Critical Review Form
Health-Related Quality of Life

Validity of a Verbally Administered Numerical Rating Scale of Acute Pain for Use in the Emergency Department, *Acad EM* 2003;10: 390-392

Objective

"To validate the pain numerical rating scale (NRS) in the ED setting by assessing its comparability to the VAS (visual analog scale)" and "to identify the minimum clinically significant difference in pain that could be detected by patients on the NRS compared with the VAS." (p. 390)

Methods

Prospective convenience sampling of adult patients presenting with pain <24-hours duration, recruited at Albert Einstein College of Medicine ED between 8AM – 8PM three days per week for an undefined time period. Exclusion criteria included AMS, decreased visual acuity, or motor abnormalities that prohibited effective use of the VAS.

Subjects marked their pain rating on a 10cm VAS with the left anchor point "no pain" and right anchor joint "worst possible pain" and then they were asked to verbally rate their pain from 0 (no pain) to 10 (worst possible pain). The order of the VAS and NRS was randomly varied. The NRS and VAS were repeated at 30 and 60 minutes along with a qualitative pain rating: "much less pain", "a little less pain", "about the same pain", "a little more pain", or "much more pain".

The association between NRS and VAS was assessed statistically with the Pearson product-moment correlation coefficient. The minimum clinically significant difference was calculated as the mean change in NRS and VAS for the categories "a little less pain" and "a little more pain".

Guide		Comments
I.	**Are the results valid?**	
A.	**Have the investigators measured aspects of patients' lives that patients consider important?**	Probably, although they don't really ask subjects (who are the only one's suffering the pain!) whether "a little less pain" or "a little more pain" are relevant or at least satisfactory endpoints.

B.	**Did the health-related quality of life (HRQL) instrument work in the intended way?**	Yes, the NRS correlated almost perfectly with the previously validated VAS.
C.	**Are there important aspects of HRQL that have been omitted?** **(Construct validity)**	Probably, some domains of pain are neglected by both the VAS and the NRS (secondary gain, medication side-effect concerns, disability, depression, etc).
D.	**If there are tradeoffs between quality and quantity of life, or if an economic evaluation has been performed, have the most appropriate measures been used?** **(Content validity)**	The current tool lacks *content validity* in that other objective measure of pain might be considered (observer pain rating, analgesic requirement, functional disability, etc.)
II.	**What are the results?**	
A.	**How can we interpret the magnitude of the effect on HRQL?**	• 108 subjects were enrolled with average age 44 (range 21-85), 60% male, and heterogeneous pain locations. The etiology of pain was not described. • 83% of initial NRS scores were above 5. • The NRS correlated almost perfectly with the VAS (r=0.94, 0.93-0.95). • The minimum clinically significant difference for the NRS was 1.3 (95% CI) and for the VAS 1.4 (95% CI 1.0-1.5).
III.	**How can I apply the results to patient care?**	
A.	**Will the information from the study help patients make informed decisions about treatment?**	Yes, researchers and clinicians can use VAS or NRS interchangeably knowing the two pain scales are concordant with nearly identical changes for minimally significant differences.

B.	**Did the study design simulate clinical practice?**	Yes, a convenience sampling of patients in pain presenting to one busy academic ED. The pain scales were already widely used even before this validation paper.

Limitations

1) Visually impaired, motoring impaired, and subjects with cognitive dysfunction were excluded so results cannot be extrapolated to these populations.
2) Convenience sampling – theoretically subjects presenting 8P-8A or the other four days of the week could differ systematically from those who were enrolled (selection bias).
3) No true Gold standard for pain. Both the NRS and the VAS could be erroneously congruent (precise but not accurate). Development of an objective biomarker for pain or a multi-component tool incorporating observed pain/disability/analgesic requirement with self-reported pain would enhance pain research.

Bottom Line

The NRS correlates extremely well with the VAS and the minimum clinically significant change on the NRS is 1.3. Patients tend to rate pain higher on numeric scale than VAS as represented by the non-zero intercept.