

**CanMEDS 2000 Project Objectives in Anesthesiology:  
Perspectives of Staff and Residents**

**BY**

**Abdulaziz Boker**

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## **Abstract**

The CanMEDS 2000 Project identified seven essential roles for contemporary physicians: Collaborator, Communicator, Health Advocate, Manager, Medical Expert, Professional, and Scholar. The introduction in Anesthesiology Training Programs of new CanMEDS 2000 training objectives based on these seven roles represents a significant addition to current challenges faced by residents-in-training and program administrators across Canada. To facilitate the integration of these new training objectives into the current education environment, this study investigated the perceptions of the members of a Canadian Anesthesiology Department about the importance, teachability, and evaluation of the CanMEDS 2000 roles. Using a descriptive, cross-sectional survey methodology, data were collected using a specifically designed questionnaire. The results demonstrated the relative importance and teaching priority for each of the seven roles, and indicated variable degrees of preparedness to assume CanMEDS roles. Methods to effectively learn, teach, and evaluate these roles were also assessed. Based on the research findings, recommendations were made to the Royal College of Physicians and Surgeons Training Program at the site of the study for how to successfully implement the CanMEDS 2000 objectives in the current education environment.

## Chapter One

### Introduction

In the latter part of the twentieth century the exponential growth in medical knowledge and procedures, together with increased access to and sharing of information, forced the emergence of new movements calling for evidence- and outcome-based practice guidelines (Pedersen & Moller, 2001). While medical practitioners and educators were working feverishly to contemplate and incorporate such new approaches within the context of their practice and teaching environments, the turn of the twenty-first century is bringing even greater challenges to these professionals (Lenis, 2000).

Professional educators in medical schools anticipate a new paradigm shift not only on the level of what and how they teach their professional knowledge, skills, and values, but also on the level of their traditionally enjoyed autonomy (Hensel & Dickey, 1998). The latter is considered, particularly by sociologists and philosophers, as a hallmark of being a profession. Medicine, by possessing a complex integration of values, science, technology, and skills, has enjoyed a level of autonomy that characterizes it as a prime example of being a "profession" (Southon & Braithwaite, 1998). This high degree of autonomy is recognized by other fields as evidenced by the frequent comparisons of similarities made by other emerging or struggling professional or paraprofessional groups in the process of gaining formal recognition of being professions (Freidson, 1970).

With autonomy comes responsibility. A longstanding characteristic feature of medical practice and teaching is its preparedness to deal with ambiguities and uncertainties as normally occurring events. Nevertheless, the degree of uncertainty in what constitutes an acceptable minimum standard of professionalism is posing a

challenge even to the most experienced professionals. This is evident by the many ongoing national and international initiatives developed in order to reach a “normative definition” of professionalism in medicine (Swick, 2000).

Despite the consensus on the need to have clearly delineated limits and definitions for professionalism in medicine, the reasons for this renewed interest are variable. These are largely influenced by a number of global, and at times very specific regional, social, political, or personal factors. Among the world-wide phenomena that are creating such interest are factors such as the increasing corporate control, particularly in the United States, over the health care system funding, which potentially threaten the essence of the doctor-patient relationship (Finkel & Adams, 1999; Sullivan, 2000). This direct relationship was, for many centuries, the single determinant of the nature, the type of interactions, and the conduct between the patient and doctor. Nowadays, this relationship is altered by influential external factors like compensation (fee-per-service, versus salaries) and accessibility (insured versus non-insured) issues, which occupy centre-stage in some of the patient-health care providers’ interaction debates (McArthur & Moore, 1997).

To give just one example from Anesthesiology practice in the United States, the issue of whether epidural analgesia during childbirth is a right or a privilege for patients is a current debate, not only in society-at-large, but also within members of the profession (Chestnut, 1999). Given the globalization taking place in contemporary society, these issues will not only be representative of the debates at that particular location, but will extend to the various parts of the “meta-community” that we live in today (Burbules & Torres, 2000). The ultimate risk of such changes is the transformation of medical care,



and subsequently medical teaching, becoming a mere commodity. Because these trends are so pervasive, they are creating a press for change in medical education (Swick, 2001).

### North American Medical Education Reform

Since the early 1900s, many medical education reform movements have taken place, usually ending with calls to return to more socially oriented medicine and medical education. Some of these movements, and in particular the Flexner Reports (Fischer, 1999; Fox, 1999; Regan-Smith, 1998), succeeded in achieving major positive changes, but many other projects ended with echoing a listing of recommendations that may or may not have been acted upon (Christakis, 1995). In contrast to all of these other movements, two particular projects, both started in the early 1990s, are creating a snowball effect and initiating this paradigm shift in the medical practice and education arenas. These are "Project Professionalism" by the American Board of Internal Medicine (ABIM) (American Board of Internal Medicine, 1995) and the "Educating Future Physicians for Ontario" (EFPO) project (Neufeld et al., 1998). These two projects represent examples of the regional and sociopolitical factors that have necessitated an effort to create and to implement explicit definitions of the competencies taught to future medical professionals. More importantly, these projects were directed at "implementing" a vision, rather than "recommending" a proposed change.

For example, Ontario's EFPO project was initiated after a significant gap between "The [medical] profession's view of itself and the expectations of the public" (Neufeld et al., 1998, p. 1134) had become evident to health care professionals. This evidence was clear to medical professionals only when the public did not support their strike in 1987, which was mainly related to the issue of "extra billing." Nevertheless, the awakening

effects of that failed work-action by the physicians promoted a progressive initiative to re-examine issues of the nature of ideal relationships between the public and medical education institutions in a collaborative and highly supportive atmosphere. This successful and innovative project concluded its second phase in 1998, with a large number of long-lasting positive changes in the medical education arena (Maudsley et al., 2000). Among these positive changes is the introduction of the CanMEDS 2000 Project by the Royal College of Physicians and Surgeons of Canada (RCPSC), which provides a standard framework for educating and certifying future medical specialists in this country. The RCPSC is the only accrediting and certifying agency for medical specialists in Canada and, as such, is the leading force for any meaningful medical education reforms.

In addition to defining the roles of the physician as including Medical Expert, a Decision Maker, and a Scholar, the RCPSC's CanMEDS 2000 Project's objectives place particular emphasis on the need for specialist physicians to demonstrate competency as Communicators, Collaborators, Managers, Health Advocates, and Professionals. In the past, many medical doctors have assumed and displayed some of these roles at one or more points in their practice. Nevertheless, it is the premise of the CanMEDS 2000 Project's objectives to prepare all future medical specialists during their residency training years to assume minimum levels of competence in all of these functional roles or areas, and to demonstrate these competencies on a more consistent basis.

#### Statement of the Problem

The increasing societal demands for accountability from professional medical organizations and self-regulating agencies are not occurring in isolation, but are

combined with progressive increases in the amount and the rate of growth of knowledge, and the time required for residents to acquire and reliably demonstrate the attainment of these needed competencies. These increasing expectations have precipitated more careful evaluation of the required modifications and changes without increasing the already prolonged duration of specialty medical training (Langer, 2001). While various medical specialties require a different set of competencies to practice safely, the CanMEDS Project provides a general framework of desirable "generic" competencies. However, it does not address the particular and variable needs for different competencies of each individual medical specialty. Hence, there is a need to research and develop a specialty-specific articulation of standard competencies and complementary competency-based evaluation methods for each branch of medicine (Long, 2000).

The success of any new objectives to achieve a desired change in an educational setting is dependent on a clear understanding by the potential users of these objectives (Canfield, A.A. 1968) cited in (Girard, 1992). The development of the CanMEDS 2000 Project's objectives represented a significant shift in priorities and breadth in key areas of teaching, assessing, and subsequently, licensing of medical specialists. The newly introduced objectives of training in Anesthesia training programs represent a number of significant challenges for program directors and teaching faculty in these programs with respect to some of these roles. Moreover, a significant degree of confusion is expressed about the relevance, the ability to teach, and the effective methods to document and assess some of these competencies by teaching faculty and residents alike (personal communication, Dr. M. Lampe, Chair, Royal College Specialty Committee on Anesthesia).

### Purpose of the Study

To address these emerging concerns in Anesthesiology education, the questions that will frame this research project include:

- (1) What is the perceived importance of each role/competency identified in the CanMEDS 2000 Project to the practice of Anesthesiology?
- (2) What is the perceived importance of each role/competency identified in the CanMEDS 2000 Project for the teaching of Anesthesiology?
- (3) Does the current program structure, as viewed by the staff and residents, satisfy the various components of the proposed seven categories (or roles) in the CanMEDS 2000 Project?
- (4) Do patterns of responses to these questions vary between:
  - A) Staff Anesthesiologists and residents?
  - B) Different levels of resident seniority (PGY1-5)?
  - C) Staff Anesthesiologists practicing at different practice settings?
- (5) What are the effective methods to formally teach and objectively assess CanMEDS 2000 competencies in the Anesthesiology program?

### Importance

The successful integration of the objectives of the CanMEDS 2000 Project into the current Anesthesiology training program requires clear definitions of terms, awareness of implications for curriculum revision, and careful consideration of faculty development needs. The proposed study was designed to identify curriculum and faculty development issues in Anesthesiology, and to assess the level of acceptance of residents and staff with respect to the CanMEDS 2000 objectives.

Undoubtedly, the teaching of medicine to students or trainees can not be conducted in isolation from the direct influence of changing medical practice (Epstein, 1999). Medical teaching and medical practice have always been closely linked (Puschmann & Hare, 1966; Relman, 1998). Thus, this study assessed the extent to which the CanMEDS 2000 Project's objectives are represented in the current Anesthesiology practice, and identified how the Anesthesiology training program curriculum can be adjusted and strengthened to meet the CanMEDS 2000 Project's objectives, providing an important step in the full implementation of the CanMEDS new vision.

Another benefit of such a project is to sensitize program participants about the new goals expected by the RCPSC for the Specialty Training Programs, as well as to provide an opportunity to express their points of view regarding how these goals can be met in a systematic manner. It was anticipated that this research project would help to explore, based on a wide pool of opinions from both Anesthesiology faculty and residents-in-training, the relative importance of each of these roles and the optimal methods for assessing these competencies. By engaging department members in exploring their own practice, this study may enhance the "knowledge creating capacity of [a] professional practitioner" (Coles, 1997, p. 488). Also, the department members' involvement, at a relatively early stage of implementing this new proposed curriculum, will enhance their sense of ownership of the change process. This sense of ownership, on its own, and with other motivations, is an important step in facilitating the acceptance by the faculty of the proposed changes, which will be crucial during the subsequent implementation process (Bland et al., 2000).

This project was hoped to give some insight into whether the newly formulated objectives for the Anesthesiology training programs by the Anesthesia Specialty Committee of the RCPSC were considered, by the community-hospital practitioners, teaching-hospital staff, and residents, as relevant to their day-to-day practice of Anesthesiology. It has been previously shown that these two groups of practitioners may have different perceptions about the relative importance of some of these roles, particularly during their years of Anesthesia residency education (Girard, 1992).

### Conceptual Framework

The literature review for this project focused on four main areas. First, a number of contemporary perspectives related to the term “professionalism” from the points of view of sociologists, philosophers, educators, and medical experts are presented and analyzed. The special emphasis on the essence of professionalism stems from its centrality to most of the recent North American education reform movements. Analyses of the key characteristics that surround ongoing societal recognition of the medical profession and its self-governance will be highlighted. Second, the linkage between medical practice, medical education, and the changing enrolment and teaching philosophies during the last century will be reviewed. This will be followed by an overview of the North American (USA and Canadian) initiatives as they relate to reforms within the current medical education curricula and their potential impact on the practice and teaching of physicians, including the CanMEDS 2000 Project. Third, evaluation and the setting of standards within the medical educational context are presented, particularly as they relate to the assessment of non-cognitive skills, classically known as “attitude” or

“soft social” skills. Finally, the limited related resources available on Anesthesiology training and evaluation will be outlined.

### Methodology

Because not a lot is known yet about the impact of the CanMEDS 2000 objectives on the current Anesthesiology training programs, this project followed an exploratory design. The main data collection instrument was a descriptive cross-sectional, self-report survey design, which elicited both qualitative and quantitative data. Anesthesia department members, faculty (n=73, including fellows), other City of Winnipeg community hospitals’ practitioners (n=34), and residents (n=24) in the RCPSC Training Program of Anesthesiology, at the Faculty of Medicine, The University of Manitoba, Winnipeg, MB, Canada, represent the target population. A comprehensive sampling approach using a developed instrument was planned. The questionnaire was developed based on the published general and Anesthesiology specialty-specific objectives of the CanMEDS 2000 Project. In addition to structured responses, participants were given selected opportunities to enter qualitative comments to explain their rankings. The structured responses (rankings) facilitated data analysis and provided an objective and efficient scoring option, while the unstructured format provided freedom for the participants to explain their choices, and to provide data that enriched the interpretation process. The clarity and effectiveness of this questionnaire was assessed in a multidisciplinary focus group conducted at the Bannatyne campus, as well as using a pilot pre-test to refine and fine-tune the survey instrument.

The survey length was limited to approximately 30-45 minutes to ensure a high participation rate. The data from the survey were entered into a database, and were

analyzed with parametric and non-parametric techniques as appropriate, using a NCSS (Number Cruncher Statistical System) and /or SAS package. A formal consultation with a bio-statistician, Mrs. Mary Cheang (M. Math) was arranged during the planning stages of the instrument, and after collection of the data for analysis. The qualitative data were systematically tabulated and analyzed to identify themes and issues. The conditions for using either parametric or nonparametric tests, for comparisons or correlation tests, and for the limitations of the current study design and strategies used to address and minimize their effects will be detailed in chapters three and five of this study report.

### Summary

A recently introduced "skills for the new millennium" document by the Royal College of Physicians and Surgeons of Canada, as an initial step in implementing the CanMEDS 2000 Project, is a reflection of the changing societal expectations from health care professionals. This project has interesting and far-reaching consequences for each and every practicing physician, for medical institutions, and particularly, for medical educators and program directors. These have to do with every aspect of medical school: mission statements, program design and goals, planning and implementing of curriculum, evaluation and certification as well as maintenance of certification, of all health care providers.

In order to optimally incorporate these new benchmark competencies into everyday practice and teaching, within the context of Anesthesiology training programs, grounded inquiry of the evolving relationships between these changing societal expectations and the current status of professional education is needed. This study aimed



to facilitate the integration and subsequent implementation of this new CanMEDS 2000 project's vision in contemporary professional Anesthesiology training programs, by exploring: the nature of professionalism, in general, and specifically in medicine; the changing themes within medical schools curricula; the evolving assessment methods of non-cognitive aspects of medicine; and, then, defining Anesthesiology teachers' and learners' perspectives toward these roles.

## Chapter Two

### Conceptual Framework (Literature Review)

Over the last thirty years there have been increasing indications of erosion to the meaning of “professionalism” in medicine (Frenk & Dur'an-Arenas, 1993). While sociologists, educators, and philosophers were conceptualizing professionalism in their own fields, based on models from medicine, North American medical institutions, themselves, had embarked on a movement to redefine professionalism in medical practice. Spanning the 1980s and 1990s, these efforts were led by the American Board of Internal Medicine (ABIM) in Project Professionalism in the United States. In the Canadian context, the redefinition movement started with the EPFO project in the province of Ontario and culminated in the CanMEDS 2000 Project by the Royal College of Physicians and Surgeons of Canada. In each of these two countries, the motives for this renewed interest are different but many of the results have been similar, particularly with respect to changes in the process of medical education at the undergraduate and postgraduate levels. The impact of these reforms will be felt at many levels, but their strongest impact is likely to be in the evaluation and certification of all specialists in medicine, as well as maintenance of accreditation and certification for both Academic Medical Centers and individual practitioners.

Because of its centrality to medical education and practice, the development of contemporary thinking about the meaning of professionalism in medicine forms the conceptual framework for this investigation and the extent to which the contemporary definitions of professionalism, as they relate to the CanMEDS 2000 Project, are reflected

in teaching, learning, and evaluation in a Canadian Anesthesiology training program. In order to provide a comprehensive foundation for this research project, a literature search was conducted to identify published relevant citations. The resources of MEDLINE, ERIC, PSYCHLIT, BISON, Web of Science, Sociology, Dissertation Abstract databases and EBCOHOST databases were used initially. Combinations using the following terms were initially utilized to identify related publications: "medical education," "Anesthesia education," "medical profession," "evaluation," "curriculum," and "certification." These searches generated possible-related references: abstracts and keywords were then used to fine-tune the search for relevant sources. Subsequently, selected literature was located from earlier identified articles, as well as from manual searches in recent thematic issues of *Academic Medicine*.

These resources were critically reviewed and will be discussed following an outline that builds the conceptual framework for the investigation of the CanMEDS Project and its application to an Anesthesiology-training program. First, the development of professionalism in general terms and specifically in medicine will be discussed as it relates to curriculum. This section includes an introduction, definitions of terms, and the conceptual characteristics that shape professions and professionalism. Building on this general foundation, contemporary perspectives on medical professionalism will be outlined and discussed.

Second, the general education of physicians will be reviewed. This section includes a brief review of the "Full Circle" of medical students' general education over the last century, and of the emerging dual role of healer and professional, as an alternative model for contemporary medical education and training.

Third, the recent developments in terms of national projects dealing with medical educational issues in the USA and Canada will be highlighted. In this section, current points of view on how to shape medical school curricula to achieve both professional and societal expectations from medical school graduates and specialists will be reviewed. These views mainly will include Project Professionalism, Educating Future Physician for Ontario, and the CanMEDS 2000 Project. For each of the three projects, a short account of their history and the most important contributions, as they relate to the present research, will be discussed. Fourth, issues around assessment of medical trainees' competence will be reviewed, particularly assessment of non-cognitive attributes needed for the practice of medicine. The final section of this literature review will explore the available literature on Anesthesia training programs in Canada, which demonstrates the need for this research project.

The Development of Professionalism in "General" and in "Medicine"  
as it Relates to Curriculum

Historically, the word "profession" and its derivatives, professionalism and professionalization, has occupied a center stage position in many discussions among vocational, occupational and scientific communities (e.g. social workers, educators, nurses, judges, and pharmacists). Many of these discussions were intended to shed light on what it means to be recognized as a "professional" by defining terms, stating rights, and in most instances, gaining certain privileges (Freidson, 1986). These initiatives were sincere and centered on bringing about a common good to society by encouraging and maintaining a higher degree of service standards. Nevertheless, many circumstantial reasons precluded public acceptance of the findings of these initiatives. Some reasons for

this rejection by the public may have to do with the prevailing sense of self-serving potential of these initiatives on one hand and, on the other, the anticipated loss of rewards, monetary and otherwise, associated with granting such status to a given group over other competitive groups (Goode, 1960).

The lack of acceptance of the general concept of professionalization might not be particularly difficult to explain, since this kind of dialogue is common when one group is claiming ultimate control over particular areas of expert services to society, in order to provide and maintain higher standards of practice to the public. This control is justified by the application of more stringent licensing criteria and comprehensive guidelines for the services provided (Freidson, 1986). In response, other competing groups might opt either to fulfill these criteria by basically joining the group seeking control, or to utilize alternative approaches to obtain similar recognition, thereby maintaining the existing balance (Wolinsky, 1993). Public willingness and support may contribute to the final say on gauging the privileges each of the groups will receive, based on the demand-supply scenario (Huag & Sussman, 1968). A classic example of such relationships exists between mainstream medical practice and alternative medicine, such as homeopathy, and chiropractor practice.

These control tensions are not restricted to the situations between groups, but may well occur, at times, within a given discipline, in cases of the emergence of a subspecialized or special-interest group, that makes claim to an even higher degree of technical and/or scientific competence. Such claims will undoubtedly make certain members of the group look less competent with the applications of these new and "additional" criteria (Goode, 1960).

Historically, medicine and its practitioners enjoyed a longstanding privilege of being considered the prime example of what constitutes a “profession” and “professionals” (Frenk et al., 1993). From the turn of twentieth century to the late 1980s, most conceptualizations and discussions of the status of professionalism in medicine were initiated by groups, other than physicians, in order to gain insights on what and why medicine had such a status (e.g. Nursing and Pharmacy). Subsequently, these authors applied and contrasted the findings of their analyses to their particular situations, in order to gain similar recognition for being a professional group. Notably, most of these analyses were undertaken by educators, philosophers, ethicists, and sociologists. While the focus of these analyses was medicine, its practitioners and the nature and characteristics of doctor-patient relationships, physicians and their medical organizations, either were not interested or were defensive toward some of the more critical writings by these authors. Cruess and Cruess argue that the interest of physicians, as a community with respect to the issues of professionalism and professionalization, only started as a new wave in the last two or three decades of the twentieth century (Cruess & Cruess, 1997a). In contrast, other authors had suggested that such erosions started earlier in the 1950s, when medicine became affected with a confusion of identity: Is medicine a profession or a business? (Kassirer, 1993). This state of confusion was compounded (or exacerbated) by the invasion of the megacorporations, private and public, into the “new medical-industrial complex” (Reed & Evans, 1987, p. 3279), making the need to define the terms clearly and to refine the boundaries between these conflicting forces a mere necessity and not merely an option. With such longstanding issues surrounding the nature of professionalism in medicine remaining unanswered, a critical evaluation of

professionalism, as the basis for medical education, seems long overdue (Cruess, Cruess, & Johnston, 1999).

### Definitions of Terms

The growing interest in the topic of “medical professionalism,” though widespread, is hampered by the lack of a clear definition of the term. For instance, professional development and continuing education have been used interchangeably to describe both the maintenance of skills and the dissemination of cutting edge discipline knowledge, including new research findings and consensus-building related to emerging and changing practice issues. Because of the variable perceptions regarding the meaning and the connotation of the term professionalism, there is a press to reach “toward a normative definition of medical professionalism” through grounded inquiry, and to reach a certain degree of consensus sufficient to enable medical education leaders and licensing bodies to base further discussions on such vital issues in the future (Swick, 2000).

Extensive background information is not found in medicine, but rather in other disciplines, where most of the discussion took place during a good part of the twentieth century. Hence, the conceptual characteristics that shape professions, professionalism, and professionalization processes will be presented from the following four perspectives.

### The Sociological Perspective

Goode (1960), a sociologist from Columbia University, in a seminal presidential address at the annual meeting of the Eastern Sociological Society, presented the notion that various occupations exist on different points along a “professional continuum.” Goode highlighted the relationships of the three professions of sociology, psychology, and medicine (psychiatry), and their competition over the right to provide and to control

services to the public as they relate to the practice of clinical psychology. He separated the defining characteristics of professionals into two main subgroups: two “core,” and ten “derived characteristics” (see Table 1) (Goode, 1960).

Table 1

Summary of Goode’s Professional Characteristics

|  |
|--|
| <b>Core</b>  |
| <ol style="list-style-type: none"> <li>1. Prolonged specialized training in a body of abstract knowledge.</li> <li>2. Collectivity or service orientation.</li> </ol>  |
| <b>Derived</b>   |
| <ol style="list-style-type: none"> <li>1. The profession determine its own standards of education and training.</li> <li>2. The student professional goes through a more far-reaching adult socialization experience than the learners in other occupations.</li> <li>3. Professional practice is often legally recognized by some form of licensure.</li> <li>4. Licensing and admission boards are ... [staffed] by members of the profession.</li> <li>5. The profession shapes most legislation concerned with the profession.</li> <li>6. The occupation gains in income, power, and prestige ranking, and can demand higher caliber students.</li> <li>7. The practitioner is relatively free of lay evaluation and control.</li> <li>8. The norms of practice enforced by the profession are more stringent than legal controls.</li> <li>9. Members are more strongly identified and affiliated with the profession than are members of other occupations with their professions or occupations.</li> <li>10. The profession is more likely to be a terminal occupation. Members do not care to leave it, and a higher proportion assert that if they had it to do over again, they would choose that type of work again.</li> </ol> |

Source: (Goode, 1960).

Goode asserted that these ten derived features are caused by the two core, or essential, characteristics. Further, an important analysis of the interaction between these factors, professionals, society, and the state is elegantly presented by Goode;

Consequently, an important part of the process by which an occupation becomes a profession is the gradual institutionalization of various role relationships between itself and other parts of the society. These clients or agencies, or the society generally, will concede autonomy to the profession only if its members are able and willing to police themselves; will grant higher fees or prestige only when both



its competence and its area of competence seem to merit them; or will grant an effective monopoly to the profession through licensure that it is the sole master of its social craft, and that its decisions are not to be reviewed by other professions (Goode, 1960, p. 903).

Therefore, from Goode's viewpoint, the pivotal creation and possession of new and specialized knowledge represent a basic foundation of professionalism. Subsequently, this knowledge enables professionals to solve specific human problems and to provide specialized services to the public, who will, in turn, grant them certain privileges in terms of power, income, and prestige (Goode, 1960). This particular perspective prevailed throughout the next four decades among many of the definitions and conceptualizations of the term profession and remains a defining feature of professionalism in contemporary literature.

Freidson's professional dominance perspective. An alternative perspective on the nature of professionalism was initially described by Freidson (1970), and provocatively propagated over the next three decades (Freidson, 1986, 1993). In his arguments he refuted "causal" relationships between the two "core" characteristics and the ten "derived" characteristics suggested by Goode. Freidson stressed that five out of ten of Goode's derived characteristics—"professional self-determination of its own standards of education and training; professional practice legal recognition by some form of licensure; licensing and admission boards are .... [staffed] by members of the profession; profession shapes most legislation concerned with the profession; and practitioner relatively freedom of lay evaluation and control" (p. 77)—are the essential ingredients in creating a state of "functional" and "professional autonomy." In turn, such autonomy

distinguishes professional groups from other occupational affiliations. In particular, he argued that **autonomy** represents the basic underpinning of defining professions (Freidson, 1970). He used examples from a number of different aspiring allied health fields, like pharmacy and nursing, as prime examples where the core characteristics of prolonged, abstract, and specialized training, and the collective service commitments did not necessarily grant them the autonomy they deserved. Freidson viewed the politically driven and institutionally persistent lobbying process of professionalization as an essentially persuasive process to attain autonomy and ultimate control for full dominance over other competing groups.

In concluding his discussion on the formal characteristics of the professions, Freidson reminds us of yet another essential proviso to professional autonomy, when he stated, "Just as autonomy is the test of professional status, so is self-regulation the test of professional autonomy" (p. 84). In other words, to earn professional status, the professionalizing group should pay the expected cost, by being accountable to individuals and society-at-large, an issue that will be revisited in a later section on the contemporary definition of professionalism in medicine.

It is important to notice how influential and provocative Freidson's writings have been. Although his writings at times have been troublesome to the medical profession, his sustained work in this field has been central to discussions on this topic since the publication of his book in 1970. His writings influenced the North American medical social sciences literature, particularly in the following decades (Hafferty & McKinlay, 1993b). Meanwhile, other authors presented theoretical bases for the notion of deprofessionalization (Haug, 1973, 1988) and proletarianization (McKinlay, 1973) of

medicine from the sociological perspectives, but their conclusions were neither based on testable hypotheses nor supported by data (Wolinsky, 1993). Nevertheless, some degree of noticeable decline in professional autonomy, the hallmark for Freidson's perspective, is agreed upon even by Friedson, although implicitly, in his more recent publications;

Before we even pretend to be able to determine whether professions are powerful or powerless, we must examine[d] the entire range of professional institutions and their connections with the ultimate sources of power: the state and capital. Should we do that scrupulously, and examine the workings of the state and of corporate capital rather than merely their formal structure, and the actual professional labor process rather than the formal administrative procedures said to control it, we would avoid much of the sterile debate that has exercised us for long and instead collect and exchange new, richer information that will be considerably more enlightening, even if not so striking or entertaining. (Freidson, 1993, p. 66)

Strict application of Freidson's professional dominance perspective in the Canadian context has been discussed by Coburn (1993). The increasing public demands for cost effectiveness from medical professions, as well as the introduction of state regulation in the provisions of health services, may have been signals that a certain degree of "deprofessionalization" of medicine is taking place. On the other hand, the strong persistence of internal self-regulation by medicine is viewed as maintenance of autonomy, a fundamental condition for being a profession (Coburn, 1993).

Thus, from the sociological perspective, the degree of self-regulation is considered one of the major determinants of being a profession. Obtaining such status results from creating and displaying specialized kinds of knowledge and services, which

determine other characteristics of professionalism. Regular internal reviews and audits ensure the provision of higher standards of performance and reinforce accountability of the profession to society. The specific application of these critical principles, self-regulation, maintenance of higher standards, and accountability, will become more relevant to this presentation when the contemporary concepts in medical professionalism are discussed.

### The Educational Perspective

Educators have also struggled with the concept of professionalism. Houle (1980), in *Continuing Learning in the Professions*, provided an interesting commentary as a definition of professionals:

The lives of some men and women are structurally shaped by the fact that they are deeply versed in advanced and subtle bodies of knowledge, which they apply with dedication in solving complex practical problems. They learn by study, apprenticeship, and experience, both by expanding their comprehension of formal disciplines and by finding new ways to use them to achieve specific end, constantly moving forward and backward from theory to practice so that each enriches the other. Such people protect one another and are sometimes extended special protection by society far beyond that granted to other citizens. The price of protection is vigilance against poor performance and unethical behavior, and that the privileged person exercises vigilance, by others of similar specialization, and by society. These people are called professionals. (Houle, 1980, p. 1).

The above definition was crucial to Houle’s subsequent presentations and discussions related to the nature of education, socialization, certification, induction, and the continuing education of professionals, and to the professional obligation, individually and collectively, in maintaining the acclaimed high standards to society by members of the profession. It was not the intention of Houle to specifically discuss the education of teachers, but that discussion was necessary in order to help readers understand the professional obligation of educators to society. Despite its emphasis on teaching, his definition included most of the recurring themes that underpin being a professional in the contemporary medical perspective. Moreover, Houle elaborated on fourteen characteristics that he considered necessary prerequisites to the dynamic professionalization process. These characteristics are listed and summarized in Table. 2.

Table 2

Houle’s Professional Characteristics

|  |   |
|--|---|
| 1 -  | As many members as possible of the professionalizing group should be concerned with clarifying its defining function or functions |
| <b>Performance Characteristics</b>         |   |
| 2 -  | Mastery of theoretical knowledge  |
| 3 -  | Capacity to solve problems  |
| 4 -  | Use of practical knowledge  |
| <b>Collective Identity Characteristics</b> |   |
| 5 -  | Self-enhancement  |
| 6 -  | Formal training   |
| 7 -  | Credentialing   |
| 8 -  | Creation of a subculture: with distinctive traditions, role differentiation, and relationships                                    |
| <b>Set of Regulation to Ensure</b>         |   |
| 9 -  | Legal reinforcement   |
| 10 -                                       | Public acceptance   |
| 11 -                                       | Ethical practice  |
| 12 -                                       | Penalties   |
| 13 -                                       | Relations to other vocations  |
| 14 -                                       | Relations to users of services  |

Source: (Houle, 1980).

The similarities between Houle's and Goode's views are the focus on the possession of the distinctive and special performance parameters, the provision of service components, and the elements of self-governance by the profession. A key feature of professional dominance that was stressed in Friedson's sociological perspective was replaced in Houle's framework as an arrangement of relationships, without any hierarchical structure, among a given profession and other co-existing professional or vocational groups. Important additions by the educational perspective to the contemporary framework of medical professionalism are the constant linkage between the actual practice of problem solving activities and the scholarly inquiries by the profession; and the self-direction to maintain the practical competence throughout one's professional career. The diagram in Appendix A, suggested by Houle, represents this key feature of his model. As shown in the figure, the formal training and socialization into the profession enable the learner to be inducted as a recognized professional, but the active process of maintaining such status is by continuing to be a self-directed learner, and in so doing, achieving positive advancement in the chosen field of specialization. Later in this section, these key additions from the educational perspective will be further elaborated upon within the context of the contemporary medical perspective of professionalism.

### The Philosophical Perspective

Philosophers also have examined the concept of professionalism. Sullivan (1995), in *Work and Integrity: The Crisis and the Promise of Professionalism in America* suggested yet another variant on the definition of professions:

Typically as occupations characterized by three features: specialized training in a field of **codified knowledge** usually acquired by formal education and apprenticeship, public recognition of a certain **autonomy** on the part of the community of practitioners to regulate their own standards of practice, and a commitment to provide service to the public which goes **beyond the economic** welfare of the practitioners. (Sullivan, 1995b, p. 2)

The first two features included in Sullivan's definition resemble those of Goode's and Freidson's professional dominance sociological perspectives, respectively. The distinctive feature in Sullivan's view, which is typical for the philosophical perspective, is the altruistic dimension which represents an anchor (or a central pillar) for professionalism from the moral and ethical point of view. This was recently echoed by Hensel and Dickey (1998) and Sullivan (2000) when they argued that neither specialized knowledge nor clinical expertise, though essential, would justify maintaining the traditional position of autonomy and self-regulation for medicine (Hensel et al., 1998; Sullivan, 2000).

In part, the emergence of a broader definition of professionalism is caused by increasingly conflicting and complex social demands on the medical profession (Sullivan, 2000). Calls for universal availability and increased access to care, coupled with optimal cost effectiveness in the face of reduced health care funding and increased technological

costs, are contributing to a complex state of affairs that provides an inviting medium for corporate encroachment in the provision of health care services (Wolinsky, 1993). Faced with such a progressive invasion by a corporate model of health services delivery, as in the United States, medical professionals may find themselves in the a situation of an “epic clash of cultures between commercial and professional traditions” (McArthur et al., 1997, p. 985).

The philosophical literature adds an important dimension to the emerging conceptualization of professionalism. The focus on the ethical aspects of professionalism is concerned, more with the one-to-one patient-healer relationship (Cruess et al., 1997a; Sullivan, 1995b). In contrast, the sociological perspective is more inclined to elaborate on the political relations between society, as clients or consumers, and the professions as institutionalized bodies of knowledge, through which dominance is re-enforced (Freidson, 1986). Furthermore, physicians, as masters of knowledge, and technical and highly skilled experts are trusted to provide impartial advices and service both to the public and to the health administrators. This shift away from physicians directly controlling health care spending has been seen by some authors (e.g. Cruess et al., 1999) as providing a renewed opportunity for medicine to reestablish its professional status in the western world. Hence, the focus is shifted again to be on “the importance of the individual physician as healer in both society’s view of medicine and medicine’s itself” (Cruess et al., 1999, p. 878).

These distinctions constitute important pillars for the professionalization of medicine, as Sullivan commented (Sullivan, 2000); “What is missing from these ways of responding to contemporary challenges is precisely the moral core of professionalism: the



contract between professional and society in which physician and patient are bound together within a larger 'body politic'" (Sullivan, 2000, p. 673). Having these similarities and differences among the sociological, educational, and philosophical perspectives delineated is an essential task in order to understand contemporary definitions of professionalism in medicine. These definitions will be discussed in the next section.

### Contemporary Medical Perspective

Definitions of medical professionalism are not only constantly changing, but the complex individual and cultural perceptions about its meaning may vary greatly according to many social, economic, and political interactions in different parts of the world (Hafferty et al., 1993b). Hence, it is probably more effective to develop a list of the key features that shape medical professionalism according to the complexity of a given society (Cruess et al., 1997a).

As discussed earlier, medical professionalism can be best viewed as a contract between an individual patient or society and the physician or the medical associations. The specific duties or characteristics that physicians should maintain, individually and collectively, in order to maintain certain privileges granted to them by society, or the state, for the overall best interest of both, were recently summarized by Swick (2000). Swick highlighted nine key elements to be considered in order to reach "a normative definition of medical professionalism" (Swick, 2000) (See Table 3).

Table 3  
Attributes of Professionalism in Medicine

|  |
|--|
| <p>Physicians</p> <ol style="list-style-type: none"> <li>1. Subordinate their own interests to the interest of others</li> <li>2. Adhere to high ethical and moral standards</li> <li>3. Respond to societal needs and reflect a social contract with the communities served</li> <li>4. Evince core humanistic values, including             <ul style="list-style-type: none"> <li>honesty and integrity</li> <li>caring and compassion</li> <li>altruism and empathy</li> <li>respect for others and trustworthiness</li> </ul> </li> <li>5. Exercise accountability for themselves and for their colleagues</li> <li>6. Demonstrate a continuing commitment to excellence</li> <li>7. Exhibit a commitment to scholarship and to advancing their field</li> <li>8. Deal with high levels of complexities and uncertainty</li> <li>9. Reflect upon their actions and decisions</li> </ol> |
|--|

Source: (Swick, 2000; 2001, p. 157).

The analysis and discussion within the following subsections link the above listed nine elements with our developing framework.

1) Physicians subordinate their own best interests to meet the needs of their patients and communities. This altruistic view is considered to be one of the most essential elements of professionalism in medicine, as evidenced by its inclusion in many reports related to the issue of medical professionalism (e.g. Project Professionalism, EFPO, and the CanMEDS 2000 Project). Racy (1990) asserts that in order to define medical professionalism precisely, human altruism should be the centerpiece component (Racy, 1990). Racy argues that when self-serving approaches are taken while neglecting self-discipline, the end result is loss of professional status. His argument is captured in the famous Thomas Browne's quote; "I desire rather to cure his infirmities than my own necessity" quoted in (Racy, 1990, p. 138).

The specific application of such a fundamental feature depends on the nature and scope of a particular physician or a practice group. At times, the conflicting demands can be between the private and the public health care systems, and in other situations they can be between the patient's interests and the scholarly interests of the medical profession or the professional. The ability of the medical practitioners and organizations to act as patient advocates enable them to fully and effectively discharge these conflicting duties in a rational and altruistic manner, and in turn, continue to be trusted as a self-regulated vocational group (Emanuel, 1997; Swick, 2000).

The importance of this characteristic is not limited only to the practice of medicine. It is also fundamental to teaching in the medical residency training programs (Racy, 1990). Hence, one of eight elements of the "transformative model of residency education," suggested by Johnson (2000), calls for medical residents to acquire the "ability to balance and choose among conflicting priorities and at some point transcend self-interest" during their residency training years (Johnson, 2000). It follows that it is the responsibility of medical educators to ensure that such ability is integrated as a main component of residency education, and to develop and adapt reliable measures to assess the acquisition of this capability by residents before their final qualification as independent medical professionals (Murray, Gruppen, Catton, Hays, & Woolliscroft, 2000).

2) Ethics and moral aspect. Although it is difficult to assess adherence to ethical and moral standards in one's personal and professional life, this aspect is an essential element of professionalism in medicine. Such a vital and important idealistic motive is complicated, even at the basic level of service provision in today's practice settings,

where accessibility and cost-effectiveness, both in the hand of corporations in some regions (e.g. United States of America), or the state in other countries (e.g. Canada), is beyond the direct influence of the medical profession (Reed et al., 1987). While higher ethical standards are being adopted by professional medical organizations to maintain the professional oath and to provide equal healing opportunities for the rich and poor, actual implementation of service provision may be inaccessible to direct influence of these organizations (Sullivan, 1995b). Such an argument reflects and highlights a key benefit to the public from direct involvement of professional healers in the health policy decision-making process. Unless this role is taken seriously by physicians, this loss of the one-on-one trustful healer-patient relationship will result in the demise of the profession, as a consequence of the "industrialization of medicine" (Relman, 1998; Swick, 2000).

3) Feeling the public (society) pulse. Professional medical practitioners should demonstrate appropriate responsiveness to the needs of the society they serve. Again, this element calls upon medical professionals to return to the basic dedication of the prevention and treatment of illness in society, while simultaneously accommodating the quickly changing the progressively enlightened society (Swick, 2000). The once acceptable authoritarian approach to the provision of codified technical knowledge is no longer an option (Mechanic, 1985). Medical professionals and their organizations, individually and collectively, must be systemically prepared to respond to these changes. Such responses include identifying the needs and the expectations of both society and all health care providers, and more importantly, incorporating such findings into day-to-day clinical practice and teaching. Incorporating these needs in teaching implies evaluating and certifying future practitioners according to these identified needs and expectations.

This is the focus of the notion of “social leadership by the professions” or the “civic professionalism” which was addressed and defined by Sullivan:

Professionals and their aspirations would be central to progressivism. In the ensuing debates and struggles, some influential members of the new professional class would develop a conception of professionalism opposed to the narrowing implicit in its technical form, a professionalism designed to complement and strengthen a new civic politics. We will call this civic professionalism (Sullivan, 1995b, p. 61).

4) Maintaining the humanistic attributes of the healing art. Sullivan’s position is supported by Blumenthal (1994), who presented the notion that unless organized medicine reintegrates these qualities into its routine, “the profession’s autonomy will become a moot point.” Further, he asserts a new view on the relationship between autonomy and the professional status. He stated that medical professionalism is not only a measure of autonomy, rather it is the public’s trust in medicine that will re-establish medicine’s autonomous position in the face of the dynamic health care reform movements (Blumenthal, 1994). For medical practitioners to proclaim professionalism, they should embrace “core humanistic values, including honesty and integrity, caring and compassion, altruism and empathy, ..., and trustworthiness ” (Swick, 2000, p. 614). This characteristic of professionalism suggests that physicians need to make themselves accessible, affordable, and compassionate towards their patients, patient’s families, colleagues, and others and to consider these values as vital obligations. By dedicating their knowledge and expertise to the “ministry of medicine,” physicians can resume their status and may not be subjected to external enforcement initiatives, which will be

requested by the public and/or the state (Spivey, 1990). Of course, not a single, or even a group of attributes would necessarily free the profession from society's enforcement attempts, unless coupled by maintaining transparency and accountability to the profession's internal processes.

5) Self- and peer-accountability. Medical professionals need to maintain a higher degree of self-accountability, as well as accountability toward their co-workers. The maintenance of this accountability should be evident in specifying high standards of accountability in practice, training, credentialing, and licensing to the members of the profession. Blumenthal's view above, was echoed recently by many other authors like Sullivan (2000) and Swick et al. (2000) who argued that this accountability is the main source of the public's willingness to grant medicine, and to the same extent the law, the privilege of autonomy. Any significant erosion in such trust mechanisms, either by entrepreneurial, personal, or corporate interests, or just by the lack of the needed proactive initiative by professionals, may eventually lead to the creation of an external authority to regulate what was once a self-regulated guild. An example of such an emerging tension can be seen in the British medical system, where lack of a proactive approach by the RCPS (UK), to maintain the public trust by responding, in a timely manner, to the calls for accountability, had led the state to demand an end to historically maintained self-regulation by the profession, even at the accreditation levels by these colleges (Severs & Crane, 2000).

6) Self-direction to maintenance of competence. Medical professionals maintain an ongoing and "continuing commitment to excellence" (Swick, 2000, p. 615).

Professionalism has been considered, from the sociological perspective, as fundamentally

based on the power gained through the possession and the generation of specialized knowledge resulting in a particular position to provide highly sophisticated technical skills (Freidson, 1970; Goode, 1960). Even more important is the continuing learning process after being inducted into the profession. This feature, of being self-directed and intrinsically motivated to achieve excellence, is expected from all medical students, residents, and practicing physicians. Means to foster and prove the acquisition, development, and maintenance of such attributes become a pre-requisite for maintaining accountability by the profession to the public. This feature of professionalism is highlighted in all of the major projects dealing with medical education reform.

7) Scientific contribution and advancement of a body of knowledge. Medical practitioners, in addition to maintaining an internal focus on excellence, should work in a cooperative and collaborative manner to ensure the advances in the current body of medical knowledge, as well as discovering new facts externally. This must be applied at both the individual patient and the community levels. Practically, this is done by incorporating principles of Evidence-Based Medicine in order to either generate general consensus statements or develop and update current practice guidelines for the care of common clinical conditions. Pedersen (2001) recently discussed this aspect from the practice of Anesthesia's point of view (Pedersen et al., 2001). Another needed commitment is toward the advancement of both basic science and clinical research; such roles are clearly emphasized in the CanMEDS 2000 Project (see below).

8) Dealing with ambiguity and uncertainty. Southon and Braithwaite (1998) suggested yet another approach to articulating medical professionalism in order to optimize its central role in developing a collaborative working climate within the

emerging organizational structure. They pointed out that medical professionalism is explained preferably as “primarily a task-related phenomenon,” rather than through the prevailing social dominance perspective. With tasks that are characteristically uncertain and complex, as in the practice of medicine, health care reform movements tend to address such issues in a simplified manner. This approach downgrades the role of professionalism and frequently leads to inconsistencies, conflicts, and contradictions (Southon et al., 1998). Examples of such issues are evident in many health care systems around the world, the closest of which is the health care reform in the United States of America. The intent of that movement was to provide improved access to care to all and to improve the quality of services provided. While the advances in technology and bioscientific knowledge ensured the quality improvement in services, the corporate culture and cost issues reduced access to even greater sections of society (Hafferty & McKinlay, 1993a). Even the most critical authors, Friedson, and Hafferty and McKinlay, warn against this simplistic approach to the complex phenomenon of medical professionalism (Hafferty et al., 1993a).

9) Self-reflection. Self-reflection in both professional and personal domains is a powerful tool that medical professionals can utilize to advance their commitment to both internal and external accountability. It empowers individuals to apply critical and deductive reasoning, particularly in the complex situations that are typical in medical practice and training settings (Epstein, 1999). On the contrary, total lack of self-doubt or arrogance of knowledge are not traits of superior physicians or scientists, who frequently review their decisions accordingly, given a particular context (Ingelfinger, 1980).



In summary, basic components that constitute and underlie the connotation of medical professionalism can be traced to a variety of sociological, educational, and philosophical perspectives. These elements have been presented and critically analyzed in this section of the developing framework. At times, some of the modern medical perspectives on professionalism in medicine might be perceived to be too idealistic or extremely nebulous, and at other times too difficult to contemplate each component in isolation of other elements. Regardless of how complicated, intermingled, and controversial some of the above concepts are, they should be translated into actions that are aimed to renew motives in reversing the perceived trend of de-professionalization of medicine (Cruess & Cruess, 1997b; Ludmerer, 1999). Such rejuvenation needs changes within medical school teaching curricula at both undergraduate and postgraduate levels.

#### General Education for Doctors

Given the contentious issues and conflicts related to current medical practice, which have direct impact on the teaching of medicine, a careful examination of the evolution of medical education is warranted. This review will include the trend to restore the balance between conflicting demands on the medical education process to get it back “on track” in fulfilling its mission to humanity (society).

#### A Brief Review of Medical Education History

Historically, future healers (medical students) were pre-screened before being accepted into medical apprenticeship to ensure that they possessed basic social skills. This pre-selection happened years before students came in contact with actual patients. Further, medieval universities screened candidates by prescribing a Liberal Arts degree (three years) as a prerequisite for enrolment in medical school program of studies. With

few exceptions, this practice changed with the German-based basic sciences revolution, after which bio-scientific competency became the benchmark in accepting applicants, in educating students, and in preparing doctors for professional practice (Puschmann et al., 1966).

Since this medical scientific revolution became the new order of doing things in medical education an interesting dichotomy existed for decades. This trend was manifested by the overwhelming emphasis on the academic achievements of students, prior to their admission into the course of study in the medical college. Once admitted, under the “scientific healer” model, they were assumed to be in need of more of the same bio-scientific knowledge, in order to become competent practitioners, (Hunt, Scott, Phillips, Yergan, & Greig, 1987; Phelan, Obenshain, & Galey, 1993). On the other hand, candidates were expected to become “professionals” without explicit instruction to this effect, as they progressed through their medical training. Implicitly, they were expected to become socialized to medical ethical practices and other professional attributes by simply observing the “outstanding role models.” Consequently, although assessment and evaluation of these elements were needed, they were not implemented during the first eight decades of the last century. No other kind of medical knowledge was expected to be acquired in this way. As an analogy, surgical residents do not observe surgeons performing a certain number of complex surgeries and then complete “a written test” which, if passed, could qualify them to practice these procedures independently. Such an analogy illustrates how contemporary society might view past educational practices with respect to the development of important aspects of medical knowledge.

To support this analysis, there is ample evidence about the disproportional development of medical students' and residents' skills and knowledge areas across their years of training. While technical and scientific knowledge grow continually, their professional, behavioural, and moral reasoning decline or fail to grow at a similar rate as their age-matched controls (Feudtner, Christakis, & Christakis, 1994; Wolf, Balson, Faucett, & Randall, 1989).

What, then, is the relationship between these emerging concerns and the clinical practice of medicine? Do these concerns translate into issues in practice situations? The answers to these questions might not come as huge surprises. Most of the complaints against physicians are not because of inadequate technical skills or the lack of medical knowledge, but are due to either unprofessional conduct or deficiency in interpersonal skills (Ginsburg et al., 2000; Papadakis, Osborn, Cooke, & Healy, 1999). These are not particularly new developments, since the same trend has been noted and reported in the 1970s. Pickering (1973), in a survey sponsored by the Ontario Medical Association, has shown that one of the two main areas with deficits in medical profession, as seen by the patients, was related to poor "human relations" by physicians (the other was access to care) cited in (Neufeld et al., 1985).

#### Dual Role of Today's Physician, an Alternative Model

These trends indicate that there is a distinction to be made, between two complementary roles for each medical doctor: those of "healer" and "professional." Cruess and Cruess, argued that both roles have different historical origins and developmental stages that make them separate from each other (Cruess et al., 1997a). They contended that both roles should be presented and explicitly taught to all

undergraduate and postgraduate medical learners, as well as should become a part of ongoing continuing medical education. The authors cautioned medical educators about ignoring the explicit teaching of professionalism as such, which would make future medical practitioners vulnerable to repeating the mistakes of their predecessors. They also pointed out that “medicine’s self-perception differs from society’s view of the profession. We create a mystique around ourselves, which we then come to believe.” (p. 408). Thus, it is essential to assume a critical and realistic perspective of both roles when formulating academic plans to educate and prepare all physicians for their future professional duties.

Unfortunately, Cruess and Cruess (1997) did not stress the role of medical educators in testing and evaluating these attributes or in ensuring the existence of such knowledge in each and every graduating medical practitioner. Hence, a “New Curriculum” emerged four decades ago in the western world to bring back a balance between bio-scientific knowledge and these professional attributes, once considered “soft” social skills, as dual cornerstones for educating all men and women in medicine. As stated by Ginsburg and Regeher (2000), “for the future of medicine, attention to the teaching and evaluation of professionalism is vital” (Ginsburg et al., 2000). The calls for a new curriculum stimulated the introduction of many revitalizing projects in medical education in North America. These projects constitute the focus of the next section of this review.

## Recent North American Medical Education Reforms

### Overview and Background

This section will focus mainly on two important projects in North American professional medical education during the last decade. Project Professionalism, by the American Board of Internal Medicine (ABIM), and Educating Future Physicians for Ontario (EFPO) have provided much needed momentum and interest in the field, and subsequently have fueled the ongoing CanMEDS 2000 Project by the Royal College of Physicians and Surgeons of Canada (RCPSC).

### Project Professionalism

Project Professionalism was initiated by the American Board of Internal Medicine (ABIM) in response to the perceived ongoing erosion in professional standards. The main sources for such erosion, as viewed by many American authors, were progressive changes in the physicians' payment plans; invasion by competitive business companies to provide the most cost-effective care, regardless of many other compelling professional values; and increasing levels of competition between different medical professional groups (Spivey, 1990). Corporate structures, at many times, are contradictory to the professional humanistic qualities of "integrity, respect, and compassion" (Blumenthal, 1994; McArthur et al., 1997; Wolinsky, 1993). Beginning in the early 1990s, Project Professionalism was a movement to revive and maintain professionalism as a fundamental component of the art and science of medicine, through the process of education and certification of specialists and sub-specialists in Internal Medicine.

Within Project Professionalism, the emphasis was on the dual role of attending to patient's needs as the focal point of care, while holding high regard for maintaining a

unique professional relationship within and between health care professional groups. Hence, the ABIM defines medical professionalism, as it relates to this framework, as an aspiration “to altruism, accountability, excellence, duty, service, honor, integrity, and respect for others” (Stobo & Blank, 1994). The final project report provided further information and explicit definitions of each of these components; signs and symptoms of their loss with examples such as abuse of power, arrogance, greed, misrepresentation, impairment, lack of conscientiousness, and many more manifestations of loss of professional values; listings and example of aids and barriers to being professional during the years of training; together with strategies to assess and evaluate professionalism in internal medicine residents during the years of training. Appendices B, C, D, and E contain forms that were developed, as part of the project, to be used by faculty and/or other residents to assess different aspects of professional attributes during residency education (American Board of Internal Medicine, 1995).

Socially Relevant Medical Education: Educating Future Physicians for Ontario (EFPO) Project

The EFPO project also was initiated in the early 1990s as a collaborative effort between five independent medical schools in the province of Ontario, Canada. These were McMaster University Faculty of Health Science, University of Ottawa Faculty of Medicine, Queen’s University Faculty of Health Sciences, University of Toronto Faculty of Medicine, and University of Western Ontario Faculty of Medicine and Dentistry. It is interesting to note the initial stimulus for this important initiative. This project came into existence after the failed Ontario’s physicians strike over the “extra billing” issue in 1987. The failure of that strike raised the awareness of the medical profession about the

increasing gap between the profession's self-image and the perceptions of society-at-large (Neufeld et al., 1998). This is similar to the notion of "medicine identity confusion" that was suggested by Kassirer (Kassirer, 1993).

The EFPO project consisted of two closely related, but independent, stages. The first stage took place between January 1990 to December 1994, while the second extended from January 1995 to December 1999 (Maudsley et al., 2000; Neufeld et al., 1998). The first stage focused on actions required to establish a new vision for society's needs for a responsive medical education, mainly at the undergraduate level, beginning with developing a method for gathering the public's expectations for physicians.

This phase resulted in defining eight descriptive roles for current and future, practicing physicians. These were "medical expert-clinical decision maker, communicator, collaborator, health advocate, [resource] manager, learner, scientist-scholar, and person" (Maudsley et al., 2000, p. 114). The follow-up action steps were to create educational objectives that stem from these expectations, to prepare competent medical educators, to construct valid evaluation tools to ascertain the acquisition of these competencies, and finally to ensure the sustenance of the transformation by developing a committed and stable leadership for the desired project vision (Maudsley et al., 2000).

The second stage of the project placed more emphasis on extending the eight identified roles to residency education programs, and focusing on four competencies, communicator, collaborator, health advocate, and resource manager. An extensive review of various aspects of these two stages of the project has been published recently, giving a detailed account of particular areas like the history, the implementation stages, together

with analysis of the project's success and long term plans (Maudsley et al., 2000; Neufeld et al., 1998).

It is crucial to recognize that the extensive number of national and international reports calling for reform in the medical education field from the early 1900s up to 1993 have resulted in few major changes, despite the recurrent themes for the need to change. These reports called consistently for greater emphasis on "the social nature of the medical profession and self-regulation of the profession" (Christakis, 1995, p. 706), but made few recommendations for implementing these changes. One feature that distinguishes the Educating Future Physicians for Ontario (EFPO) project, from every other initiative in the field of reform in the medical education arena, is its focus on the implementation of the change, rather than on just developing a list of recommendations (Christakis, 1995). The implementation focus is further translated through the adoption of the EFPO vision into actions by the Royal College of Physicians and Surgeons of Canada in its CanMEDS 2000 Project. This project provides a national model for educating, evaluating, certifying, and maintaining the certification of all specialists, and the accreditation of all specialist training programs across Canada.

#### CanMEDS 2000 Project

The Royal College of Physicians and Surgeons of Canada (RCPSC) undertook the CanMEDS 2000 Project as a logical extension and amplification of the EFPO project, in part, to deal with the paradigm shift in the scope and priorities that are needed to achieve the best training environment for future medical specialists in Canada. The Report of the Societal Needs Working Group, which constituted the foundations for the CanMEDS 2000 Project, was presented to the RCPSC Council in 1996. The major reason cited as an



impetus for the project was to “assist future specialists in responding to innumerable challenges as health-care providers – challenges that will require them to function in a health-care system in a constant state of flux and facing increasing fiscal constraints – while providing the best specialty care” (The Royal College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project, 1996, p. 1). The project sought wide-based and active participation from as many stakeholders as possible in a collaborative effort to articulate the required roles for future Royal College fellows. In addition to the public, other participants in this project included nurses and other allied health professionals; medical resident and intern associations; provincial medical colleges, licensing, and health authorities; and the College of Family Physicians of Canada. The findings and recommendations of this report were shared with all concerned, particularly the sixteen medical schools across Canada, where the actual implementation of these new “guidelines” will take place.

The main outcome of this project was the development of the additional six competencies for all specialists, in addition to being Medical Experts and Clinical Decision-Makers. The report stated that the future specialist should also be “a Communicator, a Collaborator, a Manager, a Health Advocate, a Scholar and a Professional.” Complete and detailed descriptions of these roles/ competencies were included in the report, together with specific objectives for each of these seven roles. Appendices F, G, and H contain summarized tables of the essential CanMEDS roles and key competencies, an overview of the educational strategies designed to implement these roles, and suggested evaluation strategies to assess the various competencies (The Royal

College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project, 1996).

The potential challenges to implementing the CanMEDS 2000 Project are numerous. First, these roles might be applicable more to medical than surgical specialty programs, a limitation mentioned briefly in the report itself. Specialties providing a wider range of variable clinical services that bridge medical and surgical areas, like Anesthesiology or surgical-medical intensive care, might present even greater challenges in that they would require composite versions of these general roles applied to them. Hence, the need for further articulation of specialty-specific roles became apparent and was the focus of a follow up task force, the Specialty Physician Resources Working Group. The reports of the new training program objectives for different specialties were published in 2000.

The second limitation is the lack of a cohesive national implementation policy as an integrated portion of the CanMEDS 2000 Project. The report gave broad directions for: learning during the years of residency, general evaluation strategies, and, in particular, encouraged a commitment to faculty development in best implementing these new roles. On the other hand, it is understandable that given the wide variability between various postgraduate specialty programs at different institutions, trying to uniformly implement and enforce such roles might not be practical. Such issues are compounded by decreasing resources and increasingly complex bio-scientific curriculum content (Langer, 2001).

It might be argued that the external accreditation reviews of residency training programs and the certification and re-certification of specialists may well become the

mechanisms to enforce these recommendations at both organizational and individual levels. These processes, particularly accreditation and certification, have stood the test of time and are largely responsible for many positive changes in the field of postgraduate medical training programs in Canada since the 1970s. This observation provided further evidence that candidates' performance assessments can be an influential tool in promoting the change. This view has been explicitly expressed by Neufeld (1985), "Generations of medical students had discovered that the 'bottom line' of getting through the medical school involves understanding the evaluation system and complying with the behavior pattern that it demands. It is the evaluation system that the 'real' objectives of any program are displayed, and the truly important values become apparent" (Neufeld et al., 1985a, p. 7). For that reason, the following section will deal with an overview of physician competence evaluation and assessment, with particular emphasis on non-cognitive aspects of training.

#### Assessments, Evaluations, and Setting of Standards in Medicine

In 1971, a classical and simple definition of educational evaluation as a "systematic collection and analysis of information for the purpose of making decisions" was suggested (Stufflebeam, Foly, Gephart, et al., 1971) cited in (Gordon, 1997). But the question of validity and reliability as a means for assessing physician competence to practice medicine has focused for decades on assessing cognitive and psychomotor skills. This focus is evident from the pattern of assessment methods predominantly used by most of the medical national and international board certification and re-certification processes. Until recently, the methods used extensively in most specialty and subspecialty exams, were the multiple-choice questions (MCQ) and oral or clinical

exams. While the former is an exclusively medical knowledge-based assessment tool with many advantages, it is significantly limited in its ability to reflect on many other crucial aspects of physician practice.

Clinical and/or oral exams, on the other hand, add many other dimensions to the assessment process such as, the assessment of oral communications and interpersonal skills with patients and colleagues; the formulation of problem lists and the setting of priorities; breadth and depth of knowledge; and performance under stress and situations of uncertainties. Hence, the oral examination has achieved status as the "rite of passage" step to the certification in areas of specialization in medicine. That being said, the utility of clinical and oral exams as tools for certification is highly questionable and has long been shown to be unreliable, despite apparent high face-validity (Hubbard, 1971, p. 71) cited in (Muzzin & Hart, 1985).

#### Assessment of Physicians' Competencies

Competency-based medical training. Long (2000) recently reviewed the limitations of the current postgraduate training programs, both in terms of the fixed training time requirement and the lack of accurate evaluation strategies. He argued that, in order to achieve effective competency-based residency training, individual learner abilities should be taken into consideration when developing effective and efficient means for assessment that are both sensitive and specific to each specialty of medicine. He described the experience with this approach in the Neurosurgery Residency Training Program at John Hopkins University School of Medicine, Baltimore, Maryland. The results from their pilot project showed a marked reduction in the time requirement to attain competence, when this approach to evaluation was used. One of the criticisms of

this argument, addressed partially in his discussion, is that accurate methods of evaluation of these specialty-specific competencies should be in place before introducing any significant alterations in the duration of the required length of training (Long, 2000).

What competencies are important? A comprehensive account of the existing methods of assessing clinical competence from a North American and, particularly, a Canadian perspective was provided by Neufeld and Norman (1985). Together with contributing authors, they reviewed a variety of methods that could be used to test the ability of medical students, residents, and physicians to perform the needed medical competencies. The methods presented included: direct observation; oral examinations; various written examinations (Essay, MCQs, and Modified Essay Questions); global rating scales (e.g., Final In-Training Evaluation Report, FITER); medical record review (both the traditional Source-Oriented Record, SOR, and the Problem-Oriented Medical Record, POMR); both linear and branching patient management problems (PMPs); computer simulations (including computer-aided instruction and diagnosis); and simulated patients. The authors reviewed the relevant literature and presented their opinions as field experts of the measurement properties for each of the methods discussed. These properties included: credibility, comprehensiveness, precision, quantitative validity (concurrent, predictive, and construct validity), feasibility, and educational considerations such as appropriateness, user awareness of findings about the strengths and the limitations of the method, and side effects of the method itself (Neufeld, 1985a).

This comprehensive review included many applications in terms of evaluating and assessing different aspects of required competencies of physicians, including assessment

of technical skills, the use of diagnostic tests, and the evaluation of doctor-patient relationships. Education, research, and health care, as well as licensure and certification implications of using these evaluation strategies, also were assessed. Although the authors conceptualized different competencies to be evaluated in physicians, there was a striking absence of any explicit linkages between the necessity of maintaining such efforts in training programs and the collective professional accountability with respect to setting and ensuring high standards to the served society. Indirect evidence about the lack of a comprehensive approach to evaluation can be abstracted from the lack of widespread applications of many of the alternative methods suggested by the authors as an alternative to traditional ways of evaluation. This is more noticeable in some postgraduate training programs, where the reliance on MCQs, oral examinations, and Final In-Training Evaluations reports by the program directors are still the main methods used.

Many of the research questions posed by Neufeld and Norman in 1985 have been answered over the last two decades, and other new methods of evaluations like Objective-Structured Clinical Examinations (OSCE) have been introduced. In addition, a number of factors related to changing practice conditions and changing social values have created increasing pressures on professional medical organizations and medical educators. These changes have resulted from thorough reconsideration of why, what, how, when, and who is responsible to assess, document, process, present, and act upon the result of these evaluations in each branch of medicine. The CanMEDS 2000 Project by the RCPSC of Canada is a landmark step in that direction.

In 1991, the Evaluation Committee of the RCPSC and The McLaughlin Centre for Evaluation appointed a special task force to “study the examination system of the Royal College and to make recommendations to the Evaluation Committee” (p. 1). This initiative was promoted by the progressive changes in the field of evaluation, the wide variations of practice of different specialty examination boards, and the escalating costs of these examinations. This task force utilized a variety of means to gather stakeholders’ views about the process and the impact of evolving evaluation methods. The task force provided a list of 25 recommendations to the RCPSC Council representing the evident commonalities regarding the issue of assessing the clinical competence of residents (Task Force of the Evaluation Committee: The Royal College of Physicians and Surgeons of Canada, 1993). The majority of these recommendations have been implemented, at least in part, since 1993.

One of the important aspects of the task force mandate was, on one hand, to identify challenges created by competing specialty-specific issues and the subsequent need to maintain each specialty uniqueness; and on the other hand, the need to have a widely acceptable standard for the evaluation process. A questionnaire was developed and subsequently answered by 84 educators (61% response rate) from various Canadian medical schools and various committees and task forces who have an intimate involvement in the RCPSC examination and certification process. Areas that had the strongest agreement among the respondents were as follows: the Royal College examination should be concerned with determining the minimum acceptable standard of performance, rather than excellence; the reliability and validity of each assessment and examination method should be measurable and demonstrable; some skills should be

tested by the Royal College, recognizing the need for specialty-specific exams; and similarly, not all skills are amenable to a final test by the College and assessments of these should be delegated to the training programs. In turn, these programs should work to improve their Final In-Training Evaluation Report (FITER) development and documentation methods. It is notable that this last recommendation is still in the process of being realized as a result of another review within the CanMEDS 2000 Project with an implementation date set by the end of 2002.

Other features of this report were the inclusion of information about the evolving role of OSCE station-style examinations in the Royal College exams to assess competencies other than cognitive and psychomotor skills, as well as to call for more relevant examination strategies that had proven records for long-term predictability for actual clinical performance.

#### Tools for Assessing Professionalism

As stated previously, for decades the majority of the published medical education literature had focused on the principles of teaching and evaluating areas that were considered the most valued skills for physicians: problem solving, critical thinking, and psychomotor skills. Interpersonal and communication skills were increasingly recognized as core critical areas, and needed to be assessed during the 1970s, the '80s, and beyond. In contrast, the interest in explicitly teaching and objectively assessing and evaluating these professional skills in a comprehensive and explicit manner is relatively new. Project Professionalism in the US, and EFPO and the CanMEDS Projects in Canada, can be credited with this new emerging wave of interest during the 1990s, or these projects can simply be a reflection of this emerging societal need.



A number of assessment tools are being used by different medical schools to assess medical trainee professional attributes. Sugar, Catton, Tallett, and Rothman (2000) recently reviewed some of the tools used by program directors to guide them in developing professional behaviour evaluation systems according to the objectives of both Project Professionalism and the CanMEDS 2000 Project. They also highlighted dilemmas faced by medical educators in using the results of even well-structured, patient-based, Objective Structured Clinical Examinations (OSCE) as a reflection of attainment of professional values by residents. Mainly this was due to the fact that being in an examination process is likely to encourage candidate to "behave courteously," which may not be predictive of their behaviours when not observed in a clinical encounter. In such circumstances, the test process will show the learner's "knowledge of the importance of manifesting this behaviour, rather than the desired level of living up to that standard," which is the aim of this whole process of revisiting the training programs (Sugar, Catton, Tallett, & Rothman, 2000).

Using questionnaires. As an alternative to OSCE, Arnold (1998) used a multicenter study (n=5) to develop and test a scale to measure professionalism in the medical environment. The instrument was a 12-item questionnaire, based on different components of professionalism as defined by the American Board of Internal Medicine. Factor analysis of the 529 responses showed three factors, "excellence," "honor/integrity," and "altruism/respect" to be responsible for 51% of the total variance (Arnold, Blank, Race, & Cipparrone, 1998). Further subscale analyses showed a need to modify the latter two subscales to achieve higher internal reliability (i.e. higher Cronbach's Alpha values). The authors, in their discussion regarding this attempt to

develop such short and practical instrument in the future, highlighted that an underlying strategy is needed which “encourages individual and collective thinking by the profession about its core values, a healthy exercise that can [re-energize] physicians about their responsibility to patients [society] and their accountability to the medical profession at a time when rigor is critical” (p. 1121).

Self-evaluation. Another approach in assessing professionalism is self-evaluation. While being a self-directed learner and practitioner is a goal cited in most modern medical schools’ mission statements, many medical educators may voice uneasiness when it comes to giving the residents opportunities and responsibilities for the identification and remediation of their weaknesses (Gordon, 1997). In response to these concerns, Gordon (1997) suggested an alternative dual model of evaluation of residents intended to provide the advantage of abolishing the need for evaluators to ascertain high degrees of “psychometric precision, objectivity, and the statistical processing of forms” which sometimes precludes the most effective use of assessment information to guide the learning process. This evaluation model is based on an effective “air-tight” separation between two main areas:

1. Minimal standards-monitoring prerogatives of the faculty, which are controlled by a faculty-dominated professional standards committee. This committee provides a quality-control function.
2. Professional-development prerogatives of the residents, that are under the directive of a resident-dominated professional development committee. This committee provides guidance, support, and empowerment for resident professional development.

The premise of this separation is to provide increased motivation to medical trainees to participate in self-assessment and reflection, to enhance their clinical performance, to increase their self-direction, and to improve communications among medical educators and medical residents and students.

Context-dependent evaluation of professionalism. These alternative approaches identify the role of context in assessing professionalism. Yet, another question becomes essential in reducing the ambiguity of such a socially constructed dimension (construct) as professionalism. What are the acceptable sources, or reference points, for these ethical and moral values? Sullivan (1995) provided useful viewpoints to circumvent such “moral ambiguity” in “the struggle for professional ethics” (Sullivan, 1995a). His suggested approach includes adhering to the “highest ethical achievement” which he defined as: “The ‘practical wisdom,’ the *phronesis* which Aristotle wrote about, meaning the ability to act well in context. Practical wisdom, .... , demands the ability to balance the complexity of situations while maintaining consistent moral aims.” (Sullivan, 1995a, p. 200).

Ginsburg et al. (2000) recently presented and discussed many of the practical challenges faced by the current medical education paradigms when it comes to evaluating this particular competency. They suggested that self-evaluation is helpful in gaining insights into the process used to reach a decision or to adopt certain behaviour. This is particularly important when it comes to situations that are conflict-laden or contextually situated, which are commonplace in medical practice. The authors also stressed the importance of peer evaluation as an additional means to assess professional behaviours,

which should be the focus of such evaluation, rather than relying on vague assessments of both personal character and behavioural traits (Ginsburg et al., 2000).

Evaluation challenges. While the importance of establishing tools for the effective assessment of professionalism is getting wide-spread agreement among different stakeholders, there are a number of potential obstacles to developing such tools. The most important are:

1. Lack of clear standards, because the connotation of professionalism is a value-laden identity formed by a socially constructed process, which becomes even more difficult and complex in multicultural societies such as Canada and the United States. The diversity within the population of medical teachers and practitioners, learners, and the public makes the process of developing across-the-board standards an even more challenging task. Diversity in this context includes, but is not limited to, racial, ideological, cultural, or life-style related factors.
2. Whether it is more important to assess personality traits, attitudes, behaviours, or the thought process leading to a given behaviour has not been determined. Many of the practiced methods and published reports focused on observing single or a combination of variables, such as personality traits which might not be predictive of an individual's future behaviour (Garfinkel, Bagby, Waring, & Dorian, 1997); and/or attitudes which are vaguely described and difficult to assess. Medical practice is characteristically ambiguous and full of conflicting considerations when it comes to setting priorities in dealing with issues of patient care. The ability to test a learner's particular behaviour becomes

secondary to the full understanding of “the process that led to the behaviour” which will be more telling about the learner’s perception of the wide range of concepts involved, rather than a “right or wrong” approach (Ginsburg et al., 2000, p. 6).

3. Faculty are reluctant to fully participate in the identification and documentation of unprofessional behaviour among residents. In assessing the naturally unstable doctor-patient relationship, (i.e. trainees’ humanistic qualities), the effectiveness of direct observation of students and residents is dependent on the participation of at least 20 to 50 faculty members per learner to achieve acceptable validity (Woolliscroft, Howell, Patel, & Swanson, 1994). This number might be impractical to achieve given the degree of reluctance among faculty to participate in such a process. Burack, Irby, Carline, Root, & Larson (1999) published the results of an observational study of attending staff responses to obvious unprofessional behaviours (hostility, rudeness or disrespect for patients) by their trainees. Their findings suggested that, in most cases, faculty did not intervene during these disturbing actions and if they did intervene, used implicit nonverbal gestures, such as remaining silent, not smiling, or maintaining a rigid posture. Moreover, faculty avoided discussing attitudes, professional, or moral issues in an explicit manner, and were rarely observed in providing trainees with any behaviour-specific assessments. There were numerous reasons listed by faculty to explain their “lack of action” and subsequently missing these “teaching opportunities.” These include considerations of the stress of being in training, questionable effectiveness of

potential intervention, inadequate opportunities to observe trainees, and “lack of professional reward for giving negative feedback” (Burack et al., 1999, p. 45).

4. Providing negative feedback, with respect to professionalism, is a high-stakes intervention for both faculty and residents. The perceived risk to faculty of placing the label of “unprofessional” on a given medical trainee’s behaviour forces faculty either to be very cautious to leave “room for face-saving reinterpretations (Burack et al., 1999) or to avoid identifying problems, because of the fear of potential litigation against them (Irby & Milam, 1989). Irby and Milam (1989) identified three cases heard by the Supreme Court of the United States regarding medical school academic dismissal appeals. Though the authors had reassured faculty that such “academic” dismissals would withstand judicial review if grounded professional judgment processes have been used, they cautioned that “disciplinary” dismissals may require more scrutiny, in terms of formal notices, due process, and documented hearing procedures (Burack et al., 1999; Irby et al., 1989). Obviously, these requirements negatively influence the likelihood of any formal faculty involvement.

#### Anesthesiology-Related Literature

Compared to other disciplines in medicine, Anesthesiology is a relatively new field that was recognized as a distinct specialty of medicine only in the 1940s and 1950s in North America, though occasional full-time Anesthesiologists had practiced in these regions even before the twentieth century (Shephard, 1990). The history of Canadian

Anesthesiology, and in particular, the history of the Canadian Anesthesiologists Society from 1943 to 1993, has been reviewed by Shephard (1993). The author reflected in some detail on the specific regional practice and organizational challenges that Anesthesia practitioners, represented by their professional association, then the Canadian Anaesthetists Society (CAS), went through in order to establish today's unique prestigious image of this professional community in this part of the world. The current positive image of Anesthesiology, as a specialty in Canada, is quite different than in most of the major European countries, where Anesthesiology is very much underestimated and regarded as a second class specialty (Dercq, Smets, Somer, & Desantoine, 1998; Swinhoe & Groves 1994). The monograph by Shephard included a chapter that dealt with the training and continuing education in Anaesthesia in an overall and general fashion from the early 1900s, through the 1970s and '80s. The author reviewed the process of establishing today's single standard of credentialing in Anesthesia by the Royal College of Physicians and Surgeons in the Canada in the 1970s, to replace the double standard of certification and fellowship that existed before that time, in which certification and fellowship components existed as independent categories.

It is important to recognize that since Shephard's monograph, entitled *Watching Closely Those who Sleep* was written, many significant changes have occurred in the practice of Anesthesiology. Relatively few patients actually "go to sleep" during the course of their surgeries when they are under the care of Anesthesiologists. Many have either non-surgical treatments or minimally invasive surgical procedures requiring only sedation and/or local Anesthesia. Consequently, the functions of today's Anesthesiologist include many other roles. Anesthesiology departments are transforming into either

preoperative medicine departments, with or without acute and chronic pain services, and intensive care units. Moreover, because of the nature of the work they do, an increasing number of Anesthesiologists are asked to be in charge of various resources management duties, within both the ambulatory and inpatient surgical facilities (Thoms, McHugh, Pollard, & Moore, 1999). In order to be able to carry out these new roles, the current training program structure needs to change to accommodate such new demands (Lenis, 2000), that coincidentally, parallel roles outlined in the CanMEDS 2000 Project.

### Professionalism in Anesthesiology

Some earlier writings on Anesthesiology identified the need for understanding the field in broad professional terms.

While Plato wished to rise to a knowledge of the supreme idea through the realization of the lower ideas, and showed that these contain the essence of things, he pointed out that it is the object of science completely to disclose the attributes of all entities, the idea of good being the keystone of all rational investigation...

Anyone contemplating a surgical operation is subject to some degree of fear, from mild apprehension to extreme dread. Out of it may come excruciating phantasmagoria during the period of going under an anaesthetic, and such spectres are so realistic that severe shock may ensue, the end-result of which nobody can foretell... In conclusion, while regretting the postponement of Plato's Republic, let us so cultivate our science that we may have Anaesthesia fit for this Republic, so desperately needed, so woefully forgotten. (Dr. Wesley Bourne, a pioneer Canadian Anesthesiologist, 1938) cited in (Bevan & Pacelli, 1996).



Perhaps the best articulated notion of Anesthesiology as a profession was offered by Vandam (1973), who suggested the following definition for professionalism in Anesthesia: "a calling in which one professes to have acquired some special knowledge used by way of instructing, guiding, or advising others or of serving them in some art." In addition to mere specialization, he added "professionalism in any field entails study with consequent progress, the teaching and recruitment of others, integration with other branches of medicine, and devotion to the kind of investigation that solves its own problem" (Vandam, 1973, p. 265). The broad perspective taken in this definition was shaped by the pioneers in the field of Anesthesiology, but they also reflect the status of professionalism as it was developing in other disciplines, as demonstrated in the earlier sections of this review.

More recently, citing the organizational changes in the western world, Myerson (1998) warned that professionalism in Anesthesiology is not immune to the current negative trends toward "the role of [the] professional that are [becoming] common to a range of professions" (Myerson, 1998b, p. 1039). Further, citing the British Audit Commission inquiry into: "Who should give anaesthetics?," Myerson stated that;

Our professionalism as ...[Anesthesiologists] is not something we can take for granted; it is not something that is static and unchanging. It is constantly in need of development, of nurturing, if our specialty [is] to survive. The way to ensure that this happens is to instill professional habits in our trainees, using assessment techniques not only [to] measure professional behavior but help to encourage and build it too. Professionalism should not be regarded as a 'second-level' activity to

be mastered after basic skills, but should be integrated from the beginning of training (Myerson, 1998b, p. 1039).

Myerson concluded his editorial by calling upon the medical professionals in Anesthesiology to develop more rigorous approaches for assessing trainees' abilities, based on promoting self-assessments as an essential component in maintaining the professionalism in Anesthesiology.

### Anesthesiology Curriculum and the CanMEDS 2000 Project Objectives

Despite the progressive growth, in scope and complexity of practice, of Anesthesiology as a specialty over the last thirty years, there are a limited number of studies dealing with Anesthesia training, evaluation, and credentialing processes (Klemola & Norros, 1997). Relevant published reports will be explored in the following sections, which will be followed by the final summary of this literature review.

Anesthesiology curriculum. In 1974, Green et al. were the first to propose an "[inter]-national curriculum in Anaesthesia." In addition to the authors' expert opinions, they reviewed and included published curricula from a number of leading training postgraduate Anesthesia programs, on which they based their recommendations regarding the content that candidates need to know during their training. The sources of these data came from four Canadian and four British institutions (Green et al., 1974). This work had, and still has, very important merits as a landmark step in highlighting the knowledge and technical skill areas needed in Anesthesia and internal medicine to safely practice Anesthesiology. These recommendations were considered the essential requirements at that time, given the quick and tremendous growth of the specialty over a short period of time. Strikingly missing, though not surprising, was any mention of either the required

professional attributes or specific interpersonal skills. There is no clear answer to explain this omission, but the following three reasons might be argued as possible explanations, though none can be empirically supported. First, these omission may just reflect the dominant view which did not give due consideration to these issues in medical education in the 1970s and 1980s, even though these issues were being discussed in other fields, such as sociology, education, and philosophy (Cruess et al., 1997a). Second, this omission may reflect the view that these issues of interpersonal skills and professional attributes are a given, and are taken for granted by residents, medical educators, and certifying bodies. A third explanation is founded in the prevalent enrolment pattern at that time, whereby medical graduates worked for a number of years as independent practitioners, before joining a postgraduate specialty training program. Older medical trainees usually possess advanced coping skills, particularly toward the professionalization process (Kay & Blythe, 1984). These re-entry residents came to the training programs environment with rich life experiences and prior professional knowledge (Tweed & Donen, 1994). Consequently, the curriculum outlined by Green et al. might have considered these professional and interpersonal qualities as entry criteria, rather than as learning objectives.

Behavioral objectives. These broad curriculum guidelines translate into the learning objectives observed in Anesthesiology training programs. Girard (1992) compared the responses of two groups of Anesthesiology practitioners in a questionnaire that consisted of 288 behavioural objectives (Girard, 1992). The questionnaire contained about 300 objectives related to the Anesthesia and Internal Medicine rotation components of training. The first group consisted of members of an education committee in a large

academic Anesthesia program at the University of Montreal, Quebec (n=6), and the other group was represented by the non-teaching, practicing Anesthesiologists in community hospitals in the same city (n=24). The behavioural objectives in the questionnaire were derived from an education committee list which included both the RCPSC standards of training, as well as six internal medicine rotations objectives (Critical Care, Hematology, Cardiology, Respiratory Medicine, Nephrology, and Endocrinology). The author demonstrated a high degree of agreement between the two groups with respect to acute care issues, while a lesser degree of agreement was noted on issues related to chronic care areas of the internal medicine rotations' objectives. Interestingly, issues other than pure medical knowledge were not given particular importance either at the level of the drafted objectives, or in the subsequent questionnaire. On the other hand, in the open-ended sections of the returned survey from the non-teaching hospital practitioners, it was suggested that issues of ethical, interpersonal, collaborative, and administrative importance be added to the critical care component of the objectives list. Though this aspect was not emphasized in the paper, it was suggested, based on the community hospital practitioners' perspectives on the relative importance of these traditionally non-acknowledged attributes for Anesthesiology residency.

In 1994, Tweed and Donen proposed yet another curriculum model for future education specialists in Anesthesia. They introduced the experiential curriculum that is both an evidence-based and learner- (problem-) based approach. In their proposed alternate curriculum, the main emphasis was to produce self-directed and self-evaluating learners with an integrated curriculum, to respond to any newly introduced competencies that might be expected from future Anesthesiology practitioners (Tweed et al., 1994). In

such an academic plan, as suggested by Ende and Atkins (1992) and Stark and Lattuca (1997), content-oriented approaches to curriculum do not remain the only focus of education during the years of residency training. Rather, it is a comprehensive and congruent framework that addresses: student needs; desired outcomes; approaches achieved by instruction, tutoring, mentoring, or role-modeling; and the evaluation of methods used to judge the attainment of these desired cognitive, psychomotor, and attitudinal skills required for safe Anesthesia practice (Ende & Atkins 1992; Stark & Lattuca 1997).

To compare the situation in Canada to Anesthesiology training programs in other western countries, Strang and Ball, in 1996, briefly reviewed the structure and the dynamics of Anesthesia training programs in the United States. The authors provided an overview of the various components of training programs in the US, as regulated by the American Board of Anesthesiology (ABA), and in particular, focused on those features that are significantly different than the existing programs in the UK under the umbrella of the Royal College of Anaesthetists of the UK. While there are many differences between programs in the two countries with respect to the timelines of enrolment and duration of training, the collegial and supportive working environment in the American programs was highlighted in the paper as a distinctive feature in the latter. Still, strikingly absent from all these programs was any specific training in management or administration skills (Strang & Ball, 1996).

In the Canadian context, and as a result of the CanMEDS 2000 Project, the RCPSC Specialty Committee on Anesthesia developed a new list of Anesthesiology training objectives based on the CanMEDS 2000 roles (available online, please see

references) (Education Committee of the RCPSC, 2001). While many of the training objectives included within the introduced objectives are not different than previously used by Anesthesia programs, some of the objectives of these roles might be relatively new to many educators in these programs. "New" here does not mean that these aspects are not recognized as part of the practice, rather it is the nature of citing the objectives as explicit training objectives that need to be incorporated into the actual instruction, assessment, and then certification of residents. Thus, once learning objectives are set, the next challenge becomes how to assess whether the learning objectives have been met. Previously used methods in assessment and evaluation of Anesthesia residents, as well as recently suggested improvement in these techniques, will be discussed next.

### Assessment and Evaluation

The following section will briefly review the various means of evaluating learning as they relate to the context of contemporary Anesthesia education and practice. Most of the literature in this section draws from other medical and surgical subspecialty program experiences. Only a few sources are from publications dealing directly with Anesthesia practice in western countries.

Oral exams and cognitive tests. During the Royal College certification process, the utility of oral examination in the assessment of Anesthesia residents' cognitive knowledge, problem solving skills, and communication abilities has been described by Eagle, Martineau, and Hamilton (1993). They also presented briefly the advantages and the major limitations of the other components of the final examinations in Anesthesia: the Final In-Training Evaluation Report (FITER) and the Multiple Choice Questions

(MCQs). From the authors' perspective, the process of the oral examination in Anesthesia has the potential for low face validity and limited comprehensiveness, with no specific predictive validity for the future independent practice of Anesthesia. It is important to note that the process of the oral examination has been changing since their analyses. The training of new examiners, the implementation of clear marking policies with higher number of independent marks (total of 24 marks by six to twelve examiners per candidate), and the utilization of standardized, peer-reviewed questions which are uniformly scattered to cover twelve specific knowledge-grid areas, will potentially improve the serious limitations outlined in Eagle's critique (Eagle, Martineau, & Hamilton, 1993). That being said, the effectiveness of these new strategies to reduce the perceived subjectivity of the oral exam process will still need to be proven.

Direct observation. Doung and Havel (1992) estimated the minimum number of cardiac Anesthesia cases that residents need to manage before achieving an acceptable level of skill to be about 20 for basic cases, and 30 cases for more complicated types of management. They utilized a performance-based case evaluation, through direct observation, and concluded that this method was the best means in dealing with the great interpersonal variability of different residents in achieving the required skills (Duong & Havel, 1992). Utilizing such a mode of assessment to ascertain competence, in isolation of other means, may provide a false sense of security that a resident is ready to perform the task. Inasmuch, it fails to examine deeper levels of performances under adverse conditions of uncertainty and/or rapidly changing circumstances, which is one of the major criticisms of using this method widely (Greaves, 1997). Nevertheless, supplementing direct observation by integrating it with other assessment techniques to

evaluate critical performance qualities has been recognized and advocated (Forster, 1998; Myerson, 1998a).

Assessment of non-cognitive characteristics. The importance of assessing the non-cognitive skills in Anesthesia was shown by Rhoton, Barnes, Flashburg, Ronai, and Springman (1991). In this study, the authors reported the results of a clinical assessment of 37 Anesthesia residents in five US universities over a period of 24 months. Faculty (n=163) observed residents' clinical performance, noted the occurrence of critical incidents, and recorded their comments on CASE (Clinical Anesthesia System of Evaluation) cards, which were subsequently assigned to either positive (n=13) or negative (n=15) categories.

These categories included cognitive (e.g. "Critical Incidents, Management, Efficiency/Organization, Learning Rate/Intelligence, and Pre/Postoperative Care") and non-cognitive (e.g. "Confidence, Composure, Conscientiousness, Eagerness to Learn, Interpersonal Skills, Willingness to Take Instruction, and Unprofessional Behaviour") attributes (p. 360). It was shown clearly that conscientiousness was a strong predictor of both critical incidents, as well as overall performance. While knowledge accounted for most of the management scores, which in combination with conscientiousness, and composure contributed significantly to total critical incidents scores. The authors concluded their report by highlighting the importance of placing more emphasis on assessing these alternate competencies during Anesthesia residency. As stated by Rhoton et al., "medical educators must... broaden the dimension of clinical evaluation methods, [and]...reconsider the lack of emphasis historically placed on the non-cognitive aspects of performance" (Rhoton, Barnes, Flashburg, Ronai, & Springman, 1991).



In a follow-up and similarly-designed study, Rhoton (1994) specifically examined the relationship between the reported unprofessional behaviour and clinical excellence assessment among 71 Anesthesiology residents, over a 24 months observation period. He reaffirmed many of the findings from the previous study regarding the relationship between the cognitive and non-cognitive parameters. Furthermore, the additional analysis of these reports showed that, 1% of the total negative comments (n=27) were reported as a lack of professional behaviour in 15 residents (21%). These behaviours included: unacceptable behaviour; abdication of responsibility outside, or inside, the operating room; fabrication; refusing or disregarding direct orders; and breaking protocols. Another important pattern was also recognized – the fact that “clinical excellence and unprofessional behavior rarely coexist” (Rhoton, 1994, p. 313).

Based on the above work and findings, the Departments of Clinical Education and Anesthesiology, Medical College of Wisconsin, USA, developed minimum criteria for clinical competence of Anesthesiology residents, containing both cognitive and non-cognitive categories. These criteria were developed to be used in evaluating residents at 6 months, first, and third year of their training. The faculty Clinical Competence Committee was assigned the responsibility of residents’ promotion from one to another stage of training. This committee used a cut-of-threshold point that was placed at what they called an “Essential Character Attributes” limit. These attributes were listed on their final reports as “honesty and ethics; reliability, conscientiousness, and responsibility; the ability to learn from experience; appropriate reaction to stressful situations; and freedom from chemical dependence” (p. 663). The lack of any one of the preceding personal characteristics was considered a “basis of an automatic unsatisfactory report from

the...Committee" (Madsen, Woehlck, Cheng, Kampine, & Lauer, 1994, p. 663). This is certainly encouraging progress in the field of assessment and evaluation, but unfortunately, currently there is no evidence to support the effectiveness of such systems, particularly the day-to-day application in education and practice. Nevertheless, this work is still an important advancement in this area.

The importance of the work by Madsen et al. stems from the fact that they developed explicit criteria to assess trainees' performance, based on their respective stages of training. On the other hand, an important question emerges: What are the acceptable means of gathering and generating the necessary input to facilitate the function of the Clinical Competence Committee decision-making process? A recent work by Greaves & Grant (2000) provided some answers to this question (Greaves & Grant, 2000).

Using a qualitative research methodology (a multiple focus group interview technique), Greaves & Grant systematically analyzed 16 Anesthesiologists' (4 trainees and 12 consultants) views regarding the importance and attributes necessary in achieving reliable assessment of clinical competence by direct observation of Anesthesiology trainees. Five questions represented the starting points of discussion. These were, "(a) How do consultants...[Anesthesiologists] currently assess trainees by practice observation?; (b) Can practice observation form the basis of a valid judgment of trainees' competence?; (c) What methods are used by consultants...[Anesthesiologists] to recognize competent behaviour?; (d) Can observation of practice be standardized?; and (e) Is it possible to recognize levels of professional competence appropriate to a

particular stage of training?" (Greaves & Grant, 2000, p. 526). Among the most important findings and contributions from this study are the development of:

1. A list of qualities that emerged, based on congruent opinions, as essential for a competent Anesthesia practice. Again, features other than just cognitive skills resurfaced as integral for such a practice. For example, good manners; good communication and fluency; organization, anticipation, and flexibility; vigilance, responsiveness, and perception, were some of these enlisted characteristics.
2. An inventory of the above characteristics, with specific descriptors for each of the three grid areas, in terms of: lack of, appropriate, or over-expression of the quality of behaviour.

It is important to note the difference in the practice settings between the UK, where the above study took place, and what is currently practiced in Canada. This has to do with consultant (faculty) to resident ratios. In the UK, usually two or three trainees (interns or junior residents) work under the "direct" supervision of a consultant. At other times, senior house officers (called senior registrars) might be in the middle of the practice-observation pyramid, i.e. observing and supervising more junior trainees while being supervised by the consultant. In the Canadian training programs, there is a one-to-one supervising faculty to trainee ratio, with only very rare exceptions. It is not clear whether these practice pattern differences would alter the perception of resident and faculty, in the Canadian context, to the reported findings from the above study.

Nevertheless, this developed list and this inventory represent important progress in the application of direct observation, but are still in need of added refinement through further

educational research and prospective application to an actual training environment, to enhance its construct reliability as a valid assessment tool.

Computer and realistic simulation. The use of an anesthesia screen-based computer stimulator-recorder systems has been proposed as both an educational and an evaluation tool in Anesthesiology (Schwid & O'Donnell, 1990). The use of this modality for these purposes is gaining more acceptance within Anesthesiology, as well as many other medical and surgical specialties (Issenberg et al., 1999; Larbuisson, Pendeville, Nyssen, Janssens, & Mayne, 1999; Sica, Barron, Blum, Frenna, & Raemer, 1999). One of the main reasons for such innovations is the similarities between the complex clinical practice of Anesthesia (in terms of the need to quickly formulate an action plan to diagnose and compact system failures or life-threatening incidents) and other high-risk industries, like space operation and aviation, has been recognized (Gaba, Maxwell, & DeAnda, 1987). Another reason for the use of such technology is the characteristically high degree of unpredictability, uniqueness, and uncertainty in everyday Anesthesiology practice (Klemola et al., 1997). Hence, the advent of a more complex stimulated environment, by incorporating an interactive mannequin that can respond in a physiological- and pharmacological-correct manner, provides another attractive medium for rich interaction, teaching, and evaluating serious, but clinically rare, incidents in a completely controlled environment (Hartmannsgruber, Good, Carovano, Lampotang, & Gravenstein, 1993), without subjecting patients to any risks (Larbuisson et al., 1999).

Recently, the internal consistency and the construct validity of using such stimulated-environments has been shown by Devitt et al. (1998). This group of investigators showed that simple modifications in the simulation protocol could result in

achieving relatively higher internal consistency scores (up to Cronbach alpha value of 0.66) in the assessment modules, both for resident and faculty. Further, more experienced practitioners were able to demonstrate better performance than Anesthesiology residents, reinforcing the discriminate validity of this modality of assessment (Devitt et al., 1998).

A Virtual Anesthesia Training Simulation System™ (VATSS) has been developed in the Department of Anaesthesia, University of Toronto (Canadian Simulation Centre for Human Performance and Crisis Management Training Sunnybrook and Women's College Health Science Centre, 2001). The implementation of an innovative Crisis Management Program (CMP) for Anesthesia residents, using a full-sized mannequin with clinically detectable physical signs concurrent with video taping of the training sessions, has been briefly described by Byrick et al. (1998). Their program is mainly geared for educational rather than assessment or evaluation purposes. Each simulation session is followed by a debriefing meeting in which events, emotions, actions by the residents, as well as processes used to reach given decisions are reviewed, analyzed, and discussed. The program was rated very highly by 95% of the participating residents, particularly the component of immediate videotaping-related feedback. The significant obstacle for such a program is its labor-intensiveness for faculty, which is clearly outweighed by the educational value for the residents involved. Another serious limitation to this innovation is the associated start-up and maintenance costs for such projects, which limits the widespread use of this innovative approach (Byrick, Cleave-Hogg, & McKnight, 1998).

### Validity of Current Assessments

Despite the fact that many decades have passed since the introduction of the fellowship and board certification examinations in Anesthesia in Canada and the US, there were only two references that dealt specifically with the validity of these examinations. In 1994, Slogoff et al. assessed, indirectly, the construct validity of the American Board of Anesthesiology (ABA) certification exam. They compared the actual residents pass rates in the examination with their program directors' willingness to receive one, or more, of three increasingly complex anesthetics from the same residents whom they supervised during the residency training. The proportion of actual pass rates during the final examination were correlated with the personal willingness of the supervising faculty members to be actual patients for these residents. In addition, faculty were asked to select any number of characteristics from a list of 26 personal characteristics that they thought each particular resident would be ranked with a less than average score. Ninety-three residents (7%), of those who were allowed to sit for the final examinations, would not have been rated as acceptable in giving any "personal" anesthetic procedures to their programs directors. About half of these residents had passed the final ABA examinations. On the other hand, 63% (828 residents) were considered to have achieved acceptable clinical skills to administer the three anesthetic procedures on their supervising program directors, including the most complex one, for a sitting posterior fossa craniotomy to remove a brain tumor. This group had the highest pass rates in the ABA exam at 74.6%. The other two groups who would have been considered acceptable in giving intermediate complex anesthetic, laparotomy for acute bowel obstruction (20% of all residents), or only the least complex anesthetic, elective

gall bladder surgery (10% of all residents), had a 54% and 45% pass rate in the final exam, respectively. In addition to the attributes related to the amount and applications of knowledge, other personal qualities included “motivation, clinical judgment, manual dexterity, industriousness, reliability, responsibility, response to criticism, [and] all three characteristics related to handling of stress (ability to prioritize multifaceted problems, smoothness of daily activities, and responses to life threatening situations)” (p. 743), were shown to be important for the Anesthesia practice as, indicated by higher clinical skill ratings by the faculty in this study (Slogoff, Hughes, Hug, Jr., Longnecker, & Saidman, 1994). The authors considered these findings as being supportive of the validity of the ABA examination process.

According to Slogoff et al., amid the personal qualities that were not shown to have any significant correlation with either the faculty ratings, or the future practice of Anesthesia, were, “intellectual honesty and curiosity; interpersonal, doctor-patient, and doctor-doctor relationships;..., treatment plan, [and] record keeping..” (p. 743). This represents yet another stimulus for this master’s thesis project; to compare these findings from the American context in the 1990s, to the perception of the importance of these qualities by faculty and residents in a Canadian context in the 2000s.

The other study that reviewed the validity of the Anesthesia examinations in the Canadian context was published in the *Canadian Journal of Anesthesia* in September, 2000. In a retrospective manner, Kearney et al. obtained the results of 165 resident performances from nine (out of 13) English speaking Canadian Anesthesiology training programs in the in-training American Board of Anesthesiology-American Society of Anesthesiologists (ABA-ASA) exams during the 1995 academic year. These were

compared to the same residents' performance in the final RCSPC exams in Anesthesia (both the written and the oral exam components). A weak to moderate positive correlation ( $r = 0.28 - 0.51$ ) was found between the scores. This study, in addition to having a relatively small number of observations, had other problems in design that preclude any meaningful interpretation of the data. The most important of these problems was the lack of actual exam scores from both examinations; instead the authors correlated the percentile performance results from the ABA-ASA exam to the pass-fail marks in the Canadian exam, and as such, complicated the subsequent interpretation of the study's findings. This critical limitation was only partially addressed in the paper. Of course, it is not a huge surprise that a resident with an outstanding score in one exam (ABA score  $>55\%$  during the internship year) will have a good chance of passing the other Royal College exam (90%) after four or five years of intensive Anesthesia training. Also, this does not really address the relative validity of the exams, because each of them is testing different attributes, with a number of overlapping areas. The ABA-ASA exam is mainly a clinically-oriented, multiple-choice question exam, which tests cognitive knowledge recall and some problem solving "deductive" skills, with no oral component included. In contrast, the Canadian final exam results include both written and oral components, which provide additional means of assessing verbal communication skills and responses to emergency, stressful, and quickly changing simulated clinical scenario (Kearney, Sullivan, & Skakun, 2000).

### Summary

Despite the progressive growth of the specialty of Anesthesiology, it is clear from the literature review conducted to support this study, that there is room to improve



education and evaluation practices in Anesthesiology through “cross pollination” from higher education, as well as other medical education literature. The integration of such teaching and evaluation strategies that have proven to be effective in other fields support the recommendations of the CanMEDS 2000 report and might further enhance the implementation of the new CanMEDS 2000 program objectives within the context of Anesthesiology training programs in Canada.

## Chapter Three

### Methodology

The objective of this research was to provide evidence for the Anesthesia training program directors and administrators to be able to utilize and implement the new curriculum objectives outlined in the CanMEDS 2000 report. The kinds of evidence that represented the focus of the research included: a clear understanding by the residents and faculty of the importance of these roles; the implications surrounding these various roles from both the practice and the educational points of view; the Anesthesiology Department members' preparedness to assume these roles; and their perceived opinions regarding the ability to teach and evaluate all of these roles and competencies. Consequently, the research methodology that was used in this project followed a descriptive research approach. This involved "collecting data in order to ... answer questions concerning the current status of the subject of the study" (Gay, 1987, p. 11).

This particular method of inquiry was chosen because not a lot is known yet about either the perceptions of physicians or residents concerning the relative importance of each of the different roles outlined in the CanMEDS document, or the impact of the CanMEDS 2000 objectives on the Anesthesia training programs. Thus, this project followed an exploratory design to assess opinions about the relevance and the applicability of the CanMEDS 2000 roles in Anesthesia. These descriptive data were collected using a survey format. Data pertaining to the above various aspects were sought and collected from all Anesthesia faculty, practitioners, and residents at a Canadian Anesthesia residency-training program. The main data collection instrument was a

descriptive cross-sectional, self-report questionnaire, which elicited both qualitative and quantitative responses from participants.

The following sections of this chapter will discuss the rationale for using this particular research approach through the presentation of the advantages and disadvantages of the survey inquiry, the different stages and parts of the developed (appended) survey instrument, the procedure for data collection and analyses, limitations of the project and ways to address them, and the ethical considerations of the research process utilized.

### Research Design

Sample survey research was defined by Rea & Parker (1997) as: a process of “soliciting self-reported ....information from people about themselves” (p. 2). The possibility of gathering data from only a representative “sample” to yield meaningful and generalizable results to an entire, or larger, population, is responsible for the wide use of this scientific research method in a variety of public, corporate, and academic investigations (Dillman, 2000; Rea & Parker, 1997). This study protocol followed a modified Dillman’s Tailored Design Methodology (TDM), which is based on four contacts with the potential survey participants. Conceptually, this approach is founded on the “Social Exchange Theory” as a means to explain, predict, and enhance people perception regarding self-administered surveys. Dillman’s TDM predicts that rewards, costs, and trust are the three critical elements determining individual’s actions. As stated by Dillman, “*rewards* are what one expects to gain from a particular activity, *costs* are what one gives up or spends to obtain the rewards, and *trust* is the expectation that in the long run the rewards of doing something will outweigh the costs.” (Dillman, 2000, p. 14).

The procedure followed in this study has been shaped by this approach through the strengthening of the matrix between rewards, cost, and trust. The advantages and disadvantages of using this research design in this study will be discussed in the following subsections.

### Advantages

Compared to alternative methods of descriptive data collection – interview and observation – the use of a sample survey has many advantages. These include the potential for: (a) generalizing the findings to the larger group of practicing Anesthesiologists and residents-in-training in Canada, without the need to survey all of them, resulting in the added benefits of time and cost efficiency; (b) obtaining a snapshot about the prevailing opinions regarding the new CanMEDS 2000 roles, that can be followed up in the future to track the changes in the sample population's perception of the importance of these roles, as well as; (c) assessing their personal preparedness to assume these roles; and (d) determining their ability to teach and to evaluate these new competencies. This research design also helps generate data that can be standardized and readily assessed with advanced computer analysis packages. Inherently, this method of a self-administered or mail-in survey provides the respondents with anonymity and time convenience in terms of when, exactly, they choose to complete the questionnaire. The structured nature of the survey also reduces the researcher/ interviewer-introduced bias which is a well-known disadvantage with personal phone and direct-interviewing or other observational methodologies (Rea et al., 1997).

### Disadvantages

Because many of the questions related to this project in this particular specialty have not been specifically asked before in the field of Anesthesiology training, a new survey instrument needed to be developed, piloted, and then used. This new instrument may have the potential of reduced validity and reliability, which may have a detrimental impact on the applicability and usefulness of the study findings beyond the sample group. Additional resources to develop such an instrument were needed. Also, the possibility of a lower response rate, compared to other in-person types of data collection, may lead to difficulties in generating valid conclusions. Other disadvantages related to this method are self-selection of the respondents; the lack of interviewer involvement, which limit the opportunity for explanations of unclear portions of the instrument; and the lack of opportunity for the recording of spontaneously volunteered reactions (Gay, 1987; Rea et al., 1997). Primary investigator contact numbers were made available to all potential participants to address any such further inquiries. Other approaches used to minimize the potential negative effects of these factors will be addressed in the final chapter (see Limitations section).

### The Questionnaire

As mentioned above, the lack of previously developed acceptable instruments to achieve the aims of this project resulted in the need to develop a specifically designed well-structured questionnaire to collect the required data for the purpose of the research. The appended questionnaire (Appendix K) was developed and used for data collection. A description of the stages of the instrument development and of the instrument, itself, is presented in the following subheadings.

### The Development of the Instrument

Initially, a draft questionnaire based on an earlier survey by Brownell (personal communication, Brownell, 2000) was constructed. This draft was based on the published general objectives of the CanMEDS 2000 Project, as well as on the revised Anesthesia subspecialty training objectives, as approved by the Royal College Specialty Committee on Anesthesia in September 2000 (Royal College of Physicians and Surgeons of Canada, 1995; Education Committee of the RCPSC, 2001). The clarity and effectiveness of this questionnaire were assessed in a special six-member focus group among members of the medical education journal club group at the Faculty of Medicine, the University of Manitoba, where the research was to be conducted. Additionally, copies of this draft were circulated to an additional six-member group from the Anesthesia Department of the same university. The latter group included a chief resident, two recent graduates from the program, and three senior department members. Their comments were sought specifically regarding the following aspects: the length and the complexity of the questionnaire; the clarity of the directions and the instructions in various parts of the instrument; the amount of personal information requested; the adequacy of the information requested; the consistency of the scales used and whether they were easily understood; the balance between quantitative and qualitative portions; and the need to add more or remove some specific options regarding preparing, teaching, and evaluating each of the seven roles of the CanMEDS 2000 in section B of the instrument (i.e. last three subheadings). Finally, the participants were asked if they had any other ideas or areas that they might suggest adding to the instrument. The responses were collated in a systemic manner and incorporated into the subsequent drafts of the instrument.

### The Parts of the Questionnaire

Section A. In this section of the survey, each participant was asked to rate, on a seven-point Likert scale, 27 randomly-sequenced items derived from general competencies, as suggested by the Royal College Report to the Council and the proposed Final In-Training Evaluation Report (FITER) forms. The participants were asked to rank each competency according to its importance to the day-to-day Anesthesia practice, as well as to the teaching of Anesthesiology during the years of residency. The main aim of this part of the questionnaire is to provide a data source for factors analysis, as many of the CanMEDS' generic roles might not be easily distinguishable from each other. For example, the distinction between the Medical Expert and Manager roles might be evident. However, the situation might not be as distinct for other roles, such as Communicator and Collaborator, because since it is essential to be a good communicator to be able to achieve effective collaboration with other health care team members. Thus, by randomly arranging these general competencies, without specific linkage to any of the specific seven CanMEDS 2000 roles, an alternative organization for these competencies might be suggested based on the responses from this sample population. Such findings can be subsequently tested in other programs and/or other disciplines in order to arrive at a specialty-specific composition of these general competencies. Special attention was given to the use single-inference items (or statements), as much as possible, to enhance the subsequent factor analysis procedures.

Section B. This is the longest part of the survey instrument. In this section, each of the seven roles of the Anesthesia training program objectives, as approved by the Royal College Specialty Committee on Anesthesia, was provided at the top of the left-

sided page of the two opposing pages of responses for each of the seven roles. The two pages for each role had five main subheadings dealing with each participant's own point of view (in contrast to section A, which asks about the practice of Anesthesia, in general): the relevance of the role to the practice of Anesthesia; the teaching of Anesthesia residents; the participant's preparedness to teach the role and what they view as the most effective ways to achieve this preparedness; the perceived ease of teaching of the roles and the most effective methods to achieve that; and finally, the feasibility of evaluating and the ways to achieve the most effective evaluation strategy for each particular role.

Participants were given selected opportunities to enter qualitative comments to explain their rankings. For each role, structured responses representing selected methods for facilitating preparedness in assuming the roles, and methods of teaching and evaluating were obtained from a combination of sources. These included published reports by the Royal College (The Royal College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project, 1996), as well as from the reviewed published literature. In addition, each respondent was given an opportunity to include other choices as they saw fit.

The structured responses (ranking) facilitated data analysis and provided an objective and efficient scoring option, whereas the unstructured format provided freedom for the participants to explain their choices and to provide data that was used to enrich the interpretation process (Gay & Airasian, 2000).

Section C. In this section, each respondent was asked again to rank the seven roles according to their own perception from the day-to-day practice of Anesthesia. Using ranking from one, as lowest, to seven, as highest, participants were asked to use each



rank only once. This section represents a confirmatory step in validating the findings from the previous two sections, with having the seven roles ranked and compared to each other.

Section D. The final section of the instrument consists of two parts. The first part of this section consists of a number of general questions asking the participants about their previous knowledge about the CanMEDS 2000 Project, whether they were involved in drafting new program objectives to fit the new CanMEDS' format, and soliciting any other general comments that they might have related to the project at hand.

In the second part of section D, participants were asked to provide basic demographic information about their age group, gender, and their previous education and training in order to provide data to facilitate comparative analyses. Faculty were asked about their affiliations with tertiary (teaching) versus community hospitals; their subspecialty interests, and their current or past involvement in the Anesthesia education activities; basic sciences or clinical research; and departmental, faculty, national, or other administrative positions. Further, residents were asked about their level of training, as well as their special future practice interests regarding particular subspecialties of Anesthesia, Anesthesia education, research, or other administrative aspects of the practice. Each of the above categories of personal information was needed and was collected to better understand the composition of the responding population, as well as to explore possible linkages and relationships among previous, current, or future practice-related factors on the perceived importance of some, or all, of these roles or competencies from individual and group perspectives.

## Procedure

### Sample (Target Population)

The potential participants in this project were all of the Anesthesia Department members at the University of Manitoba affiliated hospitals. Anesthesiologists (including fellows) and residents at the RCPSC Training Program in Anesthesiology at the Faculty of Medicine, the University of Manitoba, Winnipeg, MB, Canada were asked to participate in the project. A smaller group of certified or board eligible Anesthesiologists practicing within the Winnipeg Regional Health Authority (WRHA) hospitals were also approached to participate in the study.

### Administration of the survey

Data collection was done after obtaining the necessary approvals from the University of Manitoba Research Ethics Board, the University of Manitoba Anesthesiology Department Head, and the Anesthesia Program Director of the Winnipeg Regional Health Authority (WRHA-Director) (Appendix I). A comprehensive recruitment approach was utilized following the multiple contact approach as suggested by Dillman (2000). As an introduction for the project, a pre-notice letter was sent a few days before distributing the survey packages to all participants. The pre-notice and survey's cover letters were meant to highlight the importance of the response from all of the faculty and residents, in order to achieve an effective response rate, (Gay et al., 2000, p. 287). The study was also endorsed by the Head of the Anesthesia Department, the WRHA-director, and the Program Director during a Faculty Council meeting. This endorsement is a recommended strategy to establish credibility of the study with participants (Rea et al., 1997, p. 21).

A variety of options were utilized to deliver and administer the survey to ensure the highest possible response rate. On November 16, 2001, packages containing a cover letter, the survey, together with a stamped self-addressed envelope, were distributed to the hospital mailboxes of all department members at the WRHA Hospitals. During the following two weeks, a reminder was sent through the department e-mail list to encourage completion of the questionnaire. Well-developed and operational e-mail lists were available and were accessible by all department members at most of the locations. Similar announcements were made at residents' seminars during their academic day activities, by the chief resident, to further enhance the response rate. As a token of appreciation, a draw for three gift certificates was arranged. The draw was based on the codes of the returned completed surveys from each group of participants, faculty and residents. As with other aspects of handling the original survey forms, the University Teaching Services (UTS) staff member handled this draw.

Three weeks after the initial distribution of the survey, on December 10, 2001, a follow-up, second mailing of the survey packages to participants who had not yet responded was conducted with a reminder to encourage prompt response (Appendix L). Participants were thanked and asked to ignore this reminder if they already had responded (Heberlein & Baumgartner, 1981). Five days before the closing date of the study, January 5, 2002, a thank you and reminder note was sent via e-mail, asking participants to mail in their completed surveys.

Confidential tracking of responses. Each package included a self-addressed envelope for the respondents to return the completed coded surveys. The codes on the returned questionnaires were removed by the UTS Office Staff member, who had signed

a statement of confidentiality (appendix J). This procedure was chosen for two reasons. First, tracking previous respondents was helpful to best direct the second mailing and reduce costs. Second, the office UTS staff member used the codes to enter the name of the respondents into the draw for the financial incentive as a token of appreciation for the Department Members' participation. Again, both of these steps were completed through the UTS office to separate the submission of the survey from the data processing. The UTS staff member was not to be involved at any in processing the completed surveys, to further protect the confidentiality of the responses.

Length of the questionnaire. The length of the survey was estimated to be approximately 30-45 minutes to ensure a high rate of participation. This estimation was established during the constructing and piloting phases of the instrument.

Piloting. Once a draft of the developed questionnaire was formatted, it was pre-tested on 5% of the target population (residents, fellows, and faculty). This step was meant to examine: the clarity of the wording used in the instructions, questions, and directions; the sequencing of the questions; and the confirmation of the length of time needed to complete the survey. The information and feedback were used to fine-tune the survey, as per the current appended format (Rea et al., 1997).

#### Data Analysis

Data from the survey were coded and entered in a database and were analyzed using parametric and nonparametric techniques, as appropriate, using a NCSS (Number Cruncher Statistical System Inc, 2000) and a SAS (System for elementary Statistical Analysis, SAS Institute Inc.) statistical package. The Statistical analysis was done with a formal consultation with bio-statistician, Mrs. Mary Cheang, who was involved in the

project during the planning stage of the proposal, the piloting of the project, and after collection of the data. She assisted in the analysis and the interpretation processes.

Descriptive statistics were used to summarize the data collected in sections A, C, and D of the instrument. Subsequently, the non-parametric test chi square statistics were used to investigate differences (compare) between frequency counts, percentages, as well as proportions for variables with at least two exclusively mutual responses (Scheffler, 1984). On the other hand, parametric tests, t-test, and analysis of variance (ANOVA), were used for comparisons between the means of two or more groups' ratio or interval dependent variables, respectively. These tests were used if the groups' data were normally distributed and with equal variance among the groups. A p value of, or less than 0.05 was considered significant for all of these tests. If multiple tests were performed, the statistical significant levels were adjusted accordingly (Hassard, 1991).

In section A, factor analysis was used to investigate the correlational relationships between the various general competencies of the CanMEDS 2000, regardless of their initial specific roles. The use of this analysis was aimed to "produce a manageable number of factor variables to deal with and [subsequently to] analyze" (Gay et al., 2000, p. 336). These analyses may result in a regrouping of these numerous variables into a smaller condensed number of factors, or roles, from the Anesthesia practitioners' perspective.

The analysis was done at two independent levels – the relevance of these general competencies, as they relate either to the practice or to the teaching of Anesthesia. Initially, principal component analysis was performed to determine the factors' eigenvalues. Scree plots of eigenvalues were then generated and used to determine the

number of factors to be extracted. Factors were then rotated using Varimax (orthogonal rotation), to produce an optimal factor loadings on the factors identified (Kline, 1994).

The internal consistency between variables (items), within each factor was assessed by Cronbach's Coefficient alpha (Cronbach alpha) determination. Subsequently, internal consistency of each subscale was improved by performing a series of Cronbach alpha coefficient calculations for all of the involved variables, and then with each one of the variables in turn removed. If the correlation coefficient was "optimized" with the removal of an item (variable), then that item was deleted from the final factor's variable listing.

In addition, in each part of section A, the Cronbach alpha coefficient was used to assess the internal consistency of all the items listed, that were drafted from CanMEDS general competencies. This step represented one of the means of assessing this part of the instrument's reliability profile.

Qualitative data entries from respondents in the structured response sections (e.g. elaboration of the quantitative responses, explanations for extreme responses, and "other" quantitative data) were categorized and then analyzed to identify themes and issues. These qualitative data were used to enhance and/or confirm findings from other sections of the instrument, to enrich the discussion section of the final report of this project, as well as to provide some in-depth explanations for the observed trends in the collected responses (Rea et al., 1997).

#### Ethical Considerations

Guidelines for dealing with the ethics of using human participants in non-therapeutic investigations were adhered to during all stages of this project, including

participant recruitment, data collections and entry, data analysis, and subsequent presentation and/or reporting of the results. Specific issues related to informed consent; privacy and confidentiality; risks and benefits to individual participants, the medical profession and society; remuneration to study participants; and issues related to vulnerable populations were observed as per the recently published Guidelines on Ethics of Clinical Research in Anesthesia (Guidelines on the ethics of clinical research in anesthesia, 2000). These guidelines are adapted from the Tri-Council Policy Statement, particularly the Ethical Conduct for Research Involving Humans (The Tri-Council (MRC), 2001). Respect for human dignity is the fundamental principle of all these regulations, which was adhered to during this project. A summary of this research proposal, together with the instrument for data collection, was reviewed and approved by the University of Manitoba Research Ethics Committee, before the project initiation.

#### Voluntary Participation & Informed Consent

All of the Anesthesia department members were invited to participate anonymously in this relatively non-intrusive, self-administered survey research project. The pre-notice and the cover letter (Appendix K) provided the study participants with some brief general introductory information about the project's background, its aims, the potential benefits, as well as highlighted the importance of their participation in the project. A list of non-respondents to the first survey was maintained by the UTS staff member. As stated before, this staff member had signed a confidentiality pledge and was independent from the study team. This list was used for the purpose of the second mailing of the material. All potential respondents had the option of declining to participate by simply discarding the survey packages.

### Privacy & Confidentiality

Despite the fact that this is an anonymous questionnaire study, the use of a particular population, as defined in this project, may subject participants, even with the use of as few as two or three elements of personal information, to the potential for easy identification by applying simple exclusion criteria. This was a recognized potential risk. Potentially revealing, essential personal information asked in the demographic section of the survey was kept to a minimum. Personal information required for subsequent analysis as dictated by the project aims as outlined in the purpose of the study, had been identified from the preliminary literature review and prior consultations with various experts. Thus, only factors that were deemed potentially important were solicited. The returned forms were assigned codes, for the purpose of facilitating the process of tracking records during analysis, as explained above. These codes were not be linked to any specified name listings or any other identification mechanisms, except temporarily by the UTS staff member.

Subsequently, data was entered into a personal computer Excel workbook sheet by the principal investigator. Raw data were only available to the project investigators, the involved bio-statistician, and the University of Manitoba Research Ethics Committee, on a need-to-know basis. The original completed survey forms will be kept in the department safe, for up to ten years, before destruction as per the University Ethics policy (2001). All participants were assured that their privacy and confidentiality would be respected. Participants' responses, identities and personal information were protected at all times. The analysis, results and findings of the study are presented in group format, rather than individually.



### Potential Benefits and Risks

The anticipated benefits of the project as, outlined in Chapter One, were summarized for the participants. Issues related to privacy are addressed above. There was no particular physical or mental risk anticipated from participating in this task.

### Vulnerable Populations and Justice

Residents and fellows-in-training can be viewed as potentially vulnerable participants in research projects. In this particular project, the opinions of this group were solicited, as were all other faculty participants, on a voluntary basis. Informal communications with many residents in the program and the Program Director indicated that this is not an issue, given the methodology that was used in this project. All residents and faculty participants were treated with due fairness at all stages and given the option of withdrawal from the study at any time. A special circumstance is present for the fellows in the department. These are certified graduates who are pursuing an additional one or two years of supervised clinical or research training. Given their small number, (two to three fellows in the department), they were included with the faculty for the purpose of this project, as their responses will logically follow those of recent program graduates.

### Summary

In chapter three, a detailed account was given of the research design and the methodology that was used in this descriptive research project. The advantages and disadvantages of this research approach were initially discussed, followed by an explanation of the need to develop the project survey instrument, the various stages of the instrument development, and the data analysis approaches that were used. Particular

emphasis on the methods of establishing validity and reliability of this new instrument together with the ethical considerations were then discussed as they relate to this study.

## Chapter Four

### Results

In this chapter, a summary of the study findings is presented. The presentation of results begins with information on the response rates and is followed by a description of the study participants' demographics. The questionnaire results are reported in a section-by-section reporting of the findings, followed by the organization of the questionnaire format.

#### Response Rates

Using the procedure described in the preceding chapter, 130 survey packages were initially distributed on November 16<sup>th</sup>, 2001. Six practitioners were unavailable during the study period, and one respondent refused to participate (returned blank form), leaving a total of 123 potential respondents. During the subsequent three weeks, 79 (63.7 %) surveys were returned. A second mailing of 46 replacement packages was done on December 10<sup>th</sup>, 2001, which resulted in a further 22 surveys returned by the closing date of the study period, January 5<sup>th</sup>, 2002. The final response rate was 82 % (Table 4). This response rate was consistent across the three main subgroups in the study: Tertiary, Non-Tertiary practitioners, and Residents Groups.

Table 4  
Numbers of Surveys Mailed and Received

|   | <u>n</u>   |
|---|------------|
| Surveys delivered to hospital mailboxes                     | 130        |
| Number of practitioners unavailable during the study period | 6          |
| Respondents refused to participate (returned blank form)    | 1          |
| Total number of possible respondents                        | <b>123</b> |
| Number of surveys mailed to non-respondents                 | 46         |
| Number of surveys returned from the first distribution      | 79         |
| Number of surveys returned from the second mailing          | 22         |
| <b>Total Completed Surveys</b>                              | <b>101</b> |

### Participant Demographics

Table 5 presents a summary of the general demographic information for the participants in the study. Attending staff Anesthesiologists were divided into two major groups, tertiary and non-tertiary hospital groups. The tertiary hospital group (Tertiary Group, n=55) represents Anesthesiologists working in the University of Manitoba main teaching hospitals: Saint Boniface General Hospital and the Health Sciences Centre, which includes the General, Women's, and Children's Hospitals. On the other hand, all but two of the non-tertiary hospital staff group (Non-Tertiary Group, n=26) were Anesthesiologists practicing in the five city community hospitals Anesthesia Departments. These hospitals are the Grace, Victoria, Seven Oaks, Concordia, and Misericordia General Hospitals. The other two practitioners in this (Non-Tertiary) group included an Anesthesiologist who is working mainly at a freestanding surgical clinic, and an Anesthesiologist who works full-time in a medical administration position. Residents in-training (Residents Group, n=20) represented the third major group in the study.

#### Age, Gender, and Country and Year of Medical School

The participants' age, gender, country, and year of obtaining their medical degree are also shown in Table 5. The mean age for the study participants was 44.4 years, which was very similar to the mean age of the Tertiary Group (46.1 years), while the Residents Group was younger (29.2 years), and the Non-Tertiary Group consisted of older practitioners (52.1 years). One participant did not specify his/her age. In terms of gender, 81% of participants were male, with a male-to-female ratio fairly similar among the three main groups. Two respondents from the Non-Tertiary Group did not specify their gender.

Table 5  
Participants' Demographic Information

| Variable                  | Attending staff |                 | Residents       | Overall          |
|---------------------------|-----------------|-----------------|-----------------|------------------|
|                           | Tertiary        | Non-Tertiary    |                 |                  |
| Number                    | 55              | 26              | 20              | 101              |
| Age (Mean $\pm$ SD) years | 46.1 $\pm$ 7.8  | 52.1 $\pm$ 11.6 | 29.2 $\pm$ 3.4* | 44.4 $\pm$ 11.4* |
| Gender Male: Female       | 47:8            | 19:5**          | 16:4            | 82:17**          |
| Country of MD Degree      |                 |                 |                 |                  |
| Canada                    | 54              | 15              | 16              | 85               |
| Europe                    | 1               | 7               | —               | 8                |
| Other                     | —               | 4               | 4               | 8                |
| Year of MD Degree         |                 |                 |                 |                  |
| No Response               | 1               |                 | 1               | 2                |
| Prior to 1961             | —               | 4               | —               | 4                |
| 1961-1970                 | 8               | 8               | —               | 16               |
| 1971-1980                 | 18              | 8               | —               | 26               |
| 1981-1990                 | 23              | 4               | —               | 27               |
| 1991-2001                 | 5               | 2               | 19              | 26               |

\* One participant did not specify age

\*\* Two participants did not specify gender

All but 16 participants are graduates of Canadian medical schools. Eight respondents had graduated from European medical colleges, seven of whom are in the Non-Tertiary Group. The other subgroup, consisting mainly of African and Asian Medical School graduates, are equally divided, four in each of the Non-Tertiary and Resident Groups. The distribution of the year of graduation among the various groups is shown on the last section of Table 5. Recent graduates (graduating in the last ten years) are mostly represented in the Resident Group, while the majority of the practitioners in the Tertiary Group had graduated between 1971 to 1990. The year of graduation for the Non-Tertiary Group practitioners are, more or less, evenly distributed over the last four decades.

Other than the primary Anesthesia training and certification which is presented in the next subsection, more than half (55%) of the study participants, including residents, listed at least one additional degree. Appendix M lists the number and types of other degrees held by the study participants. Some of the unknown and not commonly-used abbreviations entered by participants precluded any further classification and meaningful interpretation of responses to this question of the survey.

#### Attending Anesthesiologists Training, Certification, and Practice Profile

Of the 81 Anesthesiologists who participated in this study, 79% had their Anesthesia training entirely in Canada, and 13.6% had a similar training with an additional training in a USA- (7.4%), South African- (3.7%), or European- (2.5%) based Anesthesia training program. Smaller proportions of the remaining practitioners had their Anesthesia training exclusively in Europe, USA, or other countries. Table 6 shows the information regarding country and the year of completion of Anesthesia training/

Table 6  
Attending Staffs Country and Year of Certification, and Number of (Mean  $\pm$ SD) Years in Anesthesia Practice

|   | Tertiary  |                 | Non-Tertiary |                  | Overall   |                 |
|---|-----------|-----------------|--------------|------------------|-----------|-----------------|
|   | n         | %               | n            | %                | n         | %               |
| <b>Country of Anesthesia Certification</b>          |           |                 |              |                  |           |                 |
| Canada  | 47        | 85.5            | 17           | 65.4             | 64        | 79.0            |
| Canada/USA  | 6         | 10.9            | 0            | 0.0              | 6         | 7.4             |
| Europe  | 0         | 0.0             | 3            | 11.5             | 3         | 3.7             |
| USA   | 1         | 1.8             | 0            | 0.0              | 1         | 1.2             |
| Canada/Africa                                       | 1         | 1.8             | 2            | 7.7              | 3         | 3.7             |
| Canada/Europe                                       | 0         | 0.0             | 2            | 7.7              | 2         | 2.5             |
| Other   | 0         | 0.0             | 2            | 7.7              | 2         | 2.5             |
| <b>Total</b>  | <b>55</b> | <b>100</b>      | <b>26</b>    | <b>100</b>       | <b>81</b> | <b>100</b>      |
| <b>Year of certification/completion of training</b> |           |                 |              |                  |           |                 |
| no response   | 0         | 0.0             | 2            | 7.7              | 2         | 2.5             |
| Prior to 1960                                       | 0         | 0.0             | 2            | 7.7              | 2         | 2.5             |
| 1961-1970   | 4         | 7.3             | 4            | 15.4             | 8         | 9.9             |
| 1971-1980   | 6         | 10.9            | 5            | 19.2             | 11        | 13.6            |
| 1981-1990   | 23        | 41.8            | 5            | 19.2             | 28        | 34.6            |
| 1991-2001   | 22        | 40.0            | 8            | 30.8             | 30        | 37.0            |
| <b>Total</b>  | <b>55</b> | <b>100</b>      | <b>26</b>    | <b>100.0</b>     | <b>81</b> | <b>100.0</b>    |
| <b>Number of years in practice</b>                  |           |                 |              |                  |           |                 |
| up to 10  | 21        | 14.2 $\pm$ 8.3* | 26           | 21.7 $\pm$ 12.8* | 81        | 16.6 $\pm$ 10.5 |
| 11 to 20  | 23        | 38.2            | 5            | 19.2             | 26        | 32.1            |
| 21 to 30  | 10        | 41.8            | 9            | 34.6             | 32        | 39.5            |
| 31 to 40  | 1         | 18.2            | 4            | 15.4             | 14        | 17.3            |
| 41 to 50  | 0         | 1.8             | 6            | 23.1             | 7         | 8.6             |
| <b>Total</b>  | <b>55</b> | <b>100</b>      | <b>26</b>    | <b>100.0</b>     | <b>81</b> | <b>100.0</b>    |

\* *p* value = .002



certification in the attending Anesthesiologist groups.

Also shown in Table 6 is the mean number of years in Anesthesia practice among the two groups. While the overall average was 16.6 years of Anaesthesia practice for the 81 Anesthesiologists, the Non-Tertiary Group had significantly longer periods in practice of more than 7.5 years, on average, than the Tertiary Group practitioners.

When asked about their subspecialty and/or special practice areas of interest, 63 Anesthesiologists indicated at least one area of such interest, while 29 and 7 respondents indicated two and three areas of interest, respectively. Provision of regional Anesthesia and acute pain management was the most chosen category in both settings, whereas Cardiac Anesthesia was the next chosen category predominantly in the Tertiary Group. A detailed account of the study participants' choices of subspecialties is outlined in Table 7.

#### Scholarly (Teaching and Research) and Administrative Participation

In terms of teaching participation, a single participant from the Non-Tertiary Group (3.8%) is currently a member of the programs' education committee; the rest of the committee membership is represented by participants from the Tertiary Group (10 members, or 18.2% of the group). As indicated in Table 8, there are no other striking differences between the groups in terms of Past or Only-During Residency membership categories in the Program Education Committee. Also shown in the other half of the table are the current and previous contributions of each group of practitioners to the teaching in the undergraduate and/or the postgraduate levels. It is interesting to note the relatively larger proportion of involvement in undergraduate teaching occurring in the non-tertiary practice settings. This is reflective of the changing curriculum in the medical school that encourages community-based training opportunities for medical students.

Table 7  
Attending Staff's Subspecialty and /or Special Practice Interests

| <b>Subspecialty/Area of interest</b> | <b>Tertiary<br/><u>n</u></b> | <b>Non-Tertiary<br/><u>n</u></b> |
|--------------------------------------|------------------------------|----------------------------------|
| No Response                          | 6                            | 12                               |
| Regional Anesthesia/Acute Pain       | 19                           | 8                                |
| Cardiac Anesthesia                   | 14                           | 1                                |
| Obstetric Anesthesia                 | 9                            | 4                                |
| Neuro-Anesthesia                     | 8                            | 2                                |
| Chronic Pain                         | 7                            | 2                                |
| Pediatric Anesthesia                 | 5                            |                                  |
| Medical Education                    | 4                            |                                  |
| Intensive Care                       | 4                            |                                  |
| Preoperative Care (PAC, PARR)        | 2                            | 1                                |
| Ambulatory Care                      |                              | 3                                |
| Ophthalmology Anesthesia             |                              | 2                                |
| Anesthesia for Orthopedics           | 1                            |                                  |
| Administration                       | 1                            |                                  |
| Research                             | 1                            |                                  |
| Dental                               |                              | 1                                |
| <b>Total Responses</b>               | <b>75*</b>                   | <b>24**</b>                      |

\* 20 participants chose two categories and six chose three categories.

\*\* 9 participants chose two categories and one chose three categories.

PAC=Pre-Anesthesia Clinic, PARR=Post-Anesthesia Recovery Room.

Table 8  
Attending Staff's Teaching Participation

|   | Tertiary  |            | Non-Tertiary |            | Overall   |            |
|---|-----------|------------|--------------|------------|-----------|------------|
|   | <u>n</u>  | %          | <u>n</u>     | %          | <u>n</u>  | %          |
| <b>Program Education Committee Membership</b> |           |            |              |            |           |            |
| No Response                                   | 15        | 27.3       | 11           | 42.3       | 26        | 32.1       |
| Current                                       | 10        | 18.2       | 1            | 3.8        | 11        | 13.6       |
| Past  | 14        | 25.5       | 7            | 26.9       | 21        | 25.9       |
| Only During Residency                         | 16        | 29.1       | 7            | 26.9       | 23        | 28.4       |
| <b>Total</b>                                  | <b>55</b> | <b>100</b> | <b>26</b>    | <b>100</b> | <b>81</b> | <b>100</b> |
| <b>Involvement in Teaching</b>                |           |            |              |            |           |            |
| No Response                                   | 2         | 3.6        | 4            | 15.4       | 6         | 7.4        |
| Current                                       |           |            |              |            |           |            |
| <i>Undergraduate</i>                          | 1         | 1.8        | 6            | 23.1       | 7         | 8.6        |
| <i>Postgraduate</i>                           | 12        | 21.8       | 2            | 7.7        | 14        | 17.3       |
| <i>Both</i>                                   | 40        | 72.7       | 8            | 30.8       | 48        | 59.3       |
| Past  |           |            |              |            |           |            |
| <i>Undergraduate</i>                          | 0         | 0.0        | 2            | 7.7        | 2         | 2.5        |
| <i>Postgraduate</i>                           | 0         | 0.0        | 1            | 3.8        | 1         | 1.2        |
| <i>Both</i>                                   | 0         | 0.0        | 3            | 11.5       | 3         | 3.7        |
| <b>Total</b>                                  | <b>55</b> | <b>100</b> | <b>26</b>    | <b>100</b> | <b>81</b> | <b>100</b> |

Regarding attending staff's research participation, which is shown in Table 9, 28% are currently involved in clinical research, 1% are interested in basic sciences research only, while 5% are involved in both clinical and basic sciences research. The Non-Tertiary Group shows a similar larger contribution to the clinical research category in the past.

When it comes to administration involvement, as can be seen in Table 10, three quarters of attending Anesthesiologists are currently, or had been involved in the past, in at least one or more administrative roles. Regardless of their current practice location, Anesthesiologists from our survey population are actively involved at many administrative levels, locally, provincially, nationally and internationally. Other additional positions held and listed by participants are as follows:

- Chair - Anesthetic of Inter/national Anesthesia Society (n=4),
- Program Director (n=2)
- Government Anesthesia/medical /Surgical (n=2)
- Member of Manitoba Medical Association Board of Directors (n=1)
- Chairman Bylaw Committee (n=1)
- Director of Research Lab (n=1)
- International lecturer on specific topics (n=1)
- Equipment Coordinator (n=1)
- Internet (n=1)

Table 9  
Attending Staff's Research Participation

| Research Participation         | Tertiary  |            | Non-Tertiary |            | Overall   |            |
|--------------------------------|-----------|------------|--------------|------------|-----------|------------|
|                                | <u>n</u>  | %          | <u>n</u>     | %          | <u>n</u>  | %          |
| No Response                    | 11        | 20.0       | 8            | 30.8       | 19        | 23.5       |
| Current                        |           |            |              |            |           |            |
| <i>Clinical Research</i>       | 21        | 38.2       | 2            | 7.7        | 23        | 28.4       |
| <i>Basic Sciences Research</i> | 1         | 1.8        | 0            | 0.0        | 1         | 1.2        |
| <i>Both</i>                    | 4         | 7.3        | 0            | 0.0        | 4         | 4.9        |
| Past                           |           |            |              |            |           |            |
| <i>Clinical Research</i>       | 10        | 18.2       | 11           | 42.3       | 21        | 25.9       |
| <i>Basic Sciences Research</i> | 4         | 7.3        | 3            | 11.5       | 7         | 8.6        |
| <i>Both</i>                    | 4         | 7.3        | 2            | 7.7        | 6         | 7.4        |
| <b>Total</b>                   | <b>55</b> | <b>100</b> | <b>26</b>    | <b>100</b> | <b>81</b> | <b>100</b> |

Table 10  
Attending Staff's Level of Administration Involvement and Duration (Mean  $\pm$ SD) in Years

| Level                  | Tertiary    |                 | Non-Tertiary |               |
|------------------------|-------------|-----------------|--------------|---------------|
|                        | <u>n</u>    | Duration        | <u>n</u>     | Duration      |
| No Response            | 15          |                 | 9            |               |
| Department             |             |                 |              |               |
| <i>Current</i>         | 18          | 12.7 $\pm$ 8.8  | 5            | 9.8 $\pm$ 8.2 |
| <i>Past</i>            | 11          | 6.1 $\pm$ 3.3   | 6            | 6.5 $\pm$ 2.7 |
| Hospital               |             |                 |              |               |
| <i>Current</i>         | 13          | 8.6 $\pm$ 9.3   | 6            | 8.3 $\pm$ 8.1 |
| <i>Past</i>            | 9           | 5.2 $\pm$ 2.9   | 6            | 8.5 $\pm$ 4.1 |
| Medical School         |             |                 |              |               |
| <i>Current</i>         | 2           | 15.5 $\pm$ 13.4 | 0            |               |
| <i>Past</i>            | 5           | 3.2 $\pm$ 1.8   | 5            | 4.4 $\pm$ 3.6 |
| University             |             |                 |              |               |
| <i>Current</i>         | 9           | 7.5 $\pm$ 7.7   | 1            | 1             |
| <i>Past</i>            | 5           | 4.8 $\pm$ 3.7   | 4            | 9.5 $\pm$ 4.1 |
| Provincial             |             |                 |              |               |
| <i>Current</i>         | 4           | 3.8 $\pm$ 1.3   | 2            | 4 $\pm$ 4.2   |
| <i>Past</i>            | 8           | 6.1 $\pm$ 4.2   | 4            | 5 $\pm$ 3.6   |
| National/International |             |                 |              |               |
| <i>Current</i>         | 4           | 9.8 $\pm$ 4.1   | 1            | 2             |
| <i>Past</i>            | 1           | 1               | 3            | 6 $\pm$ 3.6   |
| <b>Total</b>           | <b>104*</b> |                 | <b>52*</b>   |               |

\* Many staff listed more than one position

Residents' Level of Training, and Scholarly, Administrative, and Subspecialty Interests

As can be seen in Table 11, the participating Resident Group included all of the residents in the Anesthesia training program except four (one resident from each year, except the final year, did not participate in the study). Each resident was asked about her/his future practice plans. Of the participating 20 residents, 85% indicated interest in teaching, and a similar percentage reported an interest in research. A high proportion of residents chose both undergraduate and postgraduate medical education categories (70%). In the research category, clinical research is the predominant (75%) choice among this group. Only 7 (35%) residents listed current interest in administration, with the 65% either not interested or uncertain, in this regard.

Table 12 lists the subspecialty interests of the Resident Group. More than half of the 14 residents who indicated at least one subspecialty interest, have chosen non-operating room based areas of specialization, specifically chronic pain and intensive care medicine. Two residents indicated interest in pursuing a subspecialty training but are not yet certain about their future choices. Only one resident had listed an interest in palliative care, as an additional professional role, beside the listed categories.

Table 11  
Residents' Level of Training, Education, Research, and Administration Interests

| Variable                                | n         | %          |
|---|-----------|------------|
| <b>Level of Training In the Program</b> |           |            |
| <i>PGY1</i>                             | 4         | 20.0       |
| <i>PGY2</i>                             | 5         | 25.0       |
| <i>PGY3</i>                             | 4         | 20.0       |
| <i>PGY4</i>                             | 5         | 25.0       |
| <i>PGY5</i>                             | 2         | 10.0       |
| <b>Total</b>                            | <b>20</b> | <b>100</b> |
| <b>Interest in Teaching</b>             |           |            |
| <i>No response</i>                      | 3         | 15.0       |
| <i>Undergraduate</i>                    | 1         | 5.0        |
| <i>Postgraduate</i>                     | 2         | 10.0       |
| <i>Both</i>                             | 14        | 70.0       |
| <b>Total</b>                            | <b>20</b> | <b>100</b> |
| <b>Research Interest</b>                |           |            |
| <i>No response</i>                      | 3         | 15.0       |
| <i>Basic Sciences</i>                   | 2         | 10.0       |
| <i>Clinical Research</i>                | 12        | 60.0       |
| <i>Both</i>                             | 3         | 15.0       |
| <b>Total</b>                            | <b>20</b> | <b>100</b> |
| <b>Interest in Administration</b>       |           |            |
| <i>No response</i>                      | 4         | 20.0       |
| <i>Yes</i>                              | 7         | 35.0       |
| <i>No</i>                               | 8         | 40.0       |
| <i>Other-Uncertain</i>                  | 1         | 5.0        |
| <b>Total</b>                            | <b>20</b> | <b>100</b> |

PGY- Postgraduate Year



Table 12  
Residents' Subspecialty Interests

| <b>Subspecialty of interest</b> | <b><u>n</u></b> |
|---------------------------------|-----------------|
| No Response                     | 6               |
| <i>Chronic Pain</i>             | 4               |
| <i>Intensive Care</i>           | 4*              |
| <i>Cardiac Anesthesia</i>       | 1               |
| <i>Obstetric Anesthesia</i>     | 2*              |
| <i>Neuro-Anesthesia</i>         | 2*              |
| <i>Pediatrics Anesthesia</i>    | 1               |
| <i>Other-Uncertain</i>          | 2               |
| <b>Total Responses</b>          | <b>16*</b>      |

\* 1 participant listed 3 categories.

### Section A: Factor Analysis of General CanMEDS 2000 Competencies

As indicated in the previous methodology chapter, participants were asked to rate an unclassified randomized list containing 27 items from the seven CanMEDS roles, on a 7-point importance scale, ranging from lowest to highest importance. Since participants were asked to rate each item with respect to both the teaching during residency and the practice of Anesthesiology, the factor analysis results will be presented for these two different dimensions.

#### Teaching During Residency

Participants' overall responses to this section of the survey showed a high degree of internal consistency between the 27 items as indicated by a Cronbach Coefficient alpha value of 89.6%.

Initial principal component analysis was done, resulting in the selection of three factors using the Scree plot of eigenvalues. The three factors collectively explain 46% of the variance. Specifically, F1 explained, 28%; F2, 11.5%; and F3, 6.4% of the variance. The three factors were then rotated using a simple varimax, orthogonal technique. The items' original sequence numbers, codes, means, standard deviations, and factor loadings on the three factors after the Varimax rotation are shown in Table 13. Subsequently, as described earlier, in the data analysis section of the methods, internal consistency of each subscale (factor) was assessed with a series of Cronbach Coefficient alpha calculations, first, for all of involved variables, and then with each single variable removed, in turn. A decision to exclude an item was made only if the correlation coefficient was "optimized" with the removal of such an item.

Table 13

Number, Means, Standard Deviation, and Factor Loadings of the General CanMEDS Items for the Teaching of Anesthesiology

| Item No.            | Code         | Items  | n   | Mean ± SD   | Factor Loading |       |       | Cronbach Alpha* |
|---------------------|--------------|--|-----|-------------|----------------|-------|-------|-----------------|
|                     |              |  |     |             | 1              | 2     | 3     |                 |
| <b>Factor one</b>   |              |  |     |             |                |       |       | <b>84%</b>      |
| 21                  | T-ME5        | Demonstrate good understanding of clinical knowledge relevant to effective patient care  | 99  | 6.18 ± 0.87 | 0.76           | 0.01  | 0.30  | 80.50%          |
| 14                  | T-ME4        | Manage emergency conditions resulting in effective treatment   | 99  | 6.35 ± 0.77 | 0.67           | 0.08  | 0.11  | 81.87%          |
| 5                   | T-ME2        | Use of all pertinent information to arrive at complete and accurate clinical decisions   | 99  | 6.18 ± 0.76 | 0.66           | 0.08  | 0.31  | 81.48%          |
| 1                   | T-ME1        | Demonstrate good understanding of basic knowledge relevant to effective patient care   | 100 | 6.41 ± 0.67 | 0.62           | -0.05 | 0.18  | 82.76%          |
| 11                  | T-ME3        | Demonstrate proficiency in technical and procedures skills   | 100 | 5.92 ± 0.86 | 0.61           | 0.23  | 0.25  | 83.44%          |
| 12                  | T-CM2        | Prepare documentation that is accurate and timely  | 100 | 5.72 ± 0.77 | 0.59           | 0.23  | 0.13  | 82.90%          |
| 7                   | T-CM1        | Establish good relationships with peers and other health professionals   | 100 | 5.66 ± 0.95 | 0.58           | 0.10  | 0.42  | 82.27%          |
| 13                  | T-CL1        | Consult effectively with other physicians and health care professionals  | 100 | 5.73 ± 0.74 | 0.58           | 0.04  | 0.25  | 82.41%          |
| 19                  | T-S2         | Develop, implement, and monitor a personal continuing education strategy   | 99  | 5.53 ± 0.92 | 0.40           | 0.31  | 0.16  | 83.64           |
| <b>Factor two</b>   |              |  |     |             |                |       |       | <b>84%</b>      |
| 6                   | T-HA1        | Understand the specialist role to intervene on behalf of the community with respect to factors that may impact on community health     | 100 | 4.52 ± 1.16 | 0.02           | 0.76  | 0.10  | 80.61%          |
| 24                  | T-MG5        | Cost effective use of health care resources based on sound judgment  | 99  | 4.86 ± 1.09 | 0.01           | 0.71  | 0.27  | 80.37%          |
| 10                  | T-HA2        | Respond appropriately in advocacy situations for patients and communities  | 100 | 4.93 ± 1.18 | 0.11           | 0.69  | 0.13  | 80.72%          |
| 8                   | T-MG3        | Understand the principles of practice management   | 100 | 4.91 ± 1.15 | 0.14           | 0.67  | -0.12 | 82.03%          |
| 18                  | T-HA3        | Understand the specialist role to intervene on behalf of patients with respect to factors that may impact on their health              | 99  | 5.12 ± 1.05 | 0.35           | 0.65  | -0.01 | 81.31%          |
| 26                  | T-CL3        | Contribute constructively with other interdisciplinary team activities   | 98  | 5.1 ± 0.84  | 0.07           | 0.56  | 0.50  | 81.04%          |
| 25                  | T-S4         | Contribute to development of new knowledge   | 99  | 4.95 ± 1.02 | -0.18          | 0.55  | 0.05  | 82.75%          |
| 9                   | T-MG4        | Set realistic priorities to use time effectively in order to optimize professional performance   | 99  | 5.41 ± 0.88 | 0.21           | 0.55  | 0.25  | 81.65%          |
| 27                  | T-MG6        | Utilize information technology to optimize patient care, life-long learning, and other activities, such as searching medical databases | 99  | 5.34 ± 0.94 | 0.16           | 0.52  | 0.35  | 81.70%          |
| 2                   | <i>T-MG1</i> | <i>Work effectively and efficiently in a health care organization</i>  | 100 | 5.26 ± 0.79 | 0.36           | 0.37  | -0.07 | 83.10%          |
| 4                   | <i>T-MG2</i> | <i>Use resources effectively to balance patient care, learning needs, and other activities</i>   | 99  | 5.33 ± 0.82 | 0.25           | 0.30  | 0.00  | 84.04%          |
| <b>Factor three</b> |              |  |     |             |                |       |       | <b>78%</b>      |
| 16                  | T-P2         | Exhibit appropriate personal/interpersonal professional behaviours   | 99  | 5.82 ± 0.94 | 0.05           | -0.01 | 0.69  | 71.90%          |
| 23                  | T-S3         | Critically appraise sources of medical information   | 99  | 5.67 ± 0.87 | 0.23           | 0.04  | 0.66  | 74.80%          |
| 20                  | T-P3         | Demonstrate integrity, honesty, compassion, and respect for diversity  | 99  | 5.89 ± 1.02 | 0.26           | 0.14  | 0.62  | 74.42%          |
| 3                   | T-P1         | Practice medicine ethically consistent with obligations of a physician   | 100 | 6.25 ± 0.95 | 0.37           | -0.10 | 0.59  | 75.09%          |
| 17                  | T-CM3        | Establish therapeutic relationship with patients and families  | 99  | 5.18 ± 0.91 | 0.28           | 0.34  | 0.49  | 73.98%          |
| 22                  | T-CL2        | Delegate duties effectively  | 99  | 4.89 ± 0.96 | 0.00           | 0.42  | 0.45  | 76.31%          |
| 15                  | <i>T-S1</i>  | <i>Facilitate learning of patients, students, and other health professionals</i>   | 99  | 5.37 ± 0.88 | -0.08          | 0.23  | 0.42  | 78.99%          |

NOTE: The scale used is as follows:

1= Lowest Importance, 2= Very Unimportant, 3=Unimportant, 4= Neutral, 5= Important, 6= Very Important, 7=Extremely Important

Items in *italics* will be deleted from the factor for Cronbach's Alpha Coefficient optimization.

\* Cronbach's Alpha Coefficient value shown are with the item removed except for Factors one, two, &amp; three.

\*\* Significant loading on two factors.

Factor one has an eigenvalue of 7.45. As can be seen in Table 13, this factor consisted of nine variables (items). Five of the variables loading highly on this factor represent all of the listed Medical Expert role's general competencies, two from the Communicator, and one from each of the Collaborator and the Scholar categories. The Cronbach Coefficient alpha was 83.1% for these nine elements.

Factor two has an eigenvalue of 3.13. Initially there were 11 variables with high loadings on this factor, with an overall Cronbach Coefficient alpha value of 83.1%. There was an improvement in the Cronbach alpha value to 83.6 with the removal of item number 4, coded as T-MG2, which states "use resources effectively to balance patient care, learning needs and other activities." Again, the Cronbach alpha value was further optimized to the final value of 84% by the removal of item2, coded as T-MG1, which stated, "work effectively and efficiently in a health care organization." The final components of this factor are 9 items: all of the Health Advocate items (n=3), the remaining of the Manager role items (n=4), and one item from each of the Collaborator and the Scholar roles.

The eigenvalue of Factor three was 1.73. The initial analysis began by using 7 variables loading higher than 0.4, and with a Cronbach alpha value of 77.9%. The latter value was increased to 78.7%, with the removal of item 15, coded as T-S1, which read, "facilitate learning of patients, students, and other health professionals." The remaining six items consist mainly of all the items from the Professional role (n=3), and one item from each of the Scholar, Communicator, and Collaborator roles.

### Anesthesiology Practice

The presentation of the results of this section will follow the structure established for the teaching context data. Differences, when present, will be highlighted. Compared to the teaching data, a higher degree of internal consistency was demonstrated for participants' responses to the 27 items in the practice context of the survey. The Cronbach Coefficient alpha was calculated at 91.6%. Similar to the proceeding factor analysis, the use of a Scree plot of eigenvalue criterion resulted in three factors being identified. In this case, the three factors explained a slightly higher proportion of the total variance at 50.1%. In here, *F1*, *F2*, *F3* each explains 32.3%, 11.4%, and 6.5% of the variance, respectively. As before, the factors were then orthogonally rotated. Table 14 lists the item numbers, codes, means, standard deviations, and items' factor loading after the rotation.

*Factor one* in the practice of Anesthesiology situation had an eigenvalue of 8.73. Fourteen items have high loadings on this factor. The Cronbach coefficient alpha was 89.9%, with no improvements made with repeated analyses by the removal of any one of the variables. This factor contains all of the items from the Medical Expert (n=5), the Professional (n=3), and the Communicator (n=3) roles. Also, it contains items from the Collaborator (n=2) and the Manager (n=1) roles. Two items with loading on this factor, item number 22 and 12 (coded P-CL2, P-CM2), also have significant loading on *Factors two and three*, respectively (see below).

An eigenvalue of 3.08 was calculated for *Factor two*. This factor had an initial Cronbach coefficient alpha value of 84.2%, which was improved to 84.6% with the

Table 14  
Number, Means, Standard Deviation, and Factor Loadings of the General CanMEDS Items for the Practice of Anesthesiology

| Item No.            | Code  | Items  | n   | Mean ± SD   | Factors |       |       | Cronbach Alpha* |
|---------------------|-------|--|-----|-------------|---------|-------|-------|-----------------|
|                     |       |  |     |             | 1       | 2     | 3     |                 |
| <b>Factor one</b>   |       |  |     |             |         |       |       | <b>89.90%</b>   |
| 16                  | P-P2  | Exhibit appropriate personal/interpersonal professional behaviours   | 99  | 5.82 ± 0.92 | 0.73    | 0.21  | 0.16  | 88.59%          |
| 21                  | P-ME5 | Demonstrate good understanding of clinical knowledge relevant to effective patient care  | 99  | 6.24 ± 0.72 | 0.72    | -0.01 | 0.14  | 89.13%          |
| 14                  | P-ME4 | Manage emergency conditions resulting in effective treatment   | 99  | 6.44 ± 0.81 | 0.71    | 0.03  | 0.05  | 89.25%          |
| 1                   | P-ME1 | Demonstrate good understanding of basic knowledge relevant to effective patient care   | 100 | 6.43 ± 0.74 | 0.71    | -0.06 | 0.04  | 89.29%          |
| 5                   | P-ME2 | Use of all pertinent information to arrive at complete and accurate clinical decisions   | 100 | 6.16 ± 0.78 | 0.70    | 0.30  | 0.04  | 88.86%          |
| 3                   | P-P1  | Practice medicine ethically consistent with obligations of a physician   | 100 | 6.40 ± 0.80 | 0.69    | 0.14  | 0.17  | 88.93%          |
| 7                   | P-CM1 | Establish good relationships with peers and other health professionals   | 100 | 5.75 ± 0.91 | 0.65    | 0.21  | 0.11  | 89.17%          |
| 11                  | P-ME3 | Demonstrate proficiency in technical and procedures skills   | 100 | 6.18 ± 0.82 | 0.58    | -0.08 | 0.38  | 89.33%          |
| 20                  | P-P3  | Demonstrate integrity, honesty, compassion, and respect for diversity  | 99  | 5.95 ± 0.92 | 0.58    | 0.28  | 0.01  | 89.49%          |
| 13                  | P-CL1 | Consult effectively with other physicians and health care professionals**  | 100 | 5.90 ± 0.75 | 0.57    | -0.03 | 0.52  | 89.22%          |
| 2                   | P-MG1 | Work effectively and efficiently in a health care organization   | 99  | 5.69 ± 0.76 | 0.54    | 0.32  | 0.00  | 89.71%          |
| 17                  | P-CM3 | Establish therapeutic relationship with patients and families  | 97  | 5.3 ± 0.93  | 0.53    | 0.35  | 0.10  | 89.74%          |
| 12                  | P-CM2 | Prepare documentation that is accurate and timely **   | 100 | 5.77 ± 0.83 | 0.51    | 0.25  | 0.41  | 89.24%          |
| 22                  | P-CL2 | Delegate duties effectively**  | 99  | 5.37 ± 0.89 | 0.39    | 0.38  | 0.33  | 89.58%          |
| <b>Factor two</b>   |       |  |     |             |         |       |       | <b>84.56%</b>   |
| 10                  | P-HA2 | Respond appropriately in advocacy situations for patients and communities  | 100 | 5.20 ± 1.06 | 0.16    | 0.75  | 0.12  | 81.85%          |
| 24                  | P-MG5 | Cost effective use of health care resources based on sound judgment  | 99  | 5.24 ± 0.99 | 0.05    | 0.73  | 0.24  | 81.49%          |
| 6                   | P-HA1 | Understand the specialist role to intervene on behalf of the community with respect to factors that may impact on community health     | 100 | 4.69 ± 1.14 | -0.02   | 0.69  | 0.21  | 82.59%          |
| 18                  | P-HA3 | Understand the specialist role to intervene on behalf of patients with respect to factors that may impact on their health              | 99  | 5.28 ± 1.09 | 0.33    | 0.67  | 0.12  | 81.87%          |
| 9                   | P-MG4 | Set realistic priorities to use time effectively in order to optimize professional performance   | 100 | 5.54 ± 0.84 | 0.18    | 0.63  | 0.19  | 82.49%          |
| 8                   | P-MG3 | Understand the principles of practice management   | 100 | 5.17 ± 1.14 | 0.02    | 0.56  | 0.38  | 82.47%          |
| 15                  | P-S1  | Facilitate learning of patients, students, and other health professionals  | 99  | 5.23 ± 0.84 | -0.03   | 0.51  | 0.54  | 82.44%          |
| 4                   | P-MG2 | <i>Use resources effectively to balance patient care, learning needs, and other activities</i>   | 99  | 5.41 ± 0.76 | 0.24    | 0.51  | -0.11 | 84.56%          |
| 22                  | P-CL2 | Delegate duties effectively**  | 99  | 5.37 ± 0.89 | 0.39    | 0.38  | 0.33  | 83.43%          |
| <b>Factor Three</b> |       |  |     |             |         |       |       | <b>81.68%</b>   |
| 25                  | P-S4  | Contribute to development of new knowledge   | 99  | 4.91 ± 1.08 | -0.01   | 0.15  | 0.69  | 81.20%          |
| 27                  | P-MG6 | Utilize information technology to optimize patient care, life-long learning, and other activities, such as searching medical databases | 99  | 5.30 ± 0.85 | 0.17    | 0.31  | 0.69  | 78.13%          |
| 26                  | P-CL3 | Contribute constructively with other interdisciplinary team activities   | 98  | 5.31 ± 0.87 | 0.16    | 0.35  | 0.62  | 78.37%          |
| 23                  | P-S3  | Critically appraise sources of medical information   | 99  | 5.57 ± 0.74 | 0.47    | -0.02 | 0.62  | 79.02%          |
| 15                  | P-S1  | Facilitate learning of patients, students, and other health professionals  | 99  | 5.23 ± 0.84 | -0.03   | 0.51  | 0.54  | 80.24%          |
| 13                  | P-CL1 | Consult effectively with other physicians and health care professionals**  | 100 | 5.90 ± 0.75 | 0.57    | -0.03 | 0.52  | 79.15%          |
| 19                  | P-S2  | Develop, implement, and monitor a personal continuing education strategy   | 98  | 5.73 ± 0.74 | 0.29    | 0.12  | 0.43  | 80.99%          |
| 12                  | P-CM2 | Prepare documentation that is accurate and timely**  | 100 | 5.77 ± 0.83 | 0.51    | 0.25  | 0.41  | 79.48%          |

NOTE: The scale used is as follows:

1= Lowest Importance, 2= Very Unimportant, 3=Unimportant, 4= Neutral, 5= Important, 6= Very Important, 7=Extremely Important

Items in *italic* will be deleted from the factor for Cronbach's Alpha Coefficient optimization.

\* Cronbach's Alpha Coefficient value shown are with the item removed except for *Factors one, two, & three*.

\*\* Significant loading on two factors.

removal of item number 4, P-MG 2. The eight remaining variables in this factor consist of all of the items from the Health Advocate (n=3), the Manager (n=3), and one from each of the Collaborator and the Scholar roles. Item number 15, P-S1, also has significant loading on *Factor three*.

The last factor, *Factor three* had an eigenvalue of 1.7, and overall Cronbach Coefficient alpha value of 81.7% for the eight variables. All of the items from the Scholar role (n=4) are loaded on this factor, together with two items from the Collaborator, and one item from each of the Communicator and the Manager roles.

Figures 1 and 2, summarize the similarities (Figure 1) and differences (Figure 2) between factor analyses in the teaching and practice contexts. These figures also contain the final listing in both levels of the items retained by the factor analyses. As these figures demonstrate, most of the items related to the Medical Expert and both the Health Advocate and the Manager roles maintain their relative relationships with Factor one and two, respectively. Items derived from the Professional role are extracted within Factor three in the teaching-related factor analysis, but within *Factor one*, when it comes to the general practice of Anesthesiology factor analysis (Figure 2).

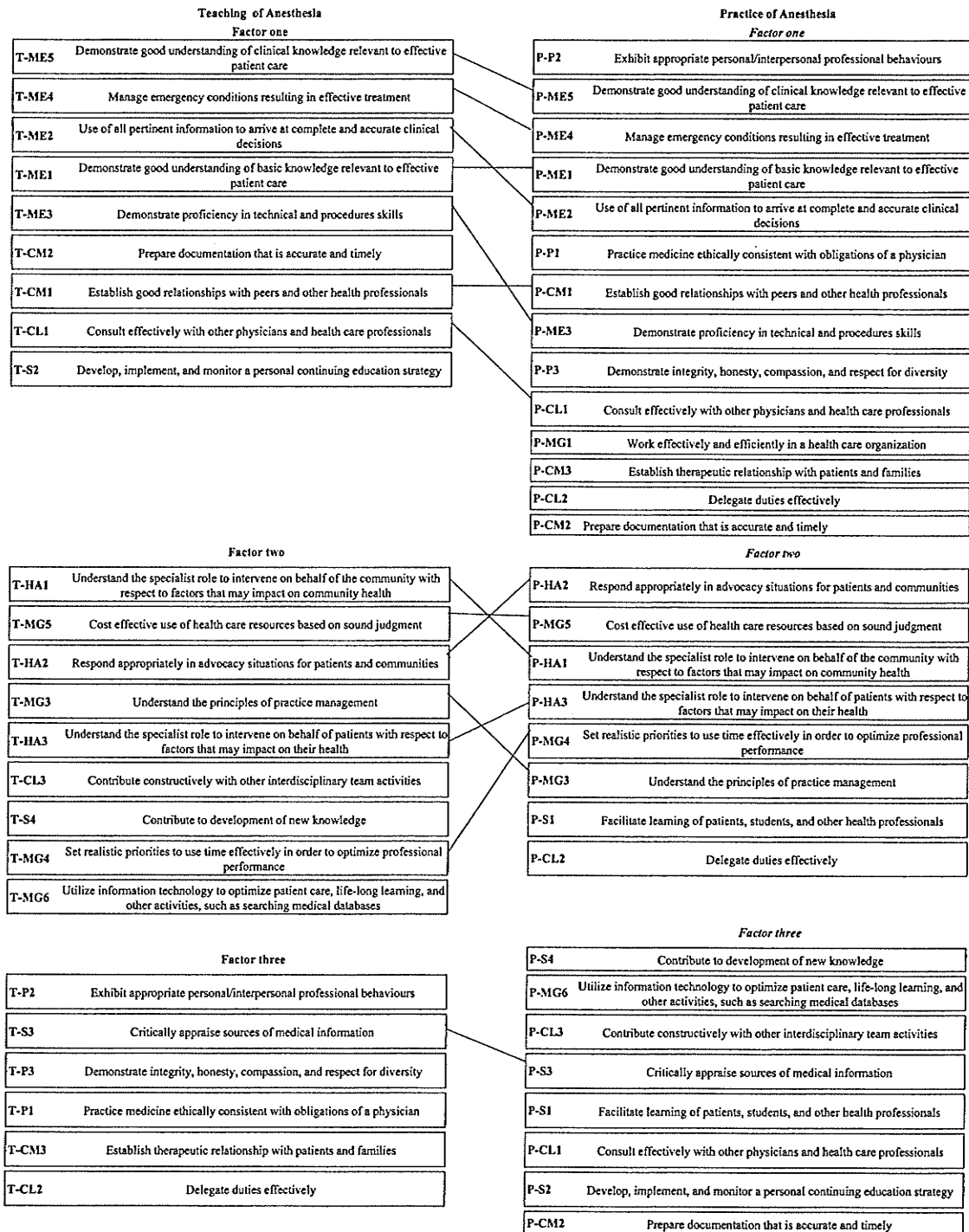


Figure 1: Items That Maintain their Factor Association in Factor Analyses Across Teaching and Practice Contexts



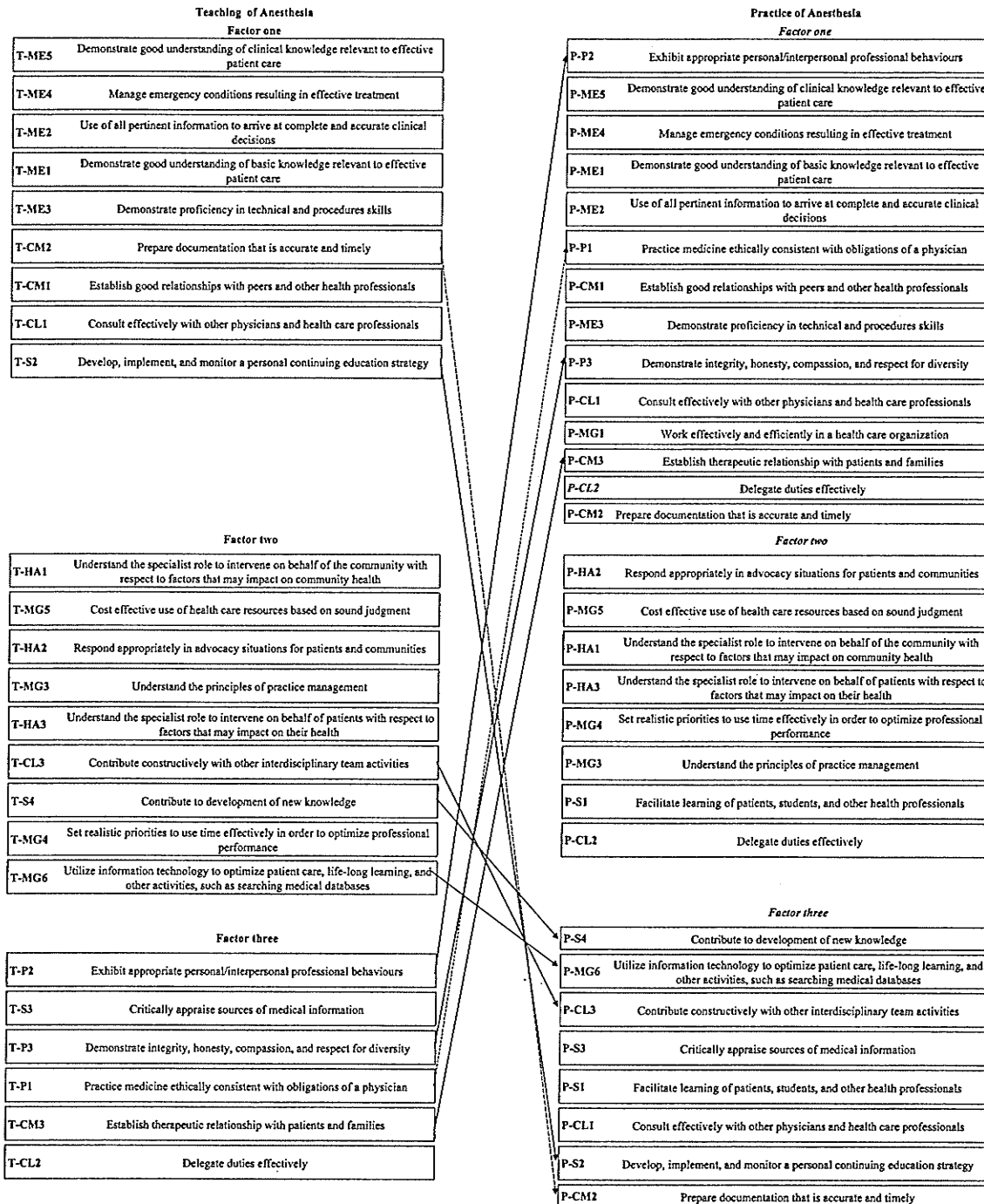


Figure 2: Items That Migrated Between Factors in Factor Analyses Across Teaching and Practice Contexts

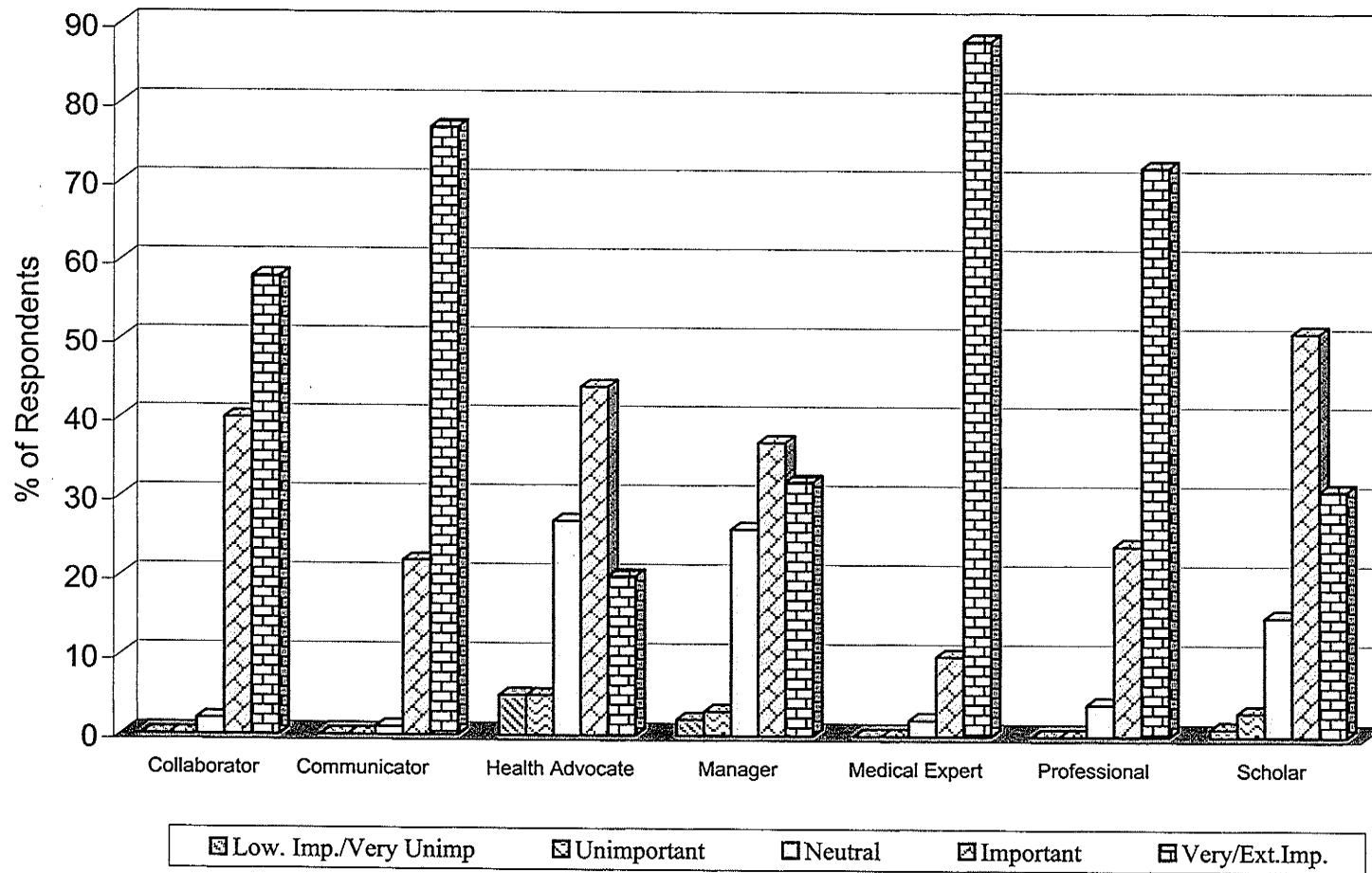
### Section B: Anesthesiology-Specific CanMEDS 2000 Training Objectives

The analysis of this section of the survey is divided into two main sections. The first section consists of a comparison of participants' responses to the five main questions (see below) across the seven CanMEDS 2000 roles. The second section presents an analysis of the methods preferred by our sample population of Anesthesiologists and residents, as the most effective means in being prepared to assume these roles, and to teach and evaluate the different CanMEDS roles.

The survey was designed to elicit participants' responses to five aspects related to implementing each of the Anesthesiology-Specific CanMEDS roles, namely: (a) the importance of the role to the participants' practice of Anesthesia; (b) the priority of teaching the role to the Anesthesia residents; (c) participants' preparedness to assume the role; (d) the perceived ease of teaching the role; and (e) the perceived ease of evaluating the role. The survey was structured to ask the same five questions, across each role, to permit an analysis of variance for repeated measures. This approach was used so that each participant serves as her/his own control, accounting for a portion of the unexplained variability. Tables 15 to 19 show the results for these analyses for each of the five questions.

Importance to the participants' practice. The percentages of respondents' overall assessment of the importance of the CanMEDS roles in practice are displayed in *Figure 3*. In their day-to-day practice of anesthesia, there was a general agreement between the three groups of participants regarding the importance of the following four roles in a descending order: Medical Expert, Communicator, Professional, and Collaborator. The

**Figure 3 : Practice Importance of CanMEDS Roles in Anesthesiology**



other three roles, Scholar, Manager, and Health Advocate were also perceived to be important by 81%, 70%, and 64% of the respondents, respectively, with some differences among the groups. As can be seen in Table 15, the Scholar role was perceived to be of less importance by 50% of the Non-Tertiary Group, compared to both the Tertiary (10%) and Residents (0%) Groups (*Chi-square, df4, p<0.0001*). Attending Anesthesiologists, from Tertiary and Non-Tertiary Groups, reported slightly higher practice importance to the Manager and the Health Advocate roles than residents did, regardless of the residents' level of training.

When attending Anesthesiologists' responses to this question were analyzed in relation to their other professional roles, it was found that higher percentages of Anesthesiologists who were involved in research, current or past, rated the importance of both the Collaborator (100% v. 89.5%, *Chi-square =6.69, p= 0.0096, df 1*) and the Scholar (84% vs. 52.6%, *Chi-square = 7.9, p=0.019, df 2*) roles in practice higher than the group who were not involved in research. Also, all Anesthesiologists with administrative involvement rated the Collaborator role in practice as important (4 or more out of 7). While those without administrative experience rated the Collaborator role as less important.

Some of the reasons cited by participants (n=5), who indicated an "unimportant" grading (less than 3 on a scale of 7) for the Manager role in practice, were related to the fact that this role was (a) being assigned to a dedicated person other than the respondent, (b) being beyond the residents' level of training, and/or (c) being in need to focus on other aspects of practice/training (n=2). One participant linked other issues, such as

Table 15  
 Percentages and Mean Rating Values for Participants' Perceived Practice Importance of the CanMEDS Roles in  
 Anesthesiology (N=100)

| Role                        | 1- 2  | 3    | 4     | 5     | 6- 7  | Mean ± SE         | Different from |
|-----------------------------|-------|------|-------|-------|-------|-------------------|----------------|
| <b>Overall</b>              |       |      |       |       |       |                   |                |
| Collaborator                | 0.0%  | 0.0% | 2.0%  | 39.6% | 58.4% | 5.65 ± 0.01       |                |
| Communicator                | 0.0%  | 0.0% | 1.0%  | 21.8% | 77.2% | 6.01 ± 0.01       |                |
| Health Advocate             | 5.0%  | 5.0% | 26.7% | 43.6% | 19.8% | 4.72 ± 0.11       |                |
| Manager *                   | 2.0%  | 3.0% | 25.6% | 37.4% | 32.3% | 4.99 ± 0.1        |                |
| Medical Expert              | 0.0%  | 0.0% | 2.0%  | 9.9%  | 88.1% | 6.41 ± 0.01       |                |
| Professional                | 0.0%  | 0.0% | 4.0%  | 23.8% | 72.2% | 5.92 ± 0.01       |                |
| Scholar                     | 1.0%  | 3.0% | 14.9% | 50.5% | 30.7% | 5.08 ± 0.01       |                |
| <b>Collaborator (CL)</b>    |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 0.0% | 1.8%  | 34.6% | 63.6% | 5.72 ± 0.1        | HA,MG,ME       |
| Non-Tertiary                | 0.0%  | 0.0% | 3.9%  | 46.2% | 50.0% | 5.58 ± 0.15       | HA,ME,SC       |
| Residents                   | 0.0%  | 0.0% | 0.0%  | 45.0% | 55.0% | 5.55 ± 0.17       | HA, MG,ME      |
| <b>Communicator (CM)</b>    |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 0.0% | 0.0%  | 21.8% | 78.2% | 6.05 ± 0.1        | HA,MG,ME,SC    |
| Non-Tertiary                | 0.0%  | 0.0% | 3.9%  | 19.2% | 76.9% | 5.9 ± 0.15        | HA, MG,SC      |
| Residents                   | 0.0%  | 0.0% | 0.0%  | 25.0% | 75.0% | 5.95 ± 0.17       | HA,MG,ME       |
| <b>Health Advocate (HA)</b> |       |      |       |       |       |                   |                |
| Tertiary                    | 1.8%  | 5.5% | 27.3% | 40.0% | 25.5% | 4.87 ± 0.1        | ME,PF,SC       |
| Non-Tertiary                | 3.9%  | 3.9% | 30.8% | 38.5% | 23.1% | 4.75 ± 0.15       | ME,PF          |
| Residents                   | 15.0% | 5.0% | 20.0% | 60.0% | 0.0%  | 4.25 ± 0.17 +,++  | ME,PF,SC       |
| <b>Manager (MG)*</b>        |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 1.9% | 22.2% | 48.2% | 27.8% | 5.05 ± 0.1        | ME,PF          |
| Non-Tertiary                | 0.0%  | 4.0% | 24.0% | 28.0% | 44.0% | 5.15 ± 0.15       | ME,PF,SC       |
| Residents                   | 10.0% | 5.0% | 35.0% | 20.0% | 30.0% | 4.55 ± 0.17 +, ++ | ME,PF,SC       |
| <b>Medical Expert (ME)</b>  |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 0.0% | 1.8%  | 9.1%  | 89.1% | 6.44 ± 0.1        | PF,SC          |
| Non-Tertiary                | 0.0%  | 0.0% | 3.9%  | 15.4% | 80.8% | 6.27 ± 0.15       | PF,SC          |
| Residents                   | 0.0%  | 0.0% | 0.0%  | 5.0%  | 95.0% | 6.55 ± 0.17       | PF,SC          |
| <b>Professional (PF)</b>    |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 0.0% | 3.6%  | 20.0% | 76.4% | 6.00 ± 0.1        | SC             |
| Non-Tertiary                | 0.0%  | 0.0% | 7.7%  | 26.9% | 65.4% | 5.77 ± 0.15       | SC             |
| Residents                   | 0.0%  | 0.0% | 30.0% | 70.0% | 0.0%  | 5.9 ± 0.17        |                |
| <b>Scholar (SC)</b>         |       |      |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 1.8% | 9.1%  | 56.4% | 32.7% | 5.23 ± 0.1        |                |
| Non-Tertiary                | 3.9%  | 7.7% | 38.5% | 30.8% | 19.2% | 4.5 ± 0.15 +      |                |
| Residents                   | 0.0%  | 0.0% | 0.0%  | 60.0% | 40.0% | 5.4 ± 0.17 ++     |                |

NOTE: The scale used is as follows:

1= Lowest Importance, 2= Very Unimportant, 3=Unimportant, 4= Neutral, 5= Important, 6= Very Important, 7=Extremely Important

\* missing two

+ P< .05 Compared to Tertiary

++ P< .05 Compared to Tertiary

staffing shortages and budgetary restrictions, to the “serious deterioration in the amount of control physicians, in general, have” over this particular role.

Similarly, six participants out of seven, who ranked Health Advocate as of no importance, cited the level of training (n=2) or not being directly involved (n=3) in this role as reason for their choice. Again, one participant cited the staff shortages and other health system problems as a leading cause to the sense of “futility” on the part of practitioners.

Two comments were made by participants (Non-Tertiary Group) to explain the low practice importance of the Scholar role in their practice. These were “I regret, research is not [one] of my priorities” and “often rely on editors, I personally do not research.” An additional participant, who rated this role as important, justified the response by stating that this role is important for being able to evaluate the literature, but not so important as regard to “industry research.”

Priority in Anesthesiology teaching. Data, with respect to the priorities of the seven CanMEDS 2000 roles in Anesthesiology teaching, are presented in Figure 4 and Table 16. These results are largely similar to data in the CanMEDS roles practice importance section, though with more agreement between the participants regarding the need to teach the seven roles during the years of Anesthesia residency training. Only 25% percent of the Non-Tertiary Group gave less than 5, (5 =high Priority) to the Scholar role teaching priority, compared to 10% of the other two groups. Similarly, the Scholar role teaching priority was rated differently by Anesthesiologists who had research involvement. Ninety-two percent of Anesthesiologists involved in research rate it 5 or higher compared

**Figure 4: Teaching Priority of CanMEDS Roles in Anesthesiology Training Program**

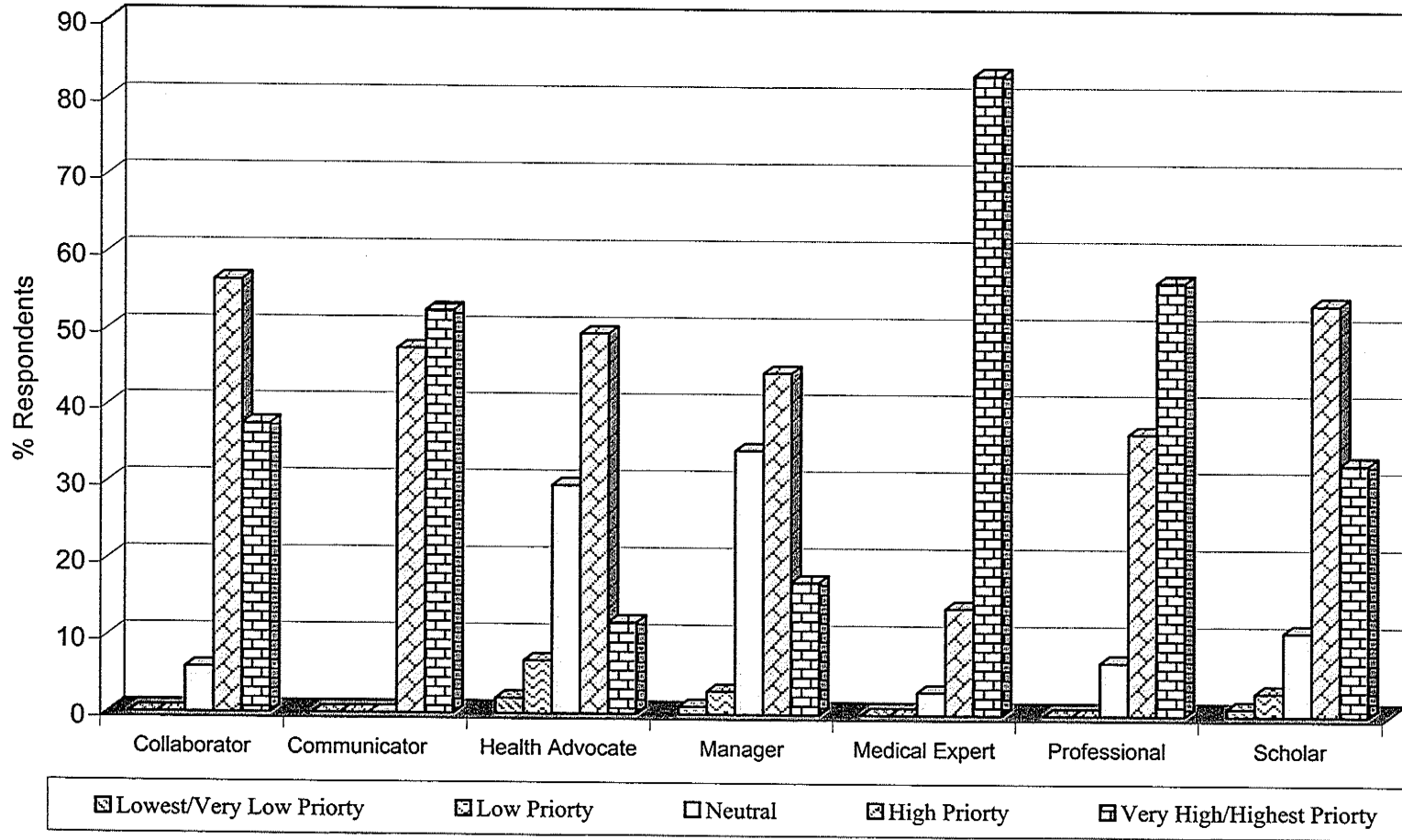


Table 16  
 Percentages and Mean Rating Values for Participants' Perceived Teaching Priority of the CanMEDS Roles in  
 Anesthesiology (N=100)

| Role                        | 1- 2 | 3     | 4     | 5     | 6- 7  | Mean $\pm$ SE      | Different from |
|-----------------------------|------|-------|-------|-------|-------|--------------------|----------------|
| <b>Overall</b>              |      |       |       |       |       |                    |                |
| Collaborator                | 0.0% | 0.0%  | 5.9%  | 56.4% | 37.6% | 5.33 $\pm$ 0.01    |                |
| Communicator                | 0.0% | 0.0%  | 0.0%  | 47.5% | 52.5% | 5.58 $\pm$ 0.01    |                |
| Health Advocate             | 2.0% | 6.9%  | 29.7% | 49.5% | 11.9% | 4.62 $\pm$ 0.01    |                |
| Manager *                   | 1.0% | 3.0%  | 34.3% | 44.4% | 17.2% | 4.76 $\pm$ 0.08    |                |
| Medical Expert              | 0.0% | 0.0%  | 3.0%  | 13.9% | 83.2% | 6.37 $\pm$ 0.01    |                |
| Professional                | 0.0% | 0.0%  | 6.9%  | 36.6% | 56.4% | 5.61 $\pm$ 0.01    |                |
| Scholar                     | 0.0% | 3.0%  | 10.9% | 53.5% | 32.7% | 5.19 $\pm$ 0.01    |                |
| <b>Collaborator (CL)</b>    |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 0.0%  | 7.3%  | 58.2% | 34.6% | 5.27 $\pm$ 0.1     | HA, MG, ME, PF |
| Non-Tertiary                | 0.0% | 0.0%  | 3.9%  | 53.9% | 42.3% | 5.38 $\pm$ 0.14    | HA, ME, SC     |
| Residents                   | 0.0% | 0.0%  | 5.0%  | 55.0% | 40.0% | 5.4 $\pm$ 0.16     | HA, MG, ME     |
| <b>Communicator (CM)</b>    |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 0.0%  | 0.0%  | 52.7% | 47.3% | 5.53 $\pm$ 0.1     | HA, MG, ME     |
| Non-Tertiary                | 0.0% | 0.0%  | 0.0%  | 43.3% | 57.7% | 5.65 $\pm$ 0.14    | HA, MG, ME, SC |
| Residents                   | 0.0% | 0.0%  | 0.0%  | 40.0% | 60.0% | 5.65 $\pm$ 0.16    | HA, MG, ME     |
| <b>Health Advocate (HA)</b> |      |       |       |       |       |                    |                |
| Tertiary                    | 3.6% | 7.3%  | 34.6% | 38.2% | 16.4% | 4.56 $\pm$ 0.1     | ME, PF, SC     |
| Non-Tertiary                | 0.0% | 3.9%  | 19.2% | 65.4% | 11.5% | 4.85 $\pm$ 0.14    | ME, PF         |
| Residents                   | 0.0% | 10.0% | 30.0% | 60.0% | 0.0%  | 4.5 $\pm$ 0.16     | ME, PF, SC     |
| <b>Manager (MG)*</b>        |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 1.9%  | 37.0% | 51.9% | 9.3%  | 4.68 $\pm$ 0.1     | ME, PF, SC     |
| Non-Tertiary                | 0.0% | 0.0%  | 20.0% | 32.0% | 40.0% | 5.05 $\pm$ 0.1     | ME, PF         |
| Residents                   | 5.0% | 0.0%  | 45.0% | 40.0% | 10.0% | 4.55 $\pm$ 0.16 ++ | ME, PF, SC     |
| <b>Medical Expert (ME)</b>  |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 0.0%  | 1.8%  | 12.7% | 85.5% | 6.4 $\pm$ 0.1      | PF, SC         |
| Non-Tertiary                | 0.0% | 0.0%  | 7.7%  | 15.4% | 76.9% | 6.19 $\pm$ 0.14    | PF, SC         |
| Residents                   | 0.0% | 0.0%  | 0.0%  | 15.0% | 85.0% | 6.5 $\pm$ 0.16     | PF, SC         |
| <b>Professional (PF)</b>    |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 0.0%  | 1.8%  | 38.3% | 60.0% | 5.69 $\pm$ 0.1     | SC             |
| Non-Tertiary                | 0.0% | 0.0%  | 77.0% | 34.6% | 57.7% | 5.65 $\pm$ 0.14    | SC             |
| Residents                   | 0.0% | 0.0%  | 20.0% | 35.0% | 45.0% | 5.35 $\pm$ 0.16    |                |
| <b>Scholar (SC)</b>         |      |       |       |       |       |                    |                |
| Tertiary                    | 0.0% | 1.8%  | 7.3%  | 58.2% | 32.7% | 5.24 $\pm$ 0.1     |                |
| Non-Tertiary                | 0.0% | 7.7%  | 19.2% | 50.0% | 23.1% | 4.92 $\pm$ 0.14    |                |
| Residents                   | 0.0% | 0.0%  | 10.0% | 45.0% | 45.0% | 5.4 $\pm$ 0.16 ++  |                |

NOTE: The scale used is as follows:

1= Lowest Priority, 2= Very Low Priority, 3=Low Priority, 4= Neutral, 5= High Priority, 6= Very High Priority, 7=Highest Priority.

\* missing two

+ P< .05 Compared to Tertiary

++ P< .05 Compared to Tertiary



to 63% by attending staff with listed no interest in research (Chi-square=10.93,  $p=0.004$ ,  $df 2$ ).

Regarding the Manager role, 38% of the participants, mostly from the Tertiary and Residents Groups, assigned a neutral (34%) or lower priority (4%) to this role. Reasons cited by three respondents, ranged from “[there is] too much other material to know,” or “one learns [this role’s competencies] indirectly,” and that “management training should be extra” and, as such, is beyond the scope of training during the years of Anesthesia residency.

Two of every five (39%) participants, in general, compared to one in five (20%) from the Non-Tertiary Group had ranked the Health Advocate role as less than a high priority (less than 3 out of 7). Reasons listed by the participants are, again, very similar to previous explanations to justify low ranking choices. These comments in this instance were as follows:

- “Too many other important things to learn.”
- “Although important, it is not a priority in a teaching program.”
- “Whether it can be taught is another matter entirely.”
- “Difficult to know what this is or how it applies to Anesthesia.”
- “I think that it is important to provide residents with the information and skills to be a good clinician – if they choose to assume a Health Advocate role, a solid clinical background and good communication skills should significantly help them to become a Health Advocate.”
- “This should be done by the leaders in Anesthesiology e.g. Dept. leader, etc. residency should be to produce safe, competent, ethical Anesthesiologists.”
- “Leadership roles may require special training e.g. MBA.”

Preparedness to assume the CanMEDS 2000 roles. Figure 5 shows the percentages of participants' self-reported levels of preparedness to assume the seven CanMEDS roles. Only 7% to 10% of respondents, mostly residents-in-training, indicated that they are less than prepared for the Medical Expert, Professional, Collaborator, and Communicator roles. In contrast, personal preparedness to assume the other three roles (Manager, Scholar, and Health Advocate) was reported at levels that were significantly lower (ANOVA Role X Group interaction,  $p < 0.0001$ ). Detailed listing of the differences between the subgroups are tabulated in the last two columns of Table 17.

Residents, in general, reported less preparedness than the attending Anesthesiologists in four out of the seven roles. These are Manager, Health Advocate, Professional, and Collaborator roles, where 95%, 60%, 31%, and 30% of residents, respectively, selected "less than prepared," (3 or less on a 7 seven-point scale) in response to this section of the survey. No significant differences were demonstrated between the level of training (PGY 1-3 compared to PGY4-5) and the perceived preparedness to assume these four roles.

Non-Tertiary Group practitioners did report relatively higher degrees of preparedness to assume both the Health Advocate (81% are prepared) and the Manager (88% are prepared) roles compared to the Tertiary Group, in which only 53% and 56% of respondents reported being prepared for these two roles, respectively.

Ease or feasibility of teaching Anesthesiology-specific CanMEDS roles. Figure 6 details participants' role-by-role overall assessment of the teachability of the different CanMEDS roles in Anesthesia. The reported difficulty was more frequent (or noticeable) for the Manager (45%), Health Advocate (43%), Scholar (43%), and Collaborator (42%)

**Figure 5: Preparedness To Assume CanMEDS Roles in Anesthesiology**

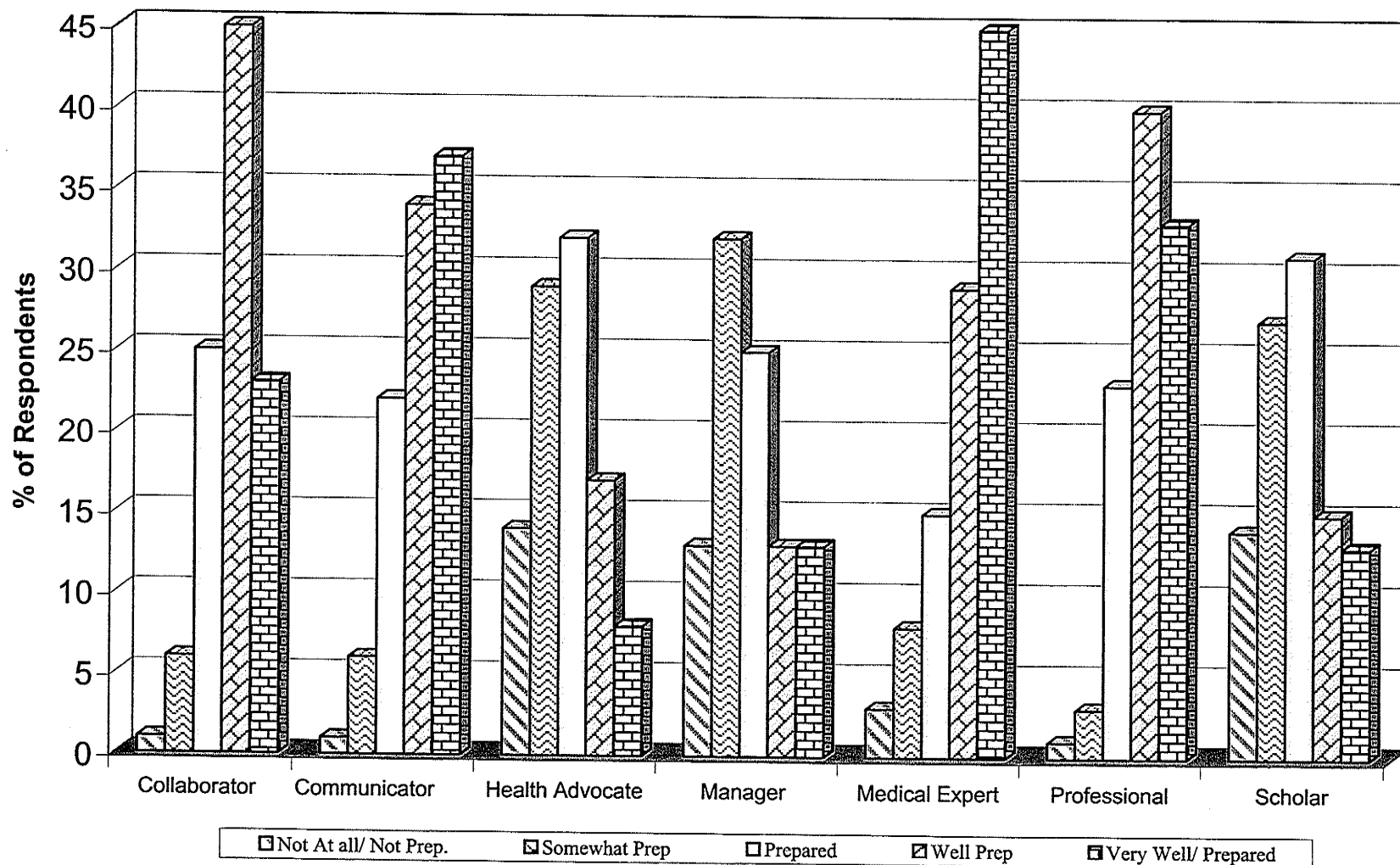


Table 17

Percentages and Mean Rating Values for Participants' Preparedness to Assume CanMEDS Roles in Anesthesiology (N=100)

| Role                        | 1-2   | 3     | 4     | 5     | 6-7   | Mean ± SE         | Different from |
|-----------------------------|-------|-------|-------|-------|-------|-------------------|----------------|
| <b>Overall</b>              |       |       |       |       |       |                   |                |
| Collaborator                | 1.0%  | 6.0%  | 25.0% | 45.0% | 23.0% | 4.86 ± 0.09       |                |
| Communicator                | 1.0%  | 6.0%  | 22.0% | 34.0% | 37.0% | 5.04 ± 0.12       |                |
| Health Advocate             | 14.0% | 29.0% | 32.0% | 17.0% | 8.0%  | 3.77 ± 0.12       |                |
| Manager *                   | 13.5% | 33.3% | 26.0% | 13.5% | 13.5% | 3.79 ± 0.13       |                |
| Medical Expert              | 3.0%  | 8.0%  | 15.0% | 29.0% | 45.0% | 5.18 ± 0.13       |                |
| Professional                | 1.0%  | 3.0%  | 23.0% | 40.0% | 33.0% | 5.06 ± 0.09       |                |
| Scholar                     | 14.0% | 27.0% | 31.0% | 15.0% | 13.0% | 3.89 ± 0.13       |                |
| <b>Collaborator (CL)</b>    |       |       |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 1.8%  | 25.5% | 49.1% | 23.6% | 4.95 ± 0.11       | HA, MG, ME, SC |
| Non-Tertiary                | 0.0%  | 0.0%  | 20.0% | 48.0% | 32.0% | 5.22 ± 0.17       | HA, SC         |
| Residents                   | 5.0%  | 25.0% | 25.0% | 30.0% | 10.0% | 4.15 ± 0.19 +, ++ | CM, HA, MG, SC |
| <b>Communicator (CM)</b>    |       |       |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 3.7%  | 24.1% | 33.3% | 38.9% | 5.11 ± 0.11       | HA, MG, ME, SC |
| Non-Tertiary                | 3.9%  | 0.0%  | 26.9% | 34.6% | 34.6% | 5.04 ± 0.16       | HA, SC         |
| Residents                   | 0.0%  | 20.0% | 10.0% | 35.0% | 35.0% | 4.85 ± 0.19       | HA, MG, ME, SC |
| <b>Health Advocate (HA)</b> |       |       |       |       |       |                   |                |
| Tertiary                    | 7.3%  | 40.0% | 27.3% | 16.4% | 9.1%  | 3.8 ± 0.11        | ME, PF         |
| Non-Tertiary                | 7.7%  | 11.5% | 42.3% | 26.9% | 11.5% | 4.31 ± 0.16 +     | ME, PF         |
| Residents                   | 42.0% | 21.0% | 31.0% | 5.0%  | 0.0%  | 2.95 ± 0.19 +, ++ | ME, PF         |
| <b>Manager (MG)</b>         |       |       |       |       |       |                   |                |
| Tertiary                    | 9.6%  | 34.6% | 34.6% | 9.6%  | 11.5% | 3.81 ± 0.11       | ME, PF         |
| Non-Tertiary                | 4.2%  | 8.3%  | 29.2% | 33.3% | 25.0% | 4.72 ± 0.17 +     | SC             |
| Residents                   | 35.0% | 60.0% | 0.0%  | 0.0%  | 5.0%  | 2.7 ± 0.19 +, ++  | ME, PF, SC     |
| <b>Medical Expert (ME)</b>  |       |       |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 3.7%  | 9.3%  | 27.8% | 59.3% | 5.96 ± 0.11       | SC             |
| Non-Tertiary                | 0.0%  | 7.7%  | 23.1% | 30.8% | 38.5% | 5.15 ± 0.16       | SC             |
| Residents                   | 15.0% | 20.0% | 20.0% | 30.0% | 15.0% | 4.1 ± 0.19 +, ++  | SC             |
| <b>Professional (PF)</b>    |       |       |       |       |       |                   |                |
| Tertiary                    | 0.0%  | 1.9%  | 14.8% | 42.6% | 40.7% | 5.31 ± 0.11       | SC             |
| Non-Tertiary                | 0.0%  | 3.9%  | 23.1% | 42.3% | 30.8% | 5.04 ± 0.16       | SC             |
| Residents                   | 5.0%  | 26.3% | 45.0% | 30.0% | 15.0% | 4.45 ± 0.19 +, ++ | SC             |
| <b>Scholar (SC)</b>         |       |       |       |       |       |                   |                |
| Tertiary                    | 9.3%  | 27.8% | 29.6% | 18.5% | 14.8% | 4.06 ± 0.11       |                |
| Non-Tertiary                | 15.4% | 23.1% | 38.5% | 7.7%  | 15.4% | 3.88 ± 0.16       |                |
| Residents                   | 25.0% | 30.0% | 25.0% | 15.0% | 5.0%  | 3.45 ± 0.19 +     |                |

NOTE: The scale used is as follows:

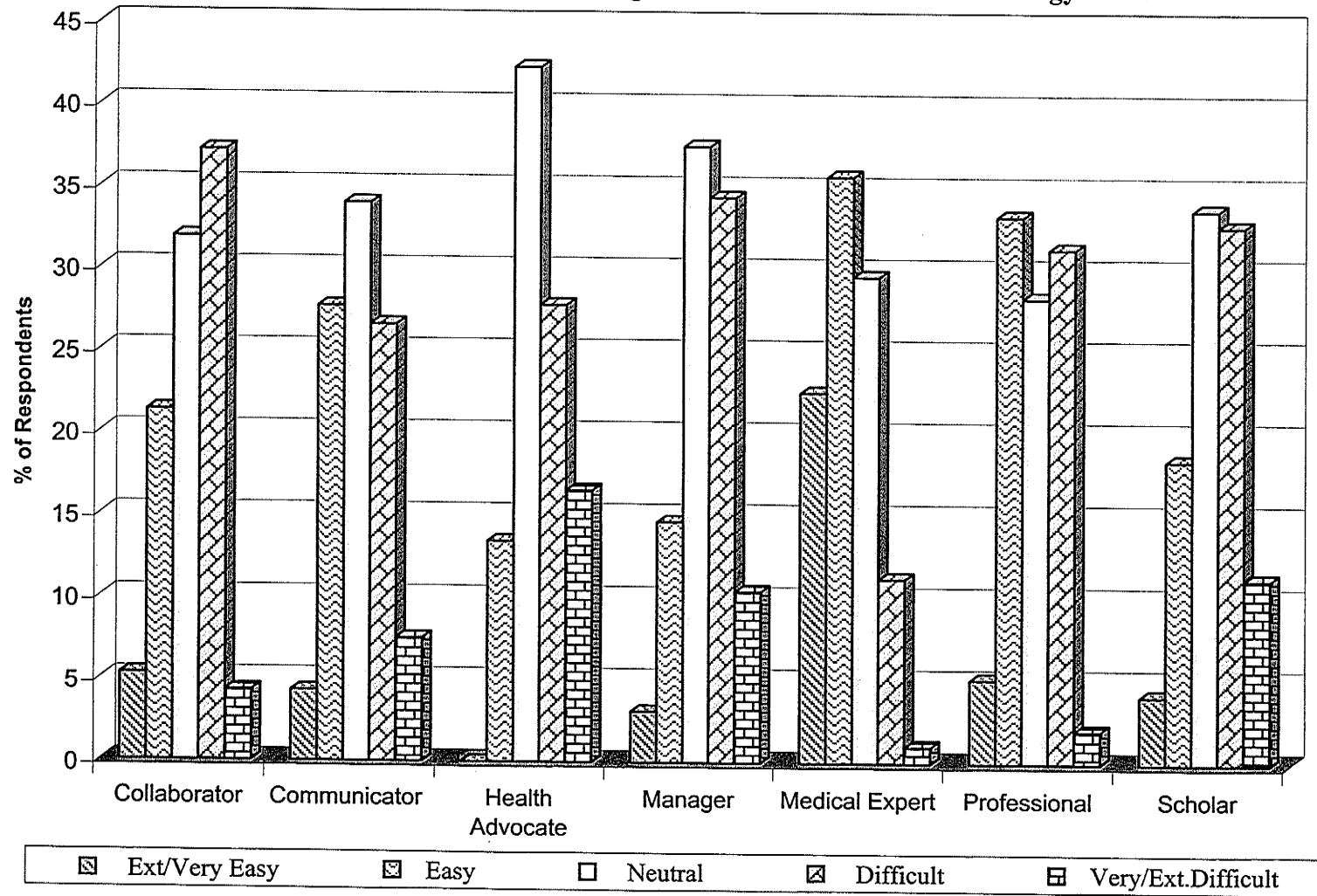
1= Not At all Prepared, 2= Not Prepared, 3=Somewhat Prepared, 4= Prepared, 5= Well Prepared, 6= Very Well Prepared, 7=Completely Prepared

\* five missing

+ P&lt; .05 Compared to Tertiary

++ P&lt; .05 Compared to Tertiary

**Figure 6: Ease of Teaching CanMEDS Roles in Anesthesiology**



roles. In comparison, one third of the participants had difficulty teaching the Professional and Communicator roles. About one-tenth of the participants reported difficulty with teaching aspects related to the Medical Expert role. With only one exception related to the Manager role, there were no differences between the three subgroups regarding the ease of teaching the CanMEDS roles, as shown in Table 18. For the Manager role, nearly half (48%) of practitioners in the Non-Tertiary Group reported “easy,” (3 or less on a 7 seven-point scale) compared to only 11% of the Tertiary Group. None of the residents had selected the “easy” category for this role.

Ease or feasibility of evaluating Anesthesiology-specific CanMEDS roles. When participants were asked about the ease of evaluating the Medical Expert role, only 13% indicated difficulty with this task. This result differed from their assessments regarding the difficulty of evaluating other CanMEDS roles. As seen in Figure 7, the percentages of respondents reporting difficulty in evaluating different roles ranged from 48% for the Health Advocate; 42% for the Collaborator; 39% for the Manager; to 38% for the Scholar role. Similar to reported results for the assessment of the ease in teaching the roles, one-third of the participants indicated difficulty evaluating the Professional role, whereas one-fifth had similar difficulties with the evaluation of the Communicator role. Again, with the exception of the Manager role, there were no significant differences between the three subgroups in terms of the perceived relative ease of the evaluation of the roles (Table 19). For the Manager role, 46% of the Non-Tertiary Group, compared to 18% of the Tertiary Group and only 12% of the Residents Group, assigned an “easy” (a rating less than 3 on a 7 points scale) as an answer to this question.

Table 18  
 Percentages and Mean Rating Values for Teaching Feasibility of CanMEDS Roles in Anesthesiology (N=100)

| Role                   | 1-2   | 3     | 4     | 5     | 6-7   | Mean ± SE   |
|------------------------|-------|-------|-------|-------|-------|-------------|
| <b>Overall</b>         |       |       |       |       |       |             |
| Collaborator           | 5.3%  | 21.3% | 31.9% | 37.2% | 4.3%  | 4.14 ± 0.11 |
| Communicator           | 4.3%  | 27.7% | 34.0% | 26.6% | 7.5%  | 4.05 ± 0.1  |
| Health Advocate        | 0.0%  | 13.4% | 42.3% | 27.8% | 16.5% | 4.52 ± 0.1  |
| Manager                | 3.1%  | 14.6% | 37.5% | 34.4% | 10.4% | 4.36 ± 0.1  |
| Medical Expert         | 22.5% | 35.7% | 29.6% | 11.2% | 1.0%  | 3.32 ± 0.09 |
| Professional           | 5.1%  | 33.3% | 28.3% | 31.3% | 2.0%  | 3.91 ± 0.09 |
| Scholar                | 4.1%  | 18.4% | 33.7% | 32.7% | 11.2% | 4.32 ± 0.11 |
| <b>Collaborator</b>    |       |       |       |       |       |             |
| Attending Staff        | 5.3%  | 24.0% | 33.3% | 34.7% | 2.7%  | 4.05 ± 0.11 |
| Residents              | 5.3%  | 10.2% | 26.3% | 47.4% | 10.5% | 4.47 ± 0.23 |
| <b>Communicator</b>    |       |       |       |       |       |             |
| Attending Staff        | 5.3%  | 26.7% | 30.7% | 30.7% | 6.7%  | 4.1 ± 0.13  |
| Residents              | 0.0%  | 31.6% | 47.4% | 10.5% | 10.5% | 4.0 ± 0.22  |
| <b>Health Advocate</b> |       |       |       |       |       |             |
| Attending Staff        | 0.0%  | 14.1% | 43.6% | 25.6% | 16.7% | 4.5 ± 0.12  |
| Residents              | 0.0%  | 0.0%  | 31.6% | 52.6% | 15.8% | 4.58 ± 0.21 |
| <b>Manager</b>         |       |       |       |       |       |             |
| Attending Staff        | 3.9%  | 18.1% | 39.0% | 29.9% | 9.1%  | 4.24 ± 0.12 |
| Residents              | 0.0%  | 0.0%  | 31.6% | 52.6% | 15.8% | 4.84 ± 0.16 |
| <b>Medical Expert</b>  |       |       |       |       |       |             |
| Attending Staff        | 25.3% | 36.7% | 24.1% | 12.7% | 1.3%  | 3.28 ± 0.11 |
| Residents              | 10.5% | 31.6% | 52.6% | 5.3%  | 0.0%  | 3.52 ± 0.18 |
| <b>Professional</b>    |       |       |       |       |       |             |
| Attending Staff        | 6.3%  | 36.3% | 26.3% | 30.0% | 1.3%  | 3.83 ± 0.11 |
| Residents              | 0.0%  | 21.1% | 36.8% | 36.8% | 5.3%  | 4.26 ± 0.2  |
| <b>Scholar</b>         |       |       |       |       |       |             |
| Attending Staff        | 5.1%  | 16.5% | 30.4% | 35.4% | 12.7% | 4.37 ± 0.13 |
| Residents              | 0.0%  | 26.3% | 47.4% | 21.1% | 5.3%  | 4.11 ± 0.23 |

NOTE: The scale used is as follows:

1= Extremely Easy, 2= Very Easy, 3=Easy, 4= Neutral, 5= Difficult, 6= Very Difficult, 7=Extremely Difficult

**Figure 7: Ease of Evaluating CanMEDS Roles in Anesthesiology**

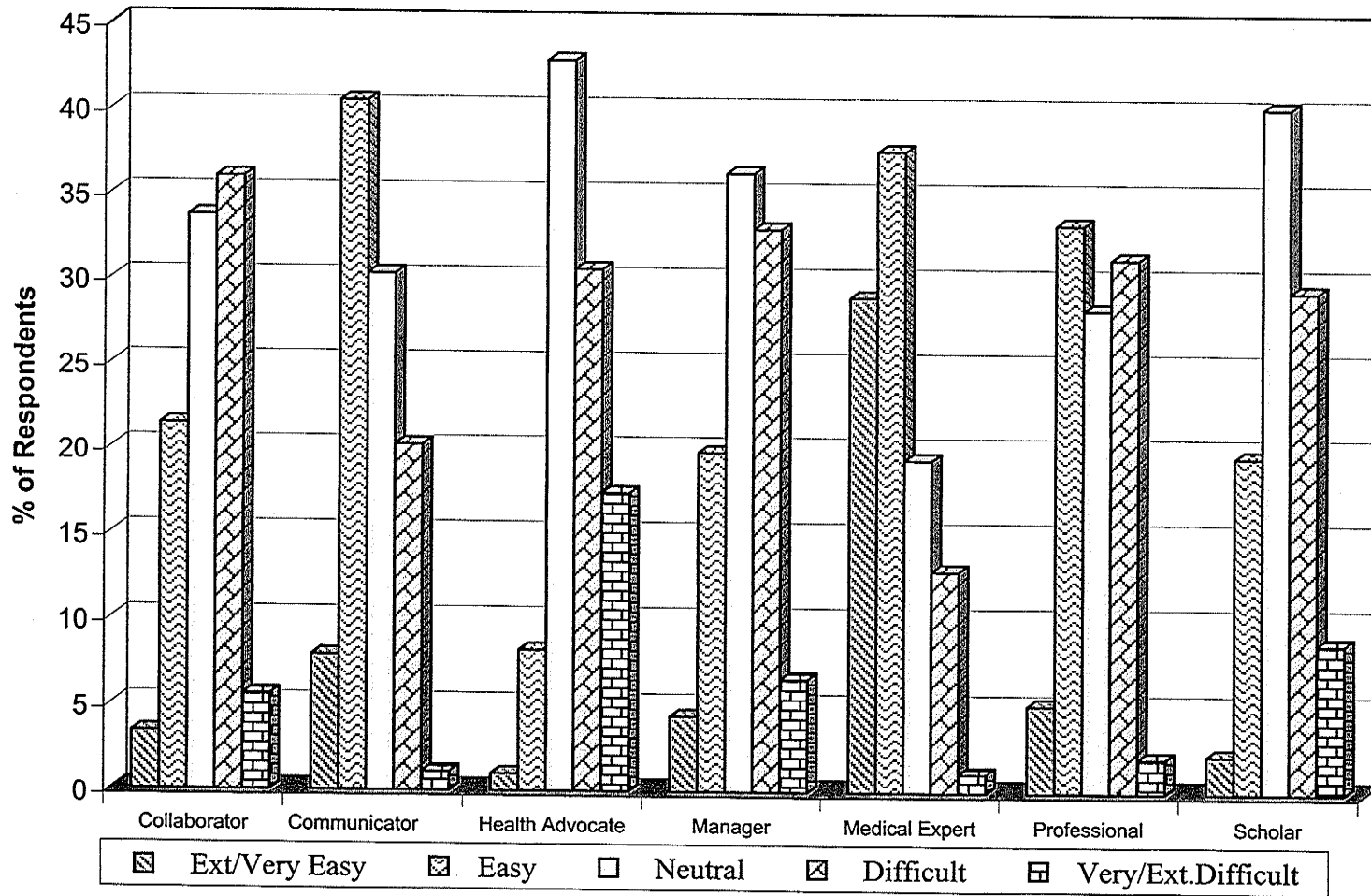




Table 19  
 Percentages and Mean Rating Values for Evaluation Feasibility of CanMEDS Roles in Anesthesiology (N=100)

| Role                   | 1- 2  | 3     | 4     | 5     | 6- 7  | Mean ± SE   |
|------------------------|-------|-------|-------|-------|-------|-------------|
| <b>Overall</b>         |       |       |       |       |       |             |
| Collaborator           | 3.4%  | 21.4% | 33.7% | 36.0% | 5.6%  | 4.2 ± 0.1   |
| Communicator           | 7.9%  | 40.5% | 30.3% | 20.2% | 1.1%  | 3.6 ± 0.09  |
| Health Advocate        | 1.0%  | 8.2%  | 42.9% | 30.6% | 17.4% | 4.6 ± 0.1   |
| Manager                | 4.4%  | 19.8% | 36.3% | 33.0% | 6.6%  | 4.2 ± 0.1   |
| Medical Expert         | 29.0% | 37.6% | 19.4% | 12.9% | 1.1%  | 3.16 ± 0.11 |
| Professional           | 3.3%  | 40.7% | 25.3% | 28.6% | 2.2%  | 3.86 ± 0.09 |
| Scholar                | 2.2%  | 19.6% | 40.2% | 29.4% | 8.7%  | 4.25 ± 0.1  |
| <b>Collaborator</b>    |       |       |       |       |       |             |
| Attending Staff        | 4.2%  | 19.7% | 35.2% | 33.2% | 7.0%  | 4.21± 0.12  |
| Residents              | 0.0%  | 27.8% | 27.8% | 44.4% | 0.0%  | 4.17± 0.2   |
| <b>Communicator</b>    |       |       |       |       |       |             |
| Attending Staff        | 8.6%  | 41.4% | 28.6% | 20.0% | 1.4%  | 3.64 ± 0.11 |
| Residents              | 5.3%  | 36.8% | 36.8% | 21.1% | 0.0%  | 3.74 ± 0.2  |
| <b>Health Advocate</b> |       |       |       |       |       |             |
| Attending Staff        | 1.3%  | 9.0%  | 43.6% | 26.9% | 19.2% | 4.59 ± 0.11 |
| Residents              | 0.0%  | 5.0%  | 40.0% | 45.0% | 10.0% | 4.65 ± 0.2  |
| <b>Manager</b>         |       |       |       |       |       |             |
| Attending Staff        | 5.4%  | 21.6% | 36.5% | 31.1% | 5.4%  | 4.11 ± 0.12 |
| Residents              | 0.0%  | 11.8% | 35.3% | 41.2% | 11.8% | 4.59 ± 0.24 |
| <b>Medical Expert</b>  |       |       |       |       |       |             |
| Attending Staff        | 29.3% | 40.0% | 16.0% | 14.7% | 0.0%  | 3.12 ± 0.12 |
| Residents              | 27.8% | 27.8% | 33.3% | 5.6%  | 5.6%  | 3.28 ± 0.29 |
| <b>Professional</b>    |       |       |       |       |       |             |
| Attending Staff        | 4.1%  | 39.7% | 24.7% | 31.5% | 0.0%  | 3.1 ± 0.12  |
| Residents              | 0.0%  | 44.4% | 27.8% | 16.7% | 11.1% | 3.94 ± 0.25 |
| <b>Scholar</b>         |       |       |       |       |       |             |
| Attending Staff        | 2.7%  | 16.4% | 38.4% | 34.3% | 8.2%  | 3.83 ± 0.11 |
| Residents              | 0.0%  | 31.6% | 47.4% | 10.5% | 10.5% | 4.0 ± 0.22  |

NOTE: The scale used is as follows:

1= Extremely Easy, 2= Very Easy, 3=Easy, 4= Neutral, 5= Difficult, 6= Very Difficult, 7=Extremely Difficult

Ways to be Prepared to Assume, to Teach, and to Evaluate the CanMEDS 2000 Roles in Anesthesiology

In this part, the findings for each role are presented separately in alphabetical order, according to the title of each role. One table is presented to summarize the results with respect to each of the seven roles. The table format is standardized for each role. The first portion of the table contains the participants' assessments of methods contributing to improved preparedness for the CanMEDS roles. The two remaining sections of each table list the results of agreements, or lack of, regarding ways to best approach the teaching and evaluation of the seven CanMEDS roles. While all the subsections of the tables will follow the same general format, the methods listed in the questionnaires were rearranged in descending order, from top to bottom, according to the overall mean value of agreements reported by the study participants for each method. If present, significant differences among the groups will be highlighted, both in the Tables and commented on in the text. Additional comments, options volunteered by the participants under "other," are categorized and presented here, as well.

The Collaborator role. When asked about the best way to be prepared to assume the Collaborator role, respondents were in agreement that direct observation and feedback, followed by individual mentorship and interdisciplinary staffing, are the best ways to be prepared. These are followed by the use of the realistic simulation sessions and the team building exercises as, shown in Table 20. Other suggestions made by the study participants include the use of case management rounds, multi-departmental projects, assuming the roles of other care team members during the years of training, and formal enrolment in Physician Management Institute (P.M.I.) courses.

Table 20

Number, Means, and Standard Errors for Participants' Opinions Regarding Approaches for the Collaborator Role

| Methods  | Overall |      | Attending Staff |             |              |              | Residents |              | p Value |
|--|---------|------|-----------------|-------------|--------------|--------------|-----------|--------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |              | n         | Mean ± SE    |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE    |           |              |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |              |           |              |         |
| Direct observation and feedback                  | 101     | 5.48 | 55              | 5.51 ± 0.13 | 26           | 5.54 ± 0.19  | 20        | 5.3 ± 0.21   | ns      |
| Individual mentorship                            | 100     | 5.12 | 55              | 5.21 ± 0.14 | 25           | 5.2 ± 0.2    | 20        | 4.75 ± 0.22  | ns      |
| Interdisciplinary staffing                       | 99      | 5.01 | 55              | 5.05 ± 0.15 | 25           | 5.2 ± 0.22   | 19        | 4.63 ± 0.26  | ns      |
| Realistic simulation sessions                    | 101     | 4.69 | 55              | 4.52 ± 0.17 | 26           | 4.84 ± 0.24  | 10        | 4.95 ± 0.28  | ns      |
| Team Building Exercises                          | 100     | 4.41 | 55              | 4.42 ± 0.19 | 25           | 4.6 ± 0.29   | 20        | 4.15 ± 0.32  | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |              |           |              |         |
| Role modeling                                    | 99      | 5.66 | 55              | 5.96 ± 0.15 | 24           | 5.41 ± 0.22* | 20        | 5.25 ± 0.35* | 0.02    |
| Case-based discussion                            | 99      | 5.35 | 55              | 5.27 ± 0.14 | 24           | 5.25 ± 0.21  | 20        | 5.7 ± 0.23   | ns      |
| Video-tape scenarios                             | 97      | 4.18 | 54              | 4.15 ± 0.15 | 23           | 4.3 ± 0.23   | 20        | 4.15 ± 0.25  | ns      |
| <b>To Evaluate</b>                               |         |      |                 |             |              |              |           |              |         |
| Direct observation by Attending Staff            | 100     | 5.82 | 55              | 5.95 ± 0.11 | 25           | 5.6 ± 0.17   | 20        | 5.75 ± 0.19  | ns      |
| Direct observation by Peers                      | 99      | 5.44 | 55              | 5.53 ± 0.11 | 24           | 5.46 ± 0.21  | 20        | 5.2 ± 0.24   | ns      |
| Direct observation by Nurses                     | 99      | 4.98 | 54              | 5.15 ± 0.19 | 25           | 5 ± 0.28     | 20        | 4.5 ± 0.31   | ns      |
| Direct observation by Program Director           | 98      | 4.8  | 54              | 4.91 ± 0.16 | 24           | 4.42 ± 0.24  | 20        | 4.95 ± 0.26  | ns      |
| Direct observation by Simulated Patients         | 98      | 4.37 | 54              | 4.54 ± 0.2  | 24           | 4.46 ± 0.31  | 20        | 3.8 ± 0.34   | ns      |
| Objective Structured Clinical Examination (OSCE) | 97      | 4.33 | 54              | 4.35 ± 0.19 | 24           | 4.33 ± 0.28  | 19        | 4.26 ± 0.32  | ns      |
| Self-Reflection                                  | 98      | 4.12 | 54              | 4.17 ± 0.18 | 24           | 4 ± 0.27     | 19        | 4.15 ± 0.3   | ns      |
| Standardized oral examination                    | 95      | 4.08 | 54              | 3.96 ± 0.18 | 24           | 4.25 ± 0.28  | 17        | 4.23 ± 0.33  | ns      |
| Written examinations                             | 96      | 3.01 | 53              | 2.87 ± 0.19 | 24           | 3.15 ± 0.29  | 19        | 3.26 ± 0.32  | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p&lt;0.05 than Tertiary Group.

\*\* p&lt;0.05 than Non-Tertiary Group.

When asked about how best to teach collaboration, 95% of attending Anesthesiologists from the Tertiary Group expressed agreement with the importance of role modeling, while only 75% of the Non-Tertiary Group and 80% of the Resident Group agreed (chi-square 12.4, df 4,  $p=0.0147$ ). Participants from the three groups agreed on the roles of clinical case-based discussions (mean value of 5.35 on a scale from 1-7), and showed a “neutral” response to the use of the video-taped scenarios as a way of teaching this role, as can be seen in the Table. One participant indicated this role might be “easily taught if the institutional culture supports it.”

The last subsection of Table 20 shows Anesthesia department members’ opinions about the use of different evaluation strategies to assess this role. There were no differences among the three groups. Direct observation by attending staff had the highest agreement among respondents (mean= 5.82), followed by the direct observation by peers, nurses, and the Program Director. The formal written examination had the lowest agreement, with the rest of the choices receiving intermediate or “neutral” responses.

The Communicator role. The findings in this role are very similar to the reported responses to the Collaborator role, above, and are shown in Table 21. Across groups, there is consensus among the participants about the importance of direct observation and feedback, individual mentorship, the role of communication skills workshops, and departmental rounds, as means to being prepared as a better Communicator. Other suggestions that were listed by the respondents, included the importance of creating a positive learning environment, whereby avoiding stressed and overworked situations ( $n=1$ ); using actual interaction with patients to assess their feedback/outcome; and finally, using a simulated environment as a preparation tool for the same purpose.

Table 21

Number, Means, and Standard Errors for Participants' Opinions Regarding Approaches for the Communicator Role

| Methods   | Overall |      | Attending Staff |             |              |             | Residents |             | p Value |
|---|---------|------|-----------------|-------------|--------------|-------------|-----------|-------------|---------|
|   | n       | Mean | Tertiary        |             | Non-Tertiary |             | n         | Mean ± SE   |         |
|   |         |      | n               | Mean ± SE   | n            | Mean ± SE   |           |             |         |
| <b>To Increase Preparedness</b>                     |         |      |                 |             |              |             |           |             |         |
| Direct observation and feedback                     | 100     | 5.81 | 55              | 5.84 ± 0.11 | 25           | 5.64 ± 0.17 | 20        | 5.95 ± 0.2  | ns      |
| Individual mentorship                               | 100     | 5.27 | 55              | 5.27 ± 0.13 | 25           | 5.4 ± 0.2   | 20        | 5.1 ± 0.22  | ns      |
| Self-reflection (on how patients should be treated) | 101     | 5.2  | 55              | 5.13 ± 0.16 | 26           | 5.54 ± 0.24 | 20        | 4.95 ± 0.27 | ns      |
| Communications skills workshops                     | 101     | 5.1  | 55              | 5.11 ± 0.17 | 26           | 5.2 ± 0.25  | 20        | 4.85 ± 0.29 | ns      |
| Rounds  | 100     | 4.76 | 55              | 4.61 ± 0.17 | 25           | 4.92 ± 0.26 | 20        | 4.95 ± 0.29 | ns      |
| <b>To Teach</b>                                     |         |      |                 |             |              |             |           |             |         |
| Role modeling                                       | 99      | 5.66 | 55              | 5.71 ± 0.12 | 24           | 5.58 ±      | 20        | 5.65 ± 0.2  | ns      |
| Case-based discussion                               | 100     | 5.3  | 55              | 5.24 ± 0.14 | 25           | 5.4 ± 0.2   | 20        | 5.35 ± 0.28 | ns      |
| Standardized patients                               | 99      | 4.58 | 55              | 4.7 ± 0.16  | 24           | 4.75 ± 0.25 | 20        | 4 ± 0.27    | ns      |
| Video-tape Scenarios                                | 98      | 4.49 | 55              | 4.56 ± 0.16 | 24           | 4.42 ± 0.25 | 19        | 4.37 ± 0.28 | ns      |
| <b>To Evaluate</b>                                  |         |      |                 |             |              |             |           |             |         |
| Direct observation by Attending Staff               | 100     | 5.98 | 55              | 5.98 ± 0.11 | 25           | 5.96 ± 0.17 | 20        | 6 ± 0.19    | ns      |
| Direct observation by Peers                         | 99      | 5.5  | 55              | 5.43 ± 0.15 | 24           | 5.75 ± 0.23 | 20        | 5.4 ± 0.25  | ns      |
| Direct observation by Nurses                        | 100     | 5.15 | 55              | 5.24 ± 0.19 | 25           | 5.4 ± 0.28  | 20        | 4.6 ± 0.32  | ns      |
| Direct observation by Program Director              | 99      | 4.83 | 55              | 4.65 ± 0.18 | 24           | 5 ± 0.27    | 20        | 5.15 ± 0.3  | ns      |
| Direct observation by Simulated Patients            | 99      | 4.8  | 55              | 4.78 ± 0.18 | 24           | 5.04 ± 0.27 | 20        | 4.55 ± 0.3  | ns      |
| Objective Structured Clinical Examination (OSCE)    | 98      | 4.63 | 55              | 4.62 ± 0.17 | 23           | 4.65 ± 0.26 | 20        | 4.65 ± 0.32 | ns      |
| Standardized oral examination                       | 98      | 4.51 | 55              | 4.45 ± 0.18 | 24           | 4.33 ± 0.27 | 19        | 4.89 ± 0.31 | ns      |
| Self-Reflection                                     | 100     | 4.49 | 55              | 4.42 ± 0.18 | 25           | 4.68 ± 0.27 | 20        | 4.45 ± 0.3  | ns      |
| Standardized patients                               | 97      | 4.48 | 55              | 4.6 ± 0.18  | 23           | 4.48 ± 0.28 | 19        | 4.18 ± 0.31 | ns      |
| Long answer questions                               | 99      | 3.40 | 55              | 3.54 ± 0.18 | 24           | 3.17 ± 0.28 | 20        | 3.3 ± 0.31  | ns      |
| Short answer questions                              | 99      | 3.12 | 55              | 2.96 ± 0.18 | 25           | 3.48 ± 0.27 | 19        | 3.1 ± 0.31  | sn      |
| Multiple choice exams (MCQ)                         | 98      | 2.66 | 55              | 2.5 ± 0.16  | 24           | 2.88 ± 0.24 | 19        | 2.84 ± 0.27 | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p&lt;0.05 than Tertiary Group.

\*\* p&lt;0.05 than Non-Tertiary Group.

Regarding the use of various teaching tools for the Communicator role, role modeling was rated the highest by all department members (mean value of 5.66), which was followed by the use of clinically Case-based discussions. The other two modalities (approaches), the use of standardized patients and video-taped scenarios, were also acceptable methods to the survey respondents, though rated lower with an average of 4.8 and 4.5 among the respondents, respectively (see Table 21). Other methods suggested by the survey participants included providing residents with many opportunities to “observe professional-professional, professional-patient interactions;” having ample chances to present during rounds and case presentations; using more frequent and regular practice (mock) oral examinations; and using appropriate facilitation from specialists in marketing, psychologists, editors, or communication experts who could direct such processes. One respondent added a reservation about the possibility of teaching people to be Communicators; “I suspect this is impossible to teach – some people are natural Communicators – others are not. This ability should be part of the selection process.”

As seen in last section in Table 21, direct observations by attending staff, peers, and nurses, were rated as the best methods to evaluate the communication skills in our survey population. These were followed by the use of direct observations by the program director and simulated patients, standardized oral examinations, Objective Structured Clinical Examination (OSCE), self-reflection, and the use of the standardized patient approach. The three written examination methods, long answer, and short answer and multiple choice questions (MCQ), were deemed as the least appropriate means in assessing this role. One participant suggested the use of the expertise of “external

specialists in communication” as a means of assessment, and one suggested that the definition of self-reflection, at the start of this survey section was unclear.

The Health Advocate role. The agreement ratings on the various methods for learning and teaching the Health Advocate role are listed in Table 22. Regarding the best approaches to in being prepared for the Health Advocate role, individual mentorship received the highest ratings, followed by self-directed learning, and then direct observation and feedback. Rounds on clinical epidemiology were the least preferred method. Five additional methods were suggested by four of the study participants: (a) These are the enrolment in a course of study “specific to health care administration and management (e.g. P.M.I);” (b) “interaction with research based organizations;” (c) seminars on the Canadian Society of Anesthesiologists (CSA) Standards and guidelines; (d) invited lectures “from biomedical engineers & respiratory technicians; and (e) attendance at debates/negotiations between Anesthesia and government/professional bodies [as a way of to] prepare for different eventualities.”

Case-based discussions, role modeling, and learning from clinical problems were all acceptable methods to teach this role effectively. No significant differences were noted between the subgroups. Additional methods suggested for teaching the Health Advocate role, included being engaged in specific health care management courses, such the pre-mentioned P.M.I courses, and self-directed learning. In addition, being able to recognize various “opportunities, [either from socially-based, epidemiological data, or new information] to advocate for needed resources or for health improvement for patients” was suggested as a strategy.

Table 22

Number, Means, and Standard Errors for Participants' Opinions Regarding Approaches to the Health Advocate Role.

| Methods  | Overall |      | Attending Staff |             |              |             | Residents |             | p Value |
|--|---------|------|-----------------|-------------|--------------|-------------|-----------|-------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |             | n         | Mean ± SE   |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE   |           |             |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |             |           |             |         |
| Individual mentorship                            | 100     | 4.98 | 54              | 4.92 ± 0.16 | 26           | 5.27 ± 0.22 | 20        | 4.75 ± 0.26 | ns      |
| Self-directed learning                           | 100     | 4.85 | 54              | 4.92 ± 0.16 | 26           | 4.73 ± 0.24 | 20        | 4.8 ± 0.27  | ns      |
| Direct observation and feedback                  | 100     | 4.82 | 54              | 4.74 ± 0.15 | 26           | 5.15 ± 0.21 | 20        | 4.6 ± 0.25  | ns      |
| Clinical Epidemiology Rounds                     | 100     | 4.35 | 54              | 4.43 ± 0.18 | 26           | 4.08 ± 0.26 | 20        | 4.5 ± 0.29  | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |             |           |             |         |
| Case-based discussion                            | 100     | 4.99 | 55              | 5.07 ± 0.16 | 25           | 4.88 ± 0.23 | 20        | 4.9 ± 0.26  | ns      |
| Role modeling                                    | 100     | 4.96 | 55              | 5.07 ± 0.15 | 25           | 5 ± 0.23    | 20        | 4.6 ± 0.25  | ns      |
| Learning from clinical problems                  | 100     | 4.82 | 55              | 4.73 ± 0.17 | 25           | 5.08 ± 0.25 | 20        | 4.75 ± 0.28 | ns      |
| <b>To Evaluate</b>                               |         |      |                 |             |              |             |           |             |         |
| Direct observation by Attending Staff            | 100     | 4.99 | 55              | 4.93 ± 0.16 | 25           | 5.24 ± 0.23 | 20        | 4.85 ± 0.26 | ns      |
| Direct observation by Peers                      | 100     | 4.74 | 55              | 4.65 ± 0.17 | 25           | 5.08 ± 0.25 | 20        | 4.55 ± 0.28 | ns      |
| Health & social policy questions                 | 99      | 4.42 | 55              | 4.47 ± 0.18 | 24           | 4.33 ± 0.27 | 20        | 4.5 ± 0.3   | ns      |
| Direct observation by Program Director           | 100     | 4.39 | 55              | 4.25 ± 0.18 | 25           | 4.76 ± 0.27 | 20        | 4.3 ± 0.3   | ns      |
| Self-Reflection                                  | 99      | 4.14 | 55              | 4.12 ± 0.16 | 24           | 4.42 ± 0.24 | 20        | 3.85 ± 0.26 | ns      |
| Direct observation by Nurses                     | 100     | 4.06 | 55              | 4.04 ± 0.21 | 25           | 4.4 ± 0.31  | 20        | 3.7 ± 0.34  | ns      |
| Clinical Epidemiology questions                  | 99      | 4.06 | 55              | 4.11 ± 0.2  | 24           | 4 ± 0.3     | 19        | 4 ± 0.33    | ns      |
| Standardized oral examination                    | 98      | 4.01 | 55              | 3.92 ± 0.16 | 24           | 4.16 ± 0.24 | 19        | 4.05 ± 0.27 | ns      |
| Direct observation by Simulated Patients         | 99      | 3.9  | 55              | 3.8 ± 0.18  | 24           | 4.38 ± 0.28 | 20        | 3.6 ± 0.31  | ns      |
| Objective Structured Clinical Examination (OSCE) | 99      | 3.86 | 55              | 3.74 ± 0.17 | 24           | 4.2 ± 0.26  | 20        | 3.8 ± 0.28  | ns      |
| Multiple choice exams (MCQ)                      | 98      | 3.30 | 54              | 3.05 ± 0.19 | 24           | 3.54 ± 0.3  | 20        | 3.65 ± 0.32 | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p&lt;0.05 than Tertiary Group.

\*\* p&lt;0.05 than Non-Tertiary Group.



In terms of evaluation methods, direct observation by attending staff and peers, questions related to health and social policy, and direct observation by the program director received the highest agreement ratings. The mean values of agreement with the other evaluation options are shown in the lower end of the Table. MCQs, OSCE, and direct observation by simulated patients were rated lowest as a means for evaluating this role. One participant suggested using projects involving various topics (economics, equipments, budgeting) as a means of evaluation.

The Manager role. Data, with respect to learning, teaching, and evaluating the Manager role, are summarized in Table 23. Overall, participants positively rated the four listed methods that were suggested as preparatory tools for the Manager role. However, the relative ratings were higher in the Non-Tertiary Group, (significant differences, in particular, to assigning responsibility for the Operating Room, Pre-Anesthesia Clinic, and in the Labor Floor). In response to the listed option of assigning a resident to the chief resident's position for three months, one participant stated that the term for chief resident should be at least six months. Many other suggestions were made by the study participants as approaches in preparing for the Manager role, including: enrolment in formal instruction, mentorship courses, or rotations dealing with management training (n=5); seminars and rounds on operating room management skills (n=2); active participation in the standards committee (n=2), outcome-based (morbidity and mortality) (n=3) and quality assurance (n=2) rounds and meetings; and active participation at various interdisciplinary (Anesthesia, Surgery, and Nursing) courses and workshops (n=2).

Table 23

Number, Means, and Standard Errors for Participants' Opinions Regarding Approaches to the Manager Role

| Methods  | Overall |      | Attending Staff |             |              |               | Residents |                | p Value |
|--|---------|------|-----------------|-------------|--------------|---------------|-----------|----------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |               | n         | Mean ± SE      |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE     |           |                |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |               |           |                |         |
| Assign responsibility for OR floor               | 98      | 5.30 | 54              | 5.07 ± 0.15 | 25           | 5.8 ± 0.23 *  | 19        | 5.26 ± 0.26    | 0.03    |
| Assign responsibility in the PAC                 | 98      | 5.22 | 54              | 4.96 ± 0.16 | 25           | 5.68 ± 0.23 * | 19        | 5.36 ± 0.26    | 0.03    |
| Assign responsibility in the Labour Ward         | 98      | 5.09 | 54              | 4.81 ± 0.16 | 25           | 5.56 ± 0.24 * | 19        | 5.26 ± 0.27    | 0.029   |
| Appoint as chief resident for 3 months           | 97      | 4.99 | 54              | 4.8 ± 0.19  | 25           | 5.48 ± 0.28   | 18        | 4.89 ± 0.32    | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |               |           |                |         |
| Role modeling                                    | 98      | 5.14 | 55              | 5.05 ± 0.15 | 24           | 5.54 ± 0.22   | 19        | 4.89 ± 0.25    | ns      |
| Case-based discussion                            | 98      | 4.93 | 55              | 4.9 ± 0.19  | 24           | 5.08 ± 0.29   | 19        | 4.84 ± 0.32    | ns      |
| Video-tape scenarios                             | 98      | 3.96 | 55              | 3.9 ± 0.19  | 24           | 4.29 ± 0.29   | 19        | 3.68 ± 0.32    | ns      |
| <b>To Evaluate</b>                               |         |      |                 |             |              |               |           |                |         |
| Direct observation by Attending Staff            | 98      | 5.33 | 54              | 5.35 ± 0.14 | 24           | 5.63 ± 0.21   | 20        | 4.95 ± 0.23    | ns      |
| Direct observation by Peers                      | 98      | 4.9  | 54              | 4.76 ± 0.15 | 24           | 5.33 ± 0.22   | 20        | 4.75 ± 0.25    | ns      |
| Direct observation by Program Director           | 98      | 4.62 | 54              | 4.37 ± 0.19 | 24           | 5.08 ± 0.28   | 20        | 4.75 ± 0.31    | ns      |
| Direct observation by Nurses                     | 97      | 4.51 | 53              | 4.64 ± 0.19 | 24           | 4.88 ± 0.28   | 20        | 3.75 ± 0.32**  | 0.026   |
| Standardized oral examination                    | 97      | 4.09 | 54              | 3.89 ± 0.18 | 23           | 4.57 ± 0.27   | 20        | 4.1 ± 0.29     | ns      |
| Self-Reflection                                  | 97      | 4.05 | 54              | 4 ± 0.17    | 23           | 4.7 ± 0.26    | 20        | 3.45 ± 0.27 ** | 0.005   |
| Objective Structured Clinical Examination (OSCE) | 97      | 3.82 | 54              | 3.76 ± 0.19 | 23           | 4.48 ± 0.29   | 20        | 3.25 ± 0.32**  | 0.018   |
| Direct observation by Simulated Patients         | 97      | 3.8  | 54              | 3.65 ± 0.19 | 23           | 4.74 ± 0.29 * | 20        | 3.4 ± 0.31**   | 0.002   |
| Short/long answer questions                      | 97      | 3.76 | 54              | 3.65 ± 0.2  | 23           | 4.13 ± 0.31   | 20        | 3.65 ± 0.33    | ns      |
| Simulated chart recall                           | 97      | 3.75 | 54              | 3.61 ± 0.19 | 23           | 4.3 ± 0.29    | 20        | 3.5 ± 0.31     | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p&lt;0.05 than Tertiary Group.

\*\* p&lt;0.05 than Non-Tertiary Group.

Regarding teaching the Manager role, the survey respondents were in agreement about the appropriateness of role modeling and case-based discussions as approaches to achieving this goal. Video-taped scenarios were not perceived to be as a useful tool particularly by the Resident Group (the difference was not statistically significant). Under the “other” category, eight participants made additional suggestions for teaching this role, including: quality assurance rounds (n=3), Canadian Medical Association P.M.I. and other management training programs/courses (n=3), and the use of seminars and specific rounds on this topic (n=2).

As with the previous roles, direct observation by the attending staff, peers, and the program director are the most agreed upon means for evaluating the Manager role, with no differences among the groups. Participants from the Non-Tertiary Group rated direct observation by nurses higher than the Residents Group, and they rated direct observation by simulated patients significantly higher than the other two groups. Under the “other” option in this part of the survey, two respondents recommended direct observation by other Managers and other learning methods from business models as, complementary to the evaluation strategies for the competencies associated with the Manager role.

The Medical Expert role. As shown in Table 24, the study participants were in favour of the use of direct observation and feedback, self-directed learning, individual mentorship and apprenticeship, and rounds as suitable means to being prepared for the Medical Expert role. Also, there was strong agreement among the respondents that learning from clinical problems, case-based discussions, and role modeling are all considered as preferred methods for teaching the Medical Expert role’s required competencies. Clinical practice and experience (n=2), formal teaching, and case-directed

Table 24

Number, Means, and Standard Errors for Participants' Opinions Regarding Suggested Approaches to the Medical Expert Role

| Methods  | Overall |      | Attending Staff |             |              |             | Residents |             | p Value |
|--|---------|------|-----------------|-------------|--------------|-------------|-----------|-------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |             | n         | Mean ± SE   |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE   |           |             |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |             |           |             |         |
| Direct observation and feedback                  | 101     | 6.14 | 55              | 6.13 ± 0.11 | 26           | 6 ± 0.17    | 20        | 6.35 ± 0.19 | ns      |
| Self-directed learning                           | 101     | 6.00 | 55              | 6 ± 0.12    | 26           | 6.08 ± 0.18 | 20        | 5.95 ± 0.21 | ns      |
| Individual mentorship/Apprenticeship             | 101     | 5.99 | 55              | 5.93 ± 0.13 | 26           | 6.04 ± 0.18 | 20        | 6.1 ± 0.21  | ns      |
| Rounds   | 101     | 5.69 | 55              | 5.56 ± 0.14 | 26           | 5.69 ± 0.21 | 20        | 5.7 ± 0.23  | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |             |           |             |         |
| Learning from clinical problems                  | 100     | 6.22 | 55              | 6.18 ± 0.11 | 25           | 6.28 ± 0.17 | 20        | 6.25 ± 0.19 | ns      |
| Case-based discussion                            | 100     | 6.14 | 55              | 6.01 ± 0.11 | 25           | 6.24 ± 0.17 | 20        | 6.35 ± 0.18 | ns      |
| Role modeling                                    | 100     | 5.72 | 55              | 5.61 ± 0.14 | 25           | 5.88 ± 0.2  | 20        | 5.8 ± 0.22  | ns      |
| <b>To Evaluate</b>                               |         |      |                 |             |              |             |           |             |         |
| Direct observation by Attending Staff            | 99      | 5.92 | 55              | 5.96 ± 0.13 | 25           | 5.84 ± 0.2  | 19        | 5.89 ± 0.23 | ns      |
| Standardized oral examination                    | 97      | 5.47 | 54              | 5.52 ± 0.15 | 23           | 5.22 ± 0.24 | 20        | 5.65 ± 0.25 | ns      |
| Direct observation by Peers                      | 100     | 5.46 | 55              | 5.38 ± 0.14 | 25           | 5.72 ± 0.21 | 20        | 5.35 ± 0.24 | ns      |
| Objective Structured Clinical Examination (OSCE) | 99      | 5.35 | 55              | 5.49 ± 0.16 | 24           | 5.41 ± 0.24 | 20        | 4.9 ± 0.26  | ns      |
| Other written exam questions                     | 99      | 5.21 | 55              | 5.4 ± 0.18  | 24           | 4.92 ± 0.27 | 20        | 5.05 ± 0.29 | ns      |
| Mannequin simulation environment                 | 99      | 5.19 | 55              | 5.18 ± 0.18 | 24           | 5.5 ± 0.28  | 20        | 4.85 ± 0.3  | ns      |
| Multiple choice exams (MCQ)                      | 99      | 5.06 | 55              | 5.1 ± 0.19  | 24           | 4.58 ± 0.28 | 20        | 5.5 ± 0.31  | ns      |
| Direct observation by Program Director           | 100     | 4.86 | 55              | 4.72 ± 0.18 | 25           | 5.16 ± 0.26 | 20        | 4.85 ± 0.29 | ns      |
| Direct observation by Simulated Patients         | 98      | 4.6  | 55              | 4.62 ± 0.18 | 23           | 5.26 ± 0.28 | 20        | 4 ± 0.3**   | 0.009   |
| Self-Reflection                                  | 97      | 4.52 | 54              | 4.33 ± 0.18 | 23           | 5.04 ± 0.27 | 20        | 4.45 ± 0.29 | ns      |
| Direct observation by Nurses                     | 99      | 4.18 | 55              | 4.07 ± 0.2  | 24           | 4.71 ± 0.3  | 20        | 3.85 ± 0.33 | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p&lt;0.05 than Tertiary Group.

\*\* p&lt;0.05 than Non-Tertiary Group.

applications of multiple basic principles are examples of other suggestions made to support the preparedness and teaching of the Medical Expert role.

With respect to evaluation, like all the other roles, attending staff observation was the first choice of all participants for evaluating the Medical Expert role. Formal “standardized” oral examinations, direct observation by peers, OSCE, other written examinations, mannequin simulation environment, and MCQ were also agreed upon as means of assessing the level of trainees’ Medical Expertise. The Residents Group rated direct observation by simulated patients lower than the Non-Tertiary Group. No other differences were noted among any other methods. In this section, no additional suggestions were made by the study participants under this section.

The Professional role. Information about the participants’ opinions regarding learning, teaching, and evaluating the Professional role are tabulated in Table 25. In terms of preparation to assume the Professional role, the method of direct observation and feedback was most preferred. Non-Tertiary Group Anesthesiologists rated self-direct learning and practice-reflection higher than the Residents Group. The responses for the rest of the options are listed in Table 25. One participant highlighted time, access, and conflict with other clinical duties as significant challenges in being able to participate in such topics in departmental rounds. Another two participants suggested that experience, mentoring, and discussion with other subgroups as ways in being to be a Professional.

Concerning evaluating the Professional role, there were no differences among the three groups about the listed methods. Direct observation by the attending staff, peers, and program director were the three most highly rated approaches for this task. In addition, five other methods were also acceptable to certain extent to evaluate

Table 25  
 Number, Means, and Standard Errors for Participants' Opinions Regarding Suggested Approaches for the Professional Role

| Methods  | Overall |      | Attending Staff |             |              |             | Residents |               | p Value |
|--|---------|------|-----------------|-------------|--------------|-------------|-----------|---------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |             | n         | Mean ± SE     |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE   |           |               |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |             |           |               |         |
| Direct observation and feedback                  | 100     | 5.72 | 54              | 5.81 ± 0.12 | 26           | 5.58 ± 0.17 | 20        | 5.65 ± 0.2    | ns      |
| Self-directed learning                           | 101     | 5.55 | 55              | 5.64 ± 0.15 | 26           | 5.8 ± 0.21  | 20        | 5 ± 0.24**    | 0.04    |
| Practice-reflection                              | 101     | 5.4  | 55              | 5.54 ± 0.13 | 26           | 5.79 ± 0.18 | 20        | 5 ± 0.21**    | 0.02    |
| Rounds   | 101     | 5.38 | 55              | 5.34 ± 0.13 | 26           | 5.5 ± 0.19  | 20        | 5.3 ± 0.22    | ns      |
| Medico-legal rounds                              | 101     | 5.26 | 55              | 5.25 ± 0.15 | 26           | 5.58 ± 0.22 | 20        | 4.85 ± 0.25   | ns      |
| Medical ethics rounds                            | 100     | 5.21 | 54              | 5.09 ± 0.16 | 26           | 5.5 ± 0.22  | 20        | 5.15 ± 0.26   | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |             |           |               |         |
| Role modeling                                    | 100     | 5.76 | 55              | 5.89 ± 0.12 | 25           | 5.68 ± 0.18 | 20        | 5.5 ± 0.2     | ns      |
| Case-based discussion on professionalism         | 100     | 5.65 | 55              | 5.58 ± 0.12 | 25           | 5.88 ± 0.16 | 20        | 5.55 ± 0.18   | ns      |
| Learning from clinical problems                  | 100     | 5.54 | 55              | 5.49 ± 0.13 | 25           | 6 ± 0.19    | 20        | 5.1 ± 0.21*** | 0.008   |
| <b>To Evaluate</b>                               |         |      |                 |             |              |             |           |               |         |
| Direct observation by Attending Staff            | 100     | 5.63 | 55              | 5.69 ± 0.13 | 25           | 5.64 ± 0.19 | 20        | 5.45 ± 0.21   | ns      |
| Direct observation by Peers                      | 99      | 5.5  | 54              | 5.24 ± 0.14 | 25           | 5.44 ± 0.2  | 20        | 5 ± 0.23      | ns      |
| Direct observation by Program Director           | 98      | 4.96 | 53              | 4.75 ± 0.17 | 25           | 4.96 ± 0.24 | 20        | 4.75 ± 0.27   | ns      |
| Self-Reflection                                  | 97      | 4.59 | 54              | 4.6 ± 0.17  | 24           | 5 ± 0.26    | 19        | 4.05 ± 0.29   | ns      |
| Direct observation by Nurses                     | 99      | 4.58 | 55              | 4.71 ± 0.2  | 25           | 4.76 ± 0.29 | 19        | 3.95 ± 0.33   | ns      |
| Direct observation by Simulated Patients         | 98      | 4.53 | 54              | 4.41 ± 0.19 | 24           | 5.04 ± 0.28 | 20        | 4.25 ± 0.31   | ns      |
| Standardized oral examination                    | 97      | 4.51 | 53              | 4.53 ± 0.17 | 24           | 4.38 ± 0.26 | 20        | 4.65 ± 0.28   | ns      |
| Objective Structured Clinical Examination (OSCE) | 99      | 4.48 | 55              | 4.47 ± 0.17 | 24           | 4.7 ± 0.26  | 20        | 4.25 ± 0.29   | ns      |
| Multiple choice exams (MCQ)                      | 99      | 3.42 | 55              | 3.23 ± 0.19 | 24           | 3.71 ± 0.29 | 20        | 3.6 ± 0.32    | ns      |
| Short/long essay questions                       | 99      | 3.40 | 55              | 4 ± 0.18    | 24           | 4 ± 0.28    | 20        | 3.5 ± 0.3     | ns      |
| Simulated chart recall                           | 99      | 3.40 | 55              | 3.85 ± 0.17 | 24           | 4.46 ± 0.26 | 20        | 3.8 ± 0.29    | ns      |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p<0.05 than Tertiary Group.

\*\* p<0.05 than Non-Tertiary Group.

professional role. These are (in order of more-to-less appropriate); self-reflection, direct observation by nurses, direct observation by simulated patients, standardized oral examinations, and OSCEs. The other three means of written examinations, essays, or MCQs, or the use of simulated chart recall did receive less than preferred ratings.

The Scholar role. Regarding preparedness to assume the Scholar role, evidence-based practice, followed by self-directed learning, rounds, direct observation and practice reflection were the preferred means in becoming prepared to assume this role, as can be seen in Table 26. In terms of teaching this role, journal-based discussions and conducting a research project were the highly rated options, whereas role modeling and learning from clinical problems were also acceptable choices in teaching the competencies associated with this role. Four additional suggestions were made. These are enrolment in education-related courses; participation in research experience and seminars; personal study; and preparation of research-related manuscripts, abstracts, and presentations.

The relative level of agreement with the different means in evaluating this role are seen in the last section of Table 26. The first three choices are similar to the recurring themes, with respect to the other roles, the direct observation by the attending staff, peers, and program director are rated the highest among the choices listed in the questionnaire. Participants showed their disagreements, with few notable exceptions as indicated in the Table, with the use of MCQs, OSCEs, and direct observation by simulated patients and nurses in evaluating this role. The Residents Group showed more disagreement with the utilization of the last two choices, than did attending Anesthesiologists. Other suggestions that were made regarding evaluating this role included: evaluation of the

Table 26  
 Number, Means, and Standard Errors for Participants' Opinions Regarding Suggested Approaches to the Scholar Role

| Methods  | Overall |      | Attending Staff |             |              |             | Residents |                 | p Value |
|--|---------|------|-----------------|-------------|--------------|-------------|-----------|-----------------|---------|
|  | n       | Mean | Tertiary        |             | Non-Tertiary |             | n         | Mean ± SE       |         |
|  |         |      | n               | Mean ± SE   | n            | Mean ± SE   |           |                 |         |
| <b>To Increase Preparedness</b>                  |         |      |                 |             |              |             |           |                 |         |
| Evidence-based practice                          | 100     | 5.63 | 55              | 5.6 ± 0.14  | 25           | 5.6 ± 0.21  | 20        | 5.6 ± 0.24      | ns      |
| Self-directed learning                           | 100     | 5.46 | 55              | 5.45 ± 0.14 | 25           | 5.44 ± 0.21 | 20        | 5.5 ± 0.23      | ns      |
| Rounds   | 100     | 5.35 | 55              | 5.29 ± 0.14 | 25           | 5.4 ± 0.21  | 20        | 5.45 ± 0.24     | ns      |
| Direct observation and feedback                  | 100     | 5.17 | 55              | 5.1 ± 0.14  | 25           | 5.24 ± 0.21 | 20        | 5.25 ± 0.23     | ns      |
| Practice-reflection                              | 98      | 5.05 | 55              | 5.05 ± 0.15 | 23           | 5.09 ± 0.23 | 20        | 5 ± 0.24        | ns      |
| <b>To Teach</b>                                  |         |      |                 |             |              |             |           |                 |         |
| Journals-based discussion                        | 99      | 6.01 | 55              | 6 ± 0.11    | 24           | 5.86 ± 0.17 | 20        | 6.2 ± 0.19      | ns      |
| Conducting a research project                    | 99      | 5.87 | 55              | 6.07 ± 0.15 | 24           | 5.63 ± 0.23 | 20        | 5.6 ± 0.25      | ns      |
| Role modeling                                    | 99      | 5.08 | 55              | 5.09 ± 0.16 | 24           | 4.92 ± 0.24 | 20        | 5.25 ± 0.26     | ns      |
| Learning from clinical problems                  | 98      | 5.02 | 54              | 4.76 ± 0.16 | 24           | 5.17 ± 0.24 | 20        | 5.55 ± 0.27 *   | 0.03    |
| <b>To Evaluate</b>                               |         |      |                 |             |              |             |           |                 |         |
| Direct observation by Attending Staff            | 99      | 5.24 | 55              | 5.33 ± 0.15 | 24           | 5.17 ± 0.23 | 20        | 5.1 ± 0.26      | ns      |
| Direct observation by Peers                      | 99      | 5.04 | 55              | 4.94 ± 0.14 | 24           | 5.2 ± 0.21  | 20        | 5.1 ± 0.23      | ns      |
| Direct observation by Program Director           | 99      | 4.6  | 54              | 4.59 ± 0.19 | 25           | 4.8 ± 0.28  | 20        | 4.35 ± 0.31     | ns      |
| Clinical Epidemiology questions                  | 98      | 4.35 | 55              | 4.34 ± 0.19 | 23           | 4 ± 0.29    | 20        | 4.75 ± 0.31     | ns      |
| Health & social policy questions                 | 97      | 4.09 | 54              | 4.13 ± 0.19 | 23           | 3.9 ± 0.28  | 20        | 4.2 ± 0.31      | ns      |
| Standardized oral examination                    | 96      | 4.02 | 55              | 3.85 ± 0.19 | 23           | 4.09 ± 0.29 | 18        | 4.44 ± 0.33     | ns      |
| Multiple choice exams (MCQ)                      | 98      | 3.90 | 55              | 3.84 ± 0.19 | 23           | 3.57 ± 0.29 | 20        | 4.45 ± 0.31     | ns      |
| Objective Structured Clinical Examination (OSCE) | 98      | 3.87 | 55              | 3.75 ± 0.18 | 23           | 4.21 ± 0.27 | 20        | 3.85 ± 0.29     | ns      |
| Direct observation by Simulated Patients         | 98      | 3.55 | 55              | 3.4 ± 0.15  | 24           | 4.38 ± 0.28 | 19        | 2.95 ± 0.31 *** | 0.002   |
| Direct observation by Nurses                     | 99      | 3.47 | 55              | 3.33 ± 0.18 | 24           | 4.13 ± 0.28 | 20        | 3.1 ± 0.31**    | 0.026   |

NOTE: The scale used is as follows:

1= Strongly Disagree, 2= Disagree, 3=Somewhat Disagree, 4= Neutral, 5= Somewhat Agree, 6= Agree, 7=Strongly Agree.

\* p<0.05 than Tertiary Group.

\*\* p<0.05 than Non-Tertiary Group.



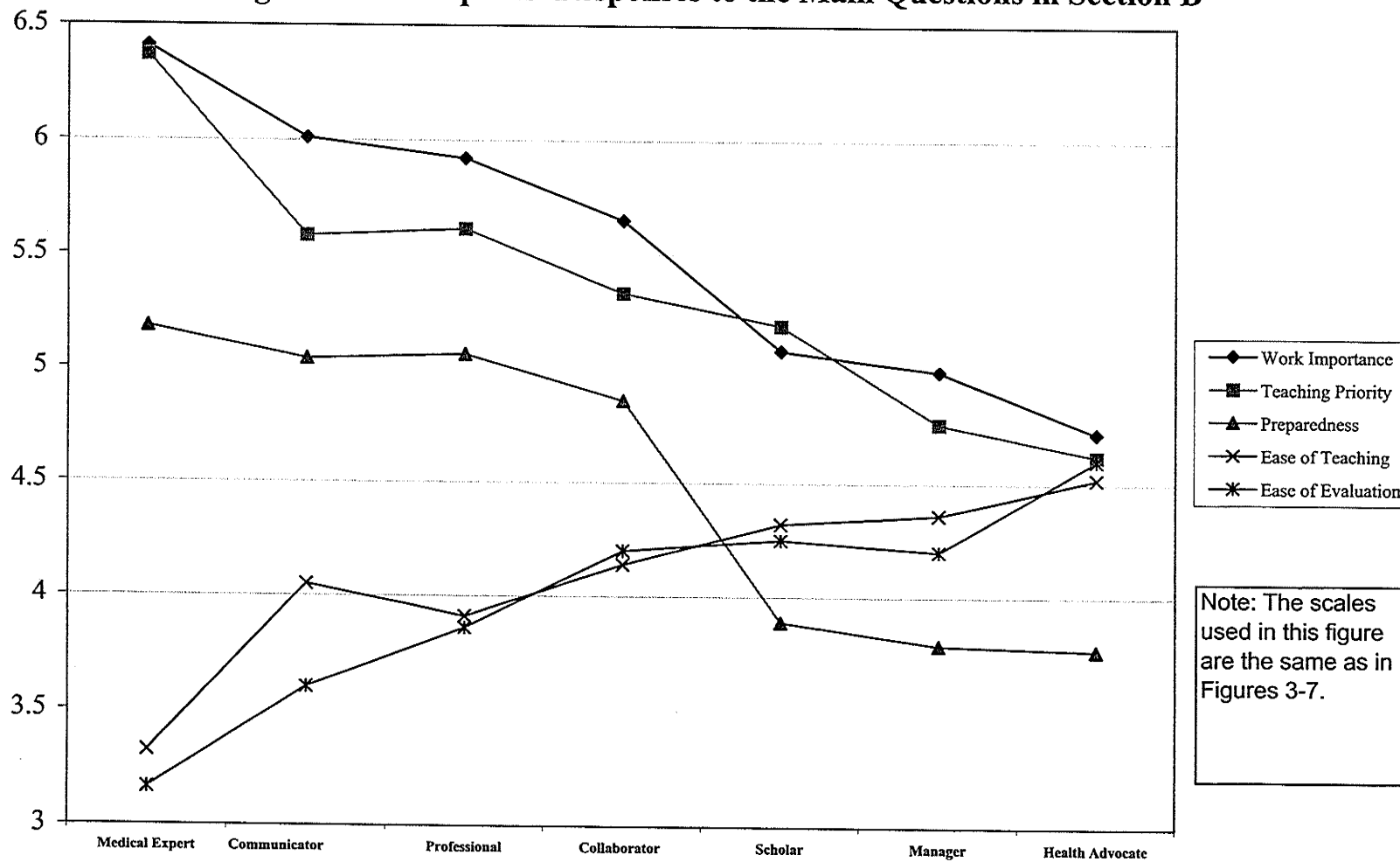
performance of completed research projects (n=3); critiquing and reviewing specific literature (n=3); and presentations at journal club meetings (n=2).

To summarize section B findings, Figure 8 shows the mean values of the participants' responses to the five main questions in this section. The seven roles have been rearranged on the horizontal-axis from left to right, based on the average ratings to the first question (the practice importance question). As is clearly shown in the figure, the Medical Expert role was rated as of the highest importance, in both the practice and teaching of Anesthesia; participants' own perceived preparedness to assume; and the easiest role to teach and evaluate. Completely opposite perceptions are made about the Health Advocate role. Other observations also emerge from this graph regarding the relationship between the participants' self-reported ratings, in terms of practice importance and teaching priority of the seven roles. While the actual ratings are significantly different from each of the other roles when compared to each other, there is a parallel relationship between these two categories. A very similar relationship to the one just described is present for the participants' assessments of the ease in teaching and evaluating the various roles. At least three more observations can be made about the behaviours of the responses to these five questions.

First, although there were significant differences among the various roles, in terms of importance, none of the roles has been deemed as un-important or of low priority to the practice of Anesthesia and to the teaching of Anesthesia during the years of residency.

Second, an inverse relationship exists between the perceived importance (to the practice, and to the teaching priority) and the reported ease of teaching and evaluating for

**Figure 8: Participants' Responses to the Main Questions in Section B**



Note: The scales used in this figure are the same as in Figures 3-7.

all of the roles. Except for the Medical Expert and the Communicator roles, the roles of Professional, Collaborator, Scholar, Manager, and Health Advocate are perceived to be either somewhat difficult or difficult to teach.

The third observation is the significant drop in the level of self-reported preparedness between the first four (Medical Expert, Communicator, Professional and Collaborator) and the last three (Scholar, Manager, and Health Advocate) roles as clearly shown in this figure.

The second part of the findings of section B demonstrates the participants' preferences regarding methods to be used in preparing to assume, to teach, and to evaluate the CanMEDS roles. These, and other significant findings of this project, will be discussed further in the next chapter.

### Section C: Overall Roles' Ranking

This section of the instrument was designed so that participants are given an opportunity to compare the seven CanMEDS roles against each other. Unfortunately, a misunderstanding of the instructions by the participants resulted in the exclusion of five respondents' entries, because they used some of the ranks more than once, thus invalidating their data. Also, 46 (45.5%) of the participants used an inverted version of the scale. A post-hoc criterion was developed to deal with this issue. A scale inversion was suspected if the known extremes, Medical Expert and Health Advocate roles' rankings, were assigned in reverse of what the same respondent ranked them in section B of the instrument. If this was the case, the entered ranking was changed to the inverse order, i.e. 7 to 1, 6 to 2, 5 to 3, and so on. A reliability test confirmed the proper use of this criterion.

The ranking of the CanMEDS roles was analyzed on a total of 96 surveys. The results are presented in Table 27. The participants from the three groups were in agreement with the relative ranking of the Medical Expert role, as first; and the Collaborator as fourth in their practice of Anesthesia. The Professional role ranked as second, and the Communicator role as third by attending Anesthesiologists from both Tertiary and Non-Tertiary Groups. Residents ranked the Communicators role as second, followed by the Professional role. The Tertiary and Residents Groups had similar rankings for the last three roles with Scholar, fifth, Manager sixth, and the Health Advocate, as last. The Non-Tertiary Group had the following order for the last three choices: Manager, as fifth; Health Advocate, as sixth; and Scholar, as seventh.

#### Section D: General Information

This section consisted of four questions and a free space for additional comments. The participants' responses to the first two questions are summarized in Table 28. Of the 101 respondents, only one-quarter had reviewed the CanMEDS 2000 roles previously, most of those who had reviewed the goals (75%) are from the Tertiary Group, whereas the remaining 25% are equally divided between the other two groups. In addition, 11 participants, again mostly from the Tertiary Group, had been involved in drafting new training objectives to meet the CanMEDS 2000's Project goals.

Apart from a few general comments made by participants, which are included below, there was no additional input to the third question (asking participants about other questions that need to be added to the survey), or the fourth question (asking participants to add any other issues to the instrument).

Table 27  
 Relative Ranking of Anesthesiology CanMEDS Roles in Participants' Practice

| Role            | Attending Staff |      |              |      | Residents   |      | Overall     |      |
|-----------------|-----------------|------|--------------|------|-------------|------|-------------|------|
|                 | Tertiary        |      | Non-Tertiary |      | n=18        | Rank | n=96        | Rank |
|                 | n=53            | Rank | n=25         | Rank |             |      |             |      |
| Medical Expert  | 6.49 ± 0.21     | 1    | 6.16 ± 0.3   | 1    | 6.67 ± 0.35 | 1    | 6.32 ± 0.14 | 1    |
| Professional    | 5.24 ± 0.21     | 2    | 4.96 ± 0.3   | 2    | 4.83 ± 0.35 | 3    | 5.09 ± 0.16 | 2    |
| Communicator    | 4.94 ± 0.21     | 3    | 4.68 ± 0.3   | 3    | 4.89 ± 0.35 | 2    | 4.86 ± 0.12 | 3    |
| Collaborator    | 4.13 ± 0.21     | 4    | 4.00 ± 0.3   | 4    | 3.89 ± 0.35 | 4    | 4.05 ± 0.13 | 4    |
| Scholar         | 3.13 ± 0.21     | 5    | 2.40 ± 0.3   | 7    | 3.50 ± 0.35 | 5    | 3.01 ± 0.18 | 5    |
| Manager         | 2.49 ± 0.21     | 6    | 3.44 ± 0.3   | 5    | 2.27 ± 0.35 | 6    | 2.70 ± 0.14 | 6    |
| Health Advocate | 1.68 ± 0.21     | 7    | 2.28 ± 0.3   | 6    | 1.94 ± 0.35 | 7    | 1.89 ± 0.12 | 7    |

Table 28

Participants' Responses to Questions in Section D

|   | <b>Attending Staff</b> |                              | <b>Residents<br/>n=20</b> | <b>Overall<br/>n=101</b> |
|---|------------------------|------------------------------|---------------------------|--------------------------|
|   | <b>Tertiary n=55</b>   | <b>Non-Tertiary<br/>n=26</b> |                           |                          |
| <b>Reviewed CanMEDS' Project's roles previously</b>                   |                        |                              |                           |                          |
| Yes   | 19                     | 3                            | 3                         | 25                       |
| No  | 36                     | 23                           | 17                        | 76                       |
| <b>Drafted new Training objectives to meet the CanMEDS 2000 goals</b> |                        |                              |                           |                          |
| Yes   | 8                      | 1                            | 2                         | 11                       |
| No  | 47                     | 25                           | 18                        | 90                       |

Few comments were entered in the space provided for open-ended comments and thoughts about the project or the survey. These ranged from: expressing difficulty to understand, to interpret, and/or to answer some of the questions and the responses in the survey (n=5); or that the survey is too long (n=2).

On the other hand, comments were made by the study participants regarding the importance of these objectives and thought-provoking exercise in completing the questionnaire (n=2), and how the questionnaire enhanced participant's awareness of some of the roles (n=2). A few participants expressed concerns about the degree of commitment/excellence that is needed to meet these goals (n=2), partly because of the lack of necessary faculty to teach some of the skills (n=2). In addition, four participants made reference, in their open-ended comments, to the need for specific interaction /instruction from other professionals to teach certain skill sets (n=4), in order to integrate some of these new competencies within the realm of the current Anesthesiology training program. Finally, one participant made an explicit reference to the need of having specific period during the years of residency, one week per year, for residents to "only" observe other Anesthesiologists during their work, without being involved in the cases.

### Summary

As demonstrated in the results, the study achieved a high and evenly distributed response rate. Section A, showed how different CanMEDS roles are relative to each other in practice and in teaching. Factor analysis also revealed different relationships between items related to various general competencies in practice and teaching contexts, and in particular identified differences with respect to the Professional role in the practice of

Anesthesiology. When the Anesthesiology-specific CanMEDS roles' objectives were presented and inquired about in section B of the instrument, different levels of practice importance and teaching priority, degree of self-assessed preparedness, ease of teaching and evaluation were expressed by the study participants. In addition, the importance ratings from section B were confirmed in the ranking section of the instrument (section C). Also presented in this chapter are the methods that study participants considered most effective for learning, teaching, and evaluating Anesthesiology-specific CanMEDS roles. Finally, the previous exposure of our sample population to these concepts was assessed, with three-quarters of the respondents having had no chance to review these roles previously, and only 10% reporting that they had experience with drafting such training objectives in the past. The implications of these findings, limitations of the study, and final recommendations are presented in the concluding chapter.



## Chapter Five

### Discussion and Recommendations

The main aim of this study was to obtain information that could facilitate the integration of the CanMEDS 2000 Project's goals as training objectives within an Anesthesiology-training program. As a first step to achieve this aim, it was necessary to investigate the perceptions of the staff Anesthesiologists and the Anesthesiology residents regarding these roles and competencies, as presented in the RCPSC revised training objectives. In this chapter, the implications and the significance of the results will be discussed in light of the reviewed literature. This is followed by comments on the limitations of the current study and how they were addressed. The chapter will conclude with a list of recommendations based on the findings of this study for the Anesthesiology Training Program at the research site and for possible future research.

At this point, it is warranted to review the questions that framed this study. These questions were: (a) what is the perceived importance of each role/competency identified in the CanMEDS 2000 project to the practice of Anesthesiology?; (b) what is the perceived importance of each role/competency identified in the CanMEDS 2000 Project for the teaching of Anesthesiology?; (c) does the current program structure, as viewed by the staff and residents, satisfy the various components of the proposed seven categories (or roles) in the CanMEDS 2000 Project?; (d) do patterns of responses to these questions vary between: (i) staff and residents?, (ii) different levels of resident seniority (PGY1-5)?, and (iii) staff Anesthesiologists practicing at different practice settings?; and (e) what are effective methods to formally learn, teach and objectively assess the CanMEDS 2000

competencies in an Anesthesiology program? The following sections of the discussion will explore some of the ways the responses to these five questions inform the needed integration of the CanMEDS 2000 objectives in this program and how they relate to the research literature.

### Response Rates

Given the length of the survey (24 pages and about 300 items) the high final response rate (82%) achieved in this project is very encouraging and significant for a number of reasons. Physicians' response rates, particularly to lengthy surveys, are usually low (Kellerman & Herold, 2001). The use of the comprehensive Dillmans' TDM multiple contacts approach contributed to achieving such high returns. In addition, the credibility of the study, with all of the Anesthesia Departments members was enhanced by the endorsements of the Anesthesia Departments at Hospitals (tertiary and non-tertiary) Affiliated with the University of Manitoba and of the administrators at the various levels, including the Winnipeg Regional Health Authority Program Director. A third factor in the high participation rate is the prevailing "teaching culture" and the commitment of the Anesthesia Department members toward the Royal College Training Program. The high response rate enhanced the quality of the results and their applicability to the Anesthesiology training program at the research site and beyond.

### Demographics

The demographics of the three main groups regarding age and year of obtaining their medical degrees are as expected for such a population. The most recent medical school graduates are the youngest participants and are currently enrolled in the training program, whereas the most senior graduates and older physicians are practicing in the

city community hospitals. The Tertiary Group practitioners, as expected, have an intermediate average age, as well as an intermediate range of year of graduation from the medical school. Male-to-female ratio in the responding sample is similar across the three main groups, and this ratio closely resembles gender distribution within the current department structure.

The majority of the study participants are graduates of Canadian medical schools. The Non-Tertiary and the Resident Groups had relatively more international medical school graduates. The numbers within these subgroups, as reported in Table 5, are too small for any valid comparisons to be made among groups based on this variable.

Of particular interest are the variations in responsibilities across groups. Providing clinical anesthetic services are the primary tasks performed by Anesthesiologists, but these are not their only duties. As seen in the results section, Anesthesiologists fulfill a wide variety of scholarly and administrative roles within the academic medical and community health centers. Regarding teaching (Table 8), the Tertiary Group is heavily involved at both the undergraduate and postgraduate Anesthesia education, hence their higher representation on the program education committee. On the other hand, as mentioned briefly in the results, the involvement of the Non-Tertiary hospitals' practitioners in undergraduate medical education is becoming more significant, similar to the trend across Canada (Brull & Bradley, 2001). This is reflective of the changing medical school curricula which is community-based, with large numbers of medical students getting their first, and sometimes their only, exposure to the practice of Anesthesiology in these practice settings. This makes it important to include the non-

tertiary Anesthesiology, medical-school instructors' opinions in medical education research.

The twenty residents participating in this project represent 83% of residents in the training program. The results of this survey support that residents-in-training largely mirror the Anesthesiologists who are currently in practice, in terms of scholarly activities. However, the categories selected by residents as their future subspecialty interests indicate an important perspective on the future of Anesthesiology practice in this particular setting. Eight out of 14 residents that indicated a future practice orientation selected either critical care medicine or management of chronic pain as a chosen field of specialization. Both of these fields are different than the historical description of operating-room based Anesthesia practice of "putting patients to sleep," and indicate the emerging roles in contemporary Anesthesia practice, where more interactions are taking place with "awake" patients.

In summary, these findings from the demographic information highlight the dynamic changes that are happening within the practice of Anesthesiology. These trends indicate more complex careers involving more interactions between Anesthesiologists and their patients and other health care providers, and underscore the need to incorporate many of the new competencies, that are included within the CanMEDS 2000 Project, into Anesthesiology training programs. The new CanMEDS 2000-based training objectives will better equip Anesthesiologists with the professional and medical expertise, effective communication and collaborative skills, and the knowledge of the health care system that they will need in a contemporary Anesthesiology practice.

### Factor Analysis of General CanMEDS 2000 Competencies

A conservative interpretation of this section's results is warranted, given the relatively large number of variables (27 items) compared to the total number of participants (N=101). While some factor analysts argue that factors to participants ratio is more important and needs to be maintained at least at 1:20, others suggest that a ratio of variables to participants could range from as high as 1:10 to as low as 1:2, with either being acceptable, with the caveat that the higher the ratio, the better (Kline, 1994). The variables: participants ratio in our study is 1:3.7. Also, in this study the final factors: participants ratio is 1:33. Nevertheless, the results of this analysis were considered within the context of its pre-planned use, before commencing data collection.

The 27 items of the CanMEDS 2000 general competencies showed high internal consistency, as indicated by Cronbach alpha values, in both teaching and practice contexts. This is an indication that when the general scope of Anesthesiology practice and teaching are considered in a holistic manner, the majority of general competencies drawn from the seven "generic" CanMEDS 2000 roles are indeed considered relevant. This also was shown, though indirectly, during the process of eliminating additional variables, post-rotational factor loading. Only a few items could be eliminated based on the repeated internal consistency testing, reconfirming the relevance of these competencies in contemporary Anesthesiology practice.

The final item compositions of the three factors at both analyses were also of interest. As expected, the Medical Expert, Professional, Health Advocate, Manager, and, to a certain extent, the Scholar roles-related items were restructured to form more comprehensive roles in teaching and practice. The items related to the Communicator and

Collaborator roles were distributed among the various factors. This finding is consistent with the expected behaviour of such inter-related roles items.

As shown in Figures 1 and 2, the behaviour of the three Professional role-related items emerged as a unique finding of these analyses. When considered in the context of Anesthesia training, they were grouped within factor three which also contained the Scholar role-related items. Then, when the analysis was done in the context of general Anesthesia practice, the Professional role items were regrouped in *Factor one*, i.e. with the Medical Expert and the Communicator roles-related items. This change in the perception of importance can be explained, to a certain extent, by the participants' responses in section B of the survey.

As indicated in the Results Chapter, although the Medical Expert role was given the highest ratings of practice importance and teaching priority, the Professional and the Communicator roles also were given slightly lesser, but parallel, ratings by the study participants. This is similar to the notion expressed by Cruess et al. about the dual role of today's physicians as healers and professionals (Cruess et al., 1997b, 1999). Cruess et al. argued that both roles have their distinct importance and both should be taught simultaneously during medical education years. The Scholar role, on the other hand, was perceived by the Non-Tertiary Group as of less importance in the practice context and the reasons for this will be discussed in the next subsection. Despite these differences, all participants agreed on a high teaching priority for the Scholar-related competencies during the years of Anesthesia residency.

### Anesthesiology-Specific CanMEDS 2000 Training Objectives

As indicated previously, the questions that framed this study are answered directly by section B of the survey. Thus, each of the four questions will appear under the corresponding subheading in this section of the discussion.

#### Importance to the Participants' Practice

##### **1. What is the perceived importance of each role identified in the CanMEDS 2000 Project to the practice of Anesthesiology?**

All of the seven roles within the CanMEDS 2000 were perceived to be of importance to the practice of Anesthesia, as indicated by the factor analysis of general competencies, and again, when participants were asked about each role, specifically. Again, when the different roles were compared to each other, as in Table 16 and Figure 8, the Medical Expert role, as expected, was ranked first among the roles. The Communicator, Professional, and Collaborator roles were also rated as highly important to the participants' practice, regardless of their particular groups. The Scholar and Manager roles were rated slightly lower in terms of overall importance, and their ratings showed linkages to the participants' practice location and profile. Although it is not possible to provide exhaustive explanations from the available results, the following observations can be made.

For the Scholar role, the qualitative entries to explain low ratings indicated that there was a tendency for participants to consider involvement in research as the main attribute of this role. Although the description provided in the survey included the ability to independently critique, effectively utilize findings of an investigation, and being an

effective teacher, participants appeared to define scholarship in the more narrow research sense.

With respect to the Manager role, the contextual differences in practice patterns between the two attending Anesthesiologists groups might explain, in part, the reported differences in ratings for the practice importance of the Manager role. The majority of Anesthesiologists from the tertiary hospitals work mainly in a group practice arrangement, while Anesthesiologists at non-tertiary hospitals work mainly as solo practitioners. And as such, the non-tertiary hospital Anesthesiologists are more involved in the day-to-day practice management issues than other practitioners.

Additional reasons and explanations for low ratings of importance for some of the roles in the practice setting are similar to those in the teaching context and will be discussed in the next subsection.

### Priority in Anesthesiology Teaching

#### **2. What is the perceived importance of each role identified in the CanMEDS 2000 Project for the teaching of Anesthesiology?**

Once again, none of seven CanMEDS roles was identified as unimportant to teaching during the years of Anesthesiology residency. The expressed differences among the teaching priorities in the seven roles, though sometimes subject to differences in responsibilities similar to those outlined in the previous subsection, are mainly related to time constraints during residency.

It is warranted, at this point, to highlight the differences between findings in this study regarding the Professional, Communicator, and Collaborator roles, and the findings of the study by Slogoff et al. (1994), which investigated Anesthesia training programs in



the United States. In this study, the authors concluded that some of the main attributes of these roles (e.g. intellectual honesty; interpersonal, doctor-patient, and doctor-doctor relationships; and record keeping) have no merit when it comes to either faculty ratings of resident performances or the actual practice of Anesthesia (Slogoff et al., 1994). Results drawn from all of the sections reported in our study are entirely different. These attributes were highly rated by all participants, regardless of how the questions were asked. Clearly, our findings support and closely resemble those of the previously discussed work of Rhoton (1994) and his conclusion that “clinical excellence and unprofessional behavior rarely coexists” in Anesthesia residents (Rhoton, 1994, p. 313). In Rhoton’s study, it appears that Professional, Communicator, and Collaborator roles were implicitly modeled and learned. In contrast, each of the three groups in the present study were able to articulate the importance of all seven roles to Anesthesiology practice and teaching.

It is important to note that high expectations to achieve all of competencies from medical professionals, be it on the part of the attending staff or residents themselves, are not devoid of potential risks for the “healers themselves.” Abruptly introducing an extended list of what is perceived as “new” explicit training and practice objectives, is not without some potential disadvantages in an already high-intensity learning experience.

In addition to the prevailing personality profiles among medical professionals, “being driven, ...competitive, who can excel at everything that they do” (Murray cited in Gundersen, 2001, p. 145), the increased public demands, and other stressors (overload with clinical duties, sleep deprivation, litigation risks, and the [perceived] lack of health

care resources) collectively are seen as potential causes leading to an increase in potential for “physician burnout” in Canada (Puddester, 2001). Considering this risk, the results of this study suggest that it may not be a disadvantage to develop priorities for the roles. To expect excellence in all of the roles by each and every resident and Anesthesiologist is clearly neither practical nor reasonable. If roles can be assigned differential levels of importance, essential primary roles could be identified, as such, from the typical pattern of Anesthesia practice. For these roles, a higher degree of competence is needed during residency. Undoubtedly, competencies related to these roles should continue to occupy the centre-stage for the training and the certification processes. For some of the other roles, which could be called secondary, a wider range of variability in the level of expectations can be maintained by determining minimum performance standards that each resident and practitioner needs to achieve and to maintain for a safe, effective, and efficient practice.

Such arrangements permit effective use of resources, particularly time during years of residency training. Based on the results of this study, the primary roles in this particular study include Medical Expert, Professional, Communicator, and Collaborator. Roles identified as secondary include Scholar, Manager, and Health Advocate. It is important to note, however, that a simple dichotomy does not exist. In order to achieve competency in the four primary roles, specific competencies drawn from the Scholar, Manager, and Health Advocate roles are essential ingredients in the training programs during the years of residency. The results of this study indicate, not so much that some roles are less important, but that there is more potential for flexibility in the degree to which some roles are developed, depending on career goals. Individuals with special interests in these

secondary roles should be provided with opportunities, through continuing medical education, to pursue such additional professional/personal goals during their years of residency or during the years of practice.

#### Preparedness to Assume CanMEDS 2000 Roles

**3. Does the current program structure, as viewed by the staff and residents, satisfy the various components of the proposed seven roles in the CanMEDS 2000 Project?**

Information obtained from the preparedness assessments is helpful in order to answer this question. The levels of preparedness reported by attending Anesthesiologist staff correlates well with the level of perceived practice importance and teaching priority importance for the first four roles (labeled above as primary roles) as seen in Figure 8. Drops in the levels of preparedness can be seen for the Scholar (particularly by the Non-Tertiary Group), Manager, and Health Advocate (particularly by Tertiary Group participants) roles. The results gathered from the Residents Group show, in general, less preparedness than the levels reported by the staff. In a similar pattern to these seven categories, preparedness is the lowest for both of the Manager and Health Advocate roles, compared to other roles. The details of these findings, together with the preferred methods presented in chapter 4 are the basis for a number of recommendations considered in the last subsection of this chapter.

#### Feasibility of Teaching and Evaluating Anesthesiology-Specific CanMEDS Roles

**4. What are the most effective methods to formally learn, to teach and to objectively assess CanMEDS 2000 competencies in the Anesthesiology program?**

The nearly full agreement on the ease of teaching and evaluating the Medical Expert role was not surprising. This is a result of many decades (and continuing efforts) of experimenting, testing, and perfecting variety of tools to assess cognitive and practical expertise (Neufeld et al., 1985a). On the other hand, there was an expressed difficulty by a larger number of participants in this study with teaching and evaluating the secondary roles, and to a lesser extent, the roles rated very closely to Medical Expert role in practice and teaching priority importance (Communicator, Professional, and Collaborator). This situation is not unique to Anesthesiology, as a profession, or to a local program (Ginsburg et al., 2000). Medical schools across North America, together with many professional medical associations, are working feverishly to deal with similar issues (Cohen, 2001). These reasons make the preferences suggested by participants regarding methods for teaching and evaluating these roles, vital to introducing successfully these roles as more “explicit” training objectives that need to be taught and, subsequently, evaluated.

#### Ways to be Prepared to Assume, to Teach, and to Evaluate the CanMEDS 2000 Roles

Many observations can be made from the detailed listing of the preferred methods to learn, to teach, and to evaluate on a role-by-role basis in chapter four. The trends noticed in both the agreement (or the lack of) regarding the various methods presented, and the methods that were volunteered by some of the participants, reflect many of the contextual features of the Anesthesiology training program at this university.

As indicated in chapter two, professional education in medicine cannot be done in isolation from the actual practice situation. The findings of this study clearly demonstrate this important linkage. Specifically, in terms of increasing the preparedness to assume and teach the seven CanMEDS 2000 roles, it was noted that methods involving one-to-

one (e.g. direct observation and feedback, individual mentorship, and role modeling) and hands-on (e.g. learning from clinical problems; case- or journal-based discussions; assigning responsibility for operating room, Pre-Anesthesia Clinic (PAC), labour ward, or as chief resident; communication skills workshops; and conducting a research project) approaches were most preferred across the seven CanMEDS roles. The use of simulation technology was mentioned by a number of participants as a suggested means to prepare and to teach, in particular, the Communicator, and the Medical Expert roles. In contrast, the use of more traditional approaches, like didactic rounds (on topics ranging from clinical epidemiology, medico-legal, to medical ethics) emerged as less preferred methods. Video-tape scenarios were not considered as an effective method in achieving these goals.

Self-directed learning and practice- and self-reflection also emerged as highly agreed-upon means for learning and teaching many of the roles. Based on the results of this study, the value of these strategies was more apparent in relation to the following three roles: Medical Expert, Professional, and Communicator roles and, to a lesser extent, the Health Advocate role. This finding corresponds directly with the previously discussed conceptualizations of Houle and Swick with regard to educational and medical perspectives on the attributes of professionalism, in which self-direction and -reflection are principal characteristics (Houle, 1980; Swick, 2000).

For roles with lower reported preparedness by attending Anesthesiologists, and especially for the Manager and Health Advocate roles, many suggestions were made that involved drawing on the experiences of other non-medical professionals. The following comments were made by two participants, reflecting this need:

“The expectation of a physician to be an ‘expert’ in the areas questioned is unrealistic, as it generally lacks faculty to serve as role models – in adult education and preparation!”

“The skill-set of some of these roles are best learned from other professionals, or business leaders.”

In general, these suggestions included either incorporating a certain degree of formal instruction by business or communications consultants to the current residency program and/or implementing faculty development plans to ensure that some of the general tasks, related to these roles, are being effectively incorporated. Alternatively, this can be done by offering specific study programs for interested individuals to participate either in specific rotations or in courses on related topics to these needed competencies. As previously noted, the final decision regarding the timing for these activities needs to be synchronized with the following elements: the degree of importance of these competencies, the availability of resources, and more importantly, the time constraints during the limited years of residency training.

Evaluation strategies. The overwhelming agreement by all of the study participants on the role of direct observation by attending staff and peers in evaluating the seven CanMEDS roles is an important finding of this study. This degree of agreement on the valuable contribution of direct observation by attending staff (including the program director as a member of the faculty) is understandable, given the day-to-day practice of Anesthesiology in the Canadian context. As noted in the literature review, when compared to training programs in Europe, trainees and consultants work consistently on a one-to-one basis in a collegial, supportive, and “seamless” atmosphere in Canadian

training programs (Strang et al., 1996). These working relationships provide important opportunities for reciprocal dialogue between faculty and their trainees about areas that require improvement in order to fulfill CanMEDS' training objectives. Nevertheless, there are still number of obstacles to be addressed in making the integration of the CanMEDS 2000 objectives a reality.

In addition to the obvious challenge of using direct observation effectively as an evaluation means in the medical environment, there is also some degree of reluctance among faculty to provide documented "written" assessments and feedback to residents, often due to the lack of clear standards about what constitutes unacceptable performance in non-cognitive or non-technical skills areas, and due to potential risk of litigation. In the context of this study, an additional and commonly cited cause for this hesitation, is that there are few opportunities during a given clinical rotation for an attending staff member to observe a resident on more than one or two occasions. This limitation is a result of the relatively large number of attending staff who frequently rotate among different hospitals to perform clinical and departmental duties. This situation is made even more challenging by a resident rotation schedule that changes every four weeks. An exception to this situation is present during subspecialty rotations, in which residents work closely with a limited number of Anesthesiologists during the rotations, allowing more contact and opportunities for observations to take place on repeated occasions. The work of Woolliscroft et al. (1994) has shown that 20 to 50 such documented direct observation evaluations by attending staff need to be conducted in order to obtain reasonable reproducibility, though the use of observation and evaluation by designated supervisors and nurses could reduce the number of required observations by half. Hence, an

adaptation of the current practice of evaluation by direct observation in the Anesthesiology training program will be suggested and explained in the following recommendations section of this chapter.

Evaluation by direct observation by peers was also highly rated for all of the roles, except for the Medical Expert role, where it was third after standardized oral examinations. Except in a few circumstances, residents do not work routinely with each other during their regular Anesthesia rotations. Most of the interactions between residents happen during the regular weekly academic seminars or during non-Anesthesia based rotations. Senior residents are also involved in providing introductory lectures and orientation sessions for more junior colleagues. This is somewhat different from other medical and surgical specialties, where senior and junior residents and fellows routinely work together, as one team. Anesthesia residents participate in these team activities during their off-service rotations.

Currently in the Anesthesiology training program, peer evaluations are done formally, after residents' grand round presentations, and, informally, for other interactions such as working together in the operating rooms during the orientation, or during introductory lectures. However, the fact that peer evaluation is considered an acceptable method of evaluation again is consistent with conceptual frameworks of professionalism. The fifth attribute in Swick's "normative definition of [contemporary] medical professionalism," stated "exercise accountability for themselves and for their colleagues" (Swick, 2001, p. 157). Based on the literature and the results of this study, there is greater room for incorporating more peer evaluation within the current program structure. In fact, in the current health system, peer evaluations on the individual,



departmental, or institutional levels are becoming the norm of practice in the so-called "Report Card Era" (Brownell, Roos, & Roos, 2001; Garson, Jr. et al., 1999; Shaw & Grenier, 2001; Tremblay, 2000; Tu, Schull, Ferris, Hux, & Redelmeier, 2001; Wielgosz, 2001). Introducing such evaluation mechanisms during residency training can be helpful to residents, as a preparatory step for their future years in practice.

Based on the published literature, together with other means of evaluations, assessment by peers definitely contributes to evaluating many distinct non-cognitive dimensions of day-to-day clinical competence attributes, with a reasonably high degree of reliability, relative to other evaluation methods (DiMatteo & DiNicola, 1981; Risucci, Tortolani, & Ward, 1989; Snell et al., 2000; Thomas, Gebo, & Hellmann, 1999; Van Rosendaal & Jennett, 1994). At the same time, certain limitations need to be kept in mind when considering peer evaluation during residency. These are mainly related to the fact that the more closely related the residents are to each other, the harder it might be to separate subjective assessments from the rigour and objectivity that is required for such evaluations. Also, the role conflict between collegiality and the need to make a judgment on the non-cognitive performance of a colleague is also a potential dilemma in this regard. This is more of an issue when peer evaluation is perceived to be a "high-stakes" undertaking. This explains, in part, some of findings of another study in an internal medicine residency training program, where the idea of peer evaluation was strongly opposed (Van Rosendaal & Jennett, 1992). It is important to note that a similar role conflict could emerge between residents and faculty in any training programs with a high degree of collegiality among various department members (Ginsburg et al., 2000). In

order to provide some solutions to these potential obstacles, at least two approaches can be suggested.

The approach introduced by Gordon (1997) offers useful solutions to circumvent such potential drawbacks and to optimize the use of peer evaluation within a collegial training program (Gordon, 1997). The use of such an approach will be revisited in the recommendation section of this chapter. As an alternative solution to peer evaluation dilemmas, the use of direct observation by co-workers, and particularly by nursing staff, is one option in overcoming problems with role conflict. Hence, many of the attributes that are optimally assessed through peer evaluation are reflected consistently by other health care team members' direct observations. The responses from participants showed that evaluation using direct observation by nursing staff is appropriate for at least three out of the seven roles. In a descending order, these are the Communicator, Collaborator, and Professional roles, which is consistent with findings from other studies (e.g. Woolliscroft et al., 1994).

The results of commonly used evaluation methods (Written exams, MCQs, and Standardized Oral Examinations) indicted that these methods are effective mainly in assessing the Medical Expert role. From the way the survey is designed, it is not possible to provide a linkage between the subcomponents of the roles and the particular evaluation methods. As an example, in the current format of 'standardized' oral examinations, verbal communication abilities are essential in formulating and in providing concise answers to complex problems within 12 to 13 minute periods, making this method of evaluation a suitable tool to evaluate some of the competencies related to the

Communicator and possibly other roles. Unfortunately, this type of analysis is beyond the scope of this project.

Similarly, the use of the OSCE station format for evaluation was rated highly for the Medical Expert (mean of 5.35 out of 7), and moderately for the Communicator (4.63) roles. There were no differences between these perceptions among the three groups. In addition, the use of simulated and/or standardized patients was perceived to be of a lower value within the program context. The use of these methods, though becoming more commonly utilized in medical schools for assessing communication skills and specific areas within cognitive or technical domains, are still considered artificial. There is, also, a perception that it is harder to introduce the high levels of complexity, typical of clinical situations, into the framework of these modalities, without jeopardizing the validity and reliability of the encounter assessment (Norman et al., 1993). Some authors maintained that these methods are best used for assessment and feedback purposes (formative evaluation) rather than for summative evaluation (Ginsburg et al., 2000).

These findings fit the context of Anesthesiology practice in Canada, in which there are constant interactions and many opportunities for real life observations on a frequent basis, over a frequently changing daily practice routine. Therefore, if clear descriptors of what constitutes appropriate and not so desirable behaviours can be developed, their use within the training program by the department members is likely. Utilizing the methodology of focus group discussions, similar to one described by Graaves and Grant (2000), it should be possible to develop clear descriptors encompassing competencies within the CanMEDS 2000 roles.

It is also noteworthy that the study respondents rated the use of mannequin simulation technology favourably (5.2 out of 7) as a means of evaluating the Medical Expert role. As indicated in the conceptual framework chapter, the use of such technology is useful for practicing clinical responses to rarely encountered conditions (e.g. general Anesthesia for pregnant patients, anaphylaxis, malignant hypothermia) or life-threatening complications (difficult intubation, laryngospasm, tension pneumothorax). The use of this promising technology is limited by its high startup and maintenance costs and labour intensiveness for faculty (Byrick et al., 1998).

In contrast to the general agreement about the use of self-reflection in preparing to assume and to teach the various CanMEDS roles, the role of self-reflection, as an evaluation tool within the CanMEDS seven roles, received lower than expected agreement ratings except, for the Professional role (mean of 4.59 out of 7). No direct explanations can be made from these results to explain this low approval for the use of this important tool, despite its importance from the contemporary medical perspective of medical professionalism (Swick, Szenas, Danoff, & Whitcomb, 1999) as a means of evaluation (Swick, 2000). Mindful practice is seen as akin to good clinical practice in Houle's previously quoted definition of professionalism (p. 24). More recently, Epstein (1999) captured the importance of self-reflection in all aspects of medical service when he stated:

Critical self-reflection enables physicians to listen attentively to patients' distress, recognize their own errors, refine their technical skills, make evidence-based decisions, and clarify their values so that they can act with compassion, technical competence, presence, and insight. Mindfulness informs all types of

professionally relevant knowledge, including propositional facts, personal experiences, processes, and know-how... Mindful practitioners use a variety of means to enhance their ability to engage in moment-to-moment self-monitoring, bring to consciousness their tacit personal knowledge and deeply held values, use peripheral vision and subsidiary awareness to become aware of new information and perspectives, and adopt curiosity in both ordinary and novel situations. In contrast, mindlessness may account for some deviations from professionalism and errors in judgment and technique. Although mindfulness cannot be taught explicitly, it can be modeled by mentors and cultivated in learners. As a link between relationship-centered care and evidence-based medicine, mindfulness should be considered a characteristic of good clinical practice (Epstein, 1999, p. 833).

Similar to the findings in this study, other authors have shown that explicit use of self-evaluation (though vital for the practice of medicine) is not suitable for formal summative evaluation due to the “socially value-laden” nature of this process (Ginsburg et al., 2000). Further research is needed to explore the reasons for such negative beliefs regarding more explicit use of self-assessment within the context of medical education.

#### Overall Roles Ranking

As pointed out in the methodology chapter, the findings of this section were meant to be used as a confirmatory step for the other parts of the instrument. After correcting for the participants’ misinterpretation of the scale used in this survey, the findings of this section showed high correlations with the results from other sections of the survey. Regardless of the group allocation, the primary four (Medical Expert,

Professional, Communicator, and Collaborator) roles were ranked as the top four roles by the study participants. As in section B of the instrument, residents rated the Communicator role slightly higher than the Professional role in regard to its importance to the practice of Anesthesia and to teaching during Anesthesiology residency. Also similar was the fact that the Residents Group ranked these roles differently than the attending Anesthesiologists' groups. The same can be said for the arrangement of the remaining three (Scholar, Manager, and Health Advocate) roles. In particular, the Non-Tertiary Group indicated different perspectives with respect to the importance of the Scholar role, and these differences reflected the interpretation of the roles in their practice. In short, the findings from section C confirmed the results obtained from other parts of the survey.

#### General Information

One of the reasons for conducting this study was to solicit participants' opinions about these "new roles" at an early stage in the introduction of the CanMEDS Project into the training program structure. This early stage involvement and consultation with the majority of the Anesthesiology department members is confirmed by the fact that three quarters of the department members had had no chance to review these objectives before participating in this study. This low rate of previous exposure to CanMEDS 2000 objectives was a surprising finding in some respects. The CanMEDS 2000 name is misleading. It gives the impression that this project was just introduced in the year 2000. The fact that this project was initiated in 1993, and that its final report to the Royal College General Council was made public in 1996, raises some questions about the publicity this project has had to date. This finding speaks to the need for more systemic

and far reaching campaigns to improve the awareness about the existence, the nature, and the scope of this initiative by the Royal College of Physicians and Surgeons of Canada and other professional medical associations.

It is important to highlight the fact that one of the other aims of this study was to encourage active participation by the faculty in this project. This was achieved, given the high response rate and the consistent patterns of responses from our sample population. Participants indicated the need for faculty involvement on a day-to-day basis that was somewhat achieved through this study. Two staff Anesthesiologists commented:

“[The] survey serves to acquaint participants with relatively new ‘teaching or teachable’ concepts. I felt acutely aware of my own unfamiliarity with how to evaluate or teach or administer information in many of the abstract areas (Collaborator, Health Advocate, and Manager specifically).”

“This questionnaire has been very thought provoking and given me some food for thought within my own practice!”

### Limitations

As stated previously in the introduction chapter, one of the main limitations for this project was the lack of a well-developed instrument, necessitating the construction of a new survey tool from other primary sources, published literature, and opinions obtained from different experts in the field. Concerns about issues of scientific validity and reliability of such instruments are recognized and are discussed in the following subsections.

### Validity

An important question like, “Does this test or instrument permit me to make the interpretation I wish to make?” (Gay et al., 2000, p. 161) needs to be addressed when constructing and working with a new instrument. Using the same wording and phrasing from the original Royal College reports about the descriptions of the general and specific roles and competencies was designed to facilitate the achievement of a high content validity, or face validity, for this instrument. The initial testing and piloting of the instrument, with the help of senior faculty in the field of training and evaluation in Anesthesia, was intended to reduce the ambiguity of directions and/or stems of the questions. These strategies are established methods of enhancing the content validity of such an instrument (Gay et al., 2000).

Except for section C of the instrument (ranking), self-reported difficulties with understanding directions, descriptions, or the survey questions were reported by less than 5% of the responding sample. In section C, the potential for misunderstanding the ranking scale was raised during the early stages of the development of the instrument. Specifically, the possibility of respondents’ intuitive sense that “1” indicates most important was noted. A decision to maintain a scale where 7 ranked the highest importance was made in order to maintain a consistent scale throughout the survey, 1 lowest to 7 highest. In addition to having the scale described with the section header directions, it was printed in the center of the page, and highlighted with a circle. Unfortunately, these steps did not prevent this misinterpretation. Nevertheless, the criterion that was developed and used to adjust for errors in scale interpretation was reliable.



Both components of criterion-related validity, concurrent and predictive, are not relevant to this study, as there are no other comparable instruments with which to compare it. That being said, the results from this project can be used, in future, for follow-up projects, which can help further define this aspect of validity by assessing the change over time within the same group or other comparable groups of participants. No follow-up testing was planned as part of this exploratory project.

The third and most important form of validity, construct validity, deals with “to what extent does this test [or instrument] reflect the construct it is intended to measure” (Gay et al., 2000, p. 169). Confirming this particular form of validity is very complicated, and involves collecting different measures on various aspects of the instrument, including content and criteria-related validity aspects, as well as correlating the results obtained through the test with other known independent factors. While these aspects might not be completely addressed in this project, some of important correlations have been examined to validate the instrument, retrospectively.

These correlations included how perceptions of the importance of specific roles, other than Medical Expert and Scholar, varied across practitioners and residents who possess special interests in research or administration. For example, participants with current or past research involvement rated the practice importance of the Scholar and Collaborator roles higher than those who did not.

### Reliability

Trustworthiness of the instrument and reproducibility of the results are the main features to be considered in reliability assessments of any new research tool. Reliability is the consistency (equivalence, within one domain of behaviour, for example), the test-

retest reliability (stability), the accuracy of the instrument at each and every time it is administered to similar subjects, as well as the internal consistency of the test.

Determining reliability is particularly challenging when dealing with questions that are primarily eliciting personal opinions. These opinions are inherently subject to change due to external reasons, other than the instrument, per se, further complicating the establishment of the instrument reliability (Bell, 1999). In this study, only internal consistency was assessed with a Cronbach alpha test in section A of the instrument (Gay et al., 2000).

It is also important to note that the primary goal of this project was not to produce an instrument for the CanMEDS 2000 Project's assessment in Anesthesiology training programs. Rather, this questionnaire is an instrument that was used to gather information needed for this observational inquiry to support curriculum development. Hence, the validity and reliability of the wording in the instrument was verified during the developmental phases and prior piloting of the initial questionnaire (Bell, 1999), with this goal in mind. Furthermore, a reasonable effort was made throughout this project to use the results of this research to refine as necessary the current instrument for the purpose of any future projects, as demonstrated in the recommendations subsection which follows.

### Recommendations

Based on the reviewed literature and findings of this study, the following recommendations are forwarded to the Department of Anesthesia and the Faculty of Medicine at the University where the study was conducted.

- 1. Wide-based discussions need to be held at the level of the training program, in order to familiarize the Department members with the**

**importance and the scope of the CanMEDS 2000 Project, and to provide background information on the history of the project.**

While the initiation of CanMEDS 2000 project commenced after the completion of the first phase of the EFPO project in Ontario in 1993, and continued with the final report to the Royal College General Council made available 5 years ago, there still is considerable lack of awareness about this project within the medical community. The Anesthesia-Specialty Committee of the Royal College is considered among the first subspecialties committees to introduce specialty-specific training objectives that follow the CanMEDS 2000 format.

Understanding the background prior to the initiation of this project is as important as the participation of the department members in integrating these training objectives in the training program environment. Indeed, these two aims must be linked to effectively achieve the mission of the CanMEDS 2000 Project. Some of the roles and competencies included in the CanMEDS 2000 Project might seem to some practitioners to be very abstract, relative to the actual day-to-day practice of Anesthesia, and for that matter probably to other specialties. Considering the components of Swick's Medical Professionalism and reflecting on some of the patterns emerging from reviewing complaints against physicians gives indications of this vital linkage. Most of the complaints against physicians are not related to the medical expertise only, but to other areas of the professional practice. Patients will always consult doctors for their medical expertise, and competencies, related to this vital role, have been and should continue to be the central focus of medical curriculum. However, competencies related to other roles

are also important and need to be systemically prioritized and incorporated into the day-to-day teaching, learning, evaluation, and practice activities.

**2. Many of the results collected in this study could be used by the training program directors and administrators to improve faculty's and residents' preparedness in assuming the various CanMEDS roles.**

As seen in participants' responses to the so-called secondary roles, there is a wide spectrum of preparedness among the faculty. Initiating cross-departmental dialogue, probably during a dedicated weekend educational retreat, will facilitate an exchange among faculty and, hence, will reduce over time the self-reported lack of preparedness for some of the roles or competencies. Also, such educational retreats or symposia can be used as a medium to arrange and to conduct some of the recommendations that follow.

**3. The program should consider the development of a dual-channeled approach to the assessment of residents' performance during the years of residency training similar, to the one suggested by Gordon (1997).**

As outlined in the literature review section of this study, the most critical feature of this system is the "air-tight" separation between the two channels for the formative and summative assessment. The summative channels deal with minimum acceptable performance standards for residents across the seven roles. Using this approach, a committee uses clearly expressed cut-off criteria to determine acceptable performance in each of the needed competencies. In the current training program, such a committee could function as a subcommittee of the Anesthesia Training Program Education Committee and could serve as a "promotion committee." This subcommittee could meet once or twice a year. This particular channel of evaluation is faculty-based, and existing

postgraduate probation policies can represent a starting point for this subcommittee's structure and guidelines. Such cumulative evaluation processes with yearly evaluations, will serve as reference points to form the Final In-Training Evaluation Report (FITER) for each resident at the end of their residency-training period.

The second channel of resident assessment aims at enhancing residents' professional development throughout their training years in the program, through formative assessment. This committee could include both faculty- and resident-based representations. Using various sources of input, issues brought for discussions to this committee could provide a means of initiating a constructive dialogue between staff and residents, even in very complex issues, without the associated apprehension of this "openness" being used toward making high-stakes judgments about individuals.

As previously stated in Chapter Two, the complete structural isolation of these two channels increases the motivation of medical trainees and faculty alike to participate in enhancing their self- and peer- assessments and reflections. In addition, it promotes increased communication among department members and enhances their professional growth. This notion is best articulated by Swick (1998), during his discussion on the clash between business and professional values, in which he wrote, "only by maintaining a practice grounded in the longstanding values of the profession will the health care needs of patients be truly served in an efficient and cost-effective manner" (Swick, 1998, p. 752).

**4. Introduce and incorporate "Real life OSCEs" in day-to-day Anesthesia practice.**

Based on the work done by Greaves and Grant (2000), it is possible to develop and draft lists of performance-related behaviours to improve and formalize the task of direct observation as a means of assessment, feedback, and evaluation across the seven roles of the CanMEDS 2000. Developing well-defined lists of “behaviour descriptors” is an important step towards establishing reference points for effective clinical observatory encounters and reduces the intuitive and subjective nature of current, daily, and monthly assessment approaches (Madsen et al., 1994). Similar to the well-established grids for evaluating medical expertise and/or communication skills-based OSCE stations, these lists can be used to enhance the objectivity and consistency of the assessment of clinical encounters. This approach would have many merits and fits the current practice setting in the Anesthesia Program. As an example, the following is a step-by-step approach suggested to achieve this recommendation.

- a) A given number of clinical Anesthesia observers could be chosen on a voluntary basis, to initiate this process. With help from specialists in education, communication, and management, this group could use focus group methodology to draft a list of behaviours using an approach similar to that explained by Greave and Grant (2000). The goal of this focus group is to build a consensus on the descriptions related to the relevant attributes of important CanMEDS’ competencies.
- b) These initially developed lists could then be shared with residents and all other department members to suggest additions, omissions, and modifications.
- c) Once the findings of this consultation process are gathered and the necessary changes incorporated, the clinical Anesthesia observers will be identified, as

such, and asked to use these criteria as the framework for their assessment and feedback during various routine and emergency situations.

- d) Residents could be encouraged to work with those designated clinical observers for a certain number of days during their Anesthesia rotations, and could be asked to provide feedback on the direct observation assessment process.

With time, the number of clinical observers will increase with subsequent repetitions of the cycle. Similar processes could be used to create and to develop modified lists to obtain similar information from direct observation from alternative sources (e.g. peers and nurses) for appropriate CanMEDS roles and competencies.

**5. Provide more opportunities for residents to assume increasing responsibilities in the routine day-to-day management duties in the Operating Rooms, Labour Floors, and Pre-Anesthesia Clinics.**

In addition to maintaining the current active participation in clinical audits, mortality and morbidity rounds, and quality-assurance meetings within the Anesthesia Department, senior residents would benefit from being assigned increasingly independent responsibilities to manage various issues directly in day-to-day routines. For example, a senior resident, during a community hospital rotation, could take a “rotating list assignment” similar to other Anesthesiologists working in the group. The staff Anesthesiologists understand that they are acting as an active “by-stander,” with no direct involvement in the case, except when their help is required and/or asked for, or if they have to intervene for other reasons. Residents, in this case, do all the tasks, particularly time management, communications, and collaboration with all other team members.

Debriefing and feedback follows at the end of the working day or week. Similar arrangements can be made during the on-call time, and at the various other locations, as listed above. This exercise also can be done with role-switching, in which the resident only watches, exposing residents to multiple models of practice, as suggested by one study participant:

“During their 5 years of residency, residents should have the opportunity each year (e.g. one week) to observe another anesthetists(s)—not to be involved as a junior or senior in the anesthetic team, but as an observer ‘in the corner of the operating room’ to see how others do certain things/or don’t.”

**6. Increase residents’ exposure and interactions with identified mentors and role models for other competencies of the Scholar role (other than research) and, particularly, those of the Health Advocate and Manager roles.**

Similar to the current practice of allowing up to six training rotations to be spent conducting a scholarly research project, an alternative arrangement for using some of that timeblock may be to participate in other areas related to competencies mentioned in this recommendation. For example, participating in education courses (e.g. Certification in Higher Education Teaching Program, CHET, or other similar professional development programs), evidence-base medicine-related courses, or even attachment with on-site managers for a rotation or two, could be elective components for interested residents.



### Recommendations for Future Research

As pointed out in earlier sections of this chapter, many questions have been raised that merit further research. The following list provides an insight into some of these questions and areas for future research, based on this study:

- 1. Further inquiries are needed to highlight, in more detail, the reasons for some of the results reported in this study.**

The attempt to survey participants' perceptions regarding all of the CanMEDS roles resulted in a lengthy instrument. This might account for a somewhat reduced amount of qualitative data entry by the participants. Thus, based on our data, more specific competencies within different CanMEDS roles can be investigated in greater depth regarding their relative relevance to the practice of Anesthesia, priority for teaching of Anesthesia, and personal preparedness to carry out these competencies. This is of particular importance to the Scholar, the Manager, and the Health Advocate roles, where most of the differences of opinions and difficulties in this study were reported.

- 2. The impact of Role Modeling in the current medical education curriculum, in particular, within Anesthesiology education, warrants further grounded enquiry.**

Considering the introduction of simulated, fully computerized educational environments and vast scientific and technological advancements in the field of Anesthesia, the changing roles of mentors and role models in Anesthesiology education is interesting and worth exploring. While at times it seemed that apprenticeship had faded from the medical education arena as a leading influence, the data reported in this study contradicts this perception. Further study could shed some light and focus on the reasons

for the persistence of the central position of role modeling in Anesthesia education, in particular, its importance and implications for today's professional Anesthesiology practice and challenges in other areas of professional education.

**3. The value of self-assessment and -reflection as an evaluation means deserve further inquiries to assess their contribution to professional practice and teaching.**

Professionals, throughout their careers, assess their own performance on an ongoing basis to inform their practice. In this study, although self-assessment was considered important for teaching and learning, it did not emerge as a preferred method of evaluation. Reasons and implications for such findings within the context of medical education are worth exploring.

**4. Many of the recommendations to the Department of Anesthesia represent areas that need further study.**

Examples include developing lists containing: the minimum acceptable standards for each of the CanMEDS roles, specific behaviour descriptors to enhance the act of direct observation from being "art" to becoming an evidence-based "scientific" endeavour.

Finally, a few specific recommendations are made for the future use of a similar survey, either as an interval follow-up to this study or modification of this instrument to assess the CanMEDS 2000 objectives in other medical and surgical specialties or in other schools of medicine. These include:

1. Issues discussed in the limitation section of this chapter should be addressed to reduce the chances of misinterpretation of the used scale, as happened in

section C in this study. Suggestions include making the specific directions stand out in the layout even more by using different colours, or by adding seven numbered stickers in this section of the survey to further reduce the chances of using a rank more than once. In addition, these stickers could be colour-, pattern-, or size-coded to highlight the transitions in the results from least important to most important.

2. For the first two questions in section B of the instrument, consideration needs to be given to adding the word “optional” in the request for participants to explain responses below 4. It was noticed that some participants had cancelled or upgraded their response from less than 3 to a 4 to avoid being “obliged” to defend their choices. Future researchers can give the participants an opportunity either to make a choice along the scale, without committing themselves to extra writing, or to require an explanation for all low responses.
3. Consideration should be given to invert the “ease” scale in section B of the instrument, so that it will range from 1 as extremely difficult to 7 as extremely easy, instead of the current arrangement.

### Summary

In this chapter, the implications and the limitations of the findings of this exploratory study were discussed. Based on these discussions, recommendations were made for the Royal College of Physicians and Surgeons of Canada Anesthesiology Training Program at the research site. Areas in need of future research have been highlighted using the research literature and data gathered in this study, together with

insights needed to optimize some of the shortcomings in the data collection instrument used.

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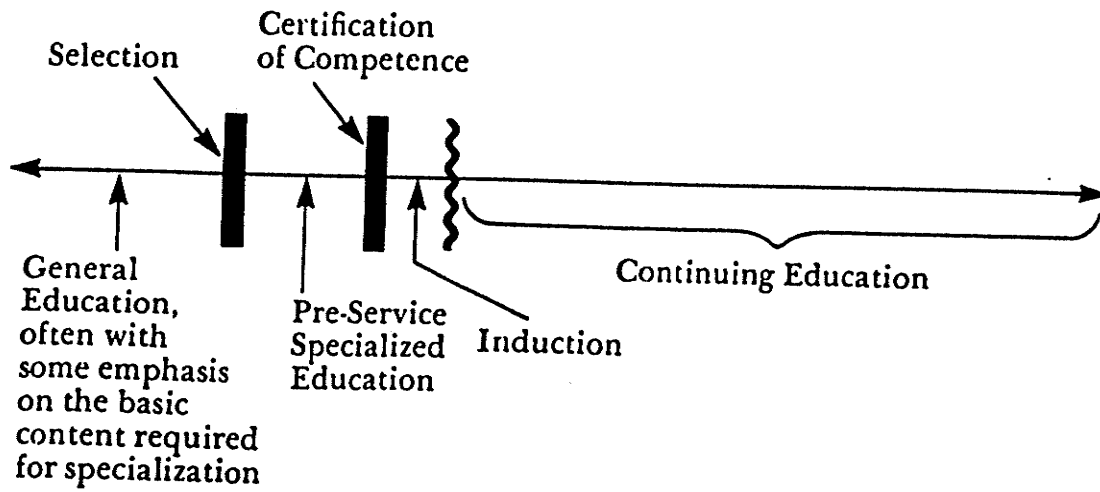


## Appendices

### APPENDIX A

#### Houle's Classic Model of Professional Education

Source: Houle, C. O., (1980). Continuing learning in the professions. (1st ed) San Francisco, CA: Jossey-Bass Inc. Publishers. p. 4.



**APPENDIX B**

**ABIM: Professional Associate Rating Form**

Source: American Board of Internal Medicine (1995). Project Professionalism.  
<http://www.abim.org/pubs/p2/index.htm> or  
<http://www.abim.org/pubs/p2/PDFForms/pars.pdf> [On-line].

**PROFESSIONAL ASSOCIATE RATING FORM**

Please rate the resident named below in comparison to other residents with whom you have worked. Circle one rating response per item. Circle the appropriate number between 1 and 9 where 1 is the lowest rating and 9 is the highest rating. If you have had insufficient contact to evaluate this resident on a particular characteristic, circle UA (unable to evaluate).

Name of Resident \_\_\_\_\_ Date \_\_\_\_\_

Your response will be anonymous. This resident will not know whether you have received or completed this questionnaire, and will not see or receive a copy of your responses.

**EXAMPLE:**

Responsiveness to Patients      1   2   3   4   5   6   7   8   9      UA

Unresponsive to patients' needs and wishes.

Very responsive to patients' needs and wishes.

This mark would indicate that Doctor X is the worst resident with whom you have worked in his/her responsiveness to patients' needs and wishes. A score of 2 would indicate that Doctor X is among the bottom few residents with whom you have worked in this characteristic.

This mark would indicate that Doctor X is among the top two or three residents with whom you have worked in his/her responsiveness to patients' needs and wishes. A score of 9 would indicate that Doctor X is the single best resident with whom you have worked in this characteristic.

|               |              |   |   |   |               |   |   |   |                    |    |
|---------------|--------------|---|---|---|---------------|---|---|---|--------------------|----|
| Rating scale: | 1            | 2 | 3 | 4 | 5             | 6 | 7 | 8 | 9                  | UA |
|               | Lowest score |   |   |   | Highest score |   |   |   | Unable to evaluate |    |

Respect                              1   2   3   4   5   6   7   8   9                              UA

Shows inadequate personal commitment to honoring the choices and rights of other persons, especially regarding their medical care.

Always shows exceptional personal commitment to honoring the choices and rights of other persons, especially regarding their medical care.

Medical Knowledge      1   2   3   4   5   6   7   8   9                              UA

Limited and fragmented.

Extensive and well-integrated.

Ambulatory Care Skills      1   2   3   4   5   6   7   8   9                              UA

Very poor ability to diagnose and treat patients and coordinate care in the outpatient setting.

Excellent ability to diagnose and treat patients and coordinate care in the outpatient setting.

Integrity                              1   2   3   4   5   6   7   8   9                              UA

Shows inadequate commitment to honesty and trustworthiness in evaluating and demonstrating own skills and abilities.

Always shows exceptional commitment to honesty and trustworthiness in evaluating and demonstrating own skills and abilities.

|   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|--|
| <b>Psychosocial Aspects of Illness</b>  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Does not recognize or respond to psychosocial aspects of illness.   |   |   |   |   |   |   |   |   |   | Recognizes and responds to psychosocial aspects of illness.  |
| <b>Management of Multiple Complex Problems</b>  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Very limited ability to manage patients with multiple complex medical problems.   |   |   |   |   |   |   |   |   |   | Excellent ability to manage patients with multiple complex medical problems  |
| <b>Compassion</b>   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Shows inadequate appreciation of patients' and families' special needs for comfort and help, or develops inappropriate emotional involvement. |   |   |   |   |   |   |   |   |   | Always appreciates patients' and families' special needs for comfort and help, but avoids inappropriate emotional involvement. |
| <b>Responsibility</b>   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Does not accept responsibility for own actions and decisions; blames patients or other professionals.   |   |   |   |   |   |   |   |   |   | Fully accepts responsibility for own actions and decisions.  |
| <b>Management of Hospitalized Patients</b>  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Very poor ability to diagnose and treat patients and coordinate care in the inpatient setting.  |   |   |   |   |   |   |   |   |   | Excellent ability to diagnose and treat patients and coordinate care in the inpatient setting.                                 |
| <b>Problem-Solving</b>  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Fails to critically assess information, risks, and benefits; does not identify major issues or make timely decisions.                         |   |   |   |   |   |   |   |   |   | Critically assesses information, risks, and benefits; identifies major issues and makes timely decisions.                      |
| <b>Overall Clinical Skills</b>  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | UA   |
| Very poor overall clinical skills.  |   |   |   |   |   |   |   |   |   | Outstanding overall clinical skills.   |

**APPENDIX C**

**ABIM: Professionalism Remediation Summary**

Source: American Board of Internal Medicine (1995). Project Professionalism.  
<http://www.abim.org/pubs/p2/index.htm> [On-line].

**PROFESSIONALISM REMEDIATION SUMMARY**

Trainee: \_\_\_\_\_ Program: \_\_\_\_\_ PGY- \_\_\_\_\_

**PROBLEM(S)** *Please check appropriate categories below and describe:*

- Unmet professional responsibilities
- Lack of effort toward self-improvement and adaptability
- Diminished relationships with patients, families, and/or professional colleagues
- Other

Description of problem(s) and frequency encountered: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**REMEDICATION** *(Please describe and check appropriate categories below)*

Time allotted for remediation: \_\_\_\_\_

Date begun: \_\_\_\_\_ Date completed: \_\_\_\_\_

Description of remediation planned, in process, or undertaken: *(e.g., increased supervision, repeated rotation(s), psychiatric consultation)* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Person(s) responsible for determining type of remediation:

- Program director
- Chairman
- Evaluation committee
- Faculty advisor
- Other

Person(s) responsible for implementing remediation:

- Program director
- Chairman
- Evaluation committee
- Faculty advisor
- Other

Person(s) responsible for assessing decision and outcome:

- Program director
- Chairman
- Evaluation committee
- Faculty advisor
- Other

**DECISION - OUTCOME** *(check only one)*

- Successful resolution of problem
- Unresponsive to remediation
- Remediation still in process
- Needs more/different remediation
- Not reappointed
- Termination

**APPENDIX D**

**ABIM: Evaluation of Research Performance**

Source: American Board of Internal Medicine (1995). Project Professionalism.  
<http://www.abim.org/pubs/p2/index.htm> or  
<http://www.abim.org/pubs/p2/pdfforms/erp.pdf> [On-line].

### EVALUATION OF RESEARCH PERFORMANCE

Trainee's Name: \_\_\_\_\_ Date: \_\_\_\_\_

- Level of Training:  Resident  Subspecialty Fellow
- Focus of Research:  Basic Research  Health Services Research  
 Clinical Research  Educational Research  
 Other

- Type of Scholarly Activities:  Original research  
 Comprehensive case reports  
 Review of assigned clinical and research topics  
 Other

Indicate period of research time this evaluation covers: From: \_\_\_\_\_ To: \_\_\_\_\_

Did you have sufficient time to observe the trainee's conduct of research?  Yes  No  Unsure

Briefly describe the goals and objectives of the research project(s) in which the trainee is involved: \_\_\_\_\_

\_\_\_\_\_

| Components of Research Conduct<br>(✓ rating applicable) |  | Unsatisfactory           | Marginal                 | Satisfactory             | Very Good                | Exceptional              |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Attributes  | Spirit of inquiry                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Integrity                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Honesty                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Collaboration                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Responsiveness to criticism                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Productivity                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Content   | Critical evaluation of scientific literature | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Study design and interpretation              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Research methodology                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Interpretation of data                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Responsible use of informed consent          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Critical assessment of new therapies         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Principles of authorship/research papers     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Indicate the strategies used to evaluate the trainee's research activities:  
(✓ applicable)

- Observation and supervision  Scientific presentations  
 Research design  Publications/peer-reviewed journals  
 Implementation of research project  Other \_\_\_\_\_  
 Participation in research conferences

General Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Have you reviewed this evaluation with the trainee?  Yes  No

Name of Evaluator and Title: \_\_\_\_\_



**APPENDIX E**

**ABIM: Praise Card or Early Concern Note**

Source: American Board of Internal Medicine (1995). Project Professionalism.

<http://www.abim.org/pubs/p2/index.htm> or

<http://www.abim.org/pubs/p2/pdfforms/praise.pdf> [On-line].

### Praise Card

**To: Faculty**  
**From: Program Director**  
**Re: Praise Card about Performance of Residents or Subspecialty Fellows**

Please complete and submit this card to me when you wish to praise the performance and/or professional behavior of a resident or subspecialty fellow. This information will be conveyed to the physician and noted in the departmental file.

Name of Physician: \_\_\_\_\_ PGY- \_\_\_\_\_ Date: \_\_\_\_\_

My praise about the performance of this physician is based on his/her demonstration of exceptional ability in the following: (please ✓)

|   |   |
|---|---|
| <input type="checkbox"/> clinical judgment    | <input type="checkbox"/> professionalism                |
| <input type="checkbox"/> clinical skills      | <input type="checkbox"/> humanistic qualities           |
| <input type="checkbox"/> medical knowledge    | <input type="checkbox"/> team management and leadership |
| <input type="checkbox"/> communication skills | <input type="checkbox"/> conduct of research            |
| <input type="checkbox"/> teaching             |   |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

### Early Concern Note

**To: Faculty**  
**From: Program Director**  
**Re: Early Concern Note About Performance of Residents or Subspecialty Fellows**

Please complete and submit this card to me when you have any concerns about the performance and/or professional behavior of a resident or subspecialty fellow. This information will be used constructively to help the physician.

Name of Physician: \_\_\_\_\_ PGY- \_\_\_\_\_ Date: \_\_\_\_\_

My concerns about the performance and/or professional behavior of this physician are based on: (please ✓)

|  |  |
|--|--|
| <input type="checkbox"/> critical incident     |  |
| <input type="checkbox"/> gut level reaction    |  |
| <input type="checkbox"/> series of "red" flags |  |

I have discussed my concerns with the physician \_\_\_\_\_ Yes \_\_\_\_\_ No  
 I feel uncomfortable discussing my concerns with the physician \_\_\_\_\_ Yes \_\_\_\_\_ No  
 Please call me about these concerns \_\_\_\_\_ Yes \_\_\_\_\_ No

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

**APPENDIX F**

**CanMEDS Project: Essential Roles and Key Competencies of Specialist Physicians**

Source: the Royal College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project (1996). Skills for the New Millennium: Report of the Societal Needs Working Group. [http://rcpsc.medical.org/english/publications/canmed\\_e.html](http://rcpsc.medical.org/english/publications/canmed_e.html) [Online].

**Table 1: Essential Roles and Key Competencies of Specialist Physicians**

| <b>Roles</b>           | <b>Key Competencies</b><br>The specialist must be able to ...   |
|------------------------|---|
| <b>Medical Expert</b>  | <ul style="list-style-type: none"> <li>• demonstrate diagnostic and therapeutic skills for ethical and effective patient care</li> <li>• access and apply relevant information to clinical practice</li> <li>• demonstrate effective consultation services with respect to patient care, education and legal opinions</li> </ul>  |
| <b>Communicator</b>    | <ul style="list-style-type: none"> <li>• establish therapeutic relationship with patients/families</li> <li>• obtain and synthesize relevant history from patients/families/communities listen effectively</li> <li>• discuss appropriate information with patients/families and the health care team</li> </ul>  |
| <b>Collaborator</b>    | <ul style="list-style-type: none"> <li>• consult effectively with other physicians and health care professionals</li> <li>• contribute effectively to other interdisciplinary team activities</li> </ul>  |
| <b>Manager</b>         | <ul style="list-style-type: none"> <li>• utilize resources effectively to balance patient care, learning needs, and outside activities</li> <li>• allocate finite health care resources wisely</li> <li>• work effectively and efficiently in a health care organization</li> <li>• utilize information technology to optimize patient care, life-long learning and other activities</li> </ul> |
| <b>Health Advocate</b> | <ul style="list-style-type: none"> <li>• identify the important determinants of health affecting patients</li> <li>• contribute effectively to improved health of patients and communities</li> <li>• recognize and respond to those issues where advocacy is appropriate</li> </ul>  |
| <b>Scholar</b>         | <ul style="list-style-type: none"> <li>• develop, implement and monitor a personal continuing education strategy</li> <li>• critically appraise sources of medical information</li> <li>• facilitate learning of patients, house staff/students and other health professionals</li> <li>• contribute to development of new knowledge</li> </ul>   |
| <b>Professional</b>    | <ul style="list-style-type: none"> <li>• deliver highest quality care with integrity, honesty and compassion</li> <li>• exhibit appropriate personal and interpersonal professional behaviours</li> <li>• practise medicine ethically consistent with obligations of a physician</li> </ul>   |

**APPENDIX G**

**CanMEDS Project: Summary of the Educational Strategies for Implementation of the Roles.**

Source: the Royal College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project (1996). Skills for the New Millennium: Report of the Societal Needs Working Group. [http://rcpsc.medical.org/english/publications/canmed\\_e.html](http://rcpsc.medical.org/english/publications/canmed_e.html) [Online].

**Table 2: Overview of Educational Strategies for Implementation of Roles**

| <b>Roles</b>           | <b>Learning Environment</b>  | <b>Bedside Teaching</b>   | <b>Structure: Cognitive Instruction<br/>( eg case discussions, half days rounds)</b>  | <b>Workshops</b>   |
|------------------------|--|---|---|--|
| <b>Medical Expert</b>  | <ul style="list-style-type: none"> <li>• self-directed learning</li> <li>• individual mentorship</li> </ul>  | <ul style="list-style-type: none"> <li>• apprenticeship model</li> </ul>  | <ul style="list-style-type: none"> <li>• problem-based learning</li> <li>• clinical reasoning</li> </ul>  | <ul style="list-style-type: none"> <li>• effective consultations</li> <li>• presentation skills</li> <li>• evidence-based medicine</li> <li>• information access/retrieval</li> <li>• bioethics</li> </ul> |
| <b>Communicator</b>    | <ul style="list-style-type: none"> <li>• empathy, respect (reflects how patient be treated)</li> <li>• individual &amp; group reflection of experiences</li> </ul>         | <ul style="list-style-type: none"> <li>• role modelling</li> <li>• effective patient and family communications</li> </ul> | <ul style="list-style-type: none"> <li>• conceptual framework of patient-MD communication</li> <li>• communication skills, special topics (eg racial, cultural issues, bad news)</li> </ul> | <ul style="list-style-type: none"> <li>• communication skills with constructive feedback</li> <li>• role playing, +/- videotape</li> </ul>   |
| <b>Collaborator</b>    | <ul style="list-style-type: none"> <li>• interdisciplinary organization/staffing</li> <li>• seamless health care delivery unit (inpatient/ ambulatory)</li> </ul>          | <ul style="list-style-type: none"> <li>• role modelling</li> </ul>  | <ul style="list-style-type: none"> <li>• relevant governance structures</li> <li>• interdisciplinary teaching sessions</li> </ul>   | <ul style="list-style-type: none"> <li>• team building exercises</li> </ul>  |
| <b>Manager</b>         | <ul style="list-style-type: none"> <li>• role modelling, managing time &amp; resources between different priorities</li> </ul>   |   | <ul style="list-style-type: none"> <li>• allocation of health care resources</li> </ul>   | <ul style="list-style-type: none"> <li>• practice management</li> <li>• leadership skills</li> </ul>   |
| <b>Health Advocate</b> | <ul style="list-style-type: none"> <li>• individual &amp; patient population and advocacy issues</li> </ul>  |   | <ul style="list-style-type: none"> <li>• relevant governance structures</li> <li>• interdisciplinary teaching sessions</li> </ul>   | <ul style="list-style-type: none"> <li>• effective intervention, assistance in patient and population problem</li> </ul>   |
| <b>Scholar</b>         | <ul style="list-style-type: none"> <li>• self-directed learning</li> <li>• evidence-based practice</li> <li>• life long learning</li> <li>• practice reflection</li> </ul> | <ul style="list-style-type: none"> <li>• learning from clinical problems</li> </ul>                                       | <ul style="list-style-type: none"> <li>• clinical standard setting</li> <li>• quality assurance/management</li> <li>• health economics</li> </ul>   | <ul style="list-style-type: none"> <li>• reflection on practice</li> <li>• critical appraisal skills</li> </ul>  |
| <b>Professional</b>    | <ul style="list-style-type: none"> <li>• direct observation and feedback</li> <li>• learner prescriptions</li> </ul>   | <ul style="list-style-type: none"> <li>• role modelling of professional attitudes and behaviours</li> </ul>               | <ul style="list-style-type: none"> <li>• case-based discussions</li> <li>• medico-legal rounds</li> <li>• medical ethics rounds</li> </ul>  | <ul style="list-style-type: none"> <li>• awareness of professional responsibilities</li> </ul>   |

**APPENDIX H**

**CanMEDS Project: Summary of the Evaluation Strategies for the Roles.**

Source: the Royal College of Physicians and Surgeons of Canada: Canadian Education for Specialists 2000 Project (1996). Skills for the New Millennium: Report of the Societal Needs Working Group. [http://rcpsc.medical.org/english/publications/canmed\\_e.html](http://rcpsc.medical.org/english/publications/canmed_e.html) [Online].

Table 3: Application of Evaluation Strategies to the CanMEDS Roles

| Evaluation Tools<br>Roles | In-Training<br>Evaluation  | Stimulated Chart<br>Recall   | Objective Written<br>Examinations<br>(MCQs, SAQs,<br>Essay Questions)  | Objective Structured Clinical<br>Examination<br>(OSCE)   | Structured Oral<br>Examination  |
|---------------------------|--|--|--|--|---|
| <b>Medical Expert</b>     | <ul style="list-style-type: none"> <li>consultation skills</li> <li>self-assessment ability (further development required)</li> </ul>  | <ul style="list-style-type: none"> <li>review of medical records</li> <li>review of written consultation skills</li> </ul> | <ul style="list-style-type: none"> <li>assessment strategies well-developed for testing most objectives</li> </ul>   |  | <ul style="list-style-type: none"> <li>assessment strategies well-developed for testing most objectives</li> </ul>                      |
| <b>Communicator</b>       | <ul style="list-style-type: none"> <li>observed behaviours best source for assessing communication skills and attitudes (further development required)</li> </ul>  | <ul style="list-style-type: none"> <li>assessment of information gathering and medical communication</li> </ul>            |  | <ul style="list-style-type: none"> <li>with appropriate design, could provide valid assessment of knowledge, skills and attitudes</li> </ul> |   |
| <b>Collaborator</b>       | <ul style="list-style-type: none"> <li>direct observation during training is the primary source of assessment</li> <li>specific input from allied health professional essential (further development re: attitudinal scales, non-quantitative methods required)</li> </ul> |  | <ul style="list-style-type: none"> <li>some aspects measurable with objective examinations</li> </ul>  |  |   |
| <b>Manager</b>            | <ul style="list-style-type: none"> <li>observed behaviours necessary to assess performance during training</li> </ul>  | <ul style="list-style-type: none"> <li>may be promising, requires much development</li> </ul>                              | <ul style="list-style-type: none"> <li>assessment of organizational aspects of practice and the health care system</li> </ul>  | <ul style="list-style-type: none"> <li>may be promising, requires much development</li> </ul>  |   |
| <b>Health Advocate</b>    | <ul style="list-style-type: none"> <li>assessment of attitudinal aspects and performance of these competencies</li> </ul>  |  | <ul style="list-style-type: none"> <li>evaluation re: <ul style="list-style-type: none"> <li>determinants of health</li> <li>clinical epidemiology</li> <li>health &amp; social policy procedures</li> </ul> </li> </ul> |  |   |
| <b>Scholar</b>            | <ul style="list-style-type: none"> <li>assessment of much of the competencies may be possible with observed clinical performance</li> </ul>  |  | <ul style="list-style-type: none"> <li>may be useful if made more reliable and valid through further development</li> </ul>  |  |   |
| <b>Professional</b>       | <ul style="list-style-type: none"> <li>observations during residency provide rich source for assessment of these competencies</li> </ul>   | <ul style="list-style-type: none"> <li>very helpful evaluation tool, with further development</li> </ul>                   | <ul style="list-style-type: none"> <li>not sufficiently valid</li> </ul>   |  | <ul style="list-style-type: none"> <li>possible to evaluate knowledge and concepts in the setting of professional behaviours</li> </ul> |



**APPENDIX I**

**Approvals for the Study**



UNIVERSITY  
OF MANITOBA

Office of the President

Office of Research Services  
244 Engineering Building  
Winnipeg, MB R3T 5V6  
Canada  
Telephone (204) 474-8418  
Fax (204) 261-0325

### APPROVAL CERTIFICATE

05 November 2001

**TO:** Abdulaziz Boker (Advisor L. Taylor)  
Principal Investigator

**FROM:** Lorna Guse, Chair  
Education/Nursing Research Ethics Board (ENREB)

**Re:** Protocol #E2001:083  
"CanMEDS 2000 Project Objectives in Anesthesiology: Perspectives  
of Staff & Residents"

---

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

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



UNIVERSITY  
OF MANITOBA

FACULTY OF MEDICINE  
Department of Anesthesia

Health Sciences Centre  
Room LB-315  
60 Pearl Street  
Winnipeg, Manitoba  
CANADA R3E 1X2

October 5, 2001

Tel: (204) 787-1125  
Fax: (204) 787-4291

Dr. Abdulaziz Boker  
Fellow  
Department of Anesthesia  
University of Manitoba  
Room LB315, Lennox Bell Lodge  
60 Pearl Street  
Winnipeg, Manitoba  
R3E 1X2

Dear Dr. Boker:

**RE: "CanMEDS 2000 PROJECT OBJECTIVES IN  
ANESTHESIOLOGY: STAFF & RESIDENTS' PERSPECTIVES"**

I am pleased to grant you permission on behalf of the University Department of Anesthesia to contact Anesthesia Department Members (staff and residents) for the purpose of above mentioned project.

Please do not hesitate to contact me if you have any questions or concerns.

Yours truly,

Greg J. Doak, MD, FRCPC, PhD  
Professor and Head,  
Department of Anesthesia  
University of Manitoba

GJD/lmb



Winnipeg Regional  
Health Authority    Office régional de la  
santé de Winnipeg

WRHA Program Office  
c/o Grace General Hospital  
300 Booth Drive  
Winnipeg, MB R3J 3M7  
Ph. (204) 837-0141  
FAX (204) 837-5781

October 25, 2001

Abdulaziz Boker, M.D.  
Fellow, Department of Anesthesia  
University of Manitoba  
Health Sciences Centre  
Room LB-315  
60 Pearl Street  
WINNIPEG, MB R3E 1X2

Dear Dr. Boker.

I am writing to confirm the support of the Winnipeg Regional Health Authority (WRHA) Anesthesia Program for your project, *"CanMEDS 2000 PROJECT OBJECTIVES IN ANESTHESIOLOGY: STAFF & RESIDENTS' PERSPECTIVES"*.

It will be interesting to see the results of the Survey, which hopefully can be shared with those in the Anesthesia Program. If there is additional assistance that the WRHA can provide, please let me know.

Regards,

Yours truly,

Linda Nugent, M.D.  
Medical Director  
Anesthesia Program

LN/el

cc    Dr. Greg Doak  
      Dr. Laurence Brownell

**APPENDIX J**

**Copy of the Statement of Confidentiality**

Re:

“CanMEDS 2000 Project Objectives in Anesthesiology:  
Perspectives of Staff & Residents”

Name: \_\_\_\_\_

Location of Employment: Program Administrator, University Teaching Services

I understand that by assisting in the above-mentioned study, I will have access to the matched list of codes and respondent names. I understand that, because this includes personal data and potentially sensitive information, it must remain confidential.

I understand that by signing this Statement of Confidentiality, I agree not to disclose or use any information to which I have access while performing my duties in this project as outlined in the study protocol. Further, this matched list of codes and respondents names will be destroyed once the study is completed.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of the Principal Investigator

\_\_\_\_\_  
Date

**APPENDIX K**

**The Pre-Notice and the Cover Letters and the Developed Survey**

Pre-notice & and cover letter: modified from:

Sources:

Dillman, D. A. (2000). Mail and internet surveys: The tailored design method. (2nd ed.) New York: Wiley, p.157 &163.

Rea, L. M. & Parker, R. A. (1997). Designing and conducting survey research: A comprehensive guide. (2nd ed.) San Francisco, Calif: Jossey-Bass Publishers, p.31.

Section-A of the survey: CanMEDS 2000 General Training Objectives, modified from:

Source: Royal College of Physicians and Surgeons of Canada (1995). CanMEDS 2000 Project: Societal Needs Working Group 1995 Report to Council, Ottawa

Section-B of the survey: the definition of self-reflection:

Source: Jarvis, P. (1992). Reflective practice and nursing. Nurse Education Today, 12, 174-181, p. 178.

Section-B of the survey: Anesthesiology-Specific Training Objectives, modified from:

Source: Education Committee of the RCPSC (2001). Objectives of Training and Specialty Training Requirements in Anesthesia.

[http://rcpsc.medical.org/english/residency/certification/training/anesth\\_e.html](http://rcpsc.medical.org/english/residency/certification/training/anesth_e.html) [On-line].



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Tel: (204) 787-1125  
Fax: (204) 787-4291

November 8, 2001

Participant Name  
Department of Anesthesia  
Participant Address  
Winnipeg, MB Postal Code

Dear Anesthesia Department Member,

A few days from now you will receive in your hospital mailbox a request to fill out a questionnaire for an important project being conducted by the University of Manitoba Department of Anesthesia Residency Training Program. The survey represents an essential part of my Master of Education degree, from this University.

The project is concerned with the newly introduced CanMEDS 2000 project's objectives, which are being applied to all of the Royal College Specialists Training Programs across Canada. Our project is entitled the "*CanMEDS 2000 PROJECT OBJECTIVES IN ANESTHESIOLOGY: STAFF & RESIDENTS PERSPECTIVES*." I am writing to you in advance to introduce the project to you and also because previous research has shown that many people prefer to know ahead of time that they will be contacted.

The CanMEDS 2000 project, itself, was initiated by the RCPSC in the early 1990s in response to increasing and changing societal expectations from the medical profession. The project's initial step was to formulate a list of roles that all future specialists certified by the College would be expected to fulfill upon certification and to maintain throughout their professional careers. These roles are [for the specialist to have the minimum competence in each of these seven areas] a collaborator, a communicator, a health advocate, a manager, a medical expert, a professional, and a scholar. After February 2002, the on-site accreditation surveys of all RCPSC Training Programs will be assessed according to the new CanMEDS 2000 project's objectives.

In 1996, the College General Council approved the general objectives for all of the training programs, and in September 2000, the Specialty Committee on Anesthesia of the Royal College approved the specialty-specific objectives, which are currently used by our program. By 2003, these objectives will represent the basis for the Final in Training Evaluating Reports (FITER) for the college exam candidates.

It is not yet known how best to integrate these new competencies into the actual practice, training, and evaluation within the context of anesthesiology. Thus, it is an aim of this study to survey all of the Anesthesia Department members (residents and staff) regarding the relative importance of each of these roles, both from the practice of anesthesia, in general, and from each individual's practice profile point-of-view. Also, this project proposes to elicit the Department Members' opinions on what are the best approaches to be prepared to assume these roles, the best ways to teach these roles to others and, subsequently, the most suitable means of evaluating the attainment of each of these competencies.

Thank you for your time and consideration. It is only with your help and cooperation in taking part in this study that this research project can be successful.

Sincerely,

Abdulaziz Boker,  
Anesthesia Fellow



UNIVERSITY  
OF MANITOBA

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Department of Anesthesia

Health Sciences Centre  
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Tel: (204) 787-1125  
Fax: (204) 787-4291

November 14, 2001

Participant Name  
Department of Anesthesia  
Participant Address  
Winnipeg, MB Postal Code

Dear Participant Name,

I would like to ask your help in a study regarding the application of the CanMEDS 2000 project's objectives to the Royal College Anesthesiology Residency Training Program, University of Manitoba. As stated in this study's pre-notice letter that we sent to you a few days ago (also, see page 23 of the survey), it is not yet known how to best integrate some, or all, of these new benchmark roles, (a medical expert, a scholar, a communicator, a collaborator, a manager, a health advocate, and a professional) into the current anesthesiology teaching and practice. Your personal viewpoints and opinions regarding this important project are essential to achieve this optimum integration of CanMEDS objectives into our daily practice. Also, results from the survey will help the Anesthesia Department plan for future professional development initiatives, as needed.

This survey is voluntary. However, we require your assistance and ask you to take 20-30 minutes to share your experiences and opinions regarding the CanMEDS 2000 project competencies. If for some reason you prefer not to respond, please let us know by returning the blank, or partially filled, questionnaire in the self-addressed, stamped envelope provided. A distinction will be made during the survey between the relevance of these various roles from the actual anesthesia practice and the education during the years of residency. There are no right or wrong answers to any of the listed questions and your participation, by answering all of the questions, is essential for the success of the study and is highly appreciated. Higher response rates will enable a meaningful statistical analysis, as well as facilitate generalization of the survey results.

The survey form is coded for two reasons: first, to facilitate the process of handing out a replacement package as a follow up step for non-respondents after the initial distribution. This will be done, if necessary, depending on the response rate. Second, as a token of appreciation for respondents, the codes will be used in a draw for three \$100 gift certificates from the University of Manitoba Book Store.

Your answers will be completely confidential. The Office of University Teaching Services (UTS) will handle the tasks of sending replacement questionnaires and managing the draw, but will not take part in handling the actual survey data. None of the project investigators will have access to these random codes. To further protect anonymity of your responses, no attempts to identify the participants will be done at any stage of collecting, analyzing, or subsequent reporting of the responses. The results will be reported in a group format as summaries, and no individual participant's responses will be identified.

The study has been approved by the Ethics Committee and a copy of the project findings will be provided to each of the participating Hospital Departments. A copy of the final thesis will be kept in the Anesthesia Department and certain sections will be considered for further publications in professional journals. Dr. Lynn Taylor is the chairperson for this thesis project advisory committee. The committee membership also includes, Dr. David Kirby, Dr. Douglas Craig, and Dr. Laurence Brownell. If you have any questions related to this survey or the thesis project, please do not hesitate to contact me at anytime using the contact number or e-mail listed on the back of the survey.

Thank you very much for helping with this important study.

Sincerely yours,

Abdulaziz Boker  
Anesthesia Fellow



**CanMEDS 2000 PROJECT OBJECTIVES IN ANESTHESIOLOGY:  
PERSPECTIVES OF STAFF & RESIDENTS**

**Questionnaire**

**Section A - General CanMEDS 2000 Competencies**

In this section, please rate your perception of the importance of these general competencies in day-to-day practice and education of residents in Anesthesiology, IN GENERAL, according to the following scale:

|                      |                     |             |         |           |                   |                       |
|----------------------|---------------------|-------------|---------|-----------|-------------------|-----------------------|
| Lowest<br>Importance | Very<br>Unimportant | Unimportant | Neutral | Important | Very<br>Important | Highest<br>Importance |
| 1                    | 2                   | 3           | 4       | 5         | 6                 | 7                     |

| Importance of this competency for →  | TEACHING during<br>Residency | PRACTICE of<br>Anesthesiology |
|--|------------------------------|-------------------------------|
| • Demonstrate good understanding of basic knowledge relevant to effective patient care   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Work effectively and efficiently in a health care organization   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Practice medicine ethically consistent with obligations of a physician   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Use resources effectively to balance patient care, learning needs, and other activities  | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Use of all pertinent information to arrive at complete and accurate clinical decisions   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Understand the specialist role to intervene on behalf of the community with respect to factors that may impact on community health | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Establish good relationships with peers and other health professionals   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Understand the principles of practice management   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Set realistic priorities to use time effectively in order to optimize professional performance                                     | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Respond appropriately in advocacy situations for patients and communities  | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Demonstrate proficiency in technical and procedures skills   | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Prepare documentation that is accurate and timely  | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |
| • Consult effectively with other physicians and health care professionals  | ① ② ③ ④ ⑤ ⑥ ⑦                | ① ② ③ ④ ⑤ ⑥ ⑦                 |

|                   |                  |             |         |           |                |                    |
|-------------------|------------------|-------------|---------|-----------|----------------|--------------------|
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Highest Importance |
| 1                 | 2                | 3           | 4       | 5         | 6              | 7                  |

| Importance of this competency for  | The TEACHING during Residency | The PRACTICE of Anesthesiology |
|--|-------------------------------|--------------------------------|
| • Manage emergency conditions resulting in effective treatment   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Facilitate learning of patients, students, and other health professionals  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Exhibit appropriate personal/interpersonal professional behaviours   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Establish therapeutic relationship with patients and families  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Understand the specialist role to intervene on behalf of patients with respect to factors that may impact on their health              | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Develop, implement, and monitor a personal continuing education strategy   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Demonstrate integrity, honesty, compassion, and respect for diversity  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Demonstrate good understanding of clinical knowledge relevant to effective patient care  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Delegate duties effectively  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Critically appraise sources of medical information   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Cost effective use of health care resources based on sound judgment  | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Contribute to development of new knowledge   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Contribute constructively with other interdisciplinary team activities   | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |
| • Utilize information technology to optimize patient care, life-long learning, and other activities, such as searching medical databases | ① ② ③ ④ ⑤ ⑥ ⑦                 | ① ② ③ ④ ⑤ ⑥ ⑦                  |

## Section B - Specific Anesthesiology Competencies

This section deals with the "Objectives of Training and Specialty Training Requirements in Anesthesia" as approved by RCPSC Anesthesia Education Committee, 2000. The following pages contain only specialty-specific objectives for Anesthesiology that reflect the new objectives for Training Programs across Canada.

In this part of the survey, each of the seven roles will be assessed on separate pages. All pages will have similar general structure, but the specific choices will be different for each role.

The list below contains brief descriptions of some of the terms and abbreviations that are used in the following pages. Please contact the investigator at any time if you have questions about any other terms that are used in the following pages and are not listed here.

---

**MCQs:** Multiple-choice questions.

**Other Written Exams:** Are short/long answer questions.

**Multiple Option Matching:** This method is similar to that of the MCQ. However, rather than five possible answers, there are a series of potential responses.

**PAC:** Pre-anesthesia clinic.

**Standardized Oral Examination:** This is an exam that is based on peer-reviewed clinical scenarios. Each question has pre-designed complexity and urgency as built-in features within the presented case scenarios, according to a specific knowledge area grid.

**OSCE (Objective Structured Clinical Examination):** Is a testing format that allows for multiple, short (5-30 minutes) observations of performance in clinical scenarios using real or standardized patients. Standardized checklists are utilized to document observed behaviours and may be utilized to assess many specific competencies.

**Simulated Chart Recall/Chart Review:** Involves review and subsequent discussion of a case using the patient chart as a focus for discussion.

**Self-Reflection:** Is an active process of turning thoughtful practice into a potential learning situation to ensure optimal integration of theory and previous experiences to yield improved performance outcomes.

**Collaborator Role**

- Demonstrate ability to function in the clinical environment (OR, ICU, Wards, and Clinics) using the full abilities of all team members.
- Consult effectively with other physicians and health care professionals.
- Contribute effectively to other interdisciplinary team activities.

In my practice, the Collaborator role is .....

①
②
③
④
⑤
⑥
⑦

Lowest Importance    Very Unimportant    Unimportant    Neutral    Important    Very Important    Extremely Important

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Collaborator role should have.....

①
②
③
④
⑤
⑥
⑦

Lowest Priority    Very Low Priority    Low Priority    Neutral    High Priority    Very High Priority    Highest Priority

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Collaborator role, I am.....

①
②
③
④
⑤
⑥
⑦

Not at all Prepared    Not Prepared    Somewhat Prepared    Prepared    Well Prepared    Very Well Prepared    Completely Prepared

In my opinion, the best approach/s to be well prepared to be a Collaborator is by .....

|  |                   |          |                   |         |                |       |                |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Interdisciplinary staffing ..... ①    ②    ③    ④    ⑤    ⑥    ⑦
- Individual mentorship ..... ①    ②    ③    ④    ⑤    ⑥    ⑦
- Team building exercises ..... ①    ②    ③    ④    ⑤    ⑥    ⑦
- Direct observation and feedback ..... ①    ②    ③    ④    ⑤    ⑥    ⑦
- Realistic simulation sessions ..... ①    ②    ③    ④    ⑤    ⑥    ⑦
- Other, please specify: \_\_\_\_\_

Regarding teaching the Collaborator role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role .....

|                                      | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--------------------------------------|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|                                      | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Video-tape scenarios .....         | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Role modeling .....                | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Case-based discussion .....        | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Realistic simulation sessions..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____       |                   |          |                   |         |                |       |                |

Regarding evaluating the Collaborator role, I find it.....to evaluate.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion the best way/s to evaluate this role is by using .....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Written examinations .....                             | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Objective Structured Clinical Examination (OSCE) ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Self-Reflection ... ..                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized oral examination .....                    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation by:                                 |                   |          |                   |         |                |       |                |
| * Peers (during seminars & rounds) .....                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Attending staff .....                                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Nurses.....  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Simulated patients .....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Program Director .....                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____                           |                   |          |                   |         |                |       |                |

**Communicator Role**

- Demonstrate consideration and compassion in communicating with patients and families.
- Provide accurate information appropriate to the clinical situation.
- Communicate effectively with medical colleagues, nurses, and paramedical personnel in inpatient, outpatient, and operating room environments.
- Demonstrate appropriate oral and written communication skills.
- Ensure adequate information has been provided to the patient prior to undertaking invasive procedures.

In my practice, the Communicator role is.....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Communicator role should have .....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Communicator role, I am .....

|                     |              |                   |          |                    |                    |                     |
|---------------------|--------------|-------------------|----------|--------------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤                  | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Very Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Communicator is by .....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Self-reflection (on how patient should be treated) ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Individual mentorship.....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Communications skills workshops.....                     | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation and feedback.....                     | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Rounds .....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____                             |                   |          |                   |         |                |       |                |

Regarding teaching the Communicator role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role .....

|                                | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--------------------------------|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|                                | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Video-tape scenarios .....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Role modeling .....          | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Case-based discussion .....  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized patients.....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____ |                   |          |                   |         |                |       |                |

Regarding evaluating the Communicators role, I find it.....to evaluate.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to evaluate this role is by using .....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Multiple choice exams (MCQ) .....                      | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Short answer questions .....                           | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Long answer questions .....                            | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Objective Structured Clinical Examination (OSCE) ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized patients .....                            | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Self-Reflection .....                                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized oral examination .....                    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation by:                                 |                   |          |                   |         |                |       |                |
| * Peers (during seminars & rounds) .....                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Attending staff .....                                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Nurses .....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Simulated patients .....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Program Director .....                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____                           |                   |          |                   |         |                |       |                |

**Health Advocate Role**

- Provide direction to hospital administrators regarding compliance with national practice guidelines and equipment standards for anesthesia.
- Recognize the opportunities for anesthesiologists to advocate for resources for chronic pain management, emerging medical technologies, and new health care practices, in general.

In my practice, the Health Advocate role is .....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Health Advocate role should have.....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Health Advocate role, I am .....

|                     |              |                   |          |               |                    |                     |
|---------------------|--------------|-------------------|----------|---------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤             | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Health Advocate is by .....

|   | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|---|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|   | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Self-directed learning .....          | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Individual mentorship .....           | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation and feedback ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Clinical Epidemiology Rounds .....    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____          |                   |          |                   |         |                |       |                |



Regarding teaching the Health Advocate role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role .....

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Learning from clinical problems .....① ② ③ ④ ⑤ ⑥ ⑦
- Role modeling .....① ② ③ ④ ⑤ ⑥ ⑦
- Case-based discussion .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

Regarding evaluating the Health Advocate role, I find it.....to evaluate.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to evaluate this role is by using .....

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Multiple choice exams (MCQ) .....① ② ③ ④ ⑤ ⑥ ⑦
- Clinical Epidemiology questions .....① ② ③ ④ ⑤ ⑥ ⑦
- Health & social policy questions .....① ② ③ ④ ⑤ ⑥ ⑦
- Objective Structured Clinical Examination (OSCE) .....① ② ③ ④ ⑤ ⑥ ⑦
- Self-Reflection ... .....① ② ③ ④ ⑤ ⑥ ⑦
- Standardized oral examination .....① ② ③ ④ ⑤ ⑥ ⑦
- Direct observation by:
  - \* Peers (during seminars & rounds) .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Attending staff .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Nurses .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Simulated patients .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Program Director .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

## Manager Role

- Demonstrate knowledge of the management of operating rooms.
- Demonstrate knowledge of the contributors to anesthetic expenditures.
- Demonstrate knowledge of the guidelines concerning anesthetic practice and equipment in Canada.
- Record appropriate information for anesthetics and consultations provided.
- Demonstrate principles of quality assurance, and be able to conduct morbidity and mortality reviews.

In my practice, the Manager role is .....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Manager role should have .....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Manager role, I am .....

|                     |              |                   |          |               |                    |                     |
|---------------------|--------------|-------------------|----------|---------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤             | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Manager is by .....

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Assign responsibility for OR floor ..... ① ② ③ ④ ⑤ ⑥ ⑦
- Assign responsibility in the PAC ..... ① ② ③ ④ ⑤ ⑥ ⑦
- Assign responsibility in the Labour Ward ..... ① ② ③ ④ ⑤ ⑥ ⑦
- Appoint as chief resident for 3 months ..... ① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

Regarding teaching the Manager role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role .....

|                                | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--------------------------------|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|                                | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Video-tape scenarios .....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Role modeling .....          | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Case-based discussion .....  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____ |                   |          |                   |         |                |       |                |

Regarding evaluating the Manager role, I find it.....to evaluate.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to evaluate this role is by using .....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Multiple choice exams (MCQ) .....                      | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Short/long answer questions .....                      | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Simulated chart recall .....                           | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Objective Structured Clinical Examination (OSCE) ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Self-Reflection ... ..                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized oral examination .....                    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation by:                                 |                   |          |                   |         |                |       |                |
| * Peers (during seminars & rounds) .....                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Attending staff .....                                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Nurses.....  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Simulated patients .....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Program Director .....                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____                           |                   |          |                   |         |                |       |                |

**Medical Expert Role**

- Demonstrate knowledge of the basic sciences as applicable to anesthesia, including anatomy, physiology, pharmacology, biochemistry, and physics.
- Demonstrate knowledge of the principles and practice of anesthesia as they apply to any specific patient's consideration during surgery or obstetrics.
- Demonstrate clinical skills necessary for basic resuscitation and life support as practiced in critical care facilities.
- Demonstrate knowledge of the principles of management of patients with acute and chronic pain.
- Demonstrate clinical skills necessary for the independent practice of anesthesia, including preoperative assessment, intraoperative support, and postoperative management of patients of any physical status, all ages and for all commonly performed surgical and obstetrical procedures.
- Demonstrate clinical skills necessary for general internal medicine and intensive care including the ability to investigate, diagnose, and manage appropriately factors that influence a patient's medical and surgical care.
- Demonstrate competence in all technical procedures commonly employed in anesthetic practice.
- Demonstrate knowledge of basic legal and bioethical issues encountered in anesthetic practice including informed consent.

In my practice, the Medical Expert role is .....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Medical Expert role should have .....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Medical Expert role, I am .....

|                     |              |                   |          |               |                    |                     |
|---------------------|--------------|-------------------|----------|---------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤             | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Medical Expert is by .....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Self-directed learning .....               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Individual mentorship/Apprenticeship ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation and feedback .....      | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Rounds .....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____               |                   |          |                   |         |                |       |                |

Regarding teaching the Medical Expert role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role .....

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Probably Disagree | Neutral | Probably Agree | Agree | Strongly Agree |

- Learning from clinical problems .....① ② ③ ④ ⑤ ⑥ ⑦
- Role modeling .....① ② ③ ④ ⑤ ⑥ ⑦
- Case-based discussion .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

Regarding evaluating the Medical Expert role, I find it.....to evaluate.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to evaluate this role is by using .....

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Multiple choice exams (MCQ) .....① ② ③ ④ ⑤ ⑥ ⑦
- Other written exam questions .....① ② ③ ④ ⑤ ⑥ ⑦
- Mannequin simulation environment .....① ② ③ ④ ⑤ ⑥ ⑦
- Objective Structured Clinical Examination (OSCE) .....① ② ③ ④ ⑤ ⑥ ⑦
- Self-Reflection ... .....① ② ③ ④ ⑤ ⑥ ⑦
- Standardized oral examination .....① ② ③ ④ ⑤ ⑥ ⑦
- Direct observation by:
  - \* Peers (during seminars & rounds) .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Attending staff .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Nurses .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Simulated patients .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Program Director .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

**Professional Role**

- Periodically review his/her own personal and professional performance against national standards.
- Include the patient in discussions concerning appropriate diagnostic and management procedures.
- Respect the opinions of fellow consultants and referring physicians in the management of patient problems and be willing to provide means whereby differences of opinion can be discussed and resolved.
- Show recognition of limits of personal skill and knowledge by appropriately consulting other physicians and paramedical personnel when caring for the patient.
- Establish a pattern of continuing development of personal clinical skills and knowledge through medical education.

In my practice, the Professional role is .....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Professional role should have.....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Professional role, I am.....

|                     |              |                   |          |               |                    |                     |
|---------------------|--------------|-------------------|----------|---------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤             | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Professional is by .....

|   | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|---|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|   | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Self-directed learning .....          | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Medico-legal rounds .....             | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Medical ethics rounds .....           | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Practice-reflection .....             | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation and feedback ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Rounds .....                          | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |

• Other, please specify: \_\_\_\_\_

**Regarding teaching the Professional role, I find it.....to teach.**

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

**In my opinion, the best way/s to teach this role .....**

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Learning from clinical problems .....① ② ③ ④ ⑤ ⑥ ⑦
- Role modeling .....① ② ③ ④ ⑤ ⑥ ⑦
- Case-based discussion on professionalism .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

**Regarding evaluating the Professional role, I find it.....to evaluate.**

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

**In my opinion, the best way/s to evaluate this role is by using.....**

|                   |          |                   |         |                |       |                |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |

- Multiple choice exams (MCQ) .....① ② ③ ④ ⑤ ⑥ ⑦
- Short/long essay questions .....① ② ③ ④ ⑤ ⑥ ⑦
- Simulated chart recall.....① ② ③ ④ ⑤ ⑥ ⑦
- Objective Structured Clinical Examination (OSCE) .....① ② ③ ④ ⑤ ⑥ ⑦
- Self-Reflection ... .....① ② ③ ④ ⑤ ⑥ ⑦
- Standardized oral examination .....① ② ③ ④ ⑤ ⑥ ⑦
- Direct observation by:
  - \* Peers (during seminars & rounds) .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Attending staff .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Nurses.....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Simulated patients .....① ② ③ ④ ⑤ ⑥ ⑦
  - \* Program Director .....① ② ③ ④ ⑤ ⑥ ⑦
- Other, please specify: \_\_\_\_\_

**Scholar Role**

- Develop criteria for evaluating the anesthetic literature and critically assess the literature using these criteria.
- Describe the principles of good research.
- Using these principles, judge whether a research project is properly designed.

In my practice, the Scholar role is .....

|                   |                  |             |         |           |                |                     |
|-------------------|------------------|-------------|---------|-----------|----------------|---------------------|
| ①                 | ②                | ③           | ④       | ⑤         | ⑥              | ⑦                   |
| Lowest Importance | Very Unimportant | Unimportant | Neutral | Important | Very Important | Extremely Important |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding anesthesia teaching, the Scholar role should have .....

|                 |                   |              |         |               |                    |                  |
|-----------------|-------------------|--------------|---------|---------------|--------------------|------------------|
| ①               | ②                 | ③            | ④       | ⑤             | ⑥                  | ⑦                |
| Lowest Priority | Very Low Priority | Low Priority | Neutral | High Priority | Very High Priority | Highest Priority |

For responses less than 4, please explain why: \_\_\_\_\_

Regarding my personal preparedness to assume the Scholar role, I am.....

|                     |              |                   |          |               |                    |                     |
|---------------------|--------------|-------------------|----------|---------------|--------------------|---------------------|
| ①                   | ②            | ③                 | ④        | ⑤             | ⑥                  | ⑦                   |
| Not at all Prepared | Not Prepared | Somewhat Prepared | Prepared | Well Prepared | Very Well Prepared | Completely Prepared |

In my opinion, the best approach/s to be well prepared to be a Scholar is by.....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Self-directed learning .....         | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Evidence-based practice .....        | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Practice-reflection .....            | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation and feedback..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Rounds .....                         | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____         |                   |          |                   |         |                |       |                |



Regarding teaching the Scholar role, I find it.....to teach.

|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to teach this role.....

|   | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|---|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|   | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Learning from clinical problems ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Role modeling .....                   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Conducting a research project.....    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Journals-based discussion.....        | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____          |                   |          |                   |         |                |       |                |

Regarding evaluating the Scholar role, I find it.....to evaluate.

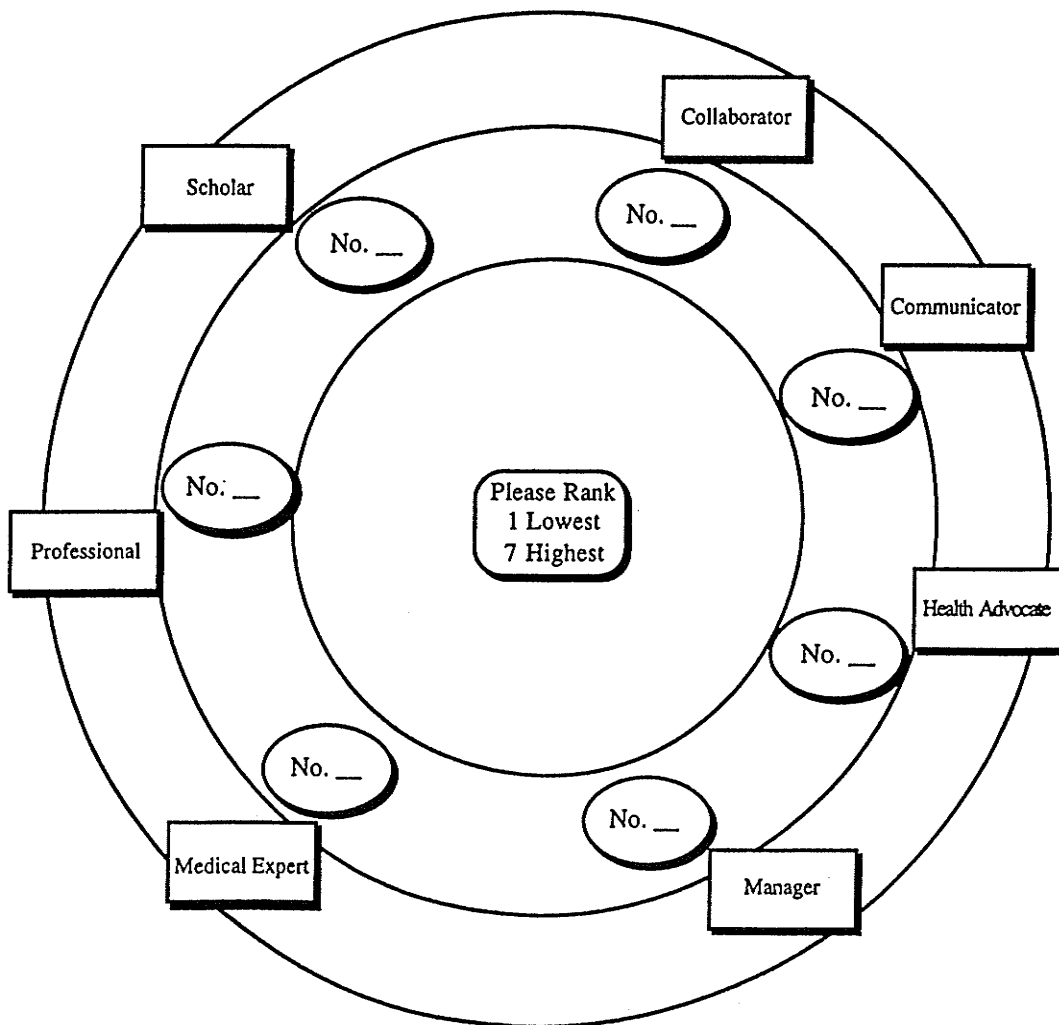
|                |           |      |         |           |                |                     |
|----------------|-----------|------|---------|-----------|----------------|---------------------|
| ①              | ②         | ③    | ④       | ⑤         | ⑥              | ⑦                   |
| Extremely Easy | Very Easy | Easy | Neutral | Difficult | Very Difficult | Extremely Difficult |

In my opinion, the best way/s to evaluate this role is by using.....

|  | 1                 | 2        | 3                 | 4       | 5              | 6     | 7              |
|--|-------------------|----------|-------------------|---------|----------------|-------|----------------|
|  | Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| • Multiple choice exams (MCQ) .....                      | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Clinical Epidemiology questions .....                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Health & social policy questions .....                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Objective Structured Clinical Examination (OSCE) ..... | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Standardized oral examination .....                    | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Direct observation by:                                 |                   |          |                   |         |                |       |                |
| * Peers (during seminars & rounds) .....                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Attending staff .....                                  | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Nurses .....   | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Simulated patients .....                               | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| * Program Director .....                                 | ①                 | ②        | ③                 | ④       | ⑤              | ⑥     | ⑦              |
| • Other, please specify: _____                           |                   |          |                   |         |                |       |                |

### Section C - Overall Roles Ranking

Please rank (1 lowest to 7 highest) the following seven roles of CanMEDS 2000 project according to their importance from your own day-to-day practice of anesthesia. Use each rank only once.



## Section D - General Information

Please provide the following general information to help us correlate data.

1. Have you had a chance to review CanMEDS 2000 project roles previously?  
 Yes       No
  
2. Have you been involved in drafting new training objectives to meet the CanMEDS 2000 goals?  
 Yes       No
  
3. Are there any other questions that you might consider adding to this Survey?
  
  
  
  
  
  
  
  
  
  
4. Do you have any other issues that you would like to add?

The space below is provided for you to write any additional thoughts or ideas that you may have.





**Residents:**

Gender:     F    M

Age:        \_\_\_\_\_ Years

Medical School:  Canada  
                   USA  
                   Europe  
                   Other (please specify \_\_\_\_\_)

Year of MD: \_\_\_\_\_

Other Degree(s) and work experiences (medical and other):  
                   Please specify \_\_\_\_\_

PGY:         1        2        3        4        5

Subspecialty interest:  Yes   (Please specify area \_\_\_\_\_)  
                               No

Future career practice plan, in addition to clinical anesthesia (check all applicable)

I have a special interest in:

*Teaching*

- Under-graduate medical education
- Post-graduate medical education
- Both

*Research*

- Basic sciences
- Clinical Research
- Both

*Administration/practice management*

- Yes
- No

*Other professional interests*

- Please specify \_\_\_\_\_

Thank you very much for sharing your thoughts and ideas in contribution to this project.  
Again, your participation is greatly appreciated.

Appendix  
Copy of the pre-notice letter.

Dear Anesthesia Department Member,

A few days from now you will receive in your hospital mailbox a request to fill out a questionnaire for an important project being conducted by the University of Manitoba Department of Anesthesia Residency Training Program. The survey represents an essential part of my Master of Education degree, from this University.

The project is concerned with the newly introduced CanMEDS 2000 project's objectives, which are being applied to all of the Royal College Specialists Training Programs across Canada. Our project is entitled the "*CanMEDS 2000 PROJECT OBJECTIVES IN ANESTHESIOLOGY: STAFF & RESIDENTS PERSPECTIVES.*" I am writing to you in advance to introduce the project to you and also because previous research has shown that many people prefer to know ahead of time that they will be contacted.

The CanMEDS 2000 project, itself, was initiated by the RCPSC in the early 1990s in response to increasing and changing societal expectations from the medical profession. The project's initial step was to formulate a list of roles that all future specialists certified by the College would be expected to fulfill upon certification and to maintain throughout their professional careers. These roles are [for the specialist to have the minimum competence in each of these seven areas] a collaborator, a communicator, a health advocate, a manager, a medical expert, a professional, and a scholar. After February 2002, the on-site accreditation surveys of all RCPSC Training Programs will be assessed according to the new CanMEDS 2000 project's objectives.

In 1996, the College General Council approved the general objectives for all of the training programs, and in September 2000, the Specialty Committee on Anesthesia of the Royal College approved the specialty-specific objectives, which are currently used by our program. By 2003, these objectives will represent the basis for the Final in Training Evaluating Reports (FITER) for the college exam candidates.

It is not yet known how best to integrate these new competencies into the actual practice, training, and evaluation within the context of anesthesiology. Thus, it is an aim of this study to survey all of the Anesthesia Department members (residents and staff) regarding the relative importance of each of these roles, both from the practice of anesthesia, in general, and from each individual's practice profile point-of-view. Also, this project proposes to elicit the Department Members' opinions on what are the best approaches to be prepared to assume these roles, the best ways to teach these roles to others and, subsequently, the most suitable means of evaluating the attainment of each of these competencies.

Thank you for your time and consideration. It is only with your help and cooperation in taking part in this study that this research project can be successful.

Sincerely,

Abdulaziz Boker,  
Anesthesia Fellow



UNIVERSITY  
OF MANITOBA

**Principal Investigator contact information:**

Abdulaziz Boker, MBBS, FRCPC  
Research Fellow, Anesthesia Department  
& Graduate (Master of Education) Student, The University of Manitoba  
Pager (204) 955- 4904

*Or*

E-mail: \_\_\_\_\_

Please return the completed questionnaire to the UTS office in the self-addressed, stamped envelope provided, or alternatively, through the inter-departmental mailing system.

---

This portion will be removed by University Teaching Services' Office, before returning the completed questionnaire to the principal investigator. As outlined in the cover letter, this step will help best direct the follow-up mailing for replacement questionnaires, as well as for managing the draw for the gift certificates independent from the surveyor.

Please return completed surveys to:

Linda Rzeszutek  
University Teaching Services  
The University of Manitoba  
220 Sinnott Bldg., 70 Dysart Road  
Winnipeg, MB R3T 2N2



**APPENDIX L**

**Follow up Letter with the Second Mailing**



UNIVERSITY  
OF MANITOBA

University Teaching Services

Centre for Higher Education  
Research and Development  
220 Sinnott Building  
70 Dysart Road  
Winnipeg, Manitoba  
Canada R3T 2N2  
Telephone (204) 474-7025  
Fax (204) 474-7607  
uts@umanitoba.ca

December 10, 2001

**Participant Name**

Department of Anesthesia

Participant Address

Winnipeg, MB Postal Code

Dear Participant Name,

I am assisting Dr. Abdulaziz Boker, Anesthesia Fellow, in a study regarding the application of the CanMEDS 2000 project's objectives to the Royal College Anesthesiology Residency Training Program, University of Manitoba. Although we have had a very good return rate, we would like to include your responses. As of Friday's mail, I have not received your survey package. We ask you to take 20-30 minutes to share your experiences and opinions regarding the CanMEDS 2000 project competencies.

I have enclosed a replacement copy and ask that you do one of the following:

- 1) Continue to *fill out the original copy of the survey*, if you have not had a chance to complete it, and mail the completed survey in the enclosed stamped self-addressed envelope; *or*
- 2) *Fill in this replacement copy of the survey*, if the original is not available, and mail it in the enclosed stamped self-addressed envelope. (Mail only one survey, otherwise there will not be enough postage); *or*
- 3) *Send back an unanswered survey* in the enclosed stamped self-addressed envelope, if you do not wish to be involved in the study. (Again, only one survey please).

The survey form is coded for two reasons: first, to facilitate the process of handing out a replacement package and second, as a token of appreciation for respondents, the codes will be used in a draw for three \$100 gift certificates from the University of Manitoba Book Store. After mail collection on Friday, January 04, 2002, I will draw three names for the gift certificates and data analysis will begin. No surveys will be accepted after this date. Thank you for your participation and good luck in the draw!

Sincerely yours,

Linda Rzeszutek  
Program Administrator, UTS

**APPENDIX M****Study Participants' Other degrees**

| Degrees                                 | Attending Staff |              |             |
|---|-----------------|--------------|-------------|
|   | Tertiary        | Non-Tertiary | Residents   |
| No response                             | 23              | 15           | 8           |
| <i>Science Degree (BSc)</i>             | 10              | 2            | 10          |
| <i>BSc (Med)</i>                        | 3               | 3            | 4           |
| <i>Fellowship Training</i>              | 8               |              |             |
| <i>Family Medicine</i>                  | 4               | 2            | 1           |
| <i>Emergency Medicine</i>               | 4               |              |             |
| <i>Nursing Degree</i>                   | 3               |              |             |
| <i>BA</i>                               | 2               | 2            |             |
| <i>Degree In Pharmacy</i>               | 2               |              |             |
| <i>Other Anesthesia Degrees</i>         | 1               | 2            | 1           |
| <i>PhD</i>                              | 1               | 1            |             |
| <i>DMD</i>                              | 1               |              |             |
| <i>DAB</i>                              | 1               |              |             |
| <i>ACBOM</i>                            | 1               |              |             |
| <i>Certification in Adult Education</i> | 1               |              |             |
| <i>B.E.S</i>                            | 1               |              |             |
| <i>Hospital Administration</i>          |                 | 1            |             |
| <i>DRCOG</i>                            |                 | 1            |             |
| <i>General Surgery</i>                  |                 | 1            |             |
| <i>LLB</i>                              |                 | 1            |             |
| <i>DCH</i>                              |                 | 1            |             |
| <i>MB Bch</i>                           |                 | 1            |             |
| <i>B.A.O.</i>                           |                 | 1            |             |
|   | <b>Total</b>    | <b>64*</b>   | <b>30**</b> |
|   |                 |              | <b>24</b>   |

\* 12 participants listed 2 degrees, and two listed 3 degrees

\*\* Six participants listed 2 degrees, and one participant list 4 degrees

Four participants listed 2 degrees