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Performance Metrics and Clinical Outcomes

Automated AIMS Analytics In (Near) Real Time!


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Disclosures

- None.

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Learning Objectives

- Review the current system for quality metric reporting
- Explore implementation requirements and potential pitfalls
- Share our collective impression of current metrics, ideas for new metrics, and wish list for outcome reporting

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Metrics, Metrics, Everywhere

- What is a metric?
 - A *system* or *standard* of measurement
- Why measure things?
 - To improve performance
- Need to distinguish
 - Process metrics
 - Outcomes



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Metrics, Metrics, Everywhere

- Personal practice
 - Understand relative performance
- Systems-based practice
 - Continuous quality improvement




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How do we measure quality?

- Define it
 - 920 defined NQF metrics, 614 currently endorsed
- Report on it



Goals:
Safer care
Better outcomes
Hold down costs

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Money on the Line

- Payors want value
 - Value = Cost / Outcomes
- Payors want improved quality
 - Quality =

Physician Quality Reporting System


Physician Quality Reporting System (Physician Quality Reporting or PQRS)
formerly known as the Physician Quality Reporting Initiative (PQRI)

CMS.gov
Centers for Medicare & Medicaid Services

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PQRS

- Physician Quality Reporting System
 - For all *eligible providers*, not just physicians
 - Established in 2007
 - Report on 3 metrics for 80% of cases, get 1.5% lump-sum bonus for Medicare Part B (physician fee)
 - Modified in 2009
 - 2.0% bonus!
 - And in 2015...
 - 2.0% penalty!



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The Math Here


- Assuming 12,000 units per EP and 27% Medicare...

ASACDR

What's at risk for your practice?


NUMBER OF EPs x \$ 1,500	AVERAGE PENALTY TO YOUR PRACTICE
25	\$ 37,500
50	\$ 75,000
100	\$ 150,000
150	\$ 225,000


http://asahq.org/~media/asacdr_PPT_RISK.jpg, accessed December 24th, 2014.

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How to report


- Group Practice Reporting Option (GPRO)
- Qualified Clinical Data Registry (QCDR)
 - For anesthesia, this is the AQI's National Anesthesia Outcomes Registry (NACOR)
 - Expanded measure set (19 vs 3)
- Claims based
- Use Certified EHR Technology (CEHRT)
 - Direct to CMS
 - Via Data Submission Vendor (DSV)



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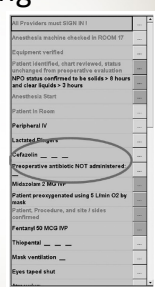
An example

- Antibiotic timing
- Easily determined using automated reporting
- Can we use technology to improve performance?

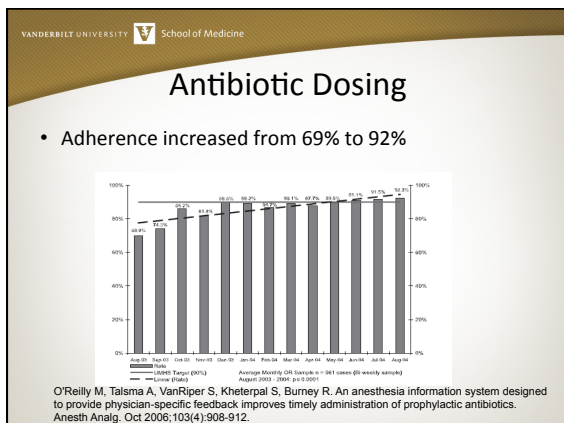
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Antibiotic Dosing

- Example from University of Michigan. GE Centricity.
- Within AIMS, a “case-based default” prompts for abx
- Feedback on performance delivered via biweekly emails
- Results posted throughout OR
- Escalated to in-person reminders
- Script tweaked for long preps



O'Reilly M, Talsma A, VanRiper S, Kheterpal S, Burney R. An anesthesia information system designed to provide physician-specific feedback improves timely administration of prophylactic antibiotics. *Anesth Analg*. Oct 2006;103(4):908-912.



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Another example

- Appropriate PONV prophylaxis
- Possibly determined using automated reporting
- Can we use technology to improve performance?

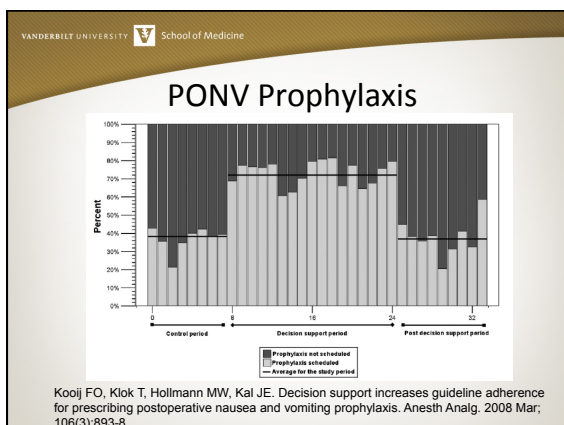
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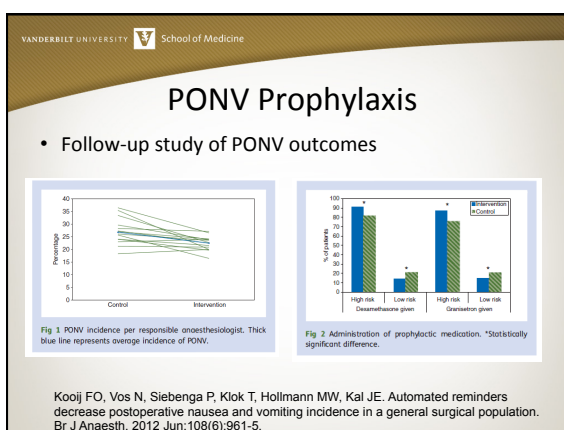
PONV Prophylaxis

- Example from Onze Lieve Vrouwe Gasthuis, Amsterdam. MetaVision.
- Required user entry of Apfel simplified risk score for PONV
- Pop-up message displayed if ≥ 3 risk factors present and if no PONV prophylaxis prescribed in pre-op visit
- Prophylaxis increased from 38% to 73% for high risk patients when the CDS was active

This patient has at least three positive risk factors for PONV and is eligible for PONV prophylaxis, but is not prescribed prophylaxis yet. Do you want to prescribe PONV prophylaxis?

Kooij FO, Klok T, Holmann MW, Kai JE. Decision support increases guideline adherence for prescribing postoperative nausea and vomiting prophylaxis. *Anesth Analg*. 2008 Mar;106(3):893-8.






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Providing feedback

- Importance of timing
 - Real-time
 - Near real-time
 - Delayed
- Private vs public
 - Personalized
 - More meaningful?
 - Public
 - Useful shaming?

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Sharing outcomes

- Elements of post-op follow-up within 48h
 - PONV?
 - Pain?
 - Vitals? Hydration?
- What is missing
 - Everything else
 - AKI? Post-op MI? Post-op death?
 - Readmission?
 - Improvement in quality of life?

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Gaming metrics

- My first day as an attending at a new institution




“Why did you do that?”

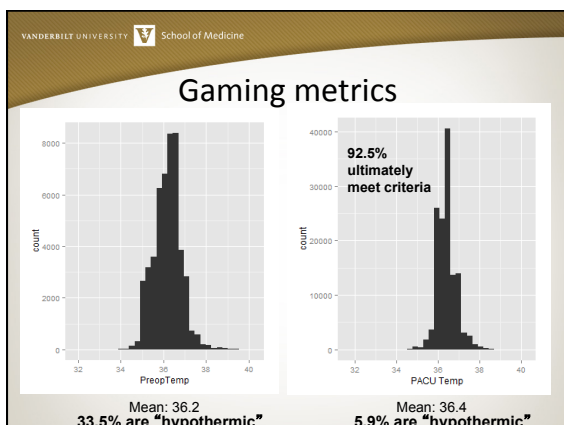
“So we’ll pass the thermometer check.”

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Gaming metrics

- Perioperative normothermia
 - Any temp > 36C in last 30 minutes of case or first 15 after
 - Or active warming
- Our thermometers
 - “These things don’t work”
 - “Try the other ear”
 - “Try your own ear”
 - “Looks like 36 to me”





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Gaming Metrics

- Instruments can have error
- Measurement substrate can be manipulated
- Measurements can be manipulated
- Results can be recorded that don't reflect measurements

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Pain Metric: Another Pitfall

- Goal
 - Rank order attendings by arrival PACU NRS pain score after adjusting for confounders
- Patients
 - All adults who provided a PACU NRS pain score between 4/11 and 3/13
 - 26,680 patients
- The Measure
 - Numerical Rating Scale
 - "No pain" for 0
 - "Worst possible pain" for 10

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Pain Metric: The Model

- Proportional odds mixed effects model
- Ordered outcomes
 - No pain (NRS=0)
 - Mild pain (NRS=1-3)
 - Moderate pain (NRS=4-6)
 - Severe pain (NRS=7-10)
- What this tells you
 - Odds that a patient from one attending will have a higher level of pain compared to the median anesthesiologist

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Pain score distribution

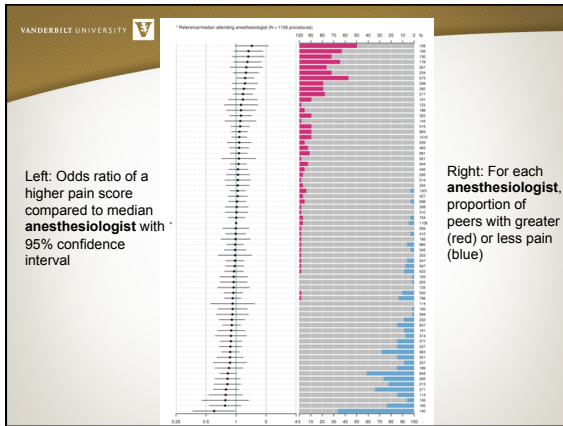
Postop pain score	Relative frequency (%)
0	57.8%
1	
2	
3	10.7%
4	
5	
6	14.1%
7	
8	
9	
10	17.4%

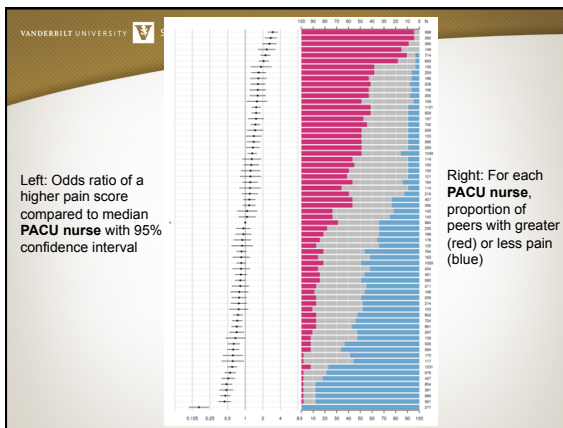
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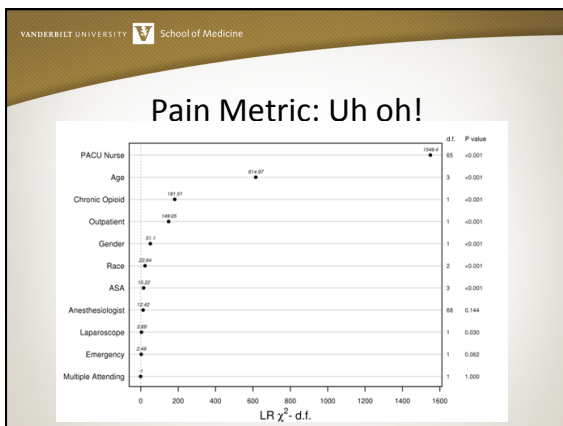
Effect of known modifiers


Modifier	OR of a higher pain score
Age (vs. 53 year)	1.21
vs. Male	0.82
vs. Caucasian	0.84
vs. ASA 1	1.17
vs. Single	1.44
Female	1.21
African American	0.82
Others	0.84
ASA 2	1.17
ASA 3	1.14
ASA 4+	0.93
Emergency Outpatient	0.89
Chronic Opioid	0.83
Laparoscopic	1.44
Multiple	0.76
Attending	1.00

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Pain Metric

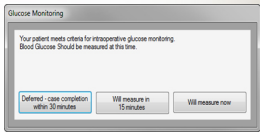
- Just because it appears to have face validity...
- ...doesn't mean it is going to mean what you think it means.



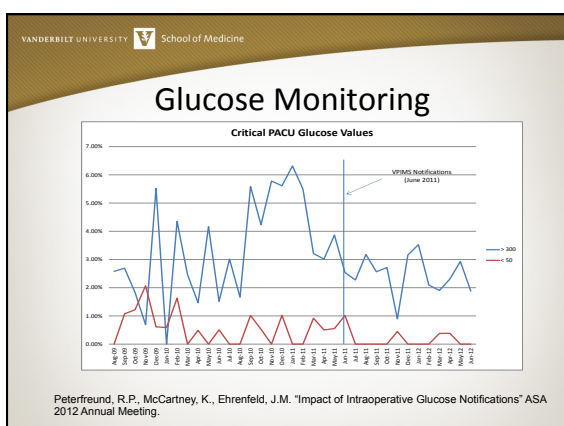
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Glucose Monitoring

- Example from Massachusetts General Hospital and Vanderbilt.
- Automated detection of diabetic patients and insulin administration
- Blood glucose check reminders for diabetics
- Pre/post implementation comparison performed




Peterfreund, R.P., McCartney, K., Ehrenfeld, J.M. "Impact of Intraoperative Glucose Notifications" ASA 2012 Annual Meeting.




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Glucose Monitoring


- Definition problem
 - Need to check glucose after giving insulin
 - But when?
 - What kinds of insulin?
- Data sources can change
 - New lab system installed
 - “Glucose Level” is now “Glucose Lvl”
 - Performance suddenly declines




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Pitfall Summary


- Your measurement may be gamed
- Your measurement may not mean anything
- Your measurement may stop working and not tell anyone




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Introspect-o-scope

- Can we get metrics automatically?
 - Are these data available for automated reporting at your institution?
- Do we have the right metrics?
 - Would tracking this metric facilitate quality improvement at your institution?
- What would the right metrics be?
- What are the right outcomes to track?



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Group Activity

- Task 1: Evaluate current anesthesia metrics
- Task 2: Propose two new anesthesia metrics
- Task 3: Propose three patient outcomes for automated reporting
- Task 4: Share your results!

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Thanks!

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