Neurointerventional Techniques

The development of neurointerventional treatments of central nervous system disorders has resulted in the need for adequate training environments for novice interventionalists. Virtual simulators offer anatomical definition but lack adequate tactile feedback. Animal models, which provide more lifelike training, require an appropriate infrastructure base.

Ribeiro de Oliveira et al, describe a training model for neurointerventional procedures using the human placenta (HP), which affords haptic training with significantly fewer resource requirements, and discuss its validation. METHODS Twelve HPs were prepared for simulated endovascular procedures. Training exercises performed by interventional neuroradiologists and novice fellows were placental angiography, stent placement, aneurysm coiling, and intravascular liquid embolic agent injection. RESULTS The endovascular training exercises proposed can be easily reproduced in the HP. Face, content, and construct validity were assessed by 6 neurointerventional radiologists and 6 novice fellows in interventional radiology. CONCLUSIONS The use of HP provides an inexpensive training model for the training of neurointerventionalists. Preliminary validation results show that this simulation model has face and content validity and has demonstrated construct validity for the interventions assessed in this study [1].

•Intracranial Aneurysms-GDC Therapy

•Arteriovenous Malformations (AVMs)

•Dural Arteriovenous Fistula (DAVFs)

•Pre-Operative Tumor Embolization

•Emergency Stroke Therapy

•Carotid Artery Angioplasty & Stenting

•Vertebroplasty

•Hemangioma Treatment

Neurointerventional treatment has been shown to be costly, but it is often the best treatment available for certain neuropathology's.

The policy requiring use of a more economical contrast agent led to a decrease in the cost of contrast usage of $42.79 per procedure for the first 6 months after implementation, and $137.09 per procedure for the most current 6-month period, resulting in an estimated total savings of $62,924.31 for the most recent 6-month period.

The standardized coil pricing system led to savings of $159.21 per coil after the policy change, and $188.07 per coil in the most recent 6-month period. This yielded total estimated savings of $76,732.56 during the most recent 6-month period. The feedback system for unused items decreased the cost of wasted products by approximately $44.36 per procedure in the 6 months directly after the policy change and by $48.20 per procedure in the most recent 6-month period, leading to total estimated savings of $22,123.80 during the most recent 6-month period. According to extrapolation

over a 1-year period, the 3 policy changes decreased costs by an estimated $323,561.34.

Simple cost-saving policies can lead to substantial reductions in costs of neurointerventional procedures while maintaining high levels of quality and growth of services [2].

1)
Ribeiro de Oliveira MM, Nicolato A, Santos M, Godinho JV, Brito R, Alvarenga A, Martins AL, Prosdocimi A, Trivelato FP, Sabbagh AJ, Reis AB, Maestro RD. Face, content, and construct validity of human placenta as a haptic training tool in neurointerventional surgery. J Neurosurg. 2015 Oct 9:1-7. [Epub ahead of print] PubMed PMID: 26452122.
2)
Kashlan ON, Wilson TJ, Chaudhary N, Gemmete JJ, Stetler WR Jr, Dunnick NR, Thompson BG, Pandey AS. Reducing costs while maintaining quality in endovascular neurosurgical procedures. J Neurosurg. 2014 Aug 29:1-6. [Epub ahead of print] PubMed PMID: 25170667.