New Paradigms in Thoracic Surgical Training to Accommodate Advances in Cardiovascular Surgical Therapy

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Historic Perspective: Thoracic Surgery

• Open operative procedures
• Cardiac
  – Revascularization
  – Valve Replacements
  – Correction of congenital lesions
• Thoracic
  – Lung and pleural procedures
  – Esophageal procedures
Training: Thoracic Surgical skill set

- Fundamental operative technique
  - General Surgery Residency
- Refined operative technique
  - Thoracic Surgery Residency
- Critical Care
- ABTS certification
  - 5-7 years general surgery
  - 2-4 years thoracic surgery
Advances in Surgical Therapy

• Rapid Growth of Procedures
• Development of Devices / Technology
• Improved imaging and diagnostics

Traditional training paradigms no longer sufficient
Off Pump CABG

- Stabilizing Devices
- Improved anesthesia
- Technical challenge
Mitral valve repair

• Preserve valve and ventricular function
• Avoid lifelong anticoagulation
• Alternative approaches
  • Mini sternotomy
  • Right thoracotomy
  • Video assisted
  • Robotics
Video Assisted Thoracic Surgery

• Lung Resection
• Emphysema treatment
• Esophagus
  • Achalasia
  • Perforation
• Cancer
Aortic Root and Arch Surgery

- Endocarditis
  - debridement
- Aneurysms
  - Prevention of complications
- Dissections
  - Restore critical blood flow
  - Preserve coronary blood flow
Endovascular stent grafting

Aneurysm or dissection
  Extends treatment to high risk
Reduced risk
  Stroke
  Paralysis
  Death

Hybrid procedure
  Operative repair
  Endovascular stent
Percutaneous / transapical heart valve replacement
Today’s Thoracic Surgeon needs a new skill set

• All the traditional skills
  – Anatomy
  – Operative technique
  – Endoscopy
  – Critical Care
  – Imaging interpretation
Additional skills

- Much expanded understanding of imaging
  - CT with 3D reconstruction
  - Magnetic Resonance Imaging (MRI)
  - Positron Emission Tomography (PET)
  - Ultrasound
  - Fluoroscopy
Additional skills

- **Endoscopic technique**
  - Working in 3D with 2D images
  - Extended instruments
- **Robotic skills**
  - Remote surgeon
- **Wire based skills**
  - Endovascular procedures
- **Currency for the future**
Integrated Thoracic Residency

• Entry into Thoracic training immediately after medical school graduation
• Anticipated 6 year program
  – Progression based on knowledge and skill development
• Graduate fully capable surgeons with skill sets to grow into the future
Integrated Thoracic Residency

• ACGME approved program by the Thoracic Surgery Residency Review Committee
  - First 4 programs approved
    • Stanford
    • UTHSCSA
    • MUSC
    • UNC
• First resident entered training July 2009
Curriculum Years 1 & 2

• Prerequisite Rotations
  – General Surgery
  – Critical Care
  – Cardiology
  – Pulmonary medicine
  – Radiology
    • Diagnostic and Intervention
  – Anesthesiology
Curriculum Years 1 & 2

- **Simulation lab**
  - Basic skills: knot tying, suturing
  - OR orientation: instruments, sterile technique
  - Hemodynamic monitoring
  - ICU skills: tubes, lines
  - Crisis management
  - Team building
Beating Heart Simulator

The Cardiac Surgery Simulator
Paul Rampant, MD
Daniel Coore, PhD
Michael Craven, PhD
Curriculum Years 1 & 2

• Didactic education
  – Weekly readings, discussion with faculty
    • Prerequisite material
  – Weekly Conferences
    • Grand Rounds
    • M&M
  – Monthly literature conference
  – Research
Curriculum Years 3 – 6....

- Specialty rotations
  - Adult Cardiac
  - General Thoracic
  - Congenital
  - Transplant
  - Percutaneous procedures

- Emphasis on resident education, not service
  - Expanded role of mid-level providers
Total Thoracic Surgeon

- Six-year program
- Eligible for American Board of Thoracic Surgery certification
- Competency in all aspects of adult thoracic surgery
- Fellowship opportunities to sub-specialize
  - Congenital, Transplant and Cardiac Assist Devices
What does the future hold?