



Reinvigorating the Pulse of the '5th Vital Sign'

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Presentation Objectives

- Understand VA's experience implementing routine pain screening and the HELP-Vets Project
- Review aims, methods, and results of analysis of alternative pain screening approaches
- Consider implications for research and quality improvement

Background

- VA mandated the '5th vital sign' in 2003 to improve pain management
- 0-10 numeric rating scale with robust research properties
- Implemented with national documentation package for CPRS
- Individual and population level pain management and accountability ***potential***

Background

- Impressed by routine clinician ignorance of NRS scores
- Yet pain remains a huge problem, even with strong evidence base (e.g., oncology)
- How can we understand and use ratings for individual and population care?
- What information about routine pain screening implementation would inform its usefulness?

Methods - HELP-Vets

- Helping Veterans Experience Less Pain Project aimed to develop approaches for improving pain management by evaluating:
 - Reproducibility, validity, and clinical meaningfulness of routinely obtained pain,
 - nursing and patient factors associated with variability,
 - physician and patient factors including pain ratings associated with the quality of pain management
 - alternative approaches to routine pain screening

Methods - HELP-Vets

- Cross sectional, random visit-based outpatient sample of veterans at all primary care, cardiology, and oncology clinics including CBOCs
- Spanning ~150 miles of VA Los Angeles and VA Long Beach – 19 clinics, 3 county region, all in VISN 22.
- Sampled clinics proportionally to encounters recorded in the prior year

Methods - HELP-Vets

- Data collection triangulated on the pain screening experience
 - Baseline attitudinal knowledge surveys of all nurses and physicians
 - Surveys of patients and physicians after the visit to evaluate the pain screening encounter
 - Chart reviews to characterize objective documentation of pain and its management
- Response rates from ~70% for patient to ~95% for provider surveys

Methods - HELP-Vets

- Veterans leaving clinics eligible on the basis of:
 - Had vital signs taken
 - Examined by consenting provider
 - Pass brief cognitive screener (c/w no worse than mild cognitive impairment)
 - Stratified by SF-1 / health status
 - All fair / poor health vets; every other good / very good / excellent (50-50 final ratio)
- Following consent, ~35 minute interview with trained research assistants
- Interview immediately replicated NRS, then other pain measures and questions

Methods – Pain Screening Strategies

- Reference standard – ‘functionally limiting pain’ = BPI (average of 7 interference items) where ≥ 5 = ‘important’
- Alternatives
 - NRS ‘now’
 - NRS ‘one week’
 - Bother ‘How much did overall pain bother you in the past week?’
 - Importance ‘How important is it for your doctor to address your pain today?’
 - Unacceptable pain, inadequate relief, numeric difference scores (exploratory)

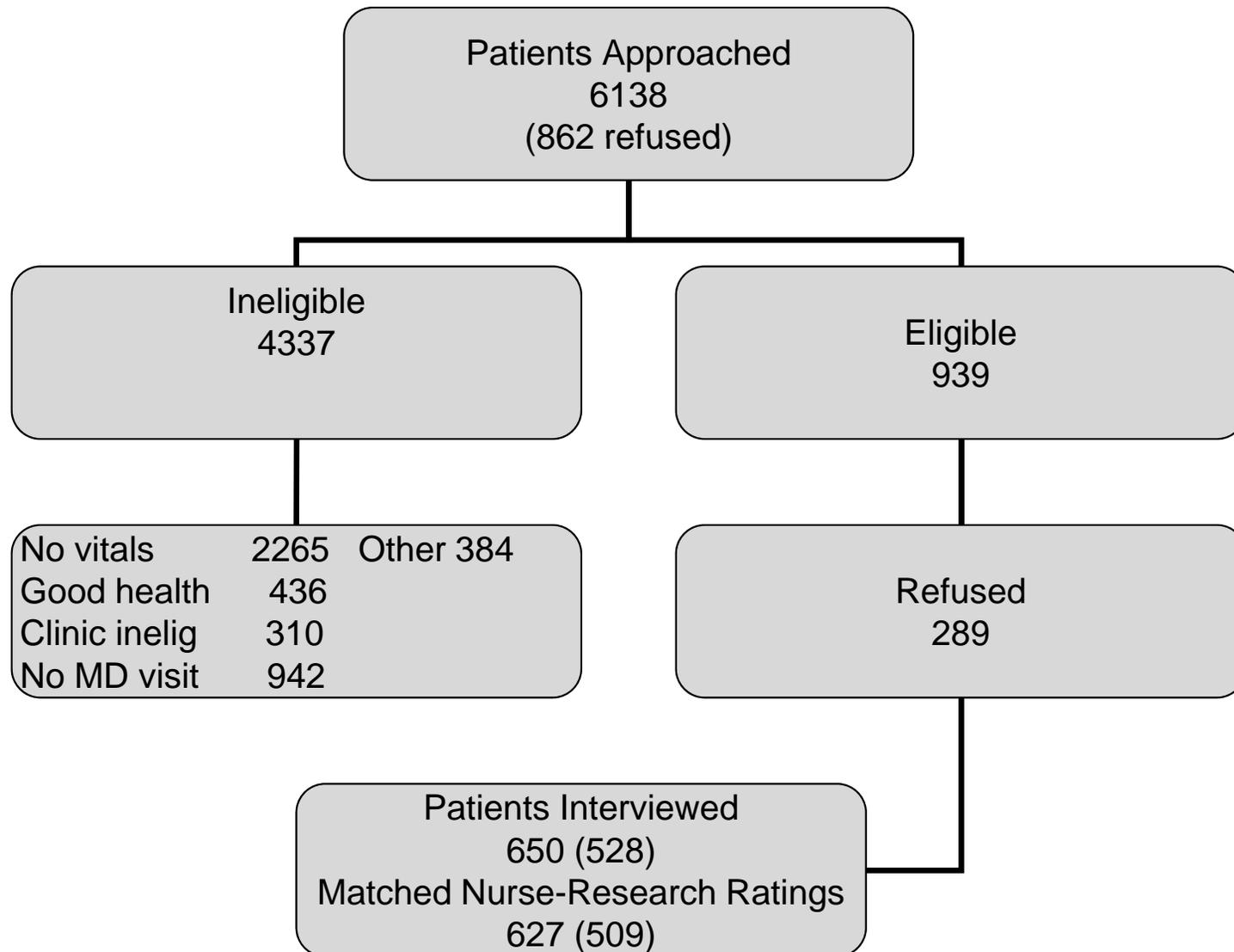
Methods – Pain Screening Strategies

- Fit ROC curves for each strategy – comparing it to ‘reference standard’ BPI
 - Determined AUC (0.5 = worthless test, 1.0 = perfect test)
- Calculated sensitivity, specificity, and accuracy (% overall correctly classified)
- Evaluated various cutoffs for measures, favoring sensitivity

Methods – Pain Screening Strategies

- Determined likelihood ratios (probability test + in population with / without pain)
 - > 1 increases probability and $= 1$ means test does not change probability
- Descriptively compared 'preferred approaches' in veterans with
 - poor vs. good health (SF-1)
 - substance abuse vs. none
 - self reported misuse of substances to manage pain

Results – Patient Recruitment



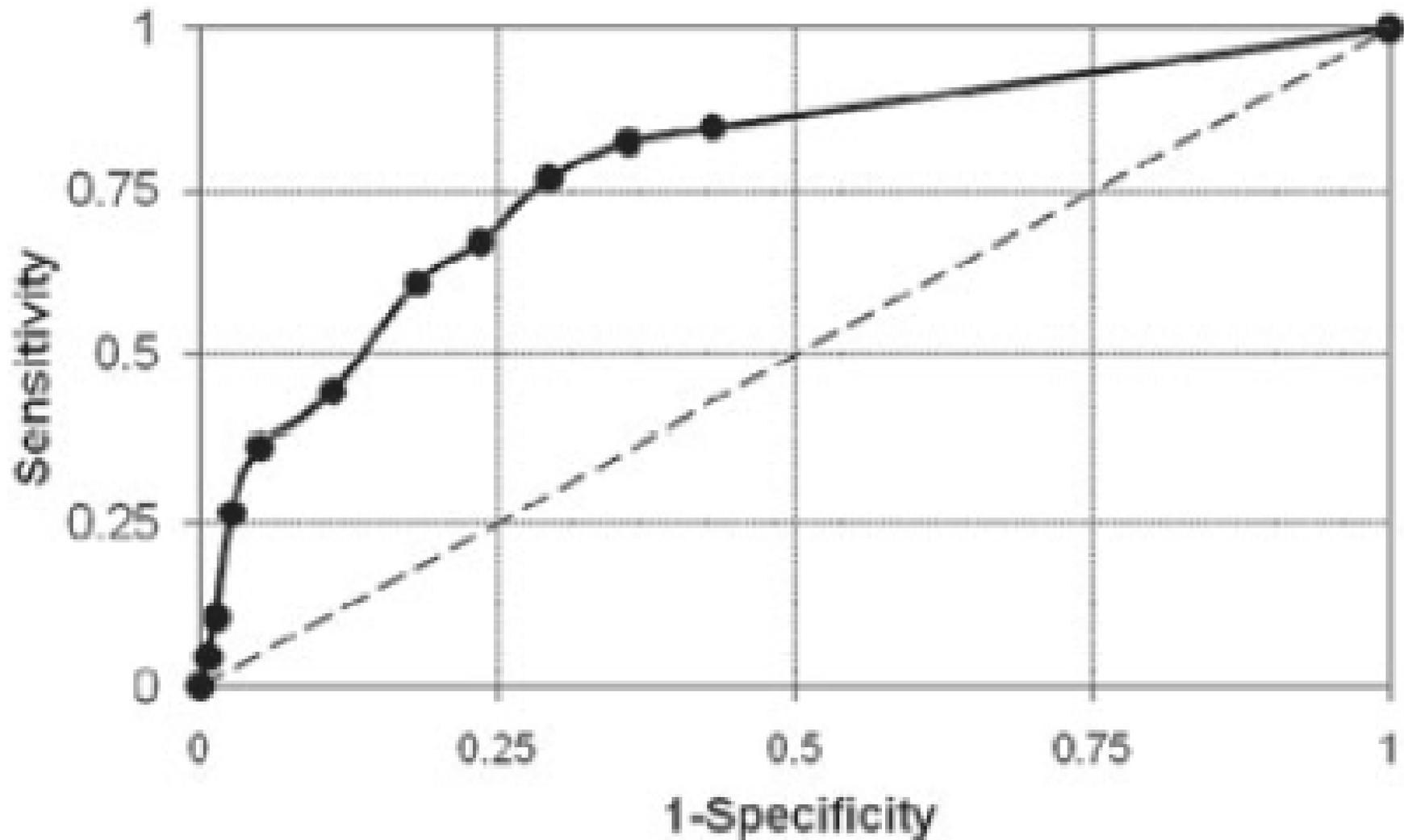
Results – Patient Characteristics

Age (years)	61.8 (12.9)
Male	94.3
Race/Ethnicity	
White	50.3
African American	24.0
Hispanic or multiple ethnicity including Hispanic	15.5
Other	14.7
General health rating* ^a	3.4 (1.1)
Research-recorded NRS	3.1 (3.2)
No pain	39
Pain	5.1 (2.5)
Nurse-recorded NRS	2.2 (3.2)
No pain	62
Pain	5.9 (2.5)
BPI	
Severity during last 24 hours	3.4 (2.9)
Severity during last week	3.7 (2.7)
Interference	4.0 (3.2)
Took pain medication during past week	60

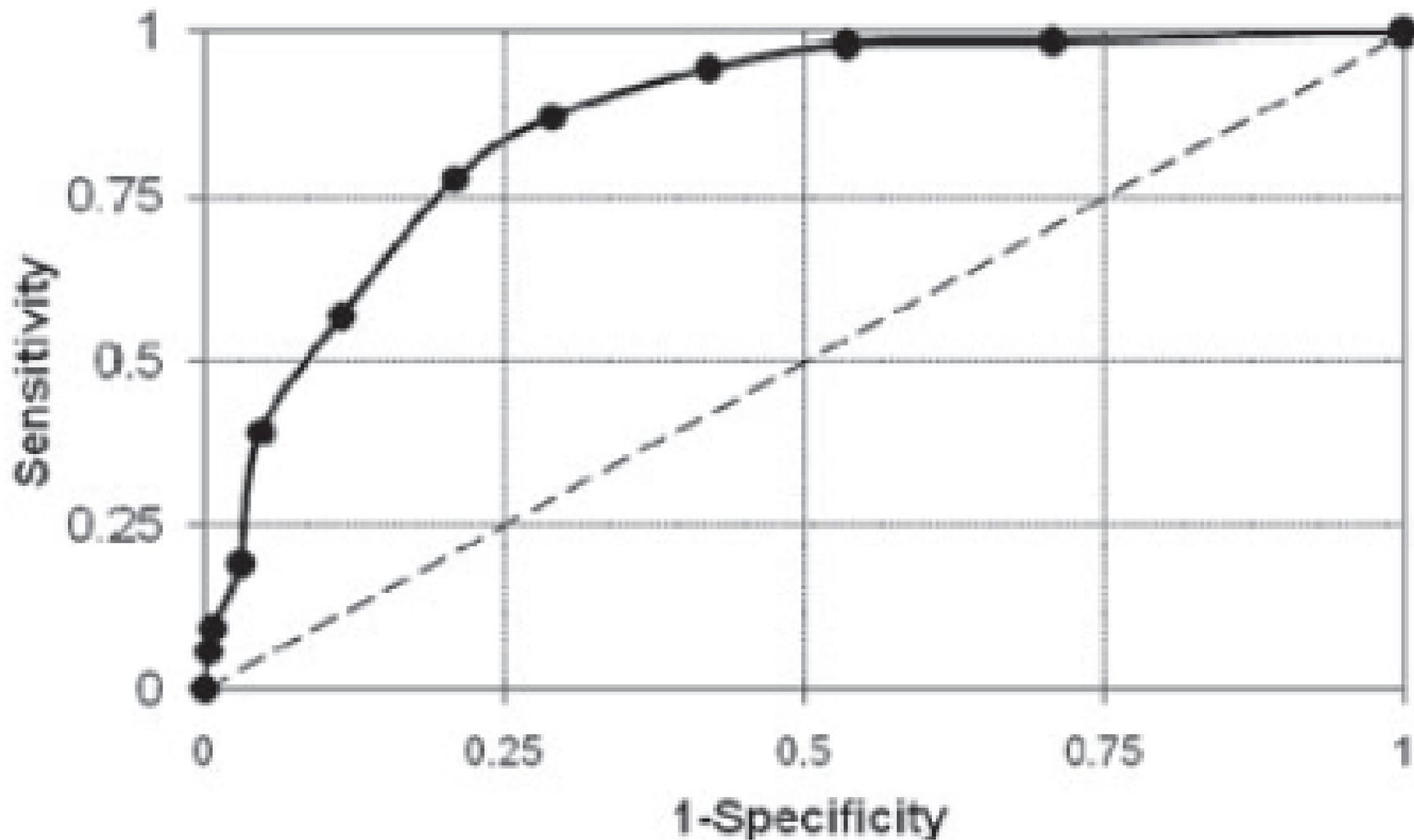
Results - Inferior Single Items

- Pain importance
 - AUC 0.66, LR's near 1.0 all cutoffs
- Inadequate relief from medication
 - Sensitivity 68% specificity 45%
 - Numeracy issues, also confounds side effects and treatment preferences
 - Invalid in 20% experiencing 'excessive relief'
- Unacceptable pain
 - Sensitivity 93% specificity 45%
 - Numeracy issues
 - Invalid in 3% with goal pain > current pain

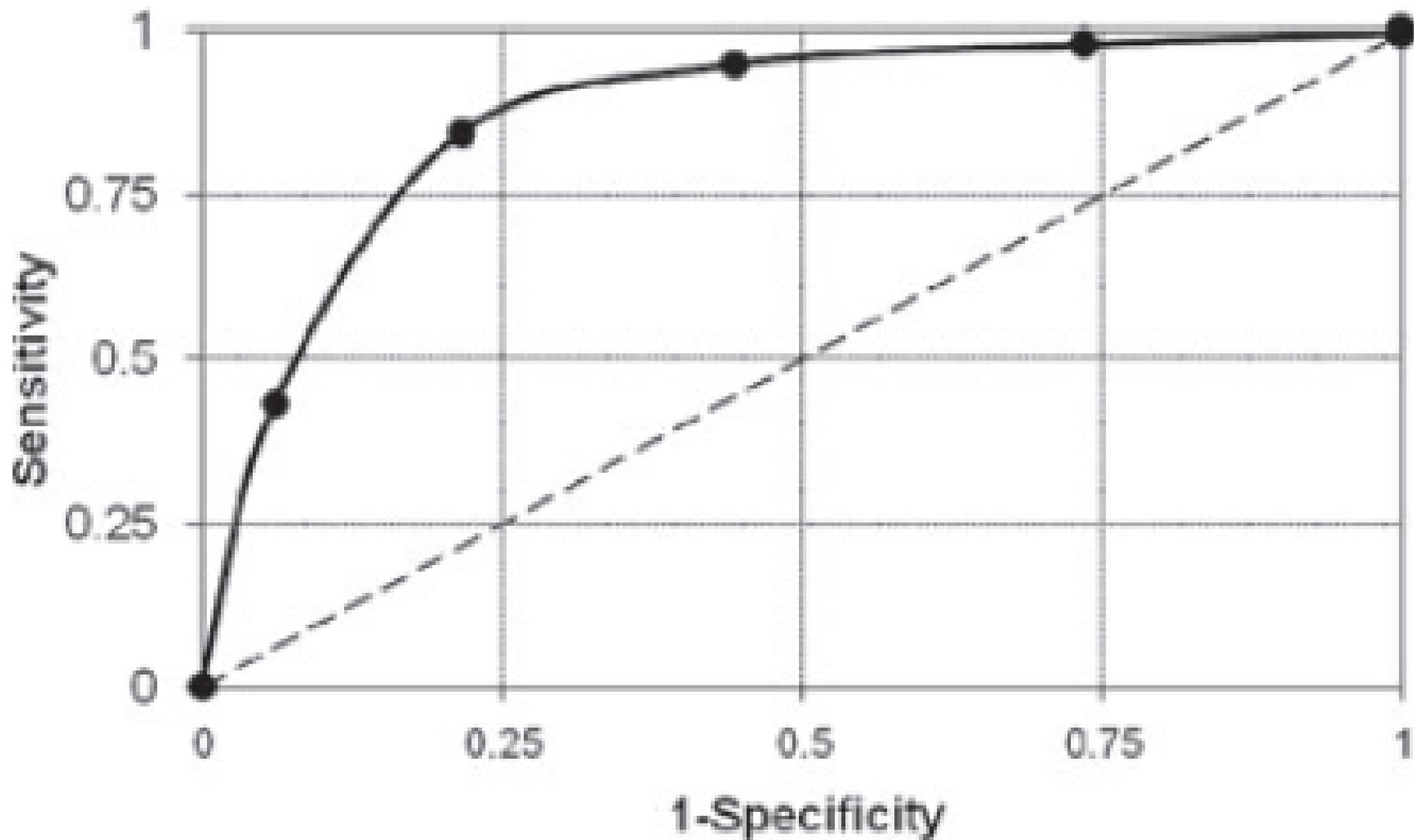
Results - Pain NRS Now vs BPI



Results - Pain NRS One Week vs. BPI



Results Pain Bother One Week vs. BPI



Results - Single Item Cutoffs vs. BPI

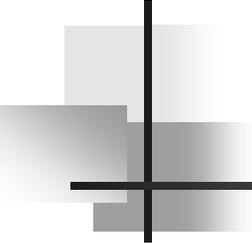
	N positive (%)	Sensitivity	Specificity	LR+ (95% CI) [†]	LR- (95% CI)
Current NRS [†] (N = 527)					
3+	264 (50.1)	0.77	0.71	2.63 (2.17, 3.18)	0.33 (0.25, 0.42)
4+	225 (42.7)	0.67	0.76	2.86 (2.29, 3.57)	0.43 (0.35, 0.52)
5+	194 (36.8)	0.61	0.82	3.35 (2.58, 4.35)	0.48 (0.40, 0.57)
Average NRS (N = 527)					
3+	343 (65.1)	0.95	0.58	2.25 (1.97, 2.58)	0.09 (0.05, 0.16)
4+	287 (54.4)	0.87	0.71	3.02 (2.51, 3.63)	0.18 (0.13, 0.25)
5+	241 (45.7)	0.78	0.79	3.73 (2.96, 4.70)	0.28 (0.22, 0.36)
Pain Bother [§] (N = 524)					
Somewhat+	349 (66.7)	0.95	0.56	2.14 (1.88, 2.44)	0.09 (0.05, 0.15)
Quite a bit+	258 (49.2)	0.85	0.78	3.90 (3.12, 4.88)	0.20 (0.14, 0.27)

Results - Two-Stage Screening vs. BPI

Pain Screening Strategy Combinations	LR (95% CI)	Post-Test Probability [†]
Combination 1		
Pain Bother negative [‡]	0.09 (0.04, 0.15)	0.05
Pain Bother positive and Current NRS <4 [§]	1.24 (0.93, 1.65)	0.45
Pain Bother positive and Current NRS ≥4	3.18 (2.50, 4.05)	0.68
Combination 2		
Pain Bother negative	0.09 (0.04, 0.15)	0.05
Pain Bother positive and Average NRS <4	0.52 (0.33, 0.82)	0.26
Pain Bother positive and Average NRS ≥4	3.34 (2.73, 4.07)	0.69

Results - Summary

- Several strategies have favorable test properties vs. BPI
 - NRS one week and pain bother –single item and sequential
- Superior to current approach in poor health (NRS one week, pain bother) and substance abuse (NRS one week) subgroups
- Of other approaches – unacceptable pain is very promising, but non-numeric specification needed

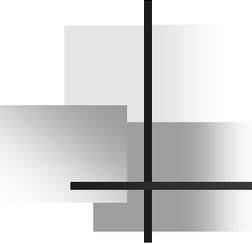


Discussion

- Optimal strategy may vary with setting -
 - E.g., Are 'bother' and 'overall pain last week' more relevant to primary care than surgery clinics?
- Optimal strategy depends on intent
 - Comparable ratings may be critical to quality assessment comparisons, but tailored approaches may be better for clinical delivery

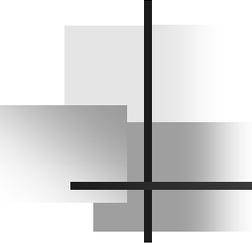
Discussion

- Need to consider patient-reported approach - nurses didn't adhere to the formal NRS in 50% of cases
 - Not surprising - reflects a normal clinical strategy (e.g., How's the leg today Mr. Jones?)
 - Tended to result in pain underestimation – although more of that pain was mild (so some of it may have reflected skilled clinical triage)
- Need to link screening to management - clinicians didn't pay attention to the rating resulting in low quality of care
 - Took action in about 15% of cases



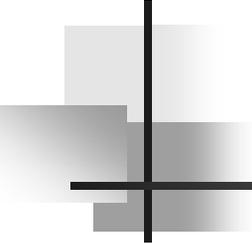
Limitations

- Outpatient – different settings may require different approaches (inpatient, ED, long term care)
- Our gold standard assumes goal of management is chronic pain care
- Cross sectional – needs to be evaluated in longitudinal, actual implementation



Next Steps

- Primary and oncology care-based study
- Implement optimal vs. current strategies in longitudinal RCT
- Patient reported component
- Reminder functionality to foster responsibility for 'actionable pain'
 - Cancer, depression present



Conclusions

- The '5th Vital Sign' is necessary but not sufficient step to improving population pain management
- Problems include implementation, linkage to action, and test properties of measure itself
- This study provides informed basis for further research and quality improvement
- Pain is paradigmatic of the challenge of screening failures and addressing a range of HRQOL-related issues.