

Improving Competency and Skill Retention in Performing Lumbar Punctures Via Use of Simulation Medicine for Pediatric Residents Prior to Day 1 of Residency

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Background

The utilization and benefit of simulation medicine is often overlooked when it comes to training residents. All pediatric residents complete an orientation week at Advocate Children's Hospital-Oak Lawn (ACH-OL) prior to their first day of residency. By utilizing simulation medicine, residents learned the step-by-step skills required to successfully perform an LP on an infant mannequin before ever performing on a patient.

Aims

- To use simulation to improve resident competency before performing LPs on patients and to maintain skill retention for future LPs.
- To provide a safe learning environment for residents to make and learn from their mistakes

Project Design/Strategy

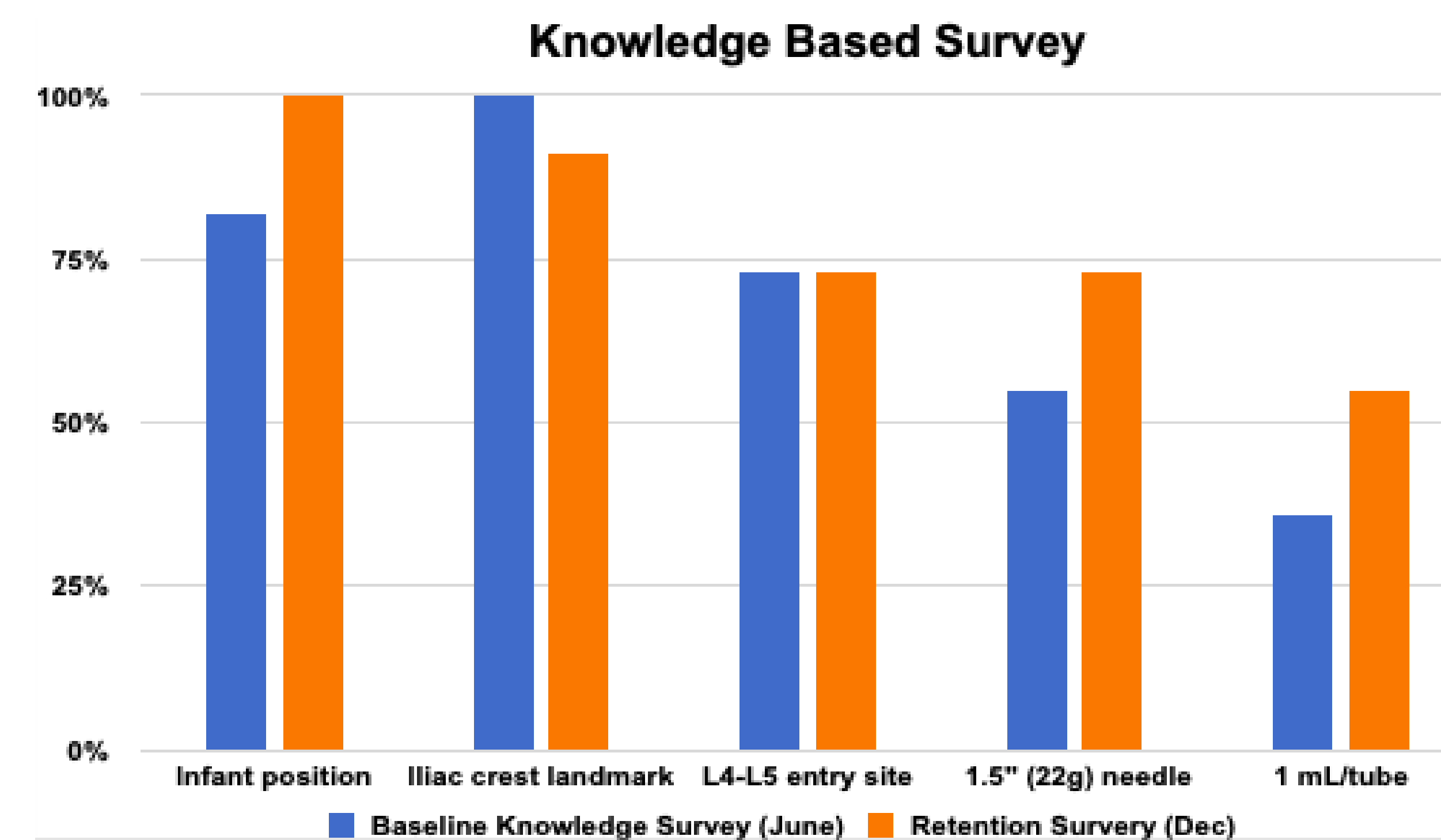
- During orientation in June 2019, a five-question survey on how to perform an LP was given to 11 residents which was followed by teaching on how to correctly perform an LP.
- Immediately afterward, residents were graded using a ten-question scoring tool on their performance of doing an LP on a mannequin.
- Six months later, the same 11 interns then repeated the simulation utilizing the same five-question survey and ten-question simulation scoring tool.



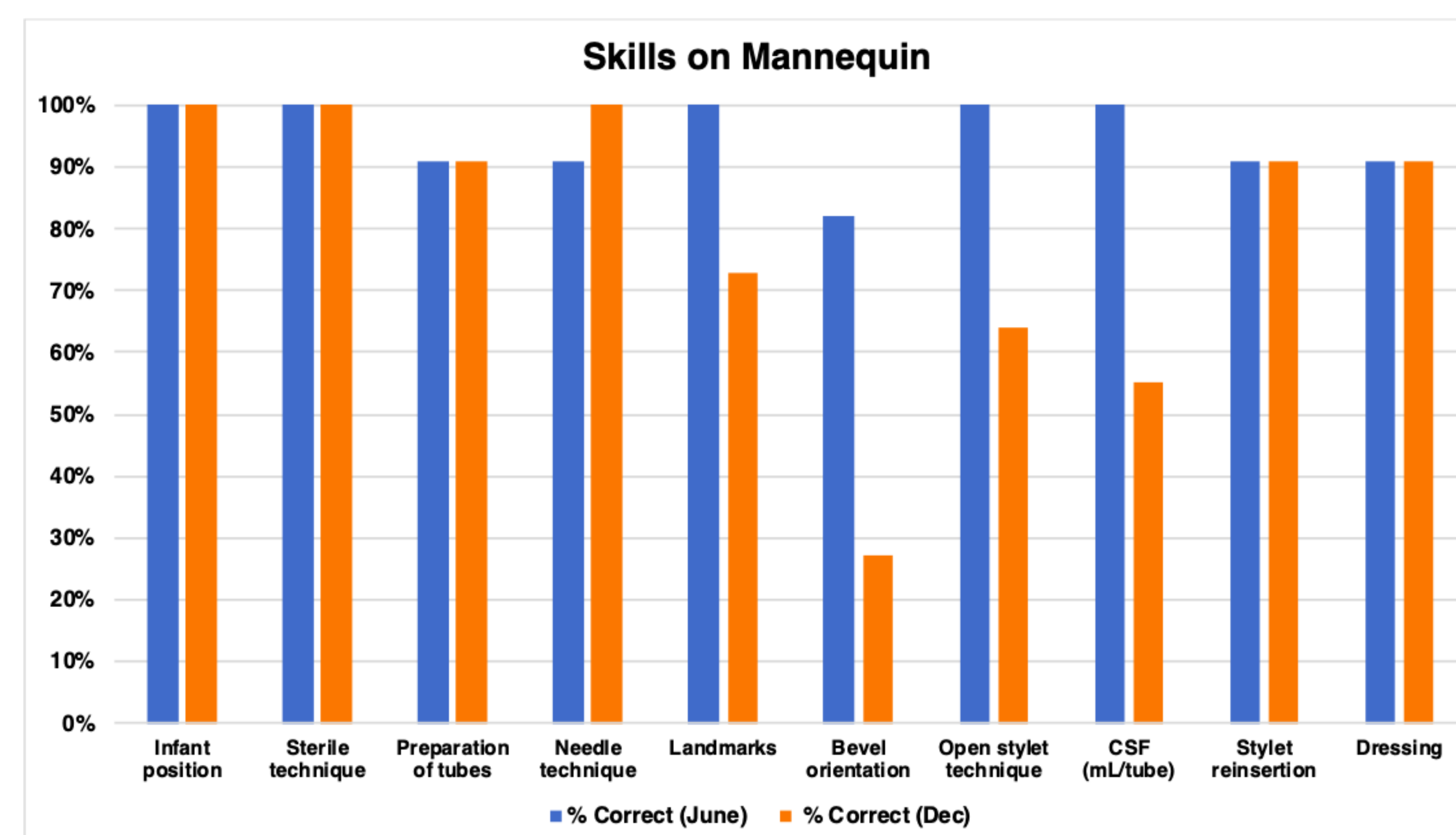
Figure 1. Simulation LP infant mannequin

Results

- The residents improved or maintained knowledge of sterile preparation, obtaining correct equipment, and proper post procedure dressing.
- The steps of performing an LP showed lack of skill retention. For example, 100% identified the iliac crests as landmarks for needle insertion in June, but only 73% retained this knowledge six months later.
- The knowledge based survey in July and December were similar showing retention or improvement in preparation and equipment needed, but lack of retention in identifying the iliac crests as the landmark to guide needle entry.



Graph 1. Results of surveys in June (baseline) vs December (retention)



Graph 2. Results of skills element in June (baseline) vs December (retention)

Outcomes/Lessons Learned

- After simulation teaching, the interns retained both knowledge and skill in identifying the correct equipment needed before and after performing an LP.
- There was a lack of retention in the steps of performing an LP. This may be related to the fact that only 45% of the interns had completed an LP on a patient after the initial simulation training.
- There was an overall reported increase in confidence and competency in performing LPs by all residents after completing simulation training.

Next Steps

- Moving forward, it may be ideal to practice the steps of an LP using the simulation mannequin immediately prior to performing on a patient or have more days dedicated to simulation training such as every other month during the first year of residency.
- As this simulation training lab showed improved knowledge of LP set up and resident confidence, it should be considered to broaden utilization of simulation training for skills such as placing life-saving intraosseous devices, performing intravenous push-pull fluids, and CPR associated with PALS.

Acknowledgements

- Thank you to the dedicated team members in the simulation lab who work tirelessly to improve the simulation experience and ultimately patient care at ACH-OL.

References

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