Targeted Procedure Lab to Improve Self-Identified Deficiencies Among Graduating Emergency Medicine Residents

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Background

- Medical simulation is an artificial recreation of an experience or environment for the purpose of education and/or evaluation
- Simulation is being utilized with increased frequency as an interactive educational strategy with >90% of emergency medicine programs in the U.S. reporting some use of simulation to train residents (compared to 29% 5 years ago)
- Emergency medicine residents do not always have sufficient opportunities to perform specific “high acuity, low opportunity (HALO)” procedures on real patients in the clinical environment (e.g., pericardiocentesis or thoracotomy)
- Simulation has been shown to provide a safe, controlled, accessible environment for practicing procedural skills – particularly infrequently encountered procedures that pose a significant risk to patients when performed by an inexperienced clinician
- Medical simulation allows learners to self-reflect in order to identify gaps in knowledge and skills as well as opportunities for growth
- Simulation improves knowledge translation and retention compared to traditional educational strategies due to its ability to promote reflective learning through Immediate constructive feedback and debriefing

Project Objectives

There is a documented lack of objective data regarding targeted procedure labs in medical education; particularly examining their utility in correcting self-identified deficiencies among emergency medicine residents.

This study was developed to test the hypothesis that a targeted procedure lab (with specific procedures in which emergency medicines report a perceived deficiency) would increase their reported level of confidence prior to residency graduation.

Methods

Study Design
This study was performed as a survey analysis.
This was a Single Center Study that took place at the University at Buffalo between June of 2020 and May of 2021

Participants:
N=31
Group A (class of 2021): 15 PGY2 Residents
Group B (class of 2020): 16 PGY3 Residents

Timeline:

	Group A (Class of 2021)	Group B (Class 2020)
June 2020	Pre-Survey Completed	Pre-Survey Completed
March 2021	Underwent targeted cadaver lab simulation including top 12 procedures in which residents reported deficiencies and requested additional practice before graduating (Question 5 of the Pre-Survey)	Control Group
May 2021	Post-Survey Completed	-

Pre and Post-Test Survey

1. What is your academic year?
2. Have you passed the procedure test?
3. What procedures are you certified in?
4. What procedures do you feel confident in performing on your own, without attending supervision?
5. What procedures do you feel you need more practice in before graduation?

Group A Pre-Survey Results Determined Targeted Procedures

Subclavian line (86.7%)
Aspiration of PTA (86.7%) *
Compartment pressure measurement (80%) *
Pericardiocentesis (80%)
Intravenous pacing (73.3%)
Lateral canthotomy (73.3%)
Blakemore tube (73.3%) *
Tube thoracostomy (73.3%)
Cricothyrotomy (66.7%)
Thoracotomy (66.7%)
Thoracentesis (60%)
Dislocation reduction (60%) ˣ

** Video provided; no hands-on simulation available*
ˣ Excluded due to inability to simulate on cadaver

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Results

Procedure	Group B (PGY-3 c/o 2020)	Group A (PGY-3 c/o 2021)	Test Statistic (TS)	p-value
Compartment Pressure	50%	46.7%	-0.181	p > 0.5
Cricothyrotomy	56.3%	46.7%	-0.534	p > .05
Lateral Canthotomy	56.3%	40%	-0.93	p > .05
Subclavian	75%	40%	-2.102	p < .05*
Tube Thoracostomy	43.8%	40%	-0.022	p > .05
Pigtail	12.5%	20%	0.5	p > .05
Pericardiocentesis	50%	50%	0.5	p > .05
Thoracentesis	31.3%	53.3%	0.89	p > .05
Blakemore Tube	68.8%	60%	-0.512	p > .05
Aspiration PTA	62.5%	60%	-0.14	p > .05
Thoracotomy	43.8%	13.3%	-2.0	p < .05*
Cardiac Pacing (Intravenous)	68.8%	46.7%	-1.2	p > .05

Table 1: Percent of participants who want more experience performing procedures compared between Group A, post simulation, and Group B
*p < .05

Conclusion

After completing a targeted procedure lab, which included the top procedures emergency medicine residents in the class of 2021 (Group A) felt least comfortable with, the post-event survey found that residents in this class felt more comfortable performing 9 out of the 12 procedures compared to the class of 2020 (Group B) who did not complete this procedure lab prior to graduation.

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