State of Duke Medicine

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Our Mission Statement

"*As a world-class academic & healthcare system, Duke Medicine strives to transform medicine and health locally and globally through innovative scientific research, rapid translation of breakthrough discoveries, educating future scientific and clinical leaders, advocating and practicing evidence-based medicine to improve community health and leading efforts to eliminate health inequalities.*"

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(Duke Medicine 2006)

DUKE MEDICINE: Seven years of Continued Success

- Developed an effective team
- Recruited new leadership & made strategic hires (DCI exec director; IT exec leader; new chairs)
- Faculty & student Leadership development (MD-MBA, MLPR,CCHAMP,DMIHI etc)
- Aligned & strengthened as an integrated healthcare system DUHS
- Continued improvements to our culture of safety & quality
- Successfully implemented most recent (2006-11) DUHS strategic plan

DUKE MEDICINE: Continued Success

- Grew clinical volumes; expanded geographic reach
- Major clinical successes (lung transplant, brain tumor, myozyme, cord blood transplant)
- Constructing the medical center of the future
- Invested in IT
- New models of care delivery (NPCC; DCI)
- Engagement to improve community health (DHI)
- Improved image & relationships with community& state
- Global health
- Humanitarian efforts (Hurricane Katrina, Haiti earthquake, NC hurricanes)

Continued Academic Excellence

School of Medicine

- #5 in USN&WR rankings of top medical schools
- PA program #1 in USN&WR rankings
- Continued top five in NIH research funding
- Key leadership hires – 10 new chairs, Director of DCI
- Newly launched Primary Care Leadership track
- Constructing the New Learning Center
- Impressive individual faculty achievements

School of Nursing

- #7 in USN&WR rankings for nation's top schools of nursing
- $15 million dollar gift –"Christine Siegler Pearson" building
- Largest enrollment in the school's 81-year history- 765 students
- Doctor of Nursing Practice program – 119 students
- Duke Translational Nursing Institute
- Continued leadership in innovation, technology and distance education

DUKE MEDICINE: Continued Success

- Duke Global Health Institute
  - Celebrated 5th anniversary in Oct 2011
- DukeTranslational Medicine Institute
- Duke NUS Medical School
  - Graduated first medical school class in July 2011
- Duke Cancer Institute
- Duke Medicine Initiative in Health Innovations

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Scorecard from last year's State of Duke Medicine

- "Must do/Must Complete" decisions -- ongoing commitments and immediate needs
- "Regretless decisions" -- necessary decisions for future success regardless of the environment
- "Unclear Risk/Reward decisions -- decisions to be largely influenced by an uncertain environment

"Must do" "Must complete" decisions

Ongoing commitments and immediate needs

- Complete clinical buildings; under budget/ahead of schedule ✔ ✔
- Start construction of Learning Center ✔ ✔
- Expedite decisions regarding immediate IT needs ✔ ✔
- Emphasis on excellent performance/cost controls; scientifically, clinically, financially ✔ ✔
- Continued support of academic mission with constraints in external funding ✔ ✔

"Regretless decisions"

Necessary decisions for future success regardless of the environment

- Alignment across Duke Medicine; “Power of One” ✔ ✔
- Innovative experiments in aligned care models; DCI ✔ ✔
- Vertically integrated care delivery ✔ ✔
- Comprehensive, strategic IT vision/direction for clinical/academic; necessity of EHR ✔ ✔
- Caring for our employees ✔ ✔
- Developing human capital ✔ ✔
- Excellence in education and training ✔ ✔
- Investment in science ✔ ✔

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"Unclear Risk/Reward Decisions"

Decisions requiring organizational investment w/o complete information

- ACOs, HIZs, Medical Homes -- what type of reform will be sustained? ✔
- Research space investment? -- appropriate size; build vs. lease; financing options ✔
- Partnership/affiliations/acquisitions ✔ ✔
  - Duke LifePoint – Maria Parham MC; Person County Memorial Hospital; MedCath cardiology assets; others in process
- Organizational innovations -- need to carefully "look before leaping" ✔

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HOWEVER,
Evolving healthcare environment: Pressures facing AHCs

- Demand for care & services is rising
- Finances are getting more challenging
- Research outgrowing “soft money” available to support it
  - NIH funding picture as major driver
- Structural challenges
  - Traditional depts, centers & institutes vs. service lines
- Cultural
  - Individual vs. team
  - Autonomy vs. regulation
- **Mission vs. business**

The "academic subsidy": at risk?

Currently:

- 30-40% "match" required for every $1 of NIH direct cost
- Many schools report medical education costs them $80-100K per student per year
- Depends on annual subsidy from clinical enterprise, endowments, philanthropy and tech transfer

In 2016?

- With declining clinical reimbursement, weak economy & flat/reduced NIH budget, this gap is likely to increase

Challenges to AHCs – 2011 to 2016

Clinical revenues remain flat & margins decline despite increasing volumes:

- Affordable Care Act
  - Medicare payment cuts to providers
  - Loss of DSH
  - Potential loss of IME
  - Expansion in Medicaid & HIE
  - Changes in reimbursement
- State Medicaid reductions
- Reduced commercial insurance reimbursement & lowered payor tolerance
  - Tiering (e.g., Food Lion & DUHS)
  - Flattening commercial rates
  - Shift from commercial to HIE
  - Decreased ability to cost-shift

Affordable Care Act

Access, cost & quality

- Medicare cuts
- Quality- penalties for readmissions, hospital acquired infection
- Value Based Purchasing
- Population Health
- Accountable Care
- Health Insurance Exchange
- Health IT

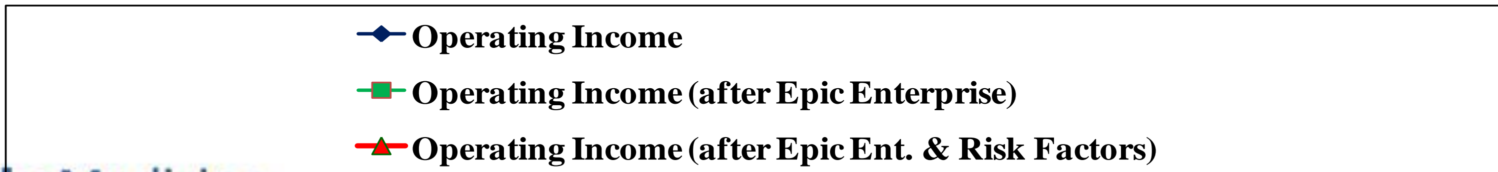
Drivers of increasing AHC shortfall

- Biomedical research & educational costs outpace normal inflation & tuition increases
- NIH budget (decrease is projected)
- Economic downturn (endowment & philanthropy continues to be down),
- Increased government oversight, difficulty managing academic-industry relationships
  - Conflict of interest
  - Regulatory pressures
- Increased IT, infrastructure & regulatory expenses

DUHS Operating Income

	FY11A	FY12B	FY13P	FY14P	FY15P	FY16P
Operating Income	$189.5, 8%	$160.0, 6%	$160.1, 6%	$108.9, 4%	$109.2, 4%	$69.0, 2%
Operating Income (after Epic Enterprise)		$125.3, 5%	$133.8, 5%	$66.7, 2%	$75.6, 2%	$38.9, 1%
Operating Income (after Epic Ent. & Risk Factors)		$109.1, 4%	$101.5, 4%	$34.3, 1%	$43.3, 1%	$6.6, 0%

Y-axis: $0, $20, $40, $60, $80, $100, $120, $140, $160, $180, $200



$ in millions

Challenges affecting Duke Medicine too

Current challenges to AHCs would impact 2016 projected finances in the following ways for Duke Medicine: ***ROUGH ESTIMATE FOR ILLUSTRATION ONLY***

- Clinical Margin – may decrease by 8%
- Research shortfall – may increase by 14%
- Education/training shortfall – may increase by 8%

Enterprise-wide financial "gap" - INCREASE

How do we respond?
Opportunity to lead

Viewpoint

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The role of academic health science systems in the transformation of medicine

Victor J Dzau, D Clay Ackerly, Pamela Sutton-Wallace, Michael H Merson, R Sanders Williams, K Ranga Krishnan, Robert C Taber, Robert M Califf

The challenges facing the health of communities around the world are unprecedented, and the data are all too familiar. For 5 billion people living in developing countries, environmental factors and inadequacies in hygiene, economic development, and health-care access are the main causes of shortened life expectancies. Improvements in health status, including reductions in infant mortality and declining incidence of infectious diseases, are being met by the new epidemics of obesity, diabetes mellitus, and cardiovascular disease.[1]

Developed countries are beset by disparities in access to care and health outcomes,[2,3] unreliable quality, and high costs.[4] Increased demand for services, ageing populations, inadequate evidence to guide practice, and a misdirected emphasis on research and treatment in late-stage disease contribute to the high cost of health care.[5] In many countries, these difficulties are exacerbated by fragmented health-care delivery systems,

In order to achieve transformation, two distinct translational blocks or gaps in the discovery-care continuum must be overcome.[11,12] The first is the gap between a scientific discovery and its clinical translation (ie, from bench to bedside); the second is the gap between expert acceptance of the application and its broad adoption in practice by local and global communities (ie, from bedside to population). AHSCs traditionally give their discoveries to industry at the first gap and to practising physicians at the second gap, thereby creating barriers and inefficiencies. We believe that AHSCs are ideally poised to become system integrators that are capable of bridging these translational gaps, thereby greatly reducing delays and inefficiencies between discovery and global adoption. These system integrators do not replace industry or non-academic providers, rather, they improve the capacity to develop and deliver new treatments by filling the spaces between academic

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Duke Medicine, Durham, NC, USA (Prof V J Dzau MD, D C Ackerly MD, P Sutton-Wallace MPH, Prof M H Merson MD, Prof R S Williams MD, Prof K R Krishnan MB BS, R C Taber PhD, Prof R M Califf MD); and Duke-National University of Singapore Graduate Medical School, Singapore (Prof K R Krishnan, Prof R S Williams)

COPY

AHCs must lead healthcare's transformation by:

- Reorganizing biomedical research & health delivery systems into **seamless continuum** from discovery to translation to clinical delivery to community health.
- Academic Health Centers (AHCs) must become **Academic Health Science System (AHSSs)**.

"Bench to Bedside to Population"

- Integrated model of **"Discovery-Care" continuum**
- Re-examine institutional research priorities
- Efficient & integrated care delivery
- Improved health outcomes
- Community & global health
-

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Dzau VJ et al, Lancet 2010

AHCs need to undertake Critical Steps

- Clinical
  - Vertical integration
  - Care redesign
- Research & education
  - Optimally sized and maximally efficient research enterprise
  - Leverage innovation
  - Reinvent medical education
- Revenues from new activities
- Mission-based accounting and management
- Enterprise-wide planning
  - Alignment of missions & organization
  - Balance of priorities

Schematic of AHSS as a Vertically Integrated Care Delivery System

AHSS

Health System, Medical and Allied Health Schools, Research Programs, etc.

Ambulatory	Inpatient
Specialty Clinics • Ambulatory Surgery • Specialty Diagnostics	**University/Tertiary Care Hospitals**
Primary Care Clinics	**Community Hospitals**
Community-Based Care • Home Health • Urgent Care	**Post-Acute + Long-Term Care** • Rehabilitation • Skilled Nursing

Education

Research

Community Partnerships

Patients and Self Care

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Dzau VJ et al, Lancet 2010

AHSS: A Vertically Integrated Care System

- Distributed sites of hospital care that address different levels of acuity, cost, & specialization
  - Tertiary/Quaternary flagship hospital focused on complex care
  - Community hospitals that provide efficient "bread-and-butter" inpatient care
  - Post-acute care
- Ambulatory specialty care
  - Community-based specialty care "focused factories"
  - Specialty "solution shops" (attached to quaternary hospital?)
- Primary & Community Care
  - Medical Homes
- Clinically Integrated Network

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A vertically integrated, distributed DUHS

- DRH & DRaH
  - General surgery, orthopedics, bariatric surgery, Ob/Gyn
- Focused factories
  - i.e. DASC, Brier Creek, Page Road
- Duke Home Care & Hospice
- Duke Physician Network (PDC, CPDC, DPC, DUHS, IPA)
- **Areas of distinction**
  - Cancer (e.g., brain tumor)
  - Lung transplant, heart transplant
  - Heart & Vascular (minimally invasive cardiac surgery)
  - Musculoskeletal
  - Pediatrics (genetic diseases, immunodeficiencies)
  - BMT, cord-blood stem cell transplantation

Care redesign

To improve quality of care, reduce cost and improve population health

- **Clinical Pathways**
  - Quality & safety (hospital & ambulatory)
  - Continuum of care focusing on transition & community
  - Management of chronic conditions
- **Community & Population Health Management**
  e.g., Community Care of North Carolina (CCNC)

Care redesign

- **Community Health Management** (cont.)
  - e-Consults for remote insulin mgt. (Endo, Rheum, Neuro to follow)
  - Working with hospital pharmacy to design pilot
    - Redirecting med-related issues to Pharm D/pharm tech team, e.g., post-discharge med reconciliation
  - Alternate care pathways
    . "PT-first" proposal for cervical, lumbar MSK complaints
  - Duke Well Program: emphasis on prevention, wellness, HRA, health coaching

DUHS's Emerging Strategic Vision for 2011-2016

World-Class Academic Health Enterprise

Regional Integrated Delivery System of Choice

DUHS, together with its Duke Medicine partners, will continue to serve as a world-class academic health enterprise

- Nationally leading clinical and health services delivery research center
- Training tomorrow's clinical leaders, educators and researchers
- Provider of highly sophisticated, cutting-edge clinical services to a global market

DUHS will be a world-class integrated delivery system serving the Greater Triangle and contiguous NC and VA counties

- Leading community provider in Durham, Wake and contiguous counties
- Regional network of physicians, inpatient and outpatient facilities
- Essential resource for complex clinical services
- Tightly integrated system of care with the capability of managing population health efficiently and to a world-class clinical standard

AHCs: Keys to Future Success

- Alignment: Power of One Vision & One Team
  - Three missions; one shared goal
- Leadership & Execution
- Innovation
- Embrace Change

Our Commitment to Research

- Emphasis on Excellence- quality vs quantity
- Driven by Innovation
- Space & Core support – core facilities
- Leadership & recruitment
- Commitment to training – eg Chancellor's Scholars (Graduate Students) Program

Investments in science

- Despite forecasts for NIH support continues for research in strategic, priority areas.
- School of Medicine 5-year budget includes ~55 research intensive recruits as part of chair commitments (over 30 in basic science depts)
- Research space being addressed strategically/efficiently through lease options
- Continuing priorities:
  - Bridge funding
  - Core facility/services support
  - Animal facility capacity
  - Biostatistics support
  - Process improvements (RACI)

Academics: Leveraging new leadership

- New Clinical Science Chairs:

  Medicine, Radiology, Psychiatry, Dermatology, Orthopaedics (recruiting)
- New Basic Science Chairs:

  Biochemistry, Biostatistics & Bioinformatics, MGM, Immunology, Neurobiology, Pharmacology & Cancer Biology
- Duke Institute for Brain Sciences Director, Doctor of Physical Therapy Director, MSTP Director
- Recruited Executive Director of DCI
- Together with existing strong leaders, we can build outstanding academic & clinical programs ahead but need collaboration and aligned institutional planning

Research: leveraging innovation

- "Optimal balance" basic & clinical research
  - Optimize enterprise (e.g., metrics; volume of unfunded research)
  - Create dedicated grant application resources (enabling more focus on PPGs, U's, & training grants)
  - Provide more structured mentoring (from "K to R")
  - Undertake enterprise-wide approach to hiring
- Reorganize research ("horizontal integration")
- Utilize strength in clinical research (CRO, first-in-human)
- Make our administrative processes more efficient (e.g., contracting process)

Seamless integration: Discovery-Care Continuum

CURRENT				
AHC, Industry, Biotech	Industry, Biotech	Clinical Research Organizations, AHC	Clinics, Hospitals, Practices, FQHC, AHC	Government, NGOs

DUKE				
Duke Medicine (DUHS, SOM, SON)				
Basic & Clinical Science	Duke Translational Research Institute	Duke Clinical Research Institute	Duke Center for Community Research	Global Health Institute

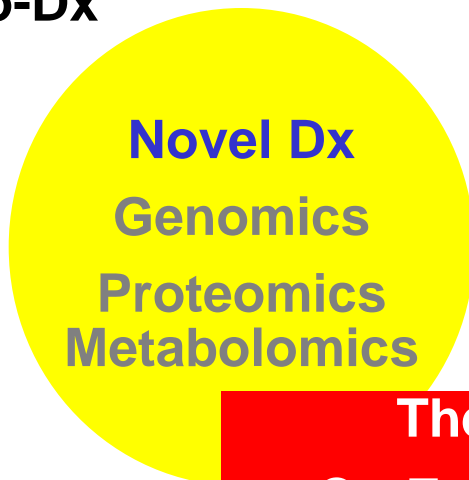
Dzau VJ et al, Lancet 2010

Research: leveraging innovation (continued)

- Make discovery-translational research more productive
  - Creating novel industry partnerships
  - "Going global" (joint discovery-translation agreements)
- Leverage key strength: access to tissue, clinical data
  - Currently only a theoretical advantage
  - Need to build infrastructure for "rapid-learning health systems"
    - Make clinical data "research grade" & lower the costs of data acquisition, new knowledge generation

Leveraging Innovation through Partnerships: Broad Public-Private Collaborations

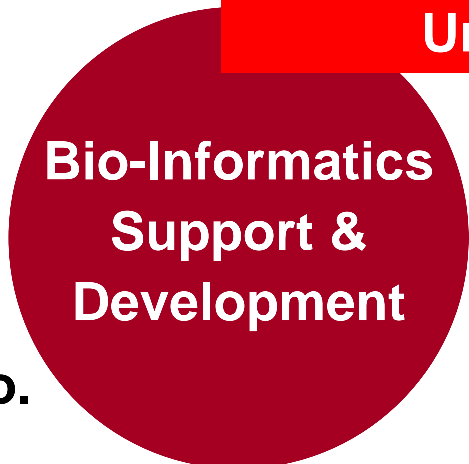
Bio-Dx



AHC

Imaging Co.

These Capabilities Do Not Co-Exist in a Single Entity in the United States or Abroad



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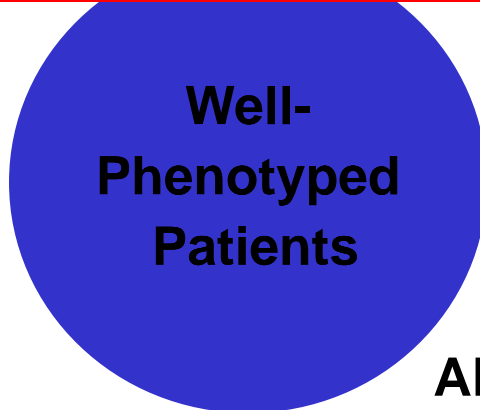

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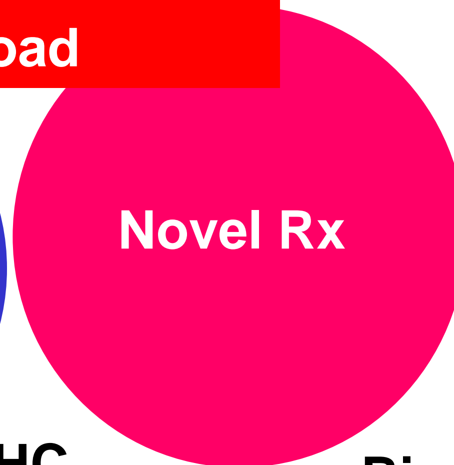

Bio-Pharma

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Leveraging innovation through partnerships

- Duke Clinical Research Institute (DCRI)
  - Largest academic CRO in world with $140M in annual revenue
- Duke Clinical Research Units (DCRU)
  - 100 beds globally for proof-of-concept first-in-human facilities
- Duke-NUS Graduate Medical School
  - $600M 5-year agreement, Signature Research Programs
- Duke-LabCorp "Biomarker Factory"
  - $24M, 6-year discovery partnership
- Duke Medicine-Jubilant partnerships
  - Multi-million $, five-year agreement
  - Move portfolio of translational research programs from Duke, apply Jubilant's proprietary drug development capabilities
  - Funds large population-based biomarker studies in India

Leveraging Innovation

- Culture of innovation & entrepreneurship
- Infrastructure support
- Technology transfer
  - University-based venture funds (Imperial, Mission Bay)
  - Novel relationships with industry (UCSF, UPenn)
  - "Express" or standard licensing agreements (UNC)
- Monetizing IP
- Conflict of interest
- Overcoming institutional & regulatory hurdles

Our Commitment to Education

- Continuum of education
- Best & Brightest
- Future leaders
- Driven by Innovation

Reinvent education & training

- New categories of healthcare professionals
  - Health coaching (contract with VA)
  - Doctor of Nursing Program (90 matriculants in 1st year)
  - New Master of Management in Clinical Informatics
  - Population health mgt (business, analytical, clinical skills)
- Specialized education
  - DCRI-Kaplan EduNeering (training in clinical res globally)
  - New DCRI Center for Excellence in Education (CEE)
- Global opportunities
  - Duke-NUS
- Cost reduction for 1st 2 years of med school ?
  - Instructor core
  - Technology & innovation e.g.,TeamLEAD
- "Fast-tracking"?
  - Combined UME-GME for primary care could save 2 years

Adapting to a changing healthcare paradigm through education

- Innovative care delivery models & implementation science
- Interschool interdisciplinary team-based education on care delivery
- Global Health Residency
- Economics & Policy
- Leadership & Management

Inter-professional Education

- Duke Primary Care Leadership Track for medical students
- Duke SON (NP, DNP, CRNA), PA, PT programs
- Inter-professional Collaboration in Education (ICE)
  - Standing working group across schools that is creating shared curriculum & clinical team experience
  - Patient safety, disaster preparedness
- Team Training (AHRQ)
  - Grant to do inter-professional team training & culture change around patient safety

Source: AAMC

Leadership & Management

- MD-MBA
- Management & Leadership Pathway for Residents (MLP-R)
  – First-of-its-kind program, 18-month rotational, project-based experience in applied healthcare & SOM management in conjunction with traditional residency
- C-CHAMP
  – For rising stars (e.g., division chiefs)
  – Core mini-curriculum in mgt, finance; group projects
  – Senior leadership heavily involved
- Basic Scientist Leadership Program
  – Led by Dean for Faculty Development
- Master of Management in Clinical Informatics

Transformation Will Require a Global Perspective

- Health inequalities
- Emerging infections
- Global burden of chronic diseases
- Service with learning & research
- Healthcare management

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Opportunities in globalization

- Addressing global health disparities
- Globalizing missions
  - *Clinical care*
    - Global franchising of clinical services
  - *Research*
    - CRO work
    - First-in-human POC
    - Overseas translational partners
  - *Education*
- Consulting

Duke's global footprint:

- Duke Global Health Institute
- Duke Clinical Research Institute
- Singapore
  - Duke-NUS GMS
  - SCRI
- India
  - Medanta Duke Res Institute
- Brazil
  - BCRI
  - Anita Garibaldi Women's Health Center
  - Edmond and Lily Safra International Institute of Neuroscience of Natal
  - Education for Life Project (City of Macaiba)
- China
  - Duke-PKUHSC partnership
  - Duke Kunshan University

What Do We Do Next?

- Duke Medicine Enterprise wide planning
  - Duke faculty DUHS alignment
  - Optimizing research enterprise
  - Reinvent education
  - Prioritize our areas of distinction

- DUHS planning
  - Care Redesign
  - Clinically Integrated Network (population health)
  - Growth & network
  - Payer strategy

Finances revised 2016

Impact to 2016 projected finances would change in the following ways for Duke Medicine:

ROUGH ESTIMATE FOR ILLUSTRATION ONLY

- Margin 5% (instead of 2%) due to care redesign
- Research shortfall – increase by 2% (instead of 14%) due to “optimizing” research
- Education/training shortfall – *decrease* in shortfall (instead of increase of 10%) due to education reforms
- Increase new sources of revenue from innovation & globalization
- Close the Enterprise-wide “gap”

Takeaways

- There will always be a need for Duke Medicine (nation's leaders and integrators of the missions)
- But we need to reinvent ourselves
- Duke Medicine must be a leader in the "transformation of medicine"
- Opportunity to produce
  - Better partnerships, reinvent drug discovery, more translation
  - Faster production of needed healthcare workforce
  - Quality efficient care & premium distinctive areas

My greatest source of pride and satisfaction

is the ability to come to work everyday alongside such great people -- our faculties and staff -- all committed passionately to our missions.

Thank you