The Cardiothoracic Surgeon as an Educator

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An Academic Cardiothoracic Surgical Educator?

Agenda

• Basic outline of an educational program
  • What we are doing
  • What is the impact of an I-6

• Efforts to improve our skills as educators
  • Educate the Educators
  • Future directions
Educational Curriculum

- Set Goals and Objectives
- Determine Instructional Method
- Create Instructional Materials
- Teach/Learn
- Educated Student

Assess Needs

Evaluate Program/Curriculum

Performance Evaluation Methods

ENVIRONMENT
- Resources
- Social
- Political
A curriculum…
defines the problem,
what the solution will resemble,
how we will make the trip,
what we will use along the way,
and how we will ensure we have arrived.

Why do we need it?

Entry Level Trainee
July 1st, 2011

Graduating Cardiothoracic Surgeon
June 30th, 20??
What are the components?

- Assess Needs
  - General needs
    - What does the idealized final product look like?
  - Targeted needs
    - What do the trainees already possess?
What are the components?

- Set Goals and Objectives

Assess Needs → Set Goals and Objectives →

General needs – Targeted Needs = Goals and Objectives

- Template exists for standard 2 and 3 year programs
- Wide variability for I-6 programs
Set Goals and Objectives

- You cannot teach everything...
- You can assess even less...

Practicing CT surgeon’s knowledge
Covered by the curriculum
Assessed
What are the components?

- Determine Instructional Methods
  - All objectives are not the same
  - All learners are not the same
Variation Among Objectives

Given a patient with the common signs and symptoms of coronary artery disease the trainee will design an evaluation and treatment plan.

Given an image from a cardiac cath, the trainee will be able to identify the specific coronary vessel being imaged.

Summarize the common findings associated with coronary artery disease seen on angiography.

Given a view from a cardiac cath, the trainee will be able to differentiate normal, non critical, and critical stenosis.

Lower Order Thinking Skills
- Remembering
- Understanding
- Applying
- Analysing
- Evaluating
- Creating

Higher Order Thinking Skills
Instructional Methods

- Increasing Complexity of Objectives
  - Readings
  - Audiovisuals
  - Lectures
  - Clinical Experience
  - Role Modeling
  - Team-based Learning
  - Demonstrations
  - Discussion
  - Small group Learning
  - Simulation

- Increasing Resource Utilization
What are the components?

- Create Instructional Material
  - Large volumes of content are already available
  - Avoid “curriculomegally”
What are the components?

- **Assessment**
  - Direct observation, evaluation forms
    - Not very reliable or valid but can provide formative feedback
  - In-training exam, ABTS certification
    - Reliable but questionable validity and mostly summative
What are the Components?

- Implementation and Programmatic Evaluation
  - Implementation is program dependent
  - Evaluation is not based on achieving objectives

Evaluate Program/Curriculum

1. Assess Needs
2. Set Goals and Objectives
3. Determine Instructional Method
4. Create Instructional Materials
5. Teach/Learn
6. Educated Student

ENVIRONMENT
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Performance Evaluation Methods
Conventional 2 or 3 Year versus Integrated 6 Year

• Why did conventional 2 or 3 year programs work?
  • Necessary basic skills obtained in general surgery
    – High volume open surgery
    – Exposure to CT surgery common
  • Limited number of objectives in early CT surgery
  • CT surgical practices were clinically heavy
    – Clinical experience
    – Role modeling

Easy to implement
Conventional 2 or 3 Year versus Integrated 6 Year

• Why move to an Integrated 6 year program?
  – The product of GS training has changed
    – Major shift in their curriculum
    – Major shift in the applicant pool


The basic skill set we rely on has changed!
Conventional 2 or 3 Year versus Integrated 6 Year

• Why move to an Integrated 6 year program?
  – The product of GS training has changed
  – Variety of operations have increased
    – ABTS case requirements remain vague
    – Still no requirement to deal with complications of surgery

The final product we are now required to produce is much more complex!
Conventional 2 or 3 Year versus Integrated 6 Year

• Why move to an Integrated 6 year program?
  – The product of GS training has changed
  – Variety of operations have increased
  – Available clinical material has decreased
Conventional 2 or 3 Year versus Integrated 6 Year

• Why move to an Integrated 6 year program?
  – The product of GS training has changed
  – Variety of operations have increased
  – Available clinical material has decreased

• What new problems will an Integrated 6 year program introduce?
  – A totally new curriculum will need to be developed!
    – We need educators who understand curriculum construction
Improving CT Surgical Educators

• JCTSE
  – Create an “Army of Educators”
    – Principles of adult education
    – Curriculum design
    – Selection of instructional methods
    – Assessment tool development
    – Program evaluation
Improving CT Surgical Educators

- JCTSE
  - Create an “Army of Educators”
  - Future Directions
    - Explore and disseminate new instructional methods
    - Develop standards for competency
Educate the Educator

• Replicates the ACS Surgeons as Educators course
• 2.5 day course concurrent with the TSDA Boot Camp
• Instructors
  • 3 Thoracic Surgeons
  • 3 PhD educators
• Topics addressed
  How People Learn  Deb DaRosa
  Curriculum design  Ara Vaporciyan
  Formative feedback  Ara Vaporciyan and Maura Sullivan
  Teaching in the OR  Steven Yang and Ed Verrier
  Skills acquisition teaching  Maura Sullivan
  Multi-media lecture design  Steven Yang
  Education as a career path  Ara Vaporciyan and Steven Yang
Educate the Educator

- **Attendees**
  - 40 faculty
  - 40 institutions with ACGME approved programs
  - Majority were young (70% <5 years in practice)

- **Impact**
  - Highly rated by all attendees
  - Majority (>80%) agreed they would pay to attend such a course
  - Leadership agreed to repeat the course in 2011.
Educate the Educator

- Additional spin-off efforts
  - Quarterly webinar on education
    - Maintain open communication
    - Address local concerns/problems in real-time
  - Mini-EtE at the AATS meeting
    - Expand attendance to programs without existing training programs
  - Educational Club
    - Present educational projects and allow informal discussion and collaboration
  - Development of an Academy of Educators
    - Increase promotional value of educational effort
Improving CT Surgical Educators

- **JCTSE**
  - Create an “Army of Educators”
  - Future Directions
    - Explore and disseminate new instructional methods
    - Develop standards for competency
Future Directions

• Instructional design improvements
  – Simulation
    • Procedural
    • Decision making
    • Error management
    • Team training
Future Directions

• Instructional design improvements
  – Simulation
  – E-Learning
    • Organize content
    • Online education
      – Collaboration
      – Experiential learning
      – Feedback
Future Directions

• Instructional design improvements
  – Simulation
  – E-Learning

• Assessment
  – Simulation
    • Formative feedback
    • Summative feedback
      – requires high reliability and strong validity data
Future Directions

• Instructional design improvements
  – Simulation
  – E-Learning

• Assessment
  – Simulation
  – E-learning
  • Online assessment
    – Quizzes, collaborative assignments, virtual patients...
Summary

• Reinvention of our educational system requires…
  – Development of a new restructured curriculum
  – A critical mass of educators who understand the steps involved
  – Exploration of new tools to instruct and assess