MEASUREMENT MATTERS

Patient-Centered Outcomes Research Engagement Measure

PCOR-EM

Version 1.0

Developed through *Measurement Matters: Refining and Validating a Patient-Centered Outcomes Research Engagement Measure*

A COLLABORATION OF

COLLECTIVE INSIGHT

LeadingAge LTSS CENTER @UMass Boston
Research bridging policy and practice

BOSTON COLLEGE
Connell School of Nursing

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PCOR-EM Purpose

The 19-item Patient-Centered Outcomes Research Engagement Measure (PCOR-EM), Version 1.0 assesses how well engagement practices are implemented within a specific research project. It produces one overall engagement-quality score. Higher scores mean stronger engagement practices. The tool measures the engagement process, not participant satisfaction or research outcomes. Research teams and patient and community partners can use the PCOR-EM to reflect on how engagement is carried out in their project, identify strengths and areas for improvement, and support constructive conversations about engagement practices.

PCOR-EM Development

The PCOR-EM was developed through *Measurement Matters*, a two-year PCORI-funded study (SOE-2022C2-28570) led by the LeadingAge LTSS Center @UMass Boston, Collective Insight, and the Boston College Connell School of Nursing. Guided by a Steering Committee and Expert Technical Advisors, the research study team engaged 102 researchers, engagement facilitators, and patient and community partners through a literature scan, two rounds of consensus methods surveys with a national panel of 49 engagement experts, seven focus groups, and 19 cognitive interviews. These activities defined high-quality engagement, identified seven engagement domains, and informed the development of a 30-item version of the measure. With guidance from a Pilot Partner Subcommittee, the research team piloted the 30-item version with 266 people involved in engaged research projects to assess its reliability, validity, and overall performance, then used item response theory and partner input to refine it to 19 items that still cover all seven domains. Full details are available in the study's final report on the project webpage.

PCOR-EM Focus Areas

The PCOR-EM measures the quality of engagement within a specific research project, meaning the extent to which core engagement practices are carried out in practice. Unlike tools that measure partner satisfaction or how involved partners feel, the PCOR-EM asks about concrete activities, such as whether money is allocated to engagement and whether partners help design the research questions. The PCOR-EM items reflect seven engagement domains:

- Organizational readiness
- Time and resources
- Logistics and meeting techniques
- Clear and transparent communication
- Valuing diversity
- Trust and relationship building
- Collaboration, co-learning, and power sharing

Together, the items produce one overall score. Research teams and patient and community partners can use the PCOR-EM to identify strengths and areas for improvement in a project's engagement.

Validation and Limitations of Version 1.0

The PCOR-EM was validated through a pilot with 266 people involved in engaged research, which found preliminary evidence of reliability and validity. It measured low to moderate levels of engagement

precisely, and its scores were positively related to an established engagement outcome measure, the Research Engagement Survey Tool (REST).[1]

As with any first version, there are limitations. Measurement precision was lower at higher levels of engagement, indicating a need for additional items that capture more advanced engagement practices. Although the pilot sample was diverse, most respondents had advanced education and substantial engagement experience, and individuals from low-income communities and those with limited English proficiency were underrepresented. Because the study could not yet confirm that items work the same way across engagement roles or demographic groups, users should be cautious about directly comparing scores across these groups. Finally, the study used a cross-sectional design and relied on self-reported data, so it could not assess change over time or show that engagement practices cause specific project outcomes. Future testing with larger and more diverse samples will address these areas.

Intended Respondents

The PCOR-EM team welcomes research teams and patient and community partners to use the PCOR-EM. The PCOR-EM is intended for individuals who conduct, oversee, or are directly responsible for implementing engagement activities within engaged health research projects, including researchers, engagement facilitators, and patient or community partners serving in formal engagement roles. Respondents should have direct experience designing, leading, or supporting engagement processes, rather than participation solely as research subjects. They should also be knowledgeable enough with the project's engagement activities to report on what happened in practice.

Before Using the PCOR-EM

All individuals preparing to use the PCOR-EM must contact the PCOR-EM Principal Investigators by completing this interest form. Completing this form allows our team to track use of the tool, collect feedback on its use, and share updates in a timely way. The form asks for your name and organization, a brief description of your project, how you plan to use the tool, and the anticipated number of respondents. After using the PCOR-EM, please consider sharing your deidentified response data with the research team to support continued testing and refinement of the tool.

Directions for Respondents

When answering the questions, consider your current or most recent engaged research project. Select one specific project and answer all 19 items based on that same project.

For each item, select the response that best reflects what occurred in practice. Answer based on what the project actually did, rather than what was planned or intended. There are no right or wrong answers.

The survey takes about 10 minutes to complete.

[1] [1] Goodman, M.S., Ackermann, N., Haskell-Craig, Z. et al. Construct validation of the Research Engagement Survey Tool (REST). Res Involv Engagem 8, 26 (2022). https://doi.org/10.1186/s40900-022-00360-y

Patient-Centered Outcomes Research Engagement Measure (PCOR-EM)

Section 1

Statement	Definitely No	Mostly No	Mostly Yes	Definitely Yes
Research team is motivated to do engagement in the project	☐	☐	☐	☐
Research team has reviewed materials on best practices of engagement	☐	☐	☐	☐
There is money allocated to engagement activities	☐	☐	☐	☐
There is a written plan for engaging patient/community partners in research	☐	☐	☐	☐
Researchers have access to training or mentoring on topics to enhance the engagement process	☐	☐	☐	☐

Section 2

Statement	Definitely No	Mostly No	Mostly Yes	Definitely Yes
There is a written plan to engage underrepresented communities in the project	☐	☐	☐	☐
There is diversity among patient/community partners, such as their age, race, gender, opinion, lived experience, and expertise.	☐	☐	☐	☐
The research team reflects one or more communities being studied	☐	☐	☐	☐

Section 3

Statement	Definitely No	Mostly No	Mostly Yes	Definitely Yes
Patient/community partners are engaged in the design of research questions	☐	☐	☐	☐
Research timelines are influenced by engagement of patient/community partners	☐	☐	☐	☐
Patient/community partners and the research team communicate at least once per month during the project	☐	☐	☐	☐
Patients/community partners have more than one way to access engagement meetings	☐	☐	☐	☐
Individual and group conversations are available to patient/community partners	☐	☐	☐	☐

Time is dedicated during meetings to allow for open discussion with patient/community partners	☐	☐	☐	☐
Individuals facilitating meetings are skilled in both reflective listening and collaborative facilitation strategies	☐	☐	☐	☐

Section 4

Statement	Definitely No	Mostly No	Mostly Yes	Definitely Yes
Patient/community partners perspectives are thematically recorded through meeting notes	☐	☐	☐	☐
Written summaries of all patient/community partner meetings are shared with meeting attendees	☐	☐	☐	☐
Actions that result from meetings with patient/community partners are documented and shared with meeting attendees	☐	☐	☐	☐
Research improvements that result from patient/community partner engagement are shared with all patient/community partners	☐	☐	☐	☐

Scoring the PCOR-EM

The PCOR-EM produces one overall engagement-quality score. All 19 items contribute to this score. Scores range from 0.5 to 9.5 on a 0–10 scale. Higher scores indicate stronger engagement practices.

The PCOR-EM score is based on item response theory (IRT), not a simple sum of responses. IRT takes into account that some engagement practices are more common than others. To make scoring easy, the PCOR-EM team developed a lookup table that converts a respondent's raw total to the PCOR-EM score. The Technical Appendix describes how the lookup table was developed and how scores are calculated.

Response Values

Each response option has a numeric value:

Response	Value
Definitely No	0
Mostly No	1
Mostly Yes	2
Definitely Yes	3

Using the PCOR-EM Score Calculator

Download the PCOR-EM Score Calculator from [link] and open it in Microsoft Excel. If a yellow bar appears at the top saying "Protected View," click Enable Editing so the drop-down lists work. Complete one calculator for each respondent.

1. For each of the 19 items, select the respondent's answer from the drop-down list in the yellow cell.
2. Once all 19 items are answered, the results panel shows:
    - the respondent's PCOR-EM score
    - the engagement-quality classification
    - the percentile range
    - a description of what the score means
3. To score another respondent, save a copy of the file, or clear the yellow cells and start again.

The calculator converts responses to the PCOR-EM score automatically. Users do not need to do any calculations.

Missing responses

The PCOR-EM score can only be calculated when all 19 items are answered. The calculator does not produce a score until every item has a response.

Interpreting Scores

The table below shows the five engagement-quality classifications, from Minimal to Exemplary, and the PCOR-EM score range for each. Each classification includes a description of typical engagement practices and an approximate percentile range, based on the distribution of scores in the PCOR-EM pilot sample.

Raw PCOR-EM Score	PCOR-EM Score Range	Classification and Performance Description	Percentile Range
0 – 25	≤ 2.00	**Minimal Engagement Quality:** Few engagement practices are evident, and those that are present are limited in scope, consistency, or integration within the research process.	Below the 2nd percentile
26 – 35	2.01 – 3.50	**Modest Quality Engagement:** Engagement practices are beginning to be incorporated but are implemented unevenly or only in selected aspects of the research process.	2nd to 16th percentile
36 – 44	3.51 – 5.00	**Moderate Quality Engagement:** Engagement practices are regularly incorporated and demonstrate meaningful engagement across several phases of the research process, although implementation is not yet fully comprehensive or consistent.	16th to 50th percentile
45 – 51	5.01 – 6.50	**High Quality Engagement:** Engagement practices are well established, consistently implemented, and integrated across most phases of the research process, supporting meaningful stakeholder participation.	50th to 84th percentile
52 – 57	≥ 6.51	**Exemplary Quality Engagement:** Engagement practices are comprehensively integrated throughout the research process and reflect sustained, consistent, and high-quality engagement in project planning, conduct, interpretation, and dissemination.	Above the 84th percentile

Questions

Contact Principal Investigator, Dr. Erin McGaffigan erin@collectiveinsight.com

Technical Appendix: How PCOR-EM Scores are Calculated

The PCOR-EM Score Calculator performs every step below automatically; this appendix explains the method for users who want to understand it.

Item response theory (IRT) scoring

The PCOR-EM is scored using IRT rather than a simple sum, because the 19 engagement practices differ in how commonly they are carried out. Items were calibrated with a graded response model using data from the 266-person pilot. IRT scores (theta) are standardized to the pilot sample (mean = 0, SD = 1) and range from about −3 (lower engagement quality) to +3 (higher engagement quality).

Estimating IRT scores with the test characteristic curve

Calculating theta directly requires specialized software. Instead, the PCOR-EM uses the test characteristic curve (TCC), which shows the raw total score (0–57) expected at each level of engagement quality (Figure A1). A respondent's raw total, the sum of all 19 item values (0–3 each), is located on the vertical axis and read across to the curve and down to the corresponding theta. For example, a raw total of 40 corresponds to a theta of about −0.5. These conversions are built into the calculator's lookup table.

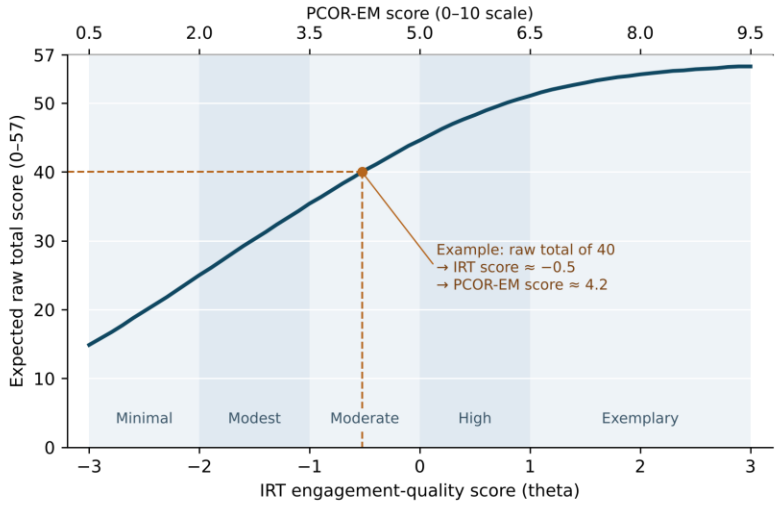


Figure A1. Test characteristic curve for the 19-item PCOR-EM, with engagement-quality classifications shaded.

Converting to the 0–10 PCOR-EM scale

To avoid negative scores, theta is converted with a linear transformation that preserves the order and spacing of scores: **PCOR-EM score = (theta × 1.5) + 5**. In the example above, a raw total of 40 becomes a PCOR-EM score of about 4.2. The pilot-sample average equals 5, each SD equals 1.5 points, and scores range from 0.5 to 9.5. Classification cut points fall at 1 SD intervals (scores of 2.0, 3.5, 5.0, and 6.5), corresponding to roughly the 2nd, 16th, 50th, and 84th percentiles of the pilot sample.

Limitations and next steps

TCC-based scoring is fast and easy to explain, but it uses only the raw total, not which items received which responses, so it only partially accounts for differences in item difficulty and precision. Because the curve flattens at the top, scores in the High and Exemplary ranges are less precise. The PCOR-EM team plans to develop a web-based tool that calculates scores from each respondent's full response pattern.