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Reliability study in five languages of the translation of the pain behavioural scale Doloplus®

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ABSTRACT

Non-verbal pain assessment scales are useful tools for pain evaluation in persons with communication disorders and moderate–severe dementia. The Doloplus® was one of the first scales to be developed and validated as a pain assessment tool in older adults with dementia. This study aims at evaluating the translation of the Doloplus® scale in five languages, as regards test–retest and inter-rater reliability. Results show that both tests are good or excellent for the English, Italian, Portuguese and Spanish versions and moderate for the Dutch version. These results bring a unique opportunity to include the translated Doloplus® scale in daily assessment of elderly persons with communication disorders, and future studies should focus on enriching the validation of the scale in each language.

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1. Introduction

Persistent pain is recognised as a very common problem in long-term aged care facilities, affecting up to 80% of residents (Roy, 1986; Parmelee et al., 1993; Gibson and Helme, 2000). Undetected or under-treated pain can have serious adverse effects on frail older adults including poorer cognitive performance, reduced quality of life, increased depression and functional disability (Gibson, 2007; Leong et al., 2007; Scherder et al., 2008). In the adult population, the group at most risk of undetected pain and poor pain manage-

ment are frail older persons with communication problems, and particularly those with dementia (Pickering et al., 2000; Marzinski, 1991). There is mounting evidence to show that older adults with dementia receive less analgesic medication than cognitively intact adults, despite the presence of similar levels of disease or injury (Scherder and Bouma, 1997; Horgas and Tsai, 1998; Pickering et al., 2006; Gibson, 2007). The identification and treatment of pain depends on appropriate pain assessment and this is often a very difficult task in those with dementia. Self-report is generally recognised as the de facto gold standard for pain assessment, but verbal communication skills are often lost or compromised in those with moderate–severe dementia. Non-verbal pain assessment methods provide an alternative strategy, and may be the preferred assessment choice in cases of moderate–severe dementia (Hadjistavropoulos et al., 2007). Recent reviews of the literature catalogue more than 20 observer-rated behavioural pain assessment tools that have

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been developed for specific use in older persons with dementia. A few of the most researched alternate measures are: Abbey Pain Scale (Abbey et al., 2004), Checklist of Non-verbal Pain Indicators (Feldt, 2000), Discomfort in Dementia of the Alzheimer's type (Hurley et al., 1992), Non-Communicative Patient's Pain Assessment Instrument (Snow et al., 2004), Pain Assessment Checklist for Seniors with Limited Ability to Communicate (Fuchs-Lacelle and Hadjistavropoulos, 2004), Pain Assessment in the Dementing Elderly (Villanueva et al., 2003), Pain Assessment In Advanced Dementia (Warden et al., 2003) and the Doloplus® (Wary et al., 2001). The French version of the Doloplus® behaviour rating scale was one of the first scales to be developed in older adults with dementia (Wary and Collectif, 1999) and has been validated in a group of 510 residents (Lefevre-Chapiro and Collectif, 2001; Wary et al., 2001). Validation of the French version of the Doloplus® scale included test–retest reliability (Spearman's correlation coefficient is >0.75 on all items of the Doloplus® scale ($r = 0.75\text{--}0.94$), inter-rater reliability ($r = 0.90$), internal consistency (Chronbach's $\alpha = 0.82$) and concurrent validity ($r = 0.65$), when compared with self-rated pain using a visual analog scale among patients who can complete self-report measures (Lefevre-Chapiro and Collectif, 2001; Wary et al., 2001). Considering the need for reliable and valid tools for older persons with moderate–severe cognitive impairment, the aim of the current study was to examine the intra (test–retest) and inter-rater reliability of the translation of the Doloplus® scale into English, Dutch, Italian, Portuguese and Spanish, in a large multicultural sample of older persons with moderate–severe cognitive impairment. See Tables S1–S5, see the online version at doi:10.1016/j.ejpain.2009.08.004.

2. Method

This is a multicentre study of the translated version of the Doloplus® scale in five languages.

2.1. Measures

Doloplus® was used to assess pain: the Doloplus® scale consists of ten items, each scored on 0–3 point scales, five somatic, two psychomotor and three psychosocial items. It takes only about 2–3 min to complete by French teams and has sufficient items to avoid missing idiosyncratic pain expressions that may be specific to pain with cognitive disorders.

Prior to the study Doloplus® was translated. The main difficulty in the translation of scales is indeed to maintain the content equivalence of the original instrument in the translated version and there is no gold standard of translation techniques in international research. The French version of the scale has been translated from French to another language (forward translation) and the reverse (backward translation) (Cull et al., 1998; MOT, 1997). Two independent bilingual health professionals (their mother tongue is the second language) translated independently the questionnaire into their native tongue. A reconciliation meeting was conducted to obtain a consensus version. Then two native French speakers who were blinded to the original version retranslated the new scale into French. The last step of the translation procedure was the pre-testing of the translated instrument using a small sample of elderly persons with communication disorders with a final debriefing summary including all participants.

Besides pain scores, demographic information (e.g. age, gender) was gathered from all the participants and recorded on a case report form. Cognitive status of all residents was evaluated using the Mini Mental State Examination (MMSE) (Folstein et al., 1975). This test ranges from 0 to 30 points and is widely

used to screen for cognitive impairment. Efforts were made to have the MMSE assessment undertaken as close to the pain assessment as possible and while most evaluations were taken in the preceding week, in a few isolated cases the evaluation was up to 3 months old. At the end of the study, the qualitative opinion of the participating physicians concerning the acceptability of the Doloplus® scale was sought with special regard to its ease of use.

2.2. Ethics committee

The protocol was approved by the French Ethics Committee. When required, it was also approved by the local Ethics Committee and informed consent of the patient or surrogate consent was obtained. Informed consent was obtained by a doctor not involved in the pain evaluation. This protocol did not change the normal care of the patients and might even have improved it, as the protocol created a dynamic awareness among the staff to pain assessment in the institution where pain was systematically evaluated.

2.3. Investigators

Nine teams (one for Dutch and two for each of the other languages) have been selected on the basis of their experience and competence in geriatrics and in pain evaluation of elderly patients with communication disorders. Each team tested the scale in their native language with at least 40 elderly persons.

2.4. Patients

Males and females aged 65 or above, with communication disorders, with or without suspected pain, were included. Any change in behaviour (posture and movement, facial expression, prostration, loss of appetite, vocal complaint, psychological and behavioural disturbances) was also an inclusion criteria.

Pain is always a potential cause of behaviour changes and even though pain might not be the most likely cause of behavioural change, it must always be considered as a potential cause in patients with dementia. The enrolment of patients without suspected pain was aimed at overcoming the misdiagnoses of pain in patients affected by dementia.

Excluded from the protocol were: patients who had acute pain needing immediate pharmacological pain management (patient with any major behavioural changes, obvious sign of distress and agitation, or complaining overtly) or who had recent analgesic treatment (within the previous 4 h), or who refused to participate. Finally, we excluded patients when they were agitated and could not be observed quietly for a few minutes by the physicians of the unit in order to have an adequate scoring of the Doloplus® scale. The level of agitation was assessed clinically (interference with and opposition to daily care) and/or by administration of the neuropsychiatric inventory scale (NPI with cut off >40/120).

Withdrawn from the protocol were: any patient who had a change of treatment between the retest evaluations or a change of treatment between the evaluations of both practitioners, any patient who refused to participate after having given informed consent. The decision to initiate analgesics or to administer a rescue dose was essentially based on a clinical evaluation indicative of obvious pain and based on a Doloplus® score >15.

2.5. Procedure

Prior to the start of the study, the teams met in order to discuss the inclusion/exclusion criteria and the methodology. They were

provided with the Doloplus[®] video, instructions for the use of the Doloplus[®] scale, the agreement of the French ethics committee, and the recommendation that only two physicians should be involved per team. An important recommendation was that the physicians should get fully accustomed to, and confident in, the use of the scale before starting the study. Considering the polymorphism of elderly patients, the training consisted of a number of evaluations with the help of the paper and video backups. B. Wary and the collective Doloplus[®] team who have 10 years experience in using the Doloplus[®] scale recommended that before starting the study, the teams should allow themselves a few days to become familiar with the scale, to include it in the clinical routine of the ward, to assess 8–10 elderly patients with communication disorders and to discuss collectively between all raters the Doloplus[®] scores obtained. On the day of the study, pain assessment was implemented during the provision of the usual care in order to integrate it as much as possible to the customary routine of the unit. Selection of the patients took place on the days where both physicians were available and was done after the round by the team of the ward.

At least 40 patients per team were required and were assessed twice by a trained physician (rater 1) at initial contact (t0) and again 4 h later (t4) without any treatment in between, and the same patient was assessed once by a second physician at t0 (rater 2). Observations were timed to avoid potentially painful experiences, such as movement or invasive nursing care.

During the study, each physician assessed the patients by observing them for a few minutes prior to scoring the Doloplus[®] scale. The raters were blind to each other's ratings and undertook the observation and completion of the Doloplus[®] scale in a sequential fashion. There was no discussion between the raters about the scores they obtained and no access to each others scores nor to their own previous score in the case of retest assessments (for rater 1). The assessment is easier and quicker if the investigator is familiar with the patient, especially concerning facial expressions and body movement; all physicians were familiar with the patient in our study and provided daily medical care. The test took an average of 5 min per patient to be performed. The study protocol did not disrupt nor change the normal care of the patients.

3. Data analysis

In each language, data collected with the scale administered by the same physician, on two occasions at 4 h intervals (t0 and t4) were used to explore the test–retest reliability. A 4-h interval was chosen because it is the usual interval of time for pain assessment in clinical practice. In our study, the Doloplus[®] scale scores at t0 were compared with their t4 scores using Student *t*-test.

In each language, the data collected independently by two trained physicians (raters 1 and 2) were compared using Student *t*-test. Kappa statistics (Landis and Koch, 1977) were calculated for each item of the Doloplus[®] scale. Kappa coefficient is a statistical measure of inter-rater reliability. It is generally thought to be a more robust measure than simple percent agreement calculation. A Kappa value higher than 0.81 typically indicates excellent inter-rater reliability, between 0.61 and 0.80 the test is good and between 0.41 and 0.60 it is moderate. Test–retest and inter-rater reliabilities were evaluated with the Pearson and the Intra-class correlation coefficients: coefficients above 0.75 are considered as good to excellent.

Differences between the settings concerning missing data and withdrawals have been compared with Chi square.

We chose a *per protocol* analysis rather than an intention-to-treat (ITT) analysis of the data in order to obtain a reliable validation of the translation with only complete case report forms.

4. Results

4.1. Completion of the scales

The nine teams recruited at least 40 patients each. In each of the eight teams, two physicians took all the training assessments with about eight patients. In the Dutch team, four physicians used the scale with about two patients as a pilot training exercise. In all teams, the same physicians undertook all the evaluations of the study thereafter. The assessment scales were completed in 406 patients, but due to missing data or patients being excluded because of an implemented treatment in the course of the study, statistics were undertaken on the complete data of 342 patients.

Data from the 64 patients that were excluded from the study comprised: 10 patients were excluded because of severe agitation assessed clinically and through Neuro Psychiatric Inventory, 16 patients needed a treatment for acute pain and were withdrawn from the evaluation and data were not fully completed or missing in 38 subjects (9% of our population). Several files per team were not analysed, mainly because one out of the 40 items had not been filled in properly or there was a missing date of birth or MMSE score. Looking for the report of missing data in the literature on scales validation the rate of missing data is not always indicated. In CNPI scale validation, Feldt, 2000; report 8% missing data, a rate quite comparable to ours. There were no significant differences between the settings concerning missing data and withdrawals (*p* value = 0.996).

No patient refused to consent to participate.

4.2. Demographical data

Seventy percentage women and 30% men (16% single, 25% married, 3% divorced and 56% widowed), aged 82 ± 2 years old were included by nine teams in five languages across six countries; Australia, Canada, Italy, Portugal, Spain and The Netherlands. Demographical data are presented in Table 1 for each of the five languages and detail the institution where the patient lives, his/her handicap (incapacity), age, gender and marital status. MMSE (\pm SD) ranged from 0 to 12 for all patients: 2(4) for Dutch, 12(10) for English, 12(5) for Italian, 4(7) for Portuguese and 8(9) for Spanish settings.

Table 1
Demographical data.

Language	Dutch	English	Italian	Portuguese	Spanish
<i>Number of residents</i>	40	90	88	57	67
<i>Institution (%)</i>					
Nursing home	100	52	84	65	0
Long-term care setting	0	44	0	0	78
Rehabilitation	0	0	13	0	21
Home dwelling	0	0	0	2	0
Acute care	0	3	0	0	0
Other	0	1	3	33	1
<i>Incapacity (%)</i>					
Dementia	100	81	45	44	57
Aphasia	0	2	37	2	18
Behavioural disorders	0	1	18	26	13
Other	0	16	0	28	12
<i>Age in years (SD)</i>	80 (6.9)	84 (7.8)	81 (7.7)	84 (8.4)	82 (10)
<i>Male n (%)</i>	7 (17.5)	30 (33)	27 (45)	9 (16)	26 (39)
<i>Marital status (%)</i>					
Single	3	8	19	32	19
Married	25	36	22	24	28
Divorced	5	2	5	0	3
Widowed	67	54	54	44	50

Table 2
(A) Test–retest and inter-rater correlations of pain scores. (B) Kappa analysis of the items of the Doloplus scale.

Language	Dutch	English	Italian	Portuguese	Spanish
(A) Pain score					
<i>Mean total score (SD)</i>					
Rater 1	5.4 (4.4)	8.3 (6.0)	12.7 (6.5)	6.1 (7.0)	6.0 (4.9)
Rater 2	4.1 (3.8)	8.8 (6.5)	12.7 (6.8)	6.2 (7.0)	6.3 (4.6)
Retest rater 1	4.9 (4.4)	7.9 (6.0)	12.7 (6.7)	6.0 (7.0)	6.0 (4.9)
<i>Pearson correlation coefficient</i>					
Inter-rater	0.75	0.94	0.97	0.97	0.92
Test/retest	0.57	0.95	0.98	0.99	0.96
<i>Intra-class correlation coefficient</i>					
Inter-rater	0.75	0.89	0.97	0.95	0.84
Test/retest	0.62	0.83	0.98	0.95	0.83
(B) Kappa analysis of the Doloplus scale (Kappa values)					
<i>Somatic reactions</i>					
Somatic complaints	0.19	0.67	0.81	0.66	0.62
Protective posture	0.31	0.51	0.96	0.75	0.87
Protection of sore areas	0.35	0.56	0.95	0.68	0.59
Expression	0.4	0.62	0.91	0.82	0.53
Sleep patterns	1	0.84	0.79	0.68	0.58
<i>Psychomotor reactions</i>					
Activities of daily living	0.56	0.79	0.84	0.82	0.47
Mobility	0.5	0.75	0.93	0.72	0.61
<i>Psychosocial reactions</i>					
Communication	0.47	0.68	0.85	0.75	0.85
Social life	0.43	0.62	0.96	0.65	0.59
Problems of behaviour	0.25	0.59	0.92	0.81	0.55

4.3. Pain scores comparison

Mean total pain scores obtained with the Doloplus® scale by raters 1 and 2, and correlations across languages are presented in Table 2. Pearson and intra-class correlation coefficients show very good to excellent results for four languages, English, Italian, Portuguese and Spanish: the Pearson correlation coefficient ranges from 0.95 to 0.99 for test–retest reliability and from 0.92 to 0.97 for inter-rater reliability; the intra-class correlation coefficient ranges from 0.83 to 0.98 for test–retest reliability and from 0.84 to 0.97 for inter-rater reliability. Dutch correlations are fair to moderate, inter-rater reliability is 0.75 and test–retest reliability is 0.57 (Pearson) or 0.62 (intra-class).

4.4. Kappa correlation of the scales across languages

Results obtained for somatic, psychomotor and psychosocial reactions, a total of 10 items, have been correlated across languages using the Kappa test. Kappa value for each of the 10 items ranges from 0.51 to 0.84 for the English scale, 0.79–0.96 for the Italian scale, 0.65–0.82 for the Portuguese scale, and 0.47–0.85 for the Spanish scale. For these languages, somatic reactions (including somatic complaints, protective posture, protection of sore areas, expression and sleep patterns) range from 0.51 to 0.96; psychomotor reactions (including activities of daily living and mobility) range from 0.47 to 0.93; psychosocial reactions (including communication, social life and problems of behaviour) range from 0.55 to 0.96.

Concerning the Dutch scale, there is a large heterogeneity of results ranging from 0.19 to 1. All of the participating physicians considered the scale to be easy to use once they were familiar with it.

5. Discussion

The aim of the present study was to validate the translation of the Doloplus® scale in five languages, with regard to test–retest

and inter-rater reliability. Results show that reliability tests and correlations are good or excellent for the English, Italian, Portuguese and Spanish versions, while the reliability correlations are fair to moderate but more heterogeneous for the Dutch scale. There are indeed discrepancies in the kappa values of the different items of the scale between the Dutch and the other language scales and a number of factors may have contributed to this discrepancy. It is very unlikely that the findings are linked to the translation itself as all five translations have been similarly carried out using the same method. The participation of only one team and training being performed on a lesser number of residents may be potential factors. Another reason might be linked to differences in the samples under study within each language group, but our sample is too small to relate the findings to the specific type of institution, the level of incapacity, the severity of cognitive impairment or cultural impacts on facial or body expression of pain. Although we should be careful with the interpretation of the results of Table 2, the lowest kappa values were obtained when the total scores were lowest. Hence the Italian scale demonstrates highest mean pain scores with highest kappa values, while the Dutch sample had the lowest total score and lowest kappa values. This would suggest that the Doloplus® scale might display better reliability in cases where pain is present and a lower inter-rater agreement with lower pain scores or with more severe dementia. This novel finding needs to be addressed in a larger, more heterogeneous sample as the current results are limited to raters who are familiar with their patients and limited to participants who are not agitated and do not have severe acute pain. Increasing the size of the sample in future studies would help remove these concerns and strengthen the widespread use of Doloplus®. Also, this scale has never been validated in agitated patients and the study of Doloplus® in this population would be an important topic for further research.

There are important issues requiring further investigation in the near future. First, sensitivity of the scales must be studied with respect to the identification of pain in each language. Specificity of each scale in differentiating pain from other types of emotion or distress must also be sought, as well as internal consistency and

congruency. Socio-cultural factors should be considered and this applies especially to Latin American Spanish and Portuguese populations, although potential linguistic adaptations of the Doloplus® scale appear to be minor. Several projects in Anglo-Saxon and American English or South American Spanish and Portuguese languages are in preparation for these adaptations of the scale and other reliability studies are being completed, including, German, Chinese, Japanese, Arabic and Czech.

Although the participating physicians considered the scale to be easy to use once familiar with the tool, their opinion should be sought with a standardized evaluation in future studies. The opinion of nurses, physical therapists, psychologists and more generally of health care professionals taking care of elderly patients with dementia and communication disorders will also be important to collect. Indeed Doloplus® has been rated by Dutch nurses as being the least useful of the scales when examined in a comparative study (Zwakhaleh et al., 2006), while in France, the Doloplus® scale is now included in the Ministry of Health official guidelines for pain evaluation of persons with communication disorders and dementia (called Mobiquil®). Indeed, it is present in the package for pain evaluation in the elderly that is distributed to health care professionals of all nursing homes to raise awareness of the need for systematic pain evaluation especially when communication disorders are present.

The reliability testing of the English, Italian, Portuguese and Spanish translations of the Doloplus® scale allows a unique opportunity to include this scale in the daily pain assessment and in studies concerning elderly persons with communication disorders. Compared to other scales, the strong psychometric properties of the Doloplus® have already been acknowledged and it has been recommended as the preferred choice among the scales that are currently available. Herr et al. (2006) describe the Doloplus® as “comprehensive, covering five of the six behaviour categories proposed by the American Geriatrics Society”. The scale was also considered to be clear, requiring a short time to be administered but was lacking validation in languages other than French. In a recent study (Zwakhaleh et al., 2006), similar issues were recognized, namely, satisfactory stability on retest, good correlation with visual analog scale test, good levels of internal consistency. A commonly recognized pitfall has always been the lack of adequate information on parameters of validity like inter-rater and test-retest reliability, in languages other than French. Finally, the Doloplus® scale is cited, but not thoroughly examined, by the (Stolee et al., 2007) review because reliability and validity data are missing.

Our study provides evidence that the Doloplus® scale is a reliable and easy to use instrument but the validity of the scale must be assessed in larger samples in order to undertake a full construct validation in each language. Furthermore, the follow-up of a larger sample would add greater confidence in the psychometric properties of the behavioural pain assessment scales in each language. Future studies should also focus on improving the scale in each language, in order to optimize pain evaluation in the population of elderly persons with communication disorders, since these scales are intended for use in this highly dependent and vulnerable group.

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Table S1
English version of the Doloplus2® scale.

<h2 style="margin: 0;">DOLOPLUS-2 SCALE</h2> <p style="margin: 0;">BEHAVIOURAL PAIN ASSESSMENT IN THE ELDERLY</p>					
NAME :		Christian name :		DATES	
Unit :					
Behavioural records					
SOMATIC REACTIONS					
1• Somatic complaints	• no complaint	0	0	0	0
	• complaints expressed upon inquiry only	1	1	1	1
	• occasional involuntary complaints	2	2	2	2
	• continuous involuntary complaints	3	3	3	3
2• Protective body postures adopted at rest	• no protective body posture	0	0	0	0
	• the patient occasionally avoids certain postures	1	1	1	1
	• protective postures continuously and effectively sought	2	2	2	2
	• protective postures continuously sought, without success	3	3	3	3
3• Protection of sore areas	• no protective action taken	0	0	0	0
	• protective actions attempted without interfering against any investigation or nursing	1	1	1	1
	• protective actions against any investigations and nursing	2	2	2	2
	• protective actions taken at rest, even when not approached	3	3	3	3
4• Expression	• usual expression	0	0	0	0
	• expression showing pain when approached	1	1	1	1
	• expression showing pain even without being approached	2	2	2	2
	• permanent and unusually blank look (voiceless, staring, looking blank)	3	3	3	3
5• Sleep pattern	• normal sleep	0	0	0	0
	• difficult to go to sleep	1	1	1	1
	• frequent waking (restlessness)	2	2	2	2
	• insomnia affecting waking times	3	3	3	3
PSYCHOMOTOR REACTIONS					
6• Activities of daily living (washing &/or dressing)	• usual abilities unaffected	0	0	0	0
	• usual abilities slightly affected (careful but thorough)	1	1	1	1
	• usual abilities highly impaired, washing &/or dressing is laborious and incomplete	2	2	2	2
	• washing &/or dressing rendered impossible as the patient resists any attempt	3	3	3	3
7• Mobility	• usual abilities & activities remain unaffected	0	0	0	0
	• usual activities are reduced (the patient avoids certain movements and reduces his/her walking distance)	1	1	1	1
	• usual activities and abilities reduced (even with help, the patient cuts down on his/her movements)	2	2	2	2
	• any movement is impossible, the patient resists all persuasion	3	3	3	3
PSYCHOSOCIAL REACTIONS					
8• Communication	• unchanged	0	0	0	0
	• heightened (the patient demands attention in an unusual manner)	1	1	1	1
	• lessened (the patient cuts him/herself off)	2	2	2	2
	• absence or refusal of any form of communication	3	3	3	3
9• Social life	• participates normally in every activity (meals, entertainment, therapy workshops)	0	0	0	0
	• participates in activities when asked to do so only	1	1	1	1
	• sometimes refuses to participate in any activity	2	2	2	2
	• refuses to participate in anything	3	3	3	3
10• Problems of behaviour	• normal behaviour	0	0	0	0
	• problems of repetitive reactive behaviour	1	1	1	1
	• problems of permanent reactive behaviour	2	2	2	2
	• permanent behaviour problems (without any external stimulus)	3	3	3	3
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Table S2
Dutch version of the Doloplus2® scale.

<h2 style="margin: 0;">DOLOPLUS SCHAAL-2</h2> <p style="margin: 0;">GEDRAGSMATIGE PIJNBEOORDELING BIJ OUDEREN</p>					
NAAM :		Voornaam :		DATUM	
Afdeling :					
LICHAMELIJKE REACTIES					
1 Lichamelijke klachten	• Geen klachten	0	0	0	0
	• Klachten alleen bij navraag	1	1	1	1
	• Spontane klachten die af en toe voorkomen	2	2	2	2
	• Spontane klachten die voortdurend aanhouden	3	3	3	3
2 Pijnvermijdend lichaamshouding in rust	• Geen pijnvermijdende lichaamshouding	0	0	0	0
	• Patiënt vermijdt af en toe bepaalde lichaamshoudingen	1	1	1	1
	• Permanente doeltreffende pijnvermijdende lichaamshouding	2	2	2	2
	• Permanente niet doeltreffende pijnvermijdende lichaamshouding	3	3	3	3
3 Afscherming van pijnlijke plaatsen	• Geen afscherming	0	0	0	0
	• Afscherming bij toenadering, zonder dat voortzetting van het onderzoek of verzorging wordt belemmerd	1	1	1	1
	• Afscherming bij toenadering met belemmering van het onderzoek of verzorging	2	2	2	2
	• Afscherming in rust, ook wanneer er geen toenadering plaats vindt	3	3	3	3
4 Gelaatsuitdrukking	• Normale gelaatsuitdrukking	0	0	0	0
	• Pijnlijke gelaatsuitdrukking bij toenadering	1	1	1	1
	• Pijnlijke gelaatsuitdrukking ook zonder toenadering	2	2	2	2
	• Voortdurend ongebruikelijke uitdrukkingloze gelaatsuitdrukking (stil, verward, lege blik)	3	3	3	3
5 Slaappatroon	• Normaal slaappatroon	0	0	0	0
	• Problemen met inslapen	1	1	1	1
	• Vaak wakker worden (onrust)	2	2	2	2
	• Slapeloosheid met als gevolg slaperigheid overdag	3	3	3	3
PSYCHOMOTORISCHE REACTIES					
6 Verzorgen en aankleden	• Geen verandering in gebruikelijke mogelijkheden	0	0	0	0
	• Gebruikelijke mogelijkheden zijn beperkt (verzorgen en/of aankleden is moeilijk maar wel volledig mogelijk)	1	1	1	1
	• Gebruikelijke mogelijkheden zijn zeer beperkt, verzorgen en/of aankleden is moeilijk en maar gedeeltelijk mogelijk	2	2	2	2
	• Verzorgen en/of aankleden is onmogelijk, de patiënt verzet zich bij elke poging	3	3	3	3
7 Bewegingen	• Geen verandering in gebruikelijke mogelijkheden	0	0	0	0
	• Gebruikelijke actieve mogelijkheden zijn beperkt (patiënt vermijdt bepaalde bewegingen en vermindert loopstanden)	1	1	1	1
	• Gebruikelijke actieve en passieve mogelijkheden zijn beperkt (zelfs met hulp vermindert de patiënt zijn bewegingen)	2	2	2	2
	• Iedere beweging onmogelijk, verzet zich tegen elke poging tot mobilisatie	3	3	3	3
PSYCHOSOCIALE REACTIES					
8 Communicatie	• Onveranderd	0	0	0	0
	• Toegenomen (de patiënt trekt de aandacht op een ongebruikelijke manier)	1	1	1	1
	• Verminderd (de patiënt isoleert zich, zondert zich af)	2	2	2	2
	• Afwezigheid van of weigering van elke vorm van communicatie	3	3	3	3
9 Sociale activiteiten	• Gebruikelijke deelname aan verschillende activiteiten (maaltijden, ontspanning, therapeutische activiteiten, etc.)	0	0	0	0
	• Deelname aan verschillende activiteiten alleen als men erom vraagt	1	1	1	1
	• Gedeeltelijke weigering om aan verschillende activiteiten deel te nemen	2	2	2	2
	• Alle sociale contacten worden geweigerd	3	3	3	3
10 Gedragsproblemen	• Normaal gedrag	0	0	0	0
	• Herhaalde gedragsproblemen bij toenadering	1	1	1	1
	• Permanente gedragsproblemen bij toenadering	2	2	2	2
	• Permanente gedragsproblemen (zonder aanleiding/ externe stimulus)	3	3	3	3
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Table S3
Italian version of the Doloplus2® scale.

		GIORNI			
NOME COGNOME :					
Servizio :					
Osservazione Comportamentale					
RIPERCUSSIONI SOMATICHE					
1• Lamentele (pianti, gemiti)	• assenza di lamentele	0	0	0	0
	• lamentele solo in caso di sollecitazione	1	1	1	1
	• lamentele spontanee occasionali	2	2	2	2
	• lamenti spontanee continue	3	3	3	3
2• Posizioni antalgiche a riposo	• assenza di posizione antalgica	0	0	0	0
	• il soggetto evita alcune posizioni in modo occasionale	1	1	1	1
	• posizione antalgica permanente e efficace	2	2	2	2
	• posizione antalgica permanente e inefficace	3	3	3	3
3• Protezione di zone dolenti	• assenza di protezione	0	0	0	0
	• protezione dopo sollecitazione senza ostacolare il proseguimento dell'esame o delle cure	1	1	1	1
	• protezione dopo sollecitazione impedendo ogni esame o cura	2	2	2	2
	• protezione a riposo, in assenza di sollecitazione	3	3	3	3
4• Mimica	• mimica abituale	0	0	0	0
	• mimica che sembra esprimere dolore sotto sollecitazione	1	1	1	1
	• mimica che sembra esprimere dolore in assenza di ogni sollecitazione	2	2	2	2
	• mimica inespessiva continua e non abituale (attonita, fissa, sguardo nel vuoto)	3	3	3	3
5• Sonno	• sonno abituale	0	0	0	0
	• difficoltà di addormentamento	1	1	1	1
	• risvegli frequenti	2	2	2	2
	• insonnia con ripercussione sulla fase di veglia	3	3	3	3
RIPERCUSSIONI PSICOMOTORIE					
6• Toilette e/o vestirsi	• abilità consuete invariate	0	0	0	0
	• abilità consuete lievemente ridotte (attività possibile usando cautela)	1	1	1	1
	• abilità consuete molto diminuite, toilette e/o vestirsi difficili e incomplete	2	2	2	2
	• toilette e/o vestirsi impossibili (paziente oppositivo ad ogni tentativo)	3	3	3	3
7• Movimenti	• abilità e attività consuete invariate	0	0	0	0
	• attività consuete lievemente ridotte (il malato evita alcuni movimenti, diminuisce la sua abituale lunghezza di deambulazione)	1	1	1	1
	• abilità e attività consuete limitate (anche se aiutato, il malato diminuisce i propri movimenti)	2	2	2	2
	• ogni movimento impossibile, ogni tentativo di mobilitazione provoca un'opposizione	3	3	3	3
RIPERCUSSIONI PSICOSOCIALI					
8• Comunicazione	• invariata	0	0	0	0
	• aumentata (la persona attira l'attenzione in modo insolito)	1	1	1	1
	• diminuita (la persona tende a isolarsi)	2	2	2	2
	• assenza o rifiuto di qualsiasi forma di comunicazione	3	3	3	3
9• Vita sociale	• partecipazione abituale a diverse attività (pasti, animazione, laboratori terapeutici)	0	0	0	0
	• partecipazione a diverse attività solo se sollecitato	1	1	1	1
	• rifiuto parziale di partecipazione alle diverse attività	2	2	2	2
	• rifiuto assoluto di partecipare a qualsiasi attività	3	3	3	3
10• Disturbi del comportamento	• comportamento abituale	0	0	0	0
	• disturbi iterativi del comportamento se sollecitato	1	1	1	1
	• disturbi continui del comportamento dopo sollecitazione	2	2	2	2
	• disturbi del comportamento continui (in assenza di ogni sollecitazione)	3	3	3	3
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Table S4
Portuguese version of the Doloplus2® scale.

<h2 style="margin: 0;">ESCALA DOLOPLUS</h2> <p style="margin: 0;">AVALIAÇÃO COMPORTAMENTAL DA DOR NA PESSOA IDOSA</p>							
APELIDO :		Nome próprio :		DATAS			
Serviço :							
Observação comportamental							
REPERCUSSÃO SOMÁTICA							
1• Queixas somáticas	• ausência de queixas	0	0	0	0		
	• queixas apenas quando há solicitação	1	1	1	1		
	• queixas espontâneas ocasionais	2	2	2	2		
	• queixas espontâneas contínuas	3	3	3	3		
2• Posições antálgicas em repouso	• ausência de posição antálgica	0	0	0	0		
	• o indivíduo evita certas posições de forma ocasional	1	1	1	1		
	• posição antálgica permanente e eficaz	2	2	2	2		
	• posição antálgica permanente ineficaz	3	3	3	3		
3• Protecção de zonas dolorosas	• Ausência de protecção	0	0	0	0		
	• protecção quando há solicitação, não impedindo o prosseguimento do exame ou dos cuidados	1	1	1	1		
	• protecção quando há solicitação, impedindo qualquer exame ou cuidados	2	2	2	2		
	• protecção em repouso, na ausência de qualquer solicitação	3	3	3	3		
4• Expressão facial	• mímica habitual	0	0	0	0		
	• mímica que parece exprimir dor quando há solicitação	1	1	1	1		
	• mímica que parece exprimir dor na ausência de qualquer solicitação	2	2	2	2		
	• mímica inexpressiva em permanência e de forma não habitual (átone, rígida, olhar vazio)	3	3	3	3		
5• Sono	• sono habitual	0	0	0	0		
	• dificuldade em adormecer	1	1	1	1		
	• despertar frequente (agitação motora)	2	2	2	2		
	• insónia com repercussão nas fases de despertar	3	3	3	3		
REPERCUSSÃO PSICOMOTORA							
6• Higiene e/ou vestir	• capacidades habituais conservadas	0	0	0	0		
	• capacidades habituais pouco diminuídas (com precaução mas completas)	1	1	1	1		
	• capacidades habituais muito diminuídas, higiene e/ou vestir difíceis e parciais	2	2	2	2		
	• higiene e/ou vestir impossíveis; o doente exprime a sua oposição a qualquer tentativa	3	3	3	3		
7• Movimento	• capacidades habituais conservadas	0	0	0	0		
	• capacidades habituais activas limitadas (o doente evita certos movimentos, diminui o seu perímetro de marcha)	1	1	1	1		
	• capacidades habituais activas e passivas limitadas (mesmo ajudado, o doente diminui os seus movimentos)	2	2	2	2		
	• Movimento impossível; qualquer mobilização suscita oposição	3	3	3	3		
REPERCUSSÃO PSICO-SOCIAL							
8• Comunicação	• Sem alterações	0	0	0	0		
	• intensificada (o indivíduo chama a atenção de modo não habitual)	1	1	1	1		
	• diminuída (o indivíduo isola-se)	2	2	2	2		
	• ausência ou recusa de qualquer comunicação	3	3	3	3		
9• Vida social	• participação habitual nas diferentes actividades (refeições, actividades recreativas, ateliers terapêuticos,...)	0	0	0	0		
	• participação nas diferentes actividades apenas quando há solicitação	1	1	1	1		
	• recusa parcial de participação nas diferentes actividades	2	2	2	2		
	• recusa de qualquer tipo de vida social	3	3	3	3		
10• Alterações do comportamento	• comportamento habitual	0	0	0	0		
	• alterações do comportamento quando há solicitação e repetidas	1	1	1	1		
	• alterações do comportamento quando há solicitação e permanentes	2	2	2	2		
	• alterações do comportamento permanentes (sem qualquer solicitação)	3	3	3	3		
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Table S5
Spanish version of the Doloplus2® scale.

<h2 style="margin: 0;">ESCALA DOLOPLUS</h2> <p style="margin: 0;">VALORACIÓN DEL DOLOR MEDIANTE EL COMPORTAMIENTO EN LAS PERSONAS MAYORES</p>							
APELLIDO :		Nombre :		FECHAS			
Servicio :							
Observación del comportamiento							
REACCIONES SOMÁTICAS							
1• Quejas somáticas	• ninguna queja	0	0	0	0		
	• quejas únicamente ante el estímulo	1	1	1	1		
	• quejas espontáneas ocasionales	2	2	2	2		
	• quejas espontáneas continuas	3	3	3	3		
2• Posiciones antálgicas en reposo	• ninguna posición antálgica	0	0	0	0		
	• el sujeto evita ciertas posiciones ocasionalmente	1	1	1	1		
	• posición antálgica permanente y eficaz	2	2	2	2		
	• posición antálgica permanente ineficaz	3	3	3	3		
3• Protección de las zonas dolorosas	• ninguna protección	0	0	0	0		
	• protección ante el estímulo que no impide continuar el examen o los cuidados	1	1	1	1		
	• protección ante el estímulo que impide todo examen o cuidados	2	2	2	2		
	• protección en reposo, en ausencia de todo estímulo	3	3	3	3		
4• Mímica	• mímica habitual	0	0	0	0		
	• mímica que parece expresar dolor ante el estímulo	1	1	1	1		
	• mímica que parece expresar dolor en ausencia de todo estímulo	2	2	2	2		
	• mímica inexpressiva de forma permanente y habitual (atonía, expresión fija, mirada vacía)	3	3	3	3		
5• Sueño	• sueño habitual	0	0	0	0		
	• dificultades para conciliar el sueño	1	1	1	1		
	• despertar frecuente (agitación motora)	2	2	2	2		
	• insomnio con repercusión en las fases de vigilia	3	3	3	3		
REACCIONES PSICOMOTORAS							
6• Aseo y/o vestido	• posibilidades habituales sin cambio	0	0	0	0		
	• posibilidades habituales poco disminuidas (con precaución, pero completo)	1	1	1	1		
	• posibilidades habituales muy disminuidas, aseo y/o vestido difíciles y parciales	2	2	2	2		
	• aseo y/o vestido imposibles, el enfermo expresa su oposición a cualquier intento	3	3	3	3		
7• Movimientos	• posibilidades habituales sin cambio	0	0	0	0		
	• posibilidades habituales activas limitadas (el enfermo evita ciertos movimientos, disminuye su perímetro de marcha)	1	1	1	1		
	• posibilidades habituales activas y pasivas limitadas (incluso con ayuda, el enfermo reduce sus movimientos)	2	2	2	2		
	• movimiento imposible, toda movilización encuentra oposición	3	3	3	3		
REACCIONES PSICOSOCIALES							
8• Comunicación	• sin cambio	0	0	0	0		
	• intensificada (la persona atrae la atención de manera inusual)	1	1	1	1		
	• disminuida (la persona se aísla)	2	2	2	2		
	• ausencia o rechazo de toda comunicación	3	3	3	3		
9• Vida social	• participación habitual en las distintas actividades (comidas, animaciones, talleres terapéuticos...)	0	0	0	0		
	• participación en las distintas actividades sólo bajo estímulo	1	1	1	1		
	• rechazo parcial de participación en las distintas actividades	2	2	2	2		
	• ausencia de toda vida social	3	3	3	3		
10• Trastornos del comportamiento	• comportamiento habitual	0	0	0	0		
	• trastornos del comportamiento bajo estímulo e iterativos	1	1	1	1		
	• trastornos del comportamiento bajo estímulo y permanentes	2	2	2	2		
	• trastornos del comportamiento permanentes (fuera de todo estímulo)	3	3	3	3		
PUNTUACION							
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