

SURGICAL EDUCATION

SE001

VTEC SKILLS LABORATORY, MELBOURNE

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Purpose A training facility for the medical fraternity, established at the college with assistance from the Federal and State Governments and with a touch of history.

Facility A purpose designed building with established links to the Anatomy Department Melbourne University. The facility level incorporates both dry and moist lab features and also virtual reality programs. Audio visual capabilities include local, interstate and international linkages.

Methods The facility is capable of providing pre-training through to master class facilities, involving local experts and international guests. Each subspecialty has control and is able to set its own education program under the umbrella of the college education committee.

Conclusion Improved training and education. Validation of the learning process with applications to research together with feedback to government bodies and the various medical colleges. The learning process is applicable to continuing professional development programs.

SE002

SURGICAL SKILLS TRAINING AND THE ROLE OF SKILLS CENTRES: RESULTS FROM A STATEWIDE SURVEY OF TRAINEES AND TRAINERS

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Purpose Surgical Skills Centres (SSC) have been developed to provide facilities for procedural skills training away from the operating theatre. This study was undertaken to ascertain the views of a representative sample of trainees and supervisors about current training deficiencies and the potential role of SSCs in surgical education.

Methodology A questionnaire was developed to ascertain trainees' perceived procedural skills deficiencies, barriers to operative skills acquisition, current experience of SSCs and perceived likelihood of attending a SSC for training in nominated procedural skills relevant to their stage of training or subspecialty interest. Separate versions of the questionnaire were developed for Basic Surgical Trainees (BSTs), Advanced Trainees in General Surgery, Orthopaedics, Urology and Plastic and Reconstructive Surgery and surgical supervisors.

NSW trainees in the above categories were identified from the RACS database and mailed the questionnaire in November 2005. The supervisors' version of the questionnaire was mailed to all members of the NSW Regional Board in General Surgery. Non-responders are being mailed up to three reminders. Survey administration will be complete in February 2006.

Results To date, response rates for each of the surveyed groups are as follows: BSTs 59.5% (103/173), ASTs in general surgery 61.2% (71/116), Orthopaedics 62.5% (35/56), Plastic and Reconstructive 66.7% (10/15), Urology 81.3% (13/16), supervisors 80.6% (29/36). Detailed analyses of survey responses will be presented.

Conclusion Findings from this survey could inform future plans for the development of SSCs to enhance surgical education.

SE003

ANATOMICALLY REALISTIC COMPUTATIONAL MODELS OF THE MALE AND FEMALE PELVIC FLOOR AND ANAL CANAL

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Purpose The understanding of the pelvic floor and anal canal, in the study of incontinence, has been limited by the inability to integrate both anatomy and physiology into a unified bioengineering model. Anatomically-based

modelling has the potential to overcome this limitation. We use such modelling techniques to help determine the mechanisms and muscular components involved in maintaining continence.

Methodology and Results Realistic three-dimensional anatomically based computer models of both the male and female pelvic floor and anal canal were constructed using cross-sectional two-dimensional photographs from the Visible Human Project (VHP) [1].

Each of the components of interest was manually segmented for axial slices of the Visible Man and Woman. Computational meshes with derivative continuous boundaries were constructed from these data points using an iterative fitting procedure [2] to an average root mean square error of less than 2 mm.

The VHP [1] provides the highest quality data set currently available, however, the images were obtained from cadavers, and thus there is no muscle tone. For this reason, we plan to repeat this process using dynamic MRI studies from 'normal' volunteers for comparison with the existing models.

Conclusions We have developed anatomically realistic computational three-dimensional models of both the male and female pelvic floor and anal canal. This will make it possible to examine the interaction of physiological events on the geometry and microstructure of this area.

1. Spitzer *et al.* 1996, J. Am. Med. Inform. Assoc. 3 118–130.
2. Bradley *et al.* 1997, Ann. Biomed. Eng. 27 96–111.

SE004

LAPAROSCOPIC HERNIA COURSE

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Laparoscopic inguinal hernia repair is not taught routinely in the public hospital system. There is a need for a course to facilitate the acquisition of the knowledge and skills required to perform the procedure.

The aim of this paper is to present the components of the course which have been held at St Vincents Hospital, Sydney for the past 2 consecutive years and the evaluation of the course by the participants.

The course is divided into the didactic components which include: the history of hernia repair, a comparison of the transabdominal (TAP) and totally extraperitoneal approach (TEP), the laparoscopic anatomy of these approaches, a review of the literature comparing the outcome of open versus laparoscopic techniques and a personal audit of 500 consecutive cases of one of the authors. The practical components involved the demonstration of the technique and anatomy using videos and live operating which allowed for interaction between the surgeons and the audience. The participants were then able to familiarise themselves with the specialised instruments and the procedure on a commercially available model. There were a total of 27 participants who were asked to evaluate each component of the course. The median score in terms of meeting their requirements was 80% (70–199) range.

Intensive courses such as these can provide trainees with many useful technical tips and the essential knowledge to safely perform the procedure.

However the facilitators acknowledge the limitations of such a course and the need for proctorship in the early learning period.

SE005

USING TRAINING THEORY TO DESIGN AND VALIDATE A COURSE TO TRANSFER THE SKILL OF LAPAROSCOPIC SUTURING

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Purpose To utilize the theories of training and skill acquisition to develop and validate a course to transfer the skill of laparoscopic suturing with intracorporeal knot-tying.

Methodology An analysis of the different approaches to laparoscopic suturing settled on intracorporeal knot tying with a square surgeon's knot using monofilament suture material and standard curved needles with a single needle holder as the best reflection of the requirements of our current surgical practice. This technique was analysed and deconstructed to determine the best way to transfer the skill – an open instrument tie with the correct knot is taken as the baseline skill to which the complexities of the laparoscopic approach are applied in turn – 1. fixed lateralization of the hands; 2. pivoted laparoscopic instruments but maintaining a 3-dimensional perspective;

3. video-laparoscopy with loss of 3-dimensional perspective. Techniques for needle handling were also instructed. Participants were guided through each stage at their own pace and were assessed pre- and post-training.

Results 7 participants completed the course in a single half-day session. Participants included 1 intern, 3 basic surgical trainees with no or limited laparoscopic experience and 3 advanced surgical trainees. All demonstrated full acquisition of the instructed skill and reported satisfaction with the course. Participants reduced their time by a mean of 49% ($P = 0.03$).

Conclusions With the prevailing limitations of theatre time and medico-legal concerns, the skill of laparoscopic suturing is best acquired outside of the operating room. Borrowing from concepts of training theory from other domains can facilitate this skill acquisition.

SE006

EXPANDING PDA USE IN SURGICAL AUDIT

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Background Surgical trainees are required to keep a logbook of their training. The use of a PDA for electronic data collection can allow bedside entry of data whilst preparing trainees for a lifetime of audit responsibilities.

Methods A HandBase 3 (DDH Software) database was developed for use on both palm and windows CE devices. The database was designed to allow linkage with the desktop Filemaker audit created by David Watters downloadable from the RACS website. Initially a Tungsten E Handheld (Palm®) and then a Treo 650 smartphone (Palm®) were used to collect data.

Results Six terms comprising over 2000 procedures of data have been collected prospectively. In the past 12 months 700 cases have been added. 100% of data required for assessment of surgical experience and throughput by the college was kept. Outcome data necessary for assessing performance and learning was easily recorded. 75% of my own patients had complete data entered according to minimum and expanded data sets. The database could be exported easily to Filemaker Pro (Authors preference), Microsoft Excel and Access. The PDA allows continual access to patients data to update follow up, search for procedures and find patients, which is particularly useful in fielding GP's calls.

Conclusion PDA's are extremely useful in Surgical Practice, particularly for audit. HandBase produced a comprehensive logbook that satisfied College requirements and runs smoothly on a PDA or smartphone. These devices and databases facilitated a healthy audit practice early in my career and are the foundation for my patient information system in the future.

SE007

ASCENDING THE LEARNING CURVE IN LAPAROSCOPIC EXTRAPERITONEAL HERNIA SURGERY USING AN INNOVATIVE HERNIA TRAINER

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Purpose Laparoscopic totally extraperitoneal (TEP) repair for groin hernias has a steep learning curve, which is one of the reasons for the limited acceptance this technique has received. There are several training instruments, both physical and virtual, which have been devised to help surgeons learn laparoscopic surgical techniques. The present study evaluates the utility of an innovative physical trainer, which has been developed as an educational tool for teaching laparoscopic TEP repair.

Methodology 18 surgeons, with a comparable level of surgical experience were randomized in two groups. Group A ($n = 9$) was provided surgical training using presentations, video recording and observing live operative sessions. Group B ($n = 9$) used the hernia trainer in addition to the above mentioned teaching instruments. A post training feedback questionnaire was obtained to assess the level of understanding participants had gained and the results analyzed.

Results Group B trainees demonstrated a better understanding of TEP hernia surgery in five out of six parameters ($P < 0.05$). They particularly demonstrated a better understanding of the extraperitoneal anatomy and of the techniques for sac dissection and mesh placement ($P < 0.01$). A higher number of Group B trainees were willing to offer this procedure to their patients as a procedure of first choice (60% vs 86.4%).

Conclusion The hernia trainer used in this study has incorporated unique features with materials simulating peritoneum and the hernial sac, which provided a better understanding of TEP surgery. Overall, the trainer proved to be a useful education tool in getting a faster grasp of 'real' surgery.

SE008

ANALYSIS OF SURGICAL CLINICAL INDICATORS: POTENTIAL FOR IMPROVEMENT

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Purpose The Australian Council on Healthcare Standards (ACHS), with colleges and other stakeholders develops clinical indicators. It reports aggregated data to participating hospitals on a six monthly basis to assist them to review their performance, benchmark against other similar organisations and identify areas for potential improvement. The objectives of this study are to report on this ACHS Comparative Reporting Service and to summarise the accumulated surgical data between 1998–2005.

Methodology The mean, 20th and 80th centiles were calculated, and data were plotted over an eight year period. Trends and significant differences between different strata and hospitals were identified.

Results Sixteen indicators address the outcomes of specific surgical procedures. Rates for a poor outcome were about 1%, except for in-hospital death from CAGS and AAA repair which had mean rates of 2% to 5%. With CAGS, some hospitals had statistically significantly high and low rates, involving an excess of 38 deaths over the 8 year period.

With the number of completely excised malignant skin tumours, 22 of the 132 hospital reports indicated significantly high or low rates, involving an excess of 556 incomplete excisions.

The results for paediatric appendectomy with normal histology show an increased rate, wide variation and six significantly high rates from 135 hospital reports.

Conclusion Many indicators reveal a high level of variation in the rates between hospitals. This should lead to questions such as: are these trends and variations important, what are the causes and what could be done to improve them?

SE009

CANMEDS – WHAT LESSONS FOR AUSTRALASIAN SURGEONS?

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Following the changes in the healthcare environment and the evolving issues and trends in medical education, Fellows of the Royal College of Physicians and Surgeons of Canada began to work on identifying the core competencies generic to all specialists necessary to meet the needs of society. Seven essential roles were identified which include Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar and Professional, and the key competencies required to fulfil these roles were ascertained. This was revised in 2005 and is now known as The CanMEDS 2005 Physician Competency Framework.

This framework has gained wide acceptance worldwide and has been adapted by the Australian Medical Council as a requirement for the accreditation of Specialist Colleges. The College is required to demonstrate that this framework has been implemented by early 2007 in order for its educational programmes for trainees and Fellows to be accredited beyond this date. Following a review of the CanMEDS Framework it was decided to add Technical Expert, Judgement and Decision Making as further essential roles. Major progress has been made by the various Boards and Specialist Societies and Associations and College staff in preparing the curricula and required competencies but much work remains to be done to ensure that all technical and non-technical competencies are appropriately assessed either in the workplace or in formal examinations.

There is no doubt that the CanMEDS Framework has been a major milestone in medical education and clinical practice in ensuring that all required competencies are acquired. However, like all new and even acclaimed innovations a balance is required and this will be discussed.