Disclosures

- Consulting fees from Edwards Life Sciences
- Talk will not touch on their products

Objectives

- Identify major drivers of ‘hospital’ investment (capital and other resources)
- Contextualize patients’ interest in anesthesia technology from a safety perspective
- Reconcile ‘anesthesia’ technology value propositions vis a vis other competing priorities
- Develop go-foward plans to
  - Optimize resource allocation in current systems
  - Inform future technology development
Not the Best Value

- Cost rising faster than GDP
- Big spend does not translate to longevity or better access
- Payers (employers) committed to bending the cost curve

The Current Spending Trend is Not Sustainable

- 6% annual growth over last decade
- Median FAMILY income = $50,000
- Expenses rising 2x revenue
- Trend in reimbursement is about 2% increases per year
- Expenses rising 4% year
- Labor
- Drugs & supplies
- Quaternary med ctrs need to find $50-$100M/yr in savings or net revenue improvements just to stay above water
- VERY focused on easy-to-quantify savers & earners

Source: CMS

For the entire U.S., this is ~$2.5 trillion, or ~17% of GDP
Health System Leader Focus:

- Cost savings - drugs, supplies & personnel
- Throughput - how to get more
- Contracting - how to get more
- High revenue services
- Outpatient specialty pharmacy
- Local competition for patients and talent
- Compliance risk & mitigation
- EHR implementation and optimization
- Physical plant - make it last

They’re Thinking About:

The No. 1 takeaway from the 2019 JP Morgan Healthcare Conference: It’s the platform, stupid
1. Create the Digital Front Door — or Someone Else Will
2. Drive Affordability and Reduce Cost — or Risk Being the Problem
3. Tackle Social Determinants of Health — or You Won’t Be the Hub for Health in Your Community
4. Create Partnerships for Healthcare Innovation — or Lose the Upside
5. Become the Hub for Targeted Services and Chronic Conditions — or They Will Go Elsewhere
6. Leverage Applied Analytics — or You’ll Lose Your Way

Patients’ Priorities

- Convenience
  - Timely, friendly appointment scheduling, communication
  - Handy location, extended hours, apps
- Price - low out of pocket
- Bedside manner, comfort, compassion, patience & personality
  - Confidence in provider’s expertise
- Quality is not a top priority
  - Patients generally unaware that quality varies
  - Spend more time researching treatment than quality or provider options
Patients assume airline-level outcome is part of the paid service
A High-Stakes Resource

- Anesthesiologists (anesthetists) are everywhere
- Necessary adjunct to procedural medicine
- Expensive!
  - Typical academic dept: 50 anesthesiologists
  - Total expense/FTE: about $600K/year
  - Revenue does not keep up with expenses
  - Institutional support to academic depts: about $100K/FTE-year
- This is real money ($5M/year)

The Anesthesia Taxi Ride

Revenue Possibilities

Cost

Quitting Time!

Drive Towards Assuring > Performing

- Anesthesia is:
  - Commonly regarded as a safety leader
  - Only specialty built around personal administration of dangerous drugs
- Yet:
  - True morbidity & mortality rates unknown (low)
  - Causes of morbidity and mortality may attach to anesthesia, or maybe not
- Do oncologists personally administer!
The Economic Imperative

Healthcare economic outcomes are the sum of enormous opposing forces

DRG-based reimbursement for inpatient care is effectively a capitated payment system

- On the revenue side
  - Payer mix
  - Contracting
  - Coding
    - Documentation quality to support coding
- On the cost side
  - Head count
  - Payroll (salaries, benefits)
  - Throughput
    - Velocity, durability
  - <Consumables>

Our Tech Must Tie to Margin

- Administrators need to see metrics they can understand:
  - Cases/OR-day (Cases/hr) [or just $$/hr]
  - Hospital throughput
  - Turns
  - Bed-days saved or returned
  - Case mix sorting or modification
  - Novel case type facilitation (setting; type)
    - Inpt > Outpt; Percutaneous valves

This is Not the Answer
Anesthesia Clinical Care Pathways

Verticals: Longitudinal through the care path of patient or procedure types - ERAS
- PONV Prophylaxis
- Multimodal analgesia
- Normothermia
- Goal-directed fluids

Horizontals: Across all or many patients

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Vertical: ERAS+ for Colorectal Surgery
- Development of decision-to-post discharge pathway for colorectal surgery patients
- Multidisciplinary initiative in collaboration with colorectal surgeons
- Target: One day off LOS (all pts; more potential)
- Full hospital: Every 4-5 patients across fixed floor bed cost base allows addition of a 5th or 6th case
- Falls straight to the bottom line

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What About Medical Outcomes?
- Difference in difference analysis: NSQIP complications

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How Do We Report Value from Verticals?

- Bed days returned:
  \[ \text{Bed days returned} = \text{Sum} \left[ \text{Median LOS (old)} - \text{Median LOS (ERAS)} \right] \times N \text{(cases)} \]
- Cost/Case
- Net Margin/Case
- Balancing metrics:
  - Readmission rates / ER visits
  - Complication rates
  - Complaints
  - HCAHPS ratings - by floor

Results Roll-up

- CRS (blocks, low opioid multimodal, NoBUGS, early feed)
  - LOS 4 >> 3 days; Net margin up
  - Hailed NSQIP complications
- WRS (blocks, multimodal, PONV; Surg Onc Obes Relat Dis 14 849 (2018))
  - Reduced PONV; Less opioid usage
- Pituitary (std process pre-, intra-, post; U bypass)
  - 1.36 LOS reduction; cost = 0.7 baseline
- Ortho Trauma (blocks, multimodal, early mob)
  - In LOS reduction
  - Hailed mortality, pneumonia & vent days in multi-Rib fx pts
- VAMC: multiple svcs (blocks, multimodal, std anesthetic)
  - 1-2d LOS reduction; $0.75M direct savings/year

References:
- Periop Med 5, 3-12 (2016)
PCS Care Plan: Colorectal ERAS Components

Preoperative Timeline

- Discharge Planning
- Non-opioid Maximodal Analgesia
- Lidocaine infusion
- Ketamine infusion
- Ketorolac IV
- Run TEC if present

Early Milestones

- Rectus Sheath Blocks
- Initial PONV Prophylaxis
- (scopolamine patch)
- Normothermia: T>36°C
- Oxygenation (FiO2 >0.8)
- Antibiotic: drug/dose(s)/timing
- Underventilation (ETCO2 >38)
- Glycemic control (Glc<180mg/dL)
- Skin prep (CHG)/no shaving

GABA: APAP clears PO up to 2h before surgery

Take 1-2 hours before surgery

Patient Feedback for OR Anesthesia Clinicians
The VUMC Strategic Directions

- Design for Patients and Families
- Discover, Learn, and Share
- Make Diversity and Inclusion Intentional
- Amplify Innovation

Our History of Patient Follow-up

- Susan Walsh RN
- 40 yr VUMC staff
- Personal calls to ambulatory patients
- On the spot survey
- Problem solving
- One person

Patient Follow-up: 2020

- To assist in better Designing for Patients and Families, we contract with Survey Vitals
  - [Google ‘VUMC Survey Vitals’]
- Three contact modes: Voice, Text, Email
- Confirm your team; complete survey
  - 1 → 5 Likert rating scales
  - Comments for ratings of ‘1’ or ‘2’ (low)
    - [Feedback]
  - “Would you like to be contacted?”
Patient Follow-up: 2020

Appeals to the Performance Orientation side

Appeals to the Developmental Orientation side
What To Do When Patients Have Critiques

ADDRESSING THE MOST COMMON CONCERNS FROM PATIENT FEEDBACK IN SURVEY VITALS

**FEEDBACK IN SURVEY VITALS**

**Principle:** Many patients want to be involved in their healthcare choices concerning anesthesia.

**Feedback:** Options for anesthesia were not explained adequately before surgery.

**Principle:** Patients like to be informed about the risks of anesthesia and process during the day of surgery.

**Feedback:** Questions about anesthesia, the process, risks, and possible after effects were not answered.

**Principle:** Patients desire privacy in a space that is intimidating when sensitive information being discussed.

**Feedback:** The anesthesia provider did not ensure patient comfort during the surgical experience.

**Principle:** The anesthesia provider did not ensure patient privacy.

**Feedback:** Questions about anesthesia, the process, risks, and possible after effects were not answered.

**Principle:** Patients want to be involved in their healthcare choices concerning anesthesia.

**Feedback:** Options for anesthesia were not explained adequately before surgery.

**Principle:** Patients want to be comfortable and reassured during the perioperative period.

**Feedback:** The anesthesia provider did not ensure patient comfort during the surgical experience.

**Principle:** Patients desire privacy in a space that is intimidating when sensitive information being discussed.

**Feedback:** The anesthesia provider did not ensure patient privacy.

Analysis courtesy of David Chestnut
Where To Now?

Should Hospital Leaders Care About Anes Technology?

- Finance leaders need to see metrics they can understand
- Patients need to see metrics that matter to them
- Our basic technology works pretty well

Direct our efforts to:

- ‘Headroom’ between revenue & expense
- Reinvest that into research & development that improves healthcare outcomes
DEPARTMENT OF ANESTHESIOLOGY
VANDERBILT UNIVERSITY MEDICAL CENTER
Compassionate | Creative | Committed | Collaborative