

# Patient-reported Physical and Mental Health Among Factors Associated with the Timeliness of Total Knee Replacement

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## Background:

- ~20% of patients undergoing elective total knee replacement (TKR) report post-surgical dissatisfaction and chronic function-limiting pain.
- Dissatisfaction and pain could be related to timing of TKR, since pre-operative function and pain vary widely TKR candidates.
- Little is known about TKR timing, and its predictors.

## Objective:

- To quantify how often patients undergo TKR in a timely fashion and examine the role of overall patient-reported physical and mental health in predicting timely vs premature or delayed TKR in a national cohort.

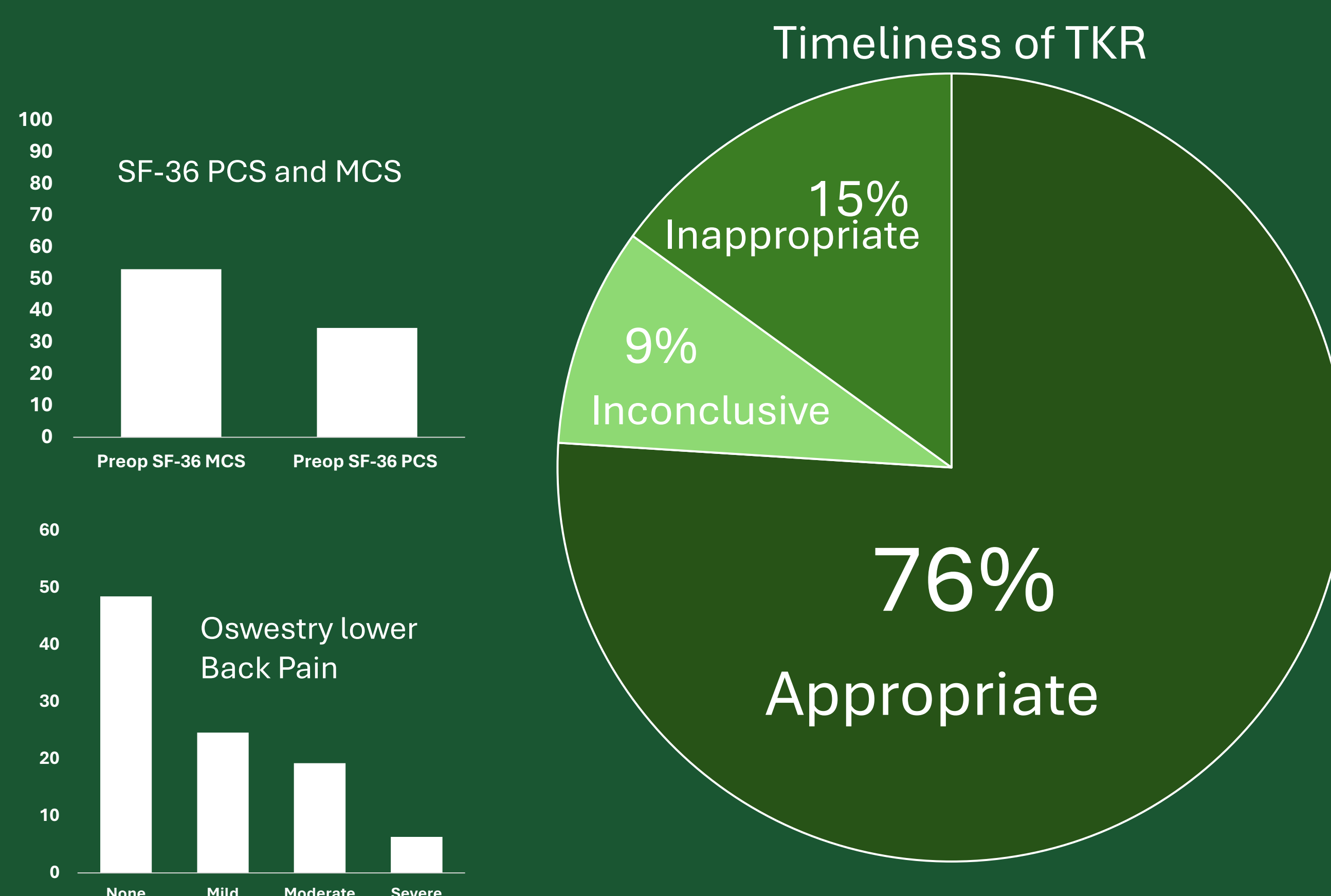
## Methods:

- Sociodemographic and patient reported data from patients undergoing primary unilateral TKRs performed at 5 high-volume centers participating in a national registry were matched with patients' X-ray data.
- A validated algorithm (Table 1) classified cases as appropriate, inappropriate/premature, or inconclusive for timeliness of TKR.<sup>1</sup>
- A multinomial logistic regression model evaluated the association of timeliness with sex, race, insurance, smoking status, Charlson comorbidity index, weight class, and the patient reported pre-operative measures Oswestry Lower Back Pain score and SF-36 PCS/MCS.

Variable	Category	N (%)
Symptoms, N (%) (Based on combined WOMAC pain and function scores)	Slight	85 (3.6)
	Moderate	225 (9.4)
	Intense	483 (20.2)
	Severe	1595 (66.8)
Kellgren Lawrence grade, N (%)	<3	158 (6.5)
	3	1170 (49.0)
	4	1060 (44.4)
No. of knee compartments with radiographic osteoarthritis, N (%) (Based on lateral and medial TF joint space OARSI grading, patellofemoral joint with OA)	0	21 (0.9)
	1	238 (10.0)
	2	1955 (81.9)
	3	174 (7.3)
Age in years, N(%)	<55 years old	896 (37.5)
	55-65 years old	245 (10.3)
	>65 years old	1247 (52.2)
Limited Mobility, N (%) (Based on Pre-operative KOOS difficulty twisting/pivoting on your injured knee)	Limited	2214 (92.7)

## Results:

- Criteria were successfully applied to 2,396 TKRs.
- Patient had a mean age 66.2 years, were 60% female and 91% White.
- Patients were insured mainly by either Medicare (49%) or Private (41%) insurance
- Most patients were either past smokers (42%) or non-smokers (51%)
- Majority of patients had either one (20%) or no comorbidities (58%)
- Majority of patients were either overweight (32%) or obese (51%)



## Conclusion:

- The criteria classified the 85% of TKR patients as appropriate or inconclusive timing.
- Premature/inappropriate TKR timing was more likely in patients with better SF-36 physical & mental scores and no low back pain.
- This highlights the importance of patient reported overall physical and mental health in determining the timing of TKR.

	Inappropriate vs. Appropriate Odds Ratio (CI)	Inconclusive vs. Appropriate Odds Ratio (CI)
<b>Sex: Female vs. Male (ref)</b>	<b>0.73**</b> (0.56, 0.95)	0.95 (0.69, 1.30)
<b>Race: Black vs. White (ref)</b>	0.97 (0.54, 1.74)	1.54 (0.84, 2.82)
<b>Other vs. White (ref)</b>	1.54 (0.64, 3.67)	1.07 (0.31, 3.69)
<b>Insurance: Private vs. Medicare (ref)</b>	<b>2.32**</b> (1.69, 2.93)	<b>1.39**</b> (1.01, 1.92)
<b>Other vs. Medicare (ref)</b>	<b>2.16**</b> (1.32, 3.53)	<b>2.03**</b> (1.19, 3.47)
<b>Smoking: Current vs. Never (ref)</b>	<b>3.34**</b> (1.96, 5.70)	<b>2.38**</b> (1.14, 4.96)
<b>Past vs. Never (ref)</b>	0.82 (0.63, 1.07)	<b>1.40**</b> (1.03, 1.91)
<b>Charlson Index: 1 vs. 0 (ref)</b>	0.97 (0.69, 1.34)	1.29 (0.89, 1.86)
<b>2-5 vs. 0 (ref)</b>	1.02 (0.64, 1.61)	1.01 (0.58, 1.76)
<b>6+ vs. 0 (ref)</b>	0.70 (0.42, 1.17)	0.90 (0.52, 1.55)
<b>Weight: Under vs Normal (ref)</b>	0.94 (0.46, 1.93)	0.67 (0.26, 1.74)
<b>Overweight vs Normal (ref)</b>	0.92 (0.60, 1.41)	1.32 (0.82, 2.14)
<b>Obese vs Normal (ref)</b>	0.93 (0.62, 1.39)	0.69 (0.43, 1.13)
<b>Preop SF-36 MCS (per 1 unit increase)</b>	<b>1.01**</b> (1.00, 1.02)	<b>1.02**</b> (1.00, 1.04)
<b>Preop SF-36 PCS (per 1 unit increase)</b>	<b>1.08**</b> (1.07, 1.10)	<b>1.06**</b> (1.04, 1.08)
<b>Backpain: Mild vs None (ref)</b>	<b>0.71**</b> (0.51, 0.97)	0.82 (0.57, 1.18)
<b>Moderate vs None (ref)</b>	0.89 (0.61, 1.28)	0.66 (0.42, 1.05)
<b>Severe vs None (ref)</b>	1.74 (0.98, 3.10)	1.17 (0.56, 2.45)

\*\* P-value<0.05; \* P-value< 0.10

## References:

- Riddle DL, Jiranek WA, Hayes CW. Use of a validated algorithm to judge the appropriateness of total knee arthroplasty in the United States: a multicenter longitudinal cohort study. Arthritis Rheumatol. 2014 Aug;66(8):2134-43. doi: 10.1002/art.38685.

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