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MP-07.01
Questioning the Construct Validity of the Total Time and Tissue Handling Parameters of the Lapsim Laparoscopic Surgical Simulator

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Purpose: To assess the construct validity of the LapSim laparoscopic surgical simulator in a urology residency training program.

Materials and Methods: A total of 15 residents participated in the study between July 2007 and July 2008. The subjects were tested six times at one-month intervals on three skill tasks using the LapSim laparoscopic simulator. The testing sessions were divided into seminar 1, which was comprised of the first three sessions, and seminar 2, which was comprised of the subsequent three sessions. The tasks examined were lifting and grasping, cutting and clip application. The metrics included in the study were total time and the following tissue handling parameters: tissue damage, maximum damage and stretch damage. The subjects were divided into junior and senior resident groups. The Wilcoxon signed-rank test for paired non-parametric data was used to compare the performances of the juniors and seniors during the first 3 sessions to their performance in the last three sessions to determine whether there was improvement over time. The Wilcoxon sum test for independent non-parametric data was used to compare the performance of the juniors to that of the seniors for seminar one, seminar two and the combination of both seminars to determine whether the more experienced senior residents performed better than the less experienced juniors.

Results: No significant performance improvement between testing sessions could be demonstrated. Similarly, there was no significant difference in performance between junior and senior residents.

Conclusions: Construct validity could not be demonstrated for the total time and tissue handling parameters of the LapSim laparoscopic surgical simulator when examined within the context of a urology residency program.

MP-07.02
Status of Robotic Assisted Surgery among Canadian Urology Residents

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Introduction and Objective: Robotic-assisted surgery (RAS) has been rapidly adopted in Urology, especially in the United States. Although less prevalent in Canada, RAS is a growing and controversial field that has implications for resident training. We report on the status and perception of RAS among Canadian Urology residents.

Methods: All Canadian Urology residents from Anglophone programs were contacted by email and asked to participate in an online survey. Current resident exposure to, and perception of RAS was assessed with this survey.

Results: Fifty of 128 (39%) residents completed the survey. Fifty-two percent have been involved in RAS. Those who have not been involved in RAS express lower interest and lesser knowledge regarding RAS. Ninety-two percent of respondents feel the use of RAS will increase, although only 29% feel it is feasible in Canada. Just 24% and 36% feel RAS to be superior to open and laparoscopic techniques, respectively. Sixty-eight percent of residents in programs with a robot viewed it as detrimental to training, whereas 81% of residents in programs without one viewed its absence to either have no impact, or even be beneficial. Both groups expressed a desire for more experience with RAS.

Conclusion: The resident experience with respect to RAS is mixed. Overall, residents view RAS as an expanding field with potentially negative impacts on their present training, while at the same time they paradoxically desire the acquisition of more experience in RAS. We plan to monitor the evolution of these perceptions over next four years.

MP-07.03
Child Life Interactive Computer for Kids Program

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Introduction: Computers have become integral tools in the everyday lives of children at home andschool. The Internet is accessed for diversion, communication, education and information gathering. Hospitalized children can experience social isolation if hospital stays are prolonged or repetitive. The Child Life Interactive Computer for Kids (CLICK) program aims to decrease isolation, reduce stress and normalize the environment by providing assistance and accessibility to computers.

Methods: In 2007, the CLICK program was initiated at the Mother & Child Center. We provide opportunities for therapeutic and diversionary play to prepare and support children during medical tests and procedures (difficult catheter insertion, urodynamic study) through education, health care play and coping skill development, and support families during hospitalization or challenging events through the use of technology. Challenges required program adaptation: infection control by multiple users, privacy and confidentiality, and safety. Nursing personnel adaptation and appreciation to this technology was assessed as well as parents/patients overall satisfaction.

Results: A total of 20 laptop and 15 desktop computers are available on a distinct network. The program provided opportunities for patients/parents to become autonomous with respect to their treatment and increase their ability to cope with medical procedure by obtaining information on reliable sites and networking with patients with similar health conditions (Wilm's, valves, exstrophy, neurogenic bladder). CLICK enhanced online communication with families, friends and school; ensured safety and provided assistance with programming. Activities were integrated to enhance the transition to adult care by assisting them to develop information gathering and record keeping skills and assume a more active role in the direction of their care.

Conclusion: The benefit of having accessible computers is in line with the ever-changing world of paediatrics and the use of technology. With these tools also comes the responsibility to ensure monitoring and utilization. The essential ingredients to success include a comprehensive assessment, individualized intervention plan and effective resources. Adaptation of current technologies to daily patient care is needed. The actual generation being treated in adult urology is connected to Internet, therefore they should be offered a program like CLICK.

MP-07.04

Career Outlooks and Choices of Graduating Canadian Urology Residents and Societal and Professional Implications

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Introduction: Manpower issues in Canadian urology have important societal implications and require ongoing assessment. However, little is known about the choices of graduating residents as well as their outlooks on the current state of the profession. These choices and attitudes are likely to shape the way urology is practiced in Canada in the future.

Methods: 74 graduates of Canadian urology programs from 2008 through 2010 were surveyed about their choices upon graduation as well as their opinions regarding the Canadian job market. Surveys were administered directly to 2010 graduates at a chief residents' meeting, whereas 2008 and 2009 graduates were surveyed in 2010 through SurveyMonkey.com®. The survey contained 13 major questions with subheadings examining the subjects' attitudes about career opportunities, and types of practices that they seek. Where applicable, answers were quantified using a 1 to 5 likert scale to express agreement or disagreement.

Results: The overall response rate was 73%. 61.6% of graduates rated the Canadian urology job market as poor or very poor. The majority of graduates have heard of no more than 2 to 4 available urology positions in the area they would like to practice in (53.1%) or nationwide (51.1%). Graduates found the help of a urology faculty within their program (71.2%), networking at meetings (73.4%), and community based electives (58%) to be essential in obtaining the position of their choice. The CUA (64.7%), AUA (68.6%), and advertizing in journals (57.7%) were found to be unhelpful. 90.4% of graduates are unaware of any CUA initiatives to identify available positions in Canada whereas 61.5% are aware of AUA initiatives to do the same in the USA. Location (98.1%), potential for income (76.9%), available resources (94%), comfort with partners (94.2%), and career opportunities for the spouse (78.4%) were identified as important factors when considering a job. The ideal department would be academic (64.1%), would have at least 5 partners (81.5%), be located in an urban area with a population of >500,000 (63%).

Conclusions: Graduating Canadian urologists tend to be dissatisfied with their career opportunities in Canada. They tend to want to work in large academic departments located in large urban areas.

MP-07.05

Fellowship Choices of Graduates of Canadian Urology Programs

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Introduction: Urology training is constantly evolving with ever increasing skills and fund of knowledge. Little is known about the fellowship choices of graduating Canadian residents and their reasons for pursuing them.

Methods: 74 graduates of Canadian urology programs from 2008 through 2010 were surveyed about their fellowship choices upon graduation. Surveys were administered directly to 2010 graduates at a chief residents' meeting, whereas 2008 and 2009 graduates were surveyed in 2010 through SurveyMonkey.com®. The survey contained 12 major questions with subheadings examining the subjects' attitudes about their fellowship choices. Where applicable, answers were quantified using a 5 point likert scale to express agreement or disagreement.

Results: The overall response rate was 73%. 85.4% of graduates are pursuing fellowships with oncology (40%) and minimally invasive urology (33.3%) being the most popular choices. Reasons cited for pursuing a fellowship included: interest in pursuing an academic career (63.1%), acquiring marketable skills to obtain a position in the community (58.7%), and interest in focusing their practice to this area of urology (82.7%). On the other hand, graduates rejected as reasons for pursuing a fellowship: inability to find a suitable position in urology in Canada (51.1%), feeling that residency did not equip them with the necessary skills to practice urology (47.8%), or learning about research methodology (54.3%). Graduates found the help of a urology faculty within their program (78.8%), networking at national or international meeting (55.3%), and their own initiative (76.1%) to be essential in obtaining the fellowship of their choice. Less helpful were sub-specialty organizations (55.3%), or electives at an outside institution (74.4%). 27.7% and 20.8% of graduates were offered a position in academic and community urology respectively prior to starting their fellowship. 76.2% of graduates felt they knew enough about academic urology to know if it would be a suitable career choice for them versus 50% regarding community urology. 58.8% of residents did a community elective during residency, and 70.7% felt they would have benefited from additional elective time in the community. Graduates tend to be very productive academically co-authoring on average 9.9 peer-reviewed abstracts or papers during residency, and 8 during fellowship.

Conclusions: Graduates from Canadian urology programs tend to be very academically oriented, opting for additional training after residency.

MP-07.06

Trends in Urology Resident Exposure to Open Surgery for Index Procedures: A Tale of Two Countries

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Introduction and Objective: Urologic surgery has trended towards an emphasis on minimally invasive surgery (MIS) in the last decade. The impact of this trend on the ultimate surgical competence of graduating residents is unknown. Our objective was to interrogate case-log data for American and Canadian urology residents to define trends in MIS and open surgery and compare operative experiences between these two groups.

Methods: Accreditation Council for Graduate Medical Education case-log data from 2004-2009 was extracted for American urology residents and compared to Canadian resident case-logs for 8 index cases which are routinely performed in both an open and MIS approach. These included nephrectomy (donor, radical, simple, partial), prostatectomy (radical), adrenalectomy, pyeloplasty, and nephroureterectomy. Case-logs were evaluated for percentage of cases performed by MIS.

Results: Linear regression analysis demonstrated a statistically significant increase in the percentage of MIS radical prostatectomies performed by American residents (11.2% to 52%), compared to Canadian residents (0.74% to 11.2%) over the study period. There was also a significant increase in the percentage of MIS donor nephrectomies by Canadian residents (5.6% to 68.7%), compared to American residents (70.1% to 89.1%). For Canadian residents, exposure to the following 3 MIS procedures increased significantly over traditional open approaches in the last 5 yrs: Adrenalectomy, radical prostatectomy and donor nephrectomy. For American residents, all index procedures with the exception of adrenalectomy underwent a significant increasing trend over the same period (all $p<0.05$).

Conclusions: Trends for 8 index procedures confirm a continuing shift towards MIS for the majority of procedures that residents are exposed to in both countries. Differences between American and Canadian trends may be only temporal and relate to dissimilar health-care delivery models with a resultant lag in the adoption of laparoscopy and robotics in Canada. The impact of these trends upon ultimate surgical competence of our graduates remains to be seen.

MP-07.07

Research in Urology: A National Survey on Attitudes and Experience in Research in Urology

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Introduction: The role of scholar is one of the seven CanMEDS roles that a Canadian resident must be proficient in prior to completion of any Royal College certified training program. However, there are no standardized criteria that a resident must meet in order to satisfy this standard. We sought to access the experiences with and attitudes towards research in Urology residents across Canada.

Methods: An anonymous, self-reporting questionnaire was filled out by 26 chief residents in Canadian Urology programs. The questionnaire was composed of 30 questions set to evaluate the residents experience with and attitudes toward research, both prior to, and during residency. The majority of the questions were graded on a five-point agreement scale.

Results: The response rate from the questionnaire was 100%. The vast majority of residents had some experience in research prior to residency and have published at least one paper (92.3% and 84.6% respectively), with the average resident publishing over 4 papers (mean = 4.65, range 0 - 11). However, less than half those surveyed believed that research during their residency was important to their overall training (11 of 26). Over half admitted that their motives for doing research was mainly to increase their chances of obtaining their desired fellowship program (15 of 26).

Ten of the residents were enrolled in programs that officially set aside time for research, however only 15% of respondents actually felt that they had adequate time to perform research in their residency. Almost 70% of those surveyed (18 of 26) would be more inclined to take part in research if there was more time specifically set aside for it.

Conclusions: The vast majority of chief residents in Canadian Urology training programs have had some first hand experience with research. Their experiences with and motives for performing research, however, are highly varied. Nonetheless, over two thirds of residents believe that they would be more inclined to perform research if they were provided more protected research time.

MP-07.08

A System for Laparoscopic Surgery Ergonomics and Skills Evaluation

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Introduction: Minimally invasive surgeries have become increasingly popular due to their benefits for the patient, but at a cost to the comfort of the surgeon. The restricted operating access can often lead to surgeons being exposed to longer periods of uncomfortable positions. Also, the newness of the procedure means surgeons are still acquiring the required skills and different instruments are still being designed. Primarily, new instruments and young surgeons are both analyzed using only subjective means. A system is proposed that has to ability to track both the instrument motions as well as the surgeon's posture. The captured trajectories can then be objectively analyzed for both ergonomic assessment when comparing different instruments, and a skills evaluation when comparing surgeons.

Methods: The system consists of several IR markers attached to the laparoscopic instruments, elbows and shoulders. A compact infrared camera is used for tracking the markers during a standardized training task (e.g. suturing); the tracking data provides the trajectories of the instruments during the procedure. Figure 1 shows the markers attached to laparoscopic instruments. These trajectories will be analyzed off-line and in order to derive different ergonomics measures and skills measures. The main component of the system is represented by the instrument marker; this marker provides the position and orientation of the instrument with respect to the camera. The marker is manufactured from clear acrylic covered in an aluminum tape with a helical marker pattern cut out. Infrared LEDs are fitted into the ends so that a helical shape with two rings at either end is illuminated. A custom image processing algorithm that provides the position and orientation of the marker using the stereoscopic images was designed and implemented. Preliminary tracking tests use a marker mounted on a robot manipulator to compare the trajectories of the robot end-effector and the stereoscopic processing.

Results: The system is capable to track six markers simultaneously. Two instrument markers and four other round markers which can be placed on elbows and wrists. The tests for the instrument markers showed that at a distance of 0.68m from the stereoscopic camera, the camera recorded trajectory differed to that of the robot by a maximum of 1.5 mm and with ~1 mm root-mean-square (RMS) error. Tests repeated at a camera distance of 0.5 m and 1.0 m show maximum RMS errors of approximately 0.61 mm and 2.4 mm, respectively.

MP-07.09

Preliminary Assessment of a Renal Tumor Materials Model

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Introduction: Advances in minimally invasive urology is leading to ablative tissue technologies which encompass complex surgical procedures that require percutaneous imaging and needle placement for biopsy and ablation. To date there has been no realistic tumor model on which to practice these skills before advancing to higher fidelity training or clinical practice.

Objective: To evaluate a unique materials model for laparoscopic guided cryotherapy or radiofrequency tissue ablation of tumors of the kidney through expert surgeon assessment.

Methods: During the inaugural American Urological Association 2010 Tissue Ablative course content validity testing of a renal tumor model was undertaken. Five nationally recognized expert faculty in cryotherapy and radio frequency ablation (RFA) techniques for renal tumor disease performed laparoscopic ultrasound examination of the tumor model. They then performed ultrasound guided placement and activation of the treatment probe into the tumor of the model. Following this they completed a questionnaire and rated the quality of the renal tumor model on a 5 point Likert scale as to its appropriateness as a teaching tool.

Results: All of the subjects assigned a score of 5 out of 5 on the Likert scale regarding the ability to identify the tumor with ultrasound, were able to deploy the ablative probe into the model under ultrasonic (US) guidance and would recommend the use of this teaching model to residents or fellows. The expert faculty felt that this tumor model was appropriate for teaching laparoscopic US imaging of a renal tumor during ablative treatment procedures, teaching and practicing laparoscopic US guided cryotherapy and teaching and practicing laparoscopic U/S guided RFA.

Conclusion: We have developed a unique model that simulates small kidney tumors that can be employed for training surgeons in ablative techniques.

MP-07.10

Integrating a Cancer Survivorship Components to Established Urologic Oncology Fellowships

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Objectives: Donatucci et al (JSM 2010, in press) recently reported that a significant proportion patients after radical prostatectomy describe incomplete preparation for the adverse effects of potentially curative surgery, and to date, none of the oncology fellowships reviewed in that study had formally incorporated cancer survivorship into their curriculum. We report on the integration of a cancer survivorship component into our

institution's urologic oncology fellowship program and the relative ease by which this can be performed.

Materials and Methods: The goal of the program was to 'educate the educator', that is, provide state-of-the-art information to trainees. In this way, interaction with patients/partners regarding potential treatments for urologic cancers would include contemporary literature-based and practice-specific oncology outcomes and adverse event data, with potential solutions including rehabilitation strategies and reconstructive options introduced to the patient at appropriate times over the treatment continuum.

Results: Didactic and practical elements of cancer survivorship and optimization of quality of life following oncologic treatments were developed. One-on-one teaching sessions and operative exposure to genitourinary reconstructive procedures (penile prostheses, artificial urinary sphincters, male slings) by subspecialist reconstructive surgeons allowed for rapid integration of these concepts into clinical practice. Key facets included inclusion criteria, outcomes data, and timing of the introduction of these elements into patient interactions. Simulated patient interactions/case reviews reinforced the practical patient information components.

Conclusions: The goal of adding cancer survivorship elements to a urologic oncology program is not to attain expertise in prosthetic urology or sexual medicine. However, awareness, understanding, critiquing, and integrating current information specific to these elements of patient care, as part of complete oncologic care, and preparing strategies for management of complications that result due to cancer-care treatments represents a step-forward in health care delivery to our patients.