

ACS 2022 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Challenges in Surgical Education

Expanding functionality and application of current examination and diagnostic breast trainer for the cost-effective simulation of nipple discharge

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Background: Breast cancer is the most common cancer among women and is the second most frequently diagnosed cancer worldwide. Education and awareness for both clinicians and patients play a critical role in early diagnosis and prevention.

Current Challenges: Current examination and diagnostic breast trainers have capabilities for nodules and cysts of various sizes, however very few have the capability to express fluid upon palpation and be readily reset after multiple iterations. Furthermore, fewer models offer the capabilities to simulate the expression of various fluids within the same model, confining current task trainers to the presentation of one type of nipple discharge per model. This limits the spectrum of presentations that can be simulated with a breast trainer, excluding the opportunity to educate learners about complex breast presentations with different discharge such as serous, white, yellow, or green discharge, milk, or blood.

Need of Innovation: Our model utilizes parts from an IV kit, suture, endotracheal tube, and a 20ml syringe to combine two existing breast models, the Gaumard Scientific Advanced Patient Care Breast Palpation Bra 20/4 and the Health Edco Interchangeable Nodules Breast Self Examination Model into a single model that can express any type of fluid upon the performance of a breast examination. These modifications have the possibility of being readily applied to other existing models creating a cost-effective solution that can be duplicated for various educational applications. Pilot experiments integrating our model into existing medical school curriculum revealed positive feedback from both faculty and students. This model has the potential to be expanded upon with the addition of a pressurized pump and modified parts of a central line kit to create a single model with the capability of switching between three different discharge types without additional set-up.

Materials Used

SafeDAY IV Administration Set with Universal Spike, Back-Check Valve, Roller and Slide Clamps, SafeDAY Valves 8" and 14" Above Distal End, Sliding SPIN-LOCK Connector, 105" L, 15 Drops per mL, 18.5 mL Priming Volume,
Undyed PGA Braided Suture, Size 4-0, 18", PS-2 Needle, 3/8 Circle Reverse Cut 19mm
Endotracheal Tube Flexicare® Ventiseal Cuffed 6.5 Mm
Sterile BD™ Luer-Lok™ Syringes, 20mL

