Editor’s Corner

This fall issue of the CAME Newsletter reflects the diversity of the medical education community in Canada and covers a vast spectrum of topics. This issue presents articles based on award-winning posters at 2011 CCME in Toronto, their appearance in the CAME Newsletter may prompt you to take a second, longer look at them. They are worthwhile reads and sure to stimulate some fresh thinking!

If you have a short conference presentation or Graduate student paper in medical education, please consider submitting it to the CAME Newsletter!

Muhammad Iqbal
Associate Editor CAME Newsletter

Learning pediatrics in a community vs tertiary hospital: Does it make a difference to academic outcomes

by Mumtaz Virji, Joan Fraser, George Pachev, University of British Columbia

With expansion of the medical school at University of British Columbia, the Department of Pediatrics expanded its core clerkship program across 5 local community-based hospitals. The objectives, the academic requirement and the assessment methods were kept the same at all sites. It was expected that the experience of the clerkship in community sites would be different from the tertiary site.

We set to explore whether these different experiences would affect the attainment of the desired learning outcomes. All end of rotations assessments from 2006 to 2010 were reviewed. These included clinical evaluations, objective structured clinical exam (OSCE) and national board specialty exams for Pediatrics (NBME).

We compared the students trained in tertiary centre to students trained in a community hospital on their clinical marks, NBME and OSCE results.

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**RESULTS:** Comparisons on the outcome measures of students educated at the tertiary hospital (N = 381) vs. students trained in community-based hospital settings (N = 482) during the last five years by means of t-test for independent means, revealed no statistically significant differences (see Figure 1, error bars describe 95% CI based on the standard error of the mean). The same comparison by year-cohort detected significant differences in the OSCE measure (2006-07 academic year) and Clinical Evaluation measure (2008-09 academic year). Both differences resulted in students trained into the tertiary centre having statistically higher overall average. All values, however, were in the range of acceptable performance level.

One-way analysis of variance (ANOVA) with the overall mark as dependent variable compared the aggregated throughout the five years results of students trained at each of the seven sites. The overall ANOVA was significant, \( F(6,856) = 2.42, p < 0.05 \), but follow-up multiple comparisons (Scheffe procedure) failed to detect significant differences between any pair of means. The same pattern of analyses was applied to the other three measures. Differences were detected for the Clinical Evaluation measure for which BCCH and LGH students outperformed students NMP students. Effect-size analyses indicated that these differences were negligible. No differences were found in performance on the OSCE and written-examination measures.

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**What to Do About OSCE Examiners Who Score Too Leniently or Too Harshly?**

_by Ilona Bartman, Marguerite Roy, Sydney Smee, Timothy Wood, The Medical Council of Canada_

Performance assessments such as the OSCE are powerful methods for assessing clinical skills and the underlying medical knowledge; however, these methods rely on human judgment and as such are vulnerable to rater effects (e.g., halo, leniency/harshness, etc.). Making valid inferences from clinical performance ratings, especially for high-stakes purposes, requires monitoring and control of rater effects. A simple method for detecting extreme raters in high-stakes OSCE has been developed by the Medical Council of Canada (MCC) as part of its quality assurance checks for the Qualifying Examination Part II (QE II). This method was presented at the CCME meeting in Toronto, May 2011 as an approach to quality assurance that does not require sophisticated statistical knowledge or software and that can be used in any context involving raters. We believe it could be easily employed by any faculty running examinations that rely on human raters.

The method has three steps. In the first step extreme raters are identified by comparing individual rater means to the mean of all raters. The MCC considered a rater to be extreme if their mean was three standard deviations below (hawks) or above (doves) the overall mean. This criterion is adjustable. The MCC chose three standard deviations as the focus was on identifying only extreme raters. In the second step, the distribution of the scores awarded by a dove or a hawk was compared to the overall distribution for all raters for the same station. This step has a dual purpose. First, to eliminate the possibility that an examiner is labeled a dove or hawk due to the station they were rating. Some stations have a limited range of scores and can easily result in extreme scoring. Second, to evaluate the extent to which extreme examiners demonstrate variance in their scoring; that is, can they differentiate between candidates with different abilities? For the third step, we examine the cohort of candidates that were rated by a dove or a hawk. If a
dove happens to rate a cohort of outstanding candidates (based on scores from other stations) then perhaps he/she is not a dove. Vice versa logic is applied to the hawks. If a hawk examiner happens to rate a group of very weak candidates, then perhaps he/she is not a hawk.

The MCC monitors the performance of raters on regular basis and the impact of these raters on candidate results is considered before results are finalized. Raters who are identified as extreme are contacted by the MCC to review their rating style. If this intervention does not lead to improved discrimination and fairness by a dove or hawk, that rater is no longer invited to examine for the QE II.

This procedure has been used only for the past 2 years. Of over three thousands of examiners, fewer than 0.3% have been identified as extreme. As more data on the examiners is collected the MCC will study it and develop more approaches to improving the performance of the raters.

References
Asclepius: A Medical Day Camp Program for Youth of Low-Income Backgrounds

Alex O'Dunn-Orto, Erin Gordey, Keir Peterson, Khera Sheny, Kathryn Dong
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Canadian medical schools aim to enrol a diverse population of learners as an ethical consideration and in an effort to reach a broad patient population. However, students of low-income backgrounds are significantly under-represented, due to financial and social obstacles, such as inflated estimates of education costs and a perception of medicine as a culturally alien profession.

A group of medical students at the University of Alberta designed a week long day camp with the aim of exposing high school students of low-income backgrounds to the field of medicine, and in doing so reduce the perceived barriers preventing this population from entering medical school. The program was modeled upon a successful initiative in the UK with similar objectives.

The authors contacted high schools in low-income neighbourhoods and presented the program to science departments. Teachers were asked to nominate students they felt resided in a low-income household and possessed the qualities necessary for the practice of medicine. Thirty students were selected to attend the camp, where activities included medical lectures, financial counselling, problem-based learning, and clinical skills sessions. Volunteers were medical students, faculty, residents, allied health professionals, and members of the public.

Demographic information was collected to determine if selection methods were successful in recruiting low-income students. Compared to the Canadian population, considerably more camp participants were employed and more identified with a visible minority. However, the desired population was not reached with respect to parent education level and household income, and changes were consequently made to the 2011 selection process.

The program's primary goals were to increase participant self-confidence, knowledge of the process of obtaining a medical education, and personal interest in pursuing a medical career. The program's effect in these areas was evaluated using pre- and post-camp surveys. Self-concept was measured using statements from the Self Description Questionnaire (SDQ) II, which showed a statistically significant difference in post-program responses. Similarly, Likert scale responses regarding knowledge and interest in the medical field were both found to be significantly different in post-program surveys.

In addition to continued surveying of participants from each year of camp (the second cohort completed participation in July 2011), long term follow-up surveys have been administered to track participant educational pathways.

References
2. Greenhalgh T, Russell J, Dunkley L, Boynton P, Lefford F and N Chopra "We were treated like adults" - development of a pre-medicine summer school for 16 year olds from deprived socioeconomic backgrounds: action research study. Brit Med J 2006; 332 (7544) 762 – 766B
In the UK, medical graduates enter a two year general medical training programme, when they are known as junior doctors, prior to commencing specialist training. Junior doctors in their first year of work take a significant leap in responsibility when they go 'on-call' for the first time, and become the primary contact for nurses' concerns about inpatients. Inevitably, this includes nurses alerting doctors about unwell patients on the ward. The assessment of acutely ill patients is often discussed at medical school, however the translation of this theory into the practicalities of the job is rarely addressed, and new graduates are often lacking in both experience and confidence.

Our research team of four junior doctors reflected on our experience of 'on-calls'. We set out to assess how prepared final year students felt to be 'on-call'. Initially we ascertained the most common activities undertaken by junior doctors 'on-call' by surveying a cohort of doctors over 18 shifts. We then surveyed 152 final year medical students to measure their perceived ability to perform these tasks (eg: prescribing IV fluids, prescribing analgesia, assessing patients with pyrexia or low urine output), independently or under supervision. The results demonstrated a self-perceived lack of ability in performing tasks associated with interpretation of investigations, decision-making and prescribing independently. This lack of preparedness for 'on-call' shifts may impact the work of teams working together 'on-call' with new junior doctors.

We developed an evidence-based teaching programme called “Doctor, come quickly...” to highlight the skills necessary for junior doctor 'on-call' work. This includes the assessment of patients with chest pain or shortness of breath, but also reviewing a patient with new confusion or hypoglycaemia and initiating appropriate management. During the six hour course, students are encouraged to develop a systematic approach to patient assessment and initiation of supportive management, concentrating on common and life-threatening situations encountered 'on-call'. The students are given the opportunity to practice prescribing and are actively involved in the management of simulated cases, which integrate the curriculum we constructed from our research. Common examples include treatment of hyperkalaemia, hypoglycaemia, hypoxia and shock.

A core tenet of our course is risk stratification of potentially unwell patients, and when to call for senior help. Our course content has been verified by senior clinicians and we have delivered the course to three separate groups of final year students and to all incoming doctors at our hospital.

We evaluated student feedback after individual sessions, and also following the entire programme. Our first feedback concluded that the sessions were clear, relevant and well structured, and encouraged active student participation. The second feedback form revealed students felt more prepared for 'on-call' shifts. They felt they knew when to call for help, and were more able to initiate patient management independently. They also developed a greater awareness of their own limitations. This curriculum was developed as a sustainable programme where current junior doctors will teach final year medical students and incoming doctors within a systematic and validated programme. We hope that this programme will have a positive impact on the care of patients, and the ability of hospitals to run efficiently when new cohorts of junior doctors receive their first “Doctor, come quickly” calls.

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Introduction
Both peer- and computer-assisted learning strategies are increasingly being utilized for simulation-based education as they have the potential to provide students with flexible opportunities for deliberate practice, while lessening demands on faculty time. However, it is unclear if all sources of feedback are beneficial to procedural skill learning. While it intuitively makes sense that expert feedback is optimal, there are reasons why peer- and computer-assisted feedback, in certain circumstances, could be better for novice learners. From a theoretical perspective, expert performers, who are in the automatic phase of the motor skill learning continuum, are thought to have difficulty articulating very simple aspects of a skill. Based on this model of learning, novice performance relies heavily on cognitive and verbal processes; therefore, it could be expected that feedback from a fellow novice would have greater utility as compared to feedback from an expert whose motor performance is automatic and non-verbal. In the same manner, computer-assisted learning that is designed to provide the learner with clear and focused teaching scripts that break skills down into their component parts may be better suited to the cognitive processing of a novice learner.

Purpose
This study aimed to compare the effectiveness of expert-assisted learning (EAL), peer-assisted learning (PAL) and computer-assisted learning (CAL) on the acquisition, retention and transfer of procedural skills in the simulated setting.

Methods
Sixty undergraduate medical and nursing students were recruited to participate in this study. All participants initially viewed a 10 minute instructional video on urinary catheterization, which demonstrated the skill on an adult female part-task simulator. After viewing the video, participants performed a pre-test urinary catheterization procedure on the same adult female simulator. Subsequently, participants were randomly assigned to practice urinary catheterization in an expert-, peer- or computer-assisted simulation-based learning environment. During practice all participants performed three urinary catheterization procedures on the female simulator. Students in the EAL group received performance feedback from an expert instructor. Students in the PAL group worked in pairs, alternating back and forth between practicing the skill while receiving feedback from their partner and providing feedback to their practicing partner. Participants in the CAL group were provided with no extrinsic feedback, but were able to interact with a computer-based instructional video in a self-directed manner throughout practice.

Effectiveness of training was evaluated using an immediate post-test and one week later on a retention and standardized patient-based transfer test. Performance measures included number of breaks in aseptic technique and blinded expert assessments (using previously validated task-specific checklist and global rating scales). In addition, for the transfer test, global clinical performance and communication skills were evaluated by blinded experts using previously validated scales.
Results

All groups performed similarly on the pre-, post-, and retention tests ($p > .05$). For all groups, the number of breaks in aseptic techniques were significantly reduced and catheterization checklist and global rating scale scores increased significantly from pre-test to post-test ($p < .05$). This indicates that performance improved with training. Furthermore, performance remained stable over the one-week retention period, with no significant differences detected between the post-test and retention test scores.

On transfer testing, however, the EAL group performed significantly better than the PAL group as measured by global clinical performance, catheterization checklist scores, and number of breaks in aseptic technique ($p < .05$). The performance of CAL group participants did not differ significantly from EAL or PAL group participants and communication and catheterization global rating scale scores were equivalent for all groups ($p < .05$) at transfer.

Discussion

Feedback from an expert has traditionally been considered a fundamental component of learning. However, newer instructional methods, such as computer- and peer-assisted learning, are increasingly being utilized within the simulated setting as a way to create new educational environments that can be delivered at lower costs and with decreased faculty support.

Studies to date which have shown that PAL and CAL can enhance performance at a comparable level to expert-led training, have failed to assess trainees’ abilities to transfer the skills they have learned to new contexts. The inclusion of a transfer test in this study helped to differentiate temporary changes in performance from more permanent changes in capability (true learning); characterized by one’s ability to generalize training to related tasks and altered contexts. Specifically, while the performance of participants in all three groups improved, the use of EAL and CAL resulted in better learning as demonstrated by superior performance on transfer testing. Perhaps novice learners do not possess the content knowledge required to assess, and provide useful feedback on, their partners’ performance. Alternatively, the instructional video, along with the intrinsic feedback provided by the simulator, likely contained sufficient information for novice learning to occur.

Conclusions

While both peer- and computer-assisted learning are potentially time- and cost-efficient alternatives to traditional teaching strategies, our results suggest that, for novices, computer-assisted learning (and not peer feedback) can be as effective as expert feedback in the instruction of basic procedural skills in the simulated setting. When instruction is provided, the expertise level of the teacher appears to be a critical factor influencing the effectiveness of training, with expert-based instruction being more effective than peer-assisted learning.

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Ethical Approval

The research ethics boards at the University of Toronto and Ryerson University approved this study.