

AVANT-GARDE HEALTH

Let's Take a Closer LookTM

NERVESAre You Measuring What Matters?

September 23, 2022



We provide health systems and physicians with comprehensive insight into their care cost, revenue, and outcomes through our software, and empower them to improve their finances and deliver the best care possible to their patients.















Current Hospital Scenario

- Other Industries Measuring What Matters
- Intro to Time-Driven Activity-Based Costing
- Measuring What Matters
- Practical Examples of Internal Cost Improvements







WHY HEALTH-CARE Workers are quitting in Droves

About one in five health-care workers has left their job since the pandemic started. This is their story—and the story of those left behind.

By Ed Yong

"1 in 5 physicians and 2 in 5 nurses intend to leave their current practice within two years" American Medical Association

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HEALTH

Current Hospital Context

\$1 Million Cost to Replace

\$4.6 Billion Cost due to burnout





Current Hospital Context



Source: January 2022 Kaufman Hall National Hospital Flash Report



Current Hospital Context

Even without a COVID surge, state's largest hospitals suffer multimillion-dollar losses

By Jessica Bartlett Globe Staff, Updated August 12, 2022, 3:05 p.m.

"Mass General Brigham, the state's largest health system and its largest private employer, reported a \$120 million operating loss for the quarter ending in June, compared to \$128 million in operating gain in the same period last year.

Beth Israel Lahey Health reported a \$60.5 million operating loss for the quarter ending in June, compared to a \$59.9 million operating gain in the same quarter last year."





Current Hospital Scenario

Other Industries Measuring What Matters

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Other Industries Measuring What Matters







Just in Time Manufacturing







Other Industries Measuring What Matters







Just in Time Manufacturing



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Benefits of JIT Manufacturing

- Reduction in throughput times
- Reduction in WIP
- Improvement in quality
- Improvement in productivity
- Reduction in resource requirements
- Improvement in customer satisfaction
- improvements in return on assets







Are you Measuring What Matters?

VALUE =

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Quality COSt **PPROPRIATENESS**

Why Surgeons Should Care About Hospital Costs (Even if You're Not an Owner)

Negotiating Leverage

Having a Say



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If you are part of the solution, it helps avoid top-down mandates that impact your practice

If the profitability of your service line decreases, it decreases what you are worth





Why Surgeons Should Care About Hospital Costs (Even if You're Not an Owner)









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Time-Driven Activity-Based Costing (TDABC)





- What activities are performed over the care cycle for a medical
- Who is performing each activity?
- **How long** does each activity take?

What is the cost per unit of time for each type of personnel?

What materials, supplies, and drugs are consumed during the

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Understand the care processes

- Process-Steps: All the administrative and clinical process-steps used over a patient's complete cycle of care for a medical condition
- Resources: personnel, equipment, consumable medicines and supplies – used at each process step
- Time Estimates: The personnel and equipment time used at each process step for that patient



Patient arrives

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Calculate the Capacity Cost Rate for each type of personnel and resource

- Costs: All the costs (salary, fringe benefits, occupancy, support resources) associated with having that person (or piece of equipment) available to treat patients
- Capacity: The capacity (time) that each resource (personnel, equipment) has available for treating and caring for patients • Number of days person shows up, available for clinical work
 - ...multiplied by...
 - Number of minutes available per day for patient-related work (net of breaks, meetings, training, education, etc.)
- Capacity Cost Rate (\$/minute) = Resource Cost/ Resource Capacity

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Calculate the Capacity Cost Rates (CCR)

Data are illustrative



	Surgeon	Physician Assistant	RN	X-Ray Tech	Scribe	Office Assistant
Total Clinical Costs	\$546,400	\$120,000	\$100,000	\$64,000	\$51,000	\$61,000
Personnel Capacity (minutes)	91,086	89,086	89,086	89,086	89,086	89,086
Personnel Capacity Cost Rate	\$6.00	\$1.35	\$1.12	\$0.72	\$0.57	\$0.68

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We compute total patient-level care costs by multiplying capacity cost rates by process times and summing across each patient's cycle of care

Initial consultation



Surgical procedure



Follow-up or post-operative visit

Plastics surgery follow-up appointments (post-op or other)



n	Personnel Type	Minutes	Cost/ minute	Total
initial partient appointment-RM	MD	X ₁	Y ₁	136.13
	RN	X ₂	Y ₂	68.04
	CA	X_3	Y ₃	6.17
	ASR	X_4	Y_4	15.74
				\$266.08
e	MD	X ₁	Y ₁	584.99
Surgery: press holding	Anes.	X_2	Y ₂	603.89
	RN	X_3	Y ₃	136.29
$\longrightarrow \qquad \qquad$	Tech	X_4	Y ₄	97.82
	OR	X_5	Y ₅	329.16
				\$1752.15
-operative visit	MD	X ₁	Y ₁	55.19
	RN	X_2	Y ₂	13.61
	CA	X_3	Y_3	3.09
	ASR	X_4	Y ₄	1.77
				\$73.66





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Measuring What Matters

• Practical Examples of Internal Cost Improvements





TDABC – Personnel Cost Per Case By Physician



TDABC – OR Time Per Case By Physician

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- Closure to Wheels Out Minutes
- Incision to Closure Minutes
- Wheels in to Incision Minutes
- = 50th National Percentile
- = 90th National Percentile

TDABC – Length of Stay Per Case By Physician

- = 50th National Percentile
- 90th National Percentile

Length of Stay by Surgeon Trend

Lumbar Fusion Discharge Disposition by Surgeon

Individual Surgeons

Average

Principal Sources Of Cost Variation

- Prices paid for implants
- Surgeon's time/Operating room time
- Pain management
- Initiation of physical therapy
- Length of stay
- Post-discharge care
 - Home rehabilitation, or
 - SNF and In-patient rehab
- Prices and usage of other materials and supplies (e.g., bone cement)

Supply Cost Details

Supply Cost Details

Supply Cost Details by Case

968 cases total

Case Study: Analyzing Detailed Supply Variation by Surgeon at New England Baptist

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Examples of High-Cost Supplies Identified

- Medications (e.g. Exparel)
- Biologics (e.g. BMP)
- Instrumentation (e.g. Aquamantys)
- Incision Management (e.g. Prevena)
- Cement (e.g. antibiotic-infused)
- Implants (e.g. vitamin-E infused)

Detailed Case-Level Supply Comparison – Preference Cards

Example Case A Total Supply Cost: \$11,446

Part Name	Supply Category	Total spend	Quantity	Part Name	Supply Category	Total spend	Quantity
CAGE ELEVATE 7X23MM	Spacer	\$3,738	1	CAGE SPN ENDSKLTN 4D LRDTC LRG 9X10X26MM	Spacer	\$3,500	1
CONNECTOR ROD SPINE DOMINO SD5.5 CURVE TITANIUM SOLID	Spinal Fixation Device	\$1,383	2	SCREW SPINE MULTI AXIAL 7.5X40MM	Pedicle Screw	\$2,149	Z
SCREW 5.5 MAS 6.5X45MM	Pedicle Screw	\$1,074	2	KIT MATRIX SURGIFLO HEMOSTATIC S 8ML 6/BX	Sealants Or Hemostats	\$508	3
CONNECTOR ROD CD HRZN 25MM SPN LTRL CLSD	Spinal Fixation Device	\$1,048	2	SCALPEL BONE BLUNT NEURO 20MM	Drills Or Blades	\$405	1
SEALANT DURAL ADHERUS 6ML	Sealants Or Hemostats	\$795	1	ROD SPINAL CD HORIZON 40MM 5.5MM CURVE COCRMO NONSTERILE	Rod	\$320	2
SCREW SPINE SET TITANIUM	Pedicle Screw	\$532	6	BLADE MILL FINE 3.2MM 5/PK	Drills Or Blades	\$267	1
VASOPRESSIN 20 UNIT/ML SOLN 10 ML VIAL	MEDICATION	\$502	1	SUGAMMADEX 100 MG/ML SOLN	MEDICATION	\$239	2
KIT MATRIX SURGIFLO HEMOSTATIC	Sealants Or Hemostats	\$339	2	SET SCREW 5.5 TI NS BREAK OFF	Pedicle Screw	\$215	4
8ML 6/BX				SET SPINAL CUSTOM TRAY Ot	Other	\$119	1
BUR MATCHSTICK 3.0MM CARBIDE	Drills Or Blades	\$275	1	THROMBIN RECOMBINANT 5,000 UNIT	MEDICATION	\$103	1
MILL BONE BIOPSY 5MM MEDIUM	Other	\$267	1	SOLR 1 EACH KIT			
COARSE BLADE LATEX FREE DISPOSABLE				TUBESET IRRIGATION NEURO	Other	\$50	1

Example Case B Total Supply Cost: \$8,428

ACDF Construct Pricing – Renegotiation Opportunity

Part Name	Manufacturer Name	Supply Category	Total spend	Quantity
04.617.707S PLATE SPINE 7 TI NTR BONE ZERO-P STERL	DEPUY JOINT RECONSTRUCTION - A JOHNSON AND JOHNSON	Spinal Fixation Plate	\$1,850	1
018407 SPACER ALGRF 7MM NTR LRDTC CORTICOCANCELLOUS FRZDR	MUSCULOSKELETAL TRANSPLANT FOUNDATION	Structural Allograft	\$1,075	1
04.617.814 SCREW BONE SPINE CERVICAL ZERO-P 14MM TI 3MM SLFTP LOCK	DEPUY JOINT RECONSTRUCTION - A JOHNSON AND JOHNSON	Spinal Fixation Device	\$1,000	4

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SELF

Lowest Cost Construct \$3,925

Top percentile organizations in the AGH cohort are paying ~\$1,500 for a 1-level ACDF construct of the same components Savings opportunity by renegotiating

Single Level ACDFs - >\$130,000 (assumes all current constructs are the price above, which is conservative)

All ACDFs - > \$330,000 (assumes savings/case for multi level are the same as a single level/case)

Single Level PLIF/TLIF – Cage Pricing

Vendor	Spacer Unit Cost
GLOBUS MEDICAL INC	\$7,500 \$5,850
DEPUY JOINT RECONSTRUCTION - A JOHNSON AND JOHNSON	\$5 <i>,</i> 400
EMERGING IMPLANT TECHNOLOGIES INC	\$5 <i>,</i> 400
NUVASIVE INC	\$6,700
	\$6,500
	\$6,500
	\$6,150
	\$4,900
MIRUS LLC	\$3,600
Accelus	\$2 <i>,</i> 850

Total Annual Spend on Spacers: \$504K Savings if all spacers were Flarehawk Price: \$247K

	Quantity
Spacer Name	Used
SPACER SPINAL 55X22X10MM RISE-L 10D NONST	1
SABLE SPACER	74
EIT TLIF, H 11MM, 8 DEG	1
EIT PLIF H 8MM	1
1221260P2 CAGE SPINAL 60X22X12MM MODL 10D XL WIDE STERL LF	1
1181045P2 CAGE SPINAL 45X18X10MM MODL 10D XL STERL LF	1
1181050P2 CAGE SPINAL 50X18X10MM MODL 10D XL STERL LF	2
TLX20, 7x11x31mm 20 deg	1
TLX20 7X11X31MM 20 DEGREES	1
14-1-11007 HYPERION 3DR TLIF 10MM X 28MM X 10MM X 7	
DEGREE	1
FLAREHAWK SHIM	6

Total In Hospital Costs

Direct Contribution Margin

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Quality COSt **PPROPRIATENESS**

Patient Reported Outcomes

30-Day Readmission Rate

Outcomes Vs. Costs

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Transparency and Reporting – Physician Scorecard (Single level PLIF/TLIF)

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Practical Examples of Internal Cost Improvements

Spine Surgery Client Case Study

	3-Month Baseline	One Year Later	Improvement
Volume**	127	111	_
Avg. OR Time	333	300	10%
Avg. LOS	4.8	2.7	44%
30-Day Readmission Rate	7%	5%	28%
Discharge Home Rate	75%	92%	23%
Percent of Miscoded Lumbar Fusions	33%	13%	60%

*Includes all inpatient/outpatient spine surgeries

Coding Optimization

Baseline Year

33% of interbody fusions in the incorrect DRG

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Post Intervention

+\$312,000 Additional Annual Revenue

12% of interbody fusions in the incorrect DRG

Cervical Fusion OR Time

Lumbar Fusion Discharge to Home Rate

\$11.7M per Year in Improvements

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Common Cost Reduction Mistakes Providers Make

NOVEMBER 2014 **REPRINT R1411G**

How Not to Cut Health Care Costs

The missteps that keep us paying too much for treatment. by Robert S. Kaplan and Derek A. Haas

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