THE EFFECTIVNESS OF A LOW-COST SIMULATION-BASED MODULE FOR TEACHING ULTRASOUND-GUIDED FINE-NEEDLE ASPIRATION OF THYROID NODULES.

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BACKGROUND

- High rates of thyroid nodules in the population require many thyroid FNAs to rule out cancer
- Competency guidelines for residents and fellows to perform thyroid FNAs are lacking
- Most are taught on the job in high stress environments
- Simulation based trainings are effective but expensive and usually require travel
- Our hands-on module is 1-2 hours in length and cost effective

Hypothesis: Did our hands-on thyroid FNA module increase the comfort level of participants while being cost and time effective?

METHODS

Retrospective study comparing pre- and post-survey comfort levels for US-guided thyroid FNA in residents and fellows

- Needs assessment was done and hands-on module was developed
- Module was taught and developed by endocrinologist (Dr. Tylee) and otolaryngologist (Dr. Sardesai)
- Module required US machine and thyroid nodule models
- Data acquired through pre-surveys (n=40) and post-surveys (n=26) collected before and after the module
- Primarily otolaryngology residents (n=15, 11) and endocrinology fellows (n=13, 9)
- Models used for FNA: Blue Phantom ($25) from Northwestern Medical Center, and homemade gelatin models (<$10)
- Data collected yearly for 6 years

Pre- and Post- Survey

- Assessed participants comfort levels with specific questions (questions shown in results)
- Comfort based off a 1-5 scale with 5 being able to perform without supervision

Statistical analysis

- Results did not follow a normal distribution, so a permutation test was done to determine significance

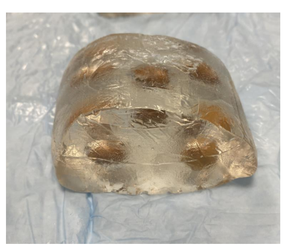
RESULTS

Survey Questions Assessed on both Pre- and Post-Surveys	Average Pre-Survey Comfort Level	Average Post-Survey Comfort Level	Average Change in Comfort Level
How comfortable would you feel trying thyroid US on a patient?	2.61	3.66	1.05
What is your comfort level interpreting thyroid US?	2.08	3.23	1.15
What is your comfort level performing US-guided FNA of thyroid?	2.01	3.13	1.12
What is your comfort level with long-axis FNA technique?	1.75	3.31	1.56
What is your comfort level with short-axis FNA technique?	1.87	3.1	1.26

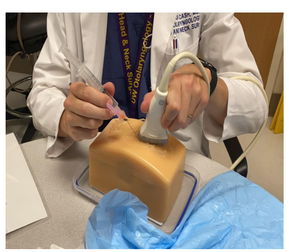
These averages are across all participants who attended these sessions including; otolaryngology (n=15, 11), endocrinology(n=13, 8), anesthesia(n=3, 3), internal medicine(n=2, 1), general surgery(n=3, 0), pathology(n=1, 1) and medical students(n=3, 2). Average change in comfort for performing US-guided FNA was 1.12 (p=0.0006).

Performing US-Guided FNA	Average Change in Comfort Level
Endocrinology Fellows	1.02
Otolaryngology Residents	1.17

Specialty specific results for change in comfort level for performing US-guided FNAs.



Close-up of homemade gelatin model.



Example of parallel approach taught on Blue Phantom model.

Example of perpendicular approach on homemade gelatin model.

DISCUSSION

Take-aways from project/module:

- It's hands-on
- Effective at improving the participant's comfort for performing US-guided thyroid FNA
- Effective at improving comfort with US interpretation of thyroid
- Easy to implement (only 1-2 hours and avoids need to travel)
- Cost effective ($10-$25)

Limitations of Study:

- Does not evaluate skill level and this could be assessed with further research
- Limited population size and specialty variety
- Varying experience levels of participants

CONCLUSIONS

Although comfort does not equivalate skill, at $25 per session our module is a promising alternative to costly and time-consuming simulations courses, which often cost upwards of $700 per individual. These training modules can be executed in most residency and fellowship training programs to provide accessible training of these important skills.

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