Evaluating the role of patient-reported outcomes in Phase 4 clinical trials: Trends, applications, and implications for post-marketing surveillance

Beecher C[a], Wellam H[a], Pannu K[a], Foy C[a]
[a]Petauri Evidence, Bicester, UK

ISPOR poster acceptance code: PCR84
Abstract ID: 3425

Introduction

Patient-reported outcomes (PROs) are increasingly recognised as essential components of clinical research, offering direct insights into how patients perceive their symptoms, functional status, and overall quality of life (QoL) (1,2). Unlike clinician-reported or laboratory-based endpoints, PROs capture the subjective experience of patients, making them valuable in assessing the real-world impact of health interventions (1,2).

Phase 4 clinical trials are post-marketing surveillance trials, conducted after regulatory approval (3). These trials assess the long-term effectiveness, risks, and benefits of the health intervention in diverse real-world populations. Incorporating PROs into these trials enhances real-world evidence (RWE) by capturing treatment impact from the patient perspective, including safety, tolerability, and effectiveness (3,4).

Objectives

To explore trends and adoption of PROs in Phase 4 clinical trials.

Methods

Database: ClinicalTrials.gov

Study type: Phase 4 clinical trials

Registration date: 2020–2024

Filters: Condition, intervention, primary outcome, PRO category

Results

Between 2020 and 2024, 6,981 Phase 4 clinical trials were registered on ClinicalTrials.gov. Of these, 17% (1,179 trials) included a PRO as the primary endpoint (Figure 1), with the annual inclusion rates remaining consistent across the 5-year period (Figure 2).

PROs were most used in trials evaluating drug interventions (1,018 trials, 86%) demonstrating that PROs are an established method to capture the patient perspective. However, the use of PROs in trials involving devices (55 trials, 5%) and other interventions (dietary supplements, combination, behavioural, and procedures, etc) remains limited (Figure 3).

The majority of trials that included PROs focused on symptom burden (912 trials, 77%) highlighting the importance of capturing subjective experiences such as pain and fatigue. Other domains were less frequently captured, suggesting that broader aspects of patients' wellbeing may often be underrepresented in post-marketing research (Figure 4).

PROs were utilised across a range of conditions affecting different body systems. PROs were most frequently used in trials focusing on the nervous system (312 trials, 26%), musculoskeletal system (208 trials, 18%), and mental health conditions (175 trials, 15%) (Figure 5). These areas often involve symptoms such as pain, mobility, and mood, which are difficult to measure objectively (5-7).

Figure 1: PRO inclusion as a primary endpoint in Phase 4 clinical trials (2020–2024)

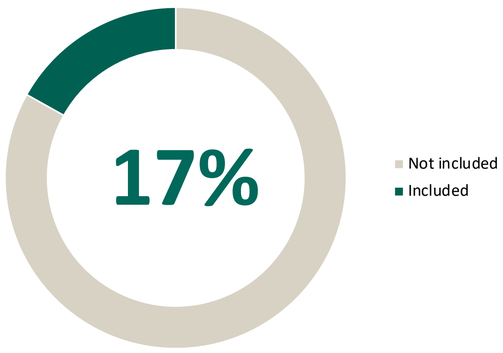


Figure 2: Annual inclusion of PROs in Phase 4 clinical trials (2020–2024)

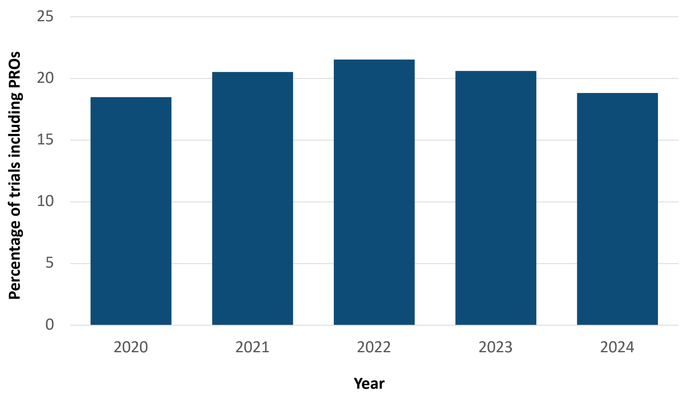


Figure 3: Intervention type using PROs

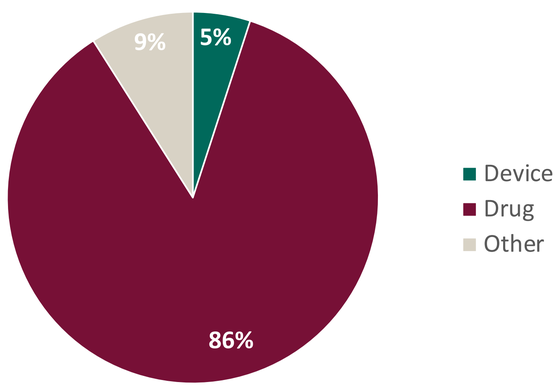


Figure 4: Distribution of PRO domains

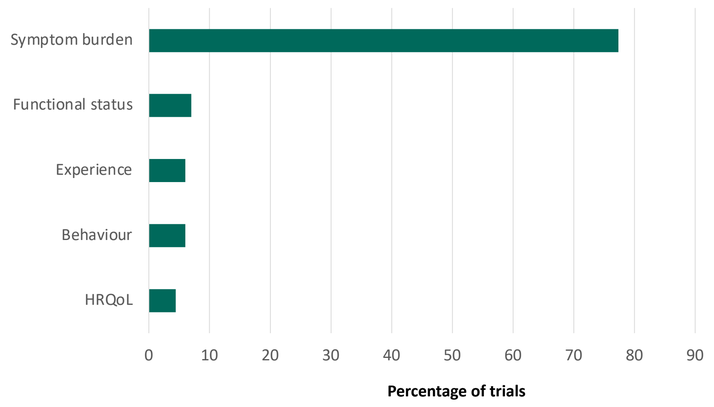
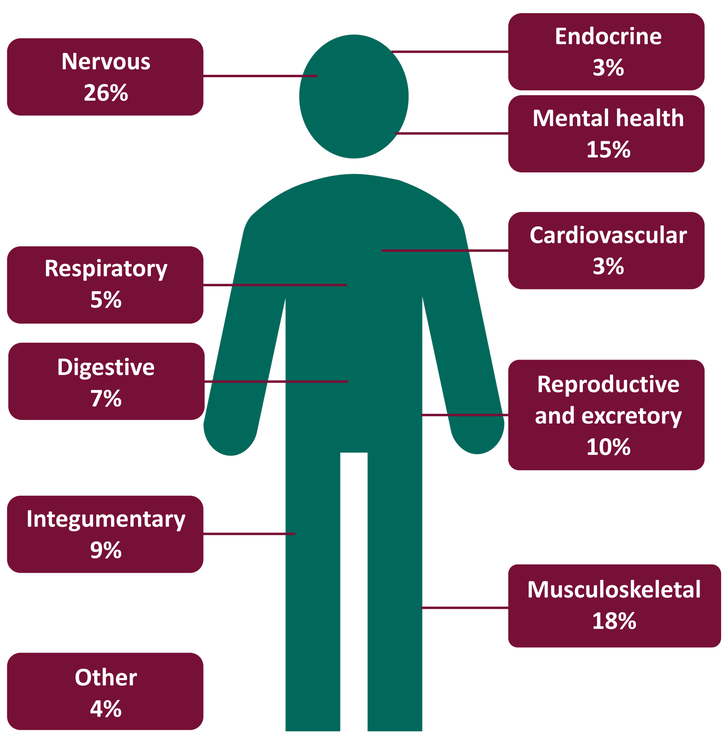


Figure 5: PRO use by body system



Discussion

Between 2020 and 2024, 17% of Phase 4 clinical trials included PROs as a primary endpoint, with integration remaining stable, averaging around 20% annually, demonstrating the value of incorporating the patient voice into clinical trials. However, the majority (83%) did not include PROs, highlighting the need for greater adoption. Barriers such as methodological heterogeneity, lack of standardisation, and limited clinician familiarity with PRO data interpretation may contribute to this (1).

There was a concentration of PROs used within specific contexts. The predominant application of PROs was in the assessment of drugs; use in device and procedural studies remained limited. The development of a novel instrument may be necessary to ensure PROs are fit for purpose in device and procedural trials (8).

Most PROs focused on symptom burden, while domains such as function, behaviour, experience, and QoL were underrepresented. This narrow focus may limit the ability of trials to fully capture the broader impact of interventions on patients' daily lives and overall wellbeing.

Conditions affecting the nervous system, musculoskeletal system, and mental health represented the largest categories utilising PROs. This is likely due to the subjective nature of symptoms, including pain, mobility, and mood, and the difficulty in quantifying their impact through clinical measures (5-7).

Conclusion

This research demonstrates that PROs are valuable in demonstrating patient-centred benefits in a real-world setting across a range of therapeutic areas. Despite their proven value, their integration into Phase 4 clinical trials remains inconsistent. Future research should explore how PRO data contribute to long-term surveillance, support comparative analysis of treatments, and inform market access, such as pricing, and coverage decisions by demonstrating the real-world impact of therapies from the patient perspective.

ISPOR Europe 2025
9–12 November
Glasgow, Scotland

Booth no. 608

References

1. Puccini A, et al. Patient-reported outcomes (PROs) in clinical trials and in clinical practice: report from the XXI national conference of the Italian Association of Medical Oncology (AIOM). BMJ Oncol. 2025;4(1):e000783.
2. Merciea-Bebber R, et al. The importance of patient-reported outcomes in clinical trials and strategies for future optimization. Patient Relat Outcome Meas. 2018;9:353-67.
3. LindusHealth. Understanding the Importance of Phase 4 Trials in Clinical Research. Available from: https://www.lindushealth.com/blog/understanding-the-importance-of-phase-4-trials-in-clinical-research. Accessed: September 2025.
4. Maruszczyk K, et al. Implementation of patient-reported outcome measures in real-world evidence studies: Analysis of ClinicalTrials.gov records (1999–2021). Contemp Clin Trials. 2022;120(4):106882.
5. National Institute of Neurological Disorders and Stroke. Pain. Available from: https://www.ninds.nih.gov/health-information/disorders/pain. Accessed: September 2025.
6. Beauchamp ML, et al. A unified framework for the measurement of mobility in older persons. Age Ageing. 2023;52(4):iv82-iv85.
7. Hammersley R, et al. How to measure mood in nutrition research. Nutr Res Rev. 2014;27(2):284-94.
8. Webber CM, et al. Patient-reported outcomes and medical device evaluation: from conception to implementation. J Patient Rep Outcomes. 2022;6(1):53.

Abbreviations

HRQoL, health-related quality of life

PRO, patient-reported outcome

QoL, quality of life

RWE, real-world evidence