Health Care Quality Measurement for the Consumer

Nicholas G. Bircher, MD, FCCM
President, University Senate

Safar Center for Resuscitation Research
ngb1@pitt.edu

Lecture Objectives

At the end of the presentation, the listener will be able to:

1. List a few publicly available measures of health care quality

2. Provide specific examples of choices consumers can make which may reduce their risk of adverse medical outcomes.

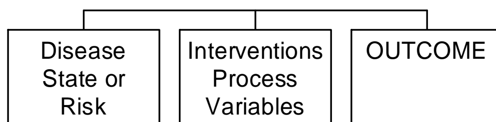
Why bother to know about quality?

1. Isn't it all the same?
2. Do I have a choice?
3. What choices can I make?
4. What are you prepared to do?

The Key to Consumer Satisfaction

Both as a provider and as a consumer is communication

Process versus Outcome



Examples

Process: Documentation
Medications given appropriately
Immunizations given

Outcome: Survival, Quality of Life, Return to work

CMS Quality Measures
(% Patients/N)

Measure For AMI	Top 10%	Top 50%	AGH	JEF	MAG
ACEI/LVSD	93%	78%	73%/64	92%/13	0/0
ASA/Adm	100%	96%	97%/64	94%/63	0/0
BB/Adm	100%	96%	92%/52	98%/59	0/0

CMS Quality Measures
(% Patients/N)

Measure For AMI	Top 10%	Top 50%	PAS	PUH	STM
ACEI/LVSD	93%	78%	42%/19	82%/98	70%/10
ASA/Adm	100%	96%	84%/98	94%/189	95%/57
BB/Adm	100%	96%	74%/82	95%/159	98%/48

PHC4 CABG Data for 2003

Parameter	PUH/SHY	WPH	AGH	Mercy
Total Procedures	1,993	823	776	563
CABG	1,073	559	413	399
LOS (days)	6.1	5.7	7.2	7.3
Mortality IH/30 day	S/S	S/S	S/L	S/S
Charge (1000s)	120.8	83.9	74.2	77.8

Health Plan Employer Data and Information Set (HEDIS®)

National Committee for Quality Assurance (NCQA)
8 major categories of measures
Survey of members (> 100)
Survey done by NCQA Certified Survey vendor

HEDIS 2005 Measures

1. Effectiveness of care- mostly process rather than outcome
2. Access/Availability
3. Satisfaction with the Experience of Care
4. Health Plan Stability
5. Use of Service
6. Cost of Care
7. Informed Health Care Choices
8. Health Plan Descriptive

The Malpractice Crisis

Is not exclusively about lawyers gone wild

Is, in part, about patients who are injured as a direct consequence of a deviation from a medical, nursing, or other standard of care

Is occasionally about unmet expectations

Quality Assurance
(Business Definition)

Method of assuring that goods or services meet customer expectations

Rosenberg, p. 432

Real Time Quality Control

Be your own advocate or bring one with you
Be reasonable
If your expectations are not being met, speak up
Recognize that those who are taking care of you directly have no control whatsoever over hospital resource allocation

The End

Error

An unintended act, either of omission or commission, or an act that does not achieve its intended outcome

Sentinel Event

An unexpected occurrence involving death or serious physical or psychological injury or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase "or risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome

Near Miss

Used to describe any process variation which did not affect the outcome but for which a recurrence carries a significant chance of a serious outcome. Such a near miss falls within the scope of the definition of a sentinel event, but outside the scope of those sentinel events that are subject to review by the Joint Commission under its Sentinel Event Policy

Hazardous Condition

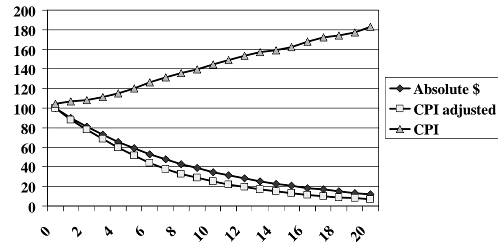
Any set of circumstances (exclusive of the disease or condition for which the patient is being treated) which significantly increases the likelihood of a serious adverse outcome

Do what's right- do it first

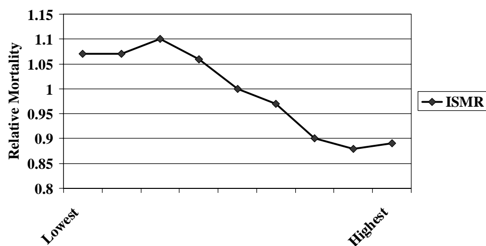
Patient Care Comes First

Under-investment in quality control predictably leads to failures

Hypothetical Budget Cuts



Nursing Labor Intensity



Hypothetical Daily Consequences if only 99% Product Conformance is the goal

2 plane crashes at each major airport
548 wrong drug prescriptions
714 incorrect surgical procedures
5,280,000 checks deducted from wrong accounts
18,921,600 misdirected phone calls

Bothe, p.65

Marketing Research

A systematic attempt to determine what the customer wants

Advertising

A systematic and non-personal attempt to convince a group of potential customers that your product is what they want.

Short Litany on Managerial Information

1. **Information requires work and expertise**
2. **Work requires time**
3. **Expertise and time requires money**
4. **Commitment is measured in dollars**

If the commitment is inadequate,
quality may be less than desired
by both consumer and producer.

Epidemiology of Infrequent Events

Outcome

The end result of an episode of care.
Can only be measured once per episode
Intermediate outcomes: ROSC, take-off
Final outcomes: survival, landing

Primary Outcome

(Statistically)

The "outcome" one uses to compute sample size
Can be a process or outcome variable

Process Variable
(Engineering)

What you are trying to control: temperature, pressure, flow, composition, pH, etc.
Also called the measurement.

Process Variable

Any variable which can be measured more than once for a defined episode of care

Examples: Blood pressure, temperature

May be controlled or observed

Surrogate Outcomes

Process variables thought to be predictive of actual outcome

Fraught with potential error

Usually picked to save money on a study: you get what you pay for

Only outcome is a measure of outcome

Statistical Power

The likelihood that a negative result is accurate

The Statistical Power of Zero

The statistical power of zero incidence is exactly zero, i. e., any study too small in sample size or too insensitive in study design to detect even one of the events in question is completely worthless with respect to establishing safety

Dogma versus Data

The weaker the data, the stronger the dogma

Heroic Statistics

The more valiant the statistical attempt to resuscitate a study, the weaker the underlying data tend to be

Risk Assessment and Outcome in Anesthesia

How much trouble can we reasonably anticipate in this case?

How to stay out of trouble

How to see trouble coming

How to get out of trouble

Classes of Risk Factors

Patient
Anesthetic
Surgical
System

The Law of Large Numbers

Given enough opportunity, weird things will happen just by chance

Orkin, p.9

Patient Risk Factors

Most anesthetics are won or lost in the Preoperative Evaluation

Key Questions

Who? **Patient Population**
What? **Specific Complication**
When? **Pre-, Intra-, Postoperative**
How? **Mechanism of death**
Why? **What provoked this episode**
Modifiable? **Fixed versus variable risk**

Risk of What?

Death
Cardiac Arrest
Grievous bodily harm
Minor bodily harm
Pain and suffering
Litigation

Reducing Litigation Risk

Duty
Breach
Harm
Causation

Risk Modification

What can be done to reduce risk of complications

It is not necessary to repeat personally every mistake that has ever been made in the history of anesthesia: Some mistakes can be avoided by understanding the risks

Classification of variables

Outcome
Process
Pre-existing
System

Predictable Failures

Predictable failures occur when rules are knowingly violated

Causes of Death

With the exception of medical error, the diseases that kill patients perioperatively are the same ones that kill them in general

Relative Frequency of Associated Factors (number cited)

1. Inadequate total experience	77
2. Inadequate familiarity with equip	45
3. Poor communication with team	27
4. Haste	26
5. Inattention/carelessness	26
6. Fatigue	24

Cooper, Anesthesiology 49: 399-406, 1978

JFK, Jr. Scenario

1. Young pilot
2. Flying tired
3. At night
4. Under difficult conditions
5. Who doesn't understand the instruments

Causes of Death 2001

1. Heart disease	700,142
2. Cancer	553,768
3. Stroke	163,538
4. COPD/Asthma	123,013
5. Accidents	101,537

Causes of Death 2001

6. Diabetes	71,372
7. Influenza/Pneumonia	62,034
8. Alzheimer's	53,852
9. Renal Disease	39,480
10. Septicemia	32,238

Causes of Death 2001

11. Suicide	30,622
12. Liver disease	27,035
13. Homicide	20,308
14. Hypertension	19,250
15. Aspiration	17,301

Heart disease

Cardiac Disease is Common
Aden Thal or DSE: per ACC/AHA
Perioperative Beta-blockade works

Cancer

Chemotherapy: Cardiac and pulmonary toxicity
Malnutrition-hypoalbuminemia
Metastatic disease: Lung, Brain, Liver

Stroke

1. Thromboembolic (+/- hemorrhage)
2. Non-trauma IPH (usually hyper-tensive)
3. Aneurysmal SAH (unstable until clipped/coiled)

Intervention must be rapid to work
Prior CVA: relative contraindication to SUX
Loss of protective reflexes: Leave tube in

COPD/Asthma

Pulmonary Optimization prevents Pneumonia, prolonged mechanical ventilation and raging bronchospasm.
Home 02 is a major red flag

Accidents/ Suicide /Homicide

Immediate: ABC's
Early: “Occult” bleeding
Late: Sepsis
GSW: Bullet path unknown

Primary Survey

A. Airway Disruption
B. Tension Pneumothorax
   Open Pneumothorax
   Flail Chest
C. Massive Hemothorax
   Cardiac Tamponade

Secondary Survey

1. Simple Pneumothorax
2. Hemothorax
3. Pulmonary Contusion
4. Tracheobronchial injuries
5. Blunt Cardiac injuries
6. Traumatic Aortic Disruption
7. Traumatic Diaphragmatic injury
8. Mediastinal Traversing wounds

Diabetes

Diabetics have CAD until proven otherwise

Tight Glycemic control saves lives in the SICU

Intensive Insulin Therapy

Parameter	Tight	Conventional
Target	80-110	180-200
Mortality/Hosp	7.2%	10.9%

p-value 0.01; V7.2an Den Berghe, NEJM 345:1359, 2001

Influenza/Pneumonia

Pneumonia is a good reason to cancel an elective case

Dx: CXR infiltrate, leukocytosis, sputum WBC+org

Alzheimer's

Mechanisms of death:
Impaired pulmonary mechanics
Impaired airway protection

Would this patient have wanted this operation?

Renal Disease

Chronic Renal Failure: when will they need dialysis (e.g., preop)
Acute Renal Failure
MOSF: SCUF, PRISMA

Septicemia

Surviving Sepsis guidelines PDF

Systemic Inflammatory Response Syndrome (SIRS)

- **Temp: > 38-38.5 or < 35-36 °C**
- **HR: > 90-100 beats/min**
- **RR: > 20-24 or $PaCO_2$ < 32 mm Hg**
- **WBC: > 12.0 or < 4.0 K/mm^3**

Sepsis

SIRS due to known infection

Severe Sepsis

Sepsis with associated organ dysfunction, hypoperfusion, or hypotension

Lactic Acidosis
Oliguria
Altered Mental Status

Septic Shock

Sepsis associated with hypotension and hypoperfusion despite adequate fluid resuscitation.

Patients on inotropic or vasoconstrictive agents need not be hypotensive to qualify.

Liver disease

1. **Bleeding, Bleeding, Bleeding**
2. **Little metabolic activity (e.g., cisatracurium helps)**
3. **Little Synthetic capability (see 1, hypoalbumemia)**

Hypertension

Includes: Essential HTN
and hypertensive renal disease
Does not include:
Hypertensive heart disease
stroke

Aspiration

Hypoxia kills

History is not always clear

Gastric Content in the oropharynx or endotracheal tube is usually a good clue

ARDS Diagnostic Criteria

CXR: Diffuse interstitial infiltrates
Oxygenation: $PaO_2/PAO_2 < 0.3$
Compliance (Ctot) < 40 ml/cm H_2O
PA Wedge Pressure < 18 mm Hg

Anesthetic Risk Factors

Completeness and accuracy of Preop
Personnel
Monitoring/Use of Monitors
Technique
Doses
Post-op care

PA Catheter

A device which is placed and then not used is all risk and no benefit

Have a clear plan for what data you want and and what decisions will be made on that basis

Surgical Risk Factors

Volume-Outcome Relationship

Complexity and duration of operation

A good surgeon deserves a good anesthesia team, A bad surgeon needs one

System Risk Factors

No place for safe post-op care
Inadequate Critical Care support
Lame blood bank

If it doesn't feel good, don't do it, Send it to Presby

References

Abramson J: Overdosed America. The Broken Promise Of American Medicine. New York: HarperCollins Publishers, 2004

Angell M: The Truth About the Drug Companies. How They Deceive Us and What To Do About It. New York: Random House, 2004

Arens WF: Contemporary Advertising. Eighth Edition New York: McGraw- Hill Irwin, 2002

Atlee JL: Complications in Anesthesia. Philadelphia: Saunders, 1999

Belkin L: First, Do No Harm. New York: Fawcett Crest, 1993

Benumoff JL, Saidman LJ: Anesthesia & Perioperative Complications. Second Edition. St. Louis, MO: Mosby, 1999

Bernstein PL: Against the Gods: The Remarkable Story of Risk. New York: John Wiley & Sons, 1998

Bhote KR: The Power of Ultimate Six Sigma. New York: AMACOM, 2003

Bothe DR: Measuring Process Capability: Techniques and Calculations for Quality and Manufacturing Engineers. New York: McGraw-Hill, 1997

Brown DL: Risk & Outcome in Anesthesia, Second Edition. Philadelphia: JB Lippincott, 1992

Burns AC, Bush RF: Marketing Research. Upper Saddle River, NJ: Prentice-Hall, 2000

Carmines EG, Zeller RA: Reliability and Validity Assessment. Newbury Park: Sage Publications, 1979

Chen G, Chen G, Hsu SH: Linear Stochastic Control Systems. New York: CRC Press, 1995

Collins MJ: Hot Lights, Cold Steel: Life, Death and Sleepless Nights in a Surgeon's First Years. New York: St. Martin's Press, 2005

Cooper JB, Newbower RS, Long CD, McPeek B: Preventable Anesthesia Mishaps: A Study of Human Factors. Anesthesiology 49: 399-406, 1978

Craig PA: Controlling Pilot Error: Situational Awareness. New York: McGraw-Hill, 2001

Creighton H: Law Every Nurse Should Know. Fifth Edition. Philadelphia: WB Saunders, 1986

Donabedian A: The Definition of Quality and Approaches to its Assessment. Ann Arbor, MI: Health Administration Press, 1980

Dorner D: The Logic of Failure: Recognizing and avoiding Error in Complex Situations. Reading, MA: Addison-Wesley, 1996

Ewy W: Hospital Death and Morbidity Studies- A National Sample. In Hirsch RA, Forrest WH, Orkin FK, Wollman H: Health Care Delivery in Anesthesia. Philadelphia: George F. Stickley Company, 1980.

Foster SD, Jordan LM: Professional Aspects of Nurse Anesthesia Practice. Philadelphia: FA Davis, 1994

Gaba DM, Fish KJ, Howard SK: Crisis Management in Anesthesiology. New York: Churchill-Livingstone, 1994

Garden AL, Currie M, Gander PH: Sleep loss, performance and the conduct of anaesthesia. Aust Anaesthesia 43-51, 1996 (AIMS Study)

Gawande A: Complications: A Surgeon's Notes on an Imperfect Science. New York: Henry Holt and Company, 2002

Gerstner LV: Who Says Elephants Can't Dance: Leading A Great Enterprise Through Dramatic Change. New York: Harper Business, 2002

Ginzberg E, Yohalem AM: The University Medical Center and the Metropolis. New York: Josiah Macy, Jr. Foundation, 1974

Glickman TS, Gough M: Readings in Risk. Washington, D.C., 1990

Hindman BJ: Neurological and Psychological Complications of Surgery and Anesthesia. Intern Anesthesiology Clinics 24 (4), 1986

Iezzoni LI: Risk Adjustment for Measuring Health Care Outcomes. Ann Arbor, MI: Health Administration Press, 1994

Institute of Medicine: Crossing the Quality Chasm. Washington, DC: National Academy Press, 2001

Institute of Medicine: Insuring America's Health: Principles and Recommendations. Washington, DC: National Academy Press, 2004

Kharbanda OP, Pinto JK: What Made Gertie Gallop: Learning from Project Failures. New York: Van Nostrand Reinhold, 1996

Kohn LT, Corrigan JM, Donaldson MS: To Err is Human: Building a Safer Health System. Institute of Medicine. Washington, DC: National Academy Press, 2000

Kushida CA: Sleep Deprivation: Clinical Issues, Pharmacology, and Sleep Loss Effects. New York: Marcel Dekker, 2005

LeBow RH: Health Care Meltdown. Confronting the Myths and Fixing Our Failing System. Chambersburg, PA: Alan C. Hood, Inc., 2004

Levy M, Salvadori M: Why Buildings Fall Down New York: WW Norton & Co., 1987

Lewis JM, Fontrier T: Near Misses in Anesthesia: Lessons Learned. Boston: Butterworths, 1988

Lighter DE, Fair DC: Quality Management in Health Care: Principles and Methods. Second Edition.

Lloyd RC: Quality Health Care. A Guide to Developing and Using Indicators. Sudbury, MA: Jones and Bartlett Publishing, 2004

McConachie I: Anaesthesia for the High Risk Patient. London: Greenwich Medical Media Ltd., 2002

McKenzie JF, Neiger BL, Smeltzer JL: Planning, Implementing & Evaluating Health Promotion. A Primer. Fourth Edition. San Francisco: Pearson Education, 2005

Orkin FK, Cooperman LH: Complications in Anesthesiology. Philadelphia: JB Lippincott, 1983

Orkin M: What Are The Odds: Lotteries, Blackjack, Zero-Sum Games, and More. New York: Barnes & Noble books, 2001

Ott R, Tanner T, Henderson B (eds): Managed Care and the Cardiac Patient. Philadelphia: Hanley & Belfus, 1995

Owens WD: Anesthetic Side Effects and Complications: Seeking, Finding, and Treating. Intern Anesthesiology Clin 18 (3), 1980

Pettus MC: The Savvy Patient. The Ultimate Advocate For Quality Health Care. Sterling, VA: Capital Books, Inc., 2004

Prys-Roberts C: Hypertension, Ischemic Heart Diseases and Anesthesia. Intern Anesthesiology Clin 18 (4), 1980

Reves JG, Greene NM: Anesthesiology and the Academic Medical Center: Place and Promise at the Start of the New Millenium. Intern Anesthesiology Clinic 38(2), 2000

Riegelman RK: Studying a Study and Testing a Test: How to Read the Health Science Literature. Fifth Edition. Philadelphia: Lippincott Williams & Wilkins, 2005

Rosenberg JM: The Essential Dictionary of Management & Human Resources. New York: Barnes & Noble Books, 2004

Safar P (ed): Public Health Aspects of Critical Care Medicine and Anesthesiology. Philadelphia: FA Davis, 1974

Shealy CN: Third Party Rape: The Conspiracy to Rob You of Health Care. St. Paul, MN: Galde Press, 1993

Smith DR: Controlling Pilot Error: Controlled Flight into Terrain (CFIT/CFTT). New York: McGraw-Hill, 2001

Soden KJ, Dumas C: Special Treatment. How to Get the Same High-Quality Health Care Your Doctor Gets. New York: Berkley Books, 2003

Trotter JP: The Quest for Cost-Effectiveness in Health Care: Achieving Clinical Excellence While Controlling Costs. Chicago: American Hospital Publishing, 1995

Vitez TS: Quality Improvement Systems and Anesthesia. Intern Anesthesiology Clin 30(2), 1982

Wachter RM, Shojanis KG: Internal Bleeding. The Truth Behind America's Terrifying Epidemic of Medical Mistakes. New York: Rugged Land, 2004

Warren KS, Mosteller F: Doing More Good than Harm: The Evaluation of Health Care Interventions. Ann NYAS 703:1-341, 1993

Washington MS: Doctor, Can You Hear Me? Patient, Are You Listening? Pittsburgh: Washington Associates, 2003

Wearne P: Collapse: When Buildings Fall Down. New York: TV Books, 2000

Weinberg DB: Code Green: Money-Driven Hospitals and the Dismantling of Nursing. Ithaca, NY: Cornell University Press, 2003

Weiner EL, Kanki BG, Helmreich RL: Cockpit Resource Management. New York: Academic Press, 1993

Westhorpe RN: Ergonomics and monitoring. Anaesthesia and Intensive Care 16:71-75, 1988

Willis C, Hardcastle N (eds): The I Hate Corporate America Reader. How Big Companies from McDonald's to Microsoft are Destroying Our Way of Life. New York: Thunder's Mouth Press, 2004

Web References

Agency for Healthcare Research and Quality (AHRQ):
www.ahcpr.gov

Bureau of Labor Statistics www.bls.gov

Center for Medicare and Medicaid Services
www.cms.hhs.gov

Hospital and Healthsystem Association of Pennsylvania:
http://www.haponline.org/

Joint Commission on the Accreditation of Healthcare Organizations: www.jcaho.org

Pennsylvania Department of Rural Health:
http://porh.cas.psu.edu

Pennsylvania Department of State- Professional Licensure
http://www.mylicense.state.pa.us/

Pittsburgh Regional Healthcare Initiative:
http://www.prhi.org/

World Health Organization: http://www.who.int/en/