

### OD5-1

#### Correlation of Peg Transfer Task Time at Examinations and Training Sessions for Urology Trainees

Sero Andonian, McGill University, Murilo Luz, McGill University, Josée Delisle, McGill University, Maurice Anidjar, McGill University, Mohamed Elkoushy, McGill University

**Keywords:** training, trainers, laparoscopy

**Context or Setting:** Purpose: To correlate urology trainees' peg-transfer task time (PTT) of the McGill Inanimate System for Training and Evaluation of Laparoscopic Skills (MISTELS) at the semi-annual McGill Urology Objective Standardized Clinical Examinations (OSCEs) with their performance during the training sessions.

**Why the Innovation Was Undertaken:**

**Methods:** After the Institutional Review Board approval and obtaining informed consent, urology trainees (PGY-3 to PGY-5) from 4 different academic centers were recruited for the study. One of the rest stations at the semi-annual urology OSCE was replaced by the Peg Transfer task of the MISTELS. Trainees' PTT at MISTELS were compared with previous laparoscopic experience and scores at training sessions.

**What Was Done:** Results: A total of 54 urology trainees were evaluated for 3 successive semi-annual OSCEs from May 2011 to May 2012, including 32 (59%) trainees from a training program with dedicated laparoscopic skills training program. Compared with their colleagues, trainees from that training program had significantly higher amount of pelvic training per week (45 [0–60] versus 0 [0–60] minutes,  $P = 0.001$ ) and lower median PTT at the OSCE (74 [52–189] versus 114 [68–209],  $P = 0.001$ ) despite significantly lower number of laparoscopic cases performed within the previous 6 months (2 [0–35] versus 13 [0–57],  $P = 0.001$ ). PTT moderately correlated with trainees' median times at the training sessions ( $r = 0.57$ ,  $P = 0.001$ ) and negatively correlated with amount of training per week ( $r = -0.41$ ,  $P = 0.003$ ). However, PTT showed no correlation with the number of laparoscopic cases performed with the previous 6 months ( $r = 0.04$ ,  $P = 0.76$ ).

**Brief Evaluation of the Innovation and/or Its Impact:** Conclusion: Trainees' PTT at MISTELS during urology OSCE examinations significantly correlated with training on the pelvic trainer rather than the number of laparoscopic cases performed.

### OD5-2

#### 'Ask the Surgeon': What do Pre-Clinical Students Want to Know About Surgeons and the Practice of Surgery?

Susan Chaudoir, University of Alberta, Jonathan White, University of Alberta

**Keywords:** Pre-clinical, Surgery, Questions

**Context or Setting:** Many authors have considered the question 'what are the factors that attract students into surgery?' with the

intent of increasing recruitment into surgical careers. This study set out instead to determine what students actually want to know about surgeons and the practice of surgery, independent of eventual career choice.

**Why the Innovation Was Undertaken:** We designed an opportunistic study to investigate pre-clinical students' learning needs by combining a naturalistic, in situ method of enquiry with an existing educational session. One of the authors (JW) delivered a 60-minute 'Introduction to Surgery' large-group session to Year 1 medical and dental students annually from 2008 to 2011 inclusive. At the start of each session, students were given cards, and asked to write down their own questions about surgery. Prizes were given for the best questions, and the cards were retained. Questions were transcribed and analyzed to identify the themes that students asked about, using an inductive method of inquiry without an a priori hypothesis.

**What Was Done:** Five hundred and nine questions were received from approximately 1000 students over 4 years. Major themes identified were: 'Living as a Surgeon', 'Experiences in the OR', 'Memorable Operations', 'Relationships with Patients', 'Career Choice & Advice', 'Residency', and 'Dealing with Difficulty'.

**Brief Evaluation of the Innovation and/or Its Impact:** This study demonstrates that pre-clinical students express specific learning needs about surgeons and the practice of surgery, which may be overlooked by those trying to influence career choice. We believe that surgical educators should focus on providing students with the information they need to make informed decisions and to be effective learners and practitioners, regardless of students' eventual career choice.

### OD5-3

#### Objective Structured Teaching Exams for Surgical Residents as Teachers (OSTEs for SRAT)

Sandra Jarvis-Selinger, University of British Columbia, Lana Newton, University of British Columbia, Henry Broekhuysen, University of British Columbia, Brian Chung, University of British Columbia, Morad Hameed, University of British Columbia, Leslie Sadownik, University of British Columbia, Tracy Scott, University of British Columbia, Yasmin Halwani, University of British Columbia, Ravi Sidhu, University of British Columbia

**Keywords:** Residents, Teachers, OSTE

**Context or Setting:** Surgical residents play a critical role in the education of medical students and residents. The UBC Surgical Residents as Teachers (SRAT) program seeks to support residents by providing an integrated curriculum across surgical programs, and was adapted for emergency medicine residents in a Medical Education for Residents in Training (MERIT) rotation. The purpose of this study was to use Objective Structured Teaching Examinations (OSTEs) to assess residents' teaching skills.

**Why the Innovation Was Undertaken:** In MERIT, residents completed a pre- and a post- four station OSTE. In SRAT, residents completed a three-station OSTE at the end of first year. Trained

faculty evaluators assessed each OSTE using standardized learners (comprised third year medical students). Each OSTE was video recorded and provided to the residents along with their assessments.

**What Was Done:** Residents were rated on a unique assessment for each case using anchored scales with a maximum score of five. Using a two-tailed paired sample *t*-test, the MERIT residents' ( $n = 7$ ) OSTE scores significantly improved from pre-test ( $M = 3.32$ ) to post-test ( $M = 3.80$ ),  $t = 9.19$ ,  $P < 0.0005$ . The mean score for SRAT residents ( $n = 21$ ) was  $M = 3.66$ . Furthermore, results have informed future curriculum development, highlighting skill areas where residents may need more support. For example, post hoc Tukey's HSD tests showed that residents scored lower in the area of encouraging further student learning than other skills categories.

**Brief Evaluation of the Innovation and/or Its Impact:** Teaching effectiveness appears to improve after residents participate in a residents-as-teachers curriculum. The OSTE is feasible to implement and can also assist in curriculum development. Residents need opportunities to deliberately practice the skills they've learned, get feedback, reflect and build on lessons learned from training and experience.

#### OD5-4

### Validating Force-Based Metrics for Computer-Based Assessment of Technical Skills in Laparoscopic Surgery

Ana Luisa Trejos, University of Western Ontario, Matthew Dawson, University of Guelph, Sayra Cristancho, University of Western Ontario, Rajni Patel, University of Western Ontario, Michael Naish, University of Western Ontario, Christopher Schlachta, University of Western Ontario, Richard Malthaner, University of Western Ontario

**Keywords:** Force, Performance metrics, Concurrent validity

**Context or Setting:** Minimally invasive surgery (MIS) is especially difficult to learn. One of the critical challenges for trainees is perceiving the magnitudes of the applied forces. The SIMIS system, developed at CSTAR, consists of sensorized instruments that measure applied forces during training for MIS. Based on the force information provided by SIMIS, two performance metrics are proposed: (i) a measure of consistency, and (ii) a measure of overall safety when applying forces to the tissue – mathematically represented by the derivative and integral of the force data.

**Why the Innovation Was Undertaken:** Thirty subjects of different experience levels performed a laparoscopic knot-tying task using the SIMIS system. The SIMIS metrics were compared to those simultaneously obtained with the ICSAD system, currently one of the few validated metrics in the literature, and correlated with experience level using Spearman's Rho Correlation. The goal of this comparison was to demonstrate concurrent validity for the proposed performance metrics.

**What Was Done:** The results show that the force-based metrics have slightly stronger correlation with experience level than those found with the ICSAD system ( $-0.781$  for safety and  $-0.796$  for consistency, compared to  $-0.736$  for path length,  $-0.629$  for number of movements and  $-0.792$  for time,  $P < 0.001$  for all correlations). There are also strong correlations between the SIMIS and the ICSAD metrics (e.g. safety correlates strongly with path length [0.754] and with time [0.783]).

**Brief Evaluation of the Innovation and/or Its Impact:** The metrics obtained with the SIMIS system reflect important performance characteristics and are shown to correlate well with experience levels and with currently validated metrics.

#### OD5-5

### Assessing In-Training Competency of Orthopaedic Residents: Use of an Objective Structured Clinical Examination (OSCE) After a Sports Medicine Rotation

Tim Dwyer, University of Toronto, John Theodoropoulos, University of Toronto, Jodie Herold, University of Toronto, Patrick Henry, University of Toronto, Lucas Murnaghan, University of Toronto, Veronica Wadey, University of Toronto, Brian Hodges, University of Toronto, J Semple, University of Toronto, Darrell Ogilvie-Harris, University of Toronto

**Keywords:** OSCE, Competency, Orthopedics

**Context or Setting:** The development of competency-based curriculum in Canadian orthopedic resident training requires an objective means of assessing in-training competence after a module. We hypothesized that a sports medicine OSCE would demonstrate sufficient reliability and validity to be used as a measure of resident in-training assessment.

**Why the Innovation Was Undertaken:** An OSCE made up of six 10-minute stations was written for orthopedic residents at the University of Toronto, assessing resident competencies in the management of common sports medicine conditions. Each station covered domains of history taking, examination, imaging, clinical decision-making, consent and surgical technique. A combination of binary checklists and overall global ratings were used. Results were analyzed for overall reliability and construct validity.

**What Was Done:** A total of 43 residents sat the OSCE. Cronbach's Alpha was 0.91 for the six stations, with each station having acceptable Corrected Item-Total Correlation Coefficients. Excellent correlation was seen between the binary checklists and the global rating. A significant effect of year of training was seen on both total checklist scores and global ratings, as well as on all individual domains except history. Final year trainees performed particularly well in clinical decision-making and surgical technique. Overall, the number of previous sports medicine rotations correlated with significant increases in checklist scores, whilst recent exposure to a competency-based sports rotation did not. **Brief Evaluation of the Innovation and/or Its Impact:** An orthopedic sports medicine OSCE has shown sufficient validity and reliability to be used as an in-training assessment tool. Issues of standard setting must now be addressed in order to determine competency.

#### OD5-6

### Making the Tacit Explicit: Developing a Language to Describe How Experienced Surgeons Approach Intra-Operative Uncertainty

Sayra Cristancho, University of Western Ontario, Meredith Vanstone, McMaster University, Tavis Apramian, University of Western Ontario, Lorelei Lingard, University of Western Ontario, Michael Ott, University of Western Ontario, Richard Novick, University of Western Ontario

**Keywords:** Uncertainty, Surgery, Challenging situations

**Context or Setting:** In clinical settings, uncertainty is a recurring part of everyday practice. However, we have little insight into how experts approach uncertainty, limiting our ability to explicitly teach and assess it in training. This study explored how uncertainty was perceived and handled by experienced surgeons during challenging intra-operative situations. Our goal was to develop a theoretical language to support both education and research.

**Why the Innovation Was Undertaken:** The study included observations and interviews during 26 surgical cases. The cases, drawn from seven staff surgeons from various specialties, were purposively sampled after being pre-identified by the surgeon as 'likely challenging'. We combined template and inductive analyses. In template analysis, an existing theory was used to identify instances of uncertainty in the dataset. Inductive analysis was used to elaborate and refine the concepts.

**What Was Done:** Template analysis confirmed that existing theoretical concepts are relevant to surgery. However, inductive analysis revealed additional concepts and positioned existing concepts within new relationships. The two key themes were recognizing

uncertainty and responding to uncertainty, each with corresponding subthemes. A consolidated analysis indicated that an uncertain situation in surgery is characterized in terms of: Novelty of the situation, Difficulty in predicting the outcome, Difficulty deciding the course-of-action.

**Brief Evaluation of the Innovation and/or Its Impact:** Our results offer a refined language for conceptualizing uncertainty in surgery. While further research is required to elaborate and test the explanatory power of this language, we anticipate that it will help surgeons and surgical trainees engage in explicit discussion about the multiple facets of intra-operative uncertainty, which currently remain part of tacit learning.