Developing the Academic Cardiothoracic Surgeon in 2012AATS
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Changing Landscape of Academic Research

• Historical models were based on clinical excellence paired with basic (usually physiology research)
  – Clinical demands were less (less co-morbidities)
    • Transplants, VADS, induction therapy, etc. were uncommon
  – Financial security allowed clinical revenues to supplement NIH funding
    • Many programs funded laboratory residents
  – Clinical trials and clinical databases did not exist
  – Educational activities were less organized
Realities of Academic Practice in 2012

• No money-no mission: need clinical engine
  – Funding academics off clinical $ is difficult

• “Triple threat” is unrealistic
  – Education
  – Clinical Excellence
  – Research

• However, new academic opportunities exists
Where are the Funding Opportunities?

• Federal (US)
  – NIH Traditional (shrinking)
  – CMS Evidence-based (Growing rapidly)
  – Agency for Health Care Policy and Research ($?)
  – VA (Includes all of above and growing)
• State/Regional/Provincial
  – Lung Cancer Tobacco Grants
  – State-wide Public Health Research
    • CV and Cancer screening/treatment/outcomes
• Foundation
  – AHA, ACS, Lung Cancer Alliance, etc.
NIH

- Extreme Budgetary constraint in place for 2012
- NHLBI and NCI are set for 3% decrease over last years 5% decrease.
  - Fewer RFAs and RFPs
  - Decreased budgets set for Program grants
  - Planned constant Investigator Initiated grants (R)
    - Funding levels at less than 10\textsuperscript{th} percentile
    - New investigators get 5%, early-stage 5% (<5-years out)
- Continued emphasis of Evidence-based Outcomes
- Completing the Translational Research Roadmap
  - Excellent role for CT surgeons in multi-PI RO1s
    - No effort restriction (10-20% is reasonable)
    - Basic scientist, CT clinician, biostatistician
    - Surgical PI developments biorepository and clinical trial
Translation Research

Success through collaboration: cannot do it alone

- Sub-cellular mechanisms predominate funding
  - Molecular analyses are expensive and technically demanding: partner with molecular biologist
  - Basic scientists lack knowledge of cardiothoracic pathophysiology and clinical relevance
  - Computational genomics and proteomics are required
  - CT surgeons have the patients, biological materials and recorded outcomes necessary for these analyses
Real World Examples

1. NCI-SPECS II Multi-center Award 2012 ($1.2M)
   • Funded Squamous Carcinoma Consortium
   • 7 Institutions (Colorado, Michigan, Wash U, Duke, Brigham, Toronto, UC Davis)
   • Each with PI (2 CT surgeons as PIs)

2. NCI Lung TCGA Project ($50M):
   Entire project based on CALGB and ACOSOG Lung Tumor Banks collected by CT surgeons
NIH-Career Development

• Traditional NIH Bethesda Fellowships still active
• Mentored K-08, K-23 are available
  – NHLBI 50% time protection is a key advantage
  – 75% at NCI and other Institutes
  – Institution (or consortium)-based K-12
    • A real opportunity for CT surgery and efforts are underway
  – Cardiac Surgery Network has funding for MPH-equivalent degree in Clinical Research/Outcomes
    • This is an excellent academic career plan
VA

• 2.3 Million new Veterans since 9-11
• Increases in spending for war-related issues
  – Mental Health (PTSD)
  – Amputee
  – Chronic Pain: Opportunity for CT and CT anesthesia, e.g., DOD grant based on Thoracotomy pain model
  – Occupational-related malignancies*
    • Agent Orange or Gulf War petroleum induced lung cancers

• Increases in Evidence-based Research
  – VA Colorado CABG project, NSQIP, (Original Left main Project)
• Cancer and CV Disease are in the VA Research Focus list
  – Merit Review now has translational focus
  – Career Development Awards (20% payline) 2+ CT surgeons
Cardiothoracic Clinical Trials

• Opportunity for surgeons to impact patient care
  – Participation open across specialty (practice settings)
  – Design, implementation, auditing, statistical analysis
  – Cancer Trials- (NCI) Alliance (CALGB/ACOSOG), etc.
  – Heart Surgery- (NHLBI) Cardiac Surgery, Congenital and Heart Failure Networks
  – Transplantation- UNOS, ISHLT
  – Industry Sponsored trials (Revenue stream)
Clinical Research: Improving Care

• CT Surgeons have access to large sets of data most other practitioners lack
• This allows large-scale investigations into linkage of diseases with procedures and outcomes
• Numerous examples exist
Aggregate Data Analysis for Quality Improvement and Clinical Effectiveness

- STS/NNE Cardiac database activities
- National Cancer Database, SEER
- CMS, administrative payor datasets
- Diversity and Access to care research
- Ability to impact Health Care Legislation
STS Database

- Adult Cardiac Database contains 100,000s of cases
  - Created risk-adjustment models for most diseases
  - Validated a quality improvement project
  - Generated 100+ publications
  - Access is open to anyone with a reasonable query

- Congenital and General Thoracic Databases
  - Reproducing the Adult Cardiac Experience
Cancer Databases

• National Cancer Database
  – Run by American College of Surgeons and American Cancer Society
  – Abstracts data from hospital Tumor Registries
  – Contains 80% of all cancers from 1990 to present
  – Demographics, histopathology, stage, treatment, outcomes

• SEER
  – NCI-funded, covers 20% of all cancers (regionalized)
  – More detailed data
CMS

Virtually no other specialty has the foundation to excel in this area of funding. Large $ at stake

- STS Cardiac and GTS databases (Medicare)
  - Need linkage to longitudinal data from CMS (Adult)
  - Many opportunities for care-enhancement
  - Multiple grants funded for demonstration projects

- Major component Grants
  - SEER-linked CMS data
    - (20% of cancer patients linked to all CMS payments)
    - Research in regional variations in care
CMS Research Datasets

• CMS: Two available for requests
  – 5% random selection: includes all data on 1/20\textsuperscript{th} of entire national information since 2007
    • Useful for a “snapshot” of care across the nation

  – 100% Smaller Focused dataset: approval (with funding) may be requested for limited sets of diagnoses for a limited interval for comparative effectiveness and access to care research
    • Lung cancer diagnosis, treatment and costs
Disparities Research: An IOM Mandate

• SES is based on education, income, occupation and wealth.
• Along with assessing SES at an individual level, neighborhood and community SES has importance too.
• Socioeconomic characteristics of neighborhoods predict the health of residents even when adjusting for their individual SES.
National Census 2000 and 2010

• Patient Data can be linked by address for regional Socioeconomic Status (SES):
  Region>State>Zipcode>Block>Neighborhood
  – Education
  – Median income
  – % below poverty
  – Racial/ ethnicity
CT Example: NSCLC Care in NC

• Health disparity studies originally focused on the effect of race on outcomes.
• African-Americans were found to have poorer survival compared to Caucasians in many facets of health.
• However strong evidence emerged revealing that SES impacted these disparities more than race alone
  – Differences were eliminated adjusting for income and education

Joshi et al., Cancer 2011
Private Funding

• Industry
  – Translational Partnerships for drug discovery
  – Clinical trials support for specific devices (FDA)
  – Phase IV trial support for required secondary endpoints
    • QoL, Costs, Safety, etc.
  – New emphasis on PPP grants- need planned focus
    • e.g., Duke-GSK-NCI TK receptor grant (Lyerly PI)

• Foundation (AHA, ACS, ASA, AATS, TSFRE, etc.)
  – Generally early career support “seed money”
  – Shifting from basic science to translational and outcomes
Education: Cardiothoracic Joint Council

• Developing and critically assessing educational opportunities for learning
  – Recognition of experts for academic advancement
    • Implement physician educator-track for tenure

  – Creation of novel templates for medical student, resident and advanced skills training
    • Simulation, competency assessment, etc.
Summary

• Although the research funding climate has significantly changed, many opportunities exist:
  – Collaborative R and P grant efforts involving clinicians
  – Enhanced clinical trial networks (public and industry)
  – Dramatic increase in Evidence-based research
  – Emphasis on Education / Research on Education

• All of this in a background of an aging population with significant problems in thoracic diseases