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Keeping you active.

Patellofemoral Arthroplasty is Great! (If you like to do revision surgery…)

Chancellor F. Gray, MD

September 20, 2024

Disclosures: This is an operation I don’t do. And (probably) won’t ever do.

Top 5 Reasons Why “Never Have I Ever”

#5. No one is an expert. Literally no one.

Table 3.K1 Number and percentage of primary knee replacements by fixation, constraint and bearing.

Fixation, constraint and bearing type	Number of primary knee operations	Percentage of each constraint type used within each method of fixation	Percentage of all primary knee operations
All types	**1,442,051**		**100.0**
Total knee replacement			
All cemented	**1,206,605**		**83.7**
unconstrained, fixed	832,844	69.0	57.8
unconstrained, mobile	41,741	3.5	2.9
posterior-stabilised, fixed	284,858	23.6	19.8
posterior-stabilised, mobile	13,486	1.1	0.9
constrained condylar	12,225	1.0	0.8
monobloc polyethylene tibia	19,151	1.6	1.3
pre-assembled/hinged/linked	2,300	0.2	0.2
All uncemented	**48,781**		**3.4**
unconstrained, fixed	19,115	39.2	1.3
unconstrained, mobile	25,860	53.0	1.8
posterior-stabilised, fixed	3,510	7.2	0.2
other constraints	296	0.6	<0.1
All hybrid	**10,116**		**0.7**
unconstrained, fixed	6,593	65.2	0.5
unconstrained, mobile	2,184	21.6	0.2
posterior-stabilised, fixed	923	9.1	0.1
other constraints	416	4.1	<0.1
Unicompartmental knee replacement			
All unicondylar, cemented	**103,385**		**7.2**
fixed	46,346	44.8	3.2
mobile	50,506	48.9	3.5
monobloc polyethylene tibia	6,533	6.3	0.5
All unicondylar, uncemented/hybrid	**33,508**		**2.3**
fixed	1,421	4.2	0.1
mobile	31,611	94.3	2.2
monobloc polyethylene tibia	476	1.4	<0.1
Patellofemoral	**16,476**		**1.1**
Multicompartmental	**622**		**<0.1**
Unconfirmed	**22,558**		**1.6**

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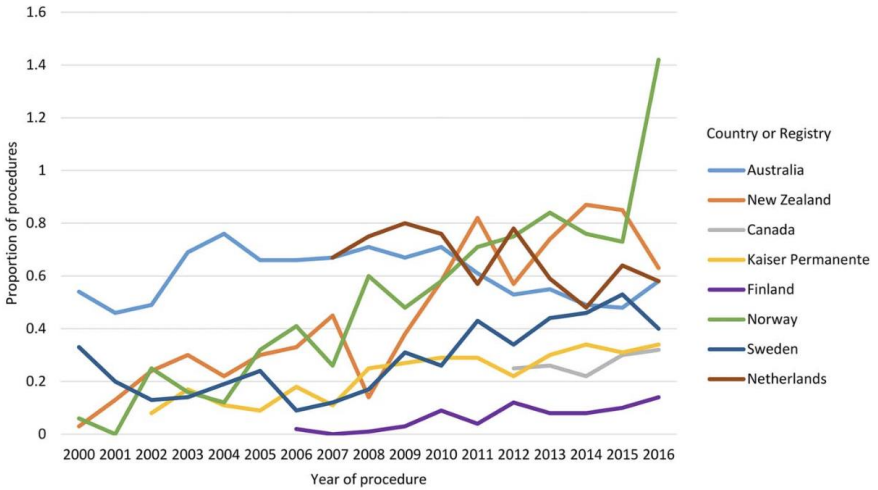

Fig. 1 This graph shows the proportion of primary patellofemoral arthroplasty procedures per year by country or registry.

Lewis PL et al, CORR 2020

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Top 5 Reasons Why “Never Have I Ever”

#5. No one is an expert. Literally no one.

#4. Mental health impacts the results even more than primary TKA

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Significant Functional Improvement at 2 Years After Isolated Patellofemoral Arthroplasty With an Onlay Trochlear Implant, But Low Mental Health Scores Predispose to Dissatisfaction

Gregory S. Kazarian, BS [a], T. David Tarity, MD [a], Erik N. Hansen, MD [b], Jenny Cai [a], Jess H. Lonner, MD [a]

[a] Rothman Institute, Thomas Jefferson University, Philadelphia, Pennsylvania
[b] University of California, San Francisco, California

Table 4
Average MH and MH Summary Scores for Satisfied vs Unsatisfied Patients, and Patients With Expectations Met vs Not Met (MH = Mental Health).

	MH	MH Summary
Satisfied	84	333
Not satisfied	67	259
Significance	$P < .001$	$P < .0001$
Expectations met	83	327
Expectations not met	66	253
Significance	$P < .001$	$P < .01$

"Despite these improvements, new Knee Society scores indicated that **fewer than two-thirds of patients were satisfied** or had their expectations met. Dissatisfied patients and those whose expectations were not met had significantly lower Mental Health scores according to the Short Form–36 following PFA."

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Top 5 Reasons Why “Never Have I Ever”

#5. No one is an expert. Literally no one.
#4. Mental health impacts the results even more than primary TKA
#3. The majority of patients cannot be optimized for the surgery

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TABLE II Factors to Optimize the Outcome of Patellofemoral Arthroplasty*

Factor	Effect (Negative or Positive)	Ways to Optimize
Patient factors		
Obesity (BMI >30)	Negative	Weight loss
Smoking	Negative	Smoking cessation
Age <40	Negative	Reconsider patients <40
Preoperative opioids or antidepressants	Negative	Preoperative pain regimen and mental health regimen optimization
High patient activity, bent-knee use†	Negative	Reconsider alternative options in these patients
Male sex†	Negative	n/a
Female sex‡	Negative (decreased improvement in PROMs)	Preoperative assessment of psychosocial factors
Unrealistic patient expectations†	Negative	Set clear expectations
Anatomic factors		
Previous surgeries or extensive soft tissue trauma associated with residual quadriceps atrophy†	Negative	Assess for preoperatively and counsel patient appropriately
Ligamentous tibiofemoral instability†	Negative	
Previous arthrofibrosis in the index joint†	Negative	
Previous meniscectomy†	Negative	
Chondrocalcinosis†	Negative	
Patella alta†	Negative	
Primary osteoarthritis†	Negative	

Bond EC, JBJS Reviews 2023.

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Top 5 Reasons Why “Never Have I Ever”

#5. No one is an expert. Literally no one.
#4. Mental health impacts the results even more than primary TKA
#3. The majority of patients cannot be optimized for the surgery
#2. Too many still are being revised

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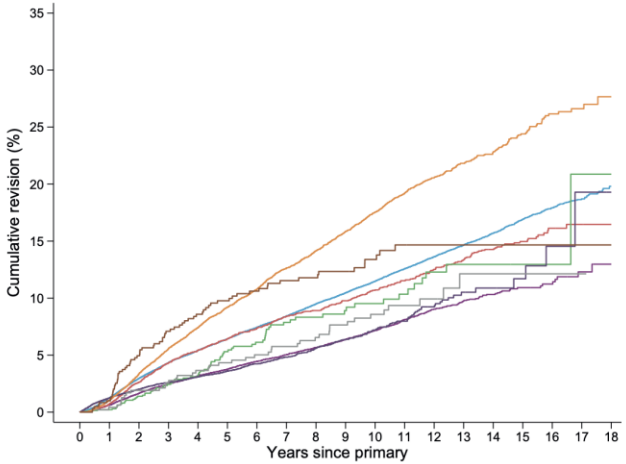
Figure 3.K4 (d) KM estimates of cumulative revision in primary unicondylar or patellofemoral knee replacements by fixation, constraint and bearing. *Blue italics in the numbers at risk table signify that fewer than 250 cases remained at risk at these time points.*



Key:

Numbers at risk

Cemented, fixed	46,346	36,071	24,108	15,718	9,626	5,478	2,775	1,256	440	*56*
Cemented, mobile	50,506	47,423	42,793	37,219	30,454	23,236	15,475	7,924	2,861	379
Cemented, monobloc polyethylene tibia	6,533	5,990	5,190	4,360	3,578	2,715	1,946	1,149	358	*28*
Uncemented/hybrid, fixed	1,421	1,130	765	514	354	252	*156*	*60*	*22*	*<4*
Uncemented/hybrid, mobile	31,611	24,458	15,513	8,027	3,734	1,808	643	*169*	*38*	*<4*
Uncemented/hybrid, monobloc polyethylene tibia	476	457	436	401	344	263	*120*	*34*	*8*	
Patellofemoral	16,476	14,564	11,858	9,205	6,840	4,664	2,795	1,308	441	*62*
Multicompartmental	622	546	475	399	324	*224*	*71*	*21*	*6*	*<4*

Table 3.K5 KM estimates of cumulative revision (95% CI) by fixation, constraint and bearing, in primary knee replacements. *Blue italics signify that fewer than 250 cases remained at risk at these time points.*

Fixation, constraint and bearing type	N	Time since primary					
		1 year	3 years	5 years	10 years	15 years	18 years
All types	**1,442,051**	**0.49 (0.48-0.51)**	**1.71 (1.68-1.73)**	**2.48 (2.45-2.50)**	**4.01 (3.97-4.05)**	**5.66 (5.58-5.73)**	**6.74 (6.57-6.91)**
Unconfirmed	**22,558**	**0.71 (0.61-0.83)**	**2.19 (2.00-2.40)**	**3.10 (2.88-3.35)**	**5.22 (4.90-5.56)**	**7.20 (6.72-7.71)**	*8.35 (7.60-9.18)*
All cemented	**1,206,605**	**0.42 (0.41-0.43)**	**1.44 (1.42-1.46)**	**2.07 (2.04-2.09)**	**3.15 (3.11-3.19)**	**4.26 (4.19-4.33)**	**5.08 (4.91-5.26)**
unconstrained, fixed	832,844	0.38 (0.37-0.40)	1.33 (1.30-1.36)	1.88 (1.85-1.91)	2.83 (2.78-2.87)	3.93 (3.84-4.01)	4.83 (4.61-5.05)
unconstrained, mobile	41,741	0.51 (0.45-0.59)	1.78 (1.65-1.92)	2.64 (2.48-2.81)	4.04 (3.83-4.26)	5.17 (4.88-5.48)	*5.53 (5.05-6.06)*
posterior-stabilised, fixed	284,858	0.48 (0.45-0.50)	1.65 (1.60-1.70)	2.44 (2.38-2.50)	3.83 (3.74-3.92)	4.98 (4.84-5.13)	5.77 (5.40-6.16)
posterior-stabilised, mobile	13,486	0.63 (0.51-0.78)	2.08 (1.84-2.34)	2.82 (2.55-3.13)	4.14 (3.78-4.54)	5.29 (4.77-5.86)	*5.42 (4.85-6.05)*
constrained condylar	12,225	0.97 (0.80-1.16)	2.10 (1.84-2.40)	2.76 (2.44-3.13)	3.93 (3.36-4.60)	*5.24 (4.02-6.83)*	
monobloc polyethylene tibia	19,151	0.35 (0.28-0.45)	1.24 (1.08-1.41)	1.68 (1.49-1.89)	2.18 (1.94-2.45)	2.53 (2.18-2.94)	*2.53 (2.18-2.94)*
pre-assembled/hinged/linked	2,300	2.07 (1.54-2.77)	4.28 (3.47-5.29)	5.95 (4.92-7.18)	8.72 (7.09-10.70)	*10.05 (7.95-12.66)*	
All uncemented	**48,781**	**0.56 (0.49-0.63)**	**2.05 (1.93-2.19)**	**2.78 (2.63-2.94)**	**3.95 (3.76-4.15)**	**5.23 (4.96-5.52)**	**6.19 (5.63-6.79)**
unconstrained, fixed	19,115	0.63 (0.52-0.75)	2.25 (2.04-2.48)	2.91 (2.67-3.18)	4.10 (3.79-4.44)	5.28 (4.86-5.73)	*5.80 (5.13-6.56)*
unconstrained, mobile	25,860	0.49 (0.41-0.58)	1.88 (1.72-2.06)	2.63 (2.43-2.84)	3.67 (3.42-3.93)	4.90 (4.54-5.30)	*5.64 (4.97-6.39)*
posterior-stabilised, fixed	3,510	0.64 (0.42-0.96)	2.27 (1.82-2.83)	3.25 (2.69-3.93)	5.44 (4.61-6.40)	7.62 (6.42-9.04)	*12.18 (8.55-17.20)*
other constraints	296	0.68 (0.17-2.69)	*2.14 (0.97-4.71)*	*2.54 (1.22-5.26)*	*2.98 (1.50-5.88)*		
All hybrid	**10,116**	**0.52 (0.40-0.69)**	**1.69 (1.45-1.97)**	**2.33 (2.04-2.66)**	**3.51 (3.13-3.93)**	**4.36 (3.89-4.89)**	*4.87 (4.23-5.62)*
unconstrained, fixed	6,593	0.46 (0.32-0.66)	1.59 (1.31-1.93)	2.19 (1.86-2.59)	3.20 (2.77-3.69)	3.99 (3.47-4.59)	*4.20 (3.61-4.88)*
unconstrained, mobile	2,184	0.92 (0.60-1.43)	1.83 (1.34-2.49)	2.37 (1.79-3.13)	3.85 (2.94-5.02)	*5.71 (4.13-7.86)*	*6.83 (4.49-10.32)*
posterior-stabilised, fixed	923	0	1.94 (1.15-3.27)	3.39 (2.20-5.20)	5.42 (3.74-7.82)	*5.80 (4.01-8.34)*	
other constraints	416	0.48 (0.12-1.92)	2.20 (1.15-4.19)	2.95 (1.69-5.13)	*4.85 (3.07-7.64)*	*5.39 (3.42-8.46)*	
All unicondylar, cemented	**103,385**	**0.95 (0.89-1.01)**	**3.58 (3.46-3.70)**	**5.41 (5.26-5.56)**	**10.03 (9.80-10.27)**	**15.17 (14.78-15.58)**	**17.90 (17.11-18.73)**
fixed	46,346	0.62 (0.55-0.69)	2.48 (2.32-2.64)	3.77 (3.56-3.98)	7.17 (6.77-7.58)	10.92 (10.09-11.81)	*12.98 (11.15-15.07)*
mobile	50,506	1.26 (1.17-1.36)	4.34 (4.16-4.52)	6.42 (6.21-6.65)	11.47 (11.17-11.79)	16.90 (16.42-17.40)	19.80 (18.88-20.77)
monobloc polyethylene tibia	6,533	0.72 (0.54-0.96)	4.31 (3.83-4.84)	6.44 (5.84-7.09)	10.69 (9.86-11.58)	14.97 (13.78-16.25)	*16.47 (14.91-18.17)*
All unicondylar, uncemented/hybrid	**33,508**	**1.18 (1.07-1.31)**	**2.59 (2.41-2.78)**	**3.71 (3.48-3.96)**	**7.37 (6.81-7.97)**	*11.51 (9.96-13.27)*	
fixed	1,421	0.22 (0.07-0.68)	2.44 (1.69-3.52)	5.31 (4.02-7.00)	9.52 (7.44-12.15)	*12.96 (9.95-16.78)*	
mobile	31,611	1.24 (1.12-1.37)	2.60 (2.41-2.79)	3.61 (3.37-3.86)	7.20 (6.60-7.86)	*11.70 (9.67-14.13)*	
monobloc polyethylene tibia	476	0.42 (0.11-1.67)	2.56 (1.46-4.47)	4.33 (2.82-6.64)	8.58 (6.24-11.73)	*12.13 (8.49-17.18)*	
Patellofemoral	**16,476**	**1.04 (0.89-1.21)**	**5.56 (5.20-5.93)**	**9.21 (8.74-9.70)**	**17.52 (16.80-18.28)**	**24.40 (23.22-25.63)**	*27.66 (25.55-29.91)*
Multicompartmental	**622**	**1.00 (0.45-2.22)**	**7.09 (5.27-9.51)**	**9.77 (7.58-12.54)**	*13.39 (10.66-16.75)*		

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Top 5 Reasons Why “Never Have I Ever”

#5. No one is an expert. Literally no one.
#4. Mental health impacts the results even more than primary TKA
#3. The majority of patients cannot be optimized for the surgery
#2. Too many still are being revised
#1. When they get revised, they’re higher risk for re-revision

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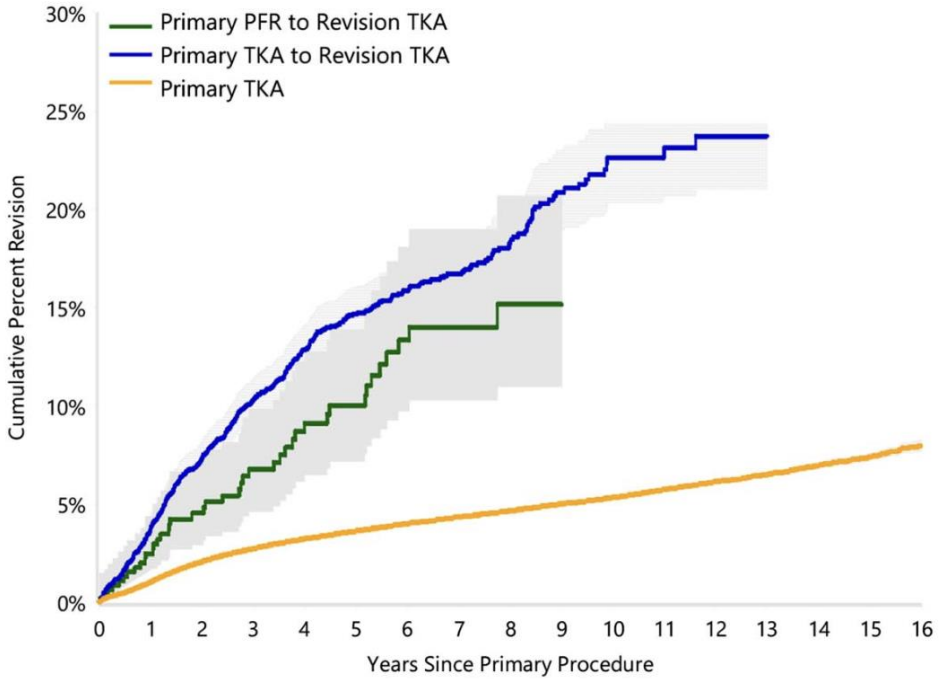

HR - adjusted for age and gender

Primary PFR to Revision TKA versus Primary TKA

Entire Period: HR = 2.39 (1.77, 3.24), p < 0.001

Primary TKA to Revision TKA versus Primary TKA

0 – 1.5 Years: HR = 3.71 (3.25, 4.24), p < 0.001

1.5 Years +: HR = 4.31 (3.84, 4.84), p < 0.001

Primary TKA to Revision TKA versus Primary PFR to Revision TKA

Entire Period: HR = 1.68 (1.23, 2.31), p = 0.001

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#1. When they get revised, they’re higher risk for re-revision
Bonus: I think they look stupid

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Just kidding!
Kind of…

Thank you!