

The 2020 User's Guide to:
Banff Patellofemoral Instability Instrument
BPII 2.0

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This guide is intended to serve as an introduction for clinicians and researchers wishing to use the BPII 2.0. For more information, please refer to the BPII website section at www.bsmfoundation.ca or to the scientific papers referred to in the different sections in that website.

The BPII questionnaire was initially published in 2013 as an instrument to fill the void for clinicians and researchers when assessing patients with patellofemoral instability¹.

In 2016, the BPII underwent a factor analysis and item reduction, along with rewording of items, language level analysis, and validity and reliability assessment leading to the publication of the updated questionnaire, the BPII 2.0^{2,3}.

The BPII 2.0 is a disease-specific patient-reported outcome measure used to measure quality of life in adults and adolescents with lateral patellofemoral instability. It can be used in adolescents as young as 10 years of age^{4,5}.

The BPII 2.0 can be used to evaluate patient status and track outcomes from interventions such as surgical stabilization or rehabilitation programs.

The BPII 2.0 is patient-administered, the format is user-friendly, and it takes 5 to 10 minutes to complete.

The BPII 2.0 is self-explanatory and can be administered in the waiting room or used as a paper, postal or electronic survey. Paper-based and computerized versions are comparable with regard to psychometric properties⁶.

The BPII 2.0 is in the public domain and is available for clinical and research use free of charge. No licensing or permission to use the BPII 2.0 is required.

The BPII 2.0 is a Quality of Life (QOL) score that consists of 23 questions across 5 domains: **Symptoms and Physical Complaints, Work and/or School Related Concerns, Recreation / Sport /Activity, Lifestyle, and Social and Emotional.**

Patients mark their answers on a visual analogue scale measuring 100 mm in length. Each item is equally weighted with the final score calculated as an average of the scores from all answered items. A higher score reflects a higher QOL.

Scoring

The BPII is scored out of 100. The VAS outputs are measured in millimetres for each question and summed. The sum is then divided by the number of questions that are answered. If all questions answered at the highest possible QOL of 100mm, then the sum of the VAS measures is 2300. The BPII score will be $2300/23 = 100/100$. Based on an analysis of BPII scores, a minimum of 19/23 questions needs to be completed for the score to be considered valid. If a patient does not answer between one and

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four questions, these unanswered questions are subtracted from the denominator. In our cohort of over 800 patients, the average pre-operative BPII score of patients who undergo a patellofemoral stabilization procedure is 23/100⁶.

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Validity

Validity has been formally established in patient with recurrent patellofemoral instability, as well as both pre- and post-operative patellofemoral stabilization. Face and content validity were established through a modified Ebel procedure¹. Construct validity has been established by correlating the BPII to the Kujala scale and the Norwich Patella Instability Score to demonstrate convergence ($p < 0.0001$)³. The BPII 2.0 has been further validated with the successful cross-cultural adaptation in German⁷.

Reliability

Reliability for the BPII is high. Internal consistency was calculated using the Cronbach alpha reliability coefficient and was found to be >0.95 ¹.

The BPII 2.0 has demonstrated a Cronbach's alpha coefficient >0.90 from pre- to 12 months post-operatively².

Test-retest reliability was also established for the BPII 2.0 (ICC 0.97)^{1,2}.

Responsiveness

Responsiveness to change of both BPII and BPII 2.0 has been demonstrated for pre- and post-surgical patients².

Correlation with responsiveness was demonstrated for BPII 2.0 by anchoring with a seven-point Likert scale where patients rated their improvement post-operatively from "significantly worse" to "significantly better"².

No floor or ceiling effect has been observed for the BPII^{1,2}.

Mean pre-operative score 23/100 and mean post-operative 65/100.

Paediatric Population

The BPII has been validated specifically in adolescents from 10.3 to 17.9 years of age, making it the only disease-specific patient-reported outcome measure validated from use in the paediatric population⁴.

Development of the BPII 2.0 through the factor analysis and item reduction process included specific changes to make the outcome measure more useable for the paediatric audience. Questions referring to "work" were modified to include "school concerns"².

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The BPII 2.0 has been assessed in a multi-centre concurrent validation to the Pedi-IKDC, demonstrating a moderate correlation between the outcome measures, as well as high test-retest reliability and no floor or ceiling effects⁵.

The **Minimally Clinical Important Difference (MCID)** in patients with patellofemoral instability is 6.2 ².

Translations

The BPII 2.0 is currently available in the original English, as well as in German⁷, French and Dutch versions.

Pending translations include Portuguese, Finnish, Spanish, Polish and Swedish.

New language versions are available at www.bsmfoundation.ca as they are developed.

Questions?

If you have any queries, first contact the BPII 2.0 web manager. The BPII 2.0 web manager also handles requests to translate the BPII 2.0 for use in other countries:

Email: sarah@banffsportmed.ca

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