Patient Characteristics and Factors Affecting Total Knee Replacement Decision-Making by Different Physician Types Treating Knee Osteoarthritis Patients

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Background

- Total knee replacement (TKR) is an effective knee osteoarthritis (OA) treatment and commonly performed orthopedic procedure that relieves pain and improves function and quality of life.[1]
- In a real-world assessment, up to 34% of patients reported persistent pain following surgery,[2] and comorbidities may limit surgical candidacy.[3,4]
- The objective of this retrospective observational chart review was to identify the real-world percentage and distribution of TKR surgical candidates across treating specialties (orthopedic surgeons [OS], rheumatologists [RH], sports medicine [SM] physicians, and pain specialists [PS]) and gain insight into patient characteristics that influence TKR candidacy decisions.

Methods

- For this study, which was conducted between March and April 2019, board-certified physicians seeing ≥10 knee OA patients per week participated in an interview about their 2 most recent knee OA patients. In total, 854 patient charts were reviewed across all specialties. Interviews (structured questions and answers) assessed demographics, referral patterns, comorbidities, time to treatment, imaging use, TKR candidacy, and reasons for noncandidacy.
- Since no patient-identifying information was included, this project was exempt from IRB review and HIPAA consent. As this study was designed to assess effect modifications, a confidence level of 90% was used.
- Limitations included potential selection bias, confounding by risk factors, inability to show causation, small subgroup sample sizes, and missing data.
- Reasons for TKR noncandidacy were not mutually exclusive; thus, the predominant reason for noncandidacy was not identified.

Discussion and Conclusions

- **Predominant TKR noncandidacy reasons were well-controlled symptoms/not needed (65%) and patient preference (29%), in addition to usual patient factors.**
- **The pattern of reasons for TKR noncandidacy was broadly similar across physician types; however, pain specialists had a higher percentage of patients with multimorbidity and worse overall health than other specialists. This may have also impacted patient preference.**
- **Although causation could not be identified, this analysis showed a substantial percentage of patients were not TKR candidates, highlighting the importance of patient factors in knee OA management and identifying a continued need for effective nonsurgical treatments.**

Results

Table 1. Demographic and Clinical Characteristics Stratified by Diagnosing Physician

	Total Patients N=854	Ortho Surgeons (OS) n=352	Rheumatologists (RH) n=250	Sports Medicine (SM) n=152	Pain Specialists (PS) n=100
Mean age (years)	65.2	65.5[C]	65.4[C]	63.3	66.3[C]
65 years of age or older (total)	56% (n=476)	56% (n=198)[C]	58% (n=145)[C]	47% (n=71)	62% (n=62)[C]
Male	49% (n=419)	53% (n=185)[B]	42% (n=106)	51% (n=77)	51% (n=51)
Female	51% (n=435)	47% (n=167)	58% (n=144)[A]	49% (n=75)	49% (n=49)
Mean BMI	30.7	30.2	29.8	33.0[AB]	31.6[AB]
BMI ≥35	22% (n=189)	17% (n=61)	18% (n=45)	32% (n=49)[AB]	34% (n=34)[AB]
Not currently employed (total)	59% (n=503)	57% (n=201)	60% (n=150)	52% (n=79)	73% (n=73)[ABC]
- Due to functional dysfunction	7% (n=30)	5% (n=8)	7% (n=10)	5% (n=3)	15% (n=9)[ABC]
Mean pain (0–10 NRS)	5.6	5.5	5.5	5.5	6.5[ABC]
Bilateral OA (total)	50% (n=428)	41% (n=146)	62% (n=96)[ACD]	49% (n=77)	51% (n=49)
Comorbidities					
Average # of comorbidities	2.6	2.3	2.6[A]	2.8[A]	3.2[AB]
Hypertension	57% (n=485)	59% (n=206)	57% (n=142)	57% (n=87)	50% (n=50)
Obesity	38% (n=326)	33% (n=117)	40% (n=99)[A]	46% (n=70)	40% (n=40)
Hyperlipidemia	33% (n=279)	28% (n=98)	36% (n=89)[A]	41% (n=63)[AD]	29% (n=29)
Type 2 diabetes	25% (n=210)	22% (n=76)	22% (n=54)	33% (n=50)[AB]	30% (n=30)[A]
Chronic back pain	21% (n=182)	17% (n=60)	19% (n=48)	24% (n=36)[A]	38% (n=38)[ABC]
Anxiety/depression	19% (n=160)	17% (n=59)	16% (n=41)	21% (n=32)	28% (n=28)[AB]
CVD	18% (n=155)	18% (n=64)	15% (n=38)	17% (n=26)	27% (n=27)[ABC]

Key: Statistical significance, P<0.1; A: versus orthopedic surgeons, B: versus rheumatologists, C: versus sports medicine physicians, D: versus pain specialists

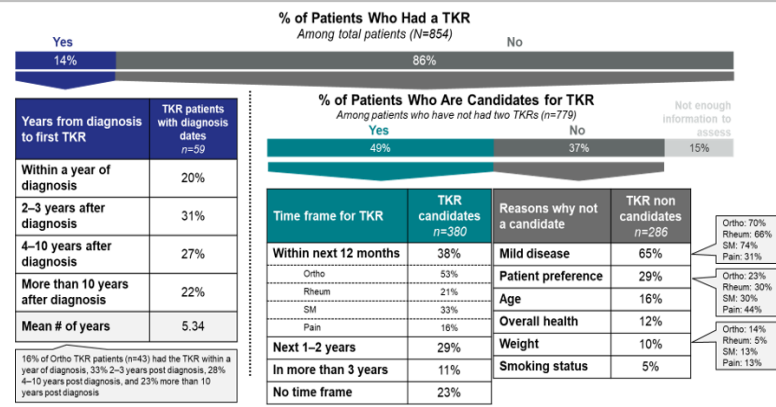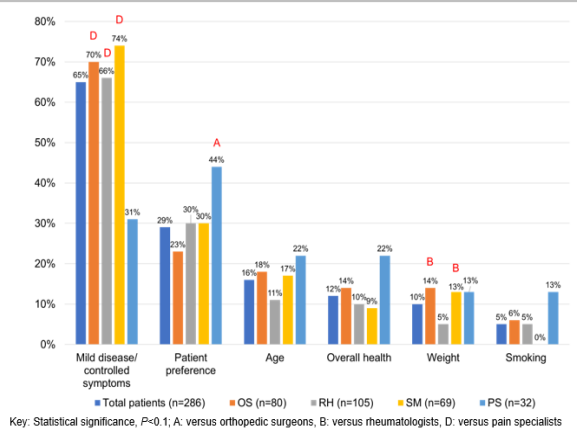### Figure 1. Patients' Path to TKR

% of Patients Who Had a TKR
Among total patients (N=854)

Yes 14% | No 86%

Years from diagnosis to first TKR	TKR patients with diagnosis dates n=59
Within a year of diagnosis	20%
2–3 years after diagnosis	31%
4–10 years after diagnosis	27%
More than 10 years after diagnosis	22%
Mean # of years	5.34

16% of Ortho TKR patients (n=43) had the TKR within a year of diagnosis, 33% 2–3 years post diagnosis, 28% 4–10 years post diagnosis, and 23% more than 10 years post diagnosis

% of Patients Who Are Candidates for TKR
Among patients who have not had two TKRs (n=779)

Yes 49% | No 37% | Not enough information to assess 15%

Time frame for TKR	TKR candidates	Reasons why not a candidate	TKR non candidates n=286
Within next 12 months	38%	Mild disease	65%
Ortho	53%		
Rheum	21%	Patient preference	29%
SM	33%	Age	16%
Pain	16%	Overall health	12%
Next 1–2 years	29%	Weight	10%
In more than 3 years	11%	Smoking status	5%
No time frame	23%		

Mild disease non candidates: Ortho: 70%, Rheum: 66%, SM: 74%, Pain: 31%
Patient preference: Ortho: 23%, Rheum: 30%, SM: 30%, Pain: 44%
Weight: Ortho: 14%, Rheum: 5%, SM: 13%, Pain: 13%

KL grades were assessed in 369 knees (Mean KL grade: 3; KL1: 10 [2.7%], KL2: 89 [24.1%], KL3: 161 [43.6%], KL4: 109 [29.6%]).

Figure 2. Reasons for TKR Noncandidacy

Mild disease/controlled symptoms: Total patients 65%, OS 70%, RH 66%, SM 74%, PS 31%
Patient preference: Total patients 29%, OS 23%, RH 30%, SM 30%, PS 44%
Age: Total patients 16%, OS 18%, RH 11%, SM 17%, PS 22%
Overall health: Total patients 12%, OS 14%, RH 10%, SM 9%, PS 22%
Weight: Total patients 10%, OS 14%, RH 5%, SM 13%, PS 13%
Smoking: Total patients 5%, OS 6%, RH 5%, SM 0%, PS 13%

Legend: Total patients (n=286), OS (n=80), RH (n=105), SM (n=69), PS (n=32)

Key: Statistical significance, P<0.1; A: versus orthopedic surgeons, B: versus rheumatologists, D: versus pain specialists

References: 1) Skou ST, et al. *N Engl J Med.* 2015; 373:1597–1606. 2) Beswick AD, et al. *BMJ Open.* 2012; 2(1):e000435. 3) Podmore B, et al. *BMJ Open.* 2018;8:e021784. 4) Thiese MS, et al. *J Thorac Dis. 2016*;8(9):E928–31.