OR Efficiency and Throughput: Benchmarking and Process Optimization

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Financial Disclosure

No Relevant Financial Relationships to Disclose



Objectives

- Discuss the heightened importance of OR Efficiency under healthcare reform
- Review the sequential processes which constitute the OR continuum
- Discuss key indicators of OR process performance
- Overview Benchmarking options
- Overview prioritization and implementation of process improvement initiatives

HC Reform – from Volume to Value

Volume-Based First Curve

Fee-for-service reimbursement

High quality not rewarded

No shared financial risk

Acute inpatient hospital focus

IT investment incentives not seen by hospital

Stand-alone care systems can thrive

Regulatory actions impede hospital-physician collaboration

Value-Based Second Curve

Payment rewards population value: quality and efficiency

Quality impacts reimbursement

Partnerships with shared risk

Increased patient severity

IT utilization essential for population health management

Scale increases in importance

Realigned incentives, encouraged coordination



OR's and Healthcare Reform

- A focus on patient safety, efficiency and customer service
- Reimbursement linked to performance
- "Patient friendly" care
- Pressure on reimbursement and margins
- Ultimately reimbursement pressure, service pressure and outcome pressure create a Darwinian "survival of the fittest" environment. Efficiency and best practices are a must.

OR Continuum



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Measuring Efficiency



OR Continuum – Key Metrics



Excess Staffing Costs

% Narcotic reversal % Relaxant reversal

Outpatient Chart Completion

- Key indicator of preop preparation
- PAT has meaningful impact on cancellations and on time starts

Definition:

- All chart work complete by EOB day before surgery
- Required labs on chart
- Required consults on chart
- Anesthesia Review
- H&P on chart
- Consents may be pending

- Results are highly variable
- Varies from 0 to 92% completed
- Most facilities do not track
- A valuable data point but requires some internal resources to track

Day of Surgery Cancellations

- Frequency varies greatly from <1-15% in published studies
- Often higher cancellation rates are in facilities with poor PAT, distant patients, or overbooked OR's
- Cancellations lead to potentially large gaps in surgical schedules – leaving expensive resources unused
- Expensive loss of \$4,550 per cancelled case to hospital per Tulane ASA study
- Consistently reduced by evaluation in PAT
- Many similar attributes for delayed first case starts

"Real World" Day of Surgery Cancellations

HOSPITAL	Cancel same day	Total Cancels	Actual Cases	Total resched	% resched	Cancelled DOS
1	18	61	428	13	21%	4.21
2	0	15	177	10	67%	0.00
3	26	105	592	39	37%	4.39
4	6	21	359	6	29%	1.67
5	4	31	323	9	29%	1.24
6	12	40	230	13	33%	5.22
7	10	134	1011	43	32%	0.99
8	5	49	383	12	24%	1.31
9	8	32	178	8	25%	4.49
10	4	39	427	11	28%	0.94
11	1	26	186	8	31%	0.54
12	12	45	300	10	22%	4.00
13	55	110	929	51	46%	5.92
14	11	58	417	8	14%	2.64
15	14	37	333	6	16%	4.20
16	2	63	462	17	27%	0.43
TOTALS	188	866	6735	264	30%	2.79

Prime Time OR Utilization

- Many ways to measure
- Need "Apples to Apples"
- EH uses Actual minutes in OR
- EH uses staffed locations
- Mixing utilization calculations is misleading
- Properly measured, utilization is the "bottom line" of efficiency analysis



"Real World" Utilization Data



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Utilization Bell Curve



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Turnover Time

- Key surgeon satisfier
- Multiple inter-related processes
- Impact increases with more cases per OR
- In order to understand TOT, need to standardize the definition
 - Close to cut
 - Wheels out to wheels in
 - Close to wheels in
 - Are flip rooms counted?
- Expected TOT varies greatly by specialty



Orthopedic Surgery: Turnover Data MD TAT following same surgeon



ENT: Turnover Time MD TAT following same surgeon



"Real World" Turnover Time Examples



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Benchmarking Efficiency



OR Benchmarking from McKesson

Indicator	Actual	Mean	Achievement 1	STAC Weighted	Achievement 2	ASC Mean	Achievement 3
				Start Time A	locuracy		
% First Case On-Time or Early +/- 5	96.0%	65.3%	147.00% 🗸 1	82.3%	118.72% 🗸 1	64.7%	148.47% 🗸 1
% Subsequent Case On-Time or Early	79.1%	55.0%	143.77% 🗸 1	58.1%	138.16% 🗸 1	59.4%	133.24% 🗸 1
	Case Time Effectiveness						
Patient In to Patient Out	62.6	92.0	148.99% 🗸 2	99.4	158.88% √ 2	64.0	102.25% 🗸 2
Patient In to Anesthesia Ready	11.6	10.0	85.94% √ 2	11.9	102.65% √ 2	6.0	51.57% 2
Patient In to Incision	15.0	22.0	146.65% 🗸 2	25.2	168.12% 🗸 2	15.0	99.99% 🗸 2
Incision to Close	42.4	61.0	143.78% 2	63.8	150.43% 🗸 2	42.0	98.98% 🗸 2
Close to Patient Out	5.2	8.0	155.11% 🗸 2	9.5	184.87% 🗸 2	6.0	116.33% 🗸 2
Average Turnover Minutes	11.4	21.0	183.73% 🗸 2	28.7	251.50% 🗸 2	18.0	157.48% 🗸 2
% Scheduling Accuracy	64.3%	49.8%	129.23% 🗸 1	40.8%	157.58% √ 1	59.7%	107.75% 🗸 1
				Utilizat	ion		
% Utilized 7am-3pm	97%	78.2%	123.54% √ 1	71.8%	134.60% √ 1	72.3%	133.68% 🗸 1
% Utilized 3pm-5pm	76%	76.3%	99.62% 🔷 1	72.8%	104.42% 1	54.4%	139.79% 🗸 1
% Utilized 5pm-7pm	69%	72.1%	95.79% 🔷 1	69.4%	99.58% 🔷 1	194.3%	35.56% 🗡 1
% Utilized 7pm-11pm	÷	57.6%	t	53.1%	t	96.0%	1
% Same Day Add-On Weekdays	4.1%	11.9%	289.09% √ 2	6.7%	162.97% 🗸 2	1.0%	24.63% 🗡 2
% Block Utilization	92.2%	77.8%	118.76% 🗸 1	58.1%	158.61% √ 1	59.4%	155.31% 1
% of Schedule Blocked	24.6%	\$	t	+	t	+	1
% Same Day Cancelled / Postponed	0.6%	3.4%	529.48% √ 2	99.9%	15,408.08% √ 2	+	1
				Quali	ty		
% Patients Screened Prior to Surgery	85.1%	69.7%	121.99% 🗸 1	44.1%	192.73% 🗸 1	1.1%	7,837.31% 🗸 1
% Surgical Pause Compliance	100.0%	97.4%	102.68% 🗸 1	99.9%	100.05% 🗸 1	99.6%	100.44% 🗸 1
% Returns to Surgery wil 24 hrs	0.3%	#	t	±	t	+	1

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OR Efficiency Scoring System

Measurements	poor performance	medium performance	high performance
Excess Staffing Costs	>10%	5-10%	<5%
Start-time tardiness (mean tardiness for elective cases/day)	>60 min	45-60 min	<45 min
Case cancellation rate	>10%	5-10%	<5%
Post Anesthesia Care Unit (PACU) admission delays (% workdays with at least one delay in PACU admission)	>20%	10-20%	<10%
Contribution Margin (mean) per operating room hour	<\$1,000/hr	\$1–2,000/hr	>\$2,000/hr
Turnover Time (for all cases mean time from previous patient out of the OR to next patient in the OR including setup and cleanup)	>40 min	25-40 min	<25 min
Prediction Bias (bias in case duration estimates per 8 hours of operating room time)	>15 min	5-15 min	<5 min
Prolonged turnovers (% turnovers lasting more than 60 minutes)	>25%	10-25%	<10%

From Macario, A. Are your hospital operating rooms efficient? Anesthesiology. 2006; 105:237-240

Vendor Internal Benchmarks

- Anesthesia Groups
- Anesthesia Billing Companies
- OR Information Systems
- Consultant Databases

Process Improvement



Initial Steps

- Establish an OR improvement committee
 - Surgeons
 - Anesthesia
 - Nursing
 - Administration
 - Other support areas as indicated (PAT, PACU, Central Sterile etc)
- Dashboard or similar where are the biggest opportunities (furthest deviation from target)?
- Quantify financial and operational impact
- Create a list of initial target opportunities
- Focus resources on a short list (1 to 3) of the highest priorities

Dashboard Example

		March	YTD
	Target	2013	March
Operating Room Metrics			
Operating Room Utilization (Prime Time)	0.75	0.63	0.61
Average Turnover Time (Prime Time)	22 Minutes	36	38
PAT Charts Complete	95%	85	73
Excess Staffing Costs	<6%	4%	3.40%
Add-On Cases	N/A	200	210
Total Cases Scheduled < or > 20 Minutes	80	82%	80%
Total Surgical Cases/Location	1,000	1,045	1,070
Call Cases	N/A	140	150
PACU Delays	<8%	12%	12%
Timely First Case Start Percentage	0.85	0.8	0.78
Same Day Case Cancellation Percentage	<1%	0.74%	0.83%

Process Improvement

- Create a process map
- Observe and measure component processes
- Parallel processing where practical
- Engage operational teams to improve processes
- Test and measure results
- Document improved process steps
- Ongoing measurement of performance

Process Map Wheels out to In – Observe and Measure Components



TOT Process Initial – Observe and Measure Components



Surgeon TOT 60 Minutes

TOT Process Improved – Parallel Processing



Surgeon TOT 45 Minutes

Take Home Points:

- Healthcare reform will likely result in "survival of the fittest"
- View the OR as a continuum of inter-related processes
- Measure Key Process Indicators
- If benchmarking, make sure you are comparing "apples to apples"
- Approach process improvement analytically, prioritize efforts and focus your resources

QUESTIONS?

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