Clinical Standards Work: Implications on Finance
HFMA Region 9
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Learning Objectives

• Describe the role of variation in health care delivery and how it impacts quality of care
• Describe the process of developing clinical standards across a health care system.
• Discuss opportunities for engagement of clinicians in linking clinical standards work with patient outcomes and financial outcomes
• Describe how an EDW and care process implementation can encourage a culture of quality and safety, providing physicians with the necessary tools to integrate financial relevance into the practice of delivering high-quality healthcare.
Johnny Jones

8 year old boy with a history of lung transplant

- Emergency department: his triage evaluation demonstrated heart rate and other findings consistent with early signs of shock
  - Delivery of critical resuscitation fluids was slow and undertreated
  - Antibiotics arrived hours after they were ordered
- Lung inpatient unit: a “Rapid Response Team” was called 3 ½ hours after the evaluation of concerning signs and symptoms
- Pediatric Intensive Care Unit
  - Blood pressure was not obtainable
  - Put on a ventilator
  - Aggressive drug therapies
  - Procedural interventions to artificially oxygenate his blood

Johnny died 18 hours after he first arrived

Root cause analysis

- Diagnostic and therapeutic errors identified in the ED and the inpatient ward by multiple provider types
- A gap in meaningful communication between providers created confusion in management plans
- Neither management guidelines nor the EMR were providing clinical standards or clinical decision support for practitioners

Systems were not well integrated
A similar story in New York State...

- The Rory Staunton Act
  - Hospitals shall have in place evidence-based protocols for the early recognition and treatment of patients with severe sepsis/septic shock...
  - Analytics: all severe sepsis/septic shock patients to be entered in the NYS database for annual risk adjusted mortality rates
  - Targeting systems of care

Quality care delivery?

- The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge

The Healthcare Value Equation

\[
\text{Value} = \frac{\text{Quality}}{\text{Cost}}
\]

- In an environment where cost is marginally increasing, healthcare must markedly improve quality.

Variability in pediatrics

- 16 hospitals treating children for bronchiolitis
- Quality metrics
  - Dx: chest radiograph, laboratory blood work
  - Tx: antibiotics, breathing treatments, IV placement
- These variations in practices were NOT explained by severity of illness

Macias et al. Variability in inpatient management of children hospitalized with bronchiolitis, Academic Pediatrics 2015
Explaining variation: translating the evidence

![Image of a graph showing the number of journal articles published on health care topics per year from 1970 to 2010. Publications have increased steadily over 40 years, with the rate of increase becoming more pronounced starting approximately in 2000. SOURCE: Data obtained from online searches at PubMed: http://www.ncbi.nlm.nih.gov/pubmed/]

Correlation between quality and cost

Describing variation in care in three pediatric diseases: gastroenteritis, asthma, simple febrile seizure
- Pediatric Health Information System database (for data from 21 member hospitals)
- Two quality-of-care metrics measured for each disease process
- Wide variations in practice
- Increased costs were NOT associated with lower admission rates or 3-day ED revisit rates

The US Healthcare system is inefficient

36% of healthcare expenditures is waste (2009)
- Unnecessary services
- Inefficiently delivered services
- Excess administrative costs
- Prices that are too high
- Missed prevention opportunities
- Fraud

$765B of healthcare expenditures is waste (2009)

Overuse for tests and therapies beyond established evidence
- Procedural/surgical intervention vs appropriate watchful wait
- Discretionary use of services or devices
- Unnecessary choice of higher cost services

Reforming health care

Institute of Medicine: Best Care at Lower Cost 2013
Clinical standards/practice guidelines

• Systematically developed statements or recommendations to assist the practitioner about appropriate health care for specific clinical circumstances.

Institute of Medicine (1992). Guidelines for clinical practice: from development to use

• Evidence based guidelines help control complexity
  • Summarize available evidence and translate to guidance for care
  • Address treatment uncertainties and reduces variation in care delivery where evidence lacks
  • Help maximize use of health care resources: system efficiency
  • Improved patient outcomes: diagnostic accuracy and therapeutic effectiveness
  • Enhance shared decision-making between patients and physicians
  • Provide a framework for analytics

• Pareto principle
  • 80/20 rule
  • 20% of the problems cause 80% of the trouble

Adapted from Penney and Foy. Best Practice and Research, 2007

Evidence Based Outcomes Center (TCH): systematic development of clinical standards

• Identifying quality gaps through big data
  • High prevalence
  • Resource intensive care
  • High morbidity or mortality
  • Marked variations in care
  • EDW, analytics and the key process analysis
EBOC process

1. Identify the quality problem/gaps: mortality, resource consumption, variability, prevalence
2. Search for existing guidelines and assess their applicability
3. Assemble a group of stakeholders (bottom up, never top down)
4. Identify the Patient Intervention Comparison Outcomes (PICO) questions
5. Search the evidence
6. Evaluate the evidence using an evidence rating AND recommendation rating tool
7. Vet with stakeholders
8. Once approved, build into Epic with consider for clinical decision support

Evidence Based Outcome Center

Acute Chest Syndrome *updated
Acute Gastroenteritis
Acute Heart Failure
Acute Hematogenous Osteomyelitis
Acute Ischemic Stroke
Acute Otitis Media
Apparent Life-Threatening Event (ALTE)
Appendicitis *updated
Arterial Thrombosis
Asthma *updated
Attention Deficit Hyperactivity Disorder
Autism Assessment and Diagnosis
Bronchiolitis *updated
Cancer Center Procedural Management
Cardiac Thrombosis
Central Line-Associated Bloodstream Infections
Closed Head Injury
Community-Acquired Pneumonia *updated
Cystic Fibrosis – Nutrition/GI >12 y/o *updated
C-Spine Assessment
Deep Vein Thrombosis
Diabetes Perioperative Management
Diabetic Ketoacidosis
Fever and Neutropenia in Children with Cancer
Fever Without Localizing Signs (FWLS) 0-60

Days *updated
Fever Without Localizing Signs (FWLS) 2-36
Months *updated
Hyperbilirubinemia
Intraosseous Line Placement
IV Lock Therapy
Kawasaki Disease
Migraine Treatment-Emergency Center
Neonatal Thrombosis
Nutrition/Feeding in the Post-Cardiac Neonate
Obstetric Hemorrhage due to Uterine Atony
Perioperative Management of Anterior Mediastinal Masses
PICC Securement
Procedural Sedation *updated
Rapid Sequence Intubation
Respiratory Management of Preterm Infants
Septic Arthritis
Septic Shock
Skin and Soft Tissue Infection
Status Epilepticus
Suspected Child Physical Abuse
Tracheostomy Management
Urinary Tract Infection
Clinical Systems Integration domains

“The means to facilitate the coordination of patient care across conditions, providers, settings, and time in order to achieve care that is safe, timely, effective, efficient, equitable, and patient focused.” - The American Medical Association

Cross cutting elements: clinical care, operations, and finance

Clinical Systems Integration Governance Structure

- **Clinical System Integration Executive Leadership Council**
  - Prioritizes and assesses technology initiatives that integrate with EMR or independent solutions
  - Oversees development and implementation of clinical programs, analytics, and knowledge assets

- **Clinical Technology Council**
  - EMR and related clinical technologies

- **Content and Analytics Team**
  - Develops clinical standards (guidelines) and oversees clinical data and predictive analytics
  - EHR and enterprise data warehouse are part of this structure

- **Clinical Implementation Team**
  - Quality and permanent care process teams
Population Health approaches: permanent teams drive PDSA cycles

Expansion for 2015: Neonatal diseases-BPD, CDH, CLABSI, readmissions, unplanned extubations, cardiac illnesses, Spine surgery, Tracheostomy, Hypospadias

Clinical Decision Support
Measurement and analytics (EDW):
Patient outcomes
Financial metrics
Utilization metrics

TCH’s EDW Architecture for Data Transparency

Metadata: EDW Atlas Security and Auditing

Common, Linkable Vocabulary

Financial Source Marts

Departmental Source Marts

Patient Source Marts

HR Source Marts

Payer Satisfaction Sources

FINANCIAL SOURCES
(e.g. EPSi)

DEPARTMENTAL SOURCES
(e.g. Sunquest Labs)

PATIENT SATISFACTION SOURCES
(e.g. NRC Picker)

EMR SOURCE
(Epic)

Human Resources
(PeopleSoft)

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EMR SOURCE
(Epic)

Human Resources
(PeopleSoft)
Registry Financial Score Card from the EDW

Data Drives Waste Reduction: Approaches

Option 1: Focus on Outliers – the prescriptive approach

**Strategy** Identify extreme cases with the potential for high costs from bad outcomes and eliminate the unfavorable tail of the curve (“executive dashboard” approach)

**Result** If the outlier trim point is set at 1.96 standard deviations, only 2.5% of cases fall under the adverse outcome tail, so the impact is minimal
Alternative Approaches to Waste Reduction

Option 2: Focus On Inliers – improving quality outcomes across the majority

Strategy Identify best practices through research and analytics and develop guidelines and protocols to reduce inlier variation

Result Shifting the cases that lie above the mean toward the excellent end of the spectrum produces a much more significant impact

Improving Cost Structure Through Waste Reduction

<table>
<thead>
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<th>Ordering Waste</th>
<th>Workflow Waste</th>
<th>Defect Waste</th>
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<td>ADEs, transfusion reactions, pressure ulcers, HAI, VTE, falls, wrong surgery</td>
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Use Cases and Business Drivers

Quicker steroid delivery for status asthmaticus, goal directed therapy for septic shock

Evidence supports

Evidence equivocal

Evidence against

CXR utilization in patients with known asthma, steroids in bronchiolitis

Hypertonic saline and bronchodilators in select patients with bronchiolitis

Asthma: Care Process Team Cohort, Percentage of Chest X-rays Ordered*
(Oct. 2010 - Apr. 2013)

* Inpatient, Emergency Center (EC) and observation patients (Care Process Team cohort), P-Chart based upon EDW data extraction of 5/14/2013 (M&W).
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- Identify opportunities for evidence infusion

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Integrated into our shared savings model
Improving Cost Structure Through Waste Reduction

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Clinical Decision Support to Minimize Errors

*used by permission of BMJ Group*
Financial Impact-inpatient
ROI For Diabetes CPT
An analysis of one improvement aim

Aim: Decrease length of stay for children with diabetic ketoacidosis by development of a Diabetic Care Unit

Unit opened in Summer 2014

Preliminary analysis suggests break-even point achieved

CPT Cost = continuing human resource costs + % of employees designated to CPT
Did not include CPT start-up costs or hardware/software costs

Net revenue = change in revenue for DKA with a increased revenue from increased capacity compared to 2013
Lessons learned

- Wide variations in practice can be minimized with systematically developed clinical standards
- Quantitative assessments can help identify gaps in quality
- Systematic use of tools will help standardize approaches to the integrity of clinical standards
- Governance, and a clinical systems integration strategy are critical to effective uptake
- Evaluation of outcomes through analytics allows guided implementation and transparency of outcomes
- Financial metrics may be linked to demonstrate and hardwire cultural attention to value and clinical standards work

Improving outcomes for populations...


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