

Checklist of Non-Verbal Pain Indicators (CNPI)

Description: Adapted from the University of Alabama at Birmingham Pain Behavior Scale (UAB-PBS), the CNPI was designed to observe and measure pain behaviors in older adults with cognitive impairment ranging from mild to severe. The tool includes six pain behavioral items commonly observed in older adults including nonverbal vocalizations, facial grimacing or wincing, bracing, rubbing, restlessness, vocal complaints. The CNPI was able to measure greater pain behaviors during movement rather than at rest.

The CNPI was tested in a convenience sample of cognitively intact and cognitively impaired hospitalized older adults with hip fracture. Moreover, observations were made by two gerontological nurse practitioners on the third postoperative day, which may indicate the patients would be experiencing less severe postoperative pain. Two subsequent studies tested CNPI in patients with predominantly persistent pain in the long-term care setting (Jones, 2005; Nygaard & Jarland, 2006). There was a wider range of mental impairment and ethnic diversity in follow-up samples. All studies had adequate sample size for tool evaluation.

Psychometric testing: Initial psychometrics were reported in 2000, and the tool presented with good face validity and strong inter-rater agreement at 93% and modest internal consistency (the Kuder-Richardson-20 $\alpha = 0.54$ at rest and 0.64 with movement). Follow-up studies show fair to higher inter-rater agreement (73.9-93.5%; Cohen's $\kappa = 0.45-0.69$) for various pain behaviors (Nygaard & Jarland, 2006). Nygaard et al. established concurrent validity by spearman's rank correlations with caregivers' proxy perception of pain intensity as measured on VAS and CNPI; three different

assessments were done. Correlations for first assessment was 0.88, 0.82 for the second, and 0.63 for the third assessment. Lower correlations were noted due to decreased sample size at each assessment. Test–retest reliability for nurses and auxiliary nurses was measured by $\kappa = 0.20–0.63$ and $0.46–0.63$. Poor sensitivity of the tool found by Jones (2005) supports Feldt’s suggestion that the CNPI observes acute pain behaviors and may not be strong in detecting persistent pain.

More recent inquiries by Ersek and colleagues also validate earlier psychometric properties. They add evidence of fair to moderate inter-rater reliability ($\kappa = 0.25$ with movement and $\kappa = 0.43$ at rest). This was slightly lower than reliability of the PAINAD ($\kappa = 0.31$ with movement and $\kappa = 0.54$ at rest). Both the CNPI and PAINAD exhibit floor effects for pain at rest. They also demonstrated construct validity by comparing the (1) correlations of the CNPI to the PAINAD (criterion validity), and (2) association of the CNPI to scales measuring similar (convergent validity using Spearman rank) and different (discriminant validity using paired *t*-tests) construct (i.e., PAINAD and Pittsburgh Agitation Scale). Cronbach’s α for CNPI at rest were 0.97 and 0.92, and 0.74 and 0.90 with movement which indicates good internal consistency. There was correlation between self-reported pain and the CNPI.

Internationally, the CNPI has been evaluated in German Acute Care hospitals where the CNPI scores were correlated with the German PAINAD (PAINAD-G) ($\rho = .81$), the ALGOLUS ($\rho = .73$), and the Observational Instrument for Assessing Pain in the Elderly with Dementia (BISAD) ($\rho = .54$) (Lukas et al., 2019). The CNPI at rest was the only tool to find a reduction in pain related to oxycodone administration between treatment and

placebo groups compared to the BISAD, ALGOPLUS, and PAINAD-G. The CNPI during movement did not detect this same effect in pain reduction.

Languages and Settings: Testing has been completed in English and Norwegian languages, with the initial study performed in acute care and all subsequent studies conducted in nursing homes. The tool has also been used in German acute care hospitals, but it is unclear if it was translated from English for testing.

Feasibility/Clinical Utility: Method of administration and scoring procedures are clearly described and appear simple to follow. No interpretation of tool score is provided however. Although the time needed to administer the tool has not been formally evaluated, it is short and appears easy to use.

Scoring and Interpretation: Each pain behavior item is scored on a dichotomous scale (1=present, 0=not present) both at rest and on movement, for a possible range of scores from 0 to 6 points for each situation and a total of 12 points. There are no recommendations for a cut-off score. For greater ease of use and understanding, each behavior item on the CNPI is accompanied by example characteristic definitions.

Summary/Critique: The CNPI is a clinically useful tool for assessing pain in older adults with varying levels of cognitive impairment, although its ability to reliably differentiate and score acute from chronic pain is not clear. Items included in the scale are conceptually sound. Although the studies are few, this tool does show sufficient psychometrics to use clinically. Further testing is needed to determine the best type of pain to use this tool for and to evaluate other older adult populations. 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.

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References:

- Ersek, M., Herr, K., Neradilek, M.B., Buck, H.G., & Black, B. (2010). Comparing the psychometric properties of the Checklist of Nonverbal Pain Behaviors (CNPI) and the Pain Assessment in Advanced Dementia (PAIN-AD) instruments. *Pain Medicine, 11*, 395-404.
- Ersek, M., Polissar, N., & Neradilek, M.B. (2011). Development of a composite pain measure for persons with advanced dementia: Exploratory analyses in self-reporting nursing home residents. *Journal of Pain and Symptom Management, 41*(3), 566-579.
- Feldt, K.S. (2000). The Checklist of Nonverbal Pain Indicators (CNPI). *Pain Management Nursing, 1*(1), 13-21.
- Feldt, K.S. (2000). Improving assessment and treatment of pain in cognitively impaired nursing home residents. *Annals of Long Term Care, 8*(9), 36-42.
- Jones, K.R., Fink, R., Hutt, E., Vojir, C., Pepper, G.A., Scott-Cawiezell, J., et al. (2005). Measuring pain intensity in nursing home residents. *Journal of Pain and Symptom Management, 30*(6), 519-527.
- Lukas, A., Hagg-Grun, U., Mayer, B., Fischer, T., Schuler, M. (2019). Pain assessment in advanced dementia. Validity of the German PAINAD-a prospective double-blind randomized placebo-controlled trial. *Pain, 160*(3), 742-753.
- Nygaard, H.A. & Jarland, M. (2006). The Checklist for Nonverbal Pain Indicators (CNPI): Testing of reliability and validity in Norwegian nursing homes. *Age and Ageing, 35*(1), 79-81.

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