The Brief Pain Inventory (BPI)

C. Cleeland, & K. Ryan (1994)

Pain assessment: Global use of the brief pain inventory.

Meetinstrument	The Brief Pain Inventory
Afkorting	BPI
Auteur	C. Cleeland, & K. Ryan
Thema	Symptoommanagement pijn
Doel	Pijn beoordelen bij de patiënt
Populatie	Oncologiepatiënten
Afname	Zorgverlener of patiënt zelf
Aantal items	32
Aanwezigheid patiënt vereist	Ja
Vindplaats meetinstrument	Cleeland, C. S. & Ryan, K. M. (1994). Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore, 23,* 129-138.

Doel

De Brief Pain Inventory (BPI) heeft tot doel de pijnintensiteit bij de patiënt te meten alsook de invloed ervan op het leven van de patiënt na te gaan. De BPI biedt eveneens informatie over de perceptie van de patiënt aangaande de pijnoorzaak, karakteristieken van de pijn en de mate waarin de pijn verlicht wordt.

Doelgroep

De doelgroep waarvoor de BPI initieel ontwikkeld werd, zijn oncologische patiënten (Cleeland & Ryan, 1994).

Latere studies rapporteren echter ook het gebruik van de BPI bij patiënten met chronische pijn. Zo werd het meetinstrument reeds gevalideerd in patiëntenpopulaties gekenmerkt door arthritis, lage rugpijn, multiple sclerose, neuropathie tengevolge van diabates,… (Keller et al., 2004; Mendoza, Mayne, Rublee, & Cleeland, 2006; Osborne, Raichle, Jensen, Ehde, & Kraft, 2006; Tan, Jensen, Thornby, & Shanti, 2004; Zelman, Gore, Dukes, Tai, & Brandenburg, 2005). Bijgevolg kan het gebruik van de BPI naar een bredere populatie gegeneraliseerd worden dan oncologiepatiënten.

Beschrijving

De BPI is oorspronkelijk samengesteld uit 32 items. De vragen handelen over de volgende thema's:

- De intensiteit van de pijn;
- De invloed van pijn op het dagelijkse leven van de patiënt;
- Percepties van de patiënt aangaande de oorzaken van de pijn;
- Karakteristieken van de pijn;
- De mate waarin de patiënt ervaart dat zijn/ haar pijn verlicht wordt.

Volgens Cleeland & Ryan (1994) volstaat het niet om op de hoogte te zijn van de aanwezigheid van pijn bij de patiënt. Belangrijker is om de intensiteit ervan te kennen. De 'intensiteitsvragen' omvatten 4 numerieke schalen gaande van 0 tot 10. Gepeild wordt naar de huidige, de gemiddelde, de ergste alsook de minste pijn van de afgelopen week. Deze numerieke beoordelingsschalen kunnen ook betrekking hebben op de pijn van de patiënt gedurende de afgelopen 24h.
Tevens is het cruciaal om zicht te hebben op de mate waarin de patiënt beperkt wordt in zijn/ haar functioneren. De invloed van pijn op het dagelijkse leven wordt bevraagd aan de hand van 7 vragen. Dit betreft eveneens numerieke schalen waarvan de uiteinden begrensd zijn door de termen 'geen beperkingen' en 'volledig beperkt tengevolge de pijn'. De 7 thema's handelen over de invloed van pijn op het gemoed van de patiënt, op wandelen en ander fysieke activiteiten, op het werk, op slapen, op relaties met anderen, op levensgenot, en op sociale activiteiten.
Een derde topic bevraagt de percepties van de patiënt omtrent de oorzaak van de pijn (bv. beïnvloedende factoren, is pijn te wijten aan ziekte of behandeling,…)
Karakteristieken van pijn hebben onder meer betrekking op de lokalisatie van de pijn en de eigenschappen ervan (bv. brandend, uitputtend, penetrerend, ondraaglijk,…).
Tot slot zijn er meerdere vragen die peilen naar de mate waarin de patiënt ervaart dat zijn/ haar pijn verlicht wordt en de huidige pijnbestrijding volstaat.

Varianten

Er bestaan tal van varianten op de oorspronkelijke versie van de BPI zoals gepubliceerd door Cleeland & Ryan (1994). Hierbij gaat het voornamelijk over ingekorte versies van de originele BPI. Cleeland heeft zelf ook de BPI short form (BPI-sf) ontwikkeld die slechts uit 9 vragen bestaat.

Wat telkens terug keert in deze aangepaste versies zijn de 'intensiteitsvragen' en de 7 vragen m.b.t. de invloed van pijn op het dagelijkse leven. Onderzoek naar de validiteit en betrouwbaarheid van de BPI richt zich dan ook steeds opnieuw op deze twee topics.

Betrouwbaarheid

Test-retest van de BPI-sf werd onderzocht in de studie van Mendoza et al. (2006) waarbij de vragenlijst gedurende een week dagelijks werd afgenomen bij osteoarthritispatiënten die behandeld werden met NSAID's. Correlaties waren hoger dan 0.80, uitgezonderd tussen de baselinemeting en dag 1. Dit kan echter te wijten zijn aan een verandering in pijnbeleving tengevolge de pijnbestrijding.

Cronbach's alpha werd reeds uitvoerig bestudeerd voor de 4 intensiteitsvragen en de 7 vragen omtrent de beperkingen die de patiënt ondervindt tengevolge de pijn (Keller et al., 2004; Mendoza et al., 2006; Mendoza et al., 2004; Osborne et al., 2006; Tan et al., 2004; Tyler, Jensen, Engel, & Schwartz, 2002; Zelman et al., 2005). Met uitzondering van één studie bedroeg de alpha coëfficiënt telkens 0.80 of meer. Vaak wordt zelfs een waarde hoger dan 0.90 gerapporteerd.

Validiteit

De validiteit van de intensiteitsvragen en de vragen aangaande de invloed van pijn op het dagelijkse leven, werden eveneens reeds uitvoerig bestudeerd.

Meerdere studies hebben de resultaten op deze vragen vergeleken met andere pijnschalen (Keller et al., 2004; Mendoza et al., 2006; Mendoza et al., 2004; Osborne et al., 2006; Tyler et al., 2002; Zelman et al., 2005). De correlaties zijn doorgaans matig tot zwak. De range over de verschillende studies bedraagt r = 0.34 – 0.81.

Een *factoranalyse* werd uitgevoerd in de studies van Keller et al. (2004), Mendoza et al. (2006), Mendoza et al. (2004), Osborne et al. (2006), Tan et al. (2004), Tyler et al. (2002) en Zelman et al. (2005). Telkens worden twee factoren bekomen, uitgezonderd in één studie met drie factoren (Mendoza et al., 2006). Zoals in de originele versie van de BPI ontwikkeld, is de eerste factor samengesteld uit de vragen omtrent pijnintensiteit en omvat de tweede factor de vragen aangaande de levensbeperkingen. Factorladingen bedragen minimum 0.40 en de totale verklarende variantie was het laagst in de studie van Tan et al. (2004), namelijk 64%.

De *convergente validiteit* werd nagegaan door de BPI te correleren aan meetinstrumenten die peilen naar het ziekteverloop (Mendoza et al., 2006) en het psychologisch (Osborne et al., 2006; Zelman et al., 2005) en lichamelijk functioneren van de patiënt (Tan et al., 2004). Telkens werden significante correlaties gerapporteerd in de gewenste richting.

De studies van Keller et al. (2004), Mendoza et al. (2006), Mendoza et al. (2004) en Tan et al. (2004) bevestigen de *sensitiviteit* van de BPI. Pijnscores op de BPI nemen af naarmate veranderingen in de pijnbeleving optreden of patiënten pijnbestrijding ontvangen.

Gebruiksvriendelijkheid

De gebruiksvriendelijkheid van dit instrument werd niet bestudeerd.
De auteurs melden echter dat afname van de BPI gemiddeld 15 minuten in beslag neemt (Cleeland & Ryan, 1994).

Opmerkingen

Aan de hand van bovenstaande resultaten kan men stellen dat de BPI-sf een valide meetinstrument is. Rekening houdend met de overbevraging en werkdruk bij verpleegkundigen, is de BPI-sf mogelijks meer aangewezen dan de BPI in de

verpleegkundige praktijk. De omvang van de BPI-sf (en bijgevolg ook de afnameduur) is namelijk meer beperkt.
Op de website, http://www.mdanderson.org/departments/prg/, bieden de auteurs een overzicht van de verschillende talen waarin de BPI vertaald en gevalideerd is. Tevens kan men een elektronische versie aanvragen van de BPI of BPI-sf in de gewenste taal. We verwijzen dan ook graag naar deze link aangezien geen copyright verkregen werd om het meetinstrument elektronisch aan te bieden. Het instrument is echter wel opgenomen in het rapport.

Referenties

Cleeland, C. S. & Ryan, K. M. (1994). Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore, 23,* 129-138.

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Mendoza, T. R., Chen, C., Brugger, A., Hubbard, R., Snabes, M., Palmer, S. N., Zhang, Q., & Cleeland, C. S. (2004). The utility and validity of the modified brief pain inventory in a multiple-dose postoperative analgesic trial. *Clin J Pain, 20,* 357-362.

Mendoza, T., Mayne, T., Rublee, D., & Cleeland, C. (2006). Reliability and validity of a modified Brief Pain Inventory short form in patients with osteoarthritis. *Eur J Pain, 10,* 353-361.

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Tan, G., Jensen, M. P., Thornby, J. I., & Shanti, B. F. (2004). Validation of the Brief Pain Inventory for chronic nonmalignant pain. *J Pain, 5,* 133-137.

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Vindplaats meetinstrument

Cleeland, C. S. & Ryan, K. M. (1994). Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore, 23,* 129-138.

BRIEF PAIN INVENTORY (BPI)

C. CLEELAND, & K. RYAN (1994)

U.S.A. (English)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Mendoza, T., Mayne, T., Rublee, D., & Cleeland, C. (2006)	A multicenter study.	Group 1: 1019 patients with osteoarthritis (OA) of the hip. Group 2: 477 patients with OA of the knee. (n = 1496)	RCT. Signs and symptoms of OA were treated in a double-blind, placebo controlled RCT. The VAS, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Patient Global Assessment of Arthritis questionnaire were administered at baseline and day 14. The modified Brief Pain Inventory – short form (m-BPI-sf) was administered at baseline and on days 1–7.	S IC	CrV CsV Sen

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(S) *Test-retest reliability:* Correlations between adjoining assessments were calculated for each of the three subscales in group 1 and 2. All three subscales – namely, pain severity, mood-related interference and activity-related interference – have acceptable test–retest reliabilities (r > 0.80) with the exception of between baseline and day 1. **(IC)** *Cronbach's alpha:* Cronbach aplha was calculated for the pain, mood and activity scales for all 7 days. Alpha coefficients ranged from 0.86 to 0.96 for each scale at baseline and on days 1 and 7. Only at baseline were the alphas (for mood and activity) below 0.90. The results of study group 1 were replicated in group 2: only at baseline were any of the alphas slightly below 0.90.	**(CrV)** *Concurrent validity:* Correlations between m-BPI-sf items and VAS and WOMAC pain scale were rather weak: correlations ranged between 0.39 and 0.65. **(CsV)** *Factoranalyse:* The items fitted into three factors: pain (including average pain in last 24 h, worst pain in last 24 h and pain now), mood (including impact of pain on mood and impact of pain on relationships with others) and activity (impact of pain on walking ability, general activity, ability to do normal work). The three-factor solution accounted for 86% of the scale's variance in the OA group 1 and accounted for 84% in group 2. *Convergent validity:* The association between change from baseline to day 7 in m-BPI-sf scales and changes from baseline to day 14 on Patient's Global Assessment of Arthritis was studied. Patients were categorised as ''improved',' ''no change'' or ''worse'' based on the difference between their baseline and 14-day scores on the Patient's Global Assessment of Arthritis. Patients who reported improved arthritis at day 14 had significant improvement in all m-BPI-sf scales. **(Sen)** Each scale became less negatively and/or more positively skewed over time, indicating that fewer patients reported high levels of pain over the course of the week.	The low test-retest reliabilities between baseline and day 1 across all three subscales in both studies, are reasonable as changes are expected in a patient's pain severity with the administration of a pain intervention. It should be noted that the pain VAS and WOMAC pain scale correlated at 0.48, indicating that the m-BPI-sf items were more strongly related to the criterion variables than the criterion variables were with each other. Preliminary factor analyses indicated that the interference items ''sleep'' and ''enjoyment of life'' did not load stably on any one factor and were conceptually different from the mood and activity items. These items were therefore dropped from analyses.

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Mendoza, T. R., Chen, C., Brugger, A., Hubbard, R., Snabes, M., Palmer, S. N., Zhang, Q., & Cleeland, C. S. (2004)	A multicenter study.	Coronary bypass graft surgery (CABG) patients. (n = 462)	RCT. To compare the safety and efficacy of an analgesic drug following CABG in a double-blind, placebo controlled RCT. Pain assessment was registered by a modified version of the BPI (m-BPI). The m-BPI contains 3 severity items and 5 interference items. The 3 pain severity items are “worst pain”, “pain on the average”, and “pain right now”. The 5 interference items are “walking ability”, “mood”, “sleep”, “relations with others”, and “ability to sleep”. The m-BPI was presented to patients beginning on the fourth postsurgical day through at least day 14. A single sternotomy pain item was administered daily during the 2 weeks after surgery.	S IC	CrV CsV Sen

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(S) *Test-retest reliability:* The test-retest reliability coefficient ranges from 0.72 to 0.95 with the exception of the test-retest reliability coefficient for the Interference subscales on day 4 and 5, which was 0.58. **(IC)** *Cronbach's alpha:* The internal consistency reliability coefficients (day 4 till day 14) ranges from 0.85 to 0.91 for the Severity scores and from 0.90 to 0.92 for the Interference scores.	**(CrV)** *Concurrent validity:* Correlations between the Sternotomy Pain Item and BPI Severity subscales were high (range 0.72 – 0.81). The BPI Interference subscales were only mildly correlated with the Sternotomy Pain Item (range 0.52 – 0.34). **(CsV)** *Factoranalyse:* Factor analyse performed a 2-factor structure. Factor 1 corresponds to the original BPI Severity subscales ("worst pain", "pain on the average", and "pain right now"); factor 2 represents the Interference items ("walking ability", "mood", "sleep", "relations with others", and "ability to sleep"). **(Sen)** As expected, scores on the m-BPI decreased over the 11 days of the study.The changes in the m-BPI were statistically significant, with the exception of the BPI Interference subscales between day 5 and 7 and between day 5 and 8.	Because the Interference subscale was only moderately reliable for day 4 (Cronbach's α of 0.58), day 5 was used as baseline when comparing changes in pain Interference for sensitivity.

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Zelman, D.C., Gore, M., Dukes, E., Tai, K.S., & Brandenburg, N. (2005)	Not specified.	Patients with painful diabetic peripheral neuropathy (DPN) were enrolled by primary care physicians, endocrinologists, neurologists, and anaesthesiologists. (n = 255)	Validation study. To validate a modified version of the BPI in a population of patients with DPN (BPI-DPN). The BPI-DPN was shortened to the 4-item pain Severity scale and the 7-item pain Interference scale.	IC	CrV CsV

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(IC) *Cronbach's alpha:* Internal consistency reliability measured by Cronbach's alpha was high (0.94) for both the Severity and the Interference scales.	**(CrV)** *Concurrent validity:* Correlations between BPI-DPN scales, Worst Pain and Average Pain, and three alternate pain rating formats (Bodily Pain from the SF-12v2, a single verbal rating scale item of pain severity, and the Pain/Discomfort scale of the EQ-5D) were moderate (range: r = 0.52 – 0.74) and significant (p < 0.001). **(CsV)** *Factoranalyse:* A two factor model was extracted and accounted for 77.6% of the variance. Loadings of Interference items on Factor 1, which was called Interference, ranged from 0.55 (General Activity) to 0.99 (Relations with Others). Loadings of Severity items on Factor 2, which was called Severity, ranged from 0.78 (Pain Now) to 0.94 (Least Pain). The first factor was the stronger of the two factors, explaining 68.4% of variance; and the second factor explained 9.2% of variance. *Convergent validity;* Moderate to weak correlations (all p < 0.001) between the Severity and Interference scales and selected scales measuring function from the SF-12v2 (range: r = -0.33 to -0.65) and the Hospital Anxiety and Depression Scale (HADS) (range: r = 0.45 to 0.62). A test of equal paired correlations shows that Interference is more highly correlated than Severity with the SF-12v2 and HADS measures, with z-scores 2.3 - 5.16, all p < 0.001 (with the exception of the Physical Component Summary, p < 0.01). A significant correlation was measured between BPI-DPN Worst Pain, Average Pain, and the Pain Interference scale and patient reports of medical utilization.	Cronbach's alpha, if any single item was deleted, ranged from 0.91 to 0.93; because dropping any item would reduce Cronbach's alpha, this suggests that all items should be retained. Although Severity is correlated with Interference, they are correlated to a different extent with other measures; taken together with the results of the factor analysis, this supports the idea that they are distinct scales.

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Keller, S., Bann, C. M., Dodd, S. L., Schein, J., Mendoza, T. R., & Cleeland, C. S. (2004)	Primary care practice clinics.	A convenience sample of patients with arthritis or low back pain (LBP). The following 4 diagnoses can be distinguished: 1. Osteoarthritis 2. Rheumatoid arthritis 3. LBP on worker's compensation 4. LBP not on worker's compensation (n = 250)	Validation study.	IC	CrV CsV Sen
Tyler, E. J., Jensen, M. P., Engel, J. M., & Schwartz, L. (2002)	University medical center.	Fifty adults with cerebral palsy randomly selected. (n = 50)	Validation study. To validate a modification of the BPI Interference subscales. 3 items were added to the 7 original interference items (interference with self-care, recreational activities, and social activities) to obtain a broader-based sample of areas that could potentially be affected by pain.	IC	CrV

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(IC) *Cronbach's alpha:* Reliability coefficients for the BPI Severity and Interference scales were high (Cronbach alpha ranging from 0.82 to 0.95)	**(CrV)** *Concurrent validity:* The BPI was significant related to other measures of pain and the condition-specific scales. Among arthritis patients, the correlation between the BPI scales and the Health Assessment Questionnaire (HAQ), an arthritis-specific measure, was r = 0.58 and r = 0.69.Similar results were found among LBP patients on the Roland Disability Questionnaire (RDQ), a measure specifically designed for patienst with LBP (r = 0.57 and r = 0.81). **(CsV)** *Factoranalyse:* A two factor model was extracted and accounted for 67% of the variance. Factor loadings were all above 0.50. **(Sen)** The BPI has good sensitivity to improvement or change in condition as measured by other pain scales (HAQ, RDQ, SF-36 Health Survey and Chronic Pain Grade).	
(IC) *Cronbach's alpha:* The internal consistency of the 10 modified BPI Interference items was α = 0.89).	**(CrV)** *Concurrent validity:* The composite score generated from the modified BPI Interference items showed a strong and significant association with the average pain over the past 24h as measured by the NRS (r = 0.66, p < 0.05).	

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Osborne, T. L., Raichle, K. A., Jensen, M. P., Ehde, D. M., & Kraft, G. (2006)	Not specified.	Community-dwelling persons with multiple sclerosis (MS). (n = 125)	Validation study. To compare and validate the original and 2 modified versions of the BPI Interference Scale. 3 items were added to the 7 original interference items (interference with self-care, recreational activities, and social activities) yielding a 10-item scale. The 12-item scale was expanded with 2 additional items: interference with communication with others, and interference with learning new information and skills.	IC	CrV CsV

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(IC) *Cronbach's alpha:* Internal consistency estimates were high for the three versions of the modified BPI Interference scale (7-item, α = 0.93; 10-item, α = 0.95; 12-item, α = 0.96).	**(CrV)** *Concurrent validity:* Pearson correlation coefficients between the pain interference items and scale scores and ratings of average pain intensity during the past week indicate that the first seven items from the BPI Interference scale were each significantly associated with average pain intensity, with correlations ranging from 0.42 to 0.69. Additionally, each of the five items that was added to this scale was also significantly associated with average pain intensity. However, the correlation coefficients for the two items that were added for the 12-item version of the scale (communication with others and learning new information and skills) demonstrated the weakest associations with pain intensity of all the modified BPI Interference items (r = 0.38 and 0.35, respectively). The scale scores for each of the three versions of the modified BPI Interference scale were all significantly related to average pain intensity (coefficients ranging from 0.61 to 0.63). **(CsV)** *Convergent validity:* Correlations between the pain interference items and scale scores and global psychological functioning, as measured by the SF-36 Mental Health scale, were all significantly and negatively associated with mental health, as were the five items added to the scale.	

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Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
	(CsV) *Factoranalyse:* The principal factor analysis examining the items from the modified 7-item version of the BPI Interference scale and the three pain intensity items resulted in a two-factor solution. The first factor accounted for 64.0% of the variance and the second factor accounted for an additional 11.0% of the variance. Each of the seven BPI Interference items had factor loadings greater than 0.40 on Factor 1 and loadings of 0.40 or lower on Factor 2. In reverse, the pain intensity items loaded only on factor 2. The principal factor analysis examining the items from the modified 10-item version of the BPI Interference scale and the three pain intensity items also resulted in a two-factor solution. The first factor accounted for 64.6% of the variance and the second factor accounted for an additional 9.2% of the variance. All 10 interference items had high factor loadings on Factor 1 (factor loadings ranging from 0.59 to 0.94) and loadings of 0.40 or lower on Factor 2. In reverse, the pain intensity items loaded only on factor 2. The principal factor analysis examining the items from the modified 12-item version of the BPI Interference scale and the three pain intensity items resulted in a two-factor solution. The first factor accounted for 63.0% of the variance, and the second factor accounted for an additional 10.0% of the variance. Eleven of the 12 interference items had factor loadings greater than 0.40 on Factor 1, but 2 of these 11 items also had factor loadings greater than 0.40 on Factor 2.	There is no conclusive evidence to suggest that the modified 10 or 12 item scale is more valid than the original 7 item version Interference scale. Additionally, a two-factor solution emerged in the factor analyses of the 3 models, but the pain interference and pain intensity factors were not as distinct from one another in the 12-item version than was observed in the factor analyses examining the 7- and 10-item versions of modified BPI Interference scale. One potential advantage to use the 10-item modified version, as stated by the authors, is that it assesses more of the domains of functioning deemed as relevant according to the WHO ICF recommendations than the original 7-item scale. Therefore, the 10-item version may be possible helpful when assessing pain-related interference with functioning in persons with disabilities and pain.

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Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
Tan, G., Jensen, M. P., Thornby, J. I., & Shanti, B. F. (2004)	The chronic pain center at a metropolitan Veteran Affairs Medical Center.	440 patients with chronic intractable pain. (n = 440)	Repeated measures design.	IC	CsV Sen

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(IC) *Cronbach's alpha:* The Cronbach α internal consistency indicated that the coefficient was 0.85 for the Intensity scale and 0.88 for the Interference scale.	**(CsV)** *Factoranalyse:* A factor analysis was performed, resulting in 2 factors. The first factor consisted of all 7 interference items and accounted for 51.1% of the variance. The second factor consisted of the 4 pain intensity scales and accounted for another 12.5% of the variance. Both factors accounted for 63.6% of the total variance. *Convergent validity:* Correlation between pain interference and disability (Roland-Morris Disability Questionnaire) was r = 0.57, and this was statistically significantly stronger ($t = 5.71$, $p < 0.01$) than the correlation between pain intensity and disability (r = 0.40). **(Sen)** BPI Intensity and Interference scales showed significant changes in the expected direction from visit 1 to visit 3, thus confirming the responsivity of this instrument for detecting improvement with pain treatment.	

Reliability: Stability (S), Internal consistency (IC), Equivalence (E)
Validity: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Brief Pain Inventory (Short Form)

Bron: Cleeland, C. S. & Ryan, K. M. (1994). Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore, 23,* 129-138.

1903

Date: ☐☐ / ☐☐ / ☐☐
(month) (day) (year)

Subject's Initials : _____

Study Subject #: ☐☐☐☐

PLEASE USE BLACK INK PEN

Study Name: _____

Protocol #: _____

PI: _____

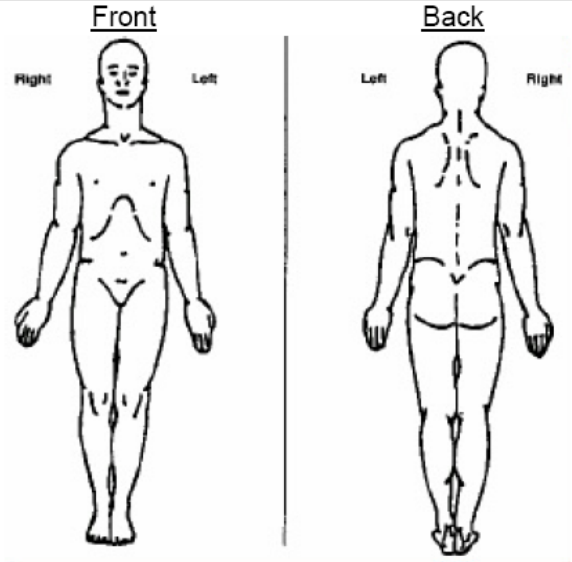
Revision: 07/01/05

Brief Pain Inventory (Short Form)

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

☐ Yes ☐ No

2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.



3. Please rate your pain by marking the box beside the number that best describes your pain at its worst in the last 24 hours.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

4. Please rate your pain by marking the box beside the number that best describes your pain at its least in the last 24 hours.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

5. Please rate your pain by marking the box beside the number that best describes your pain on the average.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

6. Please rate your pain by marking the box beside the number that tells how much pain you have right now.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

1903

Date: (month) / (day) / (year)

Subject's Initials : _____

Study Subject #:

Study Name: _____

Protocol #: _____

PI: _____

Revision: 07/01/05

PLEASE USE BLACK INK PEN

7. What treatments or medications are you receiving for your pain?

8. In the last 24 hours, how much relief have pain treatments or medications provided? Please mark the box below the percentage that most shows how much relief you have received.

0% ☐ No Relief | 10% ☐ | 20% ☐ | 30% ☐ | 40% ☐ | 50% ☐ | 60% ☐ | 70% ☐ | 80% ☐ | 90% ☐ | 100% ☐ Complete Relief

9. Mark the box beside the number that describes how, during the past 24 hours, pain has interfered with your:

A. General Activity

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

B. Mood

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

C. Walking ability

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

D. Normal Work (includes both work outside the home and housework)

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

E. Relations with other people

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

F. Sleep

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

G. Enjoyment of life

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

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Vertaling Brief Pain Inventory

STUDIE ID NR: _____ NIET BOVEN DEZE LIJN SCHRIJVEN ZIEKENHUIS NR: _____

Korte Pijn Inventarisatie (Verkorte Versie)

Datum: ____/____/____ Tijdstip: _____

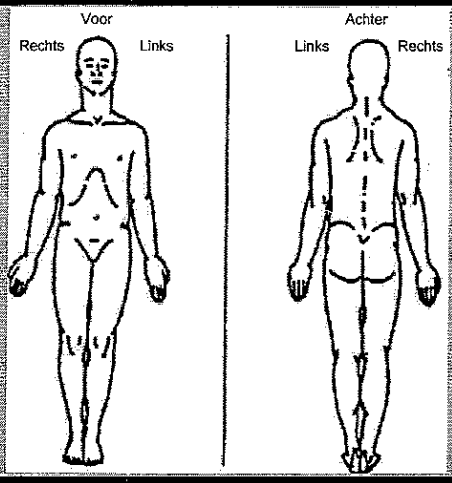
Naam: _____ _____ _____

Achternaam Voornaam Initialen

1. Tijdens ons leven hebben de meesten van ons af en toe pijn gehad (zoals lichte hoofdpijn, verstuikingen en kiespijn). Heeft u vandaag pijn gehad, anders dan deze alledaagse soorten pijn?

1. Ja 2. Nee

2. Arceer op de afbeelding de gebieden waar u pijn heeft. Plaats een "X" in het gebied waar u de meeste pijn voelt.



3. Score a.u.b. uw pijn door het ene nummer te omcirkelen dat het best uw ergste pijn in de afgelopen 24 uur omschrijft.

0 1 2 3 4 5 6 7 8 9 10
Geen pijn — Pijn zo erg als u zich kunt voorstellen

4. Score a.u.b. uw pijn door het ene nummer te omcirkelen dat het best uw pijn op z'n minst in de afgelopen 24 uur omschrijft.

0 1 2 3 4 5 6 7 8 9 10
Geen pijn — Pijn zo erg als u zich kunt voorstellen

5. Score a.u.b. uw pijn door het ene nummer te omcirkelen dat het best uw gemiddelde pijn omschrijft.

0 1 2 3 4 5 6 7 8 9 10
Geen pijn — Pijn zo erg als u zich kunt voorstellen

6. Score a.u.b. uw pijn door het ene nummer te omcirkelen dat aangeeft hoeveel pijn u nu heeft.

0 1 2 3 4 5 6 7 8 9 10
Geen Pijn — Pijn zo erg als u zich kunt voorstellen

Pagina 1 van 2

BPI-SF-DUTCH

STUDIE ID NR: _____ NIET BOVEN DEZE LIJN SCHRIJVEN ZIEKENHUIS NR: _____

Datum: ____/____/____ Tijdstip: _____

Naam: _____ _____ _____
Achternaam Voornaam Initialen

7. Welke behandelingen of medicijnen krijgt u voor uw pijn?

8. Hoeveel verlichting hebben pijnbehandelingen of medicijnen u in de afgelopen 24 uur gegeven? Omcirkel a.u.b. het ene percentage dat het meest overeenkomt met de verlichting die u heeft gekregen.

0% Geen verlichting 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% Volledige verlichting

9. Omcirkel het ene nummer dat het best omschrijft hoe de pijn in de afgelopen 24 uur belemmerend heeft gewerkt op uw:

A. Algemene activiteit

0 Geen belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

B. Stemming

0 Geen belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

C. Loopvermogen

0 Geen Belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

D. Normale werkzaamheden (hieronder valt zowel werk buitenshuis en huishoudelijk werk)

0 Geen Belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

E. Relaties met andere mensen

0 Geen Belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

F. Slaap

0 Geen Belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

G. Plezier in het leven

0 Geen Belemmering 1 2 3 4 5 6 7 8 9 10 Volledige belemmering

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Wat is BEST?

BEST staat voor BElgian Screening Tools en is een studie uitgevoerd door de Universiteit Gent, afdeling Verplegingswetenshap in opdracht van de Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu, en in samenwerking met de Université Catholique de Louvain.

Doel van BeST

Bedoeling van het project is het oprichten van een databank met wetenschappelijk gevalideerde meetinstrumenten. Met het oog op het objectiveren van de diagnostiek en van de resultaten van verpleegkundige interventies, zijn valide en betrouwbare meetinstrumenten een basisvoorwaarde om effectieve verpleegkundige zorg te kunnen bieden. Onze aandacht gaat uit naar meetinstrumenten voor de verpleegkundige interventies die bij de Minimale Verpleegkundige Gegevens gescoord worden.

Wat kan u vinden in dit rapport?

In dit rapport wordt de inhoud van het project alsook de gehanteerde methodologie beschreven. Vervolgens worden de verschillende meetinstrumenten per thema besproken. Bovendien wordt het instrument ter beschikking gesteld indien we hiertoe toestemming verkregen. Meetinstrumenten met een hoge betrouwbaarheid en validiteit werden tevens naar het Nederlands en het Frans vertaald.

Projectleiders UGent:
Prof. dr. T. Defloor
Prof. dr. M. Grypdonck

Projectmedewerkers UGent:
M. Daem
Dr. K. Vanderwee

Projectleider UCL:
Dr. M. Gobert

Projectmedewerkers UCL:
C. Piron

Projectleider FOD:
B. Folens

Projectmedewerkers FOD:
M. Lardennois

Gelieve bij elk gebruik van dit rapport als volgt te refereren:

Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu.