

**Tool:** Nursing Assistant-Administered Instrument to Assess Pain in Demented Individuals (NOPPAIN)  
**Tool developer:** Snow, A.L., Weber, J.B., O'Malley, Cody, M., Beck, C., Bruera, E., Ashton, C., Kunik, M.E.  
**Country of origin:** USA  
**Reviewed:** 04/04  
**Revised:** 06/08

<b>Conceptualization</b> Panel rating: 2 Revised: 2	
<b>Purpose</b>	The Non-Communicative Patient's Pain Assessment Instrument (NOPPAIN) is a nursing assistant-administered instrument for observing and rating pain behaviors in patients with dementia.
<b>Conceptual basis</b>	No definition of pain or identification of the conceptual basis for the tool is provided. There is recognition that verbal assessment of pain in patients with dementia Alzheimer type (DAT) is problematic. This tool focuses on observation of specific pain behaviors while doing common care tasks, such as bathing, dressing and transfers. Pain is assessed at rest and with movement. <i>NOPPAIN derives a level of pain intensity from the presence and intensity of behaviors observed. The tool developers called it a pain screening tool because diagnosis or analysis of observation is not within the scope of NA practice. NAs are asked to perform behavioral observation and rate intensity of behaviors prior to formulation of a global pain score in each patient. Horgas (2007) tested the reliability and validity of the NOPPAIN when used as assessment instrument by nurses.</i>
<b>Item Generation</b>	The tool was developed by consultation with a panel of 10 clinical and research experts in pain assessment in dementia, nursing home research and psychometrics that advised about item and instrument format issues.  Little information is provided about the actual items that were generated in this process. However, the resulting items appear to reflect those on the Checklist of Nonverbal Pain Indicators (Feldt, 1998).  The basis for assessment of intensity of behaviors is not reported <i>neither is the process of how NAs translate the NSR of behavior intensity into a VDS of pain intensity.</i>  Nursing assistants' global assessment of pain is based on the tool developer's assumption that caregivers can reliably rate the intensity of pain in elders.  <u>Tool items</u> The tool has four main sections: In the first section questions are asked about the caregiving situation (what tasks were performed and whether pain was observed). Two simple questions allow the patient to self-report about pain and hurt. In the second section the nursing assistant is presented with 6 pain behaviors with graphic illustrations: <ul style="list-style-type: none"> <li>• Pain words</li> <li>• Pain noises</li> <li>• Pain faces</li> <li>• Rubbing</li> </ul>

	<ul style="list-style-type: none"> <li>• Bracing</li> <li>• Restlessness</li> </ul> <p>For each of these items the nursing assistant is asked 1) if the behavior was observed (yes/no) and 2) to rate the intensity of the particular behavior on a 5 point numeric rating scale (NSR) with anchors 0=lowest possible intensity, 5=highest possible intensity.</p> <p>Section three allows the NA to mark the location of pain on a body schematic.</p> <p>In section four the nursing assistant is asked to rate the patient’s global pain intensity on that day on a verbal descriptor scale (VDS) in the shape of a pain thermometer with 6 verbal pain descriptors from “no pain” to “pain is almost unbearable.”</p>
<b>Content Validity</b>	<p>The NOPPAIN is based on review of the literature and was developed in consultation with a multidisciplinary panel of experts not involved in the study. <i>Content validity was established in study 1 (Snow, 2004) where nursing assistants identified NOPPAIN behaviors in a standardized actor-patient video and were able to distinguish levels of pain based on enacted behaviors by comparing 2 different videos/pain levels at a time.</i></p> <p><u>Study 3 (Horgas, 2007)</u>  <i>This study compares nurse-ratings of pain intensity with videotaped behaviors of real patients believed to be in pain. Videos were coded extensively using the Keefe and Block Pain Behavior Measurement System. This additional standard for comparison adds to claims for convergent validity of the NOPPAIN.</i></p>
<b>-Panel Commentary</b>	<p>The tool covers 3 of 6 pain behavior categories in the AGS Persistent Pain Guidelines: Facial expression, Verbalizations/ vocalizations and Body language. More subtle pain behaviors in the AGS Guidelines are not addressed: Changes in activity patterns or routines, Mental status changes, Changes in interpersonal interactions. Thus, the tool has limited comprehensiveness which may limit the likelihood of detecting pain, particularly in patients who do not present with obvious pain behaviors.</p> <p>One justification for involving nursing assistants in pain screening is that they may observe subtle behaviors. However, the NOPPAIN only addresses typical pain behaviors. <i>While the unique “knowledge” that the nursing assistant may contribute to pain screening is not specifically incorporated into the tool it is unknown how such unique knowledge influences formulation of the final global pain score assigned by the NA in each patient.</i></p> <p>The nursing assistant is expected to rate the intensity of a particular behavior on a 6 point scale. However, there is little indication as to what will be observed to differentiate levels of intensity.</p> <p><i>Beyond recognizing presence/absence of pain-related behaviors by caregivers, the current literature presents conflicting information about reliability and validity of caregivers’ proxy assessment of pain severity in elders with dementia who are experiencing pain. There is a conceptual leap in inferring not only the presence but also the intensity of pain from pain behaviors. While there is emerging evidence that observation or informant-based pain assessment tools can track change in degrees of pain for individual patients, current literature does not support the hypothesis that such tools can reliably differentiate between arbitrary categories on a VDS or even escalating levels on an NSR. More testing is needed to support any population-based normed correlation between intensity of pain behaviors and</i></p>

	<p><i>intensity of pain.</i></p> <p>Use of standardized patient behavior for pain assessment and rating in cognitively impaired older patients is debatable. <i>The addition of behavior coded real patient videos as gold standard in study 2 adds strength to the contention that nurses recognize pain behaviors and can identify levels of pain in individual patients.</i></p>
<p><b>Subjects</b>  <b>Panel rating: 3</b>  <b>Revised: 2</b></p>	
<p><b>Subjects</b></p>	<p><u>Study 1 (Snow, 2004)</u>  <i>Characteristics of nursing assistants (N=21):</i>  Gender: Female: 86%, Male: 14%  Average age: 37 years (<math>\pm 11.50</math>), Range: 21-60 years.  Racial/ethnic composition: Caucasian: 5%, African-American: 76%, Hispanic: 10%, Asian: 7%.  Education background: High school diploma/GED: 71%  Experience: average 9.8 years, range 3 mos. – 30 years  All NAs were hired from the same temporary employment agency.</p> <p><u>Study 2 (Snow 2004, unpublished)</u>  Setting: Four Houston nursing homes and a VA nursing home unit  <i>Characteristics of residents (n=83):</i>  Age of subjects: Average 83.17 years (<math>\pm 8.79</math>) Range 50-100 years  Gender: Female: 70%, Male: 30%  Average MDS-Cognition Subscale: 5.46 (<math>\pm 2.86</math>)  Racial/ethnic diversity: Caucasian: 68%, African-American: 12%, Hispanic: 11%, Other: 9%  Most common pain related diagnoses were arthritis (41%), “pain” (39%), osteoporosis (28%) and fractures (28%).</p> <p><i>Characteristics of nursing assistants (N=20):</i>  Gender: Female: 86%, Male: 14%  Average age: 37 years (<math>\pm 10.50</math>), Range: 21-60 years.  Racial/ethnic composition: Caucasian: 4%, African-American: 81%, Hispanic: 7%, Asian: 7%.  Education background: High school diploma/GED: 59%  All NAs were hired from the same temporary employment agency.</p> <p><u>Study 3 (Horgas, 2007)</u>  40 Subjects were randomly selected from a volunteer sample of 128 participants from a variety of institutional and community settings.  Mean age: 83  Gender: predominantly female  Diversity: not stated  Cognitive impairment: 20 subjects were cognitively intact (MMSE 24-30) and 20 were impaired (MMSE 10-23).  Subjects were English-speaking, able to stand up from a chair, with Dx of osteoarthritis in lower body and not visually or hearing impaired. All had previously completed pain interviews and videotaped activity protocol data from the parent study (parent study is not cited).</p> <p><i>Characteristics of raters: 2 senior honors nursing students</i></p>
<p><b>-Panel Commentary</b></p>	<p>There is a clearly identified focus on the longterm care setting. Gender balance in the NA samples of the first two studies reflects general distribution in this population. Both NA samples are racially/ ethnically</p>

	<p>diverse. Patient subjects in <i>the unpublished study 2</i> are severely cognitively impaired as measured with standard dementia assessment tool (MMSE).</p> <p><i>Study 3 sample is only 50% cognitively impaired and less diverse. Sample size (N=40) is adequate but has some missing observations.</i></p> <p><i>The tool is complex and large sample sizes would be needed to establish internal consistency for all items. Using 5 subjects per tool item as a minimum requirement for this review, a minimum sample size of 35 subjects (7 items x 5 subjects) would be needed to test the six pain behaviors, their intensities and the global pain score on the pain thermometer. Study 2 (unpublished) and study 3 involving real patients meet the minimum sample size requirement. More studies are needed beyond the laboratory setting and involving more diverse patient populations.</i></p>
<p><b>Administration, Scoring, Feasibility</b>  <b>Panel rating: 2</b>  <b>Revised: 2</b></p>	
<p><b>Administration, Scoring, Feasibility</b></p>	<p>The tool has four main sections (for specification see “Item Generation” section above). It was designed to require minimal training for proper use.</p> <p>Instructions on the form indicate that the NA should complete the form following at least 5 minutes of daily care activities while observing for pain behaviors. The form is to be completed immediately following care activities.</p> <p>In a feasibility study, administration of the NOPPAIN took nursing assistants less than 30 seconds after an average of 8.71 minutes (<math>\pm 3.70</math>, range 3-15 minutes) involved in care activity and observing the patient prior to completion.</p> <p><i>Study 3 concluded that nurse raters were able to easily, reliably and validly rate pain behavior presence and intensity after a “short” training session using CD-ROM.</i></p>
<p><b>-Panel Commentary</b></p>	<p>The method of administration is described but scoring procedures are unclear. No criteria are provided for establishing low-high intensity of pain behavior. NAs only rate behaviors associated with activities performed. There are no directions as to how missing activities influence the global pain score.</p> <p>There is concern about NA rating of severity of the resident’s pain (on the pain thermometer) given inaccuracies of surrogate reporting. <i>Study 3 (Horgas, 2007) demonstrated that accuracy of administration might be improved with training.</i></p> <p>Interpretation of the tool score is unclear. There is no indication on how to proceed once rating of individual items is completed.</p> <p>Findings for clinical utility are promising: The tool requires little time to complete following a period of observation consistent with time to complete care activities.</p> <p>The tool was clearly developed for use by nursing assistants. Scope of practice for nursing assistants in screening for pain must be considered.</p>
<p><b>Reliability</b>  <b>Panel rating: 2</b>  <b>Revised: 2</b></p>	
<p><b>Internal consistency</b></p>	<p>Internal consistency of the tool has not been established.</p>

<p><b>Interrater reliability</b></p>	<p><u>Study 2 (Snow, 2004 unpublished)</u>  Interrater reliability was conducted in a subsample of NAs (See characteristics of nursing assistants under subjects above).</p> <p>Interrater reliability was evaluated using 78 videotapes of NAs performing morning care tasks (e.g. cleaning, dressing, transferring, and toileting) with residents with dementia. Twenty-six videos were randomly chosen and shown in random order to a group of 6 NAs who had not participated in either the video development or training session on use of the NOPPAIN.</p> <p>To evaluate the effect of brief training on interrater reliability, a group of 6 NAs, independent from those who participated in the above activities, received one hour of training on how to complete the NOPPAIN. Interrater reliabilities (mean percent agreement) for each main item on the NOPPAIN for untrained and trained raters ranged as follows:</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Untrained raters</u></th> <th style="text-align: center;"><u>Trained raters</u></th> </tr> </thead> <tbody> <tr> <td>Was the activity done?*</td> <td style="text-align: center;">.79 - .94</td> <td style="text-align: center;">.78 - .94</td> </tr> <tr> <td>Pain during activity?</td> <td style="text-align: center;">.66 - .87</td> <td style="text-align: center;">.66 - .92</td> </tr> <tr> <td>Was Pain Behavior Present?</td> <td style="text-align: center;">.59 - .87</td> <td style="text-align: center;">.69 - .99</td> </tr> <tr> <td>Pain Behavior Intensity</td> <td style="text-align: center;">.68 - .92</td> <td style="text-align: center;">.77 - .99</td> </tr> <tr> <td>Pain Thermometer</td> <td style="text-align: center;">.85</td> <td style="text-align: center;">.97</td> </tr> </tbody> </table> <p>(* Activities include: lying down, turned, transferred, sitting, dressing, eating, standing, walking, bathing)</p> <p><u>Study 3 (Horgas, 2007)</u>  <i>The PI and 2 undergraduate honors nursing students reviewed a brief standardized CD-based training program, i.e. they viewed enacted levels of pain as developed by the authors of NOPPAIN (see construct validity for study 1). Raters also practiced NOPPAIN scoring until they reached 90% agreement with the author. Nursing students then independently scored forty 10-minute videotapes which depicted the standardized activity protocol to elicit pain behaviors based on the work of Keefe and colleagues (see pain behaviors listed in item generation). Behaviors were presented in random sequence to minimize order effects.</i>  <i>Across the 6 behaviors, Kappa coefficients ranged from 0.72-1.0 for presence of the behavior (M=0.88). Raters agreed in a range of <math>\kappa</math> 0.72-1.0 on pain intensity (M=0.91).</i></p>		<u>Untrained raters</u>	<u>Trained raters</u>	Was the activity done?*	.79 - .94	.78 - .94	Pain during activity?	.66 - .87	.66 - .92	Was Pain Behavior Present?	.59 - .87	.69 - .99	Pain Behavior Intensity	.68 - .92	.77 - .99	Pain Thermometer	.85	.97
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<p><b>Test-retest reliability</b></p>	<p><u>Study 2 (Snow 2004, unpublished)</u>  This study was conducted with a subset of untrained nursing assistants (see under subjects above) with no previous contact with residents while providing morning care to residents. The procedure was repeated 2 hours later (n=42) and 24 hours later (n=34). Reliabilities reported were:</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>2 hours</u></th> <th style="text-align: center;"><u>24 hours</u></th> </tr> </thead> <tbody> <tr> <td>Was Pain Behavior Present?</td> <td style="text-align: center;">.22 - .68<sup>a</sup></td> <td style="text-align: center;">.27 - .67<sup>a</sup></td> </tr> <tr> <td>Pain Behavior Intensity</td> <td style="text-align: center;">.25 - .68<sup>s</sup></td> <td style="text-align: center;">.14 - .66<sup>s</sup></td> </tr> <tr> <td>Pain Thermometer</td> <td style="text-align: center;">.60<sup>s</sup></td> <td style="text-align: center;">.39<sup>s</sup></td> </tr> </tbody> </table> <p>a = phi correlations  s=spearman correlation</p> <p><u>Study 3 (Horgas, 2007)</u>  <i>Each student rater re-scored 10% of the videos 1 week later: average <math>\kappa</math> of 0.7 and 0.86 for presence of pain</i></p>		<u>2 hours</u>	<u>24 hours</u>	Was Pain Behavior Present?	.22 - .68 <sup>a</sup>	.27 - .67 <sup>a</sup>	Pain Behavior Intensity	.25 - .68 <sup>s</sup>	.14 - .66 <sup>s</sup>	Pain Thermometer	.60 <sup>s</sup>	.39 <sup>s</sup>						
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	<i>ICC =&gt;0.67 for pain intensity ratings (missing intra-rater consistency for pain words and rubbing).</i>
<b>-Panel commentary</b>	<p>Internal consistency needs to be established yet.</p> <p>Interrater reliabilities were moderate to strong for all tool items. The reliabilities for observing presence of pain behaviors and pain behavior intensity improved with one hour of training.</p> <p>Test-retest reliability was low to moderate at both 2 and 24 hours. Only the Pain Thermometer was stronger at 2 hours than 24 hours (study 2).</p> <p><i>Test-retest/intrarater consistency over time in study 3 (Horgas, 2007) was good to very good.</i></p>
<b>Validity: Criterion or construct</b> <b>Panel rating: 2</b> <b>Revised: 2</b>	
<b>Construct validity/ Criterion related validity</b>	<p><u>Construct validity (study 1, Snow 2004)</u></p> <p>Standard videotaped patient scenarios representing a continuum of pain intensity levels were developed using an actor to portray a bed-bound patient with severe dementia receiving personal care from a nursing assistant. NAs watched and rated each video using the NOPPAIN assessment process. NAs completed the global pain rating for each video and were asked to identify the video showing the most pain from each of 15 pairs.</p> <p>NAs global pain rating on the NOPPAIN and pain levels portrayed in the videos resulted in weighted Kappa=0.87 (SE: 0.2, 95% CI: 0.82-0.91).</p> <p>For paired comparisons (Bradley-Terry model of paired comparisons), the parameter estimates conformed to expected responses, although borderline (Deviance GFI=18.14(10), p=0.0527, non-significance indicates a good fit). The lowest intensity pain condition had the smallest parameter, with parameter size increasing with each subsequent level of the pain response scale. Lack of agreement was mainly due to confusion between “mild pain” and “moderate pain,” which was shown by 65% of the raters. All pain level comparisons were 82-100% correct.</p> <p><u>Construct validity (study 2, Snow 2004, unpublished)</u></p> <p>Construct validity was evaluated by comparing nursing assistant NOPPAIN ratings to a physician gold standard. The gold standard for pain presence was consensus of two palliative care physicians on NOPPAIN scores and dichotomous pain classification.</p> <p>According to physician consensus classifications, 15 of 75 (20%) of patients were in pain. All 15 were classified by physician consensus as having mild pain on the pain thermometer; on the 0-10 pain scale, 8 (11%) were classified as having pain of level 1, 6 (8%) had pain at level 2 and 1 (1%) had pain at level 3.</p> <p>Pain behaviors were observed most often during transferring, turning, dressing. Of the pain behaviors: bracing, pain faces and pain noises were observed most often (in 67-73% of those classified as in pain), pain words (33%) and restlessness (13%) less often, while rubbing was not observed.</p>

	<p>NOPPAIN Validity Indices using sensitivity/specificity were as follows:</p> <p style="text-align: center;">Untrained rater validity:  <u>Physician ratings and NA ratings</u></p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">NA NOPPAIN and Physician NOPPAIN</td> <td style="text-align: center;">NA NOPPAIN and Physician Pain Classification (Pain/No pain)</td> </tr> </table> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>Pain Activity Summary Score</td> <td style="text-align: center;">.73/.86</td> <td style="text-align: center;">.67/.88</td> </tr> <tr> <td>Pain Behaviors Summary Score</td> <td style="text-align: center;">.90/.45</td> <td style="text-align: center;">.93/.43</td> </tr> </table> <p><u>Study 3 (Horgas, 2007)</u>  <u>Convergent validity:</u> Correlation analyses were conducted to examine the relationship between self-reported pain and NOPPAIN scores.  Correlation of NOPPAIN NRS and self-report NRS <math>r = 0.39</math> (<math>p &lt; 0.01</math>)  Correlation of NOPPAIN VDS and self-report VDS <math>r = 0.31</math> (<math>p &lt; 0.05</math>)  These correlations were twice as strong when figured separately for cognitively intact patients and not significant for the cognitively impaired sample.  NOPPAIN scores were also compared to behavioral rating scores from detailed observational coding available for videos from the parent study. In the cognitively impaired sample correlations were very strong for all pain behaviors except bracing which was not observed. In the cognitively intact sample, pain words and rubbing were not observed and there was no correlation with pain noises.  Total number of pain behaviors observed: <math>r \geq 0.63</math> in the total group as well as in cognitively intact and impaired groups (<math>p &lt; 0.001</math>).</p>	NA NOPPAIN and Physician NOPPAIN	NA NOPPAIN and Physician Pain Classification (Pain/No pain)	Pain Activity Summary Score	.73/.86	.67/.88	Pain Behaviors Summary Score	.90/.45	.93/.43
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<p><b>-Panel commentary</b></p>	<p>Preliminary evidence of tool validity is presented; however, additional study in clinical settings with larger samples and actual non-research caregivers is needed. The judgment of pain severity in persons with dementia by caregivers has not been substantiated in prior literature; however preliminary work on this tool using a standardized video approach suggests additional study in this area is warranted with clinical samples.</p> <p>The low specificity scores on the pain behavior items suggest the tool may classify patients as having pain when they are not.  A caution is warranted regarding the low levels of pain in the sample that limits evaluation of tool ability to detect pain in those with higher pain levels.</p> <p><i>The poor correlation between NOPPAIN and self-report among cognitively impaired patients underscores the need for behavioral assessment in this population.</i>  <i>The high correlation between detailed behavior coding and NOPPAIN scores strongly supports construct and criterion validity of the test outside the laboratory setting.</i>  <i>The concern remains that the tool only captures typical pain behaviors and while raters consistently identify intensity as portrayed in an enacted sequence there is no validation that patients will present with this sequence as expression of intensity. A final concern is that, while caregivers can identify pain in video, they may actually under-detect pain within the caregiving context itself.</i></p>								
<p><b>Summary of panel evaluation of pain assessment tool</b></p>									
<p>The NOPPAIN was developed for the purpose of nursing assistant's screening for pain in older adults with dementia. The tool has limited comprehensiveness with behaviors addressing only obvious and not subtle cues or changes indicated in the literature. However, preliminary testing has established that the screening</p>									

tool is reliable and has preliminary validity, thus may be useful when combined with a more comprehensive screen for other indicators. *One follow-up study supplied support for convergent validity of proxy report with detailed behavioral coding in patient video and this aspect of the tool should be evaluated further in clinical samples. The tool has been tested in a racially/ethnically diverse sample, although further study is warranted. The tool appears to be clinically useful given the ability of nursing assistants to use and the limited time required for completion. Because assessment activities are outside the scope of nursing assistant practice, it will be important to determine if the expectations of the tool for NA's are actually screening activity. The tool was used successfully by senior nursing students in the laboratory setting rating real patient videos.*

### **Sources of evidence**

- Snow , A.L., Hovanec, L., Passano, J., Brandt, J. (2001). Development of a pain assessment instrument for use with severely demented patients. Poster session presented at the Annual Meeting of the American Psychological Association. Washington, DC.
- Snow, A. L., Weber, J. B., O'Malley, K. J., Cody, M., Beck, C., Bruera, E., et al. (2004). NOPPAIN: A nursing assistant-administered pain assessment instrument for use in dementia. *Dementia and Geriatric Cognitive Disorders*, 17(3), 240-246.
- Snow, A.L., Cody, M., Beck, C., Bruera, E., O'Malley, K.J. Aston, C., El-Issa, L., Kunik, M.E. Nursing assistants as pain screeners for nursing home residents with severe dementia: In vivo validation of the NOPPAIN. (draft article, 2004).
- Horgas, A. L., Nichols, A. L., Schapson, C. A., & Vietes, K. (2007). Assessing pain in persons with dementia: Relationships among the non-communicative patient's pain assessment instrument, self-report, and behavioral observations. *Pain Management Nursing : Official Journal of the American Society of Pain Management Nurses*, 8(2), 77-85.

### **Key to panel rating**

- 3= Available evidence is strong  
2= Available evidence supports need for further testing  
1= Available evidence is insufficient and/or tool revisions are needed  
0= Evidence is absent

### **Contact address for tool developer**

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