

Effectiveness of Standardized Clerkship Teaching Across Multiple Sites

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Background. Surgical clerkship teaching for medical students at the University of Auckland is undertaken across multiple clinical campuses. Concerns are that differences in clinical experience may result in variability of learning outcome achievements. Our objectives were to investigate whether differences in clinical experience existed between teaching sites, and whether these differences correlate to differences in learning outcome achievements. Influence of clinical experience on future career choice was also explored.

Materials and Methods. Prospectively collected data were retrospectively reviewed. Clinical experience from assigned hospitals was collected using student Feedback Questionnaires and case history logbooks. Results were analyzed for inter-hospital differences. The Questionnaire included a question on influence of clinical experience on future career choice. A formative Objective Structured Clinical Examination (OSCE) was administered and results were analyzed for inter-hospital differences in learning outcome achievements.

Results. Feedback Questionnaires and case history logbooks identified inter-hospital differences in clinical experience. Clerkship enjoyment and involvement in theater correlated with increased likelihood of choosing a future surgical career. The OSCE had acceptable internal reliability (Cronbach's α 0.69–0.74) and strong correlations with other formal assessments, indicating its external validity. No significant inter-hospital differences in OSCE results were found after one-way analysis of variance comparison ($P = 0.125$).

Conclusion. Heterogeneity of clinical experience from multiple teaching sites did not translate into heterogeneity in achievement of learning outcomes when

teaching and assessment materials were standardized. Clinical experience during undergraduate clerkships may influence future career choices. The OSCE is a validated and reliable tool for assessing student achievement of learning outcomes. © 2011 Elsevier Inc. All rights reserved.

Key Words: surgical clerkship; medical student; clinical experience; objective structured clinical examination (OSCE).

INTRODUCTION

The educational climate throughout undergraduate medical education has a great impact on student satisfaction, achievement, and success [1]. It is now common practice for clerkships to be spread out amongst multiple teaching campuses, each providing a unique learning environment, clinical teachers with differing experience, and exposure to a diversity of patients. Under these conditions, studies have shown that there are differences in what the students see, learn, and ultimately achieve [2, 3]. Undergraduate clerkships also provide the opportunity for most medical students to develop their perceptions about various specialties [4]. The surgical clerkship provides medical students with the most concentrated environment for perceptions of surgeons and surgical careers to evolve [5].

Undergraduate general surgical teaching at the University of Auckland in fourth-year is undertaken across four separate clinical campuses and delivered by multiple clinical teachers. There are concerns that heterogeneity of clinical experience may result in heterogeneity of learning outcome achievements, and standardized learning materials, tutorials, and learning objectives are used to minimize the impact of this. This study was undertaken to:

- (1) investigate whether differences in clinical experience existed between the different teaching sites,

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TABLE 1

Learning Outcomes Expected at the End of a 6-Week General Surgery Clerkship

Acquisition and application of medical knowledge

1. Apply knowledge of basic anatomy, physiology and pathology to the management of general surgical patients.

- Determine the causes and mechanisms of shock.
- Illustrate the physiology of normal fluid and electrolyte balance.
- Describe the nature of intravenous replacement fluids.
- Summarize the causes and management of common abnormalities of water, sodium and potassium metabolism.
- Use recent research findings to outline the current status of solid organ transplantation in clinical practice.
- Describe the methods available for the provision of post-operative analgesia.

Professional, clinical, and research skills.

2. Evaluate general surgical patients presenting with a range of clinical problems.

- Elicit from patients presenting with a given problem, a relevant, logical and comprehensive history.
- Perform an organized and professional physical examination.

3. Formulate logical problem lists for a range of surgical patients.

- Develop a differential diagnosis list for the major problem(s) of the patients.
- Determine the most likely working diagnosis.
- Evaluate and select tests that will confirm or alter the working diagnosis.
- Interpret simple laboratory and radiology tests.

4. Prepare basic management plans for common general surgical problems.

- Apply best available evidence to solve clinical problems.
- Identify and discuss areas of controversy in patient management.
- Determine and correct gaps in underpinning knowledge.
- Apply CAT * methodology to a specific clinical question identified in a surgical patient observed during the clinical experience.
- Examine respective roles of a multidisciplinary team to provide optimal patient care.
- Prescribe fluid replacement regimens.

5. Evaluate a patient being prepared for surgery.

- Describe the principles for informed consent.
- Determine the role of preoperative medical assessment.
- Examine respective roles of a multidisciplinary team in peri-operative patient care.

6. Recognize common postoperative complications.

- Summarize the essential vital signs and systems to be monitored.
- Analyze and interpret common changes in vital signs observation charts.

Hauora[†] Maori[‡]

- Identify key Maori health issues and explain approaches to addressing the issues.
- Identify strengths and areas for improvement in both your communication and clinical skills when dealing with Maori patients.
- Develop an appropriate management plan for the Maori patient.
- Recognize particular issues for Maori with respect to tissue removal and general anesthesia.

Population and community based practice

- Suggest evidence based public health approaches that would reduce the burden of diseases requiring surgery.
- Understand the importance of community support structure for patients with surgical conditions, e.g., limb centre for amputees, hospice.

*Critically appraised topic.

[†]Maori philosophy of health.

[‡]Indigenous Polynesian people of New Zealand.

(2) whether these differences correlate to differences in achievement of standardized surgical clerkship learning outcomes (Table 1),

(3) whether early surgical clinical experience influences future career choices of fourth-year medical students at the University of Auckland.

The medical program at the University of Auckland is a 6-year degree with 140–170 students in each year. It is divided into pre-clinical (year 1–3) and clinical (year 4–6) stages. The General Surgery clerkship in fourth year is a 6-wk attachment, and the class is divided into five rotations. During each rotation, students are attached to one of four University-affiliated public teaching hospitals of their choice. All

teaching sites are urban tertiary referral centers with both post-graduate surgical trainees and medical students rotating through clinical rotations. Students are attached to surgical teams, provided with standardized tutorials and learning materials, and clinical teachers use standardized assessment methods to grade students.

The four teaching campuses differ in their patient numbers, available surgical subspecialties, and student numbers. One site receives a significantly lower number of medical students, while the other three sites have similar numbers each year. The emergency departments vary in how busy they are, with rates of patient admissions ranging from 43,000 to 91,000 per annum. One site does not have a dedicated specialist

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