Design and implementation of a Cardiothoracic surgery ‘studentship’

**Cindy Rodrigues Cleto** ¹ Gillian Hardman ² Antony H Walker ³

1. Liverpool University Medical School
2. Health Education Northwest
3. Lancashire Cardiac Centre, Blackpool Victoria Hospital
Introduction

• Worldwide the number of applicants to cardiothoracic training programmes is declining \(^1,^2\)

• As a small specialty with a centralised service, access and exposure to cardiothoracic surgery for medical students and junior doctors is becoming increasingly rare

• ST1 level application

Inspiring the next generation of Cardiothoracic Surgeons: an easily reproducible, sustainable event increases UK undergraduate interest in the specialty

Andrew Bridgeman*, Ross Findlay*, Aroon Devnani†, Diana Lim†, Krizun Loganathan†, Philip McElnay§, Douglas West§ and Aman Coonar§

Original article
Inspiring Medical Students to Pursue Surgical Careers: Outcomes From Our Cardiothoracic Surgery Research Program


Simulation Experience Enhances Medical Students’ Interest in Cardiothoracic Surgery

Leora J. Tesche, MD, Richard H. Feins, MD, Matthew M. Dedmon, PhD,

Sustained Supervised Practice on a Coronary Anastomosis Simulator Increases Medical Student Interest in Surgery, Unsupervised Practice Does Not

Xiaoying Lou, BS, Daniel Enter, MD, Luke Sheen, BA, Katherine Adams, BS,
Other undergraduate education initiatives
Introduction – *The student perspective*
Methods

• 4 students were selected from applicants following advertisement through our local affiliated medical school
• 3 female, 1 male
• 2 year 1 students, 2 year 2 students
• 2 students per programme attending for a residential, one week, Monday to Friday course
• Accommodation and 2 meals per day included in the course fee
• Subsidised by funding from Ethicon
• Cost of £45 per student
Programme design – Course Aims

• Shadow a cardiothoracic registrar and consultant during daily activities
• Gain insight into the working life of a Cardiothoracic trainee
• To be introduced to the requirements for a career in Cardiothoracic Surgery
• To be introduced to the concepts of Continuing Professional Development, Continuing Medical education and Clinical Governance
• To begin to develop clinical skills in cardiovascular history taking and examination and basic surgical skills, including both technical and non-technical skills, with an introduction to the concept of Human Factors in Surgery
Pre-course material

Cardiac intensive care unit (CICU)
What you will see
Monitoring
- 3 lead ECG, Heart rate and rhythm
- Invasive blood pressure monitoring - mean (MAP), systolic and diastolic blood waveform
- Central venous catheter - central venous pressure (CVP) and waveform
- Pulmonary artery catheter - cardiac output studies
- Pulse oximetry
- Non-invasive blood pressure (NIBP)
- Arterial blood gas measurement
- Fluid balance "input/output" - urinary catheter
- Drainage

Therapy
- Invasive and non-invasive ventilation
- Pharmacological cardiovascular support
  - Inotropes
  - Pressors
  - Inotropes
- Mechanical cardiovascular support
- Renal support

Routine post-operative care

Coronary artery bypass graft (CABG)
The operation
1. Median sternotomy
2. Long saphenous vein harvest
   targets assessed
4. Left internal mammary artery harvest
5. Systemic heparinisation
6. Pericardial stay sutures placed
7. Arterial cannulation
8. Venous cannulation
9. Conduit assessed
10. Cardiopulmonary bypass initiated
11. Myocardial protection cannula placed
12. Aortic cross clamp applied
13. Antegrade cardioplegia given
14. Distal anastomosis
15. Insufflation cardioplegia delivered
16. Re-warming
17. Cross clamp removed
18. Proximal coronary anastomosis
19. De-airing of grafts
20. Initial anastomosis
21. Weaning from bypass
22. Venous cannula removed
Introduction to the course

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<td>History</td>
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<td>Case based discussion</td>
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<td>Teaching session</td>
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<td>Cardiopulmonary bypass</td>
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<td>Cardiac anatomy</td>
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<td>Cardiac physiology</td>
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<td>Simulation and skills centre</td>
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<td>Anastomosis trainer</td>
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<td>Knot tying skills</td>
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<td>Cardiac surgery: CABG</td>
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<td>Cardiac surgery: Valvular heart disease</td>
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Key Questions in Cardiac Surgery

Cardiopulmonary Critical Care

Cardiothoracic Surgery
## Timetable

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<th>8.00</th>
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<tr>
<td><strong>Monday</strong></td>
<td>Introduction Ward round CICU</td>
<td>Theatre briefing</td>
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<td><strong>Tuesday</strong></td>
<td>Ward round CICU</td>
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<td>Outpatient clinic</td>
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<td><strong>Wednesday</strong></td>
<td>Ward round CICU</td>
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<td>Teaching</td>
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<td><strong>Thursday</strong></td>
<td>Pre-op patient review SDA unit</td>
<td>Theatre briefing</td>
<td>Theatre 2</td>
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<td><strong>Friday</strong></td>
<td>Ward round CICU</td>
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<td>Simulation and skills centre</td>
<td>Summary and assessment</td>
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Activities

Clinical anatomy revision course
Cardiac and thoracic surgery

Cardiothoracic surgery: an introduction to the specialty

Gill Hardman ST3
Cardiothoracic Surgery
Health Education Northwest
Curriculum delivery

• Formative assessment
• Certificate of completion of the programme
Methods

• Students completed a self-assessment of learning needs in areas of:
  • cardiovascular and respiratory anatomy
  • Physiology
  • clinical skills

• Pre-course ‘attitudes to cardiothoracic surgery’
• Post course completion of learning gains
• Feedback on course organisation, material and delivery
Results

• None of the students had any prior experience in or exposure to Cardiothoracic surgery
• All were considering a career in Surgery
• All were considering a career in Cardiothoracic surgery
• All 4 students had previously self-organised hospital ‘work experience’ placements in other specialties
• 2 candidates had previously attended other surgical skills events in General Surgery
Student perspectives

• Why did you want to participate in this course?
  ‘learn what the job involves’
  ‘Inform career choice’
  ‘explore the life of a Cardiac surgeon’
  ‘Meet Cardiothoracic surgeons’

• What are you hoping to gain from this course?
  ‘insight into the specialty’
  ‘find a mentor in cardiothoracic surgery’
  ‘see what the job entails’
  ‘hands-on surgical skills’
  ‘improve clinical knowledge’
Results – Attitudes to cardiothoracic surgery

- My medical school has mandatory placements in cardiothoracic surgery
- My university offers special study components in cardiothoracic surgery
- I have heard cardiothoracic surgery referred to as a 'dying specialty'
- I have heard there are no trainee jobs in cardiothoracic surgery
- Cardiothoracic surgery is highly competitive

Pre course

- I understand the day to day practice of a cardiothoracic surgeon
- I understand the differences in practice between cardiothoracic surgeons and cardiologists
- I understand the scope of practice in cardiothoracic surgery

Strongly agree - Agree - Neutral - Disagree - Strongly disagree

Pre course

Post course
Results

I have a better understanding of cardiac anatomy.
I have a better understanding of cardiovascular physiology.
I have a better understanding of pre and post operative care.
My clinical skills have developed.
My surgical skills have been developed.

I have gained experience in surgery.
I feel better prepared to pursue a career in cardiothoracic surgery.
I have been encouraged to pursue a career in cardiothoracic surgery.
The material in this course is relevant to all my future practice.
I would like to pursue a career in cardiothoracic surgery.

Post course

Strongly agree
Agree
Neutral
Disagree
Strongly disagree
Results – Feedback for the course

‘I feel that I now understand what the specialty involves’

‘This has been one of the best courses in hospital. We were well looked after and taught about what we were seeing’

‘My favorite elements were the constant interaction with staff and exposure to surgery’

‘the attitudes of our supervisors were very supportive and positive, which was a change from other doctors who have normally put me down for my career goals’

‘my favorite elements of the course were the people and the specialty’
Career development, activities, mentoring....

- SCTS Forum 2016 presentation
- Articles for Student BMJ careers section and SCTS Bulletin
- Study projects
  - RSM Cardiothoracic section
  - ASiT meeting
- Careers advice
- Mentor/mentee relationships
The future

• Our programme will run again in June and July 2016
• Extended to second local medical school
• Extend Nationally
• Encourage participation with other centres
Discussion

• Do we need to do more?
• Understanding access to Cardiothoracic surgery for Medical students
• Understanding access to Cardiothoracic Surgery for Foundation and Core Trainees
• Better understand attitudes and perceptions to Cardiothoracic surgery
Conclusion

• We have designed a week long ‘studentship’ programme with a curriculum based on published evidence and expanding on existing student engagement work

• Our results echo what has previously been shown – student engagement is possible and results in improved understanding and interest in cardiothoracic surgery

• Further work is required to fully understand the extent of the problem of student and early postgraduate access to cardiothoracic surgery and the nature of attitudes to cardiothoracic surgery to better target interventions.
Thank you
References


