

# Total Knee Arthroplasty Postoperative Day 1 Ambulation Distance and Association with Long Term Functional Outcomes

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## Introduction:

Total knee arthroplasty (TKA) is a common and effective procedure utilized to improve quality of life for patients. Early mobilization and ambulation following TKA is a key aspect to postoperative care and has been shown to improve functional outcomes, lower complication rates, and reduce hospital length of stay (1,2). However, the ambulation distance achieved on post operative day 1 (POD1) is variable among the patient population. Determining whether greater ambulation distance on POD1 correlates with improved long term functional outcomes compared to lesser distances could prove valuable to postoperative management and patient education. This study aimed to evaluate the relationship of POD1 ambulation distance and functional outcomes at 1 year.

## Methods:

This study retrospectively reviewed 667 patients of four fellowship trained arthroplasty surgeons who underwent primary TKA from June 2018 to July 2024 at a single academic institution, as approved by our institutional review board. Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOSJR) was collected preoperatively and at 1 year post operatively. POD1 ambulation distance was collected and recorded in meters with patients stratified into two groups: ambulation distance <50 meters and ≥50 meters. A KOOSJR score of ≥71 at 1 year follow up was considered achieving Patient Acceptable Symptom State (PASS). Patient demographic information and American Society of Anesthesiologists Physical Status Classification (ASA) were collected. Bivariate analysis and logistical regression were utilized to identify predictors of achieving PASS.

## Results:

The patient cohort had a mean age of 68.7 and mean BMI of 33.7, with 68.2% females. Mean preoperative and postoperative KOOSJR scores were 48.6 (SD 11.1) and 79.5 (SD 14.3) respectively, with a mean increase of 30.9 (SD 16.7). The mean ambulation distance on POD1 was 42.3m (SD 19.2m). The PASS rate of patients ambulating <50m (n = 474) on POD1 was 66.7% and 71% for patients who ambulated ≥50m (n = 193) with no significant difference between the groups (chi-square p=0.321, Fisher’s exact p=0.314). Logistical regression analysis showed POD1 ambulation ≥50m was not significantly associated with patients achieving PASS (OR 1.26, 95% CI 0.87-1.84, p=0.229). Age (OR 1.00, 95% CI 0.98-1.03, p=.749), sex (OR 0.90, 95% CI 0.63-1.30, p=0.575), BMI (OR 1.00, 95% CI 0.98-1.03, p=0.919), and ASA class (OR 1.03, 95% CI 0.69-1.50, p=0.898) were not found to be significant predictors of PASS.

## Conclusion:

In our study, greater POD1 ambulation distance was not shown to have a significant effect on patients achieving higher functional outcomes at 1 year post primary TKA. Perioperative variables such as sex, age, BMI, and ASA class were not shown to be predictive factors of patients achieving PASS. Early ambulation following TKA is shown to be a positive factor in recovery (2), but our study suggests that ambulation distance may not predict the level of functional outcome achieved. Studies with a larger sample size and POD1 ambulation recorded as a continuous variable are needed to better understand the relationship of ambulation distance and long-term functional outcomes.

## Significance/Clinical Relevance:

POD1 ambulation is critical to patient recovery, but ambulation distance achieved may not independently correlate to functional outcomes.

## References:

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- Lei YT, Xie JW, Huang Q, Huang W, Pei FX. Benefits of early ambulation within 24 h after total knee arthroplasty: a multicenter retrospective cohort study in China. Mil Med Res. 2021 Mar 5;8(1):17. doi: 10.1186/s40779-021-00310-x. PMID: 33673879; PMCID: PMC7934453.

Logistical Regression: Predictors of PASS			
Variables	OR	95% CI	p-value
POD1 ≥50 m	1.26	0.87-1.84	0.229
Age	1.00	0.98-1.03	0.749
Sex	0.90	0.63-1.30	0.575
BMI	1.00	0.98-1.03	0.919
ASA Class	1.03	0.69-1.50	0.898

Ambulation Group PASS Rates		
Distance	Total (n)	PASS Rate
<50 m	474	66.70%
≥50 m	193	71.00%