

**MEDICAL EDUCATION**

## Evaluating Resident and Program Goals for Meeting CanMEDS Manager Competencies

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### ABSTRACT

A surgical residency position typically begins with the necessity of learning how to manage new medical documentation, computer networks and information systems, and to navigate a new hospital and operating room environment. These skills fall under the CanMeds competency of "manager". A survey was constructed to understand the goals and the perceived competencies of first-year surgical residents in these basic manager tasks and to self-evaluate how these competencies changed over time. A second survey was administered to program directors and clinical teaching unit directors of the same surgical programs to compare goals, priorities and time allotment to these basic manager tasks. The surveys demonstrate that residents begin with varied amounts of prior experience; however, most report a significant reduction in difficulty of many managerial tasks by three months of residency training. The tasks that continue to cause the most difficulty for residents after this time period include participating in lifesaving protocols and computer/information systems operation. Residents also report a higher degree of difficulty with some tasks than their evaluators recognize. Both groups, however, recognize similar improvements in competency over time. Educational interventions may best be focused on tasks such as lifesaving protocols and the utilization of information systems to demonstrate the most benefit.

### INTRODUCTION

In 2000, the Royal College of Physicians and Surgeons (RCPS) implemented a set of seven competencies that has formed the current standard for graduate medical education in Canada.<sup>1</sup> These fundamental competencies, which were reinforced in the CanMeds 2005 revision, include professional, communicator, scholar, medical expert, manager, collaborator and advocate.<sup>2</sup> The objectives set out in these categories act as a guide for residency programs across the country to form educational curricula and assessment criteria for postgraduate residents. The CanMeds competencies reflect a paradigm shift in postgraduate education, focusing on a holistic approach to training rather than on specific technical and medical knowledge requirements.<sup>3</sup>

The CanMeds objectives have largely been adopted at the highest levels of postgraduate education, but few studies exist regarding the educational benefit or resident acceptance of the value of these objectives. Furthermore, while there is

ongoing development of an array of workshops and assessment strategies, there is little published research on how the implementation of these objectives has affected postgraduate medical programs.<sup>4</sup> Indeed, there currently exists a paucity of research on the implementation, acceptance, utilization and evaluation of the CanMeds competencies in Canada.<sup>6-8</sup>

The criteria of the CanMeds competency of manager is well suited for study. The objectives outline necessary skills for a physician to function within the hospital system, to use hospital resources and to utilize information technologies (Table 1). These objectives parallel resident responsibilities within the academic hospital system and outline a set of criteria by which to evaluate abilities and training.

The goals of this study are to: 1) compare residents' educational goals with respect to the CanMeds manager objectives to those of program directors and clinical teaching unit (CTU) directors, and 2) to evaluate residents' perceived difficulty in performing these tasks over the course of the first year of residency. Ultimately, identifying areas of perceived difficulty

would contribute to an improved curriculum that would help to establish these skills at the beginning of residency. In addition, understanding how the priorities of incoming residents differ from those of program directors and administrators may direct a program's learning activities. The hypotheses of this study are: 1) programs and CTU directors and residents will differ in goals related to the CanMeds manager competencies, and 2) residents' rating of difficulty will improve with experience. An understanding of deficiencies in surgical residency program curricula will allow programs to develop orientation tools that best enable residents to meet the objectives of the CanMeds manager competency.

**Table 1.** Elements of the CanMeds manager competency relevant to surgical residency orientation

- Work collaboratively with others in their organizations
- Set priorities and manage time to balance patient care, practice requirements, outside activities and personal life
- Manage a practice including finances and human resources
- Employ information technology appropriately for patient care
- Recognize the importance of just allocation of healthcare resources, balancing effectiveness, efficiency and access with optimal patient care
- Apply evidence and management processes for cost-appropriate care
- Plan relevant elements of health care delivery

Source: Frank JR, Jabbour M, Tugwell P et al. Skills for the New Millennium: Report of the Societal Needs Working Group, CanMeds Project. *Ann R Coll Physicians Surg Can* 1996; 29:206-16.

## METHODS

This study used a retrospective seven-point rating scale survey to quantify residents' learning priorities and to quantify their perceived level of difficulty with specific hospital tasks. Surgical residents from multiple surgical specialties in an academic tertiary centre in Canada as well as program administrators (program directors and CTU directors) from the same centre participated in this survey. Ethics approval was obtained for this study from the University's Research Ethics Board.

### Resident Survey

Residents in their first year from the disciplines of general surgery, orthopedics, urology, plastic surgery, cardiac surgery and otolaryngology were included. Participants were contacted by personal communication, and 18 out of 24 residents (75%) participated. The participants submitted information on undergraduate university experience, post graduate year of training and subspecialty. Residents were asked to rate the manager tasks extrapolated from the CanMeds 2005 RCPSC guidelines based on the level of difficulty. The rating scale included seven items ranging from least important to most important. The objectives included common tasks and responsibilities of residents such as the utilization of computer systems, hospital navigation, operating room (OR) procedures,

referral practices, hospital protocols, hospital forms, hospital emergency procedures, and the performance of Advanced Cardiac Life Support (ACLS) and Advanced Trauma Life Support (ATLS) protocols. Specific questions quantified the amount of teaching time devoted to each objective and asked residents to rate their proficiency in these areas. Residents were also asked to rate the level of difficulty with these tasks at one-, two-, and three-month intervals.

### Program and CTU Director Survey

A second survey was developed that paralleled the resident survey in content. These surveys assessed the program administrators' priorities in teaching the CanMeds manager objectives, quantified the amount of teaching time devoted to these objectives, and quantified the amount of difficulty they perceived that the residents had in acquiring these skills. They were also asked to rate the level of competence of the residents in performing these tasks over a six-month interval. Program and CTU directors from each of the surgical resident disciplines were contacted by email, and six of 15 participants (40%) responded.

### Analysis

Data were collected from the surveys and entered into an Excel spreadsheet. Categorical variables were reported as proportions and responses regarding the rating of resident and director priorities were reported as means and standard deviation (SD). The changes over time in reported level of difficulty were compared using Mann-Whitney U test. All tests were two-sided and an alpha of <0.05 was considered for type I error. The p-value was adjusted for multiple comparison and a p-value of <0.025 was considered significant. Statistical Package for the Social Sciences PC Version 15.0 (SPSS Inc, Illinois) was used for data analysis.

## RESULTS

### Demographics and Experience

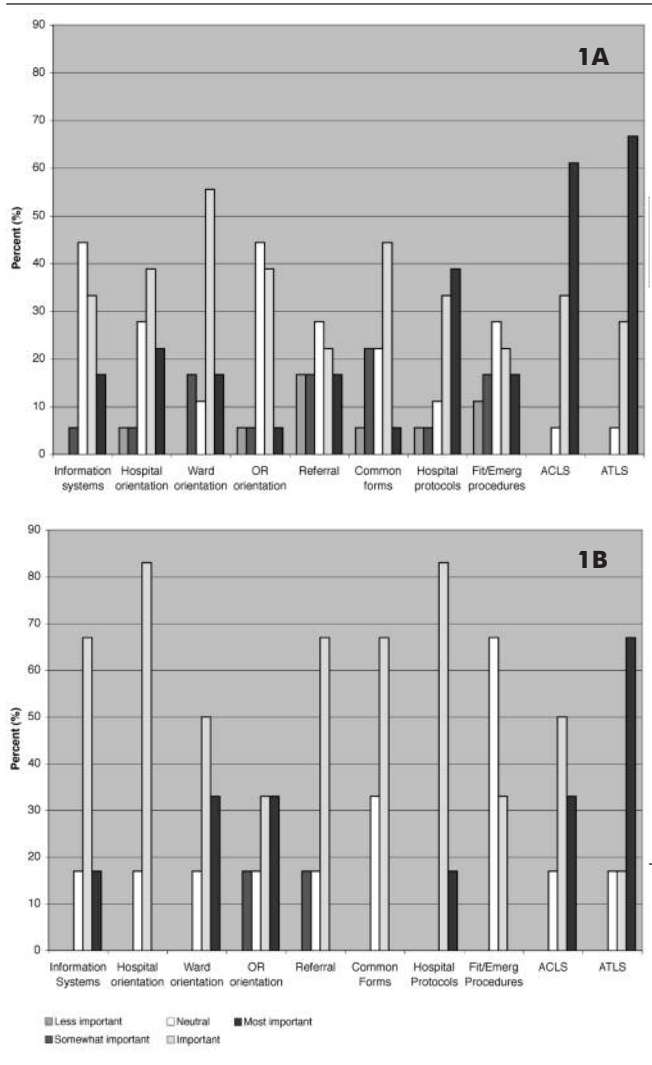
The resident survey was completed by 18 first-year residents in multiple surgical specialties. Of these 15 residents, 15 (83%) were males and three (17%) were females. The average age was 28.3 years (SD = 3.7). Many of the residents had previous experience at the current centre with 6/18 residents (33%) having completed medical school at the centre and 14/18 (78%) having previously completed an elective at the centre. Almost all residents (15/18, 83%) had rotated through a surgical rotation by six months. The program director survey was completed by six program and CTU directors covering the programs included in the resident survey.

### Learning Priorities

Residents were asked to rank several managerial tasks using a seven-point rating scale ranging from least important to most important. Residents consistently rated learning life-saving protocols such as ACLS and ATLS as the highest pri-

orities (Figure 1, Panel A). Orientation to the ward and learning hospital protocols were next highest in priority. Residents rated knowledge of referral practices and hospital forms as least important.

The program and CTU directors surveyed consistently rated all manager tasks as important or most important, with only few programs directors selecting referral practices and operating room orientation as neutral or somewhat important (Figure 1, Panel B).



**Figure 1.** Ranking of manager activity priorities by residents (A, n=18) and program and CTU directors (B, n=6). Responses are percentages of respondents per manager task, ranked from least important to most important.

**Resident Participation**

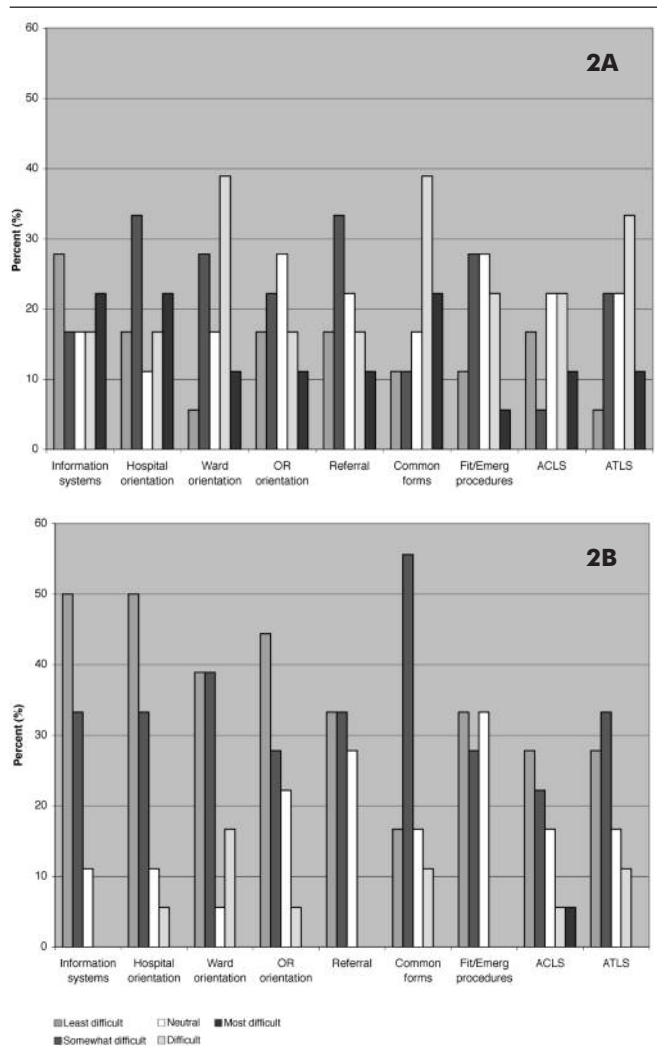
Large variations were reported between residents and administrators when respondents were asked to record the length of time spent in orientation activities directed toward manager tasks. There were no statistical differences between educational activities lasting between 30 minutes and two hours between respondents in any of the surveyed manager

tasks, with the exception of the ATLS course. Residents also reported a trend that less than 30 minutes were spent learning each of referral practices, utilization of hospital forms or hospital protocols, and in orientation to the operating room. Over 50% of residents had no instruction in ACLS.

Program and CTU directors were variable in their perception of the amount of time that is spent in ATLS and ACLS courses. Only two respondents underestimated the amount of time for these activities. The majority of program and CTU directors reported that residents spend less than 30 minutes in most educational activities related to learning manager skills.

**Perceived Difficulty**

The difficulty that residents experienced with managerial tasks changed over the course of the first three months of their training (Figure 2). Residents reported having the greatest difficulty initially with hospital forms, computer systems and navigating the hospital.



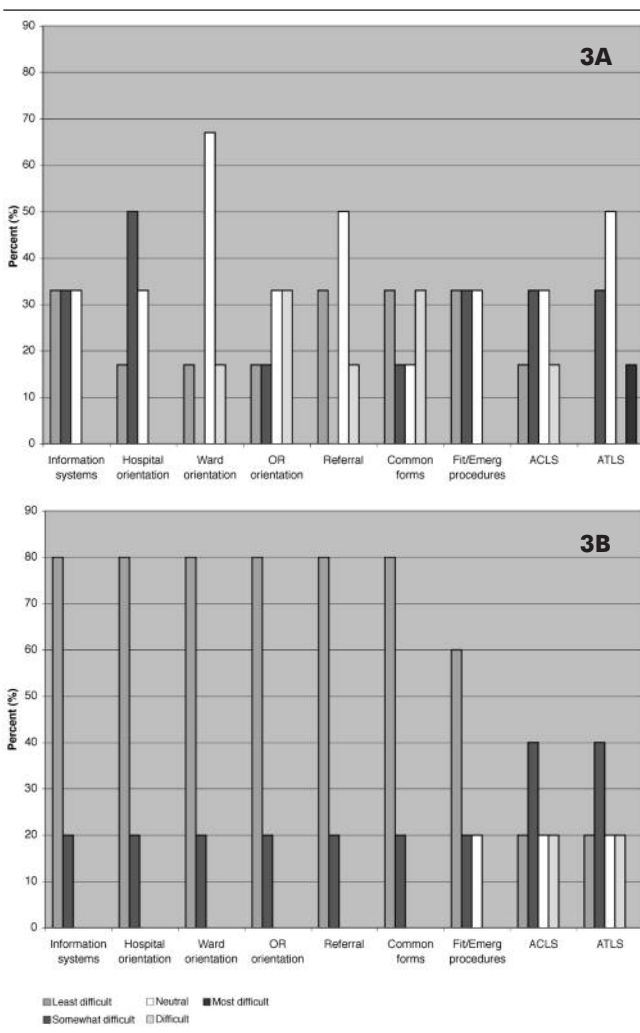
**Figure 2.** Resident perceptions of difficulty with specific tasks at one month (A) and at three months (B) of residency (n=18). Responses are percentages of respondents per manager task, ranked from least difficult to most difficult.

By three months, only lifesaving protocols and completing hospital forms were reported as persistently difficult for residents.

Statistical differences were reported in the decreases in difficulty in computer utilization occurred between one, two and three months, although the trend appeared to be of retained difficulty at three months. Decreases in difficulty in the OR and the ATLS protocols occurred later and were only between the second and third months with a trend toward persisting difficulty. No statistical differences were found between the changes in difficulty in the other tasks over time.

### Observed Difficulty

When program directors were asked to rate the difficulty that they observe first-year residents experiencing as they complete managerial tasks, they also demonstrate change over time (Figure 3).



**Figure 3.** Program and CTU directors ( $n=6$ ) observations of resident difficulty with manager tasks at one month (A) and at three months (B) of residency. Responses are percentages of respondents per manager task, ranked from least difficult to most difficult.

The program directors and CTU directors reported lower difficulty ratings than that of residents for the first three months of the residency program. They also report the same decline in difficulty observed over the two- and three-month time periods. Program directors felt that residents have the greatest difficulty with common hospital forms, ward orientation and lifesaving protocols. They also reported that at the end of three months, residents experienced little difficulty in most manager tasks with the exception of lifesaving protocols.

The majority of program directors were satisfied with the residents' performance of managerial tasks, while 83% of residents reported willingness to participate in additional training activities in managerial tasks.

### DISCUSSION

The CanMeds competency of manager encompasses the functioning of the physician within the hospital system. It includes such broad tasks as information systems management and proficiency with hospital protocols and procedures.<sup>1</sup> Becoming competent in these basic tasks are integral to the functioning of the resident in the hospital setting, and present particular challenges to the resident beginning residency in a new hospital environment or on a new clinical rotation. Finding ways to improve residency education programs to reduce these challenges is an important aspect of a successful residency program.

Residents are eager to learn and they begin their residency with variable levels of competence. Residents consistently rated the lifesaving protocols of ACLS and ATLS as highest in their priorities for learning, and these protocols had the highest proportion of ratings as "most difficult" at three months. Comparatively, the utilization of hospital forms and protocols were rated as lowest priority, but also continued to be rated as difficult over time. In this study, many residents had previously spent at least a brief period of time in the hospital environment where residency is being completed. However, this time did not appear to reduce the perceived difficulty of some tasks, especially using hospital forms and utilizing hospital specific protocols. Likely, this results from the significant changes in responsibility from clinical clerk to resident in involvement in patient care education.

Time spent in training for managerial tasks is variable. This survey demonstrated that residents and program directors differ in their perception of how much content and exposure residents receive with respect to the CanMeds manager objectives. Both program and CTU directors and residents acknowledge that there is little time allotted to training in these important skills. Regardless of how much time is spent on specific teaching towards these ends, both residents and program directors rate the manager competencies as high priorities in resident education. Reasons for this discrepancy are likely multifactorial, and may include teaching time allo-

cation and service requirements in busy surgical services conflicting with dedicated time to learn these tasks.

The plateau at three months in the difficulty of these tasks, as reported by program and CTU directors and by residents, demonstrate that an orientation activity may not necessarily contribute towards achieving these goals, and that the goals may simply be achieved through experience. Orientation activities may, however, help to reduce the difficulty that residents experience in the initial months in a new environment. They may also aid in areas of persistent difficulty through specific dedicated activities in these areas. The skills most suited for emphasis in orientation activities include hospital procedures and hospital forms, as well as information technology and, most importantly, lifesaving protocols.

A structured orientation focused on specific tasks may benefit residents in the beginning of their residency. The residency training program should develop training activities that ensure that these important managerial skills are well-learned and transferable to future practice. Lifesaving protocols were rated especially high in learning priorities in this survey. Lifesaving protocols such as ACLS and ATLS were high priorities for both residents and program directors, but were also associated with the greatest amount of difficulty over time. This reinforces that training in these protocols should be components of resident training and orientation. Recent reported surveys of other Canadian medicine residents reported similar findings with ACLS training being rated as important among medicine residents.<sup>9</sup> These surveys also reported a perceived deficiency in training in these lifesaving protocols among medicine residents, suggesting a need for a greater emphasis on these activities in their post-graduate curriculum.<sup>7</sup>

This survey suffers from certain limitations. It is a retrospective design and subject to self-reporting and recall biases. Residents may rate themselves as improving over time

due to self-report bias and a reluctance to acknowledge persistent deficits in their skills. Retrospective reporting may also lead to underreporting of difficulty after improvement has occurred. This is similarly reported by program and CTU directors as a more objective measure; however, a reluctance to report a failure to improve may also bias these results. This method does allow for the best measure of residents' perceptions over this time in a several aspects of their education, although it is underpowered and might fail to detect small differences between respondents if such differences exist. A well-powered prospective study will be beneficial to assess the changes in residents' acquisition of skills over time.

Surgical programs are shifting the emphasis of surgical education to focus on competency-based education. With limited teaching time it is important that residents and programs collaborate on establishing the priorities of their curriculum and address deficiencies as they arise. †

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