Evaluation of a live animal procedure lab for paediatric / neonatal retrieval doctors

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MedSTAR
Paediatric Emergency, Women's and Children's
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Acknowledgments

- Dr Jane Cocks (Medical Director, MedSTAR Kids)
- Sue Coretti (Nurse Educator, MedSTAR Kids)
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- Dr Tim Kuchel (Chief Vet, South Australia Health and Medical Research Institute)
- Dr Susan Kelly (MedSTAR registrar)

Scope

- See one, do one, teach one
- Can we do better?
- Study
- Work for the future

TEACHING ROUNDS

Teaching procedural skills

Teodor P Grantcharov,[1,2] Richard K Reznick[1]

"See one, do one" is not the best way to teach the complex technical procedures needed in many hospital based specialties

BMJ 2008;336:1129-31

"See one, do one": The Challenges

- The System
  - Increased number of trainees
  - Pressure of speed and maximal efficiency
  - Overcrowding & competing schedules
  - Availability rather than structured clinical objectives
  - Hierarchical approach
- Kids are not as sick!

- The Learner
- The Trainer

"See one, do one" The Challenges

- The System
- The Learner
  - Different rates
  - Pre-clinical programme
  - Learnt technical proficiency
  - Manikin based procedures
- The Trainer

"See one, do one" The Challenges

- The System
- The Learner
- The Trainer
  - Patient safety
  - Patient advocacy
  - Fear of litigation

A validated approach….BMJ 2008

Pre-patient training:	Flight school, the theory
Training in a clinical situation:	Take off / landing drill
Watch live procedure:	Observation flight….
Deconstruct key steps:	
Assist at procedure:	Co-pilot

Perform single steps under close supervision
Perform whole procedure
Continuous assessment and constructive feedback

Procedural Training: How long to mastery?

Jiang *et al. BMC Medical Education* 2011, **11**:39
http://www.biomedcentral.com/1472-6920/11/39

BMC
Medical Education

RESEARCH ARTICLE Open Access

Learning curves and long-term outcome of simulation-based thoracentesis training for medical students

Guanchao Jiang[1], Hong Chen[2*], Shan Wang[3], Qinghuan Zhou[4], Xiao Li[1], Kezhong Chen[1] and Xizhao Sui[1]

Table 1 Checklist for Procedures of Thoracentesis

1. Explain procedure to the patient, obtain a written informed consent;
2. Measure blood pressure;
3. Positioning the patient;
4. Recognizing the anatomic landmarks;
5. Percussion combine with CRX to determine the puncture site;
6. Wear hat, mask and gloves;
7. Checking equipment components;
8. Applying sterile technique;
9. Anesthetize the skin first;

Procedure Checklist

13. Change to the pleural puncture needle, advance carefully;
14. Aspirate while advancing until the color is the same as before;
15. Flexible the needle with nipper, connect the needle with drainage bag;
16. Aspirate the fluid slowly;
17. Let patient hold breath when withdrawing the needle;
18. Cover the puncture site with sterilized materials;
19. Send pleura fluid to lab for different examination;
20. Measure blood pressure again and have a auscultation;
21. Talk with patient to find any possible complications

Jiang et al. BMC Medical Education 2011

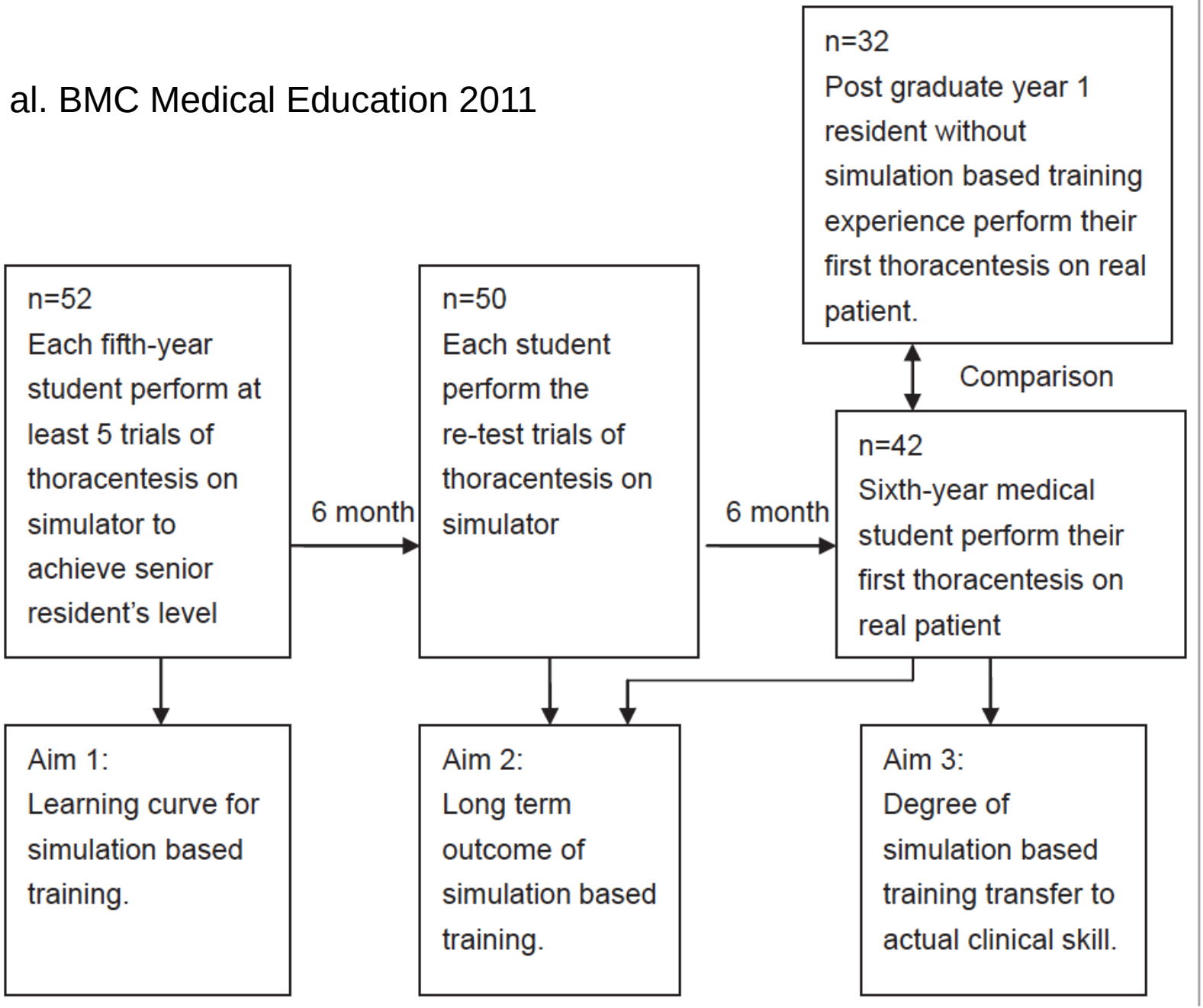
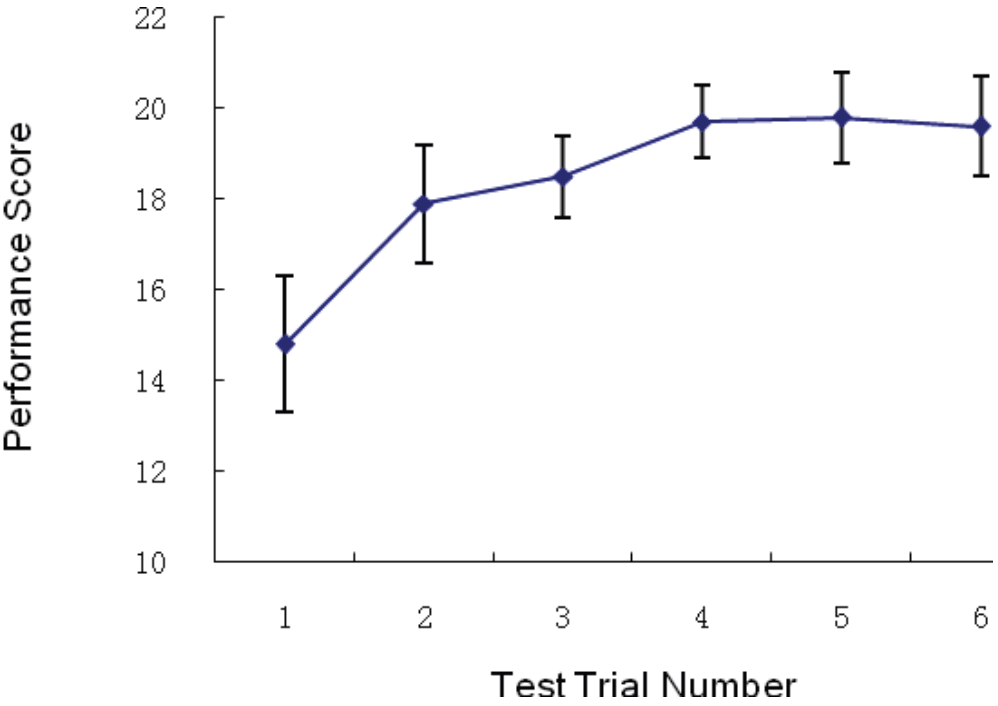
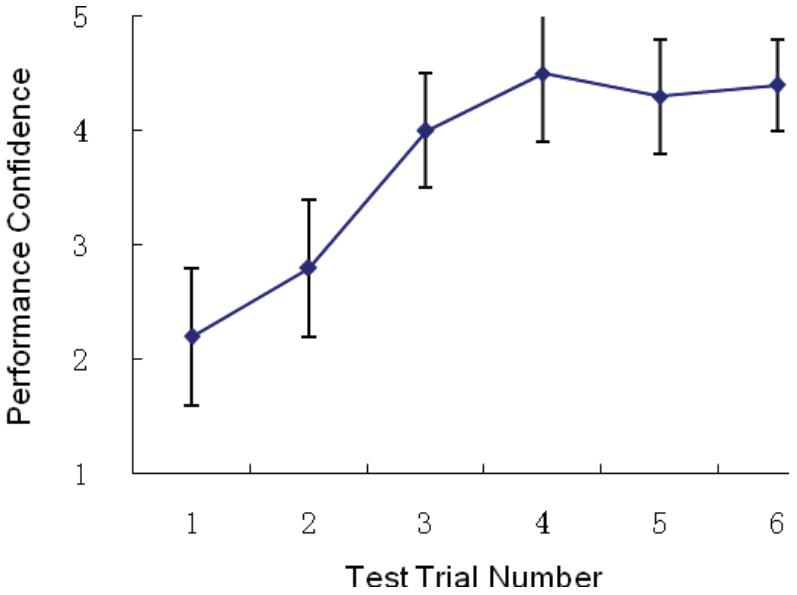
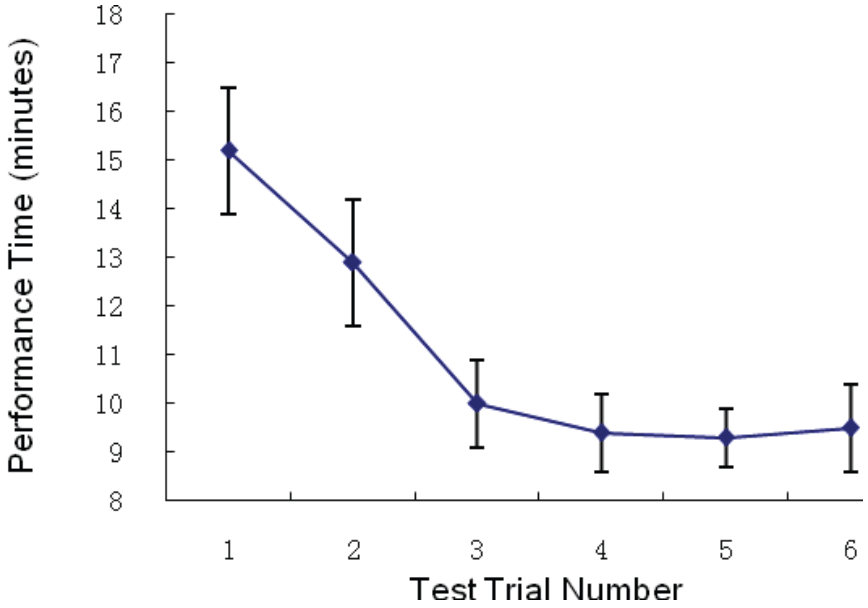


Figure 1 Flow chart showing how participants completed each of the 6 trials of thoracentesis on simulator and the actual patient care.







Jiang et al. BMC Medical Education 2011

“Do 6 Sims, See 4 Real, Do 1” Vs. “See 4 Real, Do 1”

Table 2 Comparison of personal characteristics actual clinical skills between the residents with and without simulation based training experience

	participants with training experience	participants without training experience	P value
Total	42	32	
Training year in hospital, (%)			
Postgraduate first-year residents	0	32(100%)	
Sixth-year medical students	42(100%)	0	
Gender, (%)			0.990
Female	17(40%)	13(41%)	
Male	25(60%)	19(59%)	
Self-reported prior procedures, (n)			
Simulation based	6.5	0	
Real patient based	0	0	
witnessed thoracentesis	4.2 ± 0.7	4.4 ± 1.1	0.282
Score of pre-test *	47.1 ± 1.3	46.9 ± 2.5	0.624
Clinical Competency Assessment			
Performance Score	19.2 ± 0.9	18.7 ± 1.1	0.034
Performance Time	10.4 ± 1.0	12.5 ± 1.4	< 0.001
Performance Confidence	4.4 ± 0.5	3.6 ± 0.6	< 0.001

* Pre-test, it is a multiple choice test on the knowledge about thoracentesis.

Jiang et al. BMC Medical Education 2011

Mastery, Overlearning and “Two-minute Training”

- Evidence exists of learning a specific skill to mastery (i.e. the point where the task is able to be completed without error) improves performance
- Overlearning refers to continued practice beyond this point (better if dispersed in time)
  - Leads to development of automaticity (automatic spatially guided movements)
  - Requires frequent opportunities for practice with feedback in the workplace
- Two-minute Training aims for development of automatic behaviours

ANIMAL PROCEDURE LABORATORY SURVEYS: USE OF THE ANIMAL LABORATORY TO IMPROVE PHYSICIAN CONFIDENCE AND ABILITY

Jonathan S. Olshaker, MD*, Charles K. Brown, MD†, Donald C. Arthur, MD, Deniz Tek, MD

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The Journal of EmergencyMedicine. Vol. 7, pp. 593-597, 1989

Table 1. Residencies Offering Animal Laboratories.

Frequency of Operation	Percentage
Weekly	6
Monthly	10
Every 3 months	6
Every 6 months	11
Annually	29

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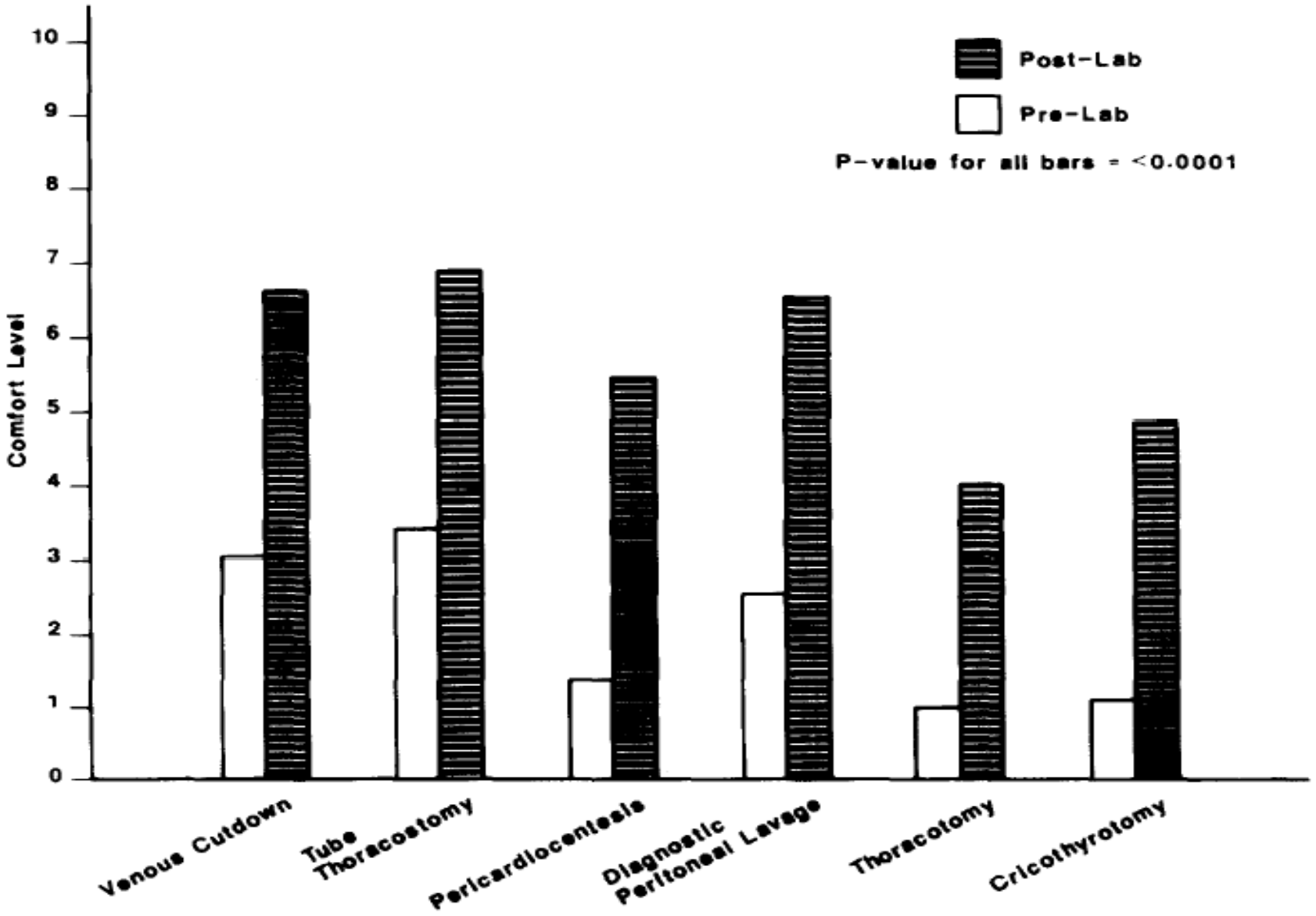
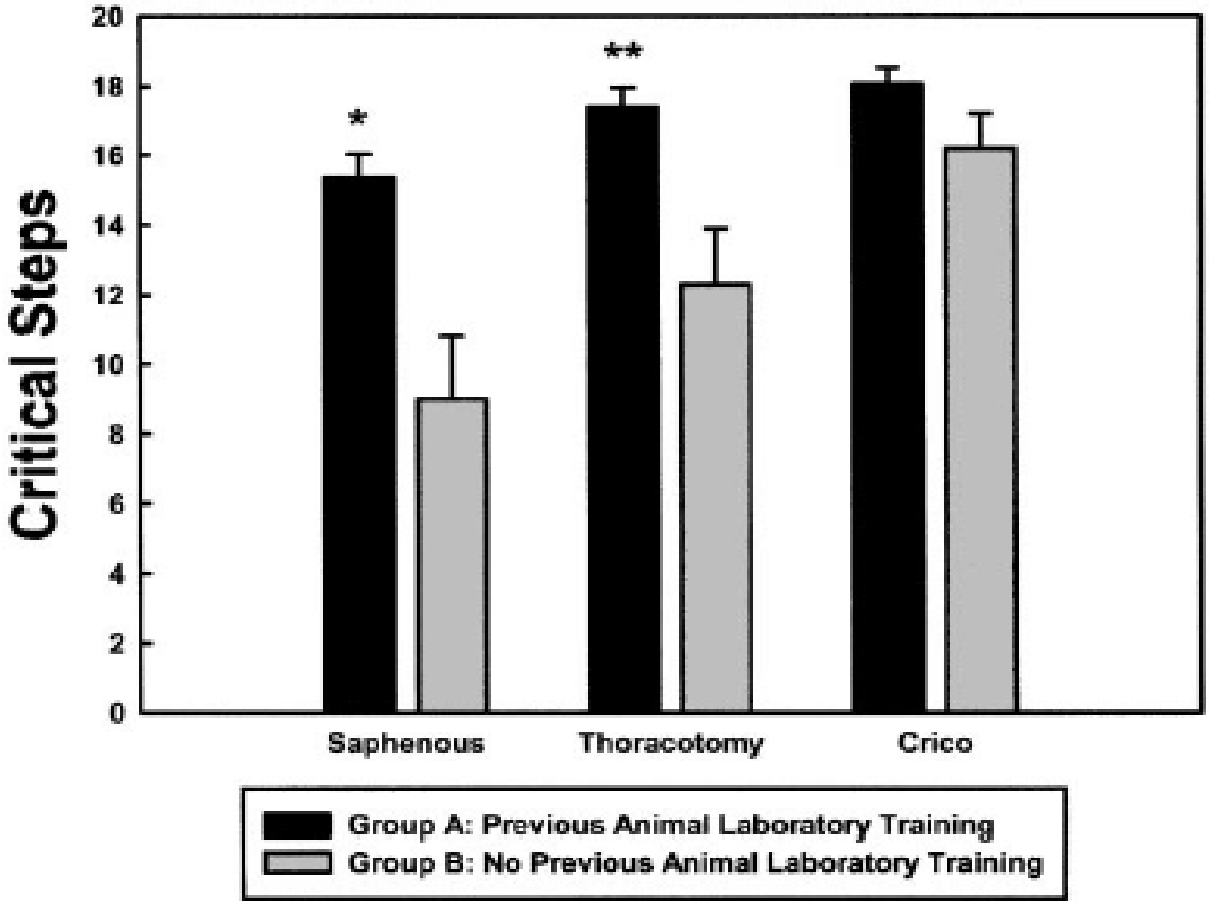


Figure 2. Comfort levels with resuscitative procedures.

EDUCATIONAL ADVANCES

Emergency Department Resuscitative Procedures: Animal Laboratory Training Improves Procedural Competency and Speed

Catherine B. Custalow, MD, PhD, Jeffrey A. Kline, MD,



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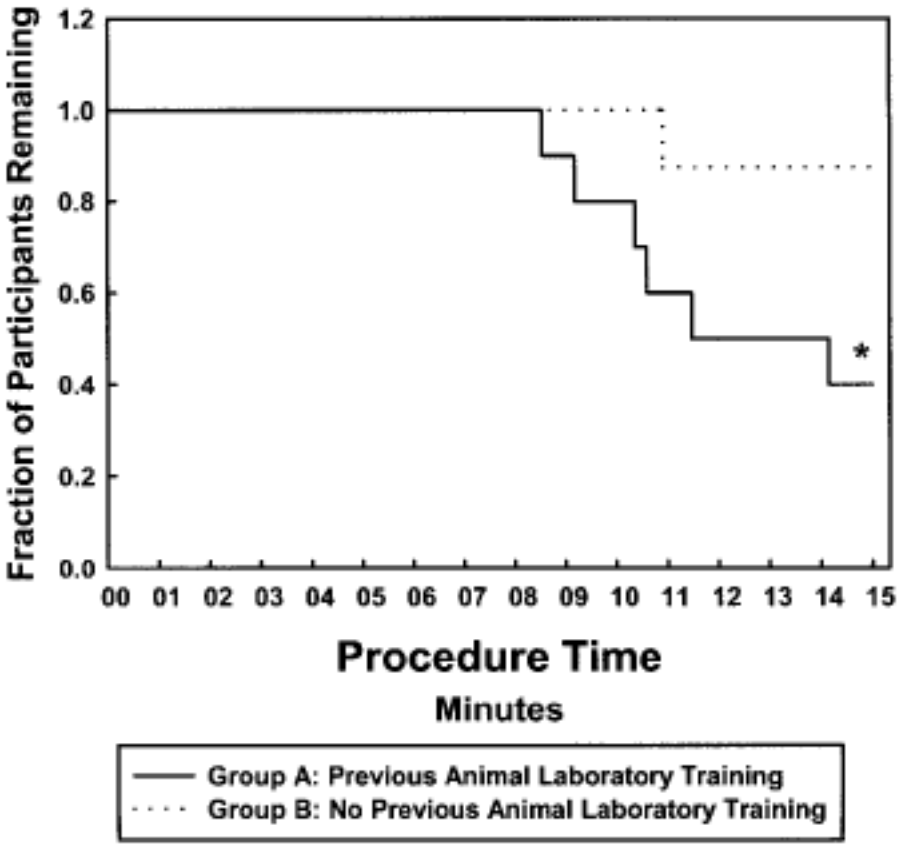
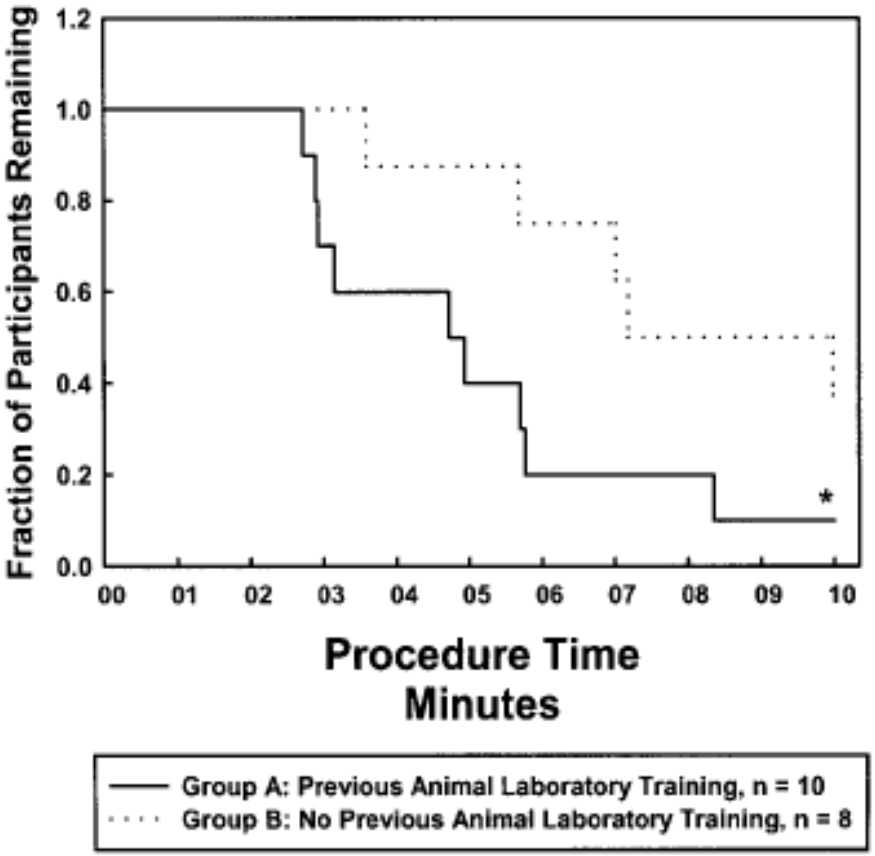




What about neonates / paediatrics?

MedSTAR *Kids* Critical Care Procedures Workshop

What about neonates / paediatrics?
MedSTAR *Kids* live animal lab

- Recognised need for minimum standard
- Heterogeneous training of doctors / nurses
- Exposed nature of the work

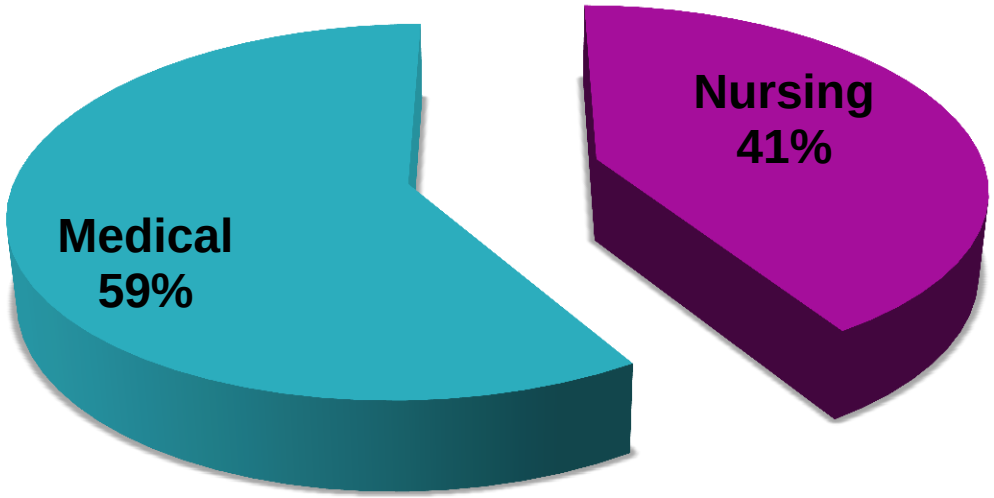
Methods

- Ethics
- Novel lamb model at South Australia Health and Medical Research Institute (SAHMRI)
- Identified key procedures (IO insertion, needle decompression, chest drain insertion, central line insertion, surgical airway, external pacing)

Methods

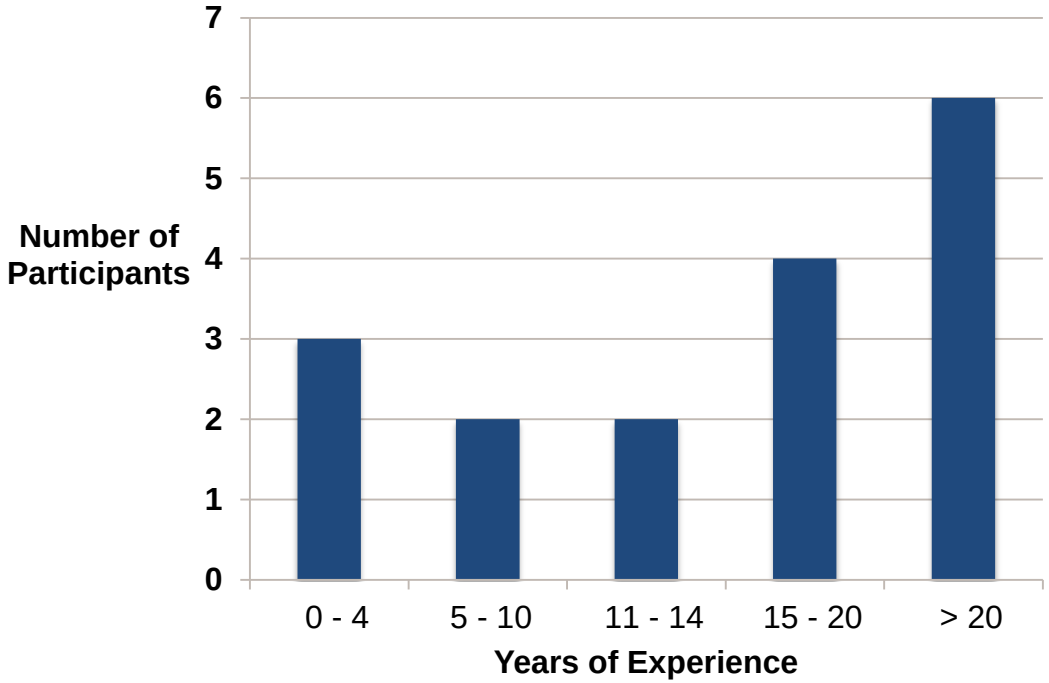
- Formal education programme
  - Pre-reading
  - Simulated procedures
  - Videos
- Small group teaching
- Pre and post animal lab survey
  - Demographics
  - Experience
  - Confidence and willingness to perform procedures

Demographics

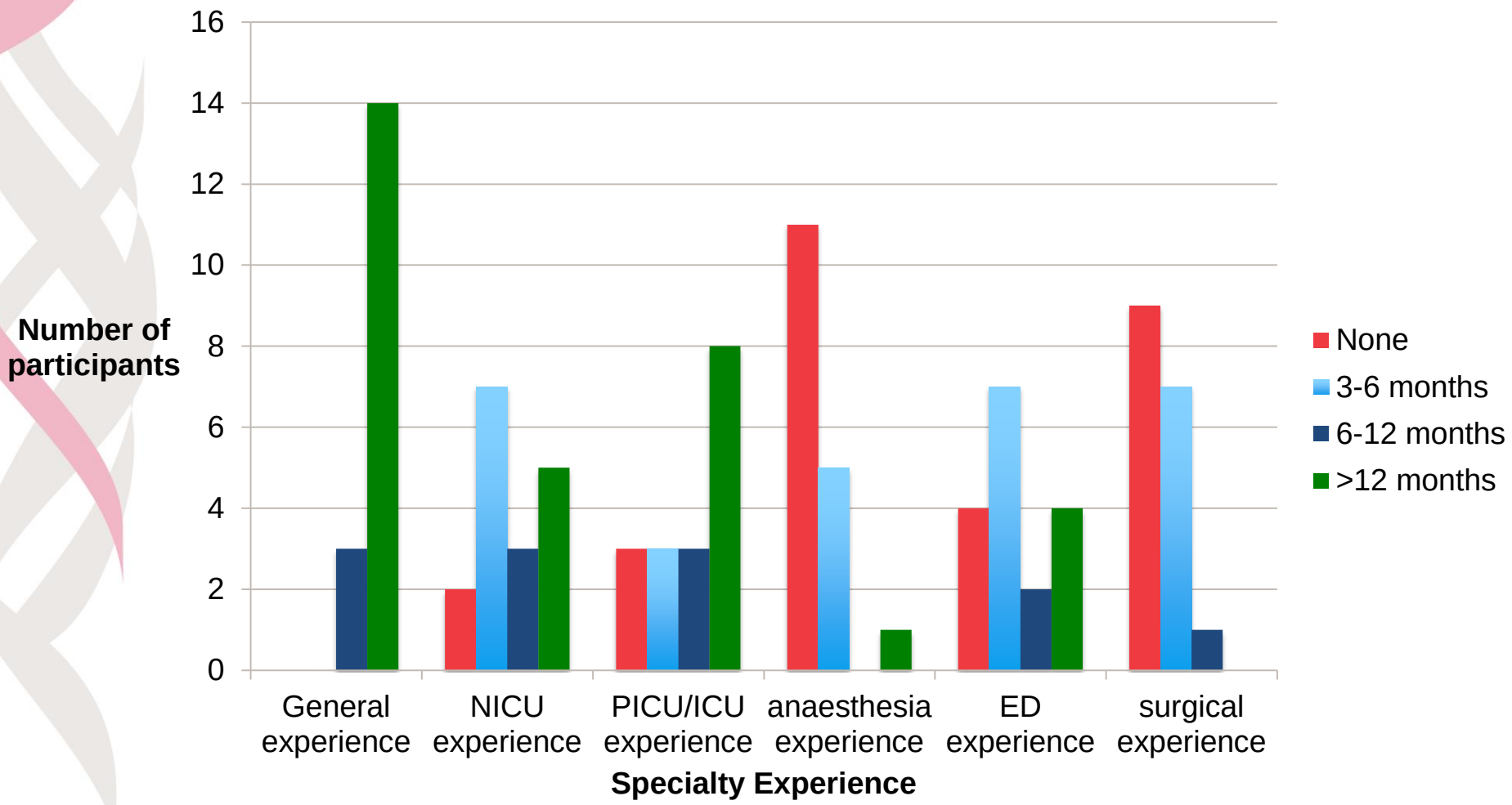


17 completed programme so far

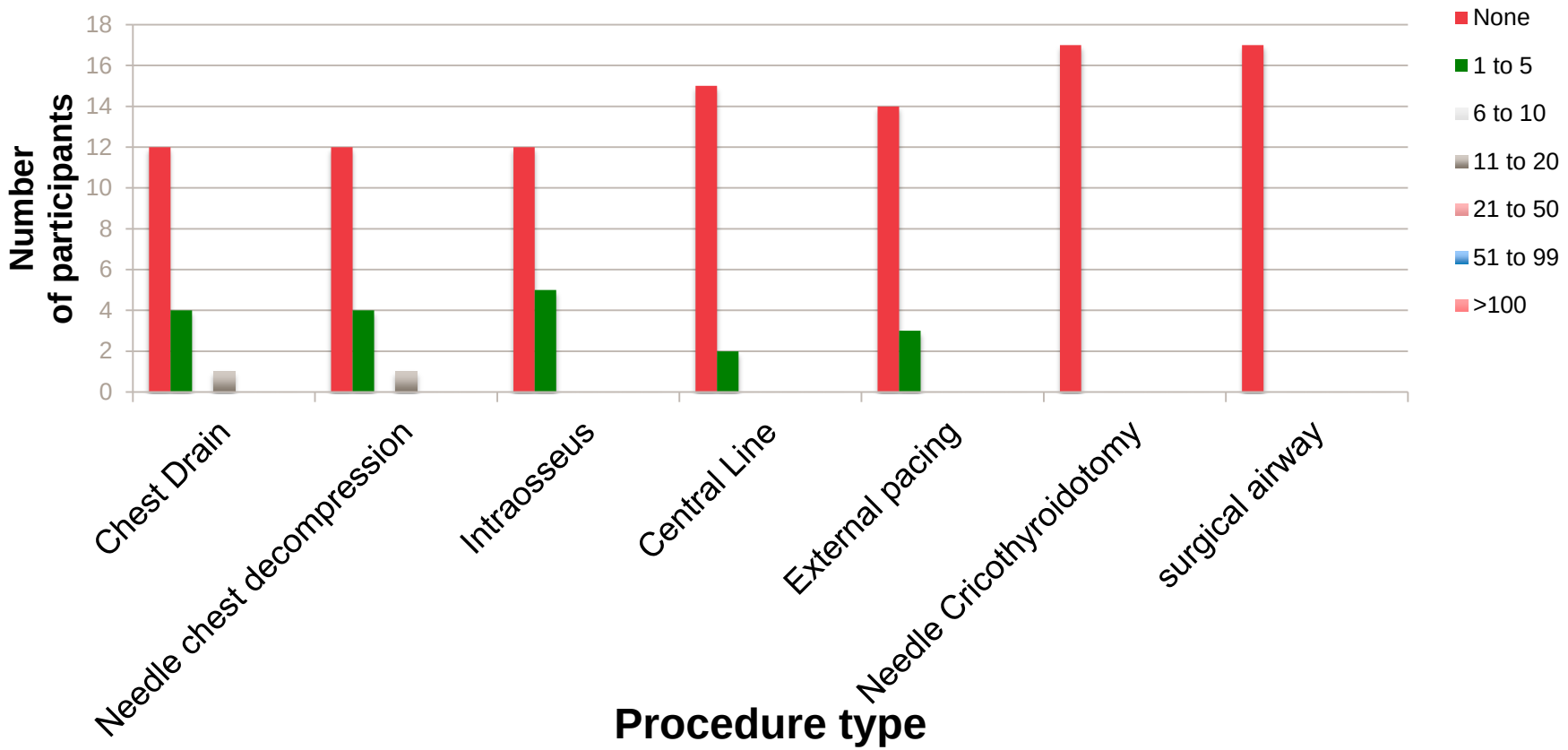
Demographics



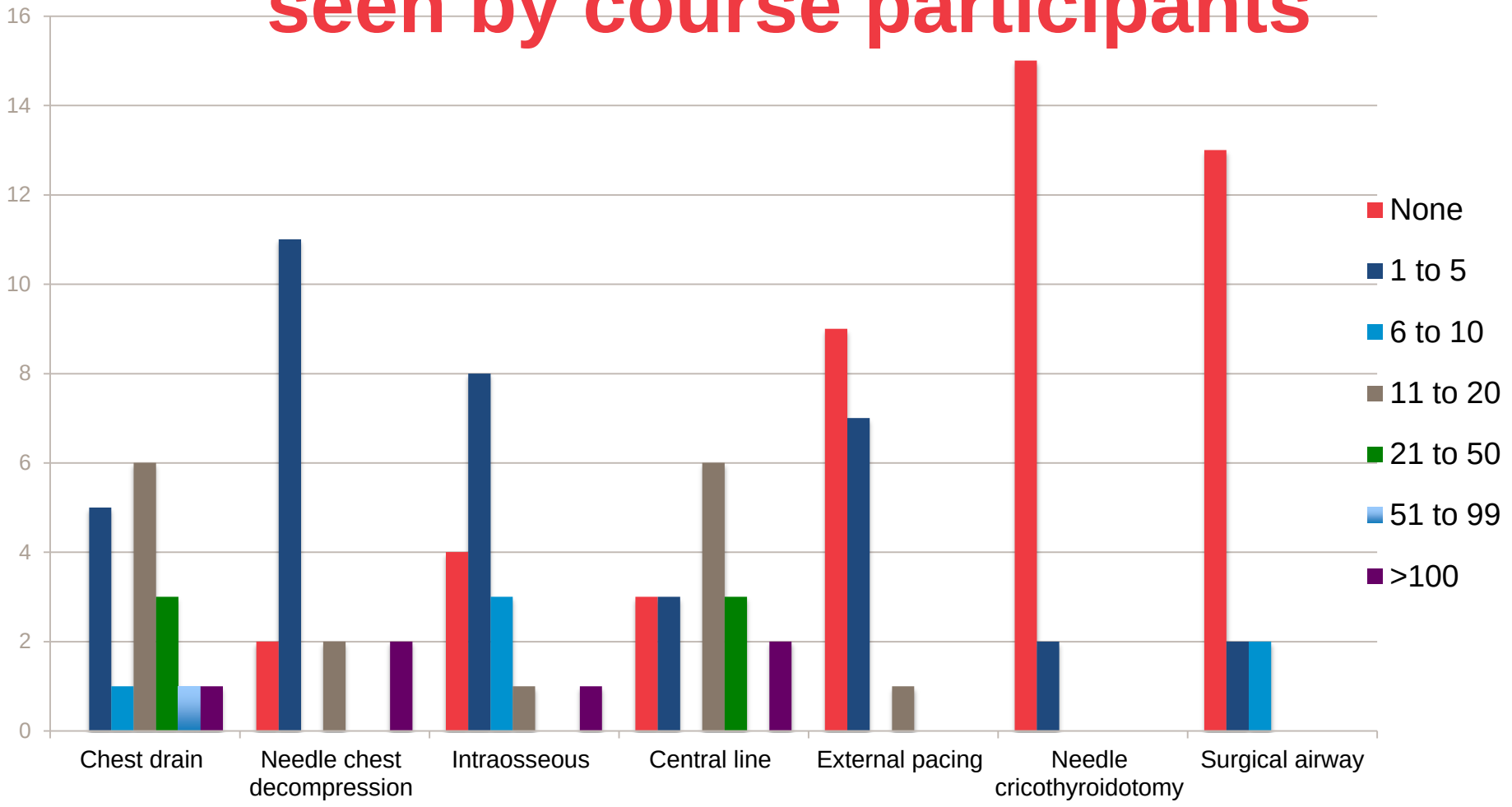
Participant Specialty Experience



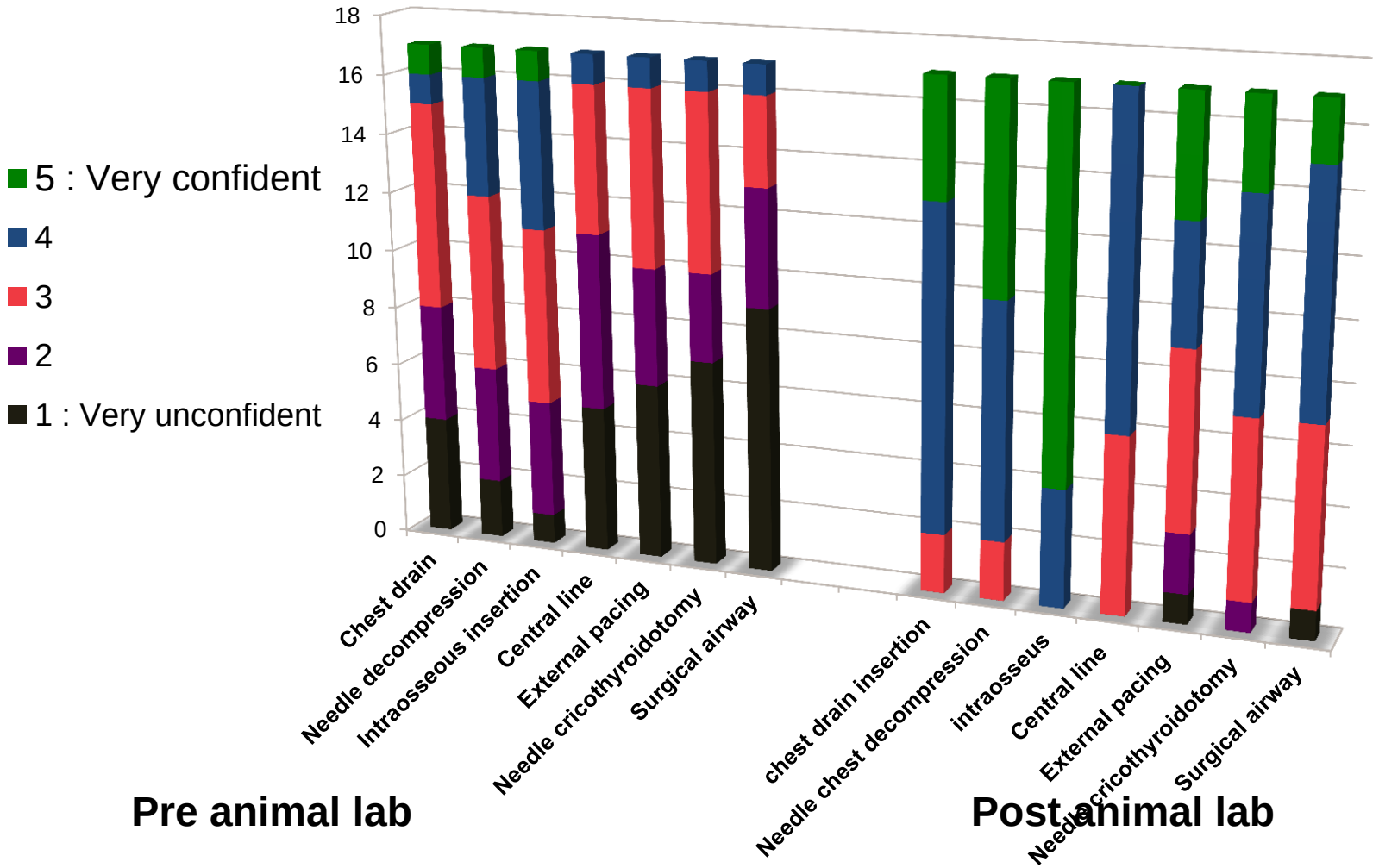
Number of procedures performed by course participants, prior to course



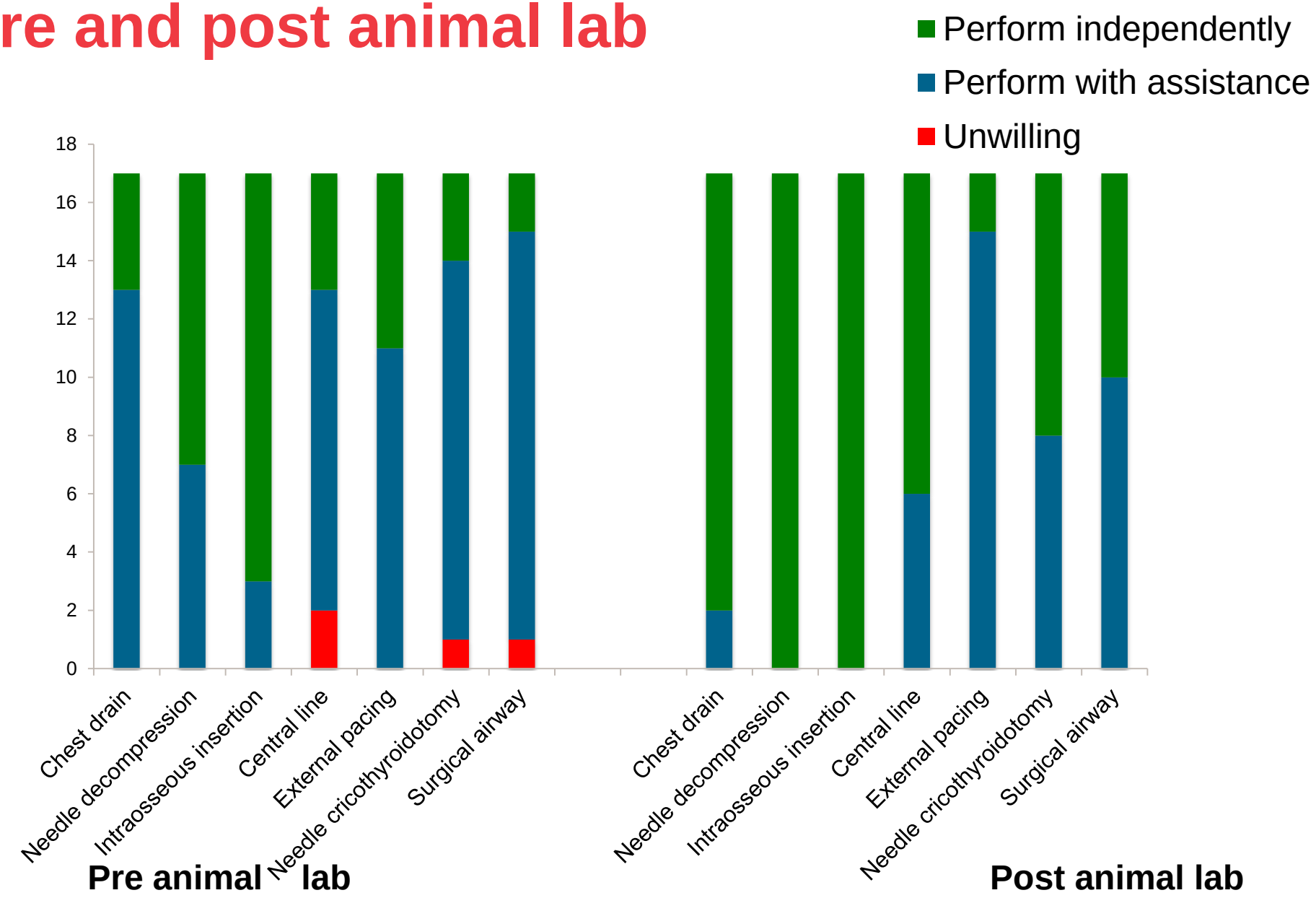
Number of procedures seen by course participants



Self rated confidence to perform procedures : pre and post animal lab



Willingness to perform procedures : pre and post animal lab



Observations

- Heterogeneous employees
- Range of experience
- Limited anesthetic training

- Limited exposure to procedures

Observations

- Improved confidence
- Improved willingness to perform procedure
- High level of satisfaction working with live anaesthetised animals

What's happening in postgraduate medical education?

M Bannon

Arch Dis Child 2006 91: 68-70

- Validated, evidence based educational model
- Qualitative improvement in staff performance
- Objective minimum standard

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- Validated, evidence based educational model
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- Objective minimum standard

- Can we translate this into improved patient outcome?

The Future

- Repeated training throughout the year
  - Mastery
- Should we time procedures
- Breakdown procedure into components
- Parallel focus:
  - Teamwork
  - Leadership
  - Crew Resource Management


SOUTH AUSTRALIA
Government of South Australia
SA Health


med STAR
Emergency Medical Retrieval