**Tool:** Checklist of Nonverbal Pain Indicators (CNPI)  
**Tool developer:** Feldt, K.  
**Country of origin:** USA

<table>
<thead>
<tr>
<th>Conceptualization</th>
<th>Panel rating: 2</th>
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<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>The Checklist of Nonverbal Pain Indicators was designed to measure pain behaviors in cognitively impaired elders.</td>
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</tbody>
</table>
| **Conceptual basis** | There is no definition of pain. However there is discussion on problems of pain and pain measurement in non-verbal elders.  
The tool measures presence/absence of observable pain behaviors commonly associated with pain in elders with dementia. |

| Item Generation  | Tool items  
|------------------|------------|
|                  | There are 6 items  
• Nonverbal vocalizations  
• Facial grimacing or wincing  
• Bracing  
• Rubbing  
• Restlessness  
• Vocal complaints  
|                  | Each item is further defined by specific behaviors.  
Each of the 6 items is scored on a dichotomous two point scale (0= not present; 1= present). The points are then added together. Pain is measured at rest and on movement with separate scores for each situation.  
| **Item generation process** | The tool was based on an extensive literature review and developed by  
• Making modifications to University of Alabama-Behavioral Pain Scale (UAB-BPS): Four inappropriate items were eliminated and one item – restlessness—was redefined.  
• One item was added based on research findings: vocal complaints.  

| Content Validity  | The CNPI was not subjected to external validation by an independent review process by content experts in the field of pain in dementia.  
The tool developer claims good face validity based on literature review.  

| Panel Commentary  | No conceptual blurring between discomfort and pain.  
The tool was developed by making modifications to UAB-PBS, a tool which has not been validated for use with older adults.  
The items are scored on a dichotomous present/absent scale and does not attempt to measure pain severity. This is consistent with the limitations of interpretation of pain behaviors in elders with dementia.  
Comprehensiveness and clarity of items  
The tool covers 3 of 6 pain behavior categories in the AGS Persistent Pain Guidelines: Facial expression, Verbalizations/ vocalizations, 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 includes behaviors most commonly reported. Moreover, these behaviors may be most salient when evaluating acute pain in elders with dementia.  

Completed 04/04
Although content validity was not evaluated through an external review by content experts, the CNPI does appear to have face validity for assessment of pain in elders with dementia.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Panel rating: 1</th>
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<tbody>
<tr>
<td><strong>Subjects</strong></td>
<td>The tool was tested in a convenience sample of 88 cognitively impaired and cognitively intact subjects undergoing surgery for hip fracture. Average age: 83.2 (±7.7) Range: 65-101. Gender: Female: 86%, Male: 14%.</td>
</tr>
</tbody>
</table>

**Panel Commentary**
Acute care hospital setting is clearly identified as the care setting. No testing in long term care is currently available. The cognitively impaired patients have been identified as having dementia using the MMSE, which is an appropriate instrument for screening for dementia. The cognitively impaired elders in this study have a low level of cognitive function on the MMSE. However, acute confusion was not measured and is also often present in hospitalized elders with hip fracture. Age of the subjects is appropriate. The sample is predominantly women. There is no information on ethnic/racial diversity. Using 5 subjects per tool item as a rule of thumb, a minimum sample size of 30 subjects (6 items x 5 subjects) would be needed. Thus, this sample of 88 subjects is sufficient for tool evaluation.

<table>
<thead>
<tr>
<th>Administration, Scoring, Feasibility</th>
<th>Panel rating: 2</th>
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</thead>
<tbody>
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<td><strong>Administration, Scoring, Feasibility</strong></td>
<td>There are 6 items, each of which is further defined by specific behaviors. Each item is scored on a dichotomous two point scale (0= not present ; 1=present). The points are then added together. Pain is measured at rest and on movement with separate scores for each situation.</td>
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</table>

**Panel Commentary**
Method of administration is clear. Scoring procedures are clearly described and simple to follow. No interpretation of tool score is provided.

**Clinical utility**
- **Time:** The time needed to administer the tool has not been formally evaluated. However, the tool is short and appears easy to use.
- **Skill needed:** Skill level needed to use the tool reliably is not addressed. In the initial study, two gerontological nurse practitioners did assessments. However, it is not known how the tool performs when administered by staff nurses.
### Reliability

#### Panel rating: 2

#### Internal consistency

Observations of the subjects were conducted at approximately the third postoperative day. Observations were made of subjects at rest and with movement (sample specifications are provided above).

Raters were gerontological nurse practitioners with Master’s degrees.

Results:

- At rest: .54 (95% CI= .38 -.68)
- With movement: .54 (95% CI= .49 -.75)

#### Interrater reliability

Interrater reliability was established in a subgroup of 12 patients from the study sample.

Raters were gerontological nurse practitioners with Master’s degrees.

Observations were conducted:
1) at rest (while the subject was lying in bed)
2) on movement (during transfer bed to chair).

Results:

93% agreement on dichotomous checklist items
Kappa=0.63-0.82 for behaviors observed.

#### Test-retest reliability

No test-retest reliability or intrarater reliability is available.

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### Panel commentary

#### Internal consistency

Raters are qualified.
Method of testing internal consistency is appropriate for the data.
Correlation coefficients are low, which may relate to the few items in the tool, however further evaluation is recommended.

#### Interrater reliability

Raters are qualified.
% agreement and kappa statistic are appropriate for the data.
Results are good. However, not all behaviors on the tool were observed.
Moreover, the results of only one study with a small sample size have been reported.

#### Test-retest reliability

Test-retest reliability is not an appropriate parameter to examine when assessing acute pain due to its changing nature. However, test-retest reliability should be established when used with persistent pain states.

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### Validity: Criterion or construct

#### Panel rating: 1

#### Construct validity/ Criterion related validity

Concurrent criterion related validity
CNPI scores compared with VDS scores (VDS scores transcribed into numbers 0=no pain, 1=slight pain, 6=pain as bad as it could be.) 64 patients had CNPI and VDS scores.

<table>
<thead>
<tr>
<th>Comparisons</th>
<th>At rest</th>
<th>With movement</th>
</tr>
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<tbody>
<tr>
<td>Pain in total population</td>
<td>$r_s=37$, $p=.001^*$</td>
<td>$r_s=43$, $p&lt;.0001^*$</td>
</tr>
<tr>
<td>Intact ($n=32$)</td>
<td>$r_s=50$, $p=.003^*$</td>
<td>$r_s=39$, $p=.032^*$</td>
</tr>
<tr>
<td>Impaired ($n=32$)</td>
<td>$r_s=30$, $p=.076$</td>
<td>$r_s=46$, $p=.009^*$</td>
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<tr>
<td>Construct validity</td>
<td></td>
<td></td>
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<tr>
<td>--------------------</td>
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<tr>
<td>The data above demonstrate construct validity of the CNPI because higher scores were attained during periods of movement eliciting discomfort than during periods of rest.</td>
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</tbody>
</table>

-Panel commentary

Use of VDS with cognitively impaired individuals as a gold standard may be problematic and contribute to lower correlation. Although the validity data is in the expected direction, testing with a more cognitively impaired sample is needed to assess tool sensitivity to detect pain.

Summary of panel evaluation of pain assessment tool

The CNPI is a brief, clinically useful approach to assessing pain in elders with cognitive impairment. Items included in the scale are conceptually sound. Preliminary tool testing provides initial support for use of the tool at least with elders in acute care setting.

The CNPI needs further evaluation to determine its usefulness with nonverbal elders including those in long term care settings. Addition of items that consider more subtle behaviors or changes in behaviors or interaction would improve comprehensiveness and ability to detect pain in those with less obvious behavioral manifestations. Additionally, tool testing with males and minority samples is needed. Additional evidence of reliability is needed, as well, particularly with use by staff nurses rather than trained geriatric nurse practitioners.

Sources of evidence


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

Evaluation completed by:

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