

# Utilizing the Patient-Specific Needs Evaluation (PSN) for Data-Supported and Individualized Treatment (UNITE)

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## VALUE AND CLINICAL UTILITY OF THE PSN

- We introduce the PSN as an ultrashort and patient-reported generic tool to:
  - increase the probability of offering patients the most appropriate treatment (first-time-right)
  - prevent ineffective or too expensive treatments
- This improves (cost)effective treatments for individuals based on real-world data instead of group means.
- It contains the Personal Meaningful Gain (PMG), a novel construct evaluating individualized, clinically relevant treatment outcomes that outperformed the MIC and PASS
- The PSN and associated decision-support model may function as a conversation starter, facilitate expectation management, and aid shared decision-making as a new framework for data-supported, patient-centered, value-based healthcare.

### The Personal Meaningful Gain (PMG)

Developed with a total of 5461 participants

The PSN is an ultra-brief, patient-specific but generic instrument that identifies:

1. The patient's most important information needs
2. The most important treatment goals
3. The individual's threshold to be satisfied with the treatment results, and
4. Evaluates whether this threshold is reached at follow-up

Scan the QR code to try the PSN



How would you rate your performance of activities at this moment?

Very poor	0	1	2	3	4	5	6	7	8	9	Excellent
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ATTENTION! A higher score means better performance of activities.

You currently rate performance of activities: 3

What is the minimum score on the performance of activities that you want to achieve with your treatment? With what score on the performance of activities would you be satisfied with the treatment result?

Assume that your score on all other domains is (already) satisfactory.

Very poor	0	1	2	3	4	5	6	7	8	9	Excellent
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ATTENTION! A higher score means better performance of activities.

I am satisfied if I improve on the performance of activities from a 3 to a 7.

The PMG has higher positive predictive value (0.76, [0.74-0.78]) for being satisfied with the treatment results compared to the PASS (0.70 [0.69-0.72]) and MIC (0.64 [0.62-0.65]) of an NRS for pain ( $p < 0.001$ ) and function (0.67 [0.65-0.68] and 0.64 [0.62-0.66],  $p < 0.001$ ). This indicates that the PMG has a superior ability to identify patients who are satisfied with their treatment results (based on  $n = 5373$ ).

### Predicting if a patient will improve beyond the PMG

Trained on 5010 participants



To predict the probability of obtaining the PMG, we selected a gradient boosting machine algorithm with thirteen predictors. This model had an area under the curve of 0.73 (0.70 - 0.76) and excellent calibration in the test set. This figure displays the user-centered shiny app we designed to visualize the predictions for different treatment options

Scan the QR code to try the personalized decision-support model

