Value and Quality Improvement
Avoiding Low Value Pitfalls

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Disclosure

We have no conflicts of interest to disclose

We do not intend to discuss the use of any unapproved devices or therapies
Agenda

• Intro to Value and Costs – Walker, Fieldston
• Article Discussion – Quinonez, Garber
• Value Framework for QI - Garber
• Share QI project - All
• Discussion/Wrap Up - All

Why?

• Idea that you can improve a process but make things worst
• Increasing and sometimes competing QI efforts
• Doing QI is expensive
• Downstream consequences
Example of QI project

• Increasing time from door to phototherapy for patients presenting to ER

• Aim: Decrease door to PTx time by 25%

• Outcome: Number of patients for which time from door to PTx was less than 45 min.

• How to improve:
  - Decrease threshold for PTx
  - Improve lab turnaround time
  - Faster methods for detection
  - Create triage protocols

• Problems?
  - Increased admissions for borderline levels
  - Evidence basis?
  - Costs?
  - Patient benefit?
• IV infiltrates - patient experience

• Asthma Action Plans - low evidence basis, but you have to do it

• Patient follow up after discharge - mixed

• Line Infections – patient experience, high evidence basis
Value QI and Costs
Lauren Walker
Evan Fieldston

Value = \frac{Quality}{Cost}
Quality in the Eyes of the IOM

- Safe
- Effective
- Efficient
- Timely
- Patient-centered
- Equitable

Value-Based Healthcare = Health Outcomes Over Care Cycle

Total Costs of Delivering Outcomes For condition

Adapted from Michael Porter, Value Based Healthcare Delivery
We’re Not Getting Value!

We Waste A Lot of What We Spend

$765 Billion in “Waste”

Unnecessary Services
$210 Billion

Excessive Administrative Costs
$190 Billion

Inefficiently Delivered Services
$130 Billion

Prices That Are Too High
$105 Billion

Missed Prevention Opportunities
$55 Billion

The World is Changing!

Consumerism

Pressure to Lower Prices

Value-based Payments, Accountable Care

Pressure to Lower Costs

Accountability

Transparency

Value

Stewardship
Identify challenges related to addressing quality, cost and value in pediatrics.
Why So Difficult?

- Accounting is not simple
- Complex reimbursement schemes
- Third-party payment
- Cross-subsidization

Cost

deposit of something, such as time or labor, necessary for the attainment of a goal

Direct or Indirect Costs?
Fixed or Variable Costs?
Marginal or Incremental Costs?
Short- or Long-term Costs?
Opportunity or Real Costs?
Cost to Whom?
Variable Costs

- Costs that vary in direct proportion with volume
  - Each viral panel associated with a royalty fee
  - Each disposable pulse ox probe costs money

Fixed Costs

- Costs that do not vary in total as the amount of activity varies within a range of volume
  - Building rent or depreciation
  - Fixed elements of staffing costs

All costs are variable in the long-run
Large Fixed Costs in Healthcare

<table>
<thead>
<tr>
<th>Fixed costs</th>
<th>Variable costs</th>
<th>Total costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>Medications</td>
<td>Disposable supplies</td>
</tr>
<tr>
<td>Equipment</td>
<td>Disposable equipment</td>
<td>Variable staffing</td>
</tr>
<tr>
<td>Fees</td>
<td>Malpractice insurance</td>
<td>Non-variable staffing</td>
</tr>
<tr>
<td>Non-variable staffing</td>
<td>Other overhead</td>
<td>Depreciation</td>
</tr>
</tbody>
</table>

Direct, Indirect and Full Cost

- All costs of an activity =
  
  direct costs (variable) → clearly and directly associated with an activity or service
  +
  indirect costs (allocated fair share)

At the end of the day, ALL costs in the hospital have to be allocated
**Average Costs**

- Full costs divided by the number of units of service or patients
  - A hospital treats 1,000 patients and the total costs of care are $10,000,000 → average cost = $10,000

**Marginal Costs**

- Change in total cost related to change in volume
  - Variable costs and any additional fixed costs incurred because volume change exceeds relevant range for existing fixed costs
  - Cost to do one more of something
  - Marginal costs almost always less than average cost
Step Costs

- Fixed costs are set for a range, so costs have more of a step function
  - Lab machine & tech can handle 10,000 specimens/year; to do ≥1 more, you need to buy another machine and hire another tech

Costs → Savings

Charge for blood test: $500
Direct cost: $50
Supplies consumed: $10

Savings from doing 1 less test? 10 less? 100 less? 1,000 less?

All costs are variable in the long-run
Right volume leads to right-sizing organization
QI Cost Reduction Challenge

• “For all these measures, it is unclear whether what might be relatively small variable cost reductions related to specific tests/procedures can lead to subsequent reduction in fixed costs related to facilities and equipment, where more than 70% of healthcare costs lie. In other words, reducing the number of lab technicians and the amount of laboratory equipment needed will lead to far greater cost reductions than reducing individual test utilization.”

– Auerbach AD, Wachter RM. Focusing on value: This time is different. J Hosp Med 2013.

Challenge: Charges ≠ Costs

• Patient’s bill = itemized charges for every item used for patient reflecting allocation of costs
  – Hospital (Technical) Charges
  – Professional Charges

“Charges for Sarah’s stay were $28,738. United and I only paid about $12,000 ($9,136 from United, $3,233 from me).”
Clinical Activities | Charge ($) | Reimbursements ($)
--- | --- | ---
Emergency Dept | 554 | 9041
Room & Board x 3 days | 9300 | 
Thiopental | 53 | 
Endostapler | 547 | 
Hot pack | 36 | 
[+86 lines of charges] | +++ | 
X-ray | 71 | 
Pharmacy | 1979 | 
Anesthesia services | 1326 | 1060
Surgical services | 3235 | 2059
Radiology services | 418 | 209
Total | 28738 | 12369

For most patients, we do not get paid for each service billed! (fee, per diem, DRG)

Cost-Charge-Payment Cycle

**Per diem or DRG-based payments, Negotiated rates off charges, Fee schedule,**

$28,738

$9136 insurer
+$3233 family
= $12,369

**Hospital input costs**

**Direct costs:** directly linked to services patient received (including department overhead)

**Indirect costs:** everything else (overhead of whole institution)
Value is in the Eye of the Consumer

“[W]e look at Sarah’s appendectomy as something of a miracle….something went haywire in the belly of our little girl, and over the course of several days, dozens...of highly trained, highly capable people worked together to fix it. They did such a remarkable job that within a week of coming home, Sarah was once again climbing the apple tree in our backyard, and showing off her three tiny scars to anyone who wanted to look.”

– Tom McGrath 2008

• Who is the consumer in healthcare?
  – Patients/families consume resources
  – Third-party payers (employers, insurers, governments) pay for most of the costs
  – Patients/families have increasing “skin in the game”

Whose Costs? Over What Time?

• Whose costs?
  – Patients/families
  – Hospitals
  – Professionals
  – Third-party payers
  – Governments
  – Employers
  – Communities
  – Society

• Over what time?
  – Immediate cost
  – Downstream costs, benefits, harms

• Opportunity costs: What else could have been done with the money?
When $ means different things

- Viral panel charge = $6000
- One insurer’s negotiated rate: $700
- Patient responsibility:
  - high-deductible plan: $700
  - after meeting deductible: $0
- Separate payment to hospital if done inpatient: $0 (if per diem, DRG) = no a la carte payments
- Cost data are (often) proprietary information
- Institutional costs are not the same as cost to patient

Sources of (Estimated) Costs

- Healthcarebluebook.com: Reports recommended prices based on typical fee that providers in a certain area accept as payment from insurance companies
- NewChoiceHealth.com: Provides a summary of providers’ list prices (not paid amount) for a particular geographic region
- Outofpocket.com: Provides a search tool to help consumers find pricing information online
- Clearhealthcarecosts.com: Displays payment data reported by consumers for various procedures; not much data for Philadelphia area
- Insurance company specific pricing tools (for plan members only): Pricing tools for members to see what the insurance company pays as well as member out-of-pocket costs
- State specific health care cost databases: A few states provide pricing information for insured and uninsured consumers based on insurance claims in the state
Articulate strategies for bringing High Value Care into QI Projects

Quality in the Eyes of the IOM

Safe
Effective
Efficient
Timely
Patient-centered
Equitable
Focus on Quality, Cost, or Value?
(The view from IHI)

- Quality improvement initially predicated on “doing the right thing”
  - Financial benefit as secondary
  - “Light green dollars” = potential cost savings that cannot be tracked to the bottom line
  - “Dark green dollars” = actual savings on the bottom line (business case)
  - Challenging because hospitals can rarely track savings to a specific budget line item

- Value improvement: systematic identification and elimination of waste, while maintaining or improving quality.
  - Aim is primarily financial; any positive impact on quality, while desired, is secondary
  - “Dark green dollars” → express improvement aim in terms of waste reduction
  - Identify inefficiencies in system and remove them


IHI Model for Enhancing Value

Summary

- The move toward value-based health care is driven by unsustainable growth in the cost of health care and sense of low- or variable-quality care.

- Better health – and better, more reliable healthcare delivery is a key driver of reducing costs and increasing value.

- Numerous opportunities exists for clinicians to improve quality, reduce variation, and have a more mindful approach to resource utilization.
Analysis of Two Different But Similar QI Projects

• Both studies published in peer reviewed journals

• Consider value of each project as you hear about them

• At the end try to think which project was published in a more prestigious journal

QI PROJECT # 1

Aim

• Determine the prevalence of bacteremia in patients with CAP at a children's hospital by chart review before institutional guideline adoption.

• Test the effectiveness of newly developed guidelines for obtaining blood cultures in pediatric patients with CAP
Multidisciplinary local guidelines

(1) febrile and age <6 months or febrile with delayed immunizations
(2) patients who are immunocompromised
(3) chronic medical conditions predisposing to severe or recurrent pneumonia
(4) hospitalization <14 days before the diagnosis of pneumonia
(5) toxic-appearing or requiring PICU admission
(6) radiographic concern for an effusion, empyema, or abscess
(7) central line in place.

Results

• Out of 330 patients, 155 (47%) blood cultures obtained
• A total of 145 (94%) blood cultures were negative
• 5 true positives, 5 false positives
• Prevalence of bacteremia 3.2% in patients with blood cultures and 1.5% in all patients
• All patients with bacteremia also had radiographic evidence of an effusion or empyema and all 5 patients were admitted to the PICU and/or described as being septic, thereby meeting institutional criteria.
• Adoption of institutional guidelines could have reduced the frequency of blood cultures from 47% to 26% without missing any true-positives
QI PROJECT # 2

Aim

• Increase adherence for BCx recommendation from national CAP guidelines
• Increase blood cultures ordering for children hospitalized for CAP from 53 to 90% in 6 months.
• Sec. Aim: Evaluate the effect of obtaining blood cultures on LOS

Method

(1) Identified key drivers
(2) Multiple PDSA cycles
(3) Multidisciplinary team engagement
(4) Run charts to track improvement over time
Results

• Percentage of blood cultures increased from 53% to 100%
• This was sustained for 12 months
• Percent true positives 2.5%
• No effect on LOS

Pair Share Discussion
Improvement and value

• QI #2
  - Before project – 6.3% of true positives
  - After project – 2.5% (They actually lowered their yield!)

• QI #1
  - True positives 3.2%
  - If blood CXs had been obtained only in patients meeting criteria –
    • 6 % true positives

QI Value Framework
The VIP Experience

Mathew Garber, MD
VIP principles

- Metrics must have robust evidence (Level 1)
- Condition should be common (or costly)
- The provider subject to the metric has control over the intervention
- Overuse (value) metrics always save money and promote convenience, they may prevent harm
- Target the places children are treated (community hospitals)
- Facilitate spread by publishing results
- Mentor the next generation of implementers

National quality measures


<table>
<thead>
<tr>
<th>Measure Category</th>
<th>All Measures, N (%)</th>
<th>Unique Measures (Duplicates Removed), N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>586</td>
<td>257</td>
</tr>
<tr>
<td>Outcome</td>
<td>118 (31)</td>
<td>83 (22)</td>
</tr>
<tr>
<td>Structure</td>
<td>29 (7)</td>
<td>22 (9)</td>
</tr>
<tr>
<td>Process</td>
<td>240 (62)</td>
<td>152 (59)</td>
</tr>
<tr>
<td>Process measures by type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underuse</td>
<td>179 (74)</td>
<td>117 (77)</td>
</tr>
<tr>
<td>Overuse</td>
<td>35 (15)</td>
<td>20 (13)</td>
</tr>
<tr>
<td>Maese</td>
<td>26 (11)</td>
<td>15 (10)</td>
</tr>
</tbody>
</table>
Measures compared to prevalence across settings

VIP principles applied to PRIMES’ (pediatric respiratory illness measurement system) 76 specified and field tested quality indicators

- Select the 19 indicators supported by the highest level of evidence
- Include all the value metrics for a total of 31 indicators
- Trial the metrics in community hospitals
- Remove metrics with near perfect compliance
- Set goals using Achievable Benchmarks of Care
- Agree with PRIMES authors that “Future validation work should include formal studies to assess the relationship between high levels of performance on these indicators and other established quality measures such as return to baseline functional status... reduction in return visits to the ED, or fewer 30-day readmissions to the hospital.”
How does your project measure up?

Lesson for QI

“Process measurement, though a useful internal strategy for health care institutions, is not a substitute for measuring outcomes.”

Michael E. Porter, What is value in health care? NEJM, 363;26