Development of a Whole-Task Carotid Simulator

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Disclosures

Consultant agreements
- Terumo
- SilkRoad Medical
Research and education support
- W.L. Gore & Associates
- Terumo
- Medtronic
- Cook
- Carestream

21st Century Training

- Traditional patient-based training still the norm
  - Increased OR time and LOS
- Change in the social contract
- Duty hours
- Public reporting and strict competition
- Over 60% of graduating uncertain about ability to practice independently

STL Models

- Idealized anatomy
- Patient-specific anatomy
- Solid Works
- Meshmixer

Creating the injection molds

Skin Layers
Other Components of Neck Anatomy

- Mandible
- Nerves
- Fascia layers
- Mastoid & zygomatic bones
- IJ, facial vein
- SCM
- Omohyoid

Blood Flow

- Carotid - Ventricular Assistive Device, pulsate flow
- IJ, facial vein - pressurized bags

Final Build

Angiography

Operative Experience

- Microscope/Loops
- Patch/Primary closure
- Instrumentation
Simulated TCAR

- Role for simulation in new technology
- OR setup
- Team rehearsal
- Training of experienced surgeons
Future Direction

• Validity Testing (face, content, construct)
  – Experts vs. Novices in clinically significant metrics
• Conductive nerves
• Patient-specific cases
• Assistive personnel
• Fully immersive OR experience to improve teamwork and communication