Full Disclosure

I have no relevant financial conflicts or industry relationships to disclose with respect to this talk (QUALITY).

But I would like to disclose my research:

- **Existing Research Relationships**
  - Barrel Trial (Medtronic) local site Principal Investigator (research funding).
  - Answer Trial (Pulsar Vascular) local site Principal Investigator, study is closed (research funding).
  - Sisters Trial (Medtronic) local site Principal Investigator, study is closed (research funding).
  - Non-funded device registries:
    - Neuroform (Stryker) Enterprise (Codman) LVIS (Microvention)
Topic Outline

• Background
  • Quality Improvement in Medicine
  • What is quality?
  • Evaluating Quality Improvement
• PQRI / PQRS
• Pay for Performance
• Neurosurgery Quality Movement
CUSTOMER CARE

If we really cared for the customer,
We'd send them somewhere better.
Quality Improvement in Medicine

• Spotlight cast on medical errors in 1999
  • Institute of Medicine Report, *To Err is Human*
  • Medical errors result in
    • 44,000 to 98,000 deaths per year (US alone)
    • 7,000 medication related deaths per year
    • $17 billion to $29 billion in total cost
  • “More people die in a given year as a result of medical errors than from motor vehicle accidents (43,458), breast cancer (42,297), or AIDS (16,516)”

The goal of the IOM report:

“The goal of this report is to break this cycle of inaction”

To Err is Human

• The inaction has been broken, sort of...

Crossing the Quality Chasm

- Second publication by the Institute of Medicine came in 2001
  
  *Crossing the Quality Chasm: A New Health System for the 21st Century*

- IOM Committee on the Quality of Health Care in America
  - Formed in June 1998
  - Goal: develop a strategy that would result in a substantial improvement in the quality of health care over the next 10 years

What is perhaps most disturbing is the absence of real progress toward restructuring health care systems to address both quality and cost concerns, or toward applying advances in information technology to improve administrative and clinical processes. Despite the efforts of many talented leaders and dedicated professionals, the last quarter of the 20th century might best be described as the “era of Brownian motion in health care.”
Six aims for improvement:

Safe: avoiding injuries to patients from care that is intended to help them.

Effective: providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those unlikely to benefit (avoiding underuse and overuse).

Patient-centered: providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide clinical decisions.

Timely: reducing waits and sometimes harmful delays for both those who receive and give care.

Efficient: avoiding waste, such as waste of equipment, supplies, ideas, and energy.

Equitable: providing care that does not differ in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

What is Quality?

- **IOM**: "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”

- **AHRQ**: “doing the right thing, at the right time in the right way, for the right person with the best possible results”

What is Quality?

• “Quality” is often equated to “Safety”
  • Avoidance of preventable errors is seen by many as a marker of quality care
  • Multiple sources, including IOM compare “safety” in medicine with the airline industry

Donabedian’s Trilogy

• **Structure**
  - How care is organized
    - ICU staffing with trained intensivists

• **Process**
  - What caregivers do
    - e.g. the percentage of cardiovascular risk patients being put on a statin

• **Outcomes**
  - Results!
    - Stroke rate during carotid endarterectomy
    - Mortality after CABG

Evaluation of Quality

Structure / Process / Outcome

• Majority of quality indicators used today are *process measures*
  • Easy to measure and compare
  • Often based on scientific evidence
  • Example: SQ Heparin and SCDs reduce DVT, and hospitals with high use rates will have lower rates of DVT & PE (and lower mortality)

• Do process measures actually change outcome?
  • We care about the final outcome, regardless of the process

Evaluation of Quality

Structure / Process / Outcome

• Outcome measures more closely align quality with the goals of clinical care
  • Some are *objective* – stroke rate after CEA
  • Many are *subjective* – pain relief after spine fusion
  • Potential for confounding factors
    • Makes it difficulty to compare quality between providers and between care centers
    • Sicker patients at tertiary care center vs. rural hospital
    • Better resources at tertiary care center
  • Obtained from medical records (not billing data)
  • Push for EMRs

Why Important?

U.S. has highest per capita spending on health care of any nation—50% greater than 2nd highest.

Current U.S. healthcare costs are projected at nearly $2.5 trillion, 17% of the entire economy.

• Annual U.S. Spine Care costs $90 billion.
• Over the past decade
  • Incidence has increased by 34%
  • Cost has increased by 65%
<table>
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<th>Year</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
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<td>5.2</td>
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<tr>
<td>National % GDP</td>
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</table>

All categories P < 0.01.
*In 2005 dollars.
†Surgical health care expenditures per capita.
‡National health care expenditures per capita.
Reducing High Cost Practice

- **Poor Safety/Quality** – financial incentives to deliver best evidence care by achieving benchmarks of quality

- **Low Value Treatments** - financial disincentives to perform low value treatments (Value-based purchasing)
GOVERNMENT

If you think the problems we create are bad, just wait until you see our solutions.
Pay for Reporting

Medicare Physician Quality Reporting Initiative PQRI

- Established in 2006 as part of the Tax Relief and Healthcare Act (TRHCA)
- CMS established a voluntary program in which participating physicians would receive incentive payments for submitting quality data
  - Elective system, started collection in 2007
  - By 2009 had 153 reportable quality measures
- 2010 changed to Physician Quality Reporting System (PQRS)

http://www.cms.gov/pqrs/
Only a fraction of the 153 quality measures apply

- **Perioperative Care (look like SCIP measures)**
  - Timing of antibiotic prophylaxis
  - Appropriate antibiotic choice (1<sup>st</sup> / 2<sup>nd</sup> cephalosporin)
  - Discontinuation of prophylactic antibiotics
  - Venous thromboembolism prophylaxis

- **Stroke**
  - Venous thromboembolism prophylaxis
  - Anticoagulant for AFIB prescribed at discharge
  - Dysphagia screening
  - Consideration / Evaluation for rehab services
  - Thrombolytic therapy for ischemic stroke

http://www.cms.gov/pqrs/
PQRS Measures for Neurosurgery

• Quality measures reported in PQRS focus on
  • Maintaining standard of care
    – Antibiotics
    – DVT prophylaxis
  • Patient safety & general health
    – Inquiring about tobacco use
    – Advising smokers to quit
    – Medication reconciliation at discharge
    – Use of EMR

http://www.cms.gov/pqrs/
Pay for reporting meets pay for performance

- 2008 – hospitals receive lower Medicare reimbursement for “hospital acquired conditions”
  - Catheter related UTI
  - Surgical site infection
  - Ventilator associate pneumonia
  - Any “hospital acquired condition” not present on admission
- P4R → P4P  \textit{pay for performance}
- Reduced payments for poor performance
Value Based Modifier

- 2010 Patient Protection and Affordable Care Act instructs the Department of Health and Human Services (HHS) to develop set of value measures to modify physician payments.

- Modifier adjusts payment based on quality and cost of care
- Physicians failing to demonstrate value as defined by HHS metrics would receive reduced re-imbursements – Must Define Benchmarks

- Applied to some specialties in 2015, all physicians 2017
- Physician society contribution of evidence-based clinical metrics encouraged
Many in the Medical Community are skeptical that ‘pay for performance’ measures will improve quality

- May make care cheaper, but better?
- Limited data that these measures work

Possible risks

- Physician avoidance of ‘sick’ patients as to not lower performance ranking
  - Shunt sick patients to public centers
  - Could lower their quality metrics
  - Result in poorly funded institutions caring for the most complex and ill patients

Organized Neurosurgery & Quality

• Neurosurgery parent organizations are actively involved in the national quality debate
  • Represented on NQF
  • Represented at SQA (Surgical Quality Alliance) and AMA
  • Washington Committee

• NeuroPoint Alliance
  • Comprehensive neurosurgery clinical data reporting system
    • Satisfy MOC case reporting
    • Satisfy P4P data collection
  • N2QOD – National Neurosurgery Quality and Outcomes Database
What is Value

• To achieve sustainability of current U.S. healthcare system, *Value-based purchasing* being adopted by most stakeholders in medicine (including payers!)

\[
\uparrow\uparrow \text{Value} = \frac{\uparrow \text{Effectiveness}}{\downarrow \text{Cost}}
\]
Comparative Effectiveness

- American Recovery and Reinvestment Act of 2009 contains $1.1 billion for comparative effectiveness research
- Distributed through AHQR, NIH, HHS
- Compares existing health care interventions to determine which pose the greatest benefits and harms
- The core question of comparative effectiveness research is which treatment works best, for whom, and under what circumstances
Comparative Effectiveness

• Efficacy and effectiveness not the same
• Translation of treatment to “Real world” effect
• Incorporates variation in health services delivery
• Prospective Observational Data
• Use patient centered, valid, reliable, responsive outcomes instruments
So what are we doing about all of this stuff?
Primary goals

- Risk adjusted morbidity and outcomes for most common NS procedures
- Infrastructure for analyzing 30 day morbidity/mortality and 12 month outcomes in real time
- Generate practice specific quality and efficacy data for payers, Nationwide for claims made to CMS/HHS/policy
- Facilitate CER researched trials
Data Output *(all risk adjusted)*

Spine Surgery Example Data:
- EBL, LOSurg, LOStay, DC status
- 30-day complications, re-op, re-admit
- Return to Work
- 3mo/12mo Pain, Disability, QALYs, Satisfaction
- Links to payer claims datasets
- Value measures (Cost/QALY-gained)
Take Home

Value of care will define which procedures are reimbursed (as healthcare consumers, we want value)

- Quality of care will define who gets paid what for those high value procedures

If we do not define the value/quality paradigm for neurosurgery, it will be defined for us

……… likely using loose proxies of quality and poorly accurate risk adjustment
There are a variety of incredible sources on Quality in Medicine, many of which I used in the creation of this talk.

Research in Neurosurgery

"Medical science has proven time and again that when the resources are provided, great progress in the treatment, cure, and prevention of disease can occur.”

“It is ironic that in the same year we celebrate the 50th anniversary of the discovery of DNA, some would have us ban certain forms of DNA medical research. Restricting medical research has very real human consequences, measured in loss of life and tremendous suffering for patients and their families.”

Michael J. Fox
Why do research?

- Intellectually Stimulating
  - Think outside the box
  - Try new devices, drugs, or treatment options
  - Advance treatment of disorders we *aren’t good at treating* with current technology

- Our Obligation
  - Advance the field of neurosurgery
  - Advance the field of endovascular neurosurgery
What kind of research are we doing?

- Clinical Trials
  - BARREL trial - Barrel Vascular Reconstruction Device
  - ANSWER trial - Pulse Rider
  - RELIEF trial – Spinal Cord Stimulation
- Registries
  - Most of these are for endovascular devices
    - Enterprise, Neuroform, LVIS/LVIS Jr, Wingspan
- Basic Science?
  - Florida Center for Brain Tumor Research
Prognostic Factors for low grade gliomas...

- Factors that help predict an *unfavorable prognosis* for low grade gliomas
  - Location in *eloquent cortex*
  - KPS < 80
  - Age > 50
  - Size > 4 cm
  - IDH 1 wild type
  - 1p/19q NOT deleted
Florida Center for Brain Tumor Research

- We participate in the Florida Center for Brain Tumor Research
  - Florida is the ONLY state with a state sponsored tumor bank for genetic research for brain tumors
  - HQ at University of Florida
  - Participating Sites
    - UF, UF Health Orlando, Mayo Jacksonville, Cleveland Clinic, University of Miami, USF, Scripps Center, and... Tallahassee Memorial Hospital
What do we do with FCTBR?

- Send Tissue!
  - Each brain tumor removed at TMH (assuming the patient has consented) has tissue sent on dry ice to UF
  - All tumor types
  - Stored in a massive tissue bank
  - Serves as a library for future investigations

- TMH had the highest enrollment rate of any site!
FCTBR

Tissue DONORS

UF

TMH

UF Orlando / ORMC

TISSUE BANK

(a bunch of freezers down in the swamp)

SMART SCIENTISTS

UF

FSU

Cleveland Clinic

Mayo Clinic

UM

USF

Scripps
**FCTBR**

- Cost to operate is $250,000 per year
- FCTBR also *awards* $250,000 (or more) per year in research grants for basic science research into brain tumors
- **2016 FCTBR Award Winners**
  - FSU – Dr. Akash Gunjan $100,000
  - UF – Dr. Jeffrey Harrison $100,000
  - Scripps – Dr. Victor Quereda $75,000
  - UF – Dr. Brent Reynolds $75,000
FCTBR Dream Objective

• What the current incentive to donate your brain tumor to FCBTR?
• What if FCBTR could give something back?
  • Undergo craniotomy → tissue sent to FCBTR
  • Most tissue banked, some is grown in culture
  • The patient’s tumor culture is then tested with current chemotherapy regimens offered
    • Results reported to the Oncologist on record

• This has never been done before
• This is a really cool idea
  and we are working to make it a reality
Thank you!

• Questions?

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