork as part of the data collection process. But this approach would be difficult given the closed nature of the medical education and more fundamentally, was not an ethical possibility due to the constraints of confidentiality in the patient-physician relationship. Qualitative research has not commonly been used in medical education research. In Harris's (2002)

review of qualitative methodologies used in education research, it was proposed that the processes of clinical teaching, instructional decision-making, learning and professional socialization could benefit from qualitative studies of the hidden dimensions of learning environments, and students' and teachers' intentions, meanings, values and beliefs (Harris, 2002).

Selection of Participants

An e-mail invitation to participate in this research (see Appendix E) was sent to all of the twelve residents as well as the four residents from the pilot program of The Utilization of High Performance Patient Simulations to Reduce Medical Error research project. This was a purposeful group who had responded to an e-mail invitation to participate (see Appendix E) in a research project promising to enhance the performance of physicians with the goal of becoming high performance physicians. The participants were all medical residents from a mid-western doctoral university who were in various stages of a residency program. There was no screening of applicants. All who applied and could fit the training into their schedule were invited to participate. All residents were informed that there would be a possibility for follow-up contacts some time after the completion of "The Utilization of High Performance Patient Simulations to Reduce Medical Error" research project so the request was not unexpected. The resulting group of participants varied in demographics, age and previous medical training (See Table 4, p. 68). This selection of participants can be viewed as purposeful sampling in that they are selected because they are the individuals that can offer their own experiences for investigation (Patton, 2002). As such, the research is aimed at gaining insight into a phenomenon (i.e., PET), not empirical generalizations from a sample to a population.

Contacting the residents was difficult as the resident's e-mail address and phone number was from the time of the original research project and as such was at least eighteen months old. Some of the residents had subsequently graduated and were in clinical practice, some were in the final months of their residency, and others were in fellowships in other provinces and/or other countries. The first contact was made through an email blind copied to the entire group (see Appendix E). There was an invitation to question the researcher about any of the research details, if they so desired. There was an immediate response of six individuals. Initially, one of the email addresses came back as unknown and two weeks after the initial request, a second request was sent and an additional email address was identified as unknown. At this point I began looking for alternate contact information. The Winnipeg Regional Health Authority, as a partner in the original research, was able to confirm current email addresses so a third email was sent to the new addresses. This third email included the formal invitation to participate as an attachment, as had the previous emails. The email also asked them to reply, even if they were unwilling to participate. Replies were positive, agreeing to participate, or no reply. I interviewed nine of the ten people who replied. The tenth person was unable to find a suitable time to meet as s/he was on a deadline for their own PhD program. I was unable to obtain one address and another one of the four residents in the initial pilot did not complete the program. Five residents did not respond at all-I was also unable to definitively identify that they had received the emails. One of these residents was from the initial pilot group who completed the last testing two years ago. Of the remaining eight residents, there were four from each of the remaining two groups of six. It was clear in the invitation to participate that part of my goal was to see if the program could be

integrated into medical education. It may be that those who chose not to reply did not want to support the addition of performance enhancement into medical education, they did not receive the email or they could also have just been too busy to respond. For the purposes of this research, I chose to view their lack of response as neutral (see Table 4, next page).

Table 4

Participant Demographics (n=16)

Characteristics	Details
Gender:	Male (11)
	Female (5)
Ages:	20-29 (5)
	30-39 (9)
	40-49 (1)
	50-59 (1)
Residency Program:	Anesthesiology (2)
	Critical Care(2)
	Community Health Science (1)
	Internal Med (1)
	Family Med (4)
	Neurology (2)
	Oncology (Med) (1)
	Oncology(Radiation) (1)
	Pediatrics (1)
	Pathology (1)
No. in a previous residency program:	Yes (2)
	No (14)
No of participants with another profession:	Yes (1)
	No (15)

Procedures

The research participants were all very busy, but willingly made time to talk to me. The time, date and location of each interview were negotiated individually. These conversations were held in spaces that worked for the participants. Sometimes it was a classroom, sometimes a restaurant. Prior to beginning the interview I repeated the purpose of the research, including the lack of monetary or “in kind” rewards for participation, which was initially identified in the email requesting their participation. I provided them with an opportunity to read and sign the consent form (see Appendix F). I also reinforced that they could stop the interview at any point. All interviews were digitally recorded to ensure accuracy in transcription. Within 24 hours the data was transferred to a portable hard drive and stored in a secure location, accessible only to myself. As well, if there was something that the residents said that they wanted excluded from the interview, they were free to indicate that to me. (This did occur in several cases. I chose to not transcribe any of those comments although they were not deleted from the original recording). During the interview the participants and I were calm, engaged and interested in the discussion. During each interview I asked the six interview questions (see Table 5, next page), always beginning in the order listed. During the interview, the responses to one question sometimes broadened to address another question further down on the list. At that point, I would indicate that I was actually going to ask them about what they were currently talking about was later on in the interview, but would ask it next, in order to facilitate the flow of our conversation.

Table 5

Interview Questions

1. What are the pre-disposing and motivating factors for participation in a performance enhancement educational intervention?
2. What factors caused the resident to contemplate behavioural change?
3. Why were they motivated to learn new skills?
4. How did the performance enhancement training impact the residents' personal life and professional practice?
5. What actions have the residents taken to adopt these new skill sets into their practice of medicine?
6. What factors have supported or provided barriers to this change in perspective and practice?

In all cases the participants answered the questions with minimal reflection during the first thirty minutes. As time passed they began to reflect on the performance enhancement training and their lives over the past two years and began to express more introspective and reflective thoughts. At this time I would summarize what I believed they were saying in an effort to validate my perceptions and interpretations of their experiences. This created an interactive synergy where they responded to my perceptions, clarified my perceptions and usually developed an insight into their behaviour that was somewhat novel to them. This exchange resulted in the recall of personal stories and the realization of how some of their current behaviours were developed after their participation in the performance enhancement training. Additionally, they generally extended an invitation to

me to contact them again if I had any additional questions. All of the participants also indicated that they were looking forward to the research results.

Instrumentation

The type of instrumentation chosen determined the type of data collected. This research used a researcher generated list of interview questions (see Table 5, p. 68). There were no questions to use from previous research therefore the questions have not previously been validated. The origins of the interview questions were derived from the research questions. I wanted to understand the individual process of change that occurred or did not occur during and after the training. The open-ended questions provided an opportunity for the residents to share their personal and professional background and demographics, their experiences and behaviours, opinions and values, feelings, and knowledge, all related to the performance enhancement training. It provided an opportunity for them to identify the motivating factors which contributed to their decision to participate in the research, and their lived experiences during the training. It also explored the impacts that were a result of the training, including factors which were enabling or provided barriers; and the relationship between factors. Prior to the development of the questions, I explored my biases and anticipated responses by documenting my expected responses and rationales for them (see Appendix B). These questions were asked, as written, to each of the residents.

Considerations of Credibility, Transferability, and Trustworthiness

There are some considerations to be identified with regards to credibility, transferability and trustworthiness of this qualitative study. A limitation to credibility may be attributed to the purposeful sample. The subjects are a purposeful group of

individuals. It may be perceived that any effect detected may be restricted to individuals with similar attributes and therefore not transferable to the larger medical resident population. And given the low number of participants ($n=9$) it would likely be considered an insufficient number of individuals to determine statistical significance, given a quantitative perspective. In this case, a qualitative approach is being used. Therefore, the sample size and composition is determined by the subjects who completed “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research. Seventy-five percent of the group participated in this study. This research is not intended to be directly transferable to the larger medical student population but to provide some understanding of the factors of the PET that created lasting behavioural change. It would require further research to evaluate the frequency and strength of the factors with a larger subject group which could then be evaluated for transferability.

There are also some considerations impacting credibility that are specific to the researcher. The data is collected and analyzed by a solitary researcher. Because qualitative research is quite dependent on the capabilities of the researcher the data collection and analysis might be less robust due to the novice status of the researcher (Patton, 2002). In this thesis, I am a graduate student with limited research experience. I do have the past experience of being involved in the initial research project as a designer of standardized patient case studies and a collaborator in the development of both quantitative and qualitative assessment tools. Additionally, in my current capacity as an educational faculty developer, I collaborate with my research colleague and unit director on a variety of qualitative program evaluation projects. This in itself provides some credibility to the qualifications of me as a researcher. In addition, I am a nurse, embedded

in a culture that is sometimes adversarial, competitive, or at times submissive to the medical culture. However, at the same time, my shared understanding of the health care system did seem to allow the participants to perceive that they were understood, accepted and valued. As a novice qualitative researcher, an educator and a nurse I also came to the topic and the interviews with some biases demonstrated in my basic beliefs and assumptions. I believed that the performance enhancement training had an impact on the participants because I saw behavioural changes in the post-performance simulations. I had observed that this type of training is used fairly extensively in sport and the literature supports its positive effects. I have also witnessed successful athletes testify to their success by using terms and beliefs that were part of the program (i.e., positive perspective, physical and emotional preparation, work/life balance, etc). But, these athletes have ongoing support, training and coaching which is not the experience of physicians so I was sceptical about a long term impact without a supportive environment. In addition, I have worked in the health care field and was unsure that the skills learned in this type of training could withstand the significant challenges of a resident's job expectations and the prevailing cultural value of the physician as the source of ultimate knowledge. It is not uncommon for physicians to project themselves as having all the answers. Given this mindset and attitude I wondered how they could think that they needed to improve if they already knew most everything. And as a nurse, I knew how hard behavioural change could be.

Additionally, there was also a pre-existing relationship with the participants, as the current researcher was involved in "The Utilization of High Performance Patient Simulations to Reduce Medical Error" research project as the designer of the low tech

case studies and as a research day coordinator. All of these factors could have provided some researcher bias. I chose to keep an open mind and to follow the voice of each participant, willing to have my assumptions supported, challenged or turned upside down. In each interview, I asked the same five questions and verified my perceptions of their responses during the interview as a way to balance my biases with their responses. When the residents disagreed with my analysis, they clarified their responses. I believe that all of the responses represent the resident's views. Their responses achieve a level of consensus that does demonstrate a reasonable level of credibility. It is also important to indicate that this research process did have an impact on the residents. The very act of speaking about the training and establishing a relationship that fostered open communication did re-energize the ideas and cause a re-contemplation of the concepts, reinforcing their commitment towards the PET.

In an effort to produce a research project that demonstrated trustworthiness I have been transparent with the entire research process, both in the interactions with the students and the thesis committee; the data collection and analysis; and in this written component of the thesis.

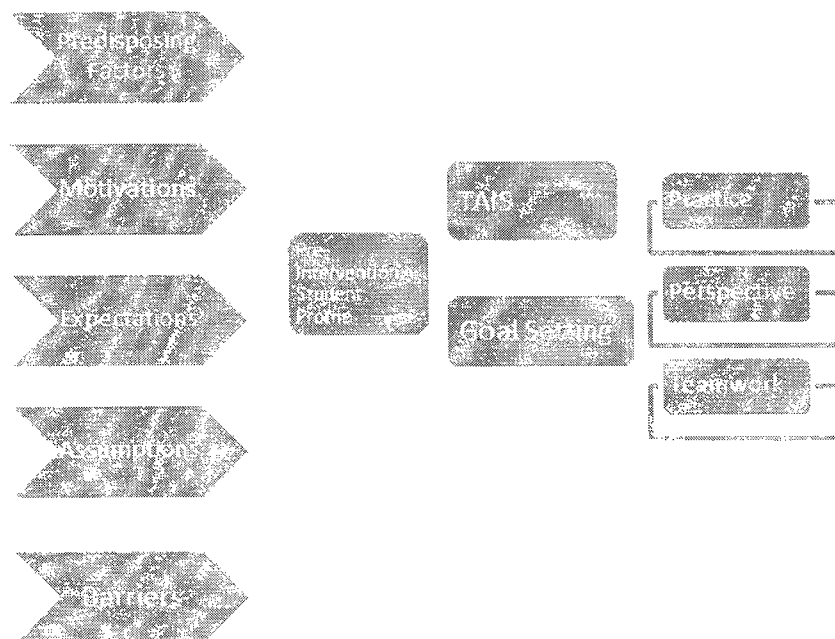
Data Coding

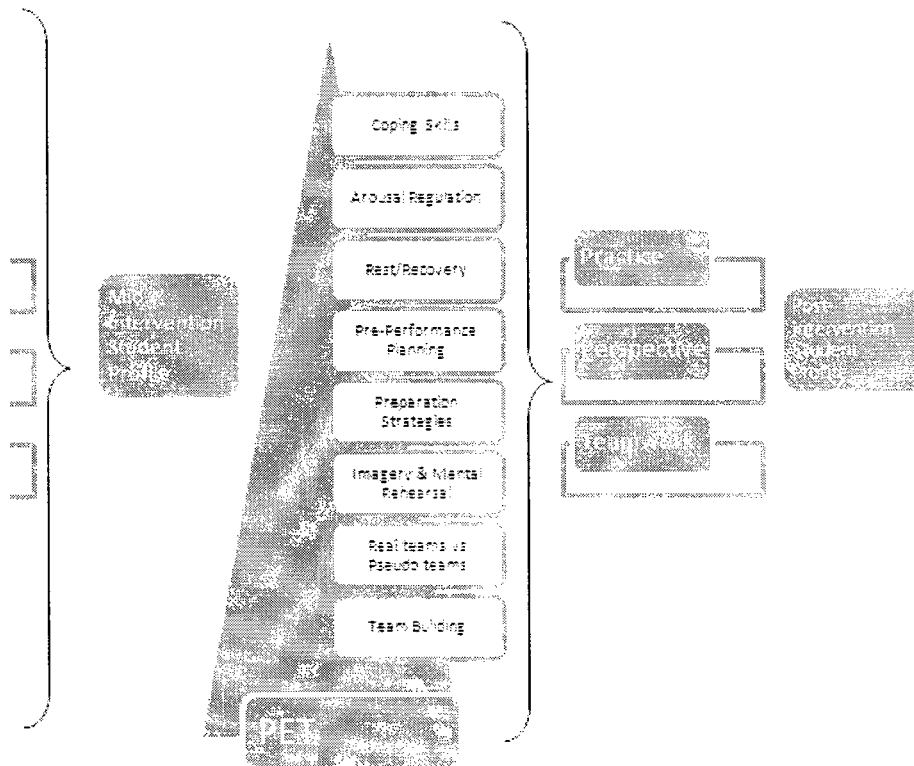
The data was collected electronically and transcribed into written documents by myself. The qualitative analysis was intended to occur in three stages - data reduction, data display and conclusion drawing or verification (Miles et al., 1994). The process of data reduction usually involved the selection, focusing, simplifying, abstracting and condensing the data collected from the interviews (Miles et al., 1994). Data is generally edited to eliminate redundancies and organize the information either chronologically or

topically, condensing the data to a manageable file. Given that I had approximately 25 pages of data for each of the nine residents I chose not to eliminate any of the data but to import all of it into the software program NVivo. In the program I designed nodes or codes using the proposed conceptual framework for the research (See Figure 5, next page).

The framework was divided into a profile of the medical resident pre intervention, mid-intervention and post-intervention. I proposed to isolate the pre-disposing factors, motivations, expectations, assumptions of performance enhancement and barriers to participation of the residents. All of this information would then have created a description of the resident who would be inclined to participate in a PET. Prior to beginning the content portion of the PET, the residents all completed the Test of Attentional and Interpersonal Style (TAIS) and engaged in a time of self-reflection where they reaffirmed their goals for becoming a physician. I then identified three concepts which I believed would be the core concepts of their learning thus describing the mid-intervention resident. I then listed the content of the PET which I believed could have had the most significant impacts. I proposed that this information would again be well organized into the three major concepts of practice, perspective and teamwork.

Figure 5. Proposed Research Framework





Early on in the coding process it became quite clear that the model would require some modifications to accurately reflect the residents' views given that the residents contextualized their responses within their beliefs and assumptions about health care, medical education and physician performance. Although, I was very aware of the impact of environment, I had intentionally focused on individual change and so did not specifically address any one question on the barriers created by the health care system, medical education or expectations of physician performance. But, these environmental factors (i.e., medical education, health care, physician performance) were embedded in all of the resident's responses. Additionally, the responses to the interview questions could not be effectively organized in the framework as it was proposed. Most of the concepts in the proposed framework remained, but the manner in which they were organized evolved to the working framework which can be seen in Figure 6, p. 64).

Both frameworks included the motivating factors which contributed to the resident's interest and subsequent participation in the research. Both included the program factors that were instrumental in triggering behavioural change. The proposed framework included all of the content topics in the program. The revised framework was changed to include only those program factors which were described as having an impact on performance. And the impacts of the program identified as behavioural that occurred over the past 18 months following the performance enhancement training are presented. Finally, the actions of the residents which are designed to maintain the behavioural change are presented, including their recommendations for implementation of a performance enhancement training program into medical education. The model also

reflects the five research questions (see Table 5, p. 55) more clearly than the original proposed research framework (see Figure 6, p. 64).

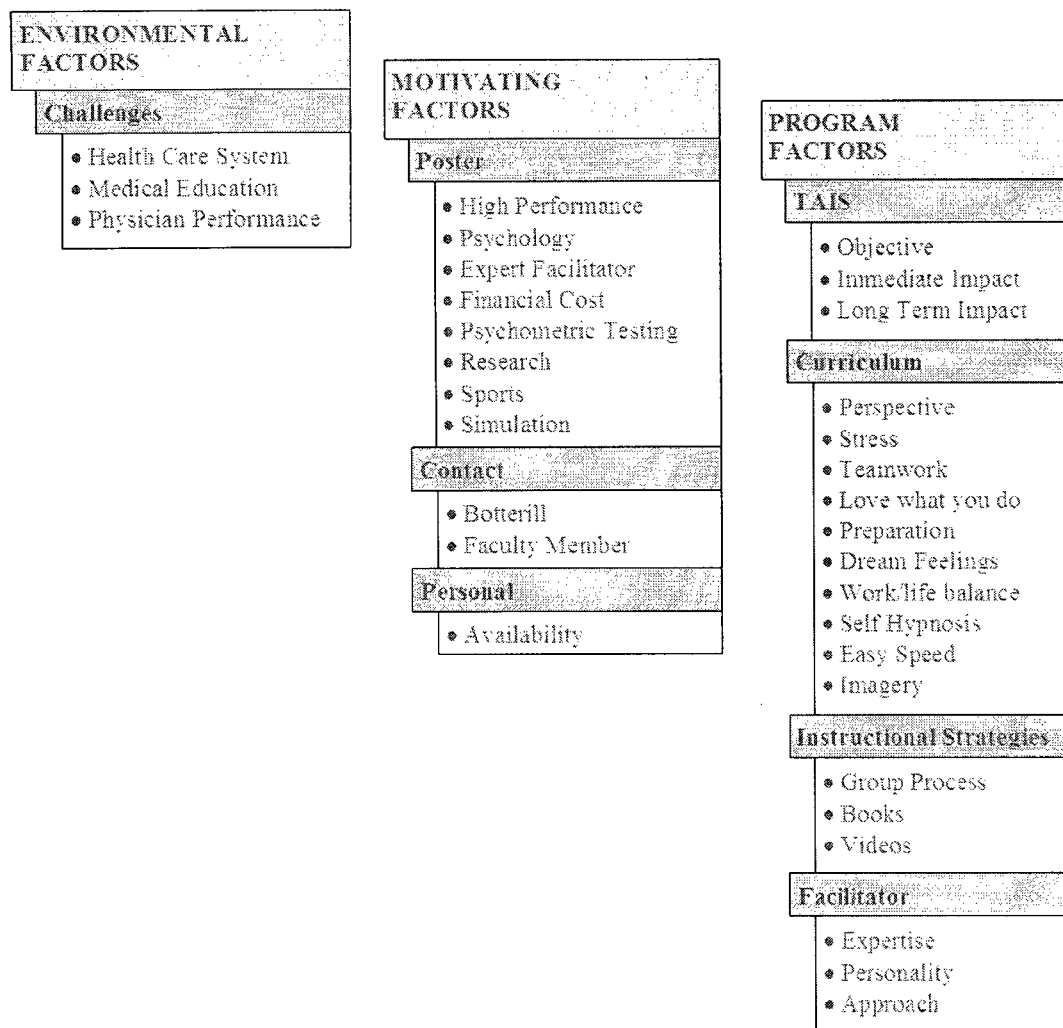
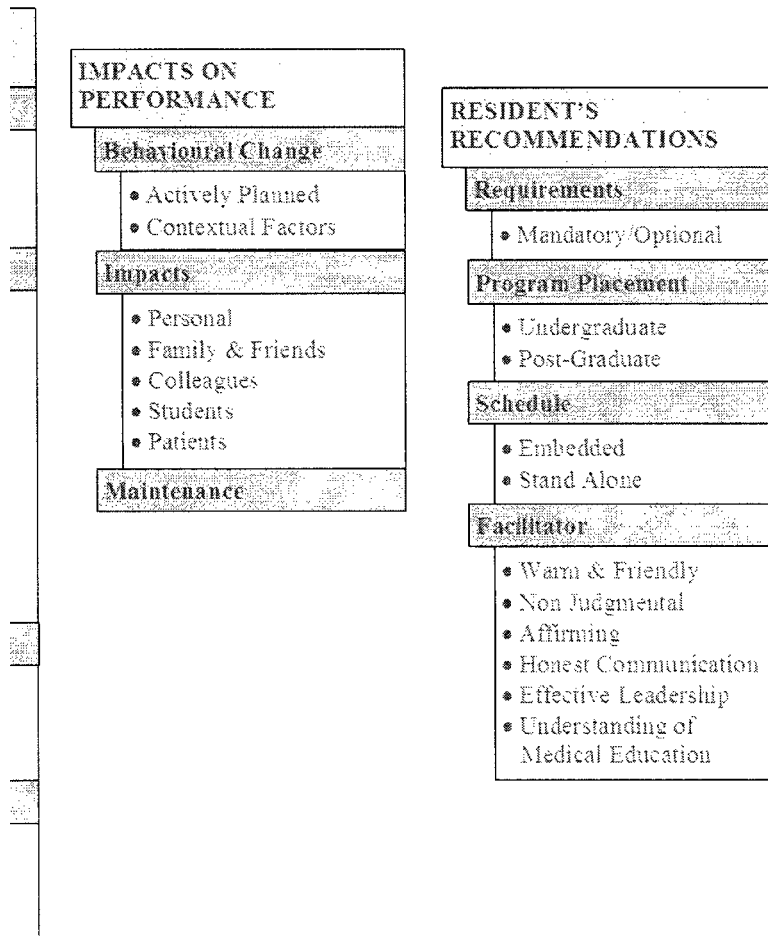


Figure 6. Revised Research Framework



CHAPTER 4 RESULTS AND DISCUSSION

The data was collected as personal accounts. It was analyzed as narrative documents. The narratives are presented as quotations using the revised research framework (see Figure 6, p. 80). It is also important to note that all of the data was collected from a one hour exchange with the resident research participant. The questions were open-ended, and it happened that many of the residents made similar comments and identified similar impacts. Their responses are based on their recall and lived experience as communicated to the interviewer during the interview session. In an effort to maintain confidentiality, residents have been assigned a numerical value which is used to reference the individual narratives. Additionally, all identifying comments related to clinical practice or personal lives have been eliminated

This thesis contains large amounts of data taken directly from the transcripts. Each section of data is preceded by a brief description designed to put the data into context for the reader. The interview or data collection process was a self-reflective activity for the residents. Many times, their first response to a question would stimulate an intellectual thought process that they would articulate audibly and would often result in a more complete response or a different response than the original one. Therefore, I thought it was helpful for the reader to view the responses as process, not as definitive, absolute responses or products. The responses to the interview questions are often grammatically incorrect and the manner of speech is maintained in the transcripts with the exceptions of repeated words and colloquialisms such as “like”, “right” and “kind of”. Where points of clarification were required, the content is enclosed in parentheses. When parts of the transcript are missing due to lack of context there is a row of three periods.

The volume of transcripts are not appropriate for a publication but I believe that they demonstrate to the reader the perspective of the interpretation that I as the researcher have given to them. Additionally, it allows the reader to come to alternate conclusions which then allows for a healthy intellectual debate. Due to the length of the results, each section of data begins with a brief statement to provide context for the quotes and ends with a discussion of the data. Organizing the results and discussion in this way also allows the reader to reference the impact of the preceding results in relationship to the following results.

Environmental Factors

The resident's interview responses were embedded with references to the environment in which they lived and worked. Therefore, it is important to gain an understanding of the residents' perspective of the environmental factors of the health care system, medical education and their expected role as physicians (see Figure 7). In fact, part of their consideration for participation was based on their beliefs and assumptions of these three factors which are presented from the researcher's perspective as challenges to performance enhancement. Additionally, these factors are foundational values on which residents evaluated the performance enhancement training concepts and consolidated their new learning.

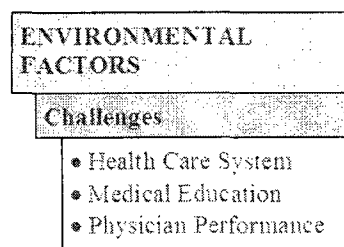


Figure 7. Environmental Factors

Health Care System

The least amount of discussion centered on the health care system and was a central point of discussion for primarily one resident.

"(Medicine is) business 24 hrs a day. But to have a blackberry and take 300 emails a day from patients- it's ridiculous. At that point you need someone to help you. It's an unrealistic expectation." (R4)

"...the changing dynamics of health care with the demands that are not going away..." (R5)

Resident's acknowledges issues of patient safety.

"In this day and age of medicine ... there is more of a focus on patient safety." (R6)

Residents had different cultural experiences with the health care system related to where they had completed medical school.

"I had been working the health care environment (which) sometimes tends to be a bit bad in terms of resources... so then parts of the country tend to be better or worse. I come from a place where there is money and resources and when I came here philosophies were different, cultures were different, and resources were different and so forth. There were a lot of things that I'd been taught that this is the way things are done...that is the way I understood things to be done, this is the way medicine is practiced and that was right. And when I came over here and I worked in some of the different places it was a different environment totally, in terms of resources, in terms of the culture of the people... initially I was kind of quiet and I'd listen and I'd try to understand but then I realized that a lot of this stuff is just baloney and as time went on I got more and more frustrated and more and more angry with what I was forced to work in, because I didn't see why certain things had to be the way that they were here and when I would bring up issues I would basically or essentially be told to shut up...I think I was even told not to rock the boat. There were certain things that occurred that I thought were critical incidents that I actually told my staff person, you know what a letter needs to be written about this ---- and I was told --- all that is going to happen is that you are going to get blacklisted. Just leave it alone, nothing is going to change." (R9)

The residents believed that in order to improve the working conditions for physicians there was a need for environmental change to occur within the health care system.

“This environment is hard to change. It will take years to change. The culture in the --- group, we are making some headway, but it is just very, very, very frustrating”. (R7)

“The whole system will be better (if there are positive changes) because it becomes an environment where people want to make the system better and want to make it work. Then they will start self-correcting. If I'm in a good place at work, I am more likely to help cover for my other buddy who might be struggling so that's the positive effect you want”. (R5)

“I think also that the face of how health care is now is more healthy for the health care worker as compared to before where it was a source of pride to be on call for three days in a row. It was almost like a hazing experience that people talk about and they are proud of it. I lived through this and I did all those hard things and nowadays you put yourself at risk and you put everyone else at risk, so it is not necessarily something you want to be proud of so I think that the culture is changing”.

In summary, the health care system was perceived to create cultural barriers between facilities and provinces which created dissonance related to expectations and performance. The health care system created workload challenges with associated risks to patient safety. In all cases, the residents indicated that there was minimal hope of substantial short-term change although there were small movements towards cultural change.

Medical Education

The second contextual factor that was mentioned was medical education. One recurring theme in medical education was the concept of being dependent on another person. The residents perceive this dependency to inhibit their ability to perform in the way they think is best.

"As a trainee, you are on someone else's schedule...Everything is mapped out and there are certain expectations that have been the held expectations for so many years and to make changes especially when you are only a temporary figure like when I'm only there for 3 years- the program went on before me and it will go on after me, you know what I mean, It's a little bit tricky....at the end of the day my attending physician is the most responsible physician so I do have to adjust the way I learn and practice from them because their name is at the bottom of the page." (R4)

Additionally, their learning experience has a significant impact on their future practice.

"If they see that you (a student) are keen and eager and willing to work then people rely on you and offer you more advancement." (R1)

What follows are the residents' views on medical education.

"When someone yells they are yelling at another human being and there is no reason to do that." (R1)

"If you are In a room where there is one person screaming, if you think they're an ass everyone else does too quit likely....If you're the person being yelled at there is all of a sudden this terrible thing -he's yelling at me and all my friends are watching. It is a terrible, terrible feeling for most people and you never ever want to see it again." (R1)

"(It is) their fear of personal things, it's not their ability to retain medical knowledge or perform little procedures." (R1)

"(Students develop) self preservation techniques, whether it's their fear of failure or their fear of criticism." (R4)

"There were lots of times were I was intimidated mostly because I felt a though I didn't have the knowledge base that I should so I was intimidated because I didn't want to be called upon to answer some things that I knew that I didn't know. It was a motivator for me to learn it." (R6)

"I don't think a very good way to teach residents the first time they do something (that it) is in the middle of a crisis and that you don't really have anyone who shows you or teaches you. The expectation is that you see one, you do one and you teach one and it is at suboptimal times and hours." (R7)

"In this day and age of medicine where there is more of a focus on patient safety and this is a big thing so maybe someone who has no experience placing chest tubes maybe you're not supposed to do that by yourself, whereas twenty-five yrs ago there was no choice, you have to do it by yourself." (R4)

"I do know 10 or 15 yrs ago that the way of teaching was intimidation and embarrassment and then there has been a change to small group learning and group participation....It started in McMaster in the late 1980s and has spread now throughout all of Canada if not North America. (It was) the idea of small group problem based learning (PBL) with team members working together to come to an answer. So pseudo teams were being formed on a daily basis as part of education. Those people who started PBL are now the junior staff so we all share similar things. Intimidation is not used as much now. Unfortunately I think embarrassment is still used a little but there is not as much yelling. (For example, instead of): I can't believe I did that stupid thing, I'm going to yell at you because I have the right to, it's more talking behind people's backs and saying mean things about people. It's much more subversive in terms of the current climate. It's different (than before), and personally I actually think that being overt about anger is probably better than being subversive...I think a lot of people get left by the wayside because of that." (R1)

"It is a high stress environment and I found that you learn pretty quickly that there are people just kind of competing with you. There are other people there not really to help you, but it feels like they are there to make it more difficult for you. There are always these sorts of politics in the environment that we are working in and the high stress so I think those things make it very difficult. I've seen it changed somewhat. I think we have a long way to go but I think definitely it is still a lot better now than what I've experienced before in my previous training."(R5)

There was also the acknowledgment that they had grown since their undergraduate years and that their focus had changed over the course of medical school.

"So as a medical student (the focus was) probably the beer, the social life and the line of credit and the Visa." (R7)

"In med school I was interested in the marks and getting into the residency I wanted. I was into being competitive and all that sort of stuff." (R1)

"It takes a while to develop a professional sense or the sense of your place and your skills...It is a big transition from med two into clerkship. It takes a long time for some people, and some people never quite make the transition."(R6)

“(In school we say): I'm stressed, I hate work. We are almost taught to be, not really depressed, but sort of complaining about things. I have to be on call, blah, blah, blah, this is just so hard. There is just this sort of mentality where I found in the beginning of my medical career, I was maybe a little bit naive, but a lot more eager as if I was going to save the world and then by the end it feels a lot like just slogging away and everybody is just having a very cynical perspective about medicine.”(R5)

“I think we move from eager to cynical because we're in a sense trained, it is sort of a culture, sometimes I think it is things like dealing with the stress, like having a patient die or really sort of disturbing health illness that patients go through and experiencing that (posttraumatic stress??) and the stress of those kinds of things. I think it is a coping mechanism. We are often sort of trying to be cynical, hard about things and selfish about our time and I think that's encouraged in the environment we are in.” (R5)

“In medical school you are basically learning for yourself and when you are in the real world you are learning for your patients so it is very different and the stakes are very different.”(R5)

In summary, the residents expressed challenges with the process of medical education. They identified that their role as students placed them in a position of dependency which they had perceived to limit their personal choices. Additionally, they were concerned about how their performance, as perceived by their teachers, would impact their future job choices. Consequently, they accepted the teaching environment which included stressful learning situations and a lack of support which contributed to the development of a cynical attitude. They also indicated that their focus in medical school had shifted from an internal focus to a focus on patients.

Physician Performance

The third contextual factor that was discussed the most by seven out of nine residents was that of physician performance, the ideal and the reality.

"You want to give something to the world and society. You want to comfortable."
(R3)

"I think probably as a physician I want to help other physicians to take care of patients, so it is ultimately because I want patients to get better. But I want other people who've done the stuff that I've had to do, understand that there's away to do (the job) where you can still end up to be a happy person that doesn't hate going to work because that leads to bad patient care."(R1)

"When meeting patients, they don't care what is going on in my personal life, how many other things I have to do, how many times my pager goes off, they don't care about all of that stuff, all they and their family care about is that patient."
(R4)

The challenges that professional expectations created for them was expressed in a variety of ways.

"In medicine, even though there so many people it can also be very isolating".
(R5)

"So many things are beyond our control." (R4)

"But medicine just rewards that (i.e., hard work) financially and in terms of accolades the harder you work the more rewards you get". (R3)

"People (i.e., doctors) don't even spend time with their own kids. It is ridiculous, working themselves into the ground, no wonder they are burned out..."I'm expected to take all of these phone calls for all of these different doctors and answer questions to patients I've never even met in my life and have no medical background on...When you calculate the hourly wage and the responsibility and all that. I've had other jobs where I've gotten paid by the hour, its different; the level of responsibility is totally different. One of my friends said she was watching Oprah and when Dr. Phil was on, this person was all stressed about their job and he said: so what if you screw up, if not like someone's going to die and actually when I'm at work if I screw up someone could die so it is a whole different perspective and a whole different level of responsibility."(R4)

"I think that is what a lot of the problems out there are about, a lot of people shift blame." (R2)

But their desire to help others is balanced against the very real knowledge and lived experience of either being unable to help enough or being a contributing factor to negative outcomes.

"Everyone (patients) say: 'Make sure I don't die'. No, I just promise you I'll do the best and the best I know how to do and if I make a mistake I'm sorry but I'm just doing my best." (R1)

"We all do that (give bad news). We try our best- we develop a skill over time. It's a terrible skill to have but someone has to have it but the fact that we have to develop it is the problem. The fact that someone has to do this is terrible but it's our lot in life." (R1)

"Over time I have come to realize that it is part of my job to help someone get through their pain for something that no one is responsible for (i.e., medical condition), as much as they may blame me or blame something else and if I make a mistake (that contributes negatively to their condition) that makes me feel worse." (R1)

"There is a fear of the unknown about what might happen next (in a difficult patient/family situation). Will I be able to do my job, will I be hurting someone, will I be opening myself to a lawsuit, and will I be threatening my livelihood? Unhappy, angry families and patients create a kind of fear that feels as though it threatens my livelihood." (R1)

The residents expressed a shared recognition of the importance of communication in their profession.

"Everyone is busy, everyone is super busy and you don't have time for things to be running inefficiently so therefore it is very important to have everyone understand exactly what your point is and that it is not misinterpreted in other ways." (R2)

"I think people that I work with appreciate that they can understand that I am showing how I came to my decision as opposed to just telling them." (R2)

"I think a lot of people all walk around thinking that they are the crazy one for doing things the way they do things - just out there in general. We all do that. I believe that when I think that someone says I know the way you are looking at it,

you're looking at it from this perspective that it's definitely self-actualizing for other people. So I think that when I do that with other people - explain that this is how I came to my decision or this is why I am doing that and why I do it so quickly so other people appreciate that because then they feel like you understand them as opposed to them feeling inferior." (R2)

The demands of medicine were expressed by the residents in the following ways.

"He was struggling in his professional life and in his personal life, trying to figure out where he was. He was lost in everything." (R4)

"I don't have time for this (i.e., performance enhancement). I can go there and it would probably be very pleasant but I have bigger more important things to do. I can't waste nine hrs talking about this and that. I've got papers to write and I've got shifts to work and I've got...and a boat to buy." (R3)

"A lot of people don't quite realize the impact of their wellbeing on their job." (R4)

This resident spoke to the belief of physicians that experience brings expertise.

"For sure the person that I think had the best perspective happened to be the oldest most senior person in our group but I wouldn't be 100 percent sure that it is because of his/her experience and age. I respect that obviously, but I do think that s/he had it going on the right way a long time ago." (R2)

In summary, the residents expressed that the primary desire of physicians was altruistic-they wanted to help others. They also expressed recognition of the burden of responsibility to people given that they can contribute to the life or death of the patients in their care. There was a shared expression of concern over the knowledge that mistakes are inevitable and the consequences are serious. Communication between all members of the health care team was seen to have an important role in physician performance. Residents recognized that the demands that their job placed on their life had impacts that they needed to acknowledge and address.

Environmental Factors Discussion

Residents all described issues in their environment which impacted their performance. These issues echoed those described in the literature as environmental factors impacting physician performance. These factors are identified as the health care system, medical education and physician performance (Mitchell, 2005). The health care system in Canada is publically funded which not only ensures that physicians are paid for their services, but decides on the level of payment and the type and level of service expected for said payment. The medical students identified that the demands on them by the health care system were such that they were required to work excessively long hours with inadequate opportunities for recovery (CAIR, 1998). This is reinforced in the literature as well as in studies of physician job satisfaction (Cohen et al, 2005). There was an expressed recognition that working in the health care system is unique in that the business is always open. The expectation to be available twenty four hours a day, seven days a week is a challenge that the residents were trying to manage. Additionally, they felt expected to extend their working hours due to the ease of technology (e.g., PDAs, Blackberries, etc.). Some residents chose to avoid this technology as it created additional stress.

The residents shared their individual experiences, some of which could be contributed to the fact that approximately sixty percent of the residents interviewed had completed their undergraduate training somewhere other than Manitoba. Consequently, there were also some cultural variations in health care delivery that created varying degrees of dissonance for those residents. In addition to the extended hours of work they are also expected to manage too many complex patients and expected to do so safely. The

residents are acutely aware of the focus on patient safety and recognize that the long hours, the complex patients, and the large patient load predispose them to making medical errors which negatively impact patient safety. The current focus on patient safety is demanding an increased level of accountability for physicians. This has further increased the resident's fear of failure, given that failure in medicine means negative patient outcomes. The residents recognized that there will need to be changes in the way medicine is practiced in order to improve patient safety. Therefore, the residents identified that anything that could improve their performance would have a positive impact for patients.

They also attributed responsibility to their working conditions not only to the health care system but also to medical education. As medical students they expressed the belief that the hierarchal structure of medical education and the health care system force their focus into accommodating their supervising physician, not necessarily patient safety. This is done in order to avoid negative repercussions like harassment and also to gain the residency or job of choice. The residents who were practicing physicians at the time of this study expressed a freedom to make choices about their performance that they believed to be absent as students. When probed about the potential to make choices about their performance as students they acknowledged that it would have been possible but that they had not realized it at the time. The individuals who were still in a residency program at the time of this study or who were in a fellowship did in fact make choices about their performance after their involvement in this study even though that they had not done so previously.

Additionally, the residents confirmed the literature on psychologically damaging effects of medical education (Barger et al, 2006). Botterill (2007), in his work with medical residents, identified that the study of medicine requires a huge investment in time and resources which creates difficult challenges and expectations. The vast amounts of knowledge to be learned and the fear of failure (i.e., hurting someone) create an emotional and cognitive overload that is inherent in medical education. The cognitive overload resulting in anxiety is a major concern in medical education. It is well accepted that an optimal degree of anxiety is motivating for learning but the high levels of anxiety experienced by cognitively overloaded residents tends to be inhibitory to learning (Schein, 2006). At this point in their training, the residents accepted that they had to learn this huge volume of information and just accepted that as normal. Unfortunately, the prevalent instructional approach in medical school does not mediate these demands. Rather it contributes to the stress by its prevalent instruction of intimidation, harassment and subversive criticism (CAIR, 1998). The residents talked about their concern about the instructional methods used in teaching. Although the residents acknowledged that the intimidation and harassment in medical education was less overt than in previous years, there was still the belief that the primary educational, motivational strategies were negative. This is well supported in the national and international literature on medical education that goes as far as to compare the treatment of medical students to those of abused individuals (McKegney, 1989). Despite these well-recognized barriers, the medical residents did not use them as an excuse to accept mediocre performance of themselves. Although the barriers of the health care system and medical education were present and acknowledged, they did not inhibit, prevent or deter the motivation to

participate in performance enhancement training. Likewise, it did not discourage residents from adopting the learning and changing their behaviour.

The final factor that the residents discussed was their belief about the expectations of physician performance. Many residents still believed in the altruistic goals of being a physician. But putting the patient first all of the time is overwhelming. There is the belief that as physicians practice more they will automatically manage the competing demands and emotional challenges of the job better. The literature indicates that as physicians practice, they make errors and learn from these errors thereby developing expertise (Mitchell et al, 2005). This directly contradicts the research in the development of expertise which indicates that time does not in and of itself produce expertise. It is rather dedicated practice in a specific domain accompanied by reflective activities, over time, which produces expertise (Ericsson, Krampe & Tesch-Romer, 1993). At some level, some of these residents are conflicted about this belief. In one case, a resident expresses the struggle that exists around this belief. The resident concludes by stating that the skills exemplified by the experienced practitioner must likely have been present at a younger age and was not a consequence of years of medical practice. The residents recognized that they could not continue at the pace of medical school for their entire career. This is supported by the literature which indicates that forty percent of practicing physicians are in advanced stages of burnout (Puddester, 2004a, Puddester, 2004b). The residents recognized that it was important to achieve some level of balance between work and their personal lives. They believed that this balance was fundamental to high performance.

In summary, these three environmental factors of health care system, medical education and physician performance form the cultural context for all of the remaining

responses. Although the residents do not specifically identify these factors as motivators they certainly are the frame of reference from which their motivations originate.

Motivating Factors

The residents all identified that they were notified of the opportunity to participate in the high performance physician research project through an email that came from their program directors. It was a generic email sent to the resident distribution list which originated from the post-graduate dean of medical education. He sent it out to the program department heads who then forwarded the email to their residents. The email included an attachment which was a poster in PDF format. In addition to the poster there were two other factors that impacted motivation. One was whether or not the resident was in contact with anyone who could provide more details about the project or whether the decision to participate was made solely on the basis of the email. The final factor was a personal one, the availability, in terms of time and work scheduling, of the resident to participate. See Figure 8 for a graphic representation of these factors.

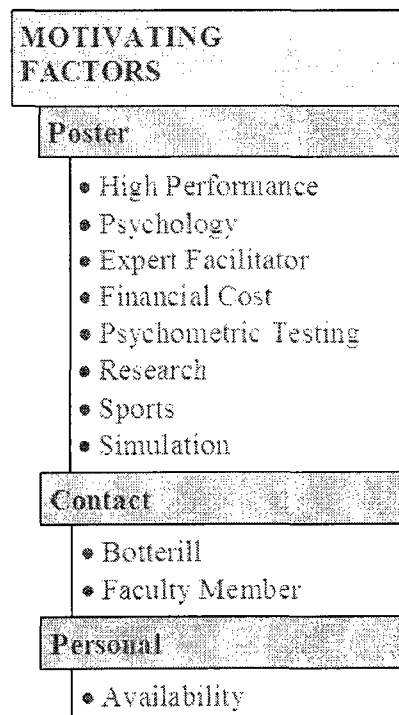


Figure 8. Motivating Factors

Research Poster

The advertising for the performance enhancement training program on the poster was titled "You can *become* a High Performance Physician" (see Figure 9)

You can become a HIGH PERFORMANCE Physician

HOW WILL THIS MAKE ME A BETTER PHYSICIAN?

You will learn to:

- Manage your emotions
- Function in a REAL team
- Get past the "fear of failure"
- Develop perspective and resonance
- Know your strengths
- Optimize recovery time and preparation
- Overcome Performance Problems such as:

- Over-analysis
- Obsessing
- Lack of recovery

WHAT YOU CAN EXPECT TO HAPPEN:

- You will demonstrate your practice of medicine in 2 simulations
- You will complete The Attentional and Interpersonal Style Inventory (TAISI)
- You will have the opportunity to participate in 15 hours of high performance cognitive training spread over a period of 2 months

Eligibility Requirements:
Open to Residents, Fellows and Faculty Members

Time Requirements:
15 hrs over 2 months

**Project Begins on the week of
Oct 24, 2006**

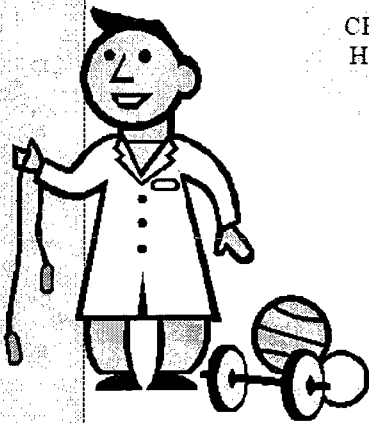
Register on line at <http://www.umanitoba.ca/uts/>



**Interprofessional Collaborative
National Research Project**



CANADIAN PATIENT SAFETY INSTITUTE



**CHARACTERISTICS OF
HIGH PERFORMANCE
INDIVIDUALS**

- Action Oriented
- Love Challenges
- Team Oriented
- Creative
- Self-Mastery

Cognitive Training provided by:
CAL BOTTERILL
the Internationally Acclaimed
Professor of Sport Psychology from
the University of Winnipeg and
Veteran of 8 Olympic Teams

Areas of Expertise include:

- Cognitive Psychology
- Leadership
- Motivation
- Personal Growth For Professionals
- Sport Psychology, Olympic Games
- Team Building



Figure 9. Poster

The poster was full of information which can be organized into nine themes ranked in the following order—high performance, psychology, expert facilitator, financial cost, psychometric testing, research, sports and simulation (see Figure 10). The reason for deconstructing the poster in this way is to identify the specific factors that attracted the attention of the residents.

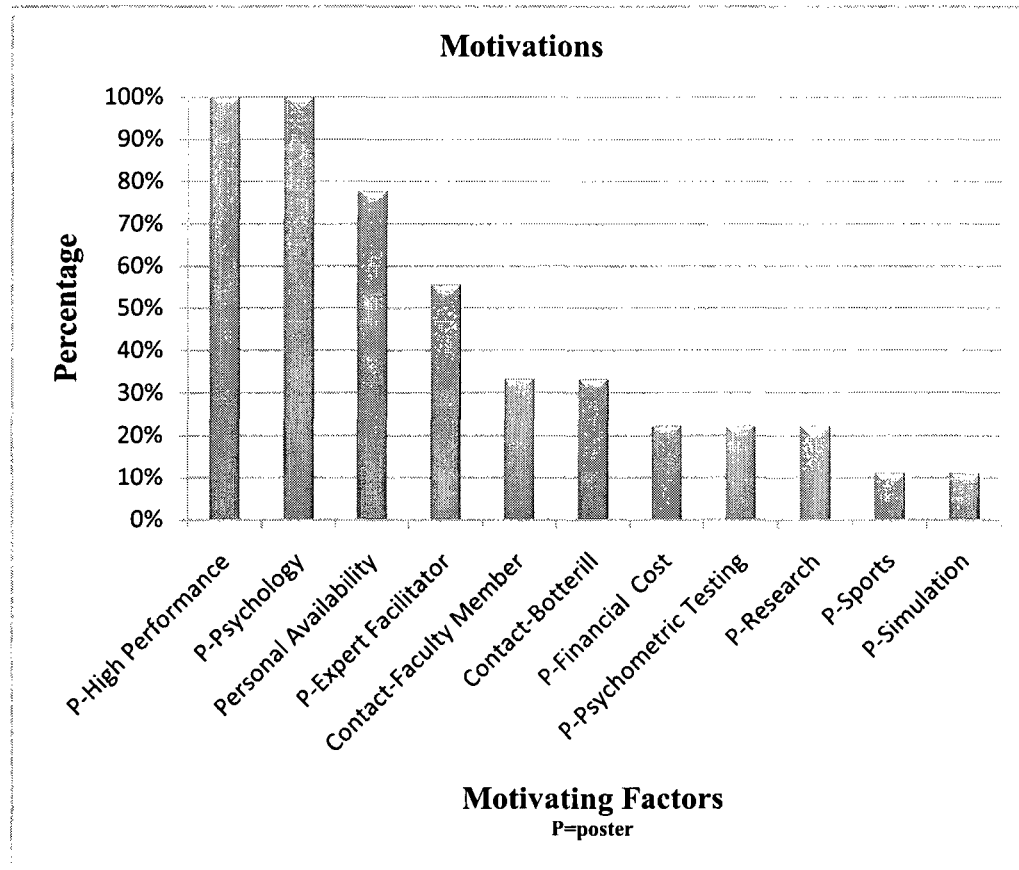


Figure 10. Motivating Factors on Poster

High Performance

All of the research participants gave a positive response to the opportunity to learn skills to improve their performance. When prompted whether they joined the program based on a perceived need to improve performance they all initially denied any

sense of needing to move from substandard performance to competent or high performance. By their own definition they were all considered strong residents.

"Everyone there was considered to be a strong resident." (R4)

Rather, it was expressed as an opportunity to improve already good performance.

"The high performance part-what could I do to improve my performance as a physician.... just something about it enticed me. I don't think it was to be a better physician but I think it was to continue to be the physician I am, but better able to manage my stress and the constant demands we all have for family, friends, work and academia." (R3)

"There is always a tendency that you want to be a little bit better ... it sounded interesting so I signed up." (R4)

"Everybody is always try to get themselves better and in (my program area) there are tremendous numbers of stressful situations and I think I actually handle them reasonably well but I thought if there is something else that you could learn why not?" (R9)

Psychology

Secondly, the method of improving performance was through psychological methods normally used in sport, commonly referred to as sports psychology. Many of the residents had a pre-existing interest in psychology and the use of psychological skills in their personal lives. The concept of using psychological training to improve their performance as physicians was novel and appealing to most of the residents.

"I think it was more a curiosity (the motivation) because it was something different." (R6)

"Motivation was simply that I have an appreciation for that type of cognitive enhancement stuff in general." (R2)

"Part of it was that I am quite motivated about motivational type materials programs and I also felt that I could use any help for my own personal

performance in life, but also in my residency as well. So I took it more broadly, to be useful to me in my whole life not just in residency.”(R5)

Additionally, in two cases the residents had begun medicine with the idea of becoming psychiatrists so they had a long-term pre-existing interest in psychological skills.

“I wanted to be a psychiatrist for a little while. It’s kind of cool to see how my brain works, so I did it because of that.”(R1)

“I went into medicine to go into psychiatry, so maybe this is just my interest.” (R2)

Neither of them went into the speciality of psychiatry, but both entered some of the most acute care medical specialities. But more than just psychology the concept of sport psychology and its relationship to physicians was very appealing.

“It seemed like a very interesting premise which was to be able to use sport psychology to try to improve physician functioning and I think the catch line was to make you a high powered or a very efficient or some kind of really good physician and so it sounded like an interesting project.”(R7)

“I already had a natural interest in basically what he was teaching- performance skill and what was behind that. I was somewhat familiar with sports psychology.” (R8)

(Part of the appeal was that this) “was sport and not medicine. I’m not sporty at all so I’m –wow-I’m part of sports, like I’m Rambo or something I mean there’s a little bit of that but also it was an area of interest for me.” (R5)

Some participants had previous experience with psychological (i.e., motivational) training. For them, this was a continuation of their pre-existing interests.

“I think we’ve already contemplated a lot of this stuff previously...I really think about this stuff often and I am interested in the literature about this stuff and I’m interested in philosophy and psychology and all this stuff.” (R2)

“I’ve done a lot of self-help, motivational books reading I’ve read Covey quite a bit.... I’m interested in principles that cause people to change their behaviour.” (R5)

I have attended workshops for how to improve your leadership skills. I took a course in sociology in terms of group theory and group dynamics, how to be a leader how to effectively draw people's skills and interests and to channel that into something that is very effective and productive and so I've always had a bit of an interest in psychology and psychiatry and sociology stuff... it was interesting to me the concept of pushing yourself to be the best and to be able to take on projects and bring them to completion." (R7)

Expert Facilitator

It was very important to the residents that the program would be facilitated by an internally respected performance enhancement consultant. The credentials were the significant factor. These included expertise in cognitive psychology, team building and performance enhancement with Olympic athletes.

"I vaguely recognize his (Cal's) name as being a sport psychologist relating to Olympic athletes that type of thing. I may have had an awareness of who he was because he has been in the news and that type of stuff but I didn't realize he was academically interested in these high stress environments or medical professions or anything like that. Cal might have been a little bit of a factor but I wouldn't say it held all the weight. I came to this whole process believing that you may be good but you want to be very good." (R2)

"The decision to participate was also a little bit about what Cal's background was because I did a lot of sports before so I thought it was interesting that someone with a sports background would be doing this." (R4)

"I didn't actually know about Cal I'm not from Manitoba so I hadn't heard about him but the fact that he did do training with Olympic athletes was compelling." (R5)

"I actually didn't really know anything about him (Cal) before... so that actually had almost nothing to do it (with my decision to participate)." (R9)

"When I took a look at it-- it was very interesting to me because number one it had a picture of Botterill and the name sport psychiatrist for the Canadian Olympic team and that was a huge draw." (R7)

"I knew of Cal and that so when they said it was somehow related to how he

trains athletes, again I assumed it was not going to be physical training but mental training.” (R6)

“I knew Botterill already. A good friend of mine played for the university of...and he had a masters degree from Cal so I knew about his history of professional skills. (R8)

“For sure it (Cal) was a factor because I knew it would be reputable research.” (R3)

Psychometric Testing

On the poster it promised personal testing with the TAIS test which is an objective psychometric evaluation of their performance.

(It seemed like it was) “pretty much to have someone assess your problems that may help you perform better. Why wouldn’t anybody take it?...My motivation to do this might have been different from other people. The TAIS test was the point--where you are being self evaluated.” (R2)

One participant had previous experience with psychological testing. Participating was a continuation of the pre-existing interest.

“So, I’ve done some of those other things like the MMPI and again I did them for fun, maybe that’s kind of weird...One of our Instructors in ____ presented us with these conflict resolution personality tests. Thompson or tomas keller or callen (Thomas Kilman). It was meant to identify your problem solving skills and conflict resolutions skills-where you more of a collaborator vs. an Instigator. So he divided us up according to that....I’d try enough other things that I kind of have a repertoire of my own psychological defense mechanisms.”(R1)

Financial cost

Another factor identified by some was the lack of financial cost. It was a “free” opportunity to get this training to improve their performance.

“...it was basically free learning, free counselling, free assessments...”(R2)

“...and it was a free opportunity to do a better job so it makes sense to take the opportunity.”(R4)

Research

The residents receive multiple requests to participate in research. This project was perceived to be a reputable collaborative research endeavour with participants from the University of Manitoba, the local Winnipeg Regional Health Authority and was funded by the national Canadian Patient Safety Institute.

"We get a ton of them (research requests), usually they are: will you answer a questionnaire or something like that." (R3)

But in one case the primary motivation for participating in the performance enhancement training was described as the willingness to be a good research colleague.

"When I read through it-- it talked about learning skill sets to help you in stressful environments and so forth and so on and so I thought that would be interesting and secondly I'm a researcher and a fellow researcher wanted some assistance with the project so I thought I would help him out because obviously we all have to work together to help each other out. It (my participation) was more related to the fact that it seemed like an interesting thing to look at as a research project so I decided to participate." (R9)

Sports

The concept of sports and sport psychology was both a contributing and a limiting factor. In one case the resident was involved in coaching sports so had an understanding of sports psychology and was intrigued as to how it could be applied to medicine.

"I did a lot of sports before so I thought it was interesting that someone with a sports background would be doing this." (R4)

And one still participated despite not liking sports:

"I'm actually not a big sports fan so that actually had almost nothing to do with my decision to participate." (R9)

Simulation

The residents seemed to accept the fact that the project included simulations but for the most part it was not a motivator for participation. Simulation as a motivating factor was mentioned by one resident who was intrigued by both the psychometric testing and the simulation.

"(When I was considering the research opportunity I contacted) Cal who talked about the psychometric testing. That was something that I always loved.... I was more interested in the in simulation and performance but was more interested in the simulation part and the psychometric testing." (R1)

Contact

In addition to the email notification with the attached poster some residents received or sought an additional contact from the associate dean of post-graduate medicine or the high tech simulation director.

"(The high tech sim director) is one of the people who were helping in the simulation and he asked me directly-you got the email, would you like to take part?... (the associate dean of post-graduate medicine) met me in the hallway and asked me if I wanted to do it so between the two of them.... I was informed several times that this was something that would interest me so I read more about it." (R1)

"(talking about the email- that no one drew it to their attention) I came across it (the poster) by myself and made that decision and there was one other person in my program who was there and but there was no talk amongst other person before I started." (R8)

These residents contacted Botterill, as part of their decision making process, in order to gain a richer understanding of what they could expect from the program.

"Saying would you like to be part of a research study that looks at performance enhancement for physicians was kind of a teaser, we didn't really know what it was about...so I talked to Cal." (R1)

I think I emailed Cal and we communicated and then we communicated by computer and he said yes maybe you would be interested." (R3)

In one case, the initial inquiry about the project unexpectedly turned into commitment.

He (associate dean post-grad medicine) basically just told me what the outline is and I guess I must have just been scheduled because someone contacted me to say so this is part of it you are going to go do the Sim man so I did that." (R6)

Although this participant does express positive outcomes this is the only participant who also indicated that the program did not meet his/her unclear expectations.

"I didn't know what to expect at all from it. I didn't know if it was supposed to be on the job training, like that where they were simulating and trying to see how you did things and how you could improve. So it turned into be much more cerebral and whatever theoretical doing things outside of work that can help with work. Basically, so I wasn't expecting that.... I was expecting more simulation, on the job type stuff-the mental skills while on the job and I just didn't know what I was getting into. It sounded interesting and I thought it was something I would at least like to know more about." (R6)

The other residents verbalized no expressions of dissonance between the program description and their expectations. One even went as far as to say:

"This was exactly what I perceived it to be from the description of what was written at that time." (R2)

Personal Availability

Many of the residents made it a priority to become involved in the project.

"I responded right away actually, as soon as I read it I responded....I had the time to do it.... I just needed an excuse to get into this kind of stuff." (R2)

"I was really excited about it so the first time I read it I basically enrolled...I know that I remember reading it on my email and remember being very excited knowing that there were only a few spots left so I quickly responded. And I think I had to wait to see if I could get in so I was pretty motivated." (R5)

In summary, the email poster invitation was a powerful tool to motivate residents to participate in the Performance Enhancement Training as all of them had a pre-existing

interest in improving their performance. Discussion with individuals involved in the project reinforced their interest, combined with the fact that they had time to devote to the project, resulted in the residents volunteering to participate.

Motivating Factors Discussion

Being aware of the environmental factors, the residents still contemplated behavioural change and volunteered to be participants in the research project. The motivating factors for their participation are organized into those which originate from the content of the poster, the residents' contact with another person during their decision making and their personal availability, in terms of time, to dedicate to their participation. There was no situation in which one solitary factor motivated the resident to participate. In all cases it took multiple factors. The minimum number of factors was two (See Figure 11).

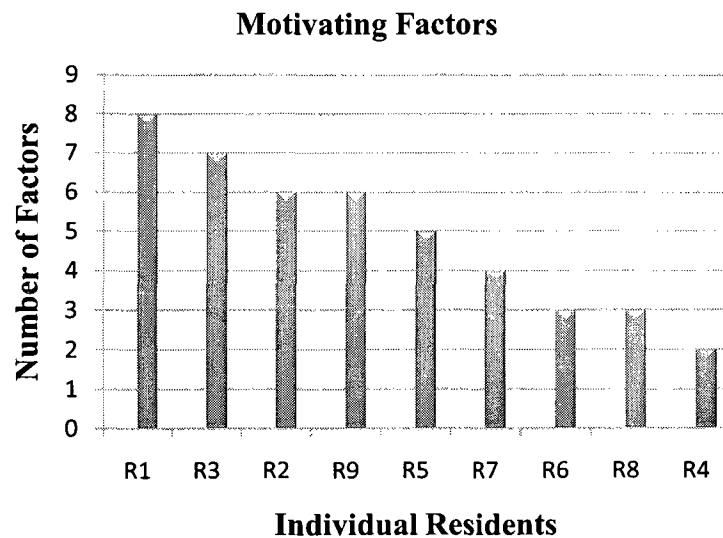


Figure 11. Individual Number of Motivating Factors

The strongest motivator was a desire to improve personal performance. The major focus of the project was the promise of high performance-you can “*become* a high performance physician” and this will “*make* you a better physician”. It promised the development of skills such as emotional management, developing perspective, getting

past the “fear of failure”, overcoming performance challenges such as over analysis, lack of recovery, etc

These residents were sensitized to issues of performance based on their pre-existing interest in cognitive training. It is interesting that the psychological training approach was motivating for all of the residents. Initially, from the research perspective, it was thought that this type of opportunity would appeal to individuals who had a need for psychological support or coaching given that the literature suggests approximately one quarter of medical residents struggle with mental health issues and as many are disillusioned with their choice of career (Canadian Association of Interns and Residents, 1998). The literature also indicates that the residents self-identify psychological support as one of the most important solutions to their issues (Canadian Association of Interns and Residents, 1998). As well, practicing physicians self-identify the need for psychological support (Puddester, 2004a, Puddester, 2004c). Given this knowledge, it did not seem surprising that residents volunteered to participate in something that would give them free psychological training. But, in the case of these residents, all of them self declared that their participation was based on a desire to improve an already strong performance. They were able to identify other individuals in their service who were struggling but did not feel that they could afford the time to give to performance enhancement training and did not participate. So, the motivators that were interpreted from the literature in medical education (Lievens et al, 2002) did not seem to be relevant for this group of residents. Therefore, I wondered if the decision to participate could best be made when Maslow’s (1978) lower level needs were being adequately met, leaving the individual with a readiness to participate in performance enhancement training. One

could look at sports in the same way. It is the already high performing athlete who has the opportunity to improve his performance through performance enhancement training. This serves to reinforce the fact that performance enhancement is not remediation (Brown, 2001). Therefore, the program cannot readily be considered a source of remediation for struggling medical students. What we have then, is an educational intervention designed to give support and direction to individuals who are already motivated to high performance.

The third most important consideration was whether or not they could commit the time required to attend the six training sessions and the three testing sessions. It is important to note at this time that there were other residents interested and registered for the program but were unable to participate due to the timing and their personal availability. The residents who did participate were either on a different type of schedule in that their clinical hours were reduced while they were taking university courses or they were on a lighter clinical rotation. It was important enough that they made it a priority. Despite their prioritizing, it was still difficult to consistently meet with everyone as a group so Botterill was very flexible in his teaching. In addition, the email became a sort of discussion group where the residents could communicate about the course content and their own challenges and successes in their workplace. This could also be considered as an instructional approach given the current educational climate of blended learning.

Many of the residents were familiar with psychological principles and somewhat familiar with concepts of high performance but having the opportunity to participate in an educational intervention led by an expert was compelling. This is logical in medicine, because of the value which is placed on evidenced based practice (Berkow, 2002)-it was

important to have the training delivered by someone who had demonstrated positive outcomes with the training. The outcomes noted were his success with Olympic athletes. Therefore, they were willing to spend the time being trained or coached by an expert. The fact that they could get this level of training at no financial cost to themselves was mentioned by only a few individuals but conceptually was acknowledged as a unique opportunity.

Some of the residents made the choice solely based on the contents of the poster. Two thirds of the residents were either approached by a faculty member or contacted Botterill to receive clarification on the performance enhancement program. This seemed to just confirm their original desire to participate. So, although an electronic format can trigger motivation, the final decision to participate still seemed to require some level of human connection.

Another large motivator for participation was the psychometric assessment. The actual testing was not as important as the fact that it was an objective assessment (Nideffer, 2006). Again, this speaks to the residents' scientific mindset and their focus on evidenced-based practice. Anything that would have not been considered valid in scientific circles would not have been valued. Even in this situation, the residents were sceptical of the test while they were taking it, but when the results seemed to be a close description of their own perceived strengths and weakness they chose to accept the test as valid. Testing creates a self-awareness that is capable of triggering behavioural changes that can affect performance. The literature indicates that self-reflection creates self-awareness that can be used to modify behaviour (Borrell-Carrio & Epstein, 2004). In the model of physician performance, the premise is that after a physician makes an error

there is a period of reflection which creates a self-awareness which does trigger behavioural change (Mitchell et al, 2005). The research on mindfulness would suggest that the self-awareness created by reflection and by mindful practice will lead to behavioural change, which could have a positive impact on patient outcomes (Epstein, 2003a). Therefore, even in the absence of a facilitator led educational intervention, the TAIS testing could have an impact.

In addition to the preceding, there are the two factors of research and sport remaining. It seems that the issue of the project being a research project was implicit. There were residents who tolerated the simulations because they wanted the training. But in a minority of cases it was the desire to be a good research colleague that was defined as the primary motivating factor. It is not known whether this resident participated in all research requests that were received. This does not seem like it would be a factor of enough importance to ensure that it was included in a future performance enhancement training session.

It was of interest that sport was a not an important issue. It would seem probable that the concept of sport and Olympic sport combined with medicine would have a strong motivational pull. Perhaps the disparity in disciplines was too great for there to be a strong sense of connection? The Olympic perspective served primarily to reinforce the effectiveness of the training. The sport appealed to some and others chose to participate in spite of the sport connection. Therefore, it was not a primary motivating factor but was also not a deterrent. It is important to acknowledge that performance enhancement expertise has grown from sport and psychology. The results from the application of

performance enhancement in medical education could further enrich their field of study as well as establish a new area of study within medical education.

In summary, the primary motivating factor was the resident's desire to improve their performance by participating in psychological skills training led by an expert performance enhancement consultant. The residents were able to prioritize their workload to accommodate the time required to participate in the educational intervention.

Program Factors

The performance enhancement training program began with individualized psychometric testing (i.e., TAIS). The residents received an individualized analysis of the test results given by Botterill. Following that, the residents began regular group sessions. The sessions included the content of the course and provided the residents an opportunity to learn collaboratively as well as to share their learning. The residents shared their perceptions of the TAIS test, the impact of the performance enhancement training content, the instructional strategies as well as the impact of the facilitator (i.e., Botterill) (see Figure 12).

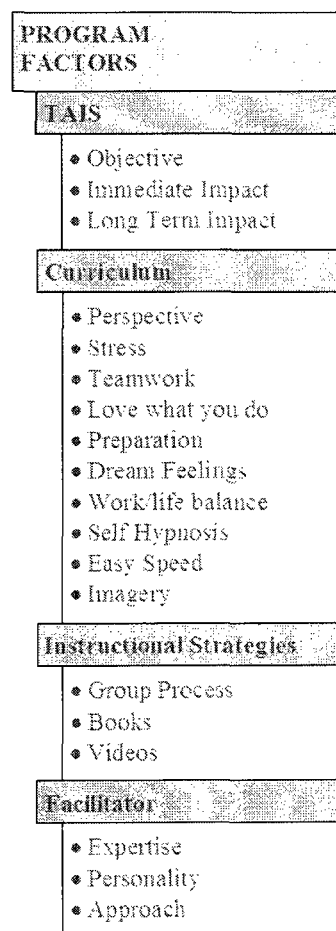


Figure 12. Program Factors

TAIS

Each participant independently completed a pen and paper psychometric test – the Test of Attentional and Interpersonal Style (TAIS). The test results were interpreted by Botterill in one-on-one sessions with the residents. In an effort to learn about the impact of the test, the following question was posed: What did you learn about yourself from the TAIS test? How did this impact you as a person and a physician? The responses are divided into the initial impact of receiving their interpreted results as well as the long term impact of that knowledge on their behaviour in the two years following the test.

Objective

The strength of the impact was directly related to the fact that the results were perceived to be objective.

I never sure what to make of those tests actually because I find that I am trying to read too much into the question, or not enough into the question or something so I am never sure if I am supposed to read into it or not so I am never sure, you know what I mean. I can guess what the appropriate answer might be, so I don't know exactly. (R6)

"When I did the TAIS it was different (than other psychological tests) because I couldn't guess what they were trying to get at, so I thought, this was kind of fun, cause I really don't know what it is going to tell me." (R1)

"You could certainly bias the test. That's the whole thing (but) you have to remember.... the point of this test is clearly it was designed, not just the test, but the whole project that you were getting people that were clearly self motivated so therefore those are the types of people that will be coming to the test. So, in contemplating that, I would think naturally that most people coming to the test are doing it honestly because there is no vested interest to lead it in any one direction. There's no doubt that it crosses your mind because when you taking this type of test you know that this test is analyzing you therefore you are only naturally curious to what it is that they are analyzing with such questions.... I think like any kind of standardized test--I remember being led into both of those camps. For example, I remember one specific question: do you eat when you can? or do you

eat planned? or like that type of thing. Instantly you think, like for me, that is a work question whereas I'll eat if I have 30 sec to eat that's when I eat because you might not (have a chance for) another 30 sec for hours. So I just remember that stands out in my head but that is a definite work question and then the next kind of question that is talking about something that is more clearly family oriented then you are thinking of the question in family terms. So it is hard to, I guess get a test that gets you to 100 percent focus without you writing out every question..." (R2)

"I know all these things are standardized and so forth and so on but sometimes you can tell obviously by the questions that are being asked as to what they're after and I think if you have your own particular perception of what yourself is, you may answer the questions that are weighted ...about you. Consciously I didn't (try to answer the questions based on my perceptions) but unconsciously I may have because I mean everybody has their own perception of what they are like and how they function and it sort of told me what I already knew. So I am assuming it is validated and all that sort of stuff but when I got the TAIS results it wasn't I didn't really think it was that important to me. There have been other questionnaires where you get them and it is like, well I know what you're trying to get at and I know what I'm going to say cause I know what I think." (R9)

I think that was the most learningful part of the whole thing for me personally because it was an objective standardized method of evaluating your honest unbiased answers to a test, therefore that was a way that someone could take your responses and give you a categorized answer, show who were you are and what this means and give you the translation of what those marks and scores meant--so I that took more seriously... with my personality its rewarding to see quantitative measures. I guess that's my research background you start to learn that it all gets muddled until you have unbiased objective standardized measurement scales so I found the TAIS test fills that need for me."(R2)

"I really enjoyed that questionnaire. I've done a lot of different ones but that one seemed quite good at what it is intended to do, for me at least. I always think that I can (cheat or pre-guess) but in the end I don't think I am able to sway it much at all. I read a question and think that they are trying to get at this so if I answer it this way it will go that way....I think (that) while I am in the process of writing it but I guess I am trying to answer it honestly so it will capture you your efforts to sway it one way or another. I had already reflected on my strengths and weaknesses. I think it is unavoidable when you are going through medical school or residency and if you haven't, people have told you....I've never set out to fool

it. Each time I want to have an accurate representation so I try to answer it honestly... ' (R8)

"...it was nice to hear on some sort of objective thing (TAIS)... "(R5)

Immediate Impact of the TAIS Test Results

At this point, it is worthy to note that the residents were responding based on test results that they had received earlier so this is based on their recall of immediate impact.

"So the TAIS test is the one with the personality scales and that kind of thing. I learned quite a lot from that and from sitting down with Cal and reviewing the results afterwards. I should have done was dug up that file so I could have reviewed it before hand (later on in the interview the resident described what had been learned). (R5)

"I learned quite a lot from that (TAIS) and from sitting down with Cal and reviewing the results. Afterwards I remember that aspect that there are certain strengths that I have but when they are not controlled or when I don't control my strengths they can become weaknesses. For example: one of my strengths are that I am very team oriented so that was good but I can't remember the downside of that. But I remember in stressful situations that I get flustered because I care too much about what everybody thinks. I think, but I'm kind of not sure. It would help if I had it in front of me. I remember him saying that what was surprising was that the results of it showed that I would make a very good leader-a lot of similarities to a leader but I had to be careful of my emotional attachment to my performance so for example if I get too passionate about a situation, if I'm too focused on how I'm going to perform then I tend to not do as well. I remember it had to do with really great potential but also that it had to be managed a certain way. My weaknesses were related to my strengths I remember that. I remember there were three aspects and they were good ones to have, a team player was one of them, something about being analytical and there was a third one and I was high on those but then it was the second one because I remember the graph there was one side of it but on the other side when I was in stressful situations my performance was more sensitive to these traits I have - I am speaking more generally because I'm trying to remember. The team aspect is that I am very sensitive to other people's emotions and their needs so I'm, I don't remember the word, something about being sensitive I think. It is really hard to explain. I remember at the time being pretty surprised by it because he (Cal) seemed to be very surprised when he was reviewing it with me. At the time I had a lot of different interests and different things going on so I was struggling with trying to manage my time and manage my focus. I think the results of the survey showed both the positives and the negatives of how I was functioning at the time. One of the difficulties

(multiple interests) I was having in my life I find that I'm very interested in a lot of different things we spend some time talking about how I process information which I think is maybe a little bit different from how other people process. Sometimes I'll come out with an idea and I'll have a conclusion about that and it will actually go really quickly so I can be talking with somebody and sometimes my mind is going so much more faster into the future so I'll mention something that is not completely in context because I'm thinking ahead so it has something to do with how quickly I think. (Being a multi-tasker) was probably one of the things if I don't control it - it gets out of control a little too much. If I go too fast it actually decreases my performance because then I make more mistakes or what not. I tend to go internal and be more concerned about my performance and it's usually when I let go of how I'm actually performing and I let go of how other people are reacting to me that I can actually perform better at the task. For example, if I'm really worried that I am not going to do a good job as a physician in a situation then I'm not going to do a good job because I'm so worried about how I'm looking and how I'm acting that I'm not actually focussing on the problem so in that sense it was one of the things we picked up in the project." (R5)

The residents generally expressed an appreciation for how well the TAIS described them and how helpful it was to have a measurement that they identified confirmed, validated and clarified their own beliefs about their interpersonal styles and focus of attention and how these were impacted by their profession. The residents developed a self-awareness of their own strengths and weaknesses.

"When you answer the questions they are very nebulous and they don't really seem to ask very much and then when Cal showed me my results what I told him was that this is (resident's name) on paper in graph form because it was very interesting to see how closely the results reflected what I was feeling." (R7)
I thought it was quite interesting how well it predicted me. I thought there weren't too many surprises... this test comes afterwards (after choosing a speciality) and it obviously does apply to me but it would also apply to a nondescript (medical specialist) as far as the things that were highlighted." (R8)

"It is interesting because he (Cal) came up with a pattern and described it. I can't say that I remember the specifics of that talk. It seemed to (describe me), generally. I am not sure if it was general enough that it could anyone or if it was because it actually did describe me in some way. It seemed that there were some reasonably specific things that it touched on about my personality, you know but

how have I used that and what have I done with that. I'm not sure, maybe I'm more aware of those aspects.... I think it said something along the lines that I don't tend to get really worked up by a situation and that I remain calm sort of thing. I thought it was a good thing, so it kind of said something about that and I think something along the lines that I see all sides of the story, all possibilities or whatever. Because one of the things that come out of that often, from Cal's perspective, is often athletes are able to see lots of things but they react specifically in one way when things are going on. And so I think that I was entertaining different possibilities based on this test but I wasn't as quick to react or I was more thinking about things as opposed to acting without really thinking things through. I'm not sure, I think that is what we just talked about....he didn't seem to be trying to use it to point out flaws, strengths or weaknesses it was just more to give us insight into who we were so that we could use those traits appropriately and when there were weaknesses that we were more aware of those weaknesses." (R6)

"I thought it was interesting that it (TAIS) called that (multitasking) a strength but at the same time it called it a weakness too. And so, I enjoyed that....I thought didn't matter but it was like it can make you strong in certain situations. It can make you weak in other situations.... Yes, and the TAIS pointed it (distractibility factor) out and I never thought of that. I know that if I'm standing in the hall talking to somebody I will reference things that are happening around us while I'm talking to somebody. You know, I'll wave at somebody or I'll be like come over we're talking about you and stuff like that so I thought it was interesting. It confirmed what I knew about myself. It pointed out some areas that I thought didn't matter as strengths or weaknesses and it also helped me to understand a little more how I process thoughts, so I've thought about it and I actually still have my copy of it. The stuff that I remember about the TAIS is that it did fit with what I thought of myself which I thought was ok." (R1)

"It reinforced some of the things I knew about myself. The way I scored he (Cal) said: you tend to be someone who takes in all the information and then makes the decision and all those things are good. A lot of the personality and behavioural traits I scored on lend themselves well to doing (a specific speciality) but I don't know if he was cautioning me. But he pointed out: you have a little bit of a sensitivity or thin skin kind of showing up here. Maybe that is something you want to pay attention to. And that is very true. I'm overly sensitive to criticism or feeling like I'm not measuring up or something. (The TAIS created) a renewed sense of self-awareness." (R3)

“The one thing that sticks out for me is something I always sort of knew I do better when I do one thing at a time and I don’t do well multi-tasking. I don’t do well jumping from one thing to the next to the next. I can block things out that are going around me and focus on the one task but as a physician we are often forced to multitask so (for example) I’m seeing a patient, someone is telling me about another patient and my pager is going off and I also have to remember to follow up on that person so I am often forced to multitask. And one of the things I found with that is Cal (is that he) said quite clearly: you do best doing one thing at a time. I know that, but having formalized that – (now) how am I going to incorporate that into my job? There are some things I can’t control about my job-like the pager going off but there is a way that I can approach it and say ok they can wait 5 min while I finish doing this thing.” (R4)

So I don’t know that he (Cal) gave me any particular insight into what to do differently but just pointing that (slower processor) out maybe made me more aware that I have to be more decisive. I thought that (taking time to come to a decision) was a strength and the fact that I often over-thought things was a bit of a weakness but it depends on a situation. I think it is situation dependent whether it was a strength or a weakness.” (R6)

I remember that sit down session one on one with Cal. We did talk about that (ability to focus and ignore “noise”) from results. I don’t know how that came to be but it was part of our discussion. I played sports quite a bit before so I was aware of visualization techniques and from a very mechanical standpoint- this is what I am going to do. I see myself doing that about sports (i.e. psychomotor preparation). I was familiar with that but I was introduced after that testing to emotional preparedness. (R8)

In this case the resident began to develop an understanding of how her/his particular style was perceived by others. This awareness ultimately caused a shift in the resident’s communication style.

“I remember learning some specific details on how you may be perceived or misinterpreted based on your collective qualities whether its presentation of your knowledge vs how much knowledge you probably attain and how other people usually are and how this means that people would assess on how you put forth through your communication skills and that type of stuff. I found that interesting...I remember specifically being asked how you interpret information, whether you are a categorical type of person or not, that type of stuff and then

how for example I remember with me it was very obvious that I put things into black or white and from that point forward there's not a lot of room for discussion cause I've used up the knowledge I have, made a decision, moved forward and how that can be interpreted as either condescending or lack of emotional ability about that. So that was an example of where you're like well I guess so. To me its logic or when things are out of your control they're not worth thinking about. In Cal's assessment by picking out these pieces of information from my scores, he makes this kind of diagnosis, well not really a diagnosis, but kind of diagnosis and then tells you how people who don't match your kind of personality for example may misinterpret things so it leads you to be so, I understand, I understand. That's important to think about so then just because it is your kind of way of doing things allows you to understand how obviously people can have different ways of approaching things but showing you what happens when you have mismatches was important." (R2)

For the following resident the magnitude of his/her TAIS profile was very striking. It created a self-awareness that his/her perception of him/herself was somewhat muted. The realization of his/her TAIS profile triggered a personal reflection that did cause him/her to initiate some significant behavioural changes.

"Oh I remember that well. It was very interesting to see how closely the results reflected what I was feeling and so the thing that stood out most and I still remember to this day is there was one category that was about worrying and anxiety. I remember seeing my score which was at the very top end of the range and it couldn't have been any higher. It was a huge realization. I know I tend to think things and worry but I didn't think I was that extreme. I thought that I did not let it take over my life the way that the result suggested. Then it made me think that maybe worrying and anxiety is actually playing more of an effect in my life than I was recognizing and it set the stage for the course because one of the things Cal told me up front was: we need to learn how to channel the negative worrying into positive worrying so instead of thinking I don't know enough, I'm not good enough-you would think this is what I'm going to do. What are the possible things that I could choose from and how can I redirect the energy?" (R7)

This alignment of TAIS results and resident's choice of speciality was affirming.

"I thought it was quite accurate his assessment. I had already reflected on my strengths and weaknesses. I think it is unavoidable when you are going through medical school or residency and if you haven't people have told you as a result

reflect on it. So I thought it was quite interesting how well it predicted. I thought there weren't too many surprises.

When we talked about it he (Cal) put it into a bigger picture. I guess I only got the results when I met with him (Cal). Is that the way it would have gone? Yes. So he was saying you scored high on this and I would say I agree and then he did a greater overall analysis. I remember him saying that I had a unique grouping of whatever categories and characteristics and from that he predicted things about me. One of the things I scored high on- the not being mislead by miscellaneous...I think that was one of the characteristics to focus in on what is truly useful. For a lot of people distractions consume their energy. The down side that is the danger is that's something that you have to be aware of. You need to be able to get rid of the noise but if you go too far the other way then you will get burnt when you see it and you are so sure that's what going on and my people that are a bit more experienced say when you know that you are so sure don't lose sight of the other possibilities because even if they are extremely unlikely you will get burnt. Hopefully when you do get burnt it is a near miss situation when that happens so it is actually talked about a lot in terms of ways to avoid that that ...tunnel vision” (R8)

Not everyone agreed with the strengths and weaknesses associated with the test results but when the characteristics were confirmed by others this resident chose to make some changes.

“That was one thing that Cal said, but he did not say it as a negative. I already knew that because I had been told that my numerous people before and the people The outcome of the TAIS test, from what I recall said that basically I was a multitasker that told me about it actually said it was a negative thing which I actually did not appreciate. Cal didn't give me that (knowledge of multitasking). I think it was actually my program director that gave me that because obviously they get feedback from nurses and so forth and so that was when you have your little sit down talk and so forth that was one of the things that was mentioned is that sometimes it just seems like I was doing too many things too quickly and maybe I didn't have to do that I thought that was totally baloney. Some of the people I work with said you don't need to try to do three things at the same time you can do them sequentially. But I'm like, why can't I do them at the same time if I can? I can't remember anything else that came out of the TAIS...In terms of cost /benefit TAIS was minimal cost, minimal effort and some benefit. I know that a couple of the people who were not in the program, like ____ and others were

quite interested in the TAIS and took it and they actually thought it was great. I didn't think it (TAIS) was that big of a deal...I actually do multitask but I probably don't multitask as much or at least I don't show that I'm multitasking as much. This was actually mentioned to me by my program director even though you know all these different things, just don't say it out loud, just keep it in your head. Just know what you want to do and just do things so that it comes across sequentially so it looks like you are more organized so that's what I do more of now." (R9)

Long Term Impact of TAIS

Residents verbally reflected on their understanding of the TAIS test results and their performance by using the interview process as a stimulus for self-reflection. In sharing their personal experiences they described ways in which the TAIS test results impacted their performance over time.

"Since then I've thought about it several times because I have that problem where I'm supposed to focus on one thing and I'm listening to a conversation in the other room because I'm too distracted...It made me aware of that so did I change my behaviour of it? I don't know. I still do this where I talk to people and I still know what is going on around me but there are times when I allow myself to do that and there are times when I try to stop myself from doing it (multitasking) for the purpose of focussing. So for instance when things are going poorly for a patient when I am taking care of them I allow myself to get the information from everyone so I have had conversations with two people at one time. Literally, two people are standing across from me and one is saying one thing and one is saying another thing and I am looking at somebody and processing what is happening, what they are telling me as well as what I am seeing, all at one time. It works well for (my speciality), it helps me with what I do. At the same time, if I am trying to focus, and I tell myself, stop listening then I think that I miss fine detail, but get the important parts that I need to know. And it happened recently when I was looking after a patient and he was not doing very well and the nurse was telling me, we gave this drug a little while ago and the doctor, the other resident, said: so his problem is that he's had this heart attack or stroke or this that or the other right. So before I'm can understand what happened- immediately I'm looking at the patient. So what happened is that I'm switching between them and I'm like "what did you say?" and I've asked them to repeat and I've changed my focus and I look back at the patient and integrate that information and I'm like, you said something about a drug that you've given him. So I found that what I can do is that I'm scanning the information and then I'm able to direct most of my

attention to where I want it to go". (R1) Later on in the interview the resident actually describe the specific strategy that was learned in the program that is being used to maintain focus.

"Since that day in his (Cal's) office I've continued to try and keep that in mind that you can't win them all you can't please everybody you don't have to take it personally. I have to keep reminding myself that I make mistakes, but most of the time I do my best so I found that really, really helpful so I still have that in my file. For example, just recently with some personal things I said whatever you're not going make everybody happy. Recently, when things happen to my colleagues at work and I go oh that's terrible and then I go home and stew about it. I have to keep reminding myself that it is not even my issue so why am I persevering on that." (R3)

"I think I just accepted it (sequential processing) as one of those things I do. I just think a little bit harder about how I can change the situation for myself because some things are out of my control but if I can change things into a way that I work best then it is worthwhile." Resident is working in a situation that often demands multitasking. *"I'm still in residency training so there are some things that I do. I really try to focus on one thing at a time not start a little project here start a little project there and all that stuff. I do make blocks of time for myself to do things more."* (R4)

Regarding impact: I don't know if I've actively been working on it. Closer to the time when I was in that group, I was more actively doing things and trying to incorporate them into my daily existence and performance. I don't know if I'm consciously doing anything differently now but at the same time I'm generally aware that I do have strengths that I just have to harness them better so that is good information for me to know because I always perceived them as negative things that Cal said were good but that they are all aspects of the same quality there are several different indicators that the TAIS survey was based on and a lot of the measurements of the different indicators, depending on the situation. If it was a more stressful situation I would easily fall from a positive thing to a negative aspect and so it is also good to think about it that if I'm concerned that I have something negative or am not doing well I can also say actually if I just harness this and control it a little better it can still be a positive thing. Now when I get busy I actually stop myself more frequently now than in the past for sure I do that more. I don't know if it is because of the study but I know I do it more. My normal tendency is to be too self aware and I'm realizing that I can stop myself in a stressful situation or a relatively stressful situation and say ok you're being too

self aware. You're being too worried about yourself, you have to focus externally to get the job done or have the performance improved so in that respect I would agree that I check myself a lot more. I think I notice it more frequently and I notice it earlier so that if I'm doing it I'll say just calm down. I'll be able to slow myself down or self correct. One of the things that I had spoken to him (Cal) about before was that I was getting very involved with the community, volunteer work, the ethnic community doing some leadership things in that realm, getting more involved at that time and now I'm taking more of a leadership role with some of those areas, as much as I can, given the time I have. I feel more confident. I am realizing that I need to focus on a few things so I've had to let a few things go instead of saying that I can handle twenty different things and not do quite as good of a job I'm saying I have to do this first and do it well before I move onto the next. I'm really trying to be strategic about how I use my time, schedule my time. I say in a way I don't think I'm at a performance level I would like to be at, but at the same time I am a little more at peace with where I am. Before, I had so many things and a lot more pressure that I put on myself. I still have that but I'm trying to use it in a way to spurn me to do well, to perform better rather than a way to beat myself up and feel bad about it. I've calmed down in some areas." (R5)

Regarding the impact of anxiety and worry: If I find myself that I am just in a rut, not really being able to move forward I do think about what can I change about my thinking that would make me more effective....(When) I was a very new senior resident I had a lot to learn and now speaking as a fourth year resident, I'm in my last year just finishing up my (speciality) I have different worries and the worries that I had back then are very different from now. I think that the combination of this course plus my own experience through residency has made me a more confident person. I do manage my worry and anxiety differently now, at least I like to think so. At least I'm not denying the fact that my worrying would impact my performance. It was a lack of recognition before, not knowing the extent to which worrying was affecting my efficiency or my productivity and I think now at the beginning of the process if I feel I'm getting bogged down then I'm better at saying ok let's take a breather and itemize. This is what I need to do and then focussing on the task instead of the circular thoughts. (Although I can't change myself completely), it is comforting in a way because if you're worrying about something you are perhaps looking for alternate solutions or trying to approach the problem differently or thinking about things you might have forgotten and sometimes it comes in handy. Impact outside of work: From a family standpoint I guess my mother is quite an anxious person and worries quite a bit so that has changed my interactions with my mother because before when she would get

worried I would get frustrated or annoyed or upset and now I'm able to see that my response to her could change how she feels. So basically trying to take more of a steady approach and the other thing is to redirect her worries into something that is effective. Impact on team: There is a difference in terms of what I feel inside and professional demeanour, so for example, in the acute code situation even though I'm potentially conflicted inside I have always tried to display the calm reassuring confident ...at least that's what I try for. People who work with me especially in acute situations typically comment that I'm quite calm and its good for the team even though that may not be how I feel inside." (R7)

"...cause I still multitask right now but nobody says anything to me cause I'm my own boss now." (R9)

In summary, the TAIS had a powerful short term and long-term impact on the residents' behaviour. Developing a self-awareness of their attentional and interpersonal strengths and challenges allowed them to modify their behaviours to maximize their performance. The personal knowledge obtained through the TAIS was something that each resident recalled regularly during their working day. It formed the basis for applying all of the other skills learned in the PET.

Curriculum

What follows are the residents’ responses to the question-What was the most significant thing that you learned during Cal’s sessions? How have you been able to incorporate it into your work and personal life? Not only do the residents share the content that they were exposed to but they also describe how the content triggered behavioural actions within them. The curriculum topics (see Appendix D for the Performance Enhancement Training Curriculum) are described and presented in order of importance identified by the residents (see Figure 13).

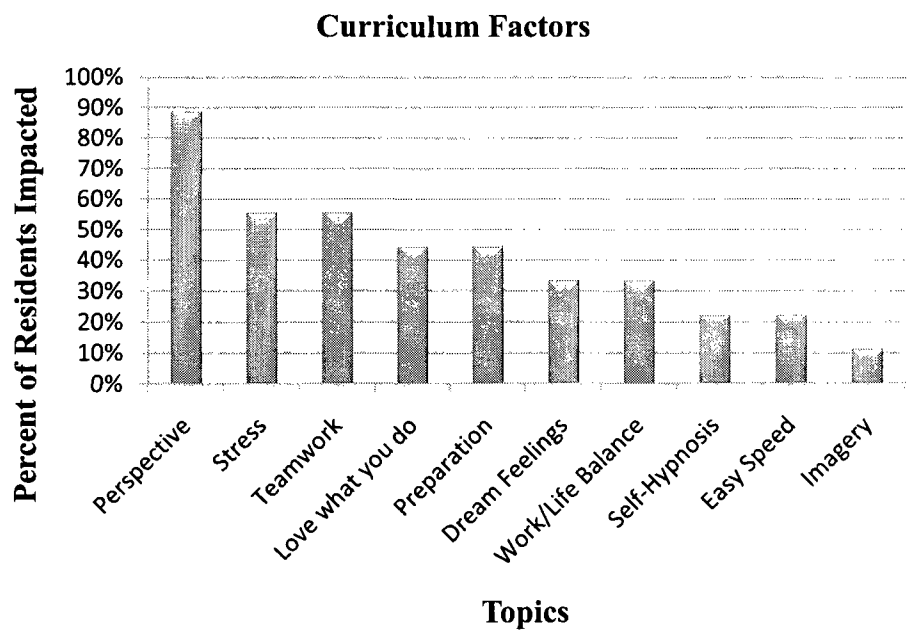


Figure 13. Curriculum

Perspective

The concept of perspective was the primary impact identified by the residents. It was embedded in all of the discussions about the program, whether talking about

instructional strategies, the impact of Cal, or their own personal growth as a result of the TAIS test.

"I reframe everything. And that's how I live my life (reframe everything to be positive). It is a personal trait, because we all have times when we don't like how things are going and if you don't understand how you as a human being can get over them then you focus on the wrong things and have a terrible feeling. When you talk about reframing that is what I did last night. I got into an argument with a family starting at 6:30 until argued again at 9:30 and then by 10:30 last night we all agreed. It was a terrible, terrible feeling because it was a young man who was brain dead and brain death is death in our province and there is no obligation to continue care but the family wasn't ready for that because he was young. I tried to meet them, we showed them cat scans and this and that and tried to explain stuff to them because they don't understand they don't know what that means when we say when he's dead if his heart beats and especially when they go and touch him and he is still warm. I tell them I don't know if I'm right or wrong if I don't know but when I do know I say I know that there is nothing I can do so I frame it differently for them too. It takes a lot of years of your life. That (changing perspective) is something that I help the nurses to do because every time they come saying the family wants us to do this thing or the other - I'm like think about it - they just found out that their loved one is going to die in the next hour -if that was you on the table and your husband came in you would be yelling and screaming save me? You are meeting these families at the worst day of their life so it is ok if they want to be weird about it."(R1)

For others it was a new way to approach work and life. Cal's book on perspective (2003) was a significant trigger for this resident. The book was read multiple times and the content resonated strongly for this individual. As a result of the impact of this concept the resident made some significant life changing decisions.

Perspective. I really, really think so. The perspective is the biggest thing for me. I think what I had lost is my perspective on things and when I lost my perspective it was a number of things. Around the time when I met with Cal I started thinking about things. I started having some important conversations with (my partner) and I also started to talk to a counsellor about some other issues. I started saying: why am I working so hard for something I probably don't want as much now as I did (some) years ago. I guess when I was applying to the residency I was thinking how much I enjoyed medical school and internship and residency and learning

new stuff and the sense of mastery that came from it but still having friends outside of medicine and still going to the bar and still playing softball and still playing hockey and going to the gym and doing all these things and every day seemed to be filled with joy- it was the joy of being a resident it was the joy of going to the bar, it was the joy of having the energy to do it and so when I say I'm burned out in (speciality) what will I do? I'll go back to school, that was the best time in my life but it was not the same. I didn't physically have the energy, I had other responsibilities and I didn't have the drive anymore that I (previously) did. What I ended up doing is around the time I met Cal I ended up taking two months off of the residency and kind of re-evaluating whether I was going to stay and at that time I decided not to come back. What has probably changed for me coming out of the residency and re-gaining perspective is I'm starting to do things for the sake of enjoyment. It was only around (six months ago) where it was kind of - ah I'm home from work. I don't be at this appointment. I don't have to do this. What will I do? I'll just sit on the deck with (my partner) and we'll have a beer and we'll talk. But in years gone by I would sit on the deck for 15 min because somebody made me and I thought I really shouldn't be doing this but I should be doing that. I've started golfing again. I've started playing the guitar a lot more and (my partner) and I walk the dogs everyday and have taken to just sitting around and talking, not having to do something. Actually I'm only working ¾ time. I have gone back to now doing a lot of stuff for the university but not because if I don't do this I'm worthless but I'm doing this because I really enjoy it."(R3)

The following resident was in a situation which requires a level of processing that is completely opposite to their preferred style. Additionally, the resident was operating within a health care system that has cultural challenges and multiple competing expectations from attending physicians. The resident had chosen to use the principles of perspective as well as his/her own self-awareness (from TAIS) to develop a strategy for optimal performance.

"I've been able to change my mindset just by putting a little more effort and thought into it, more just like reframing a situation....I decided the way I'm going to phrase it and the way I take these calls is it really comes down to three things: 1) do they need to go to the emergency department, 2) do they need to call the office in the morning and schedule an appt with the doctor or 3) should they follow up with their primary care physician? There are also a few other things like

prescription refills that I can deal with but it is really just making those three decisions and following which box it appropriately goes into and then it's not as stressful anymore. There was some stress initially. I had to just figure out a way to take things in perspective from my point of view from what the expectations should be from my boss- really they can't expect me to do anymore than that and from a patient satisfaction view –they just want some direction and they understand that I can't just fix them over the phone. That would be an example of how it just took me taking a step back relaxing and coming at the situation from a different angle. I was thinking how can I just make this a little bit easier for myself? I don't think I would have done this before the course. So I think its recognizing that different people work differently and that's ok. You just have to make it work for you. It might be a very self-centered way to do it but ... otherwise I'm not any use to them (patients) if I'm frustrated.” (R4)

Changing perspective from an internal focus to an external focus allowed this resident to improve his/her performance. S/he initially did not recognize how his/her internal focus was impeding his/her performance.

I actually stop myself and say I have to get perspective. I do that more frequently now than in the past for sure, I do that more. I don't know if it's because of the study but I know I do it more....I came to a realization that if I don't follow up on these ah ah insight things I have that I'm only really depriving the world of the strengths that I can give or whatever contributions instead of it being that I don't want to throw myself out there and embarrass myself. Now it is- if I don't, and it is something that is really valid for the good of whatever project or thing I'm learning about then really I should be thinking about that and not be so worried about myself and how I'm viewed or those kind of thing. Its takes a little bit of stress off. It can actually be that the scenario or the situation can actually become fun which is sort of a novel concept in medicine, I can actually enjoy this. I can actually have fun with the people I work with and I don't have to be so crusty, just angry about life, it can actually be a positive thing...It is sort of a refreshing change as to how I was perceiving things and how I was placing myself in my environment. I think I went through a lot of that cynicism thing. I still have a lot of that too and there are those issues that seem that they will never change but then at the same time if you really work at things- things can change and you just have to do it. Sometimes I have to do the work. If I really have a problem with something then I should do it. I've sort of trained myself to be more like that, just because I end up being healthier as a result.” (R5)

The residents all agreed that the course gave them a language to use when talking about perspective and performance. Additionally, they all agreed that the program was a triggering event that contributed to their understanding and behavioural change.

"A lot of the things that he (Cal) touched on I guess I had thought of or used in various ways before. Some of the things that I know I've used and maybe am attributing to Cal and the program because I can now label it or recognize what it is.I've always taken time to unload things from my mind on my own so I don't know if that was really something that I changed from then. It (the program) validated that I suppose. (I would have still taken the time to unload) because I found it helpful already. You have to somehow release things so basically that's what I took from that perspective. I liked the discussions around perspective. I guess that probably did change my thoughts about things a little bit. I guess to help me realize how important perspective is so I think I've always been more of a big picture person so I'm not sure it made a major impact but maybe validated that or helped to show its importance or whatever.... I'm talking about specific patient encounters where I guess what the perspective part of the course helped to emphasize for me was to see both sides and not to focus on one or the other. So I don't know if I took that away from that or whether it is my own predisposition but that's what I took from it."(R6)

The "language" of perspective gave this resident the words to describe how s/he has an awareness of the impact of perspective, how s/he recognizes when s/he has lost perspective or is losing perspective and how s/he practices regaining and maintaining perspective.

The perspective stuff- basically the losing perspective and that process of getting it back. That inevitably happens potentially quite frequently. (When you begin your training) you know why you go into this and it's all great and then you are dealing with all the crap for a while and you lose perspective and the dangers of not having any skill to regain it because otherwise you just get burned out and become a crotchety, crumpy specialist who everyone hates. I remember that everyone had a perspective and ways to regain it. I remember it was quite useful. (The perspective) had to do with awareness and reflecting on it periodically. Basically if you are on your down slope you want to interrupt it by almost scheduling a period where you reflect on why you went into this initially, almost like do it every fourth week so that if you are going down you come back up right

away instead of going down too far then making it so much harder to have to come back up. If you let it go down so far it becomes a much more significant challenge to regain perspective so again it is just a matter of taking some time to reflect on it or when something say negative happens to reflect on it fairly soon as far as acknowledging it as a negative thing...It's part of anyone's experiences, some are good and bad so you need to have those bad but you need to know about them and learn from them and maybe you will have a positive balance overall but you probably want it around 60/40 if you are the 90 positive and 10 negative that 10 will just destroy you when it happens because it will seem so foreign to you and it really throw you off. I have been doing it to certain degree but after the courses in a way I almost just have a term for it, like I'm losing it or I've lost my perspective. ...I had something more concrete in mind as far as why or what I'd enjoyed about the work so it was more in the front of my mind and I had a chance to flesh it out a bit more because of those discussions. It doesn't even require that much of an action. It is just in the recognition you've interrupted the downfall. So, if I am frustrated this week it is because all of this happening but that doesn't mean that I'm completely in the wrong field or doing what I should do and something soon or within the next hour it may be different awareness-that is probably the biggest part. Before ... a big problem for me was perfectionism. A negative thing would wear on me and for no real reason I would not gain anything from beating myself up. I don't know- there is a natural appreciation for the ups but you don't always appreciate the downs but you can. But it is normal that you wouldn't appreciate the downs but it is not all lost. (But Cal taught us) that it is a normal thing."(R8)

For some residents perspective was an internal issue about their own level of performance and for others it was about how other people's perspective of their performance could negatively impact the team functioning and ultimately the patient care.

"There probably was some impact that it (performance enhancement training) had but some of it was also related to what I did in my university courses. I personally think that the university courses had a bigger impact. As a physician I had the mentality that this is the way that it is, as opposed to a psychology or whatever....But I saw that and I actually saw that you can succeed by doing that and just some of the other things I learned from it (university courses) and I think that probably that, combined with the fact that I realized that this is the environment that I have to work in because this is where I am and realizing some of the things that have been told to me by different people throughout my training

I think sort of helped me change the way that that I did things. And then I also learned from these different things just different ways to approach people. I think that maybe the biggest thing that may have come from Cal's thing is just the perception part of it- just sort of realizing that you just sort of have to chill out, it is a big world, you are one person, you can do what you can do, but you can't do everything type of thing. So I've kind of developed a little bit more of a zen attitude and don't get as angry or as hyper or whatever when things are going wrong. There are still things that I scratch my head about and say why does it have to be that way, what were you thinking? So did you not go to school? Did you not learn this in school? You can't do that but instead of blowing my top like I have when I was doing my fellowship... I don't know if you believe in karma but karmas good. It's just a positive environment. If people are happy you're more likely to do better work, you're more likely to think straighter and all that sort of stuff. You have to be here for a number of hours a day so you might as well like the place that you're in."(R9)

Learning about the importance of perspective caused this resident to develop an increased sensitivity to others. Additionally, through the research interview process the resident came to the realization that the reason some of the performance enhancement training content did not seem novel to her/him was that her/his mentor of ten years was a living, breathing example of many of the things Botterill was teaching. This revelation was very affirming for the resident who then recognized how fortunate s/he had been to have been able to be mentored by this individual for an entire decade.

"I have become more understanding. One of my significant mentors that I work with ... has this kind of cautious optimism but it is clearly optimism. He has a track record of accomplishing many things in many different areas including borderline administrative duties and as to how he operates as a surgeon...I definitely picked up on that (his perspective) that I didn't think I had, even though I'd known him for almost 10 years. And when you think about how I've noticed that more since the course I definitely picked up that he has (a positive perspective) but he talks about his philosophy. But opposed to not being down or fearing change he has the mindset that change is good and all it takes is work and optimism that type of thing. There's logic there and that's the whole thing, because without your perspective on track: that's why I mean it is good to argue with a group of people who listen to the exact same thing and have different

opinions. It allows you to pick apart what the thing is and usually the thing is usually perspective. It's the perspective that leads people in different directions to come to different conclusions....I think that it again my take home point is that when I'm teaching someone I can tell you that it affects other people that because you are starting a process the more people becoming more aware or are having a better appreciation of their perspectives then I think that if you can communicate that effectively to someone usually with positive examples, I think they do the same things forward to the next person, there's no question. I can think of an example from yesterday of how someone I talked to in this manner now changes their behaviour with the next person. I can see it full circle because of my position I see how this type of stuff (knowledge of perspective) does fan out very quickly... You learn a couple of points but you see how it branches out into all different areas but then again it touches other people and happens for them too."
(R2)

Stress

In this example, the resident explains how to view stress positively and how to change one's view of what is stressful.

I remember this probably one of the things that was useful to me was putting a positive spin on stress, like positive rivalries, instead of it becoming a negative thing. In school we say: I'm stressed, I hate work. We are almost taught to be, not really depressed, but sort of complaining about things. I think we move from eager to cynical because we're in a sense trained, it is sort of a culture, sometimes I think it is things like dealing with the stress, like having a patient die or really sort of disturbing health illnesses that patients go through and experiencing that (posttraumatic stress??) and the stress of those kinds of things. I think it is a coping mechanism. We are often sort of trying to be cynical, hard about things and selfish about our time and I think that's encouraged in the environment we are in. It is a high stress environment and I found that you learn pretty quickly that there are people just kind of competing with you. There are other people there not really to help you, but it feels like they are there to make it more difficult for you. There are always these sorts of politics in the environment that we are working in and the high stress so I think those things make it very difficult.... So some of the things I learned were to put a positive spin on the things around me and not being so self-centered -for example, being in a situation and being "in the zone" or "in the flow", the synergistic aspect of the team and some of the things that he (Cal) taught. If I'm so concerned about myself and how I'm performing then I can't really be an effective team player so those kinds of things I realized and have had them reinforced over the course of the study....I'm not

really doing very many clinical scenarios or situations right now but I catch myself sometimes. There's the whole grind of work and I still have a ways to go but I do catch myself and say wait I can actually have fun and then I'm relaxed more. I have certainly changed. It is actually a sort of refreshing change as to how I perceived things and how I was placing myself in my environment.”(R5)

“The more important stress is the self imposed stress and for me it was going through and saying you need to know how to deal with this because the patient is relying on you and the rest of the team is relying on you and that became very apparent when I was working with people who were dropping the ball that I could not rely on- so I don't (rely on them). There are a lot of different people in medicine and there are a lot of different ways to deal with things so I don't know what the right answer is. This type of training is helpful because it allows you to take a step back and look at that and so one of the other things the way that was billed was teamwork and the way to work in a team and that was actually one of the other things I liked about it. But I do think that it was important...the self imposed stress can motivate people to do things... I am not sure if it is the stress itself that is the difference but the response to the stress so the stress could be the same but if someone takes it and says I am going to do the best I can and learn from this or I'm going to freak out or leave or whatever. In direct patient interactions- there were lots of times when I felt very uncomfortable but I always felt a sense of responsibility. That's important. There was one time that was exam related that was particularly stressful because I thought the expectations were outside of what I realized at the time so that was pretty stressful. Initially, I took that in a very negative way but I think I eventually just realized what it was supposed to be so it probably took a few hours to realize that, maybe even a couple of days I guess before I could really realize that I should use it as a motivator and I was even told at the time that this was a motivator but it was just hard to see at the time.” (R6)

Teamwork

Teamwork was so embedded in their daily practice that the residents did not always identify their changes in performance in terms of the team.

When the resident looked at the curriculum the resident began: I forgot about this team building, I actually talk to people about it but I don't consciously remember it. Once a month all the new residents in all the ____ in the city come here and we put them through the simulator and simulate terrible emergencies and make them work together and then we talk about how you become a team and we talk about those team building things. I do it once a am doing cause I bounce around

between three different hospitals so I forgot that I do that stuff.... I know that last night when I was stressed and anxious when I had to deal with this family. In the second meeting when we were now talking about getting lawyers - its quite stressful and I was actually a little month and I totally forgot that part of it. I was taught here the real teams vs. pseudo teams and that is something I do on a daily basis. I shaky after that I that meeting. I had to write a note and I was just the fear of the unknown about what might happen next- will I be able to do my job will I be hurting someone will I be opening myself to a lawsuit will I be threatening my livelihood?...my function didn't change but I chose to reframe my information. Rather than dealing in a room with forty people distantly related to somebody I sat down and talked to the _____ and said look this is something we have to talk about. Before (I reframed the situation) we were quite discordant and adversarial but now we had come to the point of collaboration where we didn't just agree, we were assisting each other in terms of what we needed to do. I know that it was very conscious -I said, this is not going well, I called two doctors who I trust their opinion for ideas -there's a friend of mine whose in another hospital, on another service. I called him and said we need to talk. I just need to know, I need some ideas... I used my social support network (team)-tell me what you think I should do because this is what I want." (R1)

"...they were kind of concepts that through self reflection or just going through things-I'm aware of these things, I'm aware of the relaxation techniques even the team building stuff too. A lot of it wasn't anything new, there wasn't anything that led me to know further what you need to do in team building. It was more about how we all have bias towards ourselves and the context. I think that was the point. I was looking to be able to see where you are shrouding the evidence. You can list the five things that make a great team but everyone is not really seeing how everyone is seeing it from a little bit of a different angle and everyone thinks that they are doing those five things as part of a team but you're not doing all of them because you don't realize you're not doing them all. That's usually the situation. I definitely use that type of stuff (communication between team members) we talked about in the first question about team building in a research environment." (R2)

"If I'm so concerned about myself and how I am performing then I can't really be an effective team player so those kinds of things I realized and have had them reinforced over the course of the study." (R5)

"For me it was going through and saying you need to know how to deal with this (personal stress) because the patient is relying on you and the rest of the team is

relying on you and that became very apparent as I was going through that that was the case. It became very apparent when I was working with people who were dropping the ball that I could not rely on. So I've learned...that there are a lot of different people in medicine and there are a lot of different ways to deal with things so I don't know what the right answer is. This type of training is helpful because it allows you to take a step back and look at that and so ... the way that was billed was teamwork and the way to work in a team. That was actually one of the other things I liked about it but I do think that it was important." (R6)

"The team stuff is always important but I can't remember how we really dealt with it- like real teams, pseudo teams, value roles, like most of these topics are important." (R8)

Love what you do

The concept of not spending your life working for the sake of working but making your work something that you love to do resonated with the residents.

(The love what you do) is a Cal thing. I knew that one before I met Cal. It is so, so important and when I talk to medical students and junior residents that's the one thing I always impress on them. I say figure out what you like, it's not about what the most prestigious thing is, figure out what you like and enjoy because then when you're there at midnight, when you've been up since six in the morning it's not as bad, really not as bad if you enjoy the work- to come in on a weekend, it's not as bad. If I was doing something I hated that would be painful....it just changes things, they (patients in the middle of the night) are not admissions, they are learning opportunities. People make fun of me for that especially at two in the morning but if that's going to save you by just shifting your attitude that little tiny bit it makes your job a whole lot more enjoyable...people are responsive. I've always had good teams...I think part of its me, part of its luck, but having the ability to make it enjoyable for people in spite of a heavy workload when it is very easy to burnout makes it more fun for everyone involved." (R4)

In fact, the residents, by their own experience, linked the concept of "love what you do" to patient safety.

If I'm in a job that I'm enjoying, if I screw up chances are the damage is going to be less because the team and the patients, everyone is going to like me more. It sounds like I'm saying you don't have to work as hard but in a way you're working just as hard but with a positive mindset and positive attitude. It spreads,

so that often times patients, just by knowing that they have a happy physician, they'll do better. So conversely, so they probably won't have as many adverse effects from treatment regimens because they have buy in from their physicians which is probably one of the most important things. Or their physicians and health care providers can be more efficient. But in terms of the health outcomes of the patient populations is better ...there is going to be less burnout if everyone is in a happy place and are actually happy and smiling and going to work where there is a good dynamic - then people are going to stay in their job longer, they are going to work longer instead of retiring. Its especially important right now as it seems to be, for example, in _____ that more and more graduates are working less, just walk-in clinics and that really speaks to its not necessarily a fault of anybody but people are really looking out for themselves. So if we can provide some kind of environment for our new physicians and health care providers to want to come to work and it is going to keep them there - even more than extra money or those kinds of things.... in a sense there's never enough money and sometimes there is too much money, sometimes what people focus on gets skewed. I'd rather enjoy my workplace.”(R5)

Preparation

Preparation was a skill that the residents learned in their performance enhancement training partly because of the post-intervention simulation. It was a way to help prepare them for performing in the simulation context. But many of the residents used that skill set in different ways.

”So I’ve had a number of exams since this and going through the exams things-like using your emotions to your advantage and visualizing and things like that have been helpful. I was doing that to some degree before. I think some of things he would always say is, get scared early or something along those lines because it gets you ready for the thing. So that I did and it seemed to be helpful.” (R6)

Some of the residents took the preparation skills and applied them in various ways to their clinical practice. In this situation the skill being practiced and utilized in various contexts is the team management during a code situation.

“The other thing was the practicing ahead of time. We did some of those simulations and thinking about how would I do this next time and all that stuff that is definitely helpful. I’ve used that a lot, actually a lot especially because I do

a lot of procedures in this _____fellowship and a lot of _____ and every time I do something if I get to a point where I get stuck then instead of going "man I couldn't do it" or whatever, I talk to him or her afterwards and say how did you get through that? Then I try to do the same thing next time when I get into a similar situation and its super helpful and even those things we did a lot of i.e., emergency multitasking things for running the codes and stuff like that and I've done a lot of ICU before but even here I remember- I was walking down the hall and I heard this person calling help, help, help, and I took the situation and oh, ok, well I was the first one there. And afterwards because I ran the code actually and I was brand new here and it was very different from the way they normally do things here actually, everyone was very calm and relaxed it was just a matter of me telling everyone what to do. But that model which I learned during my stay in Winnipeg and got reinforced with Cal-I practiced afterwards with my other ICU experience. I basically just transferred it here and everyone was really impressed. It's a _____ fellow well, this is what I learned, this is what I did before. I think I knew more about how to coordinate people and tell people how to do stuff and ok, you do this, and tell me when it's done, you do this, tell me when it's done, you do this tell me when it's done, it's that model that we learned in Manitoba about how to do these things.... we had to do all the preparedness exercises because we knew we were going to have to do it (simulation testing) before and I run through those all the time because you never know when you are going to be in that situation and just knowing and thinking and just having my mind wandering one day doing something - I was, ok, this is what I have to remember so I go back to it all the time." (R4)

Another aspect of preparation was emotional preparation. This was a fairly new concept, even for those individuals who were familiar with mental rehearsal, visualizing and psychomotor preparation. But, the concept was readily recognized for its potential benefit as physicians regularly work in situations of high or distressing emotional intensities.

"I was introduced to the concept of emotional preparedness (after the testing). When I am doing this, what if I start to feel like that? How do I take control of that? and basically it is just a different kind of visualization ...I hadn't really thought of the concept so I thought it would be good to look into that more for me, from a personal perspective, because if something unexpected happens then I am prepared. From the practical theoretical style- as far as going down pathway A, if there is a roadblock, I have A, B and C to go down. I am able to do that but if I'm going along and have an unexpected emotional experience, as far as say, frustration or uncertainty I would not have the same preparation to handle that.

So you can practice it in the exact same way. Visualize something more concrete. So if you are thinking about the situation to come and try to recreate that feeling of fear or uncertainty so that when you are in it and it happens it wouldn't overwhelm you, it will be more familiar. So that's the kind of exercises involved in emotional preparedness ...in preparing in that (emotional) way it helps you have the awareness. Oh I remember that feeling from when I was thinking about it in a safe environment when it's not actually occurring. It's not so much to eliminate it, but to be aware...I believe it does work. Basically, it is just an extension of a previous visualization where I would picture what is to happen but I would add that extra emotional layer because it's going to happen. You are going to have some emotional response so having visualized how you see yourself and acknowledging it, addressing it and dealing with it helpful when it actually happens." (R8)

The concept of "getting scared early" and using that as a motivator to learn and be prepared was something that had been recognized earlier by this resident but who valued it as a strategy. There was a recognition that stressful situations will always occur in medicine. These situations would be great learning experiences if one "gets scared early" and prepares.

"Using your emotions to your advantage and visualizing and things like that have been helpful...get scared early....the first thing I was asked to do was a sim man and I hadn't done ACLS and ICU for a couple of years and so I was a little bit out of it and I was thinking to myself -well this could be very interesting and so I knew that I wasn't prepared in the way I wanted to be. Despite that I think it went fine and it was partly because I got scared early and I use that skill anyway ...maybe that is one of the most useful things, that is to tell people that it is ok to get stressed out about things early but that it's not all consuming and it shouldn't be used as a motivator but not even expressing it like that... even just getting people involved in situations that are uncomfortable where they realize that I need to know this I need to know how to put in a line emergently and I need to know what drugs to use for this and that just even if they don't know all of this but just that they realize there's a lot more to this than I thought...it's usually because you are put in situations where you can deal with it but you don't think you can deal with it and people expect you just to deal with it so because that expectation is there you end up taking a lot away from it." (R6)

Dream Feelings

“Dream feelings” is a term similar to life goals, priorities, looking at things that matter in your life, etc. But somehow the term is so much more palatable than “establishing your life goals”. The term caused initial responses from residents- from it was too “soft”, a little “hokey” to something that was recognized as a lived experience and therefore validated and put into practice. Despite the initial reaction, it was something that was mentioned both in the context of dream feelings and in the context of perspective. Everyone recognized the importance of developing a balance in their life that could be centered on their dream feelings.

“Two things that I learned that I use. I can’t say daily but on a regular basis. One was the concept of the dream feeling which when Cal brought it up I thought it was kind of hokey. I remember Cal trying to explain it to me. I thought, it’s just not me. I’m not that kind of guy. Well when he said the word dream feeling my brain turned off. And then when he explained it, he said the dream feeling is: if you consider the moments in your life when you are the happiest, whatever they were and think about what kind of person you were and what you wanted to be, what your goals were and what made you happy, then that is what you need to work towards. What do I think is important? I need to take a focus on that and so I very much live in the right now without planning ahead. If you’re working in twenty different directions and you are feeling ungrounded or lost then when you have time to sit down and think about that. Then that will tell you what is important in your life. It will help you prioritize what is important in your life. So things like that come up on a regular basis where I say yes and I say yes and I say yes and then I am working too much and then you know it will just hit me - I haven’t seen my children in a couple of days and I just haven’t sat down and had dinner at home and so when that happens that is what I need to do. I drop everything. I ignore phone calls and I don’t work and I actually just leave the hospital and make sure that no one can find me until I feel like I have taken care of them. What I used to do is be more passive about it (my priorities). When I was off of work, I thought, I am going to do nothing, hang out with my friends and then make sure I talk to my wife, make sure we have dinner together and that would be my focus. I would prefer work and procrastinate in favour of my family. Now it is more that I actually actively can turn things down.”(R1)

I've calmed down in some areas. I've also spent a lot more time reflecting on myself and my life and tightening up the things I really want in life and the things I really don't need or aren't that important to me. That's one of the things I've benefited since the actual project." (R5)

"The loop where you have your dream and how sometimes people get stuck between the tasks and don't relate the tasks back to what you're really wanting. I guess the example would be you might want to become a really well respected doctor, somebody who patients will trust and parents love to go to and colleagues want to refer to, but then along the way you might get tripped up. For example, in the academic world you need to publish and then your academic merit is often related to your grants and your output and so I can see how your initial mandate to be that well rounded doctor to enjoy your patient care sometimes might get sidetracked by perhaps an academic career where you are going for the promotion. I think you grow from setting what's important to you and setting your boundaries. You say this is what I'm willing to do, this is what I want out of life, this is what my compromise will be or this is what I offer. In my program I've seen it approached very well and I've seen it approached very poorly and so where it has been approached well is where there's complete openness and transparency and it goes through the right channels and you have the committee and then you end up with a consensus and then there is no hard feelings because its justified and everybody knows." (R7)

Work/Life Balance

Residents all acknowledged that the work never ends. Even with the focus on dream feelings and loving their job and choosing a positive perspective, there was still a need to balance work with the rest of life.

I have always done other stuff. One of the emphasis of the program is you need to have a way out and relax. You need to have a life outside of medicine and focus on other things. I kind of knew a lot of that stuff already. In my undergraduate training the students were older. Everyone had something else. People have done amazing things outside of their life in medicine whether it be for example a performer in circ de soleil or they had another successful career as a lawyer or a lot of people did something else, and were extremely good at something else so everyone had something other than medicine. Everyone valued that. I've always done other stuff through residency and everything. I took some dance classes or I did other things so it wasn't so much of an issue for me. I know a lot people who got really burned out and in part it is because they don't take that one hour a

week and just do something for themselves whether it be go out with friends or take a class or whatever...for the hour that I'm doing gymnastics I'm not really thinking about my job. It would be distracting and then I'd hurt myself....I'm probably more aware and less afraid to approach people on this (work/life balance) and that is the big thing. Being a little more senior now I can say, how are you doing? no really, how are you doing? and just letting people talk. There are some things you can't fix about this but did you ever consider this? or is the way I see things. One thing you might want to try _____. I'm probably a little better that way, recognizing that everyone just operates a little differently. I am doing more of that now just recognizing that sometimes you have to give people permission to get a life. When I had my house staff they get a weekend off and I say: you have a weekend off, what are you doing? so in addition to reading about this which I'm asking you to do you also need to do something where you are not thinking about work, at least for an hour. And then I ask them about it on Monday - did you do this? why didn't you? well ok. but the following weekend I care about what they do outside of work. I think they think I understand them a little better...A lot of people don't quite realize the impact of their wellbeing on their job. One of my gymnastics coach who was really good at team building, he always impressed on us – you leave your problems at the door, when you come in you are with that kid for an hour and for all you know that is the most important hour of their week, the most fun they are going to have for the entire week that's your job to make it that experience for them and it is the same thing when meeting patients, they don't care what is going on in my personal life, how many other things I have to do, how many times my pager goes off, they don't care about all of that stuff, all they and their family care about is that patient. So it is a model that I am trying to transition to because I work a lot more hours too so finding that balance is so very important. It was easy to do when I only had to work 30 hrs a week.” (R4)

“I feel more confident. I am realizing that I need to focus on a few things so I've had to let a few things go instead of saying that I can handle 20 different things and not do quite as good of a job I am saying I have to do this first and do it well before I move onto the next. I am really trying to be strategic about how I use my time, schedule my time.” (R5)

Self-Hypnosis

This skill was mentioned by one resident who found it highly successful and who was encouraging his/her students to use it as a way of overcoming performance limitations. The following description is a creative expression of self-hypnosis.

"It (self-hypnosis) was something that I was interested in ... the idea of overcoming the limitations in your own performance. The big example is that when I get distracted by too much going on and I need to focus I find that self hypnosis works for me. It is literally whistling to Sesame Street. I whistle the sesame street song and my heart rate slows down. I can tell I am more relaxed. I tell myself relax and I let my body do what it's supposed to do. I usually use it in pressure situations so when I am working hard and something bad is happening then I become very introverted and internalize it. People don't like it when you're whistling sesame street and that's just one example. But another thing I do is for instance last night I went to bed at 4 In the morning and I had to be up at six so Cal said if you suggest to yourself that you will be rested and awake for the whole day and be able to perform - go to bed with that thought and you will wake up fresher. That is something I used to do a long time ago. I'd be all tired but I could have a three hour nap and I'm happy. The example is: I was actually telling one of the residents yesterday or the day before - I was thinking you know when you got married did you sleep the night before? Did you make it through the whole day? And were you excited? And were you awake the whole day? Yes! And I'm like, so what happens at work when you stay up late at night and you crash the next morning - you have the ability. You just have to convince yourself that you can do it. And he's like, well I guess so, somewhat sceptically but I believe it works. So like today for instance I slept a couple of hours. I have a full day of work and I have to go for dinner tonight at a friend's house. Tomorrow I'm in the hospital at 7am until Friday at noon so I've got some busy days coming up and I'm ok with that because I know that the time I'm home I'm going to spend with my (spouse) and kids and will be relaxed. I am going to fall asleep on the living floor. My kids are going to play on top of me but that ok but I know that's what I want. So the dream feelings and this idea of self hypnosis or self suggestion are the two most important things that I know I use on a daily basis."(R1)

Imagery

Imagery is a skill that was familiar to those with a sports background. It is something that is not taught in medicine.

I can go on! Imagery is another really big thing, an interesting concept to be able to picture in your mind step by step what needs to be done before doing it so that when you actually are in a situation in which you are performing it is not as stressful and unfamiliar because you've thought your way through it. I thought that was a very useful concept. I use it in my teaching. I do a lot of teaching for (a certain student population) because we do a lot in (my speciality). I take the medical students aside and I explain to them and sometimes show them on a

model what the needle looks like and the relationship of the needle and the vertebral bodies and then I tell them to visualize it and to use imagery just so that when they are actually there with the patient in front of them that they are not overwhelmed by the crying or the nurses or the situation the wiggling and the family who asks you've done this how many time before so I find that is helpful. I've tried it myself and I've been a little less successful. The thing that I'm hoping would be more useful for me is (a particular procedure). It seems like it is a process that should be very amenable to imagery but I just find that when I'm actually there it is usually in the resuscitation room..... there are more senior people who are anxious for the chance....it just doesn't happen for me in the really rare cases (there was success in the average cases and the resident has had less than five individual patient attempts). (R7)

Easy Speed

This was a term that was new to most everyone, but was very appealing.

Residents could recognize times in their life when this was their reality and times when it was slipping away. What follows is a description of what easy speed looks like to residents and how they attempt to achieve it, regain it and maintain it.

There was reference to the video called easy speed. I guess what had happened is when I went back to residency I was having some ... problems at the time as a result of going back to residency and it was probably not the best point in my life. ...I remember thinking back to when I was in medical school and university and the first few years and the term easy speed applied to me. There were times when I could juggle a million things and enjoy everyone of them and maybe not get enough sleep but I was going to the gym and I was going out and I had friends and I had hobbies and I had work and work was great and I was learning new stuff. I remember thinking that applied to me, that easy speed where when you're getting fulfillment out of everything when you're not looking at everything as drudgery you're doing it. You can do it all or most of it and I remember in around that time when I met Cal and became interested in participating thinking I have bit off more than I can chew and I created a lot of other problems in the meantime and I started thinking that easy speed pertains to me. I've started feeling that easy speed way of thinking again recently because I only ended up doing one year of the residency and went back to work in _____. When I think back to the times in my life where I felt easy speed it was doing things because I enjoyed doing them also you do them out of a sense that you want to give something to the world and society. You want to comfortable and all those things but any of the things I

did I didn't do them with a sense of guilt or like it has got to be fixed by this deadline. It was yes I have an exam coming up, it is a beautiful day, I am going to go play softball or things like that and again (prior to this program I was...working too hard, having family issues and trying to squeeze all of these things in and then when I said I was working too hard what am I going to do? I said: well I'm going to quit my current position and work harder in a new residency. That for sure made no sense. I actually think that talking with Cal and going to these sessions and reading the book and reflecting on things I think it did help me to make the decision that staying in the residency wasn't the right thing for me." (R3).

There are lot of pearls that still stand out quite prominently for me and so one of the things was the concept of easy speed. I was really, really enthralled with this concept and that is to be able to put in 80% of your effort and get 100% results or very good results and if you were to put in 90% effort you might not be able to achieve much more and so you should basically find a spot where you work comfortably and you are achieving it. It is something that my husband has found very easily and he's discovered his easy speed for a long time and it's something that I'm more working towards it. I guess a really concrete example would be preparing for my board exams at the end of the year and so easy speed would be doing a little bit of reading every day so by the time you come to the exam you are ready and you are not panicking and so in practice I would try to read every day and I'm getting to the point now where I need a limit of more than easy speed because I need to put in that 90% so that's an example of where the concept was very good. I'm working on it and you can translate that into life-long learning so it's better to read a couple of journal articles every day to build the knowledge over time as opposed to a few times a year going to a conference learning everything so you can getting your continuing medical education credits that way. It also affects what you think of yourself and your performance as a doctor and how you evaluate your work so I think if you're somebody whose confident and who is reading and knowledgeable I think you would feel more comfortable inside as well. Whereas if you don't necessarily think you are doing as much as you can then it does affect perhaps what you think of yourself." (R7)

In summary, individual curriculum content topics resonated with individual residents at the time of the training and persisted in the eighteen months since the training. The one concept that had universal appeal was perspective.

Instructional Strategies

The program was delivered with a variety of instructional strategies including:

- a. one-on-one counselling and coaching sessions – for the TAIS as well as for individual residents who were unable to attend a the group session,
- b. group sessions which included mini lectures and sharing of challenges and successes in performance,
- c. written resources including the facilitator's own book and
- d. videos in which physicians and others testified to the impact of the psychological skills and strategies in their own life and professional practice.

When the residents were asked about the method of instruction in terms of its effectiveness in communicating the content there was a diversity of responses. Given that most of the residents had pre-existing interests in psychology and motivational materials there was for some, initially some dissonance, as they attempted to connect the new learning to previous learning.

"I've done a lot of self-help, motivational books reading but the way he (Cal) was actually presenting a lot of that information was in a differentas well because looking at it that way, at first it was hard picking up on some of the ideas but then I realized they are similar to these other ideas but just framed a bit differently and it was another way to reinforce some of the things I've thought or learned about over the years." (R5)

Once this resident developed an understanding of the perspective of a performance enhancement program originally designed for athletes, this perspective became a winning one.

(In the program I felt that it was) "likening it to an Olympic athlete....before that I wasn't thinking of myself in that kind of a role. I think I perceived that role as something I should be scared of because I could cause damage or hurt somebody but then by thinking of it that way I wasn't able to see how I could actually apply

it and perform well. It was a big change for me (to see) how I (could) envision myself in that situation. If I started to think about it in terms of let's say I'm an athlete or a high performance (individual then) this is what I'd have to do. I'd have to practice and I would have to go through the situation or the clinical scenario first so that I can know what I'm going to be heading towards. Just the kinds of things that make sense for what we would advise an athlete or a student to do but we wouldn't necessarily think of ourselves in that situation so I think that that kind of reframing was pretty new to me... but in the context of me being the protégé athlete with my sport being really being medicine and putting it in that kind of frame was really useful for me because could see how if I were really an athlete I wouldn't be doing be defeating myself in those ways because that doesn't make any sense for my performance. I found that very useful....I did learn quite a few things.” (R5)

Group Process

The group sessions were perceived to be the most effective way for Botterill to communicate course content. The sense of group process was universally viewed as important but again one resident felt that that need had perhaps been met more extensively in the co-existing university training.

“I kind of went to the sessions, did a little bit of talking and there probably was some impact that it had but some of it was also related to what I did in my university courses....the group sessions would be good (when developing a program) because it gives people an opportunity to sort of share experiences.” (R9)

“I liked the group things, but maybe it was the content. We talked a lot in the groups and there were times when it was very useful to have the group discussion. I thought it was helpful maybe just to hear the other people's experiences. But I think too that in the group sessions we had the content that he (Cal) was providing to us either as a mini lecture or discussion or as a video or whatever –it was helpful. So those group sessions were probably better for me than the other things.” (R6)

“The discussions about the overarching themes are what is most useful.” (R8)

To this date the following individual continues to look for opportunities to engage in this

type of open, non-judgemental, cognitive dialogue.

"The discussions that engaged from a lot of the structured sessions I think were key. That's the thing different personalities are going to take the course in totally different directions. I think that was an important point because that was the point where we got to discuss things and hear points and counterpoints so probably the discussions around the actual curriculum (were the best)....I really think about this stuff often and I am interested in the literature about this stuff and I'm interested in philosophy and psychology and all this stuff so to me it's kind of like I had kind of known this stuff and had thought about it so I was ready to get down to the meat of the discussions...but I didn't think it got deep enough. It was very safe for everyone. I prefer the more "right to your issues" kind of thing. I want to be very much challenged and I found it was a really more of a very safe environment for everyone. I felt that that was the overwhelming thing where it was like everyone was kind of dancing around topics and talking about concepts... so I felt that the sessions again were kind of general for such a hard core motivated group these were a group of people that clearly volunteered a significant amount of time and had a vested interest and not just the course. I'm just thinking that all of these people are high motivated a unique group of people that are clearly seeking higher levels..He (Cal) told me that the whole analogy is to Olympic athletes from day one to the end so... but we never really got to the point where people were all focussed on you letting you know what their opinion (was) are based on how you perceive things. We didn't really have a chance to get to the meat of disagreements or get to points where one person see it a little bit differently and then start bouncing that off and then people can come to whatever I think that changes behaviour a lot more...but it just wasn't honed in enough ...I think that you had a group in this course who were people that were definitely willing to take it to that level. I think but I don't know- people who were signing up for this kind of thing clearly could appreciate the value of these types of educational strategies...I definitely do think maybe it is the motivating group but the people who worked in this class with me seemed to get what I was saying-I wouldn't say all of them. Some people were just there cause it was a little bit of a griping session, not exactly, but saw it a little bit different. But I think there are a few people that I felt a significant bond with. ... this is exactly why we have an interest in this type of cognitive enhancement...when it came to the discussions I came to realize that having those discussions are clearly important because that is what I was longing for. I realized that once the sessions were happening and over. Sure you could watch the video and they could tell you about what it means to be motivated and how to interpret your bias and that type of stuff but it wasn't until you figure out why people think differently than you that's where the money is I think."(R2)

The concept of the group as a safe environment to express personal ideas and values was echoed by other residents as well.

"I never felt self-conscious or anything. In the group you could say what you wanted and be honest. I think that's important for exercises like that. I felt that it was really important that I was honest with myself about my answers and not say everything I think everyone wants to hear but what I really think." (R4)

When I asked why the residents thought that the group was a safe environment the comments came back to Botterill, his personality and his approach.

"Cal is a pretty easy going guy. He's a very approachable person and it is easy to feel comfortable talking to him, working with him and all that stuff. He's a very good personality to do all that stuff... he's so relaxed and he puts himself out there too. Working with somebody like that makes it easy to feel comfortable because he does it the same way." (R4)

"...the way he (Cal) was able to keep the group moving along and making sure that everybody contributed. That kind of thing was really good." (R5)

"I loved coming to the small groups. What about it specifically made me want to come to every session? I think it was his (Cal's) willingness to learn and he is an expert in sports psychology, he's an expert working with highly trained athletes, elite athletes, and yet he was interested in medical education and interested in knowing what it is that medical trainees do, what's going through their minds, what are their challenges, what are their triumphs? It was just that interest that was really, really cool." (R7)

Residents also acknowledged that the frequency of the meetings within the six week window sometimes made it challenging to attend the group sessions. Despite the challenges, residents did make an attempt to be involved because of the importance they attached to their time together. The group sessions also had the added benefit of creating a sense of "team" which was valued.

"The group sessions were helpful. It was difficult for everyone to show up at the same time because of our commitments and what not but I did really enjoy that because it put it in a setting of collegiality and that there are other residents and

other groups and it was also good to just get other people's perspectives. I find in medicine, even though there so many people it can also be very isolating, so it was nice to feel like I was part of a team especially with people who were from different backgrounds...(despite everyone's busyness) it was sometimes just different avenues of communication. Everybody understood that everybody was busy so email was often the way we communicated and it was fine. I think that helped also to make it not a chore because we could still communicate we could still take part so that was also really good....I thought that the regular contact, even just a quick email was also really useful because it felt more like I wanted to work more on my performance because was part of team. We were all working on our performance so it was nice to have that camaraderie. We started a little bit on the emails joking about oh well I'm going to do better on this. The positive rivalries were coming out a little so it was fun. It was motivating and it was a fun experience. I felt like I was part of a group." (R5)

The support that was experienced in the group was a motivator for this resident to begin to create a supportive community with the medical students under his/her care by offering to be a listening ear.

"It was probably a little bit different The group interaction was very important for me, because of the things going around the table. I see myself some yrs earlier going-you know I felt that way, why didn't I do something about it back then? Why didn't I ask for help then? or Why didn't I say something then? ...I remember thinking that my students shouldn't be afraid to ask for help because I won't look at them any differently as a teacher. By them saying-you know what? I need a break. I need this. I need some help with this. I don't quite understand this. I'm having ___ trouble. You've been there. Can you tell me something about it?" (R3)

Books

Initially the residents were provided with two books. One was Botterill's (2003) book on perspective and the second one was Newburg's (2002) book. The residents were encouraged to read the books as an independent activity. The written resources were viewed as out of class assignments. There was no accountability in terms of reviewing the content or completing a quiz.

"I didn't get through all the books so they didn't have an opportunity to make an

impact the way they could have.” (R6)

“There was a lot of reading we were supposed to do. There were these sessions we were supposed to go to and so on. And even though I did have some time because I wasn’t on clinical service I was didn’t have a lot of time because I was still doing full time school and I also had some part time stuff to do at the hospital plus I had my academic half days that I had to prepare for so I actually think I did almost none or a minimal amount of the readings.” (R9)

When asked to recall instructional strategies 18 months later, the specific content was not always recalled although the sense of the impact was that it was positive.

“Specifically from the project I liked some of the things he (Cal) used like some of the readings and some of the little film clips he shared were also really good. I can’t remember them offhand but I know they were really good.” (R5)

But for some, the material was quite powerful.

“When I read that book perspective it spoke to me, it really, really did. I’m sitting there thinking- keep it in perspective-maybe you’ve done this wrong but you always try your best so keep it in perspective. Maybe this part of your life is not going well right now, but keep it in perspective. Most of the time things have gone well so that’s not really that important. So actually I really really, really enjoyed reading that book. I read it a couple of times and I found it extremely helpful. The other book I also found very interesting - it’s Newberg and I even looked up his website to look up some of his other stuff.” (R3)

Videos

Videos were also used throughout the program. The response was mixed and some residents could not recall the details.

“...nothing was new to me. There were no points in any of the videos I saw. It was a lot of re-affirmation for me vs. which is also important. There was nothing that stopped me and made me think-maybe I see things a little differently based on this or that...I do have a Curt Tribble that I know.” (R2)

“...but not on listening to the videos.” (R2)

“...he (Cal) also had some materials that were videos or interviews and those

were all really good too.” (R5)

Things valued: “...some of the videos and talks about how other people have adopted these kinds of ideas” (R8)

In one case the reflection and memory recall of the impact of the videos caused the resident to remember, revisit a concept and subsequently triggered the resident to make a decision to adopt a principle from the video apply it to professional practice from this point forward. So, 18 months later, the video had an impact!

“The videos I actually can’t remember very much. (The researcher suggested the name easy speed). Oh, where he would think about his operation and rehearse it on the way and he went through the positive route. He (would) walk down the positive hallway rather than the negative hallway or whatever.... I do remember one thing he used to tell his patients. We should do that on our unit because he actually used to tell his patients when they were sick to think about what you want to do and keep focussed on that while you’re going through all this and that is what will get you through. Actually I should remember that. I should use it. There are people that we should say that to.” (R9)

Facilitator

Another common theme that runs through everything was the role and personality of the facilitator. The facilitator designed the curriculum, chose the space, chose the text resources, chose the instructional strategies and used himself to deliver the content. So the question was asked: What effect did Botterill’s personality and approach have on your participation and learning? All of the residents had something to say about Botterill, whether they knew him before the performance enhancement training or whether they learned to know him as participants in the training. In only one case did a resident express doubt over the impact of Botterill. In this case it seemed to be the relationship between sport, Botterill and salaries.

“I like Cal. He is a nice guy, really friendly and all that sort of stuff. I think it may

have made more of a difference if I was a sports fanatic or whatever because I am actually not a sports fanatic at all. I actually don't like a lot of people that get millions of dollars playing hockey when I make measly peanuts compared to that. I have a real sort of bias against some of that sort of stuff, not against sports. I think sports are important but personally it being him didn't make a huge difference." (R9)

The remaining residents recognized expertise and experience in Botterill which created a level of respect. They found his friendliness and approachability to be positive qualities.

"It his personability and his down to earth discussions. They are welcoming. He welcomes interaction and I think that is quite nice. You can see when he's steering you. I could see when he was steering other people but I don't know if he was ever steering me but because he tries to keep it on focus. I think because of his dynamic personality he is able to deal with people who are talking about various different things and bring it back to the one common feature that he is trying to talk to people about - so I thought that was very good. He is also quite energetic. It makes people gain more from him - he's friendly so I'll be friendly...Cal was just everything I remembered about Winnipeg -where people say hello to you whether you know them or not...Cal has this legitimacy because he has some interesting life experiences so that people want to hear what he has to say." (R1)

Additionally, the residents valued that Botterill, despite his own personal expertise, went out of his way to understand their world and tried to see their perspective.

"He (Cal) brings a lot of experience and a lot of personal reflection on this issue so that was a huge advantage. He could put some of the things into perspective for us that were otherwise going to be lost... I was quite happy to have him there. He just seemed to have done this before with athletes so he just knew what worked and he seemed to be able to translate it in some way for us...I think it was actually helpful that he wasn't part of medicine but at the same time it's important that you have someone who understands the process. He tried to get involved. He went to different things. He did a shift in emergency and things like that to get an idea of what happens. I think that's important. I don't think this would be well received if it was somebody completely outside of medicine. I think without knowing some of the specific aspects of medical training (because my understanding that it's very different from a lot of other training programs) people would tune out and you would not get anything." (R6)

The following resident did not know of Botterill before the research.

"I think it was very important for me. I'm telling you how interested I was and stuff but I've never done a thing about it until the opportunity with Botterill came up so...there are probably enough of the books out there and TAIS tests you could probably do this if you were that motivated but that's the ends of my motivation and then you start to include all the rest of everyday busyness... I would say if I wouldn't have got that email from Botterill I never would have done anything different to follow up in my interest in this in general, or in these learning techniques. I probably wouldn't have because of the nature of everyone's life. You're busy, you have so many things already and procrastination, but him having that opportunity to be there I knew I'm either going to take it or I'm not going to take it and by taking it you've committed to it." (R2)

Botterill's personality and approach was definitely a strength and seen as a hugely positive aspect of the program.

"There is no doubt that his teddy bear style is very ingratiating. You feel warmth the first time you meet him...I don't know how much of it was circumstance and how much of it was Cal but I really enjoyed him and ... it just probably that much better because of Cal's personality and his empathy." (R3)

"Cal works for me!...He's got some documented successes that I could relate to as well." (R4)

"He was very non-judgemental and very approachable and easy to talk to and very easy to open up to. It is interesting because he really had a deep respect for people who have the perspective and that really comes through in his teaching. He shows us how great it can be to have these skills or you just feel that he knows something that the rest of us don't know yet and he's really excited to share it with us... he was very affirming and very encouraging." (R7)

"Cal does play a big part of it for a couple of reasons. Firstly, we were all there voluntarily after hours because of our own interest but his energy made it would have been worthwhile either way. It made the time spent sitting around the table enjoyable and engaged. It was easy to become engaged." (R8)

His personality allowed the residents to see him as a facilitator, a coach and a counsellor.

"I think it (Cal being the facilitator) had a big effect in that maybe also just knowing what he does in his life as a coach and working with athletes it really

sort of set the tone. It was like he was my coach and I was trying to impress him and being a good athlete or performer so he would be proud of me. I think the fact that he is very easy to talk to and very personable also made it a lot easier to open up and talk about my own personal things. I shared with him because there were things I was sort of struggling with and I wanted to figure out where I should go within those areas of my life. If he was more of a scary coach that I was scared of I don't think I would have shared as many things and have learned as many things about myself...he was really affirming... I think that aspect of him being very affirming, just very non-judgmental, but more objective and objectively trying to help was a really important part of helping us become more relaxed around him and want to try harder." (R5)

In summary, although the videos and skill practice was seen to be valuable, the single most valued instructional strategy was learning as a group. The effectiveness of group learning was seen to be directly related to the expertise, personality and style of the facilitator.

Program Factors Discussion

The performance enhancement training was delivered over a six week time period. In previous PET courses, Botterill would deliver this program over 12 weeks. This is a reduction of fifty percent in the time normally given to this type of program. There were time limitations in “The Utilization of High Performance Patient Simulations to Reduce Medical Error” research project which necessitated an abbreviated program. Consequently, there was a concern that there would be an insufficient period of time to absorb the program contents, much less trigger and support the behavioural changes necessary to make the program successful. Nevertheless, this did not hold true for many of the residents, all of whom took away something slightly different from the program.

There was very little content in the curriculum that did not make an impact with the residents. The concepts of perspective were identified as important by eighty-nine percent of the residents. Teamwork and stress management strategies were each identified by fifty-six percent of residents. The concepts of “love what you do” and preparation, both psychomotor and emotional were identified by forty-four percent of the residents. At least twenty two to thirty three percent of the residents attributed impact to dream feelings; self-hypnosis, easy speed and work/life balance (see Figure 14, next page). The concepts of perspective, stress and teamwork definitely speak to the challenges that residents face in their profession such as the heavy workload, the responsibility for human life and the frustrations working with so many people. All of these topics are relevant to physician performance therefore the residents were asked specifically if there was anything in the curriculum which they did not find to be of value. They were shown a copy of the curriculum and given as much time as they desired to

review it. All of them were absolute in saying that there was no topics that they felt could have been eliminated from the program. Everything in the curriculum had value, but in varying degrees to different individuals.

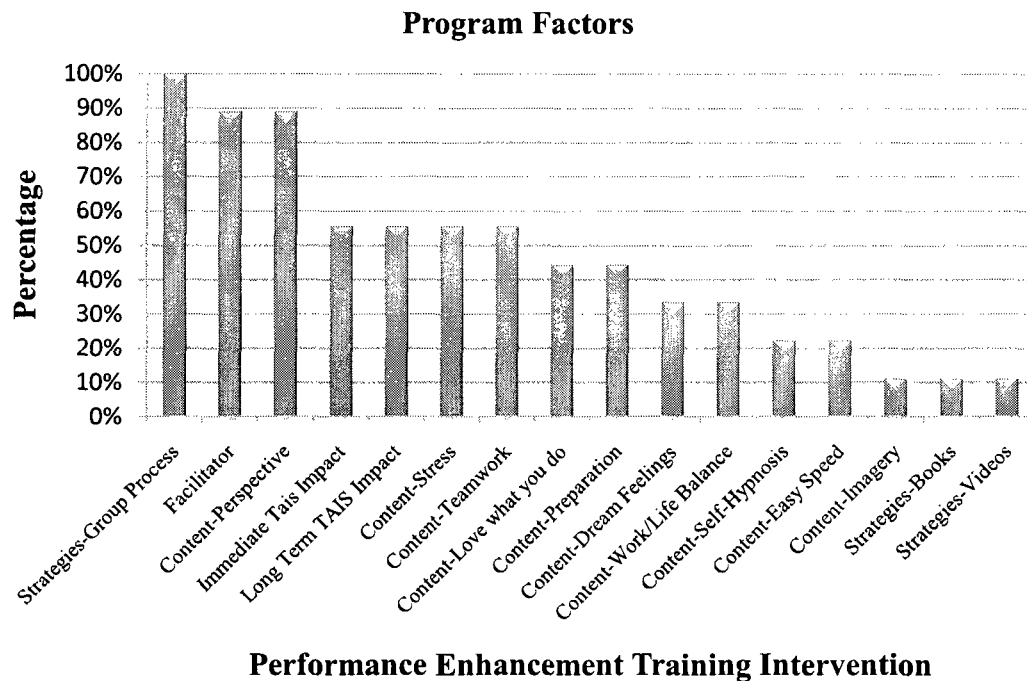


Figure 14. Program Impact

The content of the curriculum was designed to trigger and support behavioural changes. The concept of change suggests movement. Foundational to growth is the establishment of a starting point. In this case, the starting point was the development of self-awareness of personality, information processing and interpersonal relationship style. This starting point allowed the residents to reference their growth in terms of behavioural changes. This starting point was in part accomplished through the TAIS test. When the residents were asked about the impact of the test their initial responses addressed the validity of the test. This may in part be due to the fact that medical education trains students to provide “evidenced-based” care. That means that any diagnostic test or

treatment should be supported by solid research, generally referring to quantitative research. This cognitive bias towards quantitative research results, created a level of dissonance for the residents. They wanted to believe that the TAIS test was objective and standardized and described their unique constellation of characteristics but also considered that it could describe other similar people. They did consider that they may have been able to bias the test, even though they acknowledged that they did not make any conscious effort to do so.

The residents' recall was largely related to the cognitive processing style results. Most residents identified themselves as either multitaskers or non-multitaskers (i.e., sequential processors). Given the tremendous workload of physicians there seems to be the belief that the skill of multi-tasking is more efficient than the skill of sequential processing. And although consideration was given to the challenges of multitasking, it was still perceived by the multitaskers to be a distinct advantage. Having an expert provide an individualized interpretation of preferred processing style allowed the residents to accept themselves as they were, and in every case they stopped trying to change themselves based on their perceptions of other people's expectations. If they were a multitasker and knew that this style was difficult for some of their co-workers, they became less overt about their processing style and more sensitive to their co-workers, but they did not try to ignore it. Likewise, the sequential processors chose to organize their complex workload into a system that they could deal with sequentially. They no longer attempted to become multitaskers. Whether multitasker or sequential processor they were also able to develop strategies to work within the system when they were forced to perform in a style that they did not prefer.

In all cases, the residents identified that the TAIS test results created an increased level of self-awareness which they valued. In some cases, residents developed new insights, but in most cases it was an affirmation of what they already knew to be true about themselves. The one difference was that Botterill was able to give them a perspective that removed judgemental values about good or bad characteristics. Rather, he facilitated a perspective that allowed the residents to see how they could harness their particular strengths and potential weaknesses to work to their advantage. The insight gained through the TAIS test provided a sort of emotional freedom for the residents. This self-awareness was clearly identified as a stimulus for change in the majority of residents. The remaining residents identified a reinforcement of their understanding of themselves which had determined their behaviours prior to the program. The personal learning that occurred as a result of having their TAIS test interpreted was important. Most residents attributed subsequent changes in behaviour to the insights they had gained as a result of the TAIS test. Given this knowledge, it would likely be highly effective to provide this type of testing to medical students early on in their career. It is probable that this insight alone could facilitate positive choices in psychological skills effecting performance. In all cases the TAIS test provided an individual context for residents becoming engaged with program specific content.

The second starting point occurred in the content portion of the performance enhancement program with an exercise in self-reflection. All of the residents were encouraged to engage in reflecting on their original goals for choosing medicine as a career. The literature on performance enhancement clearly identifies that goal development is the first step towards improving performance (Orlick, 1980). This

corresponds well to the literature on mindfulness which suggests that the higher performing physician is the one who is reflective about his/her practice and makes the necessary adjustments to improve performance (Epstein, 1999). Botterill used the term “dream feelings” to represent goal setting thereby making an emotional association with a cognitive process. By re-visiting their goals for themselves as physicians, it served to re-energize them, reminding them that their focus as physicians was patient care. The re-affirmation of their life goals, following the acceptance of their cognitive processing style, allowed them to make some decisions about how they were conducting their lives and their practice. It was at this point that they could make decisions about how to use the content of the program. Although these residents did not express mental health issues, they did indicate that they were operating under stressful conditions and took very little time for themselves, their family or friends. It also allowed them to reclaim the feelings associated with being a physician. In the 18 months following the training many of the residents were able to identify when they lost or were losing the dream feeling. At that point, they consciously re-focussed on their goals which allowed them to focus on improving their performance.

The core concept of the curriculum was perspective. This was the concept that allowed the residents to adjust their attitudes towards those challenging issues in the health care system and medical education. For example, instead of being frustrated by hallway medicine, the perspective shifted to: how can I, as the physician in this area, ensure that the patient in the hallway has the best possible care while they are here? They also changed their attitudes towards their students. Instead of demanding performance from medical students, the shift was made to improving their performance through

encouragement and mentoring. Nothing changed in the environment. What changed was the residents' perspective on the environmental factors and on their own performance. The change in perspective was facilitated through the self-exploration of the TAIS, the re-establishment of personal goals and learning how to change their perspective. As a result the residents were able to see and accept that everyone is different, and has their own perspective. Consequently, they became less frustrated with their workplace and their co-workers and were able to see how they could make changes that could improve their performance despite their working environment. Although this concept of diversity and individuality is discussed and reinforced in the interpersonal skills training during their early medical training it resonated more at this stage. It may be that it was too conceptual early on, but now that the residents had experienced a broad variety of interpersonal successes and failures that they were more sensitized to the concept. The residents themselves reinforced the concept that as a novice "you do not know what you do not know". Although they are still novice physicians, they have been exposed to a greater number and diversity of interpersonal experiences in the preceding six years. They acknowledged recognition of the importance of interpersonal skills in their jobs and patient care that they had not recognized as a medical student. Furthermore, they expressed their belief that it was essential to try to bring home the message to medical students that interpersonal communication is an essential skill in medicine. This was one of their foundational beliefs for promoting the performance enhancement training program into medical education.

The curriculum portion of the program also introduced the residents to a broad variety of psychological skills. However, there was no single skill that was perceived to

be valuable to the majority of the residents. Those skills that were seen to have value to the individual were practiced and maintained. Many of these skills focused on self-management. These skills were introduced to them using the concept of stress and its impact on their physical and emotional bodies. The residents shared those issues in their lives with Botterill and the group that they perceived to be stressors. In return Botterill was able to help them change their perspective on some of the stressors, understanding that much of stress results from the individual's perception to a situation. There were situations like the long working hours that are stressful and not usually within the residents' power to change. For these situations, Botterill taught them skills such as hypnosis and relaxation. But he also stressed the importance of recovery and work-/life balance. Within the culture of medicine, there is a prevailing sentiment that hard work is part of the job and it is the weaker person who needs time off. Botterill correlated health to performance which the residents related to patient safety. As a result of the training they also recognized that their personal health had a huge impact on their ability to provide safe patient care. This perspective provided the psychological freedom residents required to take time away from work for themselves. In some cases, this resulted in immediate life-changing choices such as leaving the residency or taking extended time off. Consequently, each one of them found a way to develop balance between the expectations of the job and their personal and family. It was also during this time that the residents were learning these skills in the classroom that they began to put into them into action in their clinical practice. For example, they spent more time with difficult patients; they became less afraid of failure, they spent less time berating themselves for errors but

more time being mindful in their practice in an effort to prevent errors. They also became more proactive in their jobs and in their communities.

The curriculum content was valuable but the instructional style of the performance enhancement training was instrumental in making the content resonate with the residents. The training used group process for learning. The performance enhancement training was in part so successful because the group process provided these residents with a place of refuge, a sanctuary of sorts. The group meetings were an emotionally safe place where they could share their frustrations and successes with people who shared their experience and supported them and in so doing found a common voice. They became a team. It also allowed for the beginning of some healthy positive rivalries between residents. Learning in the group setting during the performance enhancement training, more closely resembled a real team where they were affirmed by Botterill and each other and worked together both for the individual and the common good. It was this safe place where they could learn some new strategies, put them into practice, reflect and share their experiences with their colleagues. Learning together sensitized the residents to the value of diverse perspectives. The open discussions that allowed for the sharing of different perspectives was, in a way, the program personified. The personal insights and shared perspectives adopted during the six weeks of the program resulted in the residents increased willingness to accept the diversity of perspectives in their co-workers, bosses and patients. The positive response to the group process may be due in part, to the fact that the practice of medicine is sometimes perceived to be a solitary venture. The pressures of the job require both self-reflection and processing of difficult experiences in order to maintain psychological balance. Given

the importance of patient confidentiality, it is difficult to engage in this process with individuals external to health care. Sharing experiences and exploring alternative actions with a group of individuals who had a depth of understanding that would not be available with any other individual external to medicine was invaluable. Not only was the group process cathartic for the residents it also provided them with the lived opportunity to experience teamwork. Patient care requires an entire team of allied health professionals. And so, the opportunity to participate in a supportive collegial community was highly valued. The residents deemed it to be essential for medical training.

Despite the value that was attributed to specific content, the residents expressed their belief that the content was less important than how it was delivered as content could be obtained from books or the internet. There was recognition that the development of expertise takes committed practice and that all of the casual book reading and video watching was not going to be enough of an impact. Learning these skills required a coach. This content itself had value because it was delivered by an individual with expertise in the field of performance enhancement. This appealed to the medical residents' need for proof and demonstrated effectiveness. It also spoke to the value they placed on Botterill as a coach. In fact, the opportunity to be a student of someone with Botterill's level of expertise was seen an opportunity that should not be missed. Because most of the residents had previous experience with psychological skills, it was more important how they were coached and trained to apply those skills to *their professional practice*. In professional sport, coaching is so important that when a team is consistently performing poorly it is not uncommon to have a change in coach. It is not surprising then, that the right coach or facilitator would be important to the success of the performance

enhancement training program. But despite Botterill's success with Olympic athletes he did not know medicine. When the residents were asked if someone with no understanding of medicine could successfully provide this training, they did not think so. What was important is that Botterill did not presume to know their struggles but accepted their challenges at face value.

More importantly, he chose to work with an experienced acute care physician for one day to gain the lived experience of being a physician. The residents really appreciated the facilitator's willingness to live their daily experience. This gave him credibility. He was also perceived to have expertise based on his accomplishments in sport. This fact was accepted and not challenged. In addition to expertise, two other factors were also very important. The first factor was the facilitator's personality. He was a low-key, warm, approachable and friendly individual. As such, it was not difficult to engage in a conversation with him. Despite his level of expertise which could be intimidating to some people, his personality quickly dispelled any concerns about his ability to relate to non-experts. Secondly, his approach was open and non-judgemental. His communication with the residents was perceived to be open and honest but always given with a positive perspective. Everyone felt accepted and valued as a person. Given the positive feedback about Botterill, as a researcher, there was the concern that this program would only be viable with Botterill. So the question was posed to the residents: Could this program be run effectively without Botterill? Despite all of their praise for Botterill, they all stated that the program could be successful with another facilitator who would use a similar approach. The approach needed to be one that was accepting, non-judgemental, nurturing, welcoming and empathetic. Therefore, when establishing an

educational intervention in performance enhancement, both the curriculum and the facilitator would warrant equal considerations.

The residents overall response to the performance enhancement training program was positive. The principles for implementation to another program of this type can be seen in Figure 14 (previously presented on page 141) which ranks the program factors in order of importance. Based on the residents' feedback a PET program's instructional strategies must include group process led by an expert, approachable, non-judgemental facilitator focussed on concepts of perspective, stress management, teamwork and goal setting which follow an individualized analysis of individual strengths and weaknesses.

Impacts on Performance

The previous data demonstrates an impact on performance that was facilitated by the performance enhancement training program. The residents also identified that part of their decision to participate in the performance enhancement training program was the anticipation of making some behavioural changes that would impact their performance. The fact that the residents actively planned to improve their performance is an important aspect to consider when evaluating the impact of the performance enhancement training.

In addition, the impact of the performance enhancement program did not occur within a vacuum. Participation in the program occurred within the context of the resident's busy lives. Some were going to university, some were dealing with personal and professional challenges, some were beginning a residency and some were close to the end of a residency. These factors also had an effect on the impact of the training.

Following their participation in the program the residents all made varying degrees of changes to their behaviour. In this section there is an identification of where the impact was directed. These changes impacted their performance at work and their relationships with family members, friends, co-workers, students and patients (see Figure 15, next page).

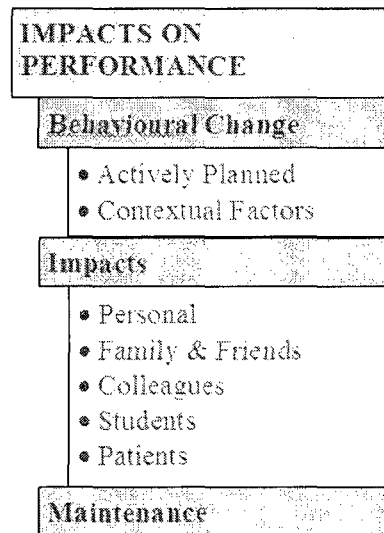


Figure 15. Impacts on Performance

Behavioural Change

In some cases the residents were able to discriminate between their previous performances in comparison to their current performance. One example is:

“Perfectionism used to be a big problem for me. A negative thing would wear on me and for no real reason. I would not gain anything from beating myself up... (Cal reframed it)- saying that it is normal that you wouldn’t appreciate the downs but it is not all lost and it is a normal thing... It is just in the recognition you’ve interrupted the downfall so for example: I am frustrated this week because all of this happening but that doesn’t mean that I’m completely in the wrong field or not doing what I should do and something soon or within the next hour may be different. Awareness is probably the biggest part of what I learned.” (R8)

Actively Planned

At various points in the interview the residents identified that they had planned to make changes or at least anticipated a change in their behaviours as part of their decision to participate in the performance enhancement training program.

“I know that the reason I was in the study is because I actually wanted something to happen...” (R1)

"I was looking for something for myself out of the program." (R3)

"I can't think that there was something specific that I wanted to change in a big way. A lot of the things that he touched on I guess I had thought of or used in various ways before. Some of the things that I know I've used and maybe am attributing to Cal and the program because I can now label it or recognize what it is... it was purely out of interest. I just wanted to see if there was something I could get from it and learn from it." (R6)

Contextual Factors

In all cases the changes in performance occurred within a context.

"(The program) could have been a step in that process of making myself hyper aware of my abilities or want to know all of these different things about cognitive enhancement of learning and that type of stuff and teaching. But it could definitely be a trigger.... just to play devil's advocate- there's all sorts of confounding other things too, age, experience. It could be no coincidence that me reflecting now, going for a PhD, all of these things could easily have advanced my thinking without the course, but that's why it all comes back to me and my objective measures." (R2)

In one case it was a spouse who modelled the principles taught in the program. This modelling of principles gave credibility to the effectiveness of the program principles. It reinforced this resident's desire to work towards higher performance by practicing the skills taught in the program.

"I think I learned a lot from my spouse during the course. I kept thinking (the spouse) does that, he could be talking about (the spouse) maybe that is what made it resonate with me. I had an example who I knew very well who was modelling these behaviours or this way of thinking. It's the combination that makes it so powerful. I found that it was a lot of those concepts that explains why those people are so well respected. He (Cal) gave us language and the framework." (R7)

Impacts

This section identifies two factors not linked specifically to the program. While the residents were participating in this program they were also involved in their regular

life and work. Some were going to university, some were dealing with personal and professional challenges, some were beginning a residency and some were close to the end of a residency. What they were learning in their other courses had an impact on how they perceived the benefits of the performance enhancement training. And secondly, participation in the program occurred within the context of the residents' busy lives. The residents described some of their changed behaviours mostly in terms of themselves, but also in terms of their family, their co-workers, their students and their patients.

Personal

Much of what has been described has included this sense of personal impact radiating outwards to a larger and larger social network.

"I only ended up doing one year of the residency and went back to work in (a speciality). What has probably changed for me coming out of the residency and re-gaining perspective is I'm starting to do things for the sake of enjoyment." (R3)

Family & Friends

Some residents had families, some had partners and others were single. Those with families and partners were able to identify ways in which they had changed for the betterment of their family.

"...when I am working too much ... I now drop everything. I ignore phone calls and I don't work. I actually just leave the hospital and make sure that no one can find me until I feel like I have taken care of them (spouse and children)." (R1)

"...with my girlfriend for example, we talk getting to this kind of level (deep)...I would go out on a limb and say that, not that it didn't happen before and now happens, but that its ramped up its its intensity." (R2)

"...now I'll just sit on the deck with (my spouse) and ... we'll talk ...we walk the dogs everyday and have taken to just sitting around and talking." (R3)

"I have changed my interactions with my mother because before when she would

get worried I would get frustrated or annoyed or upset and now I'm able to see that my response to her would change how she feels. So basically trying to take more of a steady approach and the other thing is to redirect her worries into something that is effective." (R7)

Co-Workers

Most residents work in a team setting, whether they were on a clinical service, in a research laboratory or working in community health so changes in behaviour impacted their coworkers.

"I used to think that some of my colleague who worked their shifts and went home and it didn't seem to bother them that they were insensitive. I would think that they really don't care but that's not it at all. They care just as much as I do but they recognize what they can effect and they don't beat themselves up with what they can't effect so that was important...it has probably has given me some empathy for my colleagues and superiors where I've said you know it's not that they don't care it's just that they've learned which battles to fight and which ones are just a losing battle." (R3)

Changes with supervisor: Before I used to be hypercritical of my boss -why isn't he fixing this and now I'm looking at it and saying you know what we're all doing the best we can let's keep a perspective on it." (R3)

"I take the time now to further explain myself or specifically clarify and also reaffirm that I understand that it is not as easy for other people to come around that quickly lets say to a decision or whatever. So I think that has changed things because I think people that I work with appreciate that they can understand that I am showing how I came to my decision as opposed to just telling them." (R2)

Students

Some of the residents still have students and they have made changes in how they approach or interact with their students.

"(Before the course when dealing with students and health care system frustrations) I probably would have said - well it's like that all over the country- now I probably be more apt to say to the students - what can you and I do about it (system problem) over the next eight to twelve hours? ...I've been going home and saying I didn't create the situation.... what I can do is the best I can to make it as pleasant for those people as possible or to do the best I can. But I'm no longer going to go home and consider myself a failure because there are people lying back in the hallway." (R3)

(a greater emphasis on goals) "When I talk to medical students and junior residents...I always impress on them I say figure out what you like." (R4)

(learning a psychomotor skill) "I take the medical students aside and I explain to them and sometimes show them on a model... so that they are not overwhelmed... I find that's helpful I've tried it myself." (R7)

(empathetic teaching) "Yesterday, I was in the operating room. The surgeon was agitating to get the surgery underway. It's getting late. It's getting late. The resident was trying to do a procedure that we needed before the patient could go to sleep and when he started the procedure with a needle his hands were steady and he missed the artery. It's not a major faux pa. It happens. Now the second attempt - he has the needle and his hands are shaking, he's nervous. In the background the surgeon gives a loud sigh. It's his third needle now and I just whispered in his ear -you are the best doctor in the room, you can do this, all you need to do is focus and just ignore everyone else. I'll make sure that they don't do anything bad and he just put it in. He said that was terrible my hands were shaking and I was- you did it! So, what's the point? And he said: I was worried that someone was going to say something. I said: that's not your job. Your job is to learn how to do stuff. My job is to make sure no one makes fun of you. That's just how it works. He was very thankful. But you know that kind of teaching does not happen very much." (R1)

Patients

Patient safety as an outcome of high performance was part of the initial research project. The premise was that higher performing physicians could in all likelihood provide safer patient care. During the course of this study the emphasis was on whether or not residents were able to change their behaviour based on a six week psychological skills training program. The focus was not on patient safety but the residents self-described their beliefs about the positive impact of this training on patient safety.

It (changing from an internal focus to an external focus) didn't happen all in a day but I find I have more energy when I am doing something positive and I know it's working. It's better than nothing or than when I'm going get in, get out and no one gets hurt (i.e., seeing a patient as quickly as possible). It's a different approach. So... even though things might not be measured a certain way, even though they might not show up on the stats or in the research or anything

objective came up it doesn't mean that one person won't subjectively change the world. So, if there's any way to put something like this (e.g., performance enhancement training) in place it will only make people better. It will only make physicians better. It will only make health care professionals better, patients, the whole system will be better because it becomes an environment where people want to make the system better and want to make it work so then they will start self-correcting. If I'm in a good place at work I am more likely to help cover for my other buddy who might be struggling so that's the positive effect that you want. So, instead of it being – I could help that person but I don't want to because they were mean to me so I'm just going to be crusty – it's a completely different environment and more people won't fall through the cracks that way.” (R5)

“If you have a nice work environment (based on the individual perspective and contribution)... a positive environment people are happy you're more likely to do better work and you're more likely to think straighter...” (R9)

In this case the resident equated his/her level of performance with patient safety and the recognition that performance behaviours were habitual and the developmental of positive habits had long-term implications.

In my experience, the time when people make the most mistakes or perform poorly those are the times when they should be actually encouraged to improve upon their performance so it doesn't happen again. But if they're in an environment where they are going to be punished if they say anything or show that they don't know something then it is going to be more serious effects or damaging effects because things don't get checked and people start blaming each other and hiding and covering up so it does tie in really nicely to the patient safety thing because the whole point is for us to do well and to learn and if we are going to do it we are best to learn now rather than when we were thrown off the deep end have all those bad habits it is better to catch us now.” (R5)

During reflection this resident recognized the value of “soft” skills and actually elevated their importance to the highest level when considering impact to patients.

.I was thinking about when I went through med school we had the artsy, fartsy courses that nobody took seriously because there wasn't a huge emphasis on the grade. Those end up being really, really important. I realize now that they are perceived by medical students to be "ah who cares", "it's not going to matter", but they are actually more important in the long run because it ends up affecting

their attitudes and how they treat other people which is huge, that is probably the main thing in medicine.” (R5)

This is a very specific example of how the program impacted patient safety. In this case, the resident who experienced significant levels of anxiety was able to take what was learned, make changes, move into a position of leadership and affect significant changes for residents in his/her service with a perceived improvement in patient care.

“As (leadership role) I’ve been able to try and change the curriculum or try to change the way things are done to improve safety. For example, one thing is before we used to have only one senior resident to cover for the weekend shift starting at eight in the morning on Saturday or Sunday and you take care of about forty to sixty patients and you have hopefully three, sometimes two junior house staff and they are either medical students or (speciality) first year residents or residents from other programs so you could be unlucky enough to have very weak house staff, like medical students who are early on their training or you might have a resident who is not interested in (speciality) or you just don’t trust them for whatever reason. And so as a senior resident you are responsible for a lot of patients and you can only be in one place at one time so one thing that my co-chief and I did is for the weekends we have two senior residents on (shift). We have been able to do that with our numbers and then that way if somebody gets sick we are not calling around the very last minute because there is someone there that has been very powerful. We’ve had support from our department who funded us to do a few extra paid calls to have people come into our program so we could double up on weekends...The residents are very, very happy they do not have to do more call because we have seven paid calls/month so our department has money so we could pay people who would not necessarily do call for us to come in and cover and that gives us just enough to be able to double up the weekends. The people who have seen badness go on during the weekends are happy. With the change there has been a bit of backlash where they say, well when I was a resident I could take care of the ward by myself why is it now that we now need two residents but we feel strongly that we need two. As a result of the course I think I am able to know that there are other residents to feel that there are deficiencies in the system and to be able to apply their solutions to real life. I’ve always been interested in doing systems change so I kind of wanted to be chief. I think the combination of having this course plus my own aspirations-it really came together for me. It’s kind of exciting. I’m kind of sad to go because I finish next month. We’ve done some really neat things.” (R7)

Maintenance

The residents readily acknowledged that maintaining their changed performance was an ongoing choice.

"I still actually have the same frustrations. I still get angry about the same things. I still don't understand why things are the way they are here however my approach has totally changed...some of the stuff I learned in terms of leadership styles that you have to change your style to match the environment you are working in so that actually is what I have done. When I came to the second simulation I just said I am just going to relax. I'm going to calm down. I'm going to make a conscious effort not to yell at anybody or not to get mad right and ...I'm actually just going to try and not multitask. I'm going to try and do things sequentially and that's what I actually did for my simulation...I did take some of the stuff that Cal had talked about and I personally think a lot of it actually came from my university courses and just thinking ...that you need to change your style based on the environment that you're in ... as one person you can't change it and by getting angry or whatever it doesn't help the situation at all and the other thing ...I want to change things... ...I actually saw that you can succeed by doing some of the other things I learned from it. I think that probably that (program and university courses) combined with the fact that I realized that this is the environment that I have to work in because this is where I am and realizing some of the things that have been told to me by different people throughout my training I think sort of helped me change the way that that I did things in the sense that I actually do multitask but I probably don't multitask as much or at least I don't show that I'm multitasking as much ... so it looks like you are more organized so that is what I do more of now. I also learned from these different things just different ways to approach people....I've kind of developed a little bit more of a zen attitude and don't get as angry or as hyper or whatever when things are going wrong." (R9)

"I don't have time for it (working out). I'm doing that again. I was doing well working out and then the last couple of weeks I've been really busy and it's been tomorrow, ok tomorrow and it's like I don't have time to work out today which isn't true. I don't make the time to work out but working out has always been something that's important to me... I'm actually still finding that I have to resist the anxiety that comes up on a day when there's nothing that I have to do." (R3)

"Closer to the time when I was in that group, I was more actively doing things and trying to incorporate them into my daily existence and performance. I don't

know if I'm consciously doing anything differently now but at the same time I'm generally aware that I do have strengths that I just have to harness them better. That is good information for me to know because I always perceived them as negative things that Cal said were good but that they are all aspects of the same quality. There are several different indicators that theTAIS survey was based on and a lot of the measurements of the different indicators, depending on the situation, if it was a more stressful situation I would easily fall from a positive thing to a negative aspect and so it's kind of also good to think about it that if I'm concerned that I have something negative or am not doing well I can also say: actually if I just harness this and control it a little better it can still be a positive thing... in a way I don't think I'm at a performance level I would like to be at but at the same time I am a little more at peace with where I am. Before, I had so many things (on the go) and a lot more pressure that I put on myself. I still have that, but I'm trying to use it in a way to spurn me to do well, to perform better rather than a way to beat myself up and feel bad about it... I still oscillate but I think I was more reckless with my risks before. I do take risks but they are more calculated and more strategic ...I catch myself sometimes – there's the whole grind of work and I still have a ways to go but I do catch myself and say: wait I can actually have fun and then I'm more relaxed.” (R5)

“I find that in highly stressful situations it is hard to break things down. For example, in an acute medical situation when things are happening very, very quickly and time is very critical and you are perhaps even in a situation that you have never been in before, for example: maybe your patient might be throwing up blood and so this may not be something we are very comfortable with or that we've been exposed to in the recent past, so during those times I probably revert back to more of the worrying stuff ...I just wanted to emphasize that I felt truly fortunate to have been able to participate in the study. I feel that I gained a lot from it and I think that it is something that had lasting value for me as opposed to going to conference and attending the one day seminar. You are very inspired afterwards but you don't necessarily remember as much after three, five or eight months but this I found it gave me a lot of tools and it is something I can incorporate as I get more experience and more maturity. The concepts are there and I can work towards realizing them.” (R7)

“I have (practiced emotional preparation) but I wouldn't say on any regular basis but that was something that I worked on and took to heart and have used here and there.” (R8)

Impacts on Performance Discussion

The residents were reluctant to attribute all of the impact on their performance to the performance enhancement training. In some cases it was difficult to isolate the impact of the program from other co-existing experiences, the maturation process and their new roles as independent practitioners. But they acknowledged that the program impacts were embedded in all of their current and past (i.e., eighteen months ago) experiences. Over time some of the residents had internalized their changed behaviours and were unable to identify the changes. It was only in response to the prompting of –how did you do this two years ago?-that they realized they had changed. But in some cases, the impact was so significant that residents made a commitment to themselves from that point on to focus on a specific attitude or skill set and strive to integrate it into their practice. The performance enhancement training program could be viewed as a trigger for self-awareness which impacted their performance. Also, just reviewing the content during the interview, allowed a renewal of focus for some and stimulated a new focus for others.

The impacts were not only personal, but affected their family and friends, their co-workers and patients (see Figure 16, next page). After the training they chose to spend more time with their family and friends, engaging in relaxing activities, talking and listening to each other. They were more tolerant of their co-workers, seeing them as individuals whose perspectives were different than their own. They took time to explain their thinking to their co-workers thereby changing the communication style within their own teams. Although they identified that they had not been overtly harsh with students, they now were making a conscious effort to support and nurture student learning.

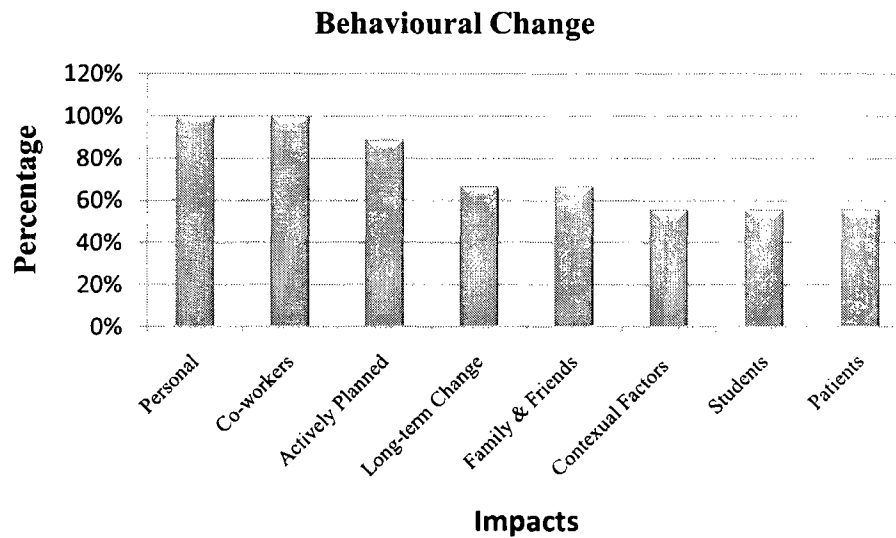


Figure 16. Behavioural Changes

Two thirds of the residents self-identified that they had made long-term behavioural changes that continue to impact their performance. The residents' responses were a testament to their own struggles with behavioural change. They were making conscious efforts to maintain their changed behaviours. The interviewing process did re-energize their interest in the project. One resident connected with Botterill after the interview looking for current opportunities to engage in a similar program as s/he remembered how enjoyable the training time had been.

All of the residents believed that if they were performing at their best, their patients were going to be positive beneficiaries of the improved performance. They believed this, even though they acknowledged, it would be difficult to make that direct link between their behaviour and patient outcomes. Although the residents described impacts, they also expressed their understanding of this change in performance as a process and not as an absolute end point.

Recommendations for Medical Education from Residents

Part of this research project was to give the residents an opportunity to express their ideas about the potential addition of performance enhancement training to medical education. The residents' belief in the impacts of the performance enhancement training were so strong that everyone stated that the program should be available to medical students at some point in their training.

"I think that workshop is a really good idea and should be incorporated somehow into the medical curriculum." (R4)

Although the value of the program was accepted, the individual differences were in the details (see Figure 17, next page), like whether it should be mandatory or optional, or whether it should be offered in undergraduate education or in residency. There was a diversity of opinion about the best timing for such a program and whether the program could have a slightly different organization. The process of how to deliver the program was debated in terms of "readiness to learn". However, the residents were explicit about the characteristics required of an effective facilitator of a performance enhancement training program.

RESIDENT'S RECOMMENDATIONS	
Requirements	
	• Mandatory/Optional
Program Placement	
	• Undergraduate • Post-Graduate
Schedule	
	• Embedded • Stand Alone
Facilitator	
	• Warm & Friendly • Non Judgmental • Affirming • Honest Communication • Effective Leadership • Understanding of Medical Education

Figure 17. Recommendations

Requirements

The residents' ideas for the program are listed in Table 6. The shaded areas represent the residents' contributions as to requirements, program placement and schedule.

Table 6

Recommendations for Medical Education

	Medical Education					
	Required		Program Placement			Schedule
	Mandatory	Optional	Undergraduate	Postgraduate	Strategic Times	Embedded vs. Stand Alone
R1						
R2						
R3						
R4						
R5						
R6						
R7						
R8						
R9						

Mandatory/Optional

There was no consensus about whether the program should be mandatory or optional. And, within an individual argument, a resident would vacillate between mandatory and optional. It was recognized that there might be naturally occurring times of readiness to learn given the natural stress points in the medical education curriculum.

"I think that there are probably two camps. One is the classic people who already are on board - they are already motivated and they are here to do it. But if you make it mainstream and more applicable to general people who are being forced into it that type of thing - I think both of them have value but I think it is just in terms of the quickness so... either make it voluntary for those that are on board, then they're on board and ready to take it the whole distance and those that aren't I don't know... the person who isn't on board simply isn't going to get it. They are going to try to memorize how to do the right thing vs. rather trying to do the right thing through a process of self-actualization, understanding, etc so I think the way I see it is, it absolutely has a role especially in the life of med school classes. You already have a degree of educational requirements so you are somewhat on a level playing field and then you can introduce it broadly but then you need the time you need a minimum of 3 months to get going..." (R2)

"I think you need a little bit of experience to get the most out of the course because if you don't know you have no clue what people are expecting of you and what needs to get done so it is important to have a little bit of exposure and experience then take what you learn in the course back to that. I know you could say maybe it's better to take the course and incorporate it right from the beginning but its hard because most people have no clue what the expectations are going to be...I think the perspective stuff and team building is better after you have a little bit of experience... just had a little bit of exposure to see how people do things." (R4)

My personal feelings are that it should be something that students elect to do as opposed to mandatory part of the curriculum. I'm close enough to medical school to remember what it was like. I probably don't remember everything that it was like but I have sense about it. Basically there seem to be two different things that are taught in the classroom, there is the book knowledge ...these are the things that are tested and then there's the softer stuff like communication conflict or ethics. I think character building sessions would fall into that category. It is interesting, but might not be tested and if it was on the test you could guess what the answers are without studying. I think if it was a mandatory part of the curriculum that students would not value it as much as if it was something they did voluntarily. I think there would be interest in this course judging from my own medical school class. People came in with a variety of interests so there were people who did bachelors of Arts or who were not as focussed on the science of medicine who came in primarily for the practice of medicine, working with people and the art and so I think it would attract a lot of people. I think it would be best actually targeted towards residents particularly at my stage of training. You have

working knowledge of the medicine, you are more in tune with what it's like being a doctor on the wards and you see the deficiencies, you see the strengths, and you see how you can maybe change your way of thinking or change the system to make it better also you are in a position where you can teach others." (R7)

Program Placement

There was a fair bit of discussion of when to begin the program, early on in undergraduate education, later on in residency or at strategic stress points like the beginning of clerkship or the second year of residency. There was no clear correlation between the statements about mandatory vs. optional and the level of training to begin. What was clear was that the successfulness of the program would be dependent on the participant's level of readiness. Most of the residents indicated that they were ready to make a change when they participated in the program. Consequently they attributed some of the program impacts to their preparedness. Despite that, they still felt that the information would be helpful, even if not embraced fully.

Undergraduate

"I think first off - to start very early, in first year, start in the fetus, start in the womb, its good learning for everybody - the earlier the better. The first year I think students really need to have an outlet, a safe place where they can get together to bitch and complain and resolve those kinds of issues early so that it doesn't become this long standing problem so that ten years later they don't end up hurting a patient or something so it's always best to start those kinds of things early and to create a positive dynamic learning environment for students and that only ends up with better performing physicians in the end. I think the earlier to start the better!" (R5)

"But for something individual like the TAIS I do think that would be helpful early on – it's helpful for things like being able to talk about yourself when you go to job interviews for your residency... because you need to know yourself to go to those interviews....the team building things just after your intern year before you become the resident with more responsibility and have to carry a team." (R4)

"In terms of place, I think it would probably be best in medical school as opposed to post-grad because I think it would be harder to do with residents and I think you would get less attendance. I think there are certain specialities that sort of look at this as soft very wishy, washy, yeah whatever type stuff.... there's a lot of people who do surgery or that are very high intensity type people would actually just brush this right off like they would be like no way. I think that even if you had it in their residency they probably would not do it. I think it would probably be better in medical school because you're a little bit less differentiated. Then there are some people ...who know what they ...are going to be so they already have that mindset...so all this other stuff is just kind of whatever, so I think it would be easier in medical school." (R9)

I think it should start early, in the first few months of medical school. It wouldn't capture everybody because at that point you're so gung-ho. You are: I'm just going to work hard because that's what got me here and that's going to make me successful - so it could have benefit there for some people. I think that when people, as they all do, in the clerkship starting getting overwhelmed I think we need to refresh it in residency - there is the high of first year then they always talk about the residency sophomore syndrome where you get into second year and you have four more years and none of this is new and interesting anymore. I have to do 2000 more call nights - so by the time they get to fourth year its - oh well I can see the end of the tunnel then in fifth year - it's just study, study, study so second year residency is a very high stress time very low morale time for residents and I think putting it in there again could be invaluable. I think you'll catch more people along the way. The undergrad will catch the people who are then receptive. Clerkship, you'll catch people that really need it then before they get into serious disillusionment and then by the time you get to second year residency - I think it really would save the sanity in some people and then how you do it for people out in practice it would be great but how you do that?" (R3)

"It's a very difficult thing (performance enhancement) to do, both for making sure that it has its impact but making sure that its received in the right places....I would have seen it very differently as a med student than as a resident." (R6)

Postgraduate

"As far as timing within the curriculum I think at the end of medical school it would be best. When you start you have the perspective that's why you're there and you maintain it through pre-clerkship. Clerkship is when you start getting beaten down and at the end of clerkship is when you are deciding on a career so to be reflecting on your personality, your strengths, your weaknesses revisiting your initial perspective all that would be very helpful for choosing a residency and it's a good time to become re-energized after clerkship with its almost more

difficult than residency.” (R8)

Schedule

In addition to the placement in the curriculum, there was a fair bit of discussion centered on whether the training should be embedded throughout the curriculum or be a stand alone (i.e., separate course).

Embedded vs Stand Alone

Embedded: “I say to do the didactic first. It opens the door and if people have an understanding of the words like dream feelings and then when you talk about them at a later time it’s a reinforcing of a previously learned concept rather than for example: it’s three in the morning, you did something bad and we need to talk about that and I need to teach you about dream feelings – that is not how it’s going to work!” (R1)

Embedded: “...in the life of med school classes you already have a degree of educational requirements so you are somewhat on a level playing field and then you can introduce it broadly...” (R2)

Stand alone: “I think that a workshop is a really good idea and should be incorporated somehow into the medical curriculum. I don’t know if it would be better in medical school or in residency and in med school, just after clerkship, once they’ve had that taste and they’re starting to apply for their residency positions it might be a good time then.” (R4)

Stand Alone: “In my experience the time when people make the most mistakes or perform poorly those are the times when they should be actually encouraged to improve upon their performance so it doesn’t happen again” (R5)

“I think you need a little bit of experience to get the most out of the course because if you don’t know -you have no clue when you are starting out what people are expecting of you and what needs to get done so it is important to have a little bit of exposure and experience then take what you learn in the course back to that. I know you could say maybe it’s better to take the course and incorporate it right from the beginning but it’s hard because most people have no clue what the expectations are going to be.” (R4)

Facilitator

In terms of the actual program I felt that it was important to ask whether or not the program could be successful if facilitated by someone other than Botterill, given their praise for his role in the program. Without exception, everyone indicated that another individual could facilitate this type of program.

"I am sure there are other people that could do it." (R1)

"I think definitely that different personality types can work...I think it could be effective with a different instructor." (R4)

"So could it be someone else. I'm sure that there's other people that have or can gain the experience or whatever but it was helpful to have him." (R6)

Although it was agreed upon that someone else could facilitate the program, the residents described the skill sets required by a successful facilitator. Additionally, the core concepts of the program would need to be maintained.

"I think that it would be helpful to have his (Cal's) input. I don't know if he would necessarily have to be the person all the time but as long as the concepts are maintained. Cal had input into it and I think that's kind of the main thing. I guess what I'm saying is it would be really great if he were there but if he weren't there I wouldn't say get rid of the whole project because it's so important...certainly his personality was a huge thing. It's hard to kind of imagine it without him but at the same time he can't be a million places at once...it would be nice if he could somehow be part of it. The facilitating part of it could be done by other people as long as they were in the right frame of mind with the material and understanding it and being really motivating and not being too hard on the people and being really positive about everything... when I've been a student, I did not really liking the field, because of the leader, rather than because of the field. So I think that aspect of him (Cal) being very affirming, just very non-judgmental but more objective and objectively trying to help. That was a really important part of helping us become more relaxed around him and want to try harder." (R5)

"The instructor needs to engage the group and be positive. That spreads out and that's important. It would be bad if it became too sterile and didactic and theoretic because then you'd be missing out on the good parts of the discussions.

It's not a textbook kind of thing." (R8)

"Whether it was Cal or somebody like a Cal that had credentials...it makes no difference whether they are in medicine or not, but they would have to have credentials." (R9)

In summary, the residents were universal in their belief that a performance enhancement training program should be available to medical students. They varied in their opinions as to scheduling in the curriculum and pre-requisites. They were also in agreement that the program could be delivered by another facilitator providing that the individual had expertise as a performance enhancement consultant and had a warm, friendly and non-judgemental approach.

Recommendations for Medical Education Discussion

There were no clear relationships between the requirements, the program placement and the schedule. The residents could see pros and cons to all options. However, they identified that the program should be available to all physicians, at some time in their career. Whether mandatory or optional, it was still believed that they could learn something out of the course. Additionally, there was the sense of the behavioural change spiral (Prochaska et al., 1997) where the medical students would take from the course what they needed or what resonated at a particular point in their practice and when they were exposed to the course in the future different concepts would resonate. For example, maybe the course in first year would have no impact but would have an impact later on, for example, during clerkship.

The residents identified that there should be an opportunity for physicians in training to be able to participate in a performance enhancement training program led by an expert. This expert should have certain core characteristics and skill sets. S/he should have a warm welcoming personality who will approach students with a non-judgemental attitude. S/he should be capable of honest exchanges with individuals and groups. S/he should demonstrate effective group leadership. S/he should use affirming facilitation skills. S/he should also develop an understanding and appreciation of the challenges of medical education and medical practice in general. These were the characteristics exemplified by Botterill and seen to be essential to effective program delivery.

CHAPTER 5: CONCLUSION

In the previous chapter I discuss the impacts of an educational intervention in performance enhancement training (PET). I explore the resident's motivations for participating in the training, the aspects of the training that resonated with them and the subsequent changes in their performance resulting from the learning. I also provide an opportunity for the residents to offer suggestions about the potential addition of such a program to medical education.

In this conclusion I summarize the key findings of the study as well as the limitations of the findings for future implementation. I discuss the considerations for implementing a PET for future medical residents by giving initial consideration to the social changes that would be required to minimize the current challenges imposed by the environmental factors of medical education and the health care system. I present a rationale for the plausibility of implementing a PET by offering some practical strategies to encourage social change. And finally, I present a proposed plan for implementation of a PET in both undergraduate and post-graduate education.

Key Findings

The residents in this study were motivated to continue to improve their already strong performance. Receiving an email invitation promising that they could become high performance physicians using psychological skills training was inviting and were the major factors which prompted resident participation. One important trigger for behavioural change was the TAIS test which residents completed in advance of the content portion of the program. It created a self-awareness that resulted in a lasting impact which was foundational to many of the behavioural changes that followed. This

self-awareness became a strong motivator for participation in the PET. The literature indicates that self-regulated learning requires self-awareness (Zimmerman, 2002). The PET provides information, a supportive learning community and a coaching style of facilitation. The student is still in control of the learning. The biggest impact of the PET was learning and applying the concept of perspective to their personal lives and professional practice. The learning was successful in part, because the residents were motivated; but also in a large part because of the facilitator and the instructional strategies he used. The residents were unanimous in their support of learning in a group setting. In addition to facilitating the learning, the group provided a safe place to share their residency experiences. The other important factor was that the facilitator was an expert in his field; and he was open to learning about the experience of residents as demonstrated by spending time with a physician in a clinical setting. Additionally, he was warm, welcoming and non-judgmental in his teaching and interpersonal relationships with the residents. This approach allowed the residents to express themselves openly with him and with their group members. The residents consequently made some behavioural changes that persistently impacted their performance in the 18 months following the training. During the training time, some residents had a decreased clinical workload which gave them the available time to take the training.

Although the learning did not occur within a vacuum, these behavioural changes occurred without any identifiable and overt changes to the environment (i.e., medical education and the health care system). This is surprising given that the development of expertise requires a supportive environment. One thing that seems to have made a difference is that the residents changed their perspective about the environmental

challenges. They seemed more empowered to make choices about their own workload management. They also seemed to have developed a confidence in their own abilities as physicians. Residents were able to identify changes within themselves and their self-management of stress. They identified that they had increased the time and commitment they were making to a work/life balance and to their family, friends and significant others. They were able to identify how the course changed the way they interacted with their co-workers, bosses and students. Finally, they indicated a change in how they approached and interacted with patients. All of these behavioural changes seemed to be triggered, or reinforced through the PET. These behavioural changes seem to indicate that despite the challenges created by the health care system, medical education and expectations of physician performance, there are residents motivated to improve their performance and are willing to put the time and effort into changing their behaviours. This is supported by Zimmerman's (2002) research indicating that learners who are self-regulated or self-motivated are more successful (Zimmerman, 2002). The PET provided an opportunity for action. But can these results be replicated for other medical residents?

Limitations

Before exploring how to implement performance enhancement training for medical residents there are some limitations in this study that need to be addressed. The first limitation is one of self-selection. The residents chose to participate. This concept of choice may require consideration when planning a broader implementation of a PET. In addition, this is one study in one location with one group of individuals. It would be worthwhile to offer the same performance enhancement training program at other medical schools across the country to determine whether these results could be replicated.

The University of Ottawa has a pre-existing interest and may be willing to run a pilot project with their medical residency program. Another limitation is the type of study. This was a qualitative study which is generally not held in high regard in medical research which is predominately quantitative. Given our lack of significant effect on the initial quantitative results of “The Utilization of High Performance Patient Simulations to Reduce Medical Error” study, it may be challenging to generate interest in the program. And perhaps the biggest limitation is the low number of subjects ($n=9$). But these nine residents volunteered to spend one hour sharing their experiences with me. Several of them delayed their sleep and most of them interrupted their daily work to meet with me. Not only were they willing to spend the time, but they had quite a detailed recall of the program 18 months after its completion and they were able to make specific links between the program and their performance.

Perhaps the biggest limitation to this study is its novelty. Performance enhancement training is commonly associated with sport. But there is not much association between performance enhancement training and health care. In health care, the emphasis on improving performance is generally related to patient safety - correlating high performance with error reduction. The current focus in patient safety research and practice are on accountability measures and system change. The belief is that if the system is organized and operates in a way that minimizes the potential for error, there will be improved performance. The patient safety approach does include the human factor as one of the seven major factors of patient safety, but it is not currently the primary focus of action. This thesis addressed the human factor and seemed to suggest that performance enhancement training could be an effective tool to improve

performance, and theoretically decrease medical error. In this study residents identified that as a result of their training they were able to minimize some stressors, they learned to deal effectively with stress, they developed a healthy perspective on themselves, their job and their life, they had much more work/life balance and their relationship to students and patients was focussed on positive interactions. Although it is impossible to make a direct link between any one behavioural change and patient safety, it is possible to view these changes as positively contributing to better patient care. By the residents own report, they were convinced that the changes in their performance were better for patients. Consequently, performance enhancement training could be an important strategy in the human factor aspect of patient safety.

The lack of awareness or implementation of performance enhancement training in medical education would suggest that in order to recommend this type of training it might first require some social change within the culture of health care. Can the individual effort of a few (i.e., residents and researchers) trigger the kind of social change in the culture of medicine and medical education that would create movement towards improving physician performance using performance enhancement training?

Social Change

I would like to suggest that this is possible using Gladwell's (2002) theory of social change. Gladwell (2002) proposes that social change does not begin with a large societal force; rather it begins at the grass route level. He likens it to an epidemic which has three components –the environment which is the culture for the infectious agent, the actual infectious agent and the people who transmit the infectious agent. He names these three

components as the power of context (i.e., culture), the law of the few (i.e., transmission) and the stickiness factor (i.e., infectious agent) (Gladwell, 2002).

If we think about cultural context in terms of epidemics we recognize that epidemics are highly sensitive to their environment—a warm, moist environment can cause the proliferation of a bacteria or virus. The question then becomes—is the environment of medical education and the health care system hospitable to improving physician performance using psychological strategies? At this point, it does not yet seem hospitable but there are many factors that point to a readiness for change.

The challenges encountered in medical school can be substantial. According to a survey completed by the Canadian Association of Interns and Residents (CAIR) (1998) the residency educational process “can result in excessive demands on residents, and high levels of insecurity, inadequacy, and fear of incompetence may develop” (p. 1). Additionally, “a culture of denial pervades medical training and residents are taught to deny that they are feeling overwhelmed, stressed, fatigued or unformed” (Canadian Association of Interns and Residents, 1998, p. 1).

The culture of medical education has traditionally “operated as a strict hierarchy, with a paternalistic approach to knowledge acquisition and development of professional identity” (CAIR, 1998, p. 15). The traditional approach of using intimidation and harassment as motivators for learning is changing, partially due to the “integration of principles of adult education into the medical training system” (CAIR, 1998, p. 15). “However, medical culture continues to tolerate and propagate attitudes and behaviours that can be labelled in no other way than resident maltreatment” (CAIR, 1998, p. 15). CAIR recommends providing opportunities for counselling to be available for residents

experiencing or propagating intimidation and harassment and well as working towards developing a training system to address these issues (CAIR, 1998).

In Botterill's (2007) experience with the residents he identified several challenges resulting from medical education.

1. Medicine requires a huge investment in time and resources. This in itself can contribute to feelings of pressure and responsibility. Being able to look at one's career "as a privilege" can be much better for health and performance, than see it "as a responsibility" or a burden (p. 1).
2. In a field where there is so much knowledge and facts to learn, even the brightest students can face dramatic "overload", with performance and health implications (p. 2).
3. It is hard to be "perceptive" when one is cognitively "over-loaded" (p. 2).
4. Residents reported "fear" regularly being used as a motivational technique...Learning to deal with fear and stress is clearly important-but overexposure without strategies is unlikely to be effective (p.2).
5. The heavy schedules of residents make "emotional preparation" and prioritized strategies for challenges difficult to accomplish. Fatigue and sleep deprivation often make optimal performance increasingly difficult (p. 2).
6. A strong perspective (where Doctors "have a life" beyond medicine) can help performers deal with excessive (sometimes irrational) demands and expectations (p. 3).
7. Sleep deprivation and fatigue are likely causing performance problems and "patient safety" risks! (p. 3)

8. Processing thoughts and feelings is often critical to personal health and recovery. Repression and denial can have scary cumulative effects on our ability to recover and perform (p. 4).
9. They (residents) comment...that teamwork often hasn't played much of a role in their training, and that dynamically changing performance conditions and environments make it difficult to accomplish "real team" relationships and dynamics (p. 4).
10. Emotional resources are also an issue in this field! Living and dying, and trying to make a difference in between!! Emotional health, skills and management seem essential; a strong human perspective seems a necessity (p. 5).

Some of CAIR's (1998) recommendations included the belief that

residency training programs (should) ensure that residents are provided with comprehensive feedback that includes the identification of both strengths and weaknesses. Appropriate levels of confidence should be fostered and encouraged. Residency training programs should include sessions on goal setting, substance use, personal and team management, and work addiction in their professional development curriculum (p. 2).

These recommendations for feedback, positive reinforcement, goal setting and teamwork were all components of the performance enhancement training program. Botterill (2007) recommended that "work on the preparation, performance & coping skills/strategies of medical students, can make a big difference. As well, changes in the learning & working environments/traditions of medicine can help optimize performance, & reduce medical

error” (p. 5). It would appear that there is a recognized need for psychological skills training/support both from the students themselves and from the expertise of Botterill as a performance enhancement consultant.

Secondly, medical education does not seem to be entirely successful in producing graduates who can consistently and completely meet the CanMed competencies (CanMeds, 2006). The current strategies are not working well enough. Participation in performance enhancement training has resulted in changes to residents’ attitudes and approaches to medical education, creating a more sensitive, empathetic and patient safety oriented approach to training. It would seem that if students were not always operating under a tremendous pressure of fear of failure that they might be able to mobilize their energies towards deeper and more effective learning. As more residents and physicians adopt the skills and techniques of performance enhancement training, student’s learning experiences could gradually become more positive. Given the tremendous publicity given to the intimidation and harassment tactics and the move towards less overt forms of abuse, there is recognition of the ineffectiveness of using these negative teaching strategies (Canadian Association of Interns and Residents, 1998; Cohen et al., 2005). Therefore, there is a readiness for an alternate approach that will be better received by students and could promote deeper learning.

Thirdly, and most importantly, is the intense focus and pressure from society and the health care system to improve patient safety, as soon as possible. There are multiple approaches to improving errors within the system but at this point in time there is not yet a significant emphasis on improving the human factor. Physicians themselves are writing articles and books on the need to make changes to improve their performance such as

Gewande's (2007) book called "Better: A surgeon's notes on performance" and Groopman's (2007) book "How Doctors Think". Epstein's (1999, 2003, 2005, 2006) multiple articles on mindful practice and Croskerry's (2000, 2003, 2005) research into cognitive error. Furthermore, our society and citizens are not likely to ignore the problem of patient safety. More and more of our older population is comprised of baby boomers who expect good health and longevity (Groopman, 2007). They are not accepting of minimally competent health care, are less awed by the power of the physician, are more demanding of information and resources and have a considerable voice, given their numbers. We have the impetus and the right social timing to trigger social change despite the less than ideal cultural context of medical education and the health care system. There is a readiness that we need to respond to.

Gladwell's (2002) second principle of social change is 'the law of the few' which states that the success of any social 'epidemic' is dependent on people. Gladwell (2002) suggests that there are three types of individuals that can trigger an epidemic of change. These people with multiple connections to other people (i.e., connectors), people who possess the knowledge about the change agent and those people who can sell the idea. In this research project we have people who have multiple connections, people who have the research knowledge and people who are passionate about sharing the idea.

The connections or networking is quite broad as the initial research project was interdisciplinary and interagency. The disciplines of medicine, nursing, sports, patient safety and education were all involved. The University of Manitoba, the Winnipeg Regional Health Authority and the University of Winnipeg partnered to deliver the project. Each individual in each of these disciplines and agencies has a wide network of

co-workers and friends that have heard about this project. Likewise, each one of the residents has family, friends, and students who have heard about their involvement. And the residents represented a diverse selection of specialities. Additionally more than fifty percent of the residents in the research are not Manitobans so their connections outside of our province have heard about the training. Finally, some of the residents are now training in other parts of the country and other parts of the world applying what they learned in Manitoba to their new workplace. Part of being a resident is also being a teacher. The structure of medical education is that you teach the student the year below you therefore all medical students become teachers. If while the residents are teaching, they model and communicate the principles of performance enhancement as this pilot group of residents have been doing over the past 18 months, and if their students pass it on, it increases the likelihood that it will spread. There is a potential for the knowledge about performance enhancement training to spread within medical education, within our local teaching hospitals and within the larger health care community.

The second type of individual who contributes to social change is someone who has a body of knowledge about the change agent (e.g., performance enhancement training)(Gladwell, 2002). These are the individuals who can substantiate the effectiveness of the change agent. In this research, they would be the researchers. These research oriented individuals are very important in a culture such as medicine which uses research evidence as foundational for the practice of medicine. It is the research individuals who give validity to the reason for social change as well as the mechanism for social change.

In this situation, it is likely that before medical education or the health care system would give consideration to performance enhancement training as a valid educational intervention for medical students they would require research evidence of the need for performance enhancement. I have suggested that the need for performance enhancement training is derived from the larger societal pressure to improve patient safety. But the need also comes from the residents themselves. In this research the need or motivation for participation was initially intrinsic. All of the research residents had a pre-existing interest in psychology and in improving their performance. But once the residents began the program, the need for performance enhancement was validated by the results of the TAIS test. The TAIS was accurately perceived by the residents to be an objective; validated psychometric testing tool. As such, the data from the TAIS was considered valid and identified for each of the residents' areas for performance enhancement.

In addition to providing research based rationales for the need for performance enhancement, it is important to validate the methods used to enhance performance. In this situation, we can begin with the evidence provided through psychology and sports psychology which have reported successes with the strategies used in Botterill's program of performance enhancement training. This study also indicates that the PET had positive impacts on performance. It would be important for that information to be presented clearly and referenced by results as well as the documented effects in physicians' performance. There is a sufficient initial body of research to create an interest in a pilot project of performance enhancement in medical education.

But, it is not sufficient to just have the research. The results need to be communicated to a larger audience. This has already happened. The results of this study

and the original study were presented to the faculty of medicine at grand rounds (April 22, 2009). The results of the original study were presented to an international group of medical educators in 2008. The research results could also be communicated by publishing the results in journals of medical education and psychology. These would be great places to seed these research based ideas for performance enhancement training interventions.

To summarize, the social change principle of the “law of a few” to this point: we have the ability to connect to a wide and diverse group of people and we have some research to support the concept of PET in medical education. The third type of individual required for the “law of the few” to work is the salesperson. The idea also needs to be sold to others. I think that this could best be done by the research participants themselves. They are enthusiastic about the project and have been witness to the effects in their lives and personal practice. They already ‘sell’ the ideas every day to their students, sometimes directly and always in the way they teach. The enthusiasm that can be generated by people with passion should not be underestimated. The leaders in the project are also well positioned to sell the concepts to the wider social community. In fact, in my own department (i.e., University Teaching Services) we have taken the concepts of performance enhancement as applied to teaching and presented them to the larger university community. It was well received and planted the ideas in multiple faculties. This concept can be communicated through the internet, through the Faculty of Medicine student distribution lists, through podcasting interviews, and through personal testimony, just to name a few. The question remains-will the ideas take hold? Or in Gladwell’s (2002) terms –What is the stickiness factor?

There is a principle in advertising that in order for a product to sell the potential customer must be exposed to the product a minimum of six times (Gladwell, 2002). This works well for multimillion dollar corporations, but may be a bit more challenging in the field of education as it is not just about being exposed to the information. It is also about creating a 'hook'-something that catches the attention of the potential buyer/participant and is very appealing to them. This research used the term High Performance Physician. By using the adjective "high" it suggested a certain discrete point of time or experience in which an individual's performance is "high" or at a pinnacle or the best it can be. This might have been somewhat misleading as it was not the intent of the project to reach a particular end point or goal but rather to engage the physicians in a process of performance enhancement. But for physicians who are highly competitive and outcome-based the concept of learning a discrete skill which would move them to a position of 'high' performance was universally appealing. The correlation between physicians as performers similar to Olympic athletes spoke to exclusivity and excellence which was also warmly embraced. It may be that a different 'hook' would be more successful, but this one seemed to work quite well.

In summary, it would appear that there is some readiness for change in the culture of health care and medical education and that there are the core factors which would support the "law of the few". But does the performance enhancement training program have what Gladwell (2002) describes as the "stickiness factor"? Is the program robust enough that it will attract interest and participation solely based on the program? Some residents embraced the concepts immediately and integrated them into their performance. These same residents also make a concentrated effort to continue to work at their

performance using what they were taught in the PET. Some residents were selective in their choice of information and made smaller changes. But ALL of the resident were firm in their belief that PET was beneficial to their performance and should be integrated into medical education. So, what is it about the PET that has that stickiness factor that has residents still enthused about the program 18 months after they finished? And how could a program of this type be integrated into medical education? What follows are some suggestions for implementation based on the aspects of the program identified by the residents as most helpful.

Suggestions for Possible Implementation of PET

Implementing a performance enhancement training program into medical education may be theoretically possible, but I would expect to encounter some obstacles. This discussion focuses on what I consider to be four of the major obstacles. Firstly, the medical curriculum has an “evidenced-based” or scientific focus which creates a particular educational culture.

Most medical curricula...remain philosophically attached to logico-rational approaches to knowledge that value objectivity, prediction, and control...As Hafferty and Franks note, if students are “surrounded by a medical culture that discourages certain feelings, introspection, or personal reflection, and buffeted by a basic science curriculum that emphasizes rote memorization, medical students may come to embrace such a reflexive myopia quite early in the training process. (Wear & Castellani, 2000, p. 606)

Despite the fact that often the current curricular focus is contrary to the development of self-awareness, goal-setting, the adoption of self-management, and stress management skills, the residents’ personal experience with the medical education process caused them to identify that these skills are a necessary and important aspect of their educational experience. The residents’ requests for psychological skill training and support are reinforced by Cohen’s (2005) Happy Doc Study and the CAIR (1998) survey results. Cohen (2005) states that “there is a definite need to properly train and educate program directors and all residents in how to deal with well-being concerns” (p. 10). CAIR (1998) makes recommendations on seven aspects of residency that require psychological skill training-“our feelings about ourselves”, “working beyond service-residents and workload

issues”, “forced martyrdom-residents and family life”, “taking care of ourselves during residency”, “training Canada’s new physician workforce-residents and career issues”, “feeling safe-residents and fears of harm” and “crossing boundaries-when training is tainted by maltreatment” (Table of Contents). Although the curriculum does not currently give much consideration to psychological skills, it appears that performance enhancement training is perceived to be a need not just by residents in this study, but by residents on a national level.

The second challenge to adding new content is that the curriculum in medical education is already over-extended. For example, the “Educating Future Physicians for Ontario” (EFPO) project of the nineties, identified that there are “highly scheduled and crowded curricula with relatively little time for independent thinking and learning by students” (Neufeld, Maudsley, Pickering et al, 1993). This is not a new problem, as Starling wrote in the British Medical Journal in 1918- “on every hand one hears of the overloading of the curriculum, and yet it is, impossible to say that any of the subjects which have been introduced are unimportant to the medical man (p. 258)”. Consequently, there will never be “room” for another program in medical education. It will require a shift in perspective from both the administration and the students to recognize that performance enhancement training can facilitate the development of personal skills, attitudes and behaviours that enhance medical students’ abilities to acquire and use the medical knowledge in the practice of medicine while still maintaining their own mental and physical health. Consequently, its addition to the program could potentially serve to mediate some of the challenges inherent in medical education and the health care system.

Robins, White and Fantone (2000) consolidate some of the current literature on the third obstacle, resistance to change, summarizing it in this way.

Faculty resistance to change is perceived to be a widespread barrier to reform.

Bloom has suggested that where curricular content and processes are concerned, faculty are frequently more vested in maintaining the status quo than investing in educational reform. Bloom states that this is because mandated educational activities are not as high a priority for clinical and basic science faculty as is their research or clinical activities, and because faculty in general prioritize the goals of their own academic specialities and departments at the expense of their school's educational goals. Achieving faculty "buy-in" is therefore a necessary precursor to implementing curricular reform.

In this case, I would hope that the results of my study, combined with the recommendations from Botterill (2007), the research from CAIR (1998) and Cohen (2005) and the suggestions for potentially successful implementation for social change might result in some faculty "buy-in" that could initiate the process of curricular adjustments to include performance enhancement.

Fourthly, is the issue of administrative will and leadership in curricular change. Robins, et al (2000) indicated that "factors found to facilitate change in medical schools include centralized curriculum governance, resources dedicated for education, and leadership committed to change" (p. 802). One current example of change in medical education is the nationalization of the CanMed competencies. The EFPO group project initiated the concept of eight physician roles. The group identified that

the project was truly collaborative and inter-institutional. It focused on leadership, and the common sense of its message was compelling. Its strengths lay in the energy and enthusiasm of its participants and the direction, guidance, and support of its leadership, including AMS (Associated Medical Services) and COFM (Council of Ontario Faculties of Medicine). Ongoing public input and the wise counsel of students and residents were strong features of the project. We struggled, however, with the issue of engaging the schools in the ownership of the project and *were unsuccessful in retaining the interest of the ministry of health and organized medicine in Ontario. We were probably somewhat naive to think that major institutional change would be achieved within a decade.* (Maudsely et al, 2000, p. 126)

There is no easy answer to change at the administrative level. Despite the EFPO's success at working as a group and their local impact, they experienced a sense of leadership apathy that was difficult to overcome. Despite the dismal sense that this realization creates, some hope remains given that seven out of the eight roles developed by the EFPO describing the ideal physician (Maudsley, et al, 2000) are now integrated into the national physician competencies (CanMEDs). "The Royal College of Physicians and Surgeons of Canada based its major initiative, CanMEDS 2000, on the roles" (Maudsley, 2000, p. 125).

In spite of these obstacles, there are some possibilities for strategies to implement performance enhancement training into the curriculum. Although the residents themselves could not come to an agreement about when and how the program should be offered they were universal in their belief that it should be part of medical education.

Right from the beginning of medical training students recognize that the demands for their learning and their own personal resources do not match. This is one of the contributing reasons for their feelings of being overwhelmed, their sense of inadequacy and their fear of failure. It is likely that the initial response to a program of performance enhancement training could be considered a soft skill by most medical students and may be initially dismissed out of hand. They may not recognize its potential impact to their performance. Even if it were a mandatory course, like the interpersonal skills and ethics courses, students are likely to mentally dismiss the content and be inconsistent with their attendance. The residents themselves communicated in the interviews that they did not value the interpersonal skills and ethics courses as medical students but now recognize the importance of the training available to them in those courses. This may be partially why there was a voluntary response by the residents who participated in the PET as they now recognized the value of psychological skill training. Therefore, it is important to ensure that the program is developed so that it will resonate with the medical students.

It would also be important to give consideration to how the program could be differentiated for different levels of medical students. The resonance with the program may be associated with a time of increased self-awareness. For example, the beginning of clerkship is a time when the academic student realizes s/he is going to be interacting with real patients. There is some concern about whether or not they have what it takes to perform in the real world. Clerkship creates a new level of dissonance when students are now exposed to real patients and are trying to consolidate their textbook knowledge with the reality of the lived patient experience. This dissonance was perceived by some of the residents to be an opportunity for growth. Another time in the training when a good deal

of self-reflection is required is when the medical student is required to submit their choices for residency positions. Part of that decision is based on their knowledge of their own strengths and weaknesses, their life goals and their perception of their own performance. An opportunity to explore these issues within the PET could have an impact on their performance. The residents identified that the PET should be mandatory by residency if it had not been offered earlier in the program. In residency the pressures of the job, the patients, the attending physicians, the health care system and medical education absolutely required some utilization of positive psychological skills in order to become a high performer.

Given that there are multiple times in medical education when the PET could be effective; a good place to start might be by offering an optional program which would be available for students who have a readiness for change. The high performance aspect of the program will most likely be appealing to all medical students given their desire to excel. Medical education sets up students to compete for best clinical positions, best residency opportunities, best jobs, etc. Just as in sports, the competitors are looking for an edge. This optional program could be perceived to be that edge. It is also known that medical students recognize their need for psychological support as they move through the program. The PET would not be appropriate as an intervention for individuals who are suffering from significant mental health concerns like depression. But, if this support is offered to medical students as a way to not only survive medical school but become higher performers, it is likely to receive a very positive response.

There were aspects of the program that were seen to be essential. The first of these was the TAIS test. It was suggested that the TAIS could be made available to medical

students prior to their clerkship as the awareness of their personal strengths and weaknesses was seen to be valuable for studying and exam preparation. For the residents, the results of the TAIS allowed them to change their perspectives about themselves and their work. It had a huge impact on their performance. The TAIS could be delivered as a stand-alone intervention. I believe that the impact would be strengthened when followed up by the psychological skill instruction which builds on the personal knowledge gained from the test. The other essential elements identified by the residents included: a small group format (6-8 students), diverse groups, and regular face to face meetings with a frequency that could be maintained given student clinical/class schedules, a facilitator with expertise in performance enhancement, consistent course content among all groups and easy access to the group leader for one on one coaching/counselling. There was an emphasis on the fact that it was fun to get together as a group to learn. Even though it was an assigned group, each of the residents chose to participate in performance enhancement thereby creating a group of individuals with shared interests. The group learning also worked because it was coached by an expert in performance enhancement. The concept of TAIS testing, group support, learning as fun, and choice, combined could create the 'stickiness' factor of the performance enhancement.

Establishing a PET within medical education will likely be challenging. The program could be offered at either the undergraduate level or the post-graduate level or both. A suggested approach to introducing PET into undergraduate medical education by the next academic term could take the following approach. Students would be introduced to the concept of PET by email, through grand rounds, in the classroom, by poster, etc. Performance enhancement would be advertised as an opportunity to become a high

performing physician. There would be one chance per year to sign up to participate in performance enhancement. This would provide an opportunity for students in any year of the training to participate in the performance enhancement training in the first year it is offered. There would be no other window of opportunity within the one year time frame. This makes participation in the program somewhat exclusive. This would appeal to the competitive nature of medical students. This once a year opportunity should correspond to periods in the curriculum which are potential readiness times in students' lives. Acceptance in the program would come with the commitment of attending and participating in twelve monthly group sessions. Once participants begin to share their positive experiences, it will motivate others to want to be part of the group, but they will have to wait until the next registration time. There would be an opportunity for the group that began in the first year to continue for multiple years or individuals could recommit to a different group during the following year(s).

Another approach might be to begin in post-graduate medical education-with residents. One option could be to partner with a particular department interested in the program. This department could in effect operate as a non-research based pilot project for the Faculty of Medicine. It could also be perceived to be a unique program offered by a particular department. As the impact of the PET spreads by word of mouth, it is possible that other departments would be interested in using the program themselves. Currently, at the University of Manitoba, there are several departments with an openness to exploring the integration of the PET into their educational programming.

Another option would be for the postgraduate or the undergraduate approach to operate as a research pilot program. The feedback about the PET would be communicated

informally by the residents from the research group and formally by the researchers. It would be effective to have this information shared in larger group forums such as grand rounds or departmental professional development sessions. It would really only take one small group one or two years of medical education to begin to infect the rest of the student population. The city of Winnipeg is reasonably small and the members of the medical community know many of their colleagues. So, the ability to infect the entire physician population could happen with several small groups. These groups may be strategically placed. For example, a group may consist of ER residents as the post graduate dean of medicine was initially part of the planning team for the research project. There is also interest in psychological skills in the neurosurgery department, as well as the intensive care unit. It might also be possible to use the program with an interdisciplinary group of health care providers. In this way, a broader group of health care providers gain the benefit of the program. The more members of the health care team working towards higher performance the greater the likelihood that there is a generalized improvement in patient care.

Another way to broaden the impact of the program is to implement some changes within the broader society. At the beginning of the research, the University of Ottawa was working towards participating in the research. It is possible that they would be interested in running a pilot performance enhancement training project in their Faculty of Medicine. They have an individual with the psychological skills training who could lead the program. There is an interest in improving the art of medicine as can be seen by the few programs in medical schools in North America which are adding optional courses on the art of medicine. There are a few American universities like the University of Virginia and

the University of Michigan who have an individual with a sports psychology background that work as consultants in the department of surgery. Publishing the results of these studies in journals and presenting at conferences will publicize the success of the program and provide a starting point for other programs. The initial results of the performance enhancement training have been presented at an international conference on medical education in 2008. The results could also be submitted as an article to the Association for the Well-being of Physicians and the Canadian Association of Interns and Residents. Both of these organizations have self-identified the need for psychological skills training for medical students and physicians and would likely be highly receptive to the outcomes of these studies.

There are no shortages of opportunities to implement a performance enhancement training program into medical education. What may be lacking are the administrative will and financial resources—two things that could be insurmountable barriers. However, administratively there is commitment to produce competent physicians who can fulfill all of the seven roles identified in the CanMEDs. Interestingly, the original EFPO described eight physician roles. The missing role is “physician-as-person” listed in the University of Western Ontario UGME competences (2009). Its descriptors include “developing an awareness of personal assets, biases, and limitations” (UGME, 2009). There is no readily available documentation to explain why this eighth role was not included in the national CanMEDs although it is currently being used at some universities across the country. The University of Saskatchewan is using “physician-as-person” as can be seen in its survey of 2010 medical student self-assessment of UGME goals and objectives (2009). The Ontario College of Physicians and Surgeons (2009) also includes “physician-as-person” as one of

its eight physician roles. It would seem that physician-as-person is still considered to be important enough to be included in some curriculums. The performance enhancement training might be an appropriate educational strategy to prepare physicians for this role. When presented to the wider Canadian medical education academic community, it is quite possible that performance enhancement training could be perceived to be a strategy for addressing the role of physician-as-person. If the training was not perceived to be an addition to the curriculum but rather a strengthening and enhancement of the curriculum and was seen to be a component of CanMEDs, it might receive a more favourable response.

In conclusion, I began this thesis with a belief that performance enhancement training had made an impact on medical resident's performance. What I learned was that participation in a PET led by an expert facilitator created the impetus for behavioural change that had long-term impacts. The residents felt that their performance had improved. Additionally, they had learned the skills to continue to improve their performance. They believed that their improved performance would naturally contribute to improved patient care. The PET created such an impact that the residents determined that all medical students should have the opportunity to become engaged in a PET at some time during their training. I have suggested that performance enhancement training could be implemented into medical education and has the potential to create changes within the medical students, residents and eventually the health care system. I would suggest that performance enhancement training could be the strategy to meet the role of physician-as-person. The next step is to communicate these findings to the larger

academic community where additional research and implementation into the field of performance enhancement training in medical education can be advanced.

Recommendations for Future Research

The results of this qualitative study provide a foundation for future research. One possibility would be to replicate at another university. That might provide support and credibility to this research or determine whether the impact here in Manitoba was isolated or relevant for a larger group of medical residents.

Given the focus on teamwork and group learning, it would be interesting to use the training in an inter-professional group of students in the health care professions (i.e. nursing, pharmacy, medical rehabilitation and medicine) to determine the impact on both individual learning but also on teamwork. It might also be beneficial to use the training and group process within a particular specialty to assess teamwork and the support within a team.

It may also be possible to take what was learned about motivating factors, program impact factors and behavioural changes in this study to develop a quantitative research project to survey a larger group of residents to determine how widespread these concepts are in the larger medical student population.

Another concept to potentially investigate is “readiness for change”. What is it that prompts medical students to want to improve their performance by adopting new cognitive and behavioural skills? Given these residents’ expression of personal desire to improve performance, their interest in psychological skills and their concern about patient safety, it may be possible to develop a survey that could explore the prevalence and strength of these issues within the larger student population and between universities.

This research project and these few recommendations are just some examples of exploring performance enhancement training for medical residents. The recommendations to future research are limited only by the creativity of the researcher.

APPENDICES

A: Utilization of High Performance Patient Simulations to Reduce Medical Error

The project was initiated in the fall of 2006 with a cohort of medical residents. There were 3 groups of residents. We had an initial pilot group of 4 and then an experimental group of 12 residents. We solicited residents by advertising the research project on a website and through word of mouth. We accepted applicants who were actively involved in a residency program. The residents came from a variety of different programs, cultures and ages. The study design was a control/experimental group pre-post test, time series experiment.

The residents initially participated in two simulated patient interactions-high tech and low tech. Both the high tech and low tech simulation are set in a critical care setting which is a high uncertainty environment pre-disposed to patient errors (Hoff et al., 2003). In the resident's orientation to the cases they are presented with the context of their environment (e.g., emergency room observation unit), the available team members and are identified of their role (e.g., emergency room resident just arrived onto the service).

The high tech simulation cases were developed and utilized in medical education at the University of Ottawa. The cases focus on a critical care patient who requires immediate medical intervention. Successful medical management requires rapid assessment, diagnosis and treatment utilizing expert psychomotor skills within a team environment. The patient is mechanically responsive but does not require any interpersonal communication. There are multiple stressors including time and resource restraints and the real possibility of causing an adverse event that will terminate the patient's life.

The low tech patient cases were developed at the University of Manitoba and are based on recommendations from the patient safety group taken from cases of medical errors, specifically adverse events. The patient safety group identified that a common theme in all of their cases of adverse events involved communication issues – either between the resident and the patient, the resident and the patient’s family and the resident and the health care team.

Groopman identifies that 80% of errors in diagnoses “could be accounted for by a cascade of cognitive errors”. (Groopman, 2007) In addition, he states that “most physicians are not aware of their cognitive mistakes”. (Groopman, 2007) Cognitive errors are “mistakes in thinking” (Groopman, 2007) or cognitive dispositions to respond (CDRs) such as failures in perception, failed heuristics and biases. (Croskerry, 2003) “All CDRs are evident in emergency medicine... Nowhere in medicine is rationality more bounded by relatively poor access to information and with limited time to process it, all within a milieu renowned for its error-producing conditions”. (Croskerry, 2002) Throughout the case notes we have attempted to build a typical patient case, set in an acute care setting, which has potential for commonly occurring CDRs. It is not our expectation that residents will make these CDRs – the information is intended for the evaluator to be aware of the potential for a particular CDR at different points in the case. Therefore, if the resident is able to maximize their performance by reducing cognitive errors this should ultimately result in a decrease in adverse events.

In addition, the cases were developed utilizing the theoretical constructs of situational awareness. Situational awareness has been used as a conceptual framework in the aviation industry (Endsley, 2000) as well as in health care teamwork. (Leonard et al.,

2004; Aggarwal, Undre, Moorthy, Vincent, & Darzi, 2004a; Leonard et al., 2004)

Situational awareness is defined as “knowing what is going on around you”. (Endsley, 2000) It can be viewed in three stages. The first stage is the ability to perceive cues in the environment. (Endsley, 2000) In our low tech simulation this would involve the actual physical setting (e.g. critical care environment), type of equipment in the room (e.g. dynamapp), equipment attached to the patient (e.g., IV) and available physical resources in the room (e.g. patient chart). It would also include patient, family and nurse’s physical appearance, verbal and non-verbal behaviour. These things are all carefully scripted in the case notes and deviation from the notes would impact the patient’s perception of cues. Therefore, the attempt was made to utilize the same Standardized Patients (SP) for each case. The second stage is the comprehension of the current situation. (Endsley, 2000) The case is designed with a series of critical events. The resident is provided with the necessary cues to help them reach each of these events. If they are unable to reach the event in the allotted time the SPs have scripted roles so they can provide additional cueing until the resident addresses the critical event. The third and final stage of situational awareness is the ability to forecast the effects of their actions on the patient’s outcomes. This aspect is explored in the debriefing with the physician at the completion of the simulation.

Therefore, the low tech cases were not focused on complex medical conditions or psychomotor skills but included a great deal of opportunity for communication and critical thinking. The low tech cases were designed to be medically common presentations that all residents would have encountered in their theoretical study of medicine and in their clinical practicum. The three cases in the study focus on the adult

patient – i.e., the young adult, the middle aged adult and the elderly adult. The medical conditions of each of the “patients” could be experienced by an adult of any age.

Although all patients have conditions that could suggest multiple differential diagnosis the resident must identify the most likely diagnosis based on the cues that are available through the environment, the patient and their family, and the health care team member – the nurse. In all cases the patient’s general ability to provide a history is poor which allows the resident the opportunity to engage the other individuals in the scenario in his/her determination of the most appropriate medical plan of care. All of the patients require expedient medical management although none are designed to cause a rapid deterioration in the patient’s clinical status which would lead to a need for emergent care. All three cases follow a similar format in order to ensure consistency in the pre-post evaluations.

On the pre-test day we ran a dual track. While one resident was completing the high tech simulation the second resident was completing the low tech simulation. In both situations the residents had 15 minutes with the patient. Immediately, upon completion of the simulation, they switched places. The immediacy of the switch was significant. We know that competing stimuli and the need for a rapid change in focus are stressful distracters that are common in the medical workplace. It was our attempt to maintain a level of pressure that reflects the normal acute care working environment. One of the key results of cognitive training is to prepare the resident to cope with the multiple demands for his/her attention. The high performance individual is a more efficient processor of information –they can do more with less, they identify the critical cues, therefore are less affected by a change of attention due to stress and distractions (Harmison, 2006).

Therefore, each case had a midpoint event that required the resident to change their focus of attention. It may be an additional added symptom that they had not previously elicited or an additional interpersonal challenge. This event may trigger a CDR or allow the resident to demonstrate his/her ability to not commit a CDR, even in the presence of an additional stressor. This allows the evaluator to more easily see a change in the resident's pre-post test performance.

Following the completion of both the high and low tech simulation the residents had an opportunity to engage in two reflective activities. In one activity the resident participated in a ten minute videotaped interview led by a research assistant. The questions were open-ended and attempted to elicit the resident's self-perception of his/her performance. Secondly, the resident had ten minutes to complete a written self-evaluation of his/her performance. Again, while one resident was completing the written self-evaluation the other resident was being interviewed. The qualitative evaluation process explored concepts that Endsley refers to as mindfulness. (Endsley, 2000) During the low tech case a physician coach completed a Lickert style evaluation form which was based on the stages of situational awareness. In the high tech case the physician coach also completed a Lickert type evaluation based on medical competencies. The evaluations were modified after the initial pilot group in an attempt to improve their measurement capacity. Following the self-evaluations, the residents received a twenty minute debriefing on each case (total of forty min). The physician coach reviewed their performance on the low tech case. The physician coach, respiratory therapist and nurse reviewed the resident's performance in the high tech case using the videotape of the case. Again, while one resident was participating in one debriefing the other resident was

participating in the other debriefing. The data collected from all of the evaluations was utilized in the implementation of the intervention.

The subject's performance within the simulations and their guided verbal self-reflection was recorded on DVD. The physician debriefing sessions were not recorded.

B: Research Questions

1. What are the pre-disposing and motivating factors for participation in a performance enhancement educational intervention?
2. What factors caused the resident to contemplate behavioural change?
3. Why were they motivated to learn new skills?
4. How did the performance enhancement training impact the residents' personal life and professional practice?
5. What actions have the residents taken to adopt these new skill sets into their practice of medicine?
6. What factors have supported or provided barriers to this change in perspective and practice?
7. What are the implications for the individual physician, medical education, the health care system and the patient?

C: Interview Questions

1. How is it that you came to be involved in the high performance physician research project?

Bias: I am attempting to solicit the motivational drive behind their participation. Is the motivation something that would be relevant at the undergraduate medical education level, post-graduate or maybe this is a motivation of practicing physicians, continuing medical education? I also think that their beliefs and values about their role as a physician will be embedded in their motivation for participating.

2. What did you learn about yourself from the TAIS test? How did this impact you as a person and a physician?

Bias: I am attempting to establish a baseline, partially on their personality, but more so as related to their coping mechanisms under stress. I can then go refer back to this to see whether the strategies they chose to use were related to the TAIS and to understand their perception of the effectiveness of those strategies.

3. What was the most significant thing that you learned during Cal's sessions? How have you been able to incorporate it into your work and personal life?

Bias: I am anticipating that some strategies will be identified. If not, I will ask them about the various strategies as a memory jog. If I have to do that, it will indicate that the skills have not been habituated and incorporated into their lives.

4. What is something that you were taught, but did not find helpful? Why?

Bias: To use this as a filter for strategies that they did not perceive to be relevant to physicians.

5. What effect did Cal's personality and approach have on your participation and learning?

Bias: I need to see if the primary intervention was Cal as a person and life coach, or whether it was broader than that. If most of the results are due to Cal this would be a challenge to translate into a curriculum.

6. Based on your involvement in the research project-what advice would you give to the designers of medical education curriculum?

Bias: Will they identify strategies that they personally found helpful or will they be more global?

D: Performance Enhancement Training Curriculum Topics

The following 6 session curriculum has been designed and delivered by Botterill.

Group Session #1 (2.5 hrs):

Topics include:

- Challenges in the Field of Medicine/How Doctors Think??
- Can "*health & performance psychology*" help?? Key lessons to consider (ppt)??
- Stress Model*: Acute & Chronic affects & implications??
- 5 Common Performance Problems....
- Are there different kinds of great Doctors??
- A model of "*resonance*".... (Dr. Curt Tribble video)

Group Session #2 (2.5 hrs):

Topics Include:

- TAIS* Test hi-lights/implications??
- Is "*Perspective*" important in medicine?? Can it be improved??
- How do we reach our "Ideal Performance State"??
- "*Easy Speed*" Video illustration.... Key Newburg Questions??
- Energizing/Relaxing* (deep relaxation tape & other techniques)
- Self-hypnosis* demystified & applied (Burchuck video)

Group Session #3 (2.5 hrs):

Topics Include:

- How does "*emotional preparation*" help??
- How can we "*manage*"/"*process*" emotions??
- Imagery & preparation* ideas (visualization video)....
- "*Self-hypnosis*" & *preparation* "efficiency"??
- Avoiding "overload"/"over-analysis"??
- "Trusting" preparation--improving "perceptiveness"....

Group Session #4 (2.5 hrs):

Topics Include:

- "*Team Building*", *Perspective*, & *Emotions*
- "Real" Teams vs. "Pseudo" Teams (video) What is the difference??
- What are the 5 dysfunctions of a team??
- Valued roles--shared vulnerability--trust....
- Professionalism--creating a "Professional Bubble"??
- Positive Rivalries*/"Energy-makers"/"Energy-Takers"???

Group Session #5 (2.5 hrs):

Topics Include:

- " (Kellmann)....
- "Debriefing"--Drawing Lessons....
- Health, *happiness*, & high performance
- Importance/Urgency Dilemma?? (Covey & Lakein)
- Recovery & Balance* in life?? (Orlick)
- Who has perspective??* Why??

Group Session #6 (2.5 hrs):

--" *Recovery*", *fitness*, & *high performance* Psycho-physiology" in Medicine
(Achterberg & Justice)

- Belief vs. Hope (False Hope vs. No Hope) difference in psycho-physiology??
- Proactive Communication*--"Nothing Never Happens"???
- Thriving & Surviving in Medicine--"scenarios" & strategies??
- "Life Lessons"??--(Elizabeth Kubler-Ross & Kessler)
- How do we maintain "perspective", & continue to grow??

E: Letter of Invitation to Participants of CPSI Study



Graduate Studies/Faculty of
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Request for Participation in Research Study:

An educational intervention in performance enhancement: What works and why?

Dear _____,

Thank you for your previous participation in the Canadian Patient Safety Institute Study on developing high performance physicians. As you might remember, I was your guide during the simulation events. I have subsequently developed a master's thesis proposal designed to study the longer term impacts of the educational intervention you participated in with Botterill. The intent is to utilize these findings to propose recommendations for a performance enhancement educational program that could be integrated into the medical education curriculum.

I would very much appreciate it if you would be willing to be interviewed for approximately one hour regarding the impacts of the training. I am willing to come to a

location of your choosing within a 2 hour radius of Winnipeg and between the hours of 0600 to 2400 hrs.

The interview will consist of semi-structured, standardized, open-ended interview questions asked only by me. During the course of the interview I will utilize additional probing questions, depending on the individuality of the initial response, as an effort to explore the individual nature of each resident's experience.

All interviews will be digitally recorded (audio only) to ensure accuracy in transcription. All digitally recorded audio data collected will be initially stored in a locked cabinet at the University of Manitoba. Data transcription and analysis will be restricted to me. Upon completion of the data transcription the files will immediately be transferred as encrypted data (i.e., password-protected) to a portable hard drive. The portable hard drive will be stored in a locked cabinet at the University of Manitoba with access restricted to the researcher. All data, including written notes and print data will be kept in the same locked cabinet in my office with access restricted to me. All electronic data will be password-protected and encrypted. All data will be stored in this secure method for a period of 7 years from the completion of the study. At this point print data will be shredded and digital data erased from the hard drive.

The University of Manitoba Education/Nursing Research Ethics Board (ENREB) may review records related to the study for quality assurance purposes.

Information gathered in this research study, including quotations from interviews may be published or presented in public forums. However your name and other identifying details will not be used or revealed.

You can stop participating at any time. There will be no consequences of withdrawing from the study and specifically there will be no effect on your in-training evaluation or your private practice.

If you would prefer to respond to the questions through a phone call or through Skype I would be willing to communicate with you in these ways as well. It would be very helpful to me if you could respond within the next two weeks. If I have not heard from you by that time I will contact you by telephone. There will also be a follow-up reminder email should I be unable to connect with you after 3 weeks.

Thank you for your consideration in this matter.

Sincerely,

Eunice Friesen

Eunice_friesen@umanitoba.ca

1-204-474-7456

F: Consent for Participation in Study

Title of Study: Performance Enhancement Training for Medical Residents: What works and why?

Researcher: Eunice Friesen
 Tel: 1-204-474-7456 or 1-204-371-5267
 Email: Eunice_friesen@umanitoba.ca

Researcher's Supervisor: Dr. Cheryl Kristjanson
 Tel: 474-7804
Cheryl_kristjanson@cc.umanitoba.ca

You are being asked to participate in a research study. Please take your time to review this consent form and discuss any questions you may have with the investigator. You may take your time to make your decision. This consent form may contain wording that is not clear to you.

Purpose of the study: The study aims to identify the longer term impact of the Performance Enhancement training to you, as a physician. You can receive a summary of the results by contacting the principal investigator by Email: Eunice_friesen@umanitoba.ca or by entering your email address in the final question.

Consent: The interview will take approximately one hour. No payment or reimbursement will be provided for any expenses related to taking part in this study. Information gathered in this research study will be published as a thesis for the Faculty of Education, however your identity will not be revealed. If participants of the study refer to individuals by name or position, or in any way reveal the identity of someone, this information will remain confidential. Your decision to take part in this study is voluntary. You may refuse to participate or you may withdraw from the study at anytime. You are not waiving any of your legal rights by signing this consent form nor are you releasing the investigator from their legal and professional responsibilities. You are free to ask any questions as a participant.

I have read this consent form. I understand that my participation in this study is voluntary and that I may choose to withdraw at any time. I freely agree to participate in this research study. I understand that information regarding my personal identity will be kept confidential. By completing this web survey I am giving Eunice Friesen permission to use the information gathered during this survey under the conditions stated above for the purpose of researching the impact of the Performance Enhancement training.

Name: _____
 (please print)

Signature: _____ Date: _____

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