**Tool:** **Elderly Pain Caring Assessment 2 (EPCA-2)**
**Tool developer:** **Morello, R., Jean, A., Alix, M., Sellin-Peres, D., Fermanian, J.**
**Country of origin:** **France**
**Reviewed:** **06/08**

| **Conceptualization**<br>**Panel rating: 2** | |
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| **Purpose** | The EPCA-2 was developed in an attempt to provide a reliable and valid tool with high clinical utility to both observe and rate the intensity of pain in non-verbally communicating older adults. The tool relies on caregiver familiarity with the patient to report changes in behavior. |
| **Conceptual basis** | This scale builds on evidence documenting pain behaviors and the role of external raters of pain in non-verbally communicating older patients (NVC-OP).<br>NVC-OPs are by conceptualization unable to evaluate themselves for pain rendering self-report and conventional intensity rating scales impractical. The EPCA-2 is hypothesized to measure pain intensity through doctors', nurses' and other caregivers' proxy ratings of the presence and qualitative intensity of identified pain behaviors. |
| **Item Generation** | The EPCA-2 was refined in 4 stages: three intermediate versions of the tool were tested before psychometrics of the final version were established.<br><br>Stage 1.<br>Literature review of all behavioral manifestations of pain in humans, along with a survey of 48 experienced nurses and caregivers led to the development of the first version with 11 items, grouped into two categories: (1) pain outside of caregiving, and (2) pain in response to caregiver interventions.<br><br>Stage 2.<br>The first version was tested on 66 NVC-OPs, each rated independently by two pairs of raters: doctor-doctor and nurse-nurse. Face validity was ascertained by the users. Psychometrics and factor analysis led to rewriting of two ambiguous items and the elimination of one item (10 item scale). Factor analysis confirmed the postulated 2-dimensional nature of pain observations.<br><br>Stage 3.<br>Version 2 was re-tested on 78 NVC-OPs in the same manner as version 1, which led to the deletion of one item that did not fit the 2-dimensional nature of the scale. In order to achieve internal consistency of Cronbach's $\alpha > 0.7$ for both doctor and nurse raters one last item was dropped from the scale yielding the final 8-item version of the tool.<br><br>Stage 4.<br>The final 8-item scale is comprised of 2 subscales each holding four items:<br><br>1) rate after 5 minutes of observation before caregiving:<br>a) facial expression<br>b) spontaneous posture adopted at rest (trying to find a comfortable position)<br>c) movements of the patient out of bed and /or in bed<br>d) interactions of all kinds with other people. |

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| | 2) signs during caregiving to be rated immediately after caregiving:<br>a) anxious anticipation of caregiver intervention<br>b) reactions during caregiver intervention<br>c) reactions of the patient when painful parts of the body are nursed<br>d) complaints voiced in the course of caregiving.<br><br>Each item intensity is rated on a 5-point scale from 0 (no pain) to 4 (intense pain). For example, facial expression "no pain" is described as "relaxed look on the face"; "intense pain" is operationalized as "totally rigid expression". The total score is the sum of corresponding scores in the two dimensions. |
| **Content Validity** | Tool development was based on the assumption that pain has 2 dimensions: (1) signs outside of caregiving, i.e. at rest and with spontaneous movement and (2) signs during caregiving.<br><br>Nurses and Doctors scored the appropriateness and clarity of wording for each item on a 3-point Likert scale.<br><br>Six experts, each with at least 20 years experience in pain management in older patients agreed that each item corresponded to one of the 2 postulated dimensions, and that each dimension was well-represented and proportionate. After independently rating each item on a 3 point Likert scale (bad, average, good) they deemed overall validity to be good. |
| ***-Panel Commentary*** | Tool items quite comprehensively cover 5 of 6 categories of non-verbal pain behaviors in the AGS Persistent Pain Guidelines: Facial expression, Verbalizations/vocalizations, Body language, Changes in activity patterns or routines and Changes in interpersonal interactions. Mental status changes are not explicitly included. Restlessness and combativeness are operationalized in the caregiving context as reactions to care and may therefore signify emotions other than pain, such as anxiety, anger or fear. This differentiation is difficult in all assessment situations.<br><br>The EPCA-2 relies on the rater's familiarity with usual behaviors of the patient which facilitates recognition of subtle changes in the presence of persistent pain as well as the more obvious signs of acute pain.<br>The proposed hierarchies of pain behaviors according to pain intensity appear logical, but no conceptual basis for this ordering is offered by the authors.<br><br>Content validity reflects the particular practice setting of both patients and healthcare providers in French longterm care facilities affiliated with University hospitals. Content validity was not established by an independent external panel of experts as 3/6 experts are co-authors of the study but factor analysis confirmed the two-dimensional aspects of pain in this setting. Face validity presumably was established by the same raters who participated in developing and administering the tool. |
| **Subjects**<br>**Panel rating: 2** | |
| **Subjects** | Hospital-affiliated longterm care centers in large urban areas in France (n=3)<br>Subjects: 340 NVC-OP recruited at random<br><br>Average age: >65 years old (mean 79.4, SD 7.4)<br>Gender: 67% female<br>Cognitive impairment: Each subject was declared cognitively or linguistically impaired according to the independent opinion of his or her attending physician and at least one nurse after a 10-day observation period.<br>Pain: Patients were suspected to be in pain by their caregivers: most frequent |

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| | painful syndromes were cancer and bedsores, patients had an average of 2.1 pain syndromes.<br>Raters: In each center, 4 doctors were randomly paired with 4 nurses; these pairs were independent from staff involved in the development and testing of the tool and had >9 yrs experience in pain assessment in NVC-OP. Caregivers were not specially trained in pain assessment but familiar with patients' baseline behaviors and received 2 hours of teaching in use of the tool, followed by 5 return demonstrations assessing NVC-OPs with supervision. |
| ***-Panel Commentary*** | The sample population is appropriate in gender and age distribution and presents with mostly advanced persistent pain due to bedsores and/or cancer. There is no standardized assessment of cognitive impairment; non-verbal status may have been due to psychiatric status or sensory limitation. Random recruitment and large sample size contribute to the reliability of findings.<br>More testing is needed with diverse populations and US practice settings. |
| **Administration, Scoring, Feasibility**<br>**Panel rating: 1** | |
| **Administration, Scoring, Feasibility** | A pilot study with 18 raters and 39 patients showed average observation times of 4.8 minutes at rest, 5.2 during interventions and 5 minutes needed to fill out the scale.<br>In order to use the EPCA-2 the observer must be familiar with the patient and his usual behavior. A manual explaining the rating of each item and precautions for using the EPCA2 in day-to-day practice is available from the authors. The scale was translated into English and then back-translated by two independent translators for publication purposes. |
| ***-Panel Commentary*** | Method of administration and scoring procedures for the EPCA-2 are clearly described. There is no recommendation for cut-off points; given the atypical study setting, these may have to be determined for American longterm care settings depending on practice patterns and patient acuity. Use of the tool requires two separate 5-minute observation periods and an additional 5 minutes to fill out the form. This may limit its clinical utility on a daily basis. Training time for proper use of the EPCA-2 was not reported but was reportedly easily incorporated in clinical practice. |
| **Reliability**<br>**Panel rating: 2** | |
| **Internal consistency** | Cronbach's $\alpha$ for EPCA-2 as global scale $\alpha$=0.79.<br>Subscale at rest $\alpha$=0.73 and subscale with caregiving $\alpha$=0.75. |
| **Interrater reliability** | Interrater reliability was established via intra-class coefficient (ICC) and its 95% confidence interval between 18 raters, rating 340 subjects in randomly assigned pairs:<br>total inter-rater reliability ICC = 0.877 (n = 340)<br>doctor-doctor ICC = 0.869 (n=56)<br>caregiver-caregiver ICC = 0.864 (n=55)<br>nurse-nurse ICC = 0.897 (n=63)<br>doctor-caregiver ICC= 0.857 (n=55)<br>doctor-nurse ICC = 0.852 (n=55)<br>nurse-caregiver ICC = 0.922 (n=56) |
| **Test-retest reliability** | Not reported |
| ***-Panel commentary*** | Initial reliability tests for this new tool are favorable. Internal consistency was established for the global scale and for each subscale separately. All Cronbach's $\alpha$ were well within the recommended range for group comparison. Interrater reliability calculated with intra-class correlation coefficient ICC at the 95% confidence interval was very good, ranking close |

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| | to +1 with range 0.85-0.92 for all groups of raters.<br>These findings should be replicated in similar and diverse settings and populations. |
| **Validity: Criterion or construct**<br>**Panel rating: 2** | |
| **Construct validity/ Criterion validity** | Convergent validity was calculated in 2 separate steps. EPCA scores assigned by raters (see subjects section) were correlated with (1) a global clinical pain score (GCS), and (2) the analgesic prescription resulting from the primary physician's assessment of the subject.<br>1. After a 7-day observation period, chart review and interviews with caregivers, two highly experienced observers allocated a GCS score between 0 (no pain) and 10 (extremely intense pain) to each patient in two independent simultaneous 10-minute observations (one at rest and one with caregiving). After comparison and discussion the 2 raters then agreed on a joint GCS for each subject's pain intensity.<br>2. A third rater randomly selected from all available personnel received the same training and rated each subject independently using the EPCA.<br>3. The subject's physician performed the usual assessment and treatment for pain (proxy report, physical examination and analgesic intervention if deemed appropriate).<br><br>Results are given for the total group and three treatment sub-groups.<br>(1) correlation between EPCA-2 score and GCS at baseline:<br>total (n=340) r =0.846<br>opioid (n=112) r = 0.782<br>non-opioid (n=171) r = 0.730<br>no analgesics (n=57) r = 0.634<br>(2) correlation between EPCA-2 and dose of opiods prescribed r = 0.698.<br><br>The authors argue that the rigor of repeated observations using both the EPCA and GCS, as well as current practice of analgesics prescription make for the best description of pain behaviors possible and therefore substitute for an absent gold standard.<br><br>Baseline mean EPCA-2 scores in the opioid subgroup (17.65) were significantly higher than the non-opioid subgroup (13.35), which in turn was significantly higher than the subgroup which received no analgesics (7.86). ($p < 0.0001$). This demonstrates good discriminant validity of the tool.<br><br>Responsiveness of the tool was tested in the following manner: 283 subjects who received analgesics (a first time) were observed again 48 hours later by the same observers.<br>• Change in EPCA-2 score with change in GCS for all treated patients (n=283): r = 0.653 [0.580; 0.715]<br>Change in EPCA-2 score with change in GCS for opioid subgroup (n=112): r = 0.567 [0.426; 0.681]<br>Change in EPCA-2 score with change in GCS for non-opioid subgroup (n=171): r = 0.707 [0.623; 0.775]<br>• Change in EPCA2 scores was correlated with change in opioid dose r = 0.619 [0.490; 0.722] for those in the opioid subgroup who had been on opioids prior to the study and received an altered dose during the study.<br>• Effect sizes (ES) and standardized response mean (SRM) for EPCA-2 and GCS respectively were:<br>In all patients treated: EPCA2 ES=1.284, SRM=1.160; GCS ES=1.466, SRM=1.239. |

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| | In opioid subjects: EPCA-2 ES=1.479, SRM=1.620; GCS ES=1.447, SRM=1.239.<br>In non-opioid subjects: EPCA2 ES=1.392, SRM=.950; GCS ES=1.566, SRM=1.103.<br>• In the opioid subgroup: for opioid dose prescribed ES=0.369; SRM=1.164.<br><br>Divergent validity was confirmed with the non-correlation between EPCA-2 score and age r = 0.020<br><br>Factor analysis performed on scales from 340 subjects via principal component analysis and varimax rotation led to the retention of components with eigenvalues >1. 4. Components each loaded on the 2 hypothesized factors of pain at rest and pain with caregiving and explained 56% of the variation in EPCA-2 scores. |
| ***-Panel commentary*** | Tool developers bring strong evidence for good convergent and discriminant validity and responsiveness of the EPCA-2. Factor analysis confirmed the 2 factors of rest and caregiving pain and explained 56% of the variation in EPCA scores.<br>It remains to be considered if the rule of analgesic use as gold standard for physician proxy report is dependent on local practice patterns and reflects the tool's inherent bias towards a large urban high acuity skilled care facility. Repeat measures of these validity findings in similar and diverse settings will strengthen the EPCA-2 for use in selected patient populations. |
| **Summary of panel evaluation of pain assessment tool** | |
| The EPCA-2 was developed using standard methods of item generation and conceptual validation. Tool evaluation was conducted in France on subjects with appropriate age and gender distribution but no diversity and no standardized assessment of cognitive impairment. Preliminary internal and interrater reliabilities are moderate-strong. There was high convergent and discriminant validity and strong responsiveness of the tool to treatment in preliminary testing. The tool does require some training and time for proper administration and has not been validated in English-speaking sample populations. This may limit its clinical utility in the US. Current psychometrics support the need for further evaluation in similar and diverse settings. | |

## Source of evidence

Morello, R., Jean, A., Alix, M., Sellin-Peres, D., & Fermanian, J. (2007). A scale to measure pain in non-verbally communicating older patients: The EPCA-2 study of its psychometric properties. *Pain, 133*(1-3), 87-98.

## .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

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