Current evidence and emerging methods regarding validation of the AHRQ QIs

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Outline and learning objectives

- No disclosures (except support from AHRQ)
- To describe key domains of validity for health care quality measures
- To illustrate these key domains of validity with examples based on the AHRQ Quality Indicators
- To summarize methods and opportunities for AHRQ QI users who may wish to be involved in validation activities

Validity

- The degree to which a measure accurately represents the true state of the phenomenon of interest (i.e., “free of systematic error”)
- Does this measure what it purports to measure (quality)?

Validation – A conceptual framework

- Face validity is the degree to which a measure "appears" to measure the phenomenon of interest
  - Content validity is a related concept, focused on whether the content of a measure adequately samples all relevant domains of the concept of interest (coverage)
- Criterion (concurrent) validity is the degree to which a measure generates data that agree with data from a better ("gold standard") approach.
- Predictive validity is the degree to which a measure successfully predicts an outcome of interest.
- Construct (convergent) validity is the degree to which a measure correlates with other measures, based on a construct that is grounded in prior literature or a sound conceptual framework

Face validity: perspectives

- Developers
- Expert panels
- Users and stakeholders

Face validity: NQF

- Health outcomes: “A rationale supports the relationship of the health outcome to at least one healthcare structure, process, intervention, or service.”
  - Measure specifications must be “consistent with the evidence presented to support the focus of measurement…”
- Intermediate outcomes: “Quantity, quality, and consistency of… evidence that the measured intermediate clinical outcome leads to a desired health outcome.”
- Processes or structures: “…evidence that the measured healthcare process leads to desired health outcomes in the target population with benefits that outweigh harms.”
- Patient experience: “Evidence that the measured aspects of care are those valued by patients and for which the patient is the best and/or only source (OR evidence that patient experience… is correlated with desired outcomes.”

AHRQ expert panel process

- Intended to establish consensual (face) validity
- Modified RAND/UCLA Appropriateness Method
- Physicians of various specialties/subspecialties, nurses, other professionals (e.g., midwife, pharmacist)
- Potential PSIs were rated by 8 multispecialty panels; surgical PSIs were also rated by 3 surgical panels
- All panelists rated all assigned indicators (1-9) on:
  - Overall usefulness
  - Likelihood of being preventable
  - Likelihood of being due to medical error
  - Likelihood of being clearly charted in the medical record
  - Susceptibility to bias due to case mix

AHRQ expert panel process

- Pre-conference ratings and comments
- Individual ratings returned to panelists with distribution of ratings and other panelists' comments
- Telephone conference call(s) focusing on high-variability items and panelists' suggestions
- Suggestions adopted only by consensus
- Post-conference ratings and comments
- Exclude indicators rated "Unclear," "Unclear-," or "Unacceptable":
  - Median score <7, OR
  - At least 2 panelists rated the indicator in each of the extreme 3-point ranges

Potential PSIs not adopted
Only 18 "accepted" from original list of 48

"Experimental" PSIs

- Aspiration pneumonia
- CABG after PTCA
- Decubitus ulcer in high risk patients
- In-hospital fractures possibly related to falls
- Intraoperative nerve compression injuries
- Malignant hyperthermia
- Postoperative acute myocardial infarction
- Postoperative iatrogenic complications – cardiac system
- Postoperative iatrogenic complications – nervous system
- Reopening of surgical site
- Suture of laceration
- Obstetric wound complications- cesarean
- Obstetric wound complications- vaginal
- Other obstetric complications
- Postpartum urinary tract infection
- Uterine rupture

"Rejected" PSIs

- Dosage complications
- Iatrogenic hypotension
- Intestinal infection due to C. difficile
- Postop iatrogenic complications – digestive complications
- Postop iatrogenic complications – respiratory complications
- Postop iatrogenic complications – urinary complications
- Postop iatrogenic complications – vascular complications
- Postoperative pneumonia
- Unexpected LOS/Conditional LOS
- Obstetric thrombosis or embolism
- Puerperal infection

Face validity varies by proposed purpose

TABLE 3. Overall Usefulness Ratings (Median Panel Scores)

Application	Quality Improvement		Comparative Reporting						Pay for Performance			
Level of Reporting	Large Physician Group Level		Area Level		Payer Level		Large Physician Group Level		Payer Level		Large Physician Group Level	
Panel	Delphi	NG	Delphi	NG	Delphi	NG	Delphi	NG	Delphi	NG	Delphi	NG
COPD and asthma (40 y+)	6*	7++	6*	6*	6*	6*	6*	7++	5*	5*	5.5*	7++
Asthma (<39 y)	7++	7++	6*	7++	6*	7++	5*	7++	6*	6*	6*	7++
Hypertension	5*	7++	6*	7++	5*	7++	4*	6*	5*	7+	4*	5.5*
Angina	6*	4*	5*	4.5*	5*	4*	5*	3−	4*	4*	4*	3−
CHF	7++	7++	6*	7++	6*	7++	7++	7++	6*	5*	6*	6*
Perforated appendix	4*	3−	5*	3−	5*	3−	4*	3.5−	3.5−	2.5−	4*	2−
Diabetes short term complications	7++	7++	6*	6*	6*	7++	6*	7++	5*	5*	6*	5*
Diabetes long-term complications	6*	7++	6*	7++	5*	6*	6*	6*	5*	4*	5*	4*
Lower extremity amputation in diabetics	6*	7++	7++	7++	6*	7++	5.5*	4*	5*	5*	5*	4*
Bacterial pneumonia	6*	6*	6*	5*	5*	5.5*	5*	6*	5*	5*	5*	6*
UTI	5*	6*	5*	6*	4*	5*	4*	4*	4*	3−	4*	3−
Dehydration	5*	3−	5*	5*	4*	3−	3−	3−	4*	3−	3−	3−

Numbers represent median usefulness ratings, as measured on a 9-point scale (1 = Highly discourage use; 9 = Highly recommend use).
Overall usefulness ratings: major concern−; some concern*; majority support+; full support++.
CHF indicates congestive heart failure; COPD, chronic obstructive pulmonary disease; NG, Nominal group; UTI, urinary tract infection.

Face validity varies by method

Table 2: Concordance between Delphi and Nominal Group (NG) on Combinations Rated

	Delphi Full Support	*Delphi General Support*	*Delphi Some Concern*	*Delphi Major Concern*
NG full support	8	2	21 (6)*	0
NG general support	0	0	1 (1)*,†	0
NG some concern	0	0	34	0
NG major concern	0	0	12 (5)*	3

*Numbers in parentheses are the number of instances in that cell where ¦Median (Delphi) – Median (NG)¦ > 1. The median difference between groups was < 1 in all other combinations.

†The support level can only deemed "General Support with Some Concern" if statistical disagreement exists within the panel.

Criterion validity: perspectives

- Is the purported “gold standard” really a gold standard? How do we know?
- Administrative data perspective versus registry data perspective
- Coding perspective versus clinical perspective (whose truth)
- Validity can change… dramatically
- Finding false positives is easy, but what about false negatives?

Criterion validity: NQF

- "Empirical evidence of validity of **BOTH data elements AND measure score** within acceptable norms; AND
- Identified threats to validity (lack of risk adjustment/stratification, multiple data types/methods, systematic missing or "incorrect" data) are empirically assessed and adequately addressed so that results are not biased."
- Could be satisifed by either criterion or construct testing

Criterion validity:
Present on admission coding vs. chart review

PDI	Percentage not POA (%)				
	NACHRI	Mich	CA	NY	Mayo
PSI 1: Complications of Anesthesia		100	100	100	94
PSI 3: Decubitus Ulcer	60	42	11	14	18
PSI 5: Foreign Body Left During Proc	80	80	64	76	54
PSI 6: Iatrogenic Pneumothorax	89	100	73	65	78
PSI 7: Infection Due To Medical Care	57	36	65	65	60
PSI 8: Postop Hip Fracture		0	21	26	22
PSI 9: Postop Hemorrhage or Hematoma	97	100	79	71	87
PSI 10: Postop Physiologic or Metabolic		91	77	64	46
PSI 11: Postop Respiratory Failure	83	100	94	93	74
PSI 12: Postop DVT or PE		67	46	43	40
PSI 13: Postoperative Sepsis	60	60	73	70	76
PSI 14: Postop Wound Dehiscence	90				100
PSI 15: Accidental Puncture/Laceration	93	84	87	87	85
PSI 16: Transfusion Reaction	71	N/A	58	78	[illegible]

Criterion validity of PSIs linked to NSQuIP

Romano PS, et al. *HSR* 2009; 44(1):182
Cima RR, et al. *Surg* 2011; 150:943
Koch CG, et al. *J Am Coll Surg* 2012

Indicator	Sensitivity		PPV		LR+	
	V2	V3/V4	V2	V3/V4		
Postoperative sepsis		37% (VA) 5-10% (C/M)		45% (VA) 19-44% (C/M)		131
Postoperative thromboembolism	56%	58-72% (C/M)	22%	42-53% (C/M)	65	
Postoperative respiratory failure		63% 21-22% (C/M)		68% 42-61% (C/M)		147
Postop physiologic/ metabolic derangement		48% 12% (M)		63% 89% (M)		744
Postop abdominopelvic wound dehiscence	29%	22% (M)	72%	47% (M)	160	

VA=Veterans Affairs; C/M=Cleveland Clinic/Mayo Clinic Rochester
Sensitivity = TP/(TP+FN) – are all the real cases captured?
PPV = TP/(TP+FP) – are all the flagged cases real?
LR = Sensitivity/(100-Specificity) – how many times more likely is the event?

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Indicator	AHRQ	NSQIP Registry
Postoperative sepsis	Sepsis or septicemia diagnosed by MD (pts with POA infection excluded)	SIRS w "definitive" evidence of any infection
Postoperative thromboembolism	DVT or PE diagnosed by MD (implied treatment)	DVT or PE treated by MD (PE requires imaging)
Postoperative respiratory failure	Diagnosed by MD or unplanned reintub >0 days or postop vent >1 day	Postop vent >48 hrs or unplanned reintub (any)
Postop physiologic/ metabolic derangement	Diagnosed by MD and new onset of dialysis (or DKA or hyperosmolar)	New onset of dialysis or ultrafiltration
Postop abdominopelvic wound dehiscence	Surgery to repair postop wound disruption	Postop wound separation w fascial disruption

PPV of the PSIs based on chart review by nurse abstractors

Indicator	VA %PPV (95%CI)	AHRQ %PPV (95%CI)	UHC %PPV (95%CI)
Pressure Ulcer	30 (22-40)	—	32 (30-35)
Foreign Body Left In	46 (36-55)	—	—
Iatrogenic Pneumothorax	73 (64-81)	78 (73-82)	—
CVC-related Bloodstream Infection	38 (29-47)	61 (51-71)	—
Postop Hip Fracture	28 (15-43)	—	—
Postop Hemorrhage/Hematoma	75 (66-83)	78 (62-95)	—
Postop Phys/Met Derangement	63 (54-72)	85 (78-92)	—
Postop Respiratory Failure	67 (57-76)	—	83 (77-89)
Postop PE or DVT	43 (34-53)	47 (42-52)	44 (37-51)
Postop Sepsis	53 (42-64)	41 (28-54)	—
Postop Wound Dehiscence	87 (79-92)	—	—
Accidental Puncture or Laceration	85 (77-91)	91 (86-94)	—

Rosen, *Med Care*, 2012; Sadeghi, *Am J Med Qual*, 2010; Zrelak, *J Healthc Qual*, 2011; White, *Med Care*, 2009; Utter, *Ann Surg*, 2009; Utter, *J Am Coll Surg*, 2010

Limitations of chart abstraction for criterion validation

- Information needed to verify complication may not be available via chart review
  - Complication was not properly evaluated or described by physicians; vicarious process
  - Absence of evidence vs. evidence of absence
- Time constraints limit abstractor's ability to assess some aspects of care (e.g., urinary catheter), may lead to premature termination
- Much cheaper to look for FPs than FNs
- Inter-hospital variation in physician documentation and nurse abstraction
- Volunteer samples (except VA)

Comparing coding vs. clinical perspective for Postop DVT/PE

UHC Cohort (n=450)	Coding	Clinical
Sensitivity	80% (46-100%)	100%
Specificity	99.5% (99.3-99.6%)	98.6% (98.6-99.2%)
Positive Predictive Value	72% (67-79%)	44% (36-52%)
Negative Predictive Value	99.6% (98.9-100%)	100%
VA Cohort (n=112)		
Positive Predictive Value		43% (34-53%)
AHRQ Cohort (n=121)		
Positive Predictive Value	84% (72-95%)	48% (42-67%)

University HealthSystem Consortium cohort includes 505 flagged, randomly sampled surgical cases from 33 volunteer hospitals in 21 states; 450 cases were fully abstracted and submitted to UHC.

453.4 Acute venous embolism and thrombosis of deep vessels of lower extremity

453.40 Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity
Deep vein thrombosis NOS

453.41 Acute venous embolism and thrombosis of deep vessels of proximal lower extremity
Femoral, Iliac, Popliteal, Thigh, Upper leg NOS

453.42 Acute venous embolism and thrombosis of deep vessels of distal lower extremity
Calf, Lower leg NOS, Peroneal, Tibial

453.5 Chronic venous embolism and thrombosis of deep vessels of lower extremity

Excludes: personal history of venous thrombosis and embolism (V12.51)

453.50 Chronic venous embolism and thrombosis of unspecified deep vessels of lower extremity

453.51 Chronic venous embolism and thrombosis of deep vessels of proximal lower extremity

453.52 Chronic venous embolism and thrombosis of deep vessels of distal lower extremity

453.6 Venous embolism and thrombosis of superficial vessels of lower extremity

453.7 Chronic venous embolism and thrombosis of other specified vessels

Excludes: personal history of venous thrombosis and embolism (V12.51)

453.71 Chronic venous embolism and thrombosis of superficial veins of upper extremity

453.72 Chronic venous embolism and thrombosis of deep veins of upper extremity

453.73 Chronic venous embolism and thrombosis of upper extremity, unspecified

453.74 Chronic venous embolism and thrombosis of axillary veins

453.75 Chronic venous embolism and thrombosis of subclavian veins

453.76 Chronic venous embolism and thrombosis of internal jugular veins

453.77 Chronic venous embolism and thrombosis of other thoracic veins

453.79 Chronic venous embolism and thrombosis of other specified veins

453.8 Acute venous embolism and thrombosis of other specified veins

Excludes: cerebral, coronary, intracranial sinus, nonpyogenic, mesenteric, portal, precerebral, pulmonary

453.81 Acute venous embolism and thrombosis of superficial veins of upper extremity

453.82 Acute venous embolism and thrombosis of deep veins of upper extremity

453.83 Acute venous embolism and thrombosis of upper extremity, unspecified

453.84 Acute venous embolism and thrombosis of axillary veins

453.85 Acute venous embolism and thrombosis of subclavian veins

453.86 Acute venous embolism and thrombosis of internal jugular veins

453.87 Acute venous embolism and thrombosis of other thoracic veins

453.89 Acute venous embolism and thrombosis of other specified veins

453.9 Of unspecified site (embolism of vein, thrombosis (vein))

Methods to reassess criterion validity of PSI 12

- Two parallel studies were conducted to update previous PPV estimates for PSI 12 and to identify actionable opportunities to improve care:
  - 7 volunteer hospitals recruited through AHRQ QI listserve, including flagged cases only
  - 15 academic health systems recruited through UHC, including both flagged and unflagged cases with TKA surgery
- AHRQ PSI 12 Version 4.1 software was applied to eligible cases from participating hospitals, using "present on admission" (POA) flags.
  - Hospital's own data (AHRQ) or Clinical Database (UHC)

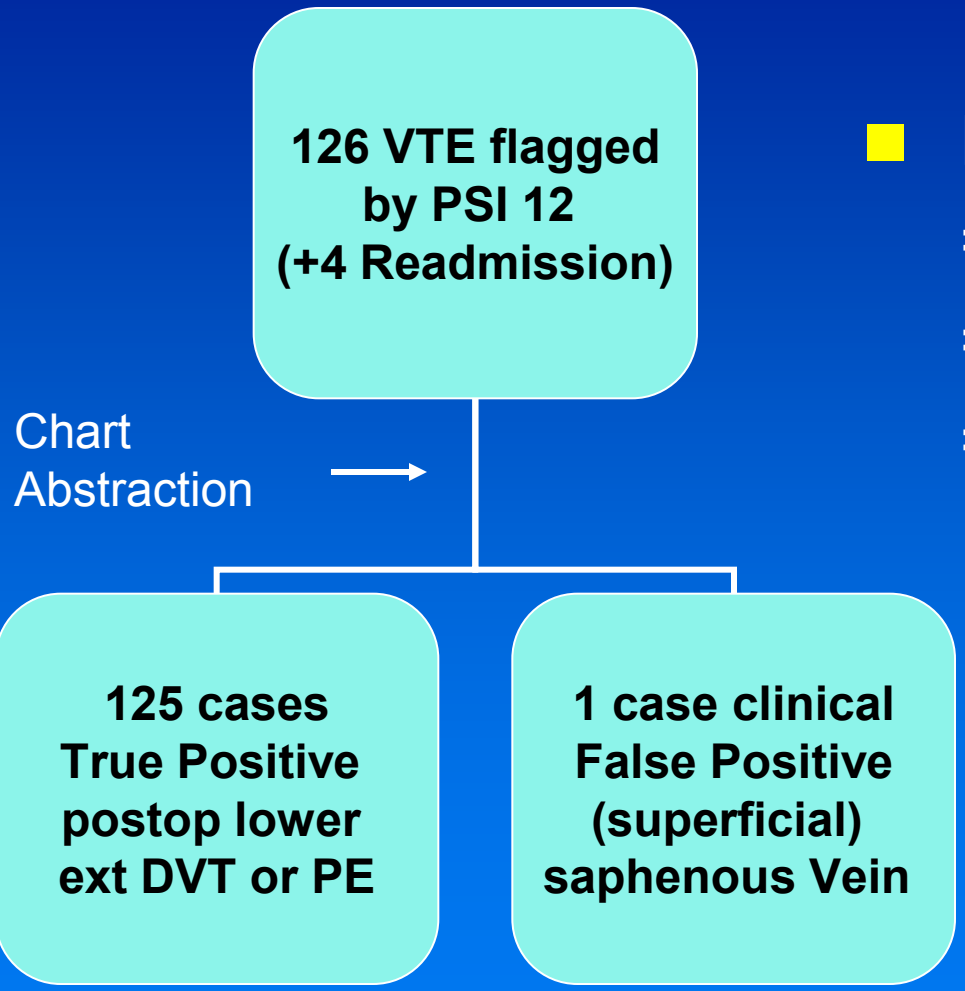
Methods to reassess criterion validity of PSI 12

- Flagged cases were reviewed by trained QI nurses at each hospital, using detailed chart abstraction tool and guidelines.
- Detailed review of discrepant cases to identify possible reasons for the discrepancy:
  - Present on admission (note one hospital did not apply denominator exclusions)
  - Location of thrombosis (upper extremity and superficial thromboses are clinical FPs)
  - Chronic vs. acute embolism (based on radiographic criteria)
- Records from volunteer hospitals in AHRQ study were sampled in sequential reverse order from 6/30/2010 back to 10/1/2009, up to N=30

Findings: 7 volunteer hospitals

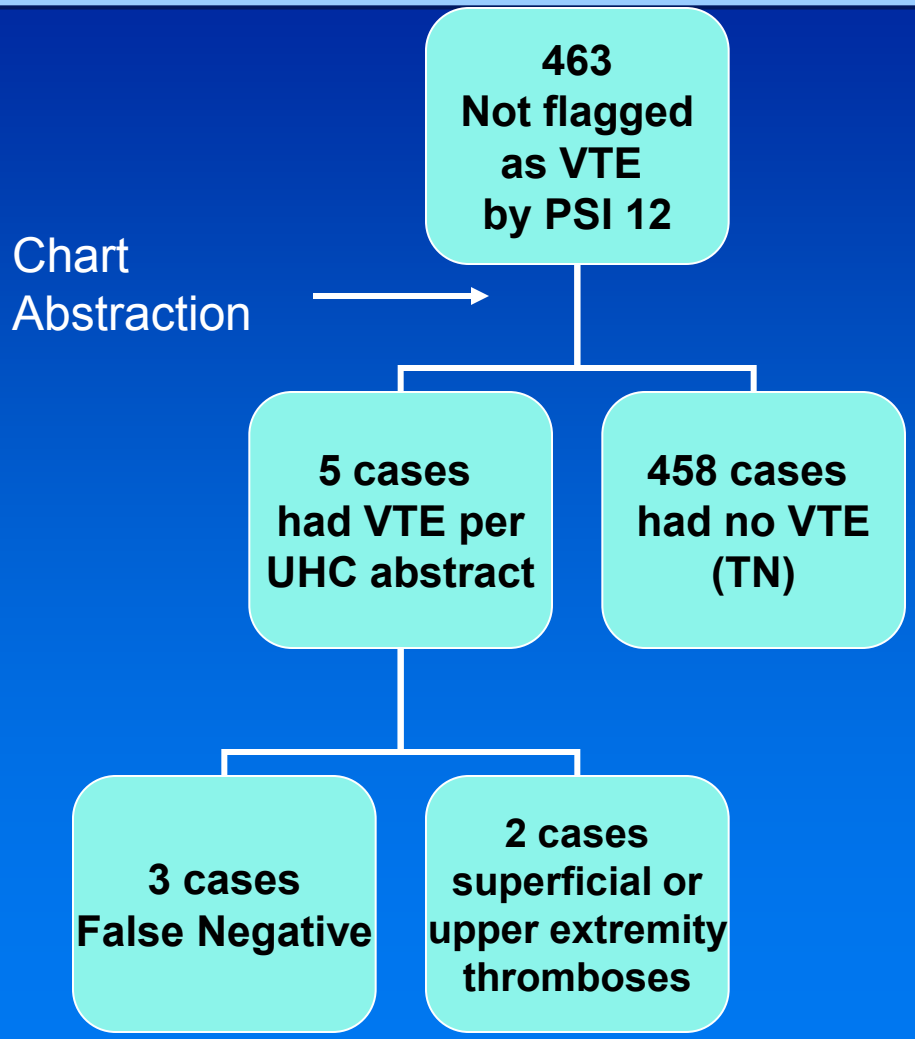
- From a total of 171 audited charts, 15 cases were excluded post hoc (because hospital did not properly apply POA)
- 30 cases were False Positive:
  - 15 cases were POA
  - 8 cases with upper extremity VT
  - 1 case with SVC (central VT)
  - 3 cases with superficial VT
  - 3 cases were chronic
- Overall PPV = 81%

Findings: AMCs with TKA patients PSI-12 flagged cases



- Positive Predictive Value
  = TP / (TP + FP)
  = 125 / (125 + 1)
  = 0.992

Findings: AMCs with TKA patients PSI-12 unflagged controls



- Negative Predictive Value
  = TN / (FN + TN)
  = 458 / (458+3) = 0.993

Estimating sensitivity: Looking for a needle in a haystack

- Retrospective cross-sectional study
  - 27 hospitals from 11 states
  - 2006-2009 PSI-negative hospitalizations
- Stratified sample
  - By hospital, risk of being falsely negative
  - Oversampled cases at risk
- Medical records abstracted locally
  - Trained staff, standard instrument
- Analysis with survey statistical methods
  - "Verification-biased sampling" approach, used model-based weights in analysis
  - Incorporated previous estimates of PPV

Suspicious records: Could they be false negatives?

Indicator	Potentially miscoded diagnosis	Alternative diagnosis	Corrective procedure	Part of composite def	High risk case
Foreign Body Left In	X		X		
Iatrogenic Pneumothorax	X		X		
Central Venous Catheter Infection	X	X			
Postop Hemorrhage/Hematoma	X			X	
Postop Phys/Met Derangement	X	X	X	X	
Postop Wound Dehiscence	X		X	X	
Accidental Puncture or Laceration	X		X		X

Sampling scheme for estimating sensitivity of selected PSIs

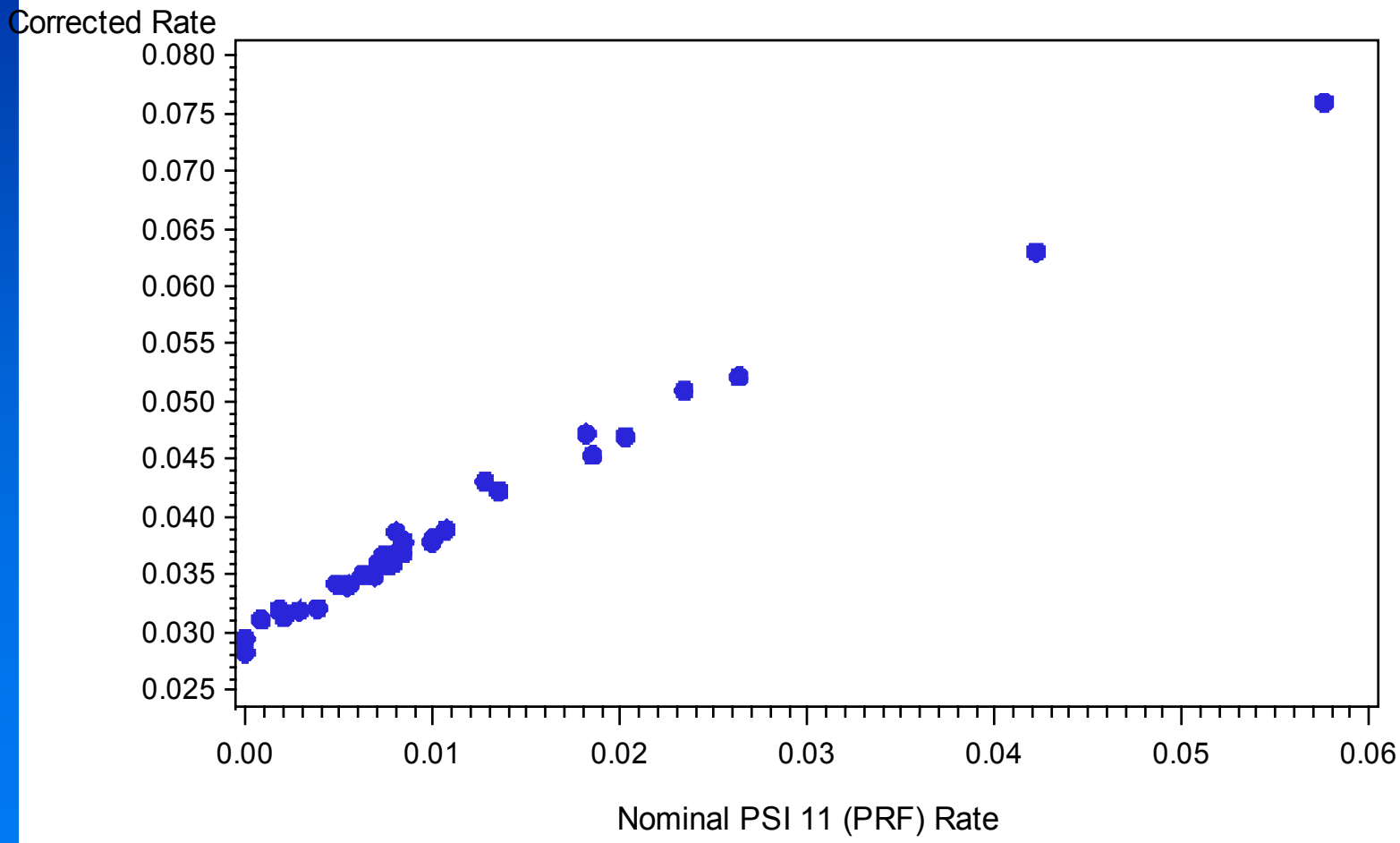
Indicator	Risk level	Sampling frame	Abstracted records n	n %
Foreign Body Left In		Low		
	664,956	99.91	295	0.04
		High	589	0.09
			21	3.56
Iatrogenic Pneumothorax		Low		
	535,648	99.92	269	0.01
		High	425	0.08
			11	2.59
Central Venous Catheter Infection	Low		453,138	
	99.29		197	0.04
		High	3,250	

Estimated sensitivity of selected AHRQ PSIs

Indicator	Abstracted records	False negative records		Sensitivity
	N % (95% CI)	All		High risk
Foreign Body Left In	316 100 (0-100)	0		—
Iatrogenic Pneumothorax	279 25 (8-58)	9		7
Central Venous Catheter Infection	223 11 (1-60)	3		2
Postop Hemorrhage/Hematoma	281 49 (26-72)	32		30
Postop Phys/Met Derangement	231	6		6

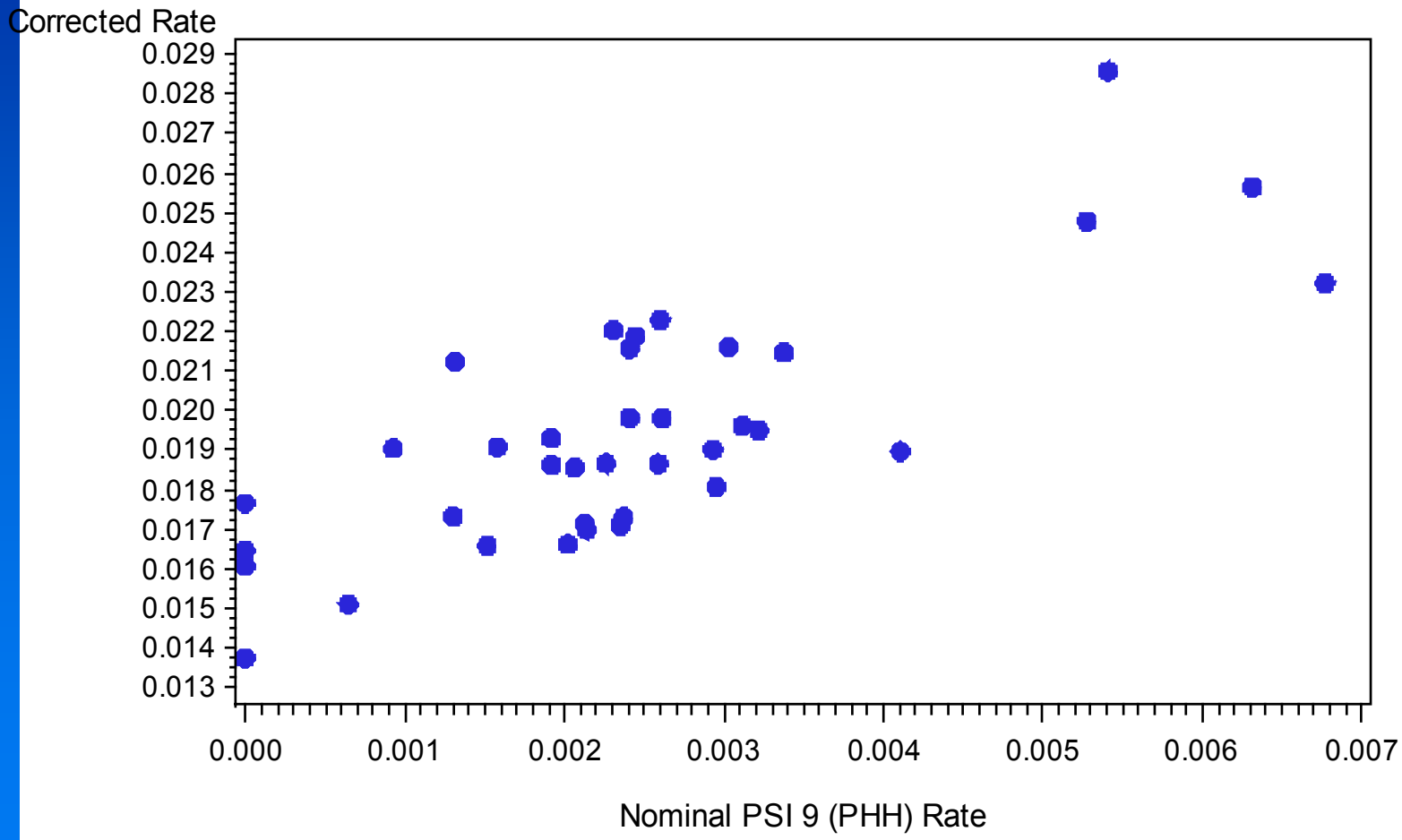
Simulating how false negatives and false positives would affect hospital-level rates

Corrected vs. Nominal PSI Rate



Simulating how false negatives and false positives would affect hospital-level rates

Corrected vs. Nominal PSI Rate



Improving the specification for Postoperative Hemorrhage/Hematoma

Indicator	Sensitivity % (95% CI)	PPV % (95% CI)
Current PSI 9 definition	49 (26-72)	78 (59-90)
PSI 9 definition + codes for treatment of PHH	71 (48-87)	76 (58-88)
PSI 9 definition + codes for treatment of PHH + codes for eval of bleeding	87 (69-95)	77 (61-87)
PSI 9 definition - requirement for procedure code	94 (80-98)	48 (30-66)

Predictive validity: perspectives

- Predicting what?
  - Mortality
  - Length of stay, charges
  - Readmission
- Time window for prediction?
- Implied gold standard

Impact of preventing a PSI on mortality, LOS, charges

NIS 2000 analysis by Zhan & Miller, *JAMA* 2003;290:1868-74

VA PTF 2001 analysis by Rivard et al., *Med Care Res Rev*; 65(1):67-87

Indicator	Δ Mort (%)	Δ LOS (d)	Δ Charge ($)
Postoperative septicemia	21.9-30.2	10.9-18.8	31264-57700
Selected infections due to medical care	2.7-4.3	9.5-9.6	13816-38700
Postop abd/pelvic wound dehiscence	9.6-11.7	9.4-11.7	18905-40300
Postoperative respiratory failure	21.8-24.2	8.6-9.1	39745-53500
Postoperative physiologic or metabolic derangement	19.8	8.9	54,800
Postoperative thromboembolism	6.1-6.6	5.4-5.5	7205-21700
Postoperative hip fracture	4.5	5.2	13,400
Iatrogenic pneumothorax	2.7-7.0	3.9-4.4	5633-17300
Decubitus ulcer	6.8-7.2	4.0-5.2	6713-10800
Postoperative hemorrhage/hematoma	3.0-5.1	3.9-3.9	7863-21400
Accidental puncture or laceration	2.2-3.2	1.3-1.4	3359-8300

Excess mortality, LOS, and charges computed from mean values for PSI cases and matched controls.

PSIs also appear to predict later readmissions

7 state SID 2004 analysis by Friedman et al., *Med Care* 2009;47(5):583-90

Indicator	Inpatient death	Readmit 1 month	Readmit 3 months
Postoperative septicemia	**4.70**	0.99	**1.26**
Selected infections due to medical care	**1.23**	1.00	**1.29**
Postop abd/pelvic wound dehiscence	**1.57**	1.24	**1.56**
Postoperative respiratory failure	**13.23**	1.03	**1.14**
Postoperative physiologic or metabolic derangement	**3.73**	1.09	**1.30**
Postoperative thromboembolism	**1.35**	**1.25**	**1.28**
Iatrogenic pneumothorax	**2.47**	1.02	**1.20**
Postoperative hemorrhage/hematoma	1.03	1.10	**1.18**
Accidental puncture or laceration	**1.52**	**1.25**	**1.16**

Risk ratios adjusted as in AHRQ model, but also for payer group and APR DRG SOI and ROM levels.
Statistically significant risk ratios are highlighted in yellow.

Predictive validity must be interpreted in context with reported prevalence (England)

	Rates/1000 admissions		Matched cases: excess mortality	
Indicator	England (2005/6)	US (2000)	England (2005/6)	US (2000)
Decubitus ulcer	7.17	21.51	13.4	7.2
Iatrogenic pneumothorax	0.12	0.67	10.6	7.0
Infections due to medical care	1.06	1.99	5.7	4.3
Postoperative hip fracture	0.08	0.77	18.2	4.5
Postoperative sepsis	2.66	11.25	27.1	21.9
Obstetric trauma:				
Vaginal with instrument	60.34	224.21	*	0.0
Vaginal without instrument	29.39	86.61	0.01	0.0

Data reported by:
UK - Raleigh VS, Cooper J, Bremner SA, Scobie S. *BMJ* 2008, 337:a1702
US - Zhan C, Miller MR. *JAMA* 2003;290:1868-74.
Reported data do NOT suggest predictive validity for Birth Trauma (PSI 17), Obstetric trauma (PSI 18/19), Transfusion Reaction (PSI 16), and Complications of Anesthesia (EXP 01).

Construct validity: perspectives

- Is the construct sound?
- Correlation with process measures
  - Do we have the right process measures?
- Correlation with structural measures
  - Do we have the right structural measures?
- Correlation with other outcome domains

Case control study of PSI 12

- Cases (up to 20):
  - Uni-TKA or Bilat-TKA
  - Oct 2008 to Mar 2010
  - >40 yrs
  - PSI-12 code for VTE within 90 days
- Controls (up to 40):
  - Uni-TKA or Bilat-TKA
  - Oct 2008 to Mar 2010
  - >40 yrs
  - NO PSI-12 code for VTE within 90 days

- No TKA or THA within 90 days prior
- No VTE as principal ICD-9-CM diagnosis
- No VTE as POA
- No pregnancy, childbirth, or puerperium

Analysis of case control data

- Classified FDA-approved pharmacologic prophylaxis as receipt of the recommended dose at the recommended starting time (per package insert) before or after surgery, and continued until at least the day of discharge
- Patients who were diagnosed with VTE on the day of surgery or the day after surgery were not included in the case control analysis
- Other risk factors assessed included age, obesity (BMI), type of TKA, race/ethnicity, date of ambulation, personal or family history of VTE, and comorbid conditions
- Analysis adjusted for conditional stratified sampling of controls without VTE

Multivariable analyses of process factors

Multivariate adjusted odds ratios and 95% confidence intervals

- Outcome: Any VTE event diagnosed Day 2 of surgery or later
- Excluded one hospital that screened TKA patients routinely for VTE

Predictive Factor	Odds Ratio (95% CI)	P value
Age	1.02 (0.99 – 1.05)	0.20
Gender (ref: male)	1.7 (0.9 – 2.9)	0.90
Ambulation (ref: no ambulation)		
•Taking steps day 1 or 2	0.3 (0.1 – 0.9)	0.005
•Taking steps after day 2	0.7 (0.2 – 2.1)	0.56
Type of TKA (ref: unilateral TKA)		
•Bilateral TKR	4.2 (1.9 – 9.1)	0.004
Recommended pharmacologic prophylaxis (ref: only mechanical)	0.5 (0.3 – 0.8)	0.01
BMI ≥ 35 (ref: BMI < 35)	0.9 (0.5 – 1.6)	0.66

Implications of recent validation studies

- Generalizability to nonparticipating hospitals remains unclear
- Limited supervision/oversight of local abstractors who may have COI
- ICD-9-CM changes and associated coder training can substantially improve criterion validity of PSIs, in the right circumstances
- Actionable opportunities to improve care may persist despite 100% compliance with TJC process measures, but often we don't know what processes to use for construct validation
- Estimating sensitivity or FN rate is still hard

Future directions in validation

- Encourage ongoing criterion validation work using previously developed tools or new learning collaboratives
- Continue to pursue opportunities to link registry or EHR data, especially laboratory, imaging, vital signs, etc.
- Encourage case control and intervention studies when we know what processes to measure or change

Improving indicator performance

- Change indicator specifications to capture false negatives or exclude false positives
- Change ICD-9-CM codes, coding guidelines, or Coding Clinic advice
- Promote universal adoption of POA flag
- Work with hospitals to improve and standardize clinical documentation and coding
- Everything will change in ICD-10-CM/PCS (10/1/2014)

http://qualityindicators.ahrq.gov/ValidationPilot.aspx

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AHRQ QUALITY INDICATORS VALIDATION PILOT

Validation Pilot Phase I Abstract

- Abstract PSI validation pilot

Documents

- Data Collection Instructions
- PSI Getting Started
- PSI 6 - Iatrogenic Pneumothorax
  - Guidelines Tool
- PSI 7 - Selected Infections Due to Medical Care
  - Guidelines Tool
- PSI 12 - Postoperative PE or DVT
  - Guidelines Tool
- PSI 13 - Postoperative Sepsis
  - Guidelines Tool
- PSI 15 - Accidental Puncture or Laceration
  - Guidelines Tool

Contact

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- Go to AHRQ QI website for full list:
  http://qualityindicators.ahrq.gov/Resources/Publications.aspx

QUESTIONS?