

## Patient Acceptable Symptom States for Patient Reported Outcomes After Tibial Plateau Fracture

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**Purpose:** Patient-reported outcomes (PROs) are frequently used to evaluate function from patients' perspective after orthopaedic injury. However, converting PROs into meaningful, clinically relevant outcomes remains challenging. Measures including the patient acceptable symptom state (PASS), which establishes PRO thresholds at which patients consider themselves beyond satisfied, have been proposed to address this. Currently, no PASS thresholds for tibial plateau fractures exist. This study was designed to define PASS thresholds for the Patient-Reported Outcomes Measurement Information System (PROMIS) Physical Function (PF) and Knee Injury and Osteoarthritis Outcome Score (KOOS) following operatively treated tibial plateau fractures.

**Methods:** All tibial plateau fractures from 2016 to 2021 at a Level I trauma center were retrospectively reviewed. 159 patients who responded to surveys at minimum 1-year follow-up were included. PASS thresholds were determined using anchor-based questions for global outcome, pain, and function. PASS positive (PASS+) was defined as "satisfied" or "very satisfied". A global anchor was used for PROMIS PF and KOOS quality of life (QOL) scores, a pain anchor was used for KOOS pain, and a function anchor was used for PROMIS PF and KOOS activities of daily living (ADL) scores. Optimal PASS thresholds were selected based on 3 receiver operating characteristic (ROC) curve methods: (1) 80% specificity, (2) 75th percentile, and (3) Youden Index to maximize sensitivity / specificity.

**Results:** Overall, 53% to 60% of patients considered their outcomes acceptable. Younger patients were more often unsatisfied with their pain ( $P = 0.001$ ) and function ( $P = 0.017$ ). Patients who had primarily lateral column involvement or an isolated lateral approach were significantly more satisfied in their global outcome ( $P = 0.045$ ,  $P = 0.024$ , respectively) and function ( $P = 0.017$ ,  $P = 0.007$ , respectively). Patients with bicondylar fractures and postoperative infections were more often unsatisfied with their pain ( $P = 0.013$ ,  $P = 0.033$ , respectively). Using 80% specificity, 75th percentile, and Youden Index, global PASS thresholds were 48.5, 53.9, and 47.9 for PROMIS and 56.3, 87.5, and 56.3 for KOOS QOL, respectively. Similarly, the KOOS pain threshold was 84.4, 97.2, and 80.6. The function PASS threshold was 48.9, 54.4, and 48 for PROMIS PF and 94.1, 99.3, and 86.8 for KOOS ADL, respectively.

**Conclusion:** Defining the PASS threshold for commonly used PROs in tibial plateau fractures will improve interpretation of postoperative PROs and allow physicians to appropriately counsel patients with risk factors for unsatisfactory outcomes. The PASS threshold for tibial plateau fracture patients should be 49 for PROMIS PF and 94 for KOOS ADL.