Surgical Skills Training with Models

Maurice Brygel

Correspondence:
Associate Professor, Notre Dame Medical School, Australia
Melbourne Hernia Clinic, Melbourne Haemorrhoid and Rectal Bleeding Clinic, Australia
Email: mbrygel@netspace.net.au

Received: June20, 2017; Accepted: July 10, 2018; Published: August 1, 2018
Citation: M Brygel. Surgical Skills Training With Models. World Family Medicine. 2018; 16(8): 46-47.
DOI: 10.5742MEWFM.2018.93486

Abstract

The article describes the outcome of a design and development collaboration between a surgeon, a skills laboratory director and a 3D printing manufacturer which has led to the development of an effective medical simulation model for skills acquisition in ingrown toenail procedures.

Key words: Surgery, surgery skills, medical simulations, continuing medical education

Introduction

Until recently surgical procedures and training have been carried out under an apprenticeship style system. Here a student, young doctor or surgical trainee observes, and through a series of steps, incrementally develops the skills needed in performing an entire operation. This process has traditionally been carried out in theatre on live patients.

With technological advances, medico-legal pressures and many new operations being devised the traditional learning model has become outdated.

As a result skills laboratories have been introduced. These range from the most basic skills acquisition such as making incisions, knot tying and suturing, to major surgery. With the introduction of endoscopic surgery and radical new techniques the apprentice system did not work as well. Skills required, such as laparoscopic knot tying, were more technically difficult. The skills laboratory is now used for all types of orthopaedic, vascular and general surgery procedures such as the common gall bladder and hernia operations.

But it is not just for these complex procedures that more training is required. As part of the ongoing pursuit of excellence continuing education became mandatory. It was expected from the profession and also from the community. The development of skills laboratories and training workshops helped achieve these goals.

In medical training, young doctors are not exposed to some of the most basic skills such as the diagnosis of and surgery for skin lesions, ingrown toe nails, suturing, lacerations and drainage of an abscess.

As a result there were many practitioners in both the metropolitan and rural & remote areas deficient in these skills and who required additional training. I have had an interest in teaching these skills and have been designing, producing and conducting training programmes at the

Royal Australasian College of Surgeons for many years. I expanded this training in Victoria, Australia and interstate to cities and rural communities in Queensland.

It was realised early on there was a need to pass on the clinical knowledge and surgical skills which have been handed down from generation to generation. Initially a series of books and videos titled the Video Book of Surgery were developed. However, the doctors still need to do hands-on practice even though the videos demonstrated the techniques.

This resulted in the development of a series of workshops on common conditions seen in general practice. These have a variety of titles including Brygel's Surgi Skills, Surgical Office Skills (SOS), and Skin Cancer Skills.

One particular topic is the treatment of ingrown toenails. Ingrown toenails are a common condition generally affecting adolescents. They usually occur in the big toe and can be quite a painful condition and infection commonly supervenes.

Ingrown toenails can be treated in a variety of ways in the office setting. Surgical treatment can involve simply the removal of the nail edge alone. Phenol can be used to ablate the nail bed. An operation termed wedge resection surgically excises this nail bed. The procedure is commonly performed in the office setting under a local anaesthetic (digital block).

Students and doctors at the tertiary hospitals, where complex surgery is the order of the day, rarely had the opportunity to even see or practise this procedure. Thus these doctors often went to remote & rural areas without the training to implement these techniques.

In recent years a simple synthetic toe model was developed and very low-cost copies are also now available. These have been ineffective as a model of the toe and do not reproduce what is required to simulate the procedure.

The rapid development of 3D printing technology has provided scope for innovation in medical education. With experience in architectural model-making and 3D printing, Ben Croudace, centred in Perth, founded a company called Medimodels to move into the medical model business. As a result he contacted Dr David Lawrence, the manager of the Skills & Education Centre at the Royal Australasian College of Surgeons head office in Melbourne, to discuss opportunities for the development of medical models. On his advice, Ben commenced development of a toe model for teaching the surgical treatment of ingrown toenails. Under the guidance of the A/Prof Brygel, the model went through a series of iterations resulting in a sophisticated model that is now being used in workshops throughout Australia. The model is now being exported to several other countries.

On this model doctors can practice:

1. digital block anaesthesia
2. excision of a nail edge
3. wedge resection (excision of a portion of the nail bed)
4. the use of phenol ablation
5. bandaging
6. post-operative care.

As a result of this interest in ingrown toenails, Brygel's Surgi Skills has developed an online teaching program with videos to support training with the models.

Toe model

Conclusion

The use of simulation and educational technology provides a far improved environment to both demonstrate and practice surgical skills.

References

(1) Croudace B, Brygel M. The Architecture of Medical Simulation - Collaborative Design Approach brings sophistication to teaching with procedure-specific silicone simulation. . Middle East Journal of Business. 2018; 13(3): 21-23. DOI: 10.5742/MEJB.2018.93467.