TRAINING WITH SIMULATION

HOW SHOULD WE TRAIN THE SURGEONS OF TOMORROW?
Dr. William Halsted
THE APPRENTICESHIP MODEL
OF TRAINING
APPRENTICESHIP IN SURGICAL TRAINING

Essential elements of apprenticeship

Repeated large-volume **practice**

( long hours/many years!! )

**Relationship** with trainer

“COMPETENCE” = “EXPERIENCE” (ie TIME SERVED)
CHALLENGES FOR SURGICAL EDUCATION AND TRAINING

• Duration of training (years)

• Working time restriction (hours)
CHALLENGES FOR SURGICAL EDUCATION AND TRAINING

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- Working time restriction (hours)
  
  Repeated large volume practice
  
  Relationship with trainer
CHALLENGES FOR SURGICAL EDUCATION AND TRAINING

• Duration of Training (years)

• Working time restriction (hours)

• Increasing technology in surgical practice

• Cancellation of elective surgery

• Service targets/ decreased time for training

• Changing public expectations
CHALLENGES FOR SURGICAL EDUCATION AND TRAINING

• Duration of Training (years)
• Working time restriction (hours)
• Increasing technology in surgical practice
• Cancellation of elective surgery
• Service targets/ decreased time for training
• Changing public expectations
• Requirement to verify and document competence
THE APPRENTICESHIP SYSTEM

BUT: Was it really that good?

Much wasted time
Opportunity rather than defined curriculum
Assumption of competence
  Subjective assessment/ no assessment tools
  Personality based
Lack of standardisation across programmes
Inefficient learning methodologies

PATIENT SAFETY!
HOW SHOULD WE TRAIN THE SURGEONS OF TOMORROW?
CHANGING TIMES: TECHNOLOGY
CHANGING TIMES: PEOPLE
CHANGING TIMES: HEALTHCARE PROCESS

Healthcare Economics
Healthcare Management
Process Improvement/LEAN
Clinical Governance/Pt Safety
Information Technology
Surgical Innovation
Global Surgery
AIRLINE PILOT TRAINING
AIRLINE PILOT TRAINING
HOW SHOULD WE TRAIN THE SURGEONS OF TOMORROW?

Remodelling for the future
NATIONAL SURGICAL & CLINICAL SKILLS TRAINING CENTRE
Simulation in Surgical Training is a complete waste of time and money
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UNLESS
Simulation in Surgical Training is a complete waste of time and money

UNLESS

It is embedded in the Curriculum for Surgical Training
NATIONAL SURGICAL AND CLINICAL SKILLS TRAINING CENTRE

Physical facilities
Curriculum
Training models
Faculty
IT’S NOT ABOUT PLAYING WITH THE TOYS!
OPERATIVE SURGICAL SKILLS COURSE

6 full days each year

1. Before

2. During

3. After
OPERATIVE SURGICAL SKILLS COURSE

6 full days each year

1. Before
2. During
3. After

Book classes
Class content
Learn steps
Practice skills
Learning outcomes
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SMARTPHONE APP FOR SURGICAL TRAINEES

One Handed Knot Tying - Basic Surgical Video to follow - Slow Motion Loop

Laparoscopic Appendectomy

Steps
1. Insertion of Ports
Camera is introduced through the periumbilical port.
At the end of this module, you should **KNOW** certain things and you should **BE ABLE TO DO** certain things.

These are your **Learning Objectives** for this module.
MODULE LEARNING OBJECTIVES

You should **KNOW:**

**A. Surgical Anatomy**
- Surface markings of inguinal canal
- Boundaries/walls of inguinal canal
- Nerves of the inguinal canal
- Borders/surface markings of superficial/deep inguinal rings
- Contents and layers of spermatic cord
- Borders/significance of Hasselbach’s triangle

**B. Operative Surgery**
- Indications/contraindications for inguinal hernia repair
- Types of open/laparoscopic repair
- Local/regional anaesthesia techniques
- Differentiating direct/indirect inguinal hernia at surgery
- Types of mesh
- Complications of inguinal hernia repair
MODULE LEARNING OBJECTIVES

You should Be Able To Do:

• Choose and make correct incision for inguinal hernia repair
• Open anterior wall of inguinal canal
• Identify and preserve the nerves of the canal
• Mobilise the spermatic cord
• Identify and dissect indirect hernia sac
• Transfix and excise sac
• Repair the deep inguinal ring
• Prepare artificial mesh to appropriate size and shape
• Place and fix the mesh
• Close inguinal canal and close wound
OPERATIVE SURGICAL SKILLS COURSE

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SURGICAL BOOTCAMP

Intensive 5 day introductory course in surgical skills/management

Technical Skills:
- Knot tying
- Suturing
- Wound closure
- Anastomosis
- Surgical technique/theatre skills
- Drains/catheters
- Minor surgical procedures
- Laparoscopy/Endoscopy
Non technical skills:

Critical care
Emergency care
Clinical decision making
Common surgical problems
Risk management
Caring for yourself
Demonstration
Practice
Proximate feedback
Coaching
Assessment
OPERATIVE SURGICAL SKILLS COURSE

6 full days each year

1. Before

2. During

3. After
SIMULATION TAKE HOME KIT
SERIOUS GAMES IN SURGICAL SKILLS TRAINING
AVAILABLE NOW FOR NINTENDO Wii U  BUY NOW
SURGICAL TECHNICAL SKILLS

Expert performance
SURGICAL TECHNICAL SKILLS

Expert performance

Deliberate practice
SURGICAL TECHNICAL SKILLS

Expert performance

Deliberate practice

PURPOSEFUL, GOAL-ORIENTED
EXPERT PERFORMANCE

- Define performance standards
- Practice
- Feedback: proximate/structured
- Encourage to achieve higher standards (coaching)
- Practice
- Feedback
- Still more practice!!
Our BIG challenge!

I have done this once

I don’t need to keep doing it

I am now an EXPERT
SURGICAL SKILLS TRAINING

Advantages of skills training outside O.R:

- Decreased risk to patients
- Availability
- Exposure to less common procedures
- Standardisation of training and assessment
- More efficient use of OR time
The way forward: STANDARDISATION

Defined syllabus
Pre-course work
Practice in safe environment
  simulation
Feedback and coaching
Post-course support
Assessment and certification
A. Surgical skills laboratory:  *Acquire skills*

- Demonstration
- Practice
- Coaching
- Feedback
- Assessment
- Documentation of proficiency
A. Surgical skills laboratory:  *Acquire skills*

Diagram:

- **Demonstration**
- **Practice**
- **Coaching**
- **Feedback**
- **Assessment**
- **Documentation of proficiency**
PATHWAY TO COMPETENCE IN OPERATIVE SURGERY

B. Workplace: *Develop skills*

- Observation/practice
- Documentation of capability
- Accumulate experience
- Achieve competence
- Expert/mastery
SURGICAL TRAINING

From NOVICE to EXPERT

Dreyfus model:

Novice
Advanced beginner
Competent
Proficient
Expert
SURGICAL TRAINING

From NOVICE to EXPERT

Dreyfus model:

Novice
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Expert

EXPERIENCE

PRACTICE+
ASSESSMENT
NATIONAL SURGICAL AND CLINICAL SKILLS TRAINING CENTRE

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ANNUAL OBJECTIVE SKILLS ASSESSMENT

- Inguinal hernia repair
- S-F junction ligation
- Resection of IGTN
- Excision of sebaceous cyst
- Bowel anastomosis
THE SURGICAL ENVIRONMENT
Components

- Personality and behaviour
- Human performance and error
- Communication
- Negotiation and conflict resolution
- Teamwork and leadership
- Decision making and judgement
- Human overload
HUMAN FACTORS IN PATIENT SAFETY

Essential components

Full team

Realistic simulations

- Briefing
- Practical exercises
- Debriefing

Regular reinforcement

Assessment

The team that WORKS together should TRAIN together!
Samsung Gear VR

Better wearing experience
- 25% lighter than previous version
- Enhanced touchpad
- Improved ergonomic design

Compatible with more smartphones

Enhanced content with hundreds of new options
AUGMENTED REALITY
COMPETENCE BY DESIGN rather than COMPETENCE BY TIME

HOW SHOULD WE TRAIN THE SURGEONS OF TOMORROW?

TRAINING WITH SIMULATION

CURRICULUM
DELIBERATE PRACTICE/ SIMULATION
TECHNICAL/ NON-TECHNICAL BLEND
ASSESSMENT
PROFESSIONAL TRAINERS