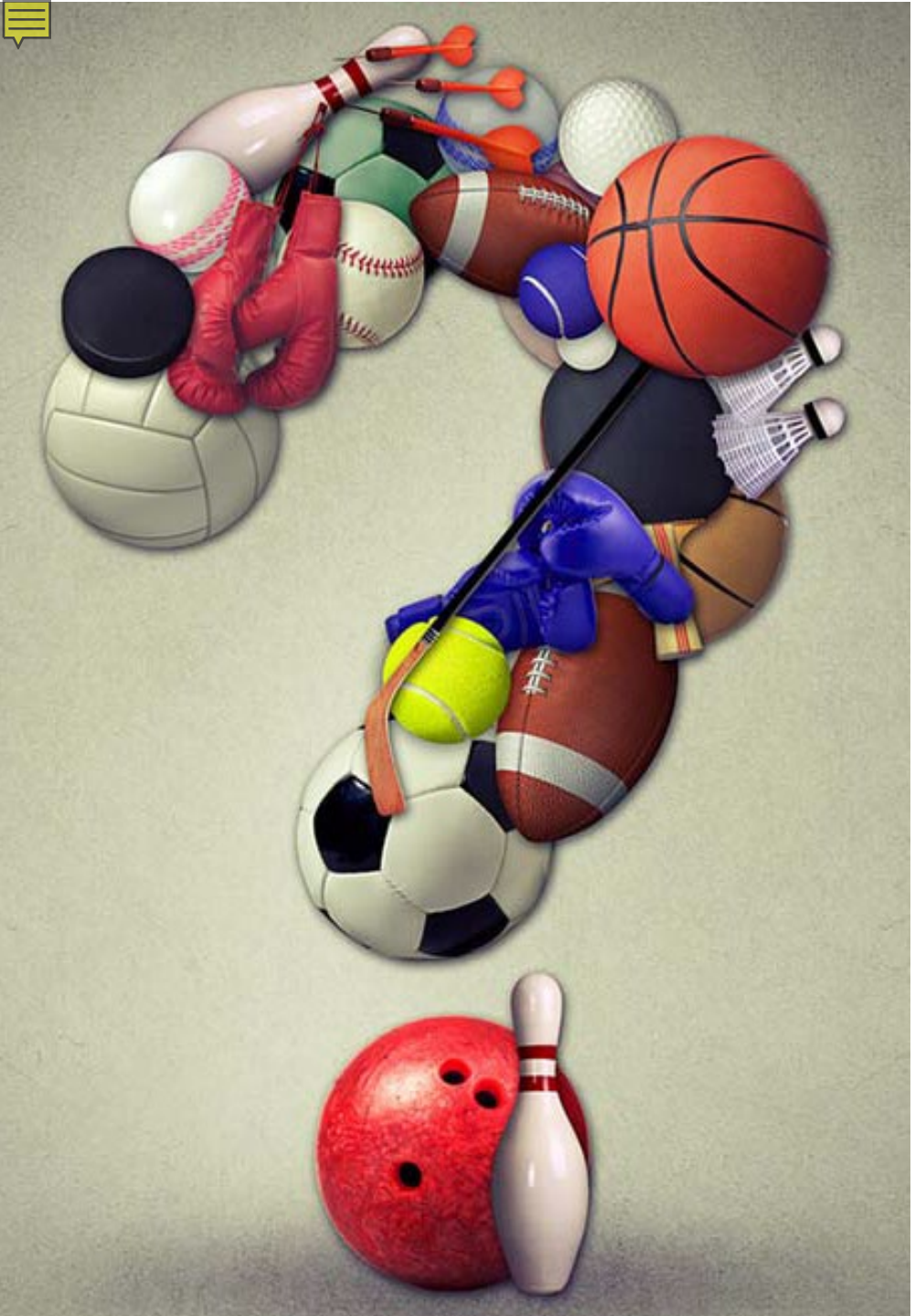


Return to Activity After Total Joints

Jon Edgington, MD

Medical Director of Total Joint Replacements

Objectives

1. Background on hip and knee osteoarthritis (5 minutes)
2. Treatment of hip and knee osteoarthritis (5 minutes)
3. Return to activities after modern total joint replacement (20 minutes)

Background on hip and knee arthritis

- 1 in 5 adults is affected by some form of arthritis
- Arthritis is the leading cause of disability, accounting for 17.5% of those on disability
- Age – Incidence 55-64

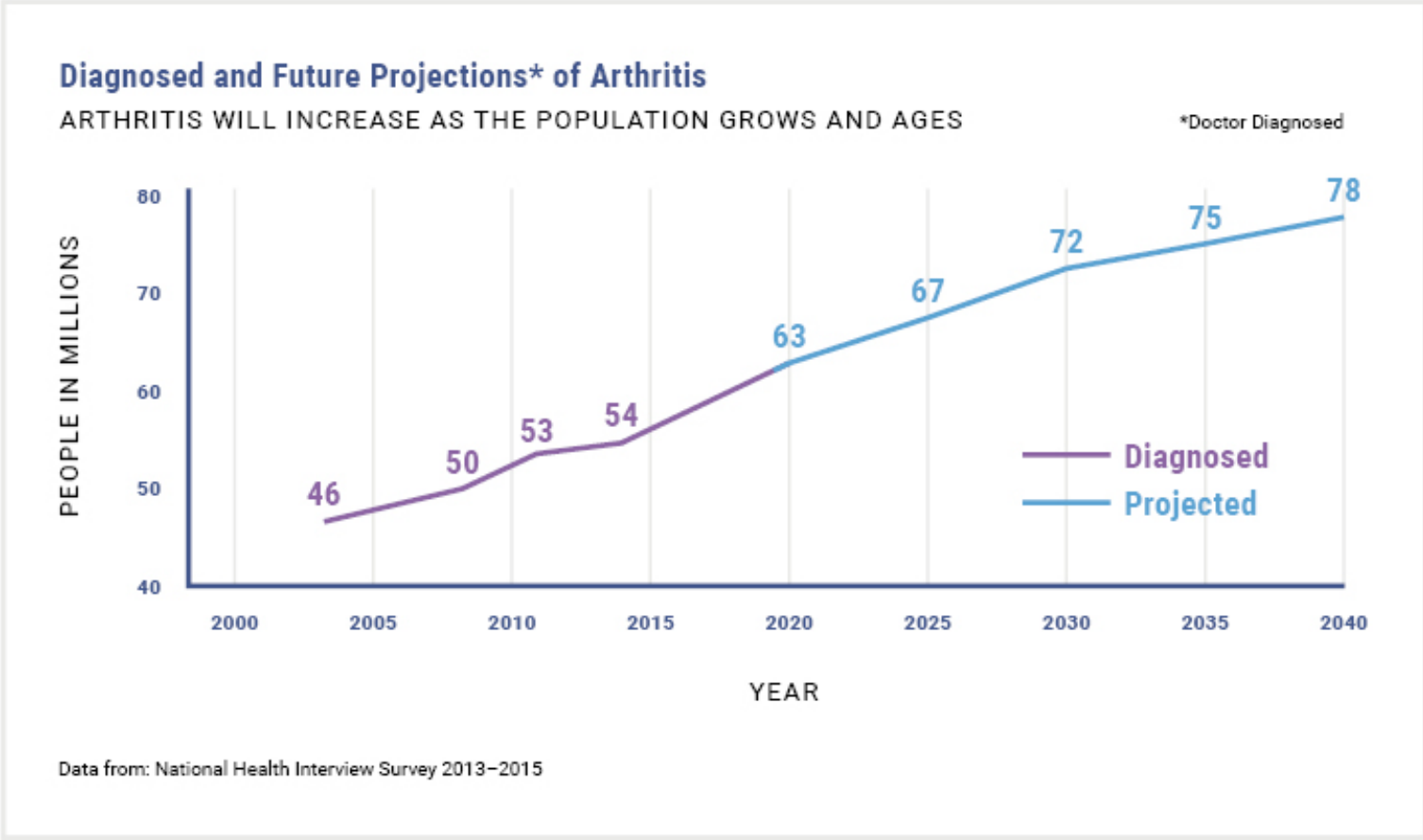
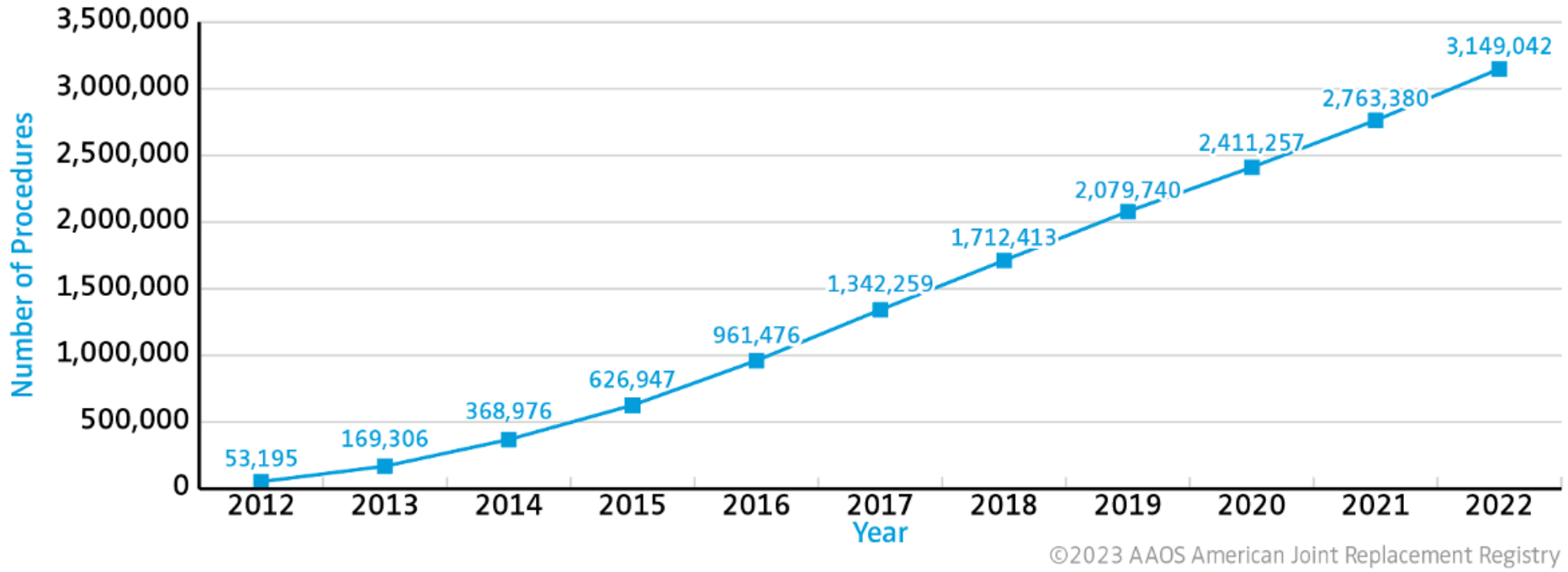


Figure 1.4: Cumulative Procedure Volume, 2012-2022 (N=3,149,042)



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Q1. Which is more common – hip or knee osteoarthritis?

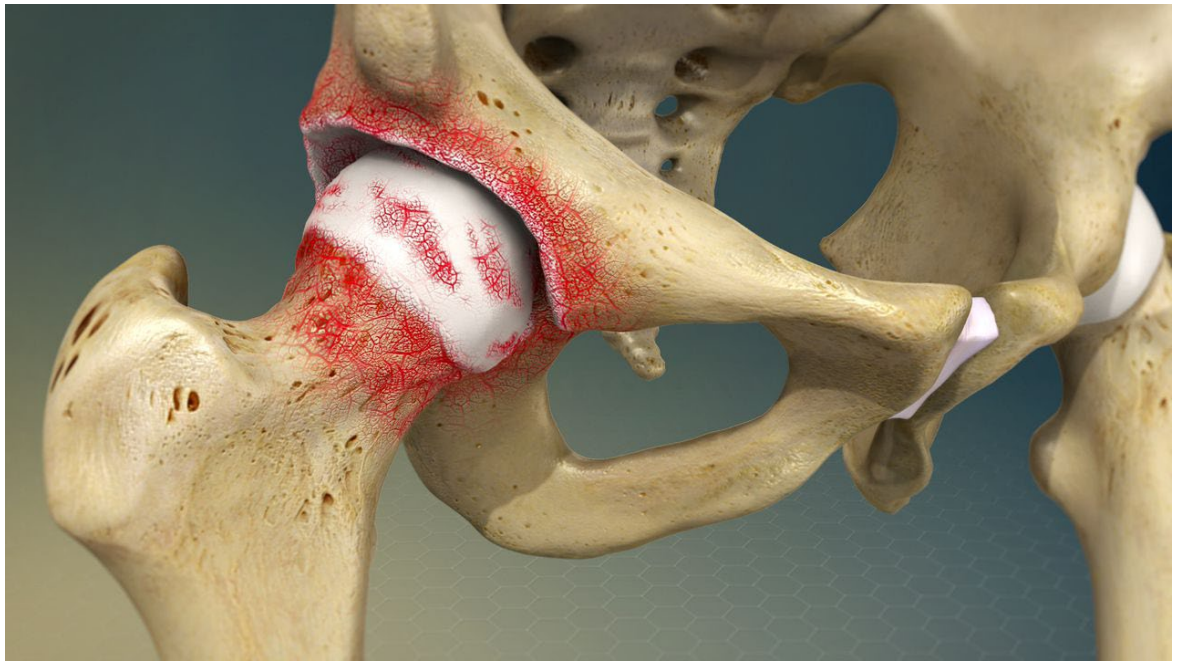
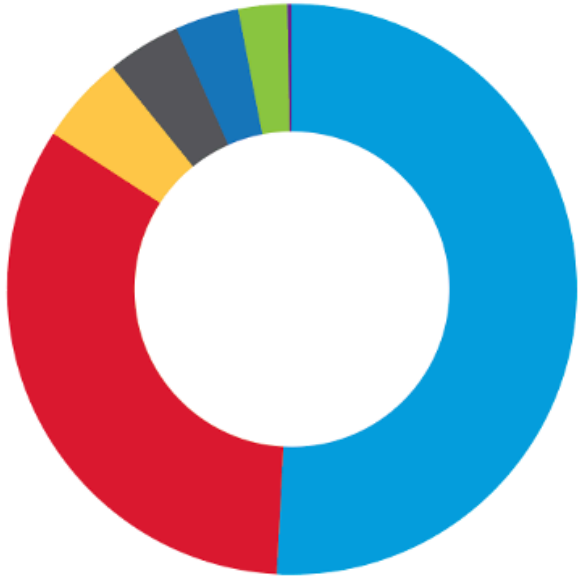


Figure 1.6: Distribution of Arthroplasty Procedures, 2012-2022 (n=3,149,042)



- Total Knee Arthroplasty (n=1,606,678, 51.02%)
- Total Hip Arthroplasty (n=1,050,821, 33.36%)
- Revision Knee Arthroplasty (n=158,438, 5.03%)
- Revision Hip Arthroplasty (n=129,127, 4.10%)
- Hemiarthroplasty (n=114,468, 3.64%)
- Partial Knee Arthroplasty (n=83,011, 2.64%)
- Hip Resurfacing (n=6,499, 0.21%)

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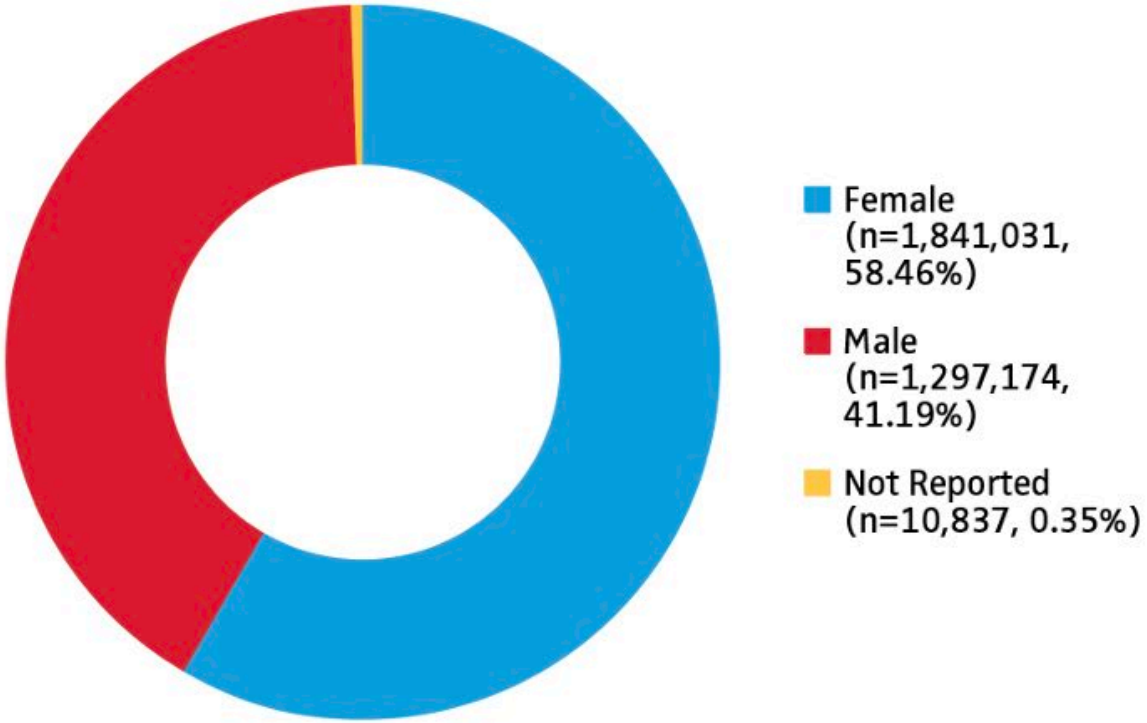
Q2. IS Arthritis more common in men or women?

- Slightly higher rates in women ~60%

Figure 1.7: Sex of Patients Undergoing Procedures, 2012-2022 (n=3,149,042)



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Patient Burden

- Pain
- Depression and isolation
- Activity limitations
- Work limitations

Economic Burden

- Overall burden in the U.S. for osteoarthritis is….
- $136.8 billion!
- Direct costs annually are about $65 billion
- Lost work

CMS.gov

Treatment

- Non-surgical treatment has little to no risk
- Surgery is elective!
  - Blood clots
  - Infection

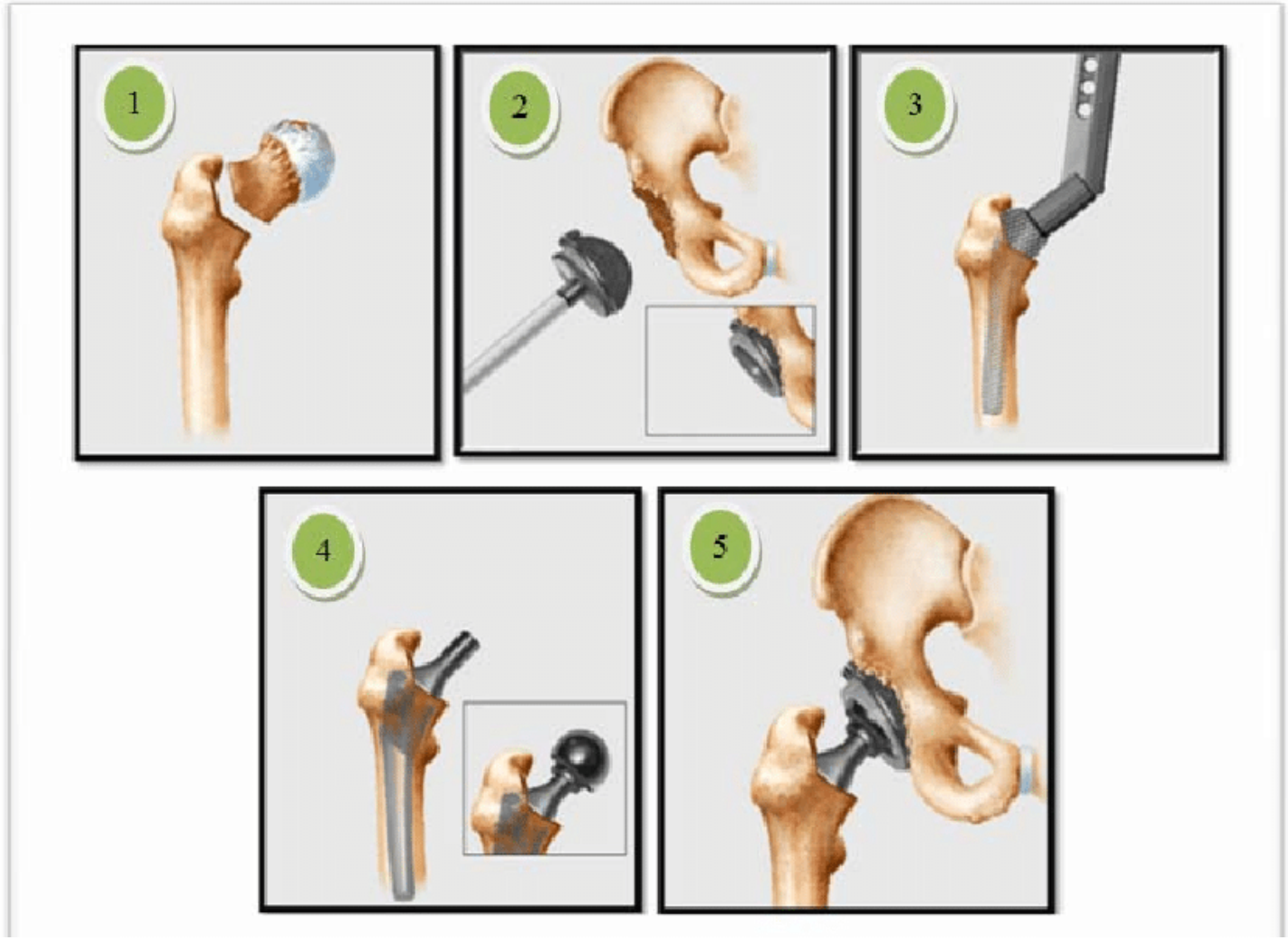
Treatment

- Patient education
- Low-impact exercise
- Physical therapy
- Weight loss
- Assistive devices

- Cane, walker
- Medications
- Anti-inflammatories
- Injections
- Steroids, lubricating gel

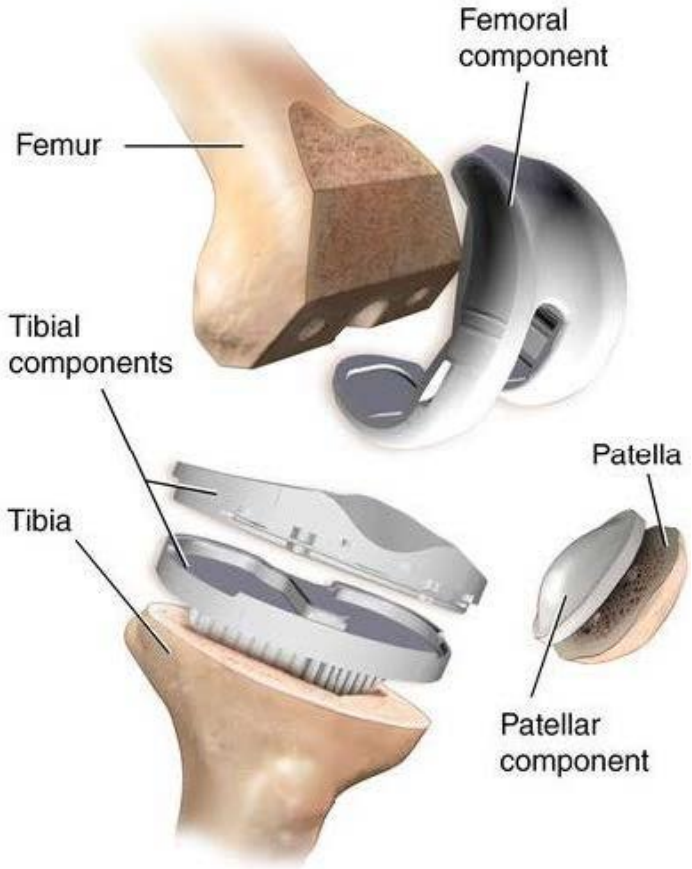
Total hip – Steps

- Remove femoral head
- Place socket
- Place stem
- Plastic spacer
- “Reduce” hip



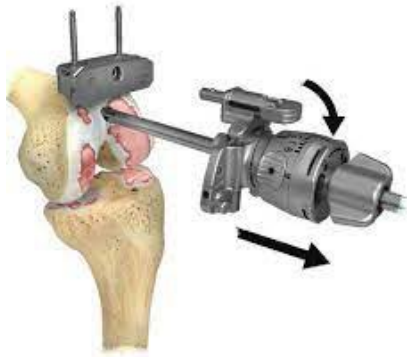
Total knee Steps

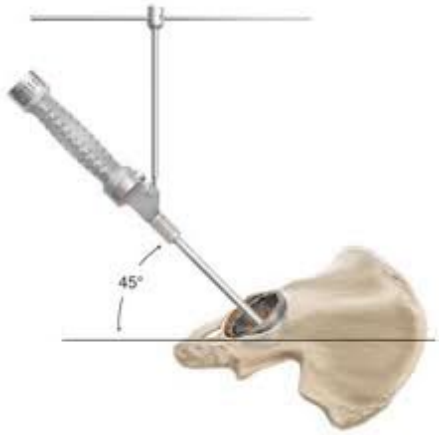
- 5 cuts on the femur
- One cut on the tibia
- **One cut on the patella
- Resurface the ends of bone
- Place plastic spacer



Technology in hip and knee replacement

- 1980 – 1990s





- 2000s – PSI/NAVIGATION

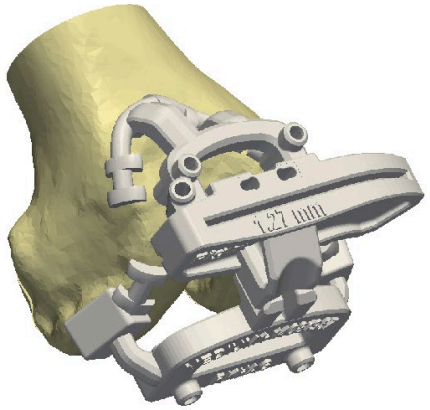


Fig. 1 Femur cut guide

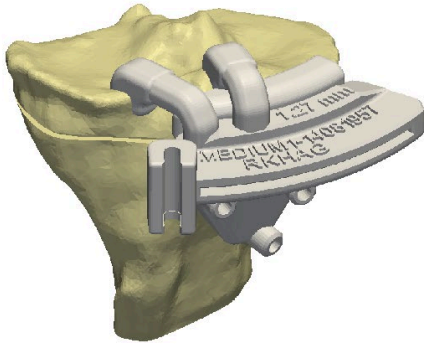
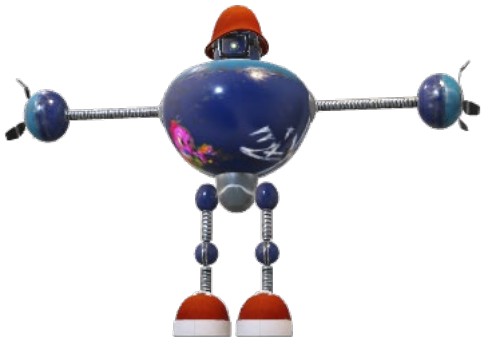


Fig. 2 Tibia cut guide

- 2010 – ROBOTICS



Stop and Summarize

Can or May?

can
ability or permission (neutral)

may
permission (polite)

"Can" and "may" are both used for permission these days. In this cartoon, the grandma is being pedantic, suggesting that "can" is only used for ability.

Return to Activity after total joints – “MAY I?”

- **54 surgeon survey 1999**
- **4 categories**
  - Allowed
  - Allowed with experience
  - Not allowed
  - No conclusion

Review > Am J Sports Med. 2001 May-Jun;29(3):377-88.
doi: 10.1177/03635465010290032301.

Athletic activity after joint replacement

W L Healy [1], R Iorio, M J Lemos

Affiliations + expand

PMID: 11394613 DOI: 10.1177/03635465010290032301

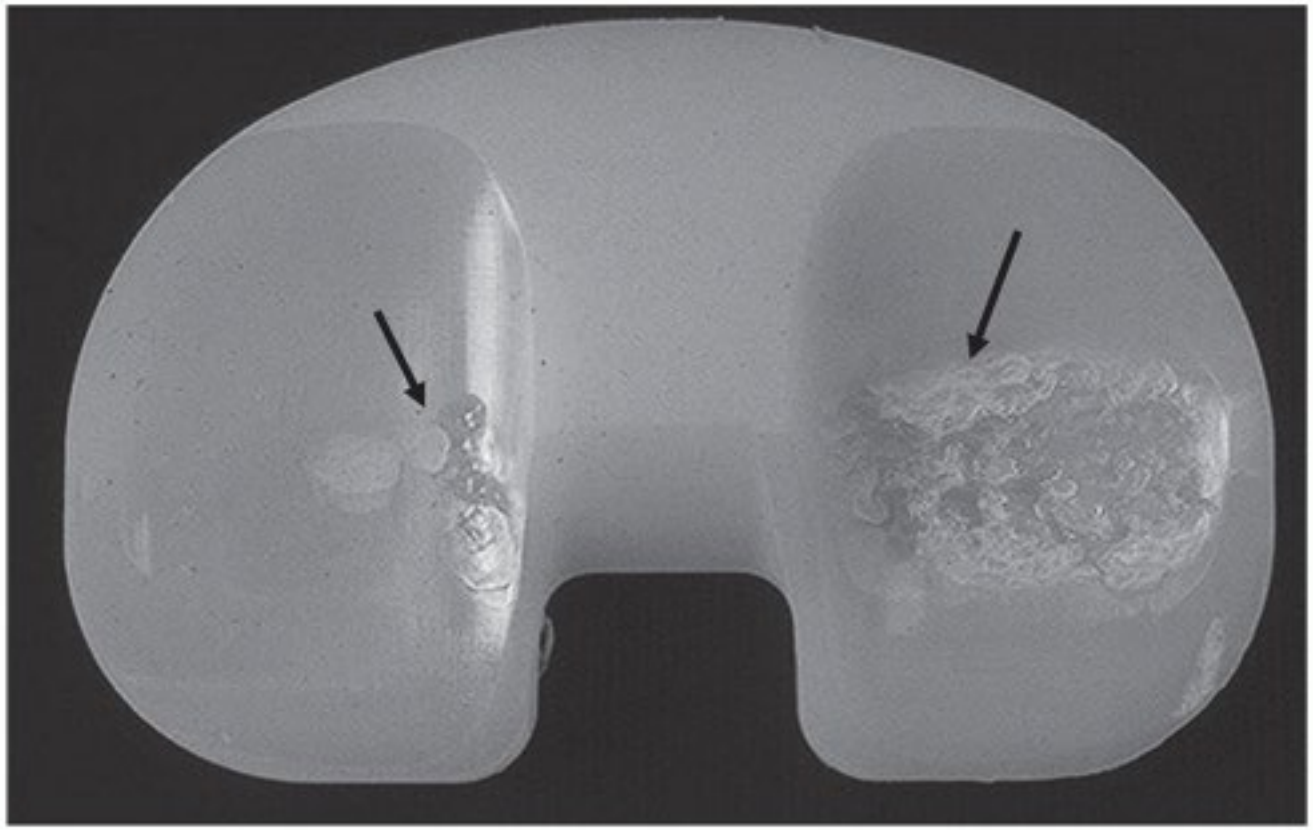
1990s Recommendations

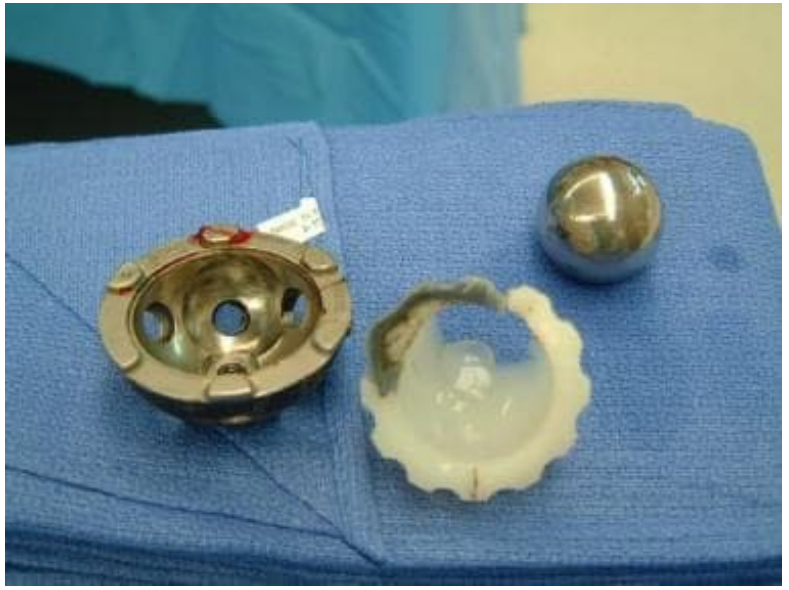
Table 2. Consensus Guidelines for Return to Activities by the Members of the HS and AAHKS

Allow	Allow With Experience	Not Allowed	Undecided
Golf	*Downhill skiing*[1]	Racquetball/squash	Martial arts
Swimming	Cross-country skiing	Jogging	*Singles tennis*[2]
Doubles Tennis	*Weightlifting*[1]	Contact sports (football, basketball, soccer)	
Stairclimber	*Ice Skating/rollerblading*[1]	High-impact aerobics	
Walking	Pilates	Baseball/softball	
Speed walking[1]		Snowboarding	
Hiking[3]			
Stationary skiing[1]			
Bowling[3]			
Treadmill			
Road cycling[3]			
Stationary bicycling			
Elliptical			
Low-impact aerobics[3]			
Rowing[1]			
Dancing (ballroom, jazz, square)[1]			
Weight machines			

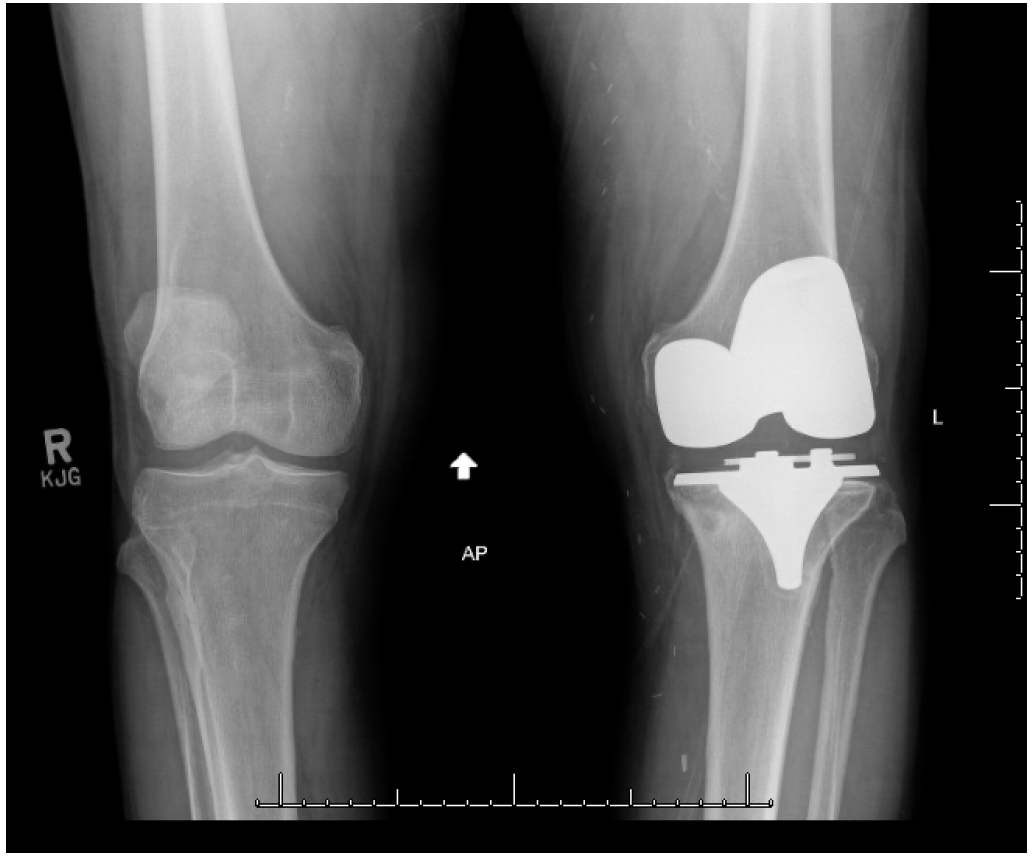
Italic type denotes classification change from a previous study by Healy [12]: 1, change from undecided; 2, change from not allowed; 3, change from allowed with experience; 4, change from allowed. Underline denotes activity not previously described.

WHY Were these consensus?





Wearing out – 3 years post-op



Highly Cross-linked polyethylene – 2000s

High impact? 2000s

- **Jogging, downhill skiing,**
  singles tennis, racquetball, squash and basketball
- **4x week average of 3.5 hours**
- **4 years of follow up**

The Journal of Arthroplasty Vol. 23 No. 6 Suppl. 1 2008

High-Impact Sports After Total Knee Arthroplasty

Michael A. Mont, MD,* David R. Marker, BS,* Thorsten M. Seyler, MD,*
Lynne C. Jones, PhD,† Frank R. Kolisek, MD,‡ and David S. Hungerford, MD†

The Journal of Arthroplasty 35 (2020) 116–120

Contents lists available at ScienceDirect

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journal homepage: www.arthroplastyjournal.org

Primary Arthroplasty

Higher Activity Level Following Total Knee Arthroplasty Is Not Deleterious to Mid-Term Implant Survivorship

David A. Crawford, MD [a, *], Joanne B. Adams, BFA, CMI [a], Gerald R. Hobbs, PhD [b], Keith R. Berend, MD [a, c], Adolph V. Lombardi Jr., MD, FACS [a, c, d]

[a] *Joint Implant Surgeons, Inc., New Albany, OH*
[b] *Department of Statistics, West Virginia University, Morgantown, WV*
[c] *Mount Carmel Health System, New Albany, OH*
[d] *Department of Orthopaedics, The Ohio State University Wexner Medical Center, Columbus, OH*

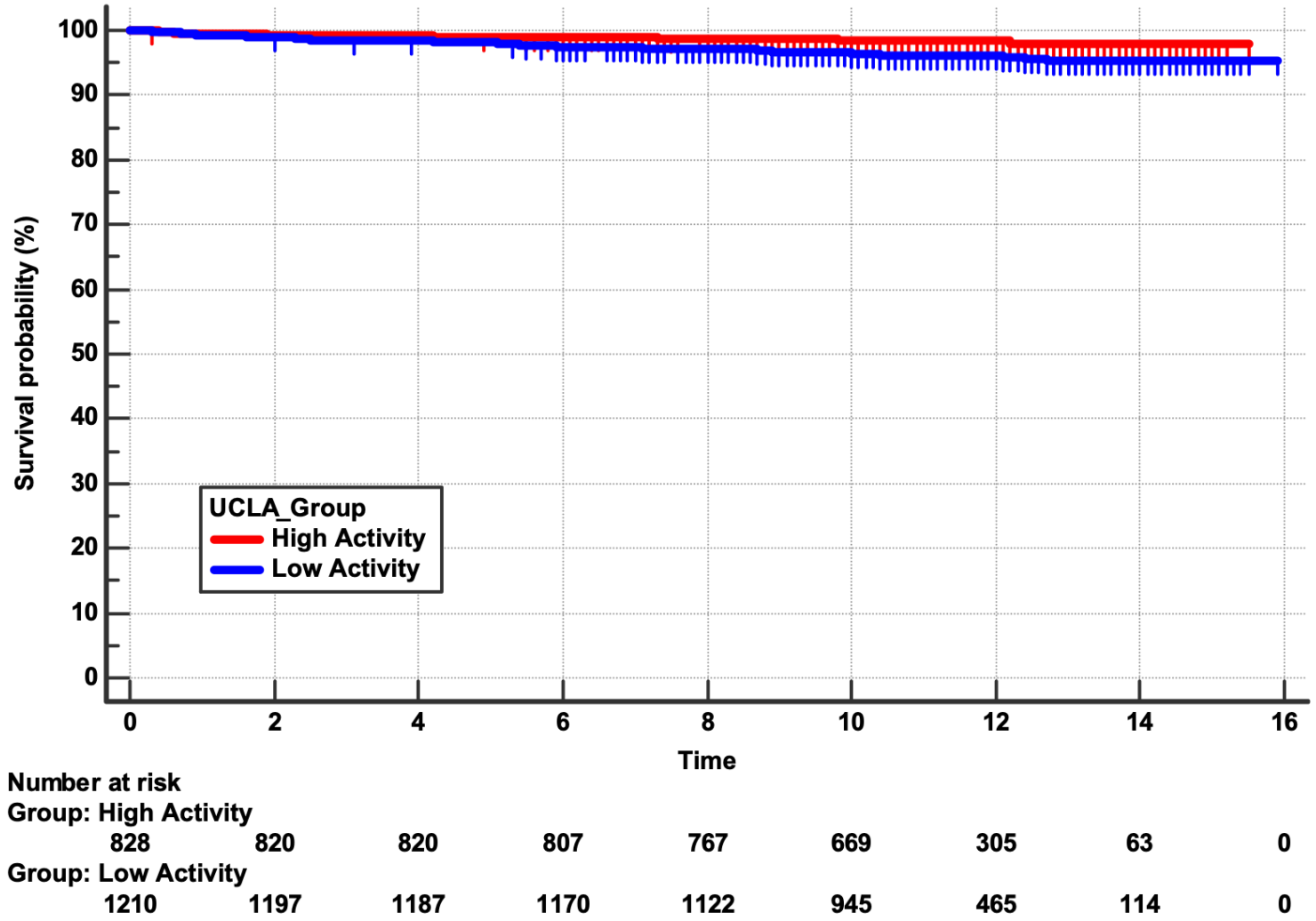

Fig. 1. Kaplan-Meier all-cause survival of low activity and high activity.

The Journal of Arthroplasty 36 (2021) 1645–1654

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Primary Hip

Return to Sports After Total Hip Arthroplasty: A Survey Among Members of the European Hip Society

Check for updates

Martin Thaler, MD, MSc [a], Ismail Khosravi, MD [a,*], David Putzer, PhD, MSc [b], Klaus A. Siebenrock, MD [c], Luigi Zagra, MD [d]

[a] *Department of Orthopaedic Surgery and Traumatology, Medical University of Innsbruck, Innsbruck, Austria*
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[d] *IRCCS Istituto Ortopedico Galeazzi, Hip Department, Milan, Italy*

Table 1
Summary of Recommendations for Endurance Sports.

Follow-Up	Allowed	Allowed When Experienced	Not Allowed	No Opinion	z-test *P* Value	Recommendation
Walking						
6 wk	97%	2%	1%	0%	.001	Recommended
6-12 wk	97%	1%	0%	1%	.001	Recommended
12 wk to 6 mo	96%	1%	0%	3%	.001	Recommended
6 mo	93%	1%	0%	6%	.001	Recommended
Walking stairs						
6 wk	91%	9%	1%	0%	.001	Recommended
6-12 wk	95%	2%	1%	2%	.001	Recommended
12 wk to 6 mo	95%	1%	0%	5%	.001	Recommended
6 mo	93%	1%	0%	6%	.001	Recommended
Jogging						
6 wk	7%	15%	77%	1%	.001	Not recommended
6-12 wk	37%	21%	39%	3%	.15	Undecided
12 wk to 6 mo	70%	11%	15%	5%	.001	Recommended
6 mo	75%	9%	9%	7%	.001	Recommended
Jogging on road						
6 wk	4%	13%	81%	1%	.001	Not recommended
6-12 wk	28%	23%	45%	5%	.001	Not recommended
12 wk to 6 mo	63%	11%	21%	5%	.01	Recommended
6 mo	69%	9%	15%	7%	.001	Recommended
Running						
6 wk	3%	9%	86%	3%	.001	Not recommended
6-12 wk	21%	19%	55%	5%	.35	Undecided
12 wk to 6 mo	51%	17%	26%	5%	.27	Undecided
6 mo	61%	12%	21%	7%	.02	Recommended
Running on a treadmill						
6 wk	7%	17%	73%	3%	.001	Not recommended
6-12 wk	30%	23%	42%	5%	.01	Not recommended
12 wk to 6 mo	60%	15%	19%	6%	.01	Recommended
6 mo	67%	11%	13%	8%	.001	Recommended
Mountain biking/incline cycling						
6 wk	7%	9%	80%	5%	.001	Not recommended
6-12 wk	19%	26%	51%	5%	.03	Not recommended
12 wk to 6 mo	45%	28%	20%	7%	.03	Recommended
6 mo	58%	22%	11%	9%	.001	Recommended
Cycling on even ground						
6 wk	28%	25%	43%	4%	.01	Not recommended
6-12 wk	55%	21%	21%	3%	.001	Recommended
12 wk to 6 mo	73%	17%	4%	6%	.001	Recommended
6 mo	77%	13%	2%	8%	.001	Recommended
Static cycling						
6 wk	73%	19%	7%	1%	.001	Recommended
6-12 wk	81%	12%	4%	3%	.001	Recommended
12 wk to 6 mo	87%	7%	0%	5%	.001	Recommended
6 mo	87%	3%	1%	8%	.001	Recommended

Comparison of Outcomes in High Versus Low Activity Level Patients After Total Joint Arthroplasty

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[b] *Rocky Vista University, Parker, Colorado*
[c] *Department of Mechanical and Materials Engineering, University of Denver, Denver, Colorado*

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ABSTRACT

Background: Activity level (AL) recommendations following total joint arthroplasty (TJA) remain controversial. Our purpose was to compare implant survivorship of high activity (HA) and low activity (LA) patients after primary TJA. We hypothesized that there would be no difference in implant survivorship based on AL.

Methods: This was a retrospective 1:1 matched cohort study after primary TJA with minimum 5-year follow-up. High activity patients were designated by the University of California and Los Angeles activity-level rating scale score $\geq$8 and matched to LA patients based on age ($\pm$5), sex, and body mass index ($\pm$5). There were 396 HA patients (149 knees and 48 hips) who met inclusion criteria. We analyzed revision rates, adverse events, and radiographic lucencies.

Results: Crepitus was the most common adverse events in both HA and LA total knee arthroplasties (TKAs). Adverse events were rare in total hip arthroplasty (THA) cohorts. For both THA and TKA patients, the HA cohort did not have increased reoperations or revisions when compared to the LA cohort. No differences were noted in overall radiographic analysis between HA (16.1%) and LA (12.1%) TKA patients ($P = .318$), and in THA patients, more radiographic problems were noted in LA ($P = .004$).

Conclusion: We found no difference in minimum 5-year postoperative implant survivorship based on AL. This may change AL recommendations after TKA and THA.

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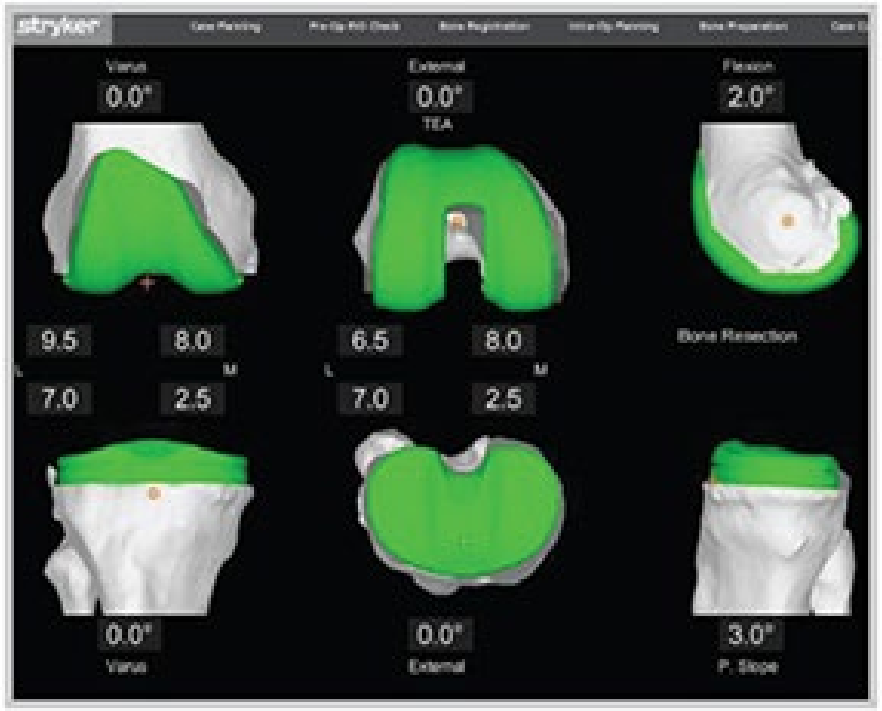
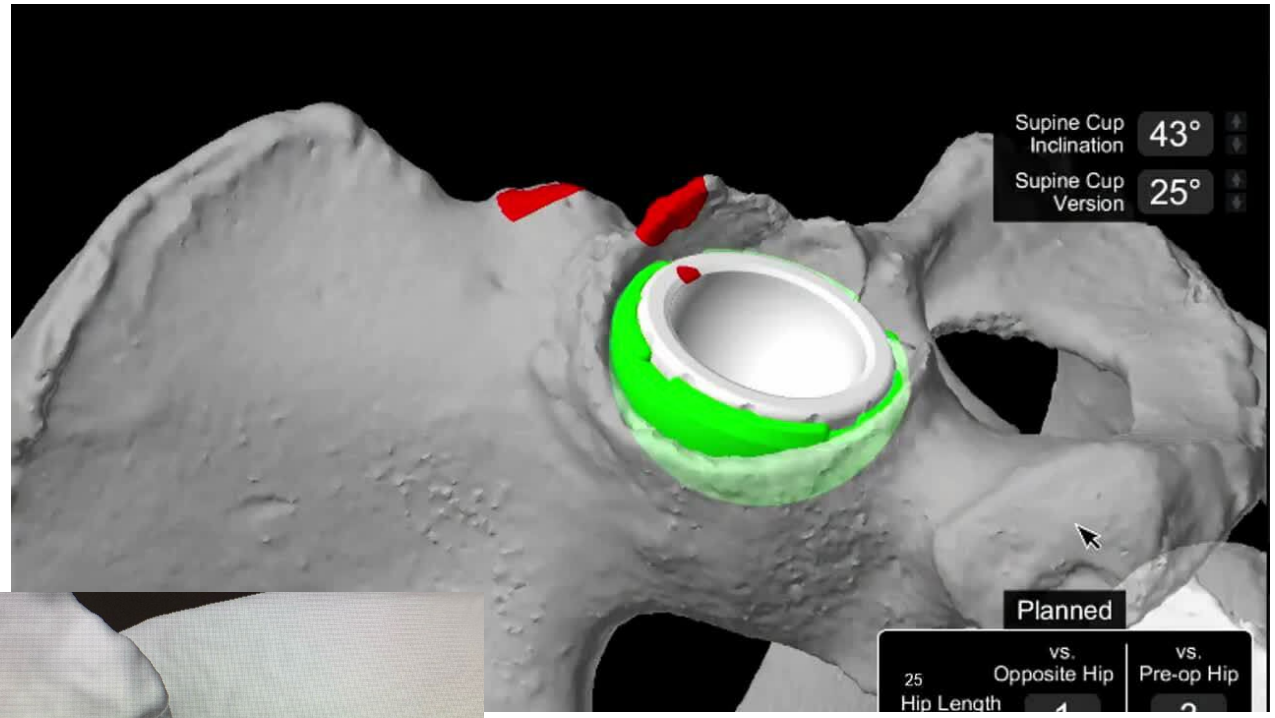
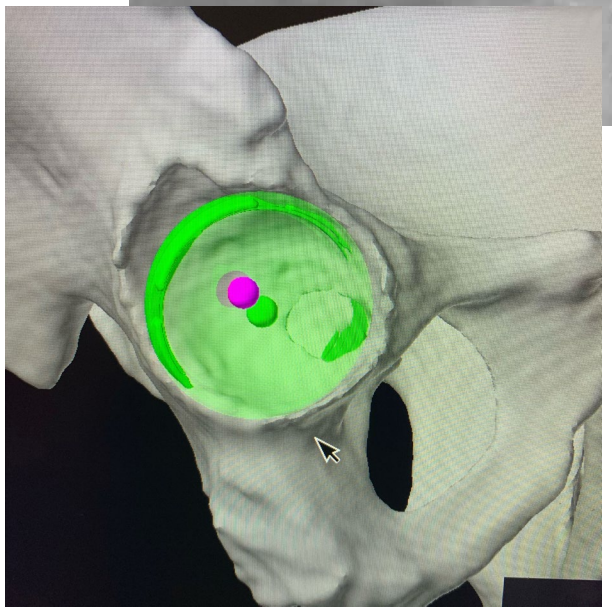
DO AS
YOU
PLEASE

Robotic Platforms

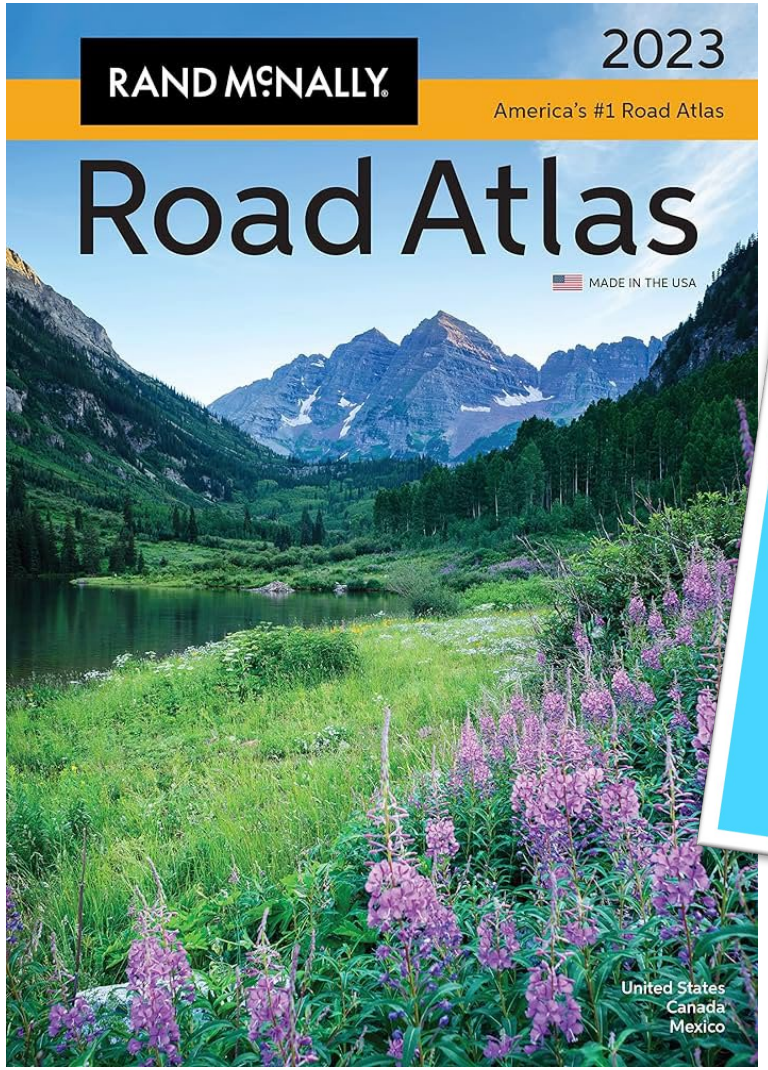






1 Personalized pre-operative plan

Poll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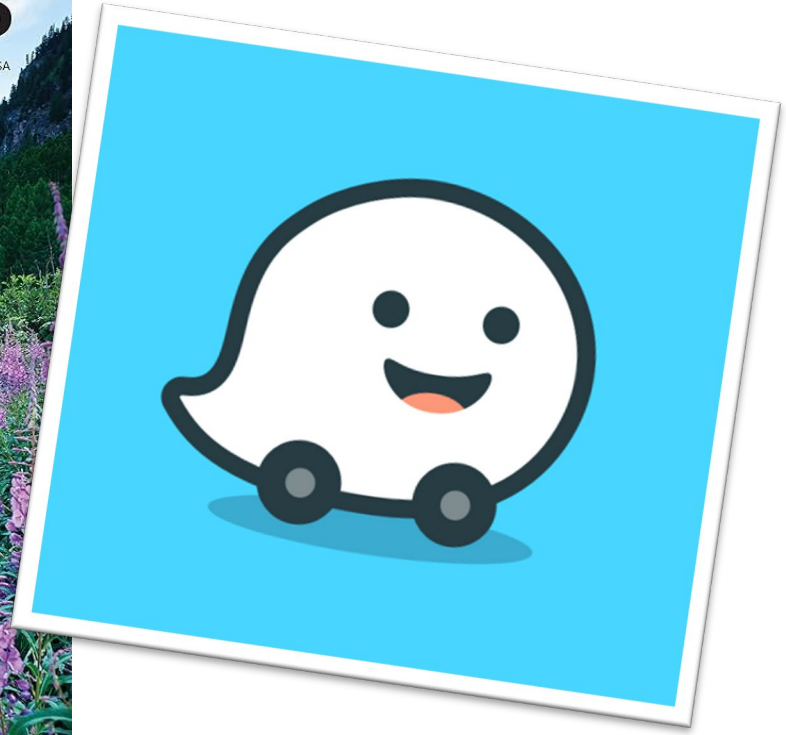
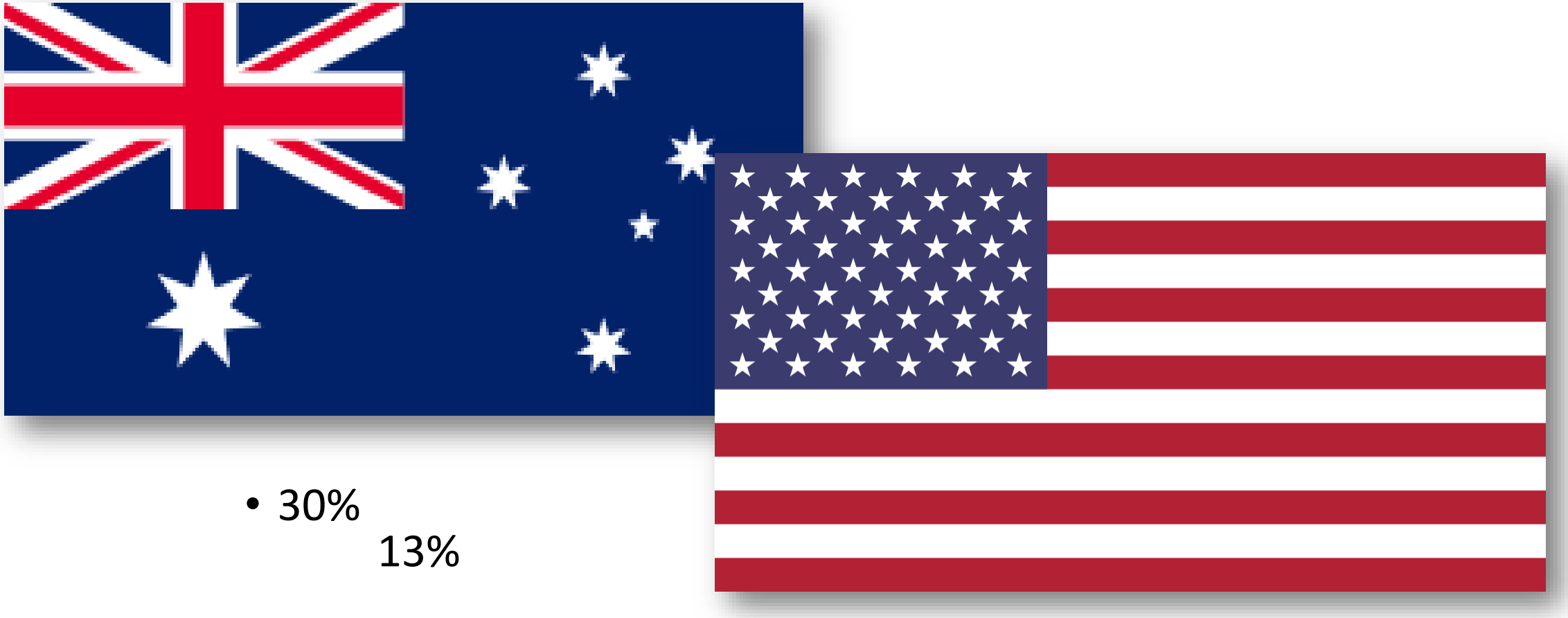
2023
America's #1 Road Atlas
Road Atlas
MADE IN THE USA
United States
Canada
Mexico



Highest rate of robotic total knee as of 2023?



- 30%

13%

Registry data

Figure KT45 Primary Total Knee Replacement by Technology Assistance (Primary Diagnosis OA)

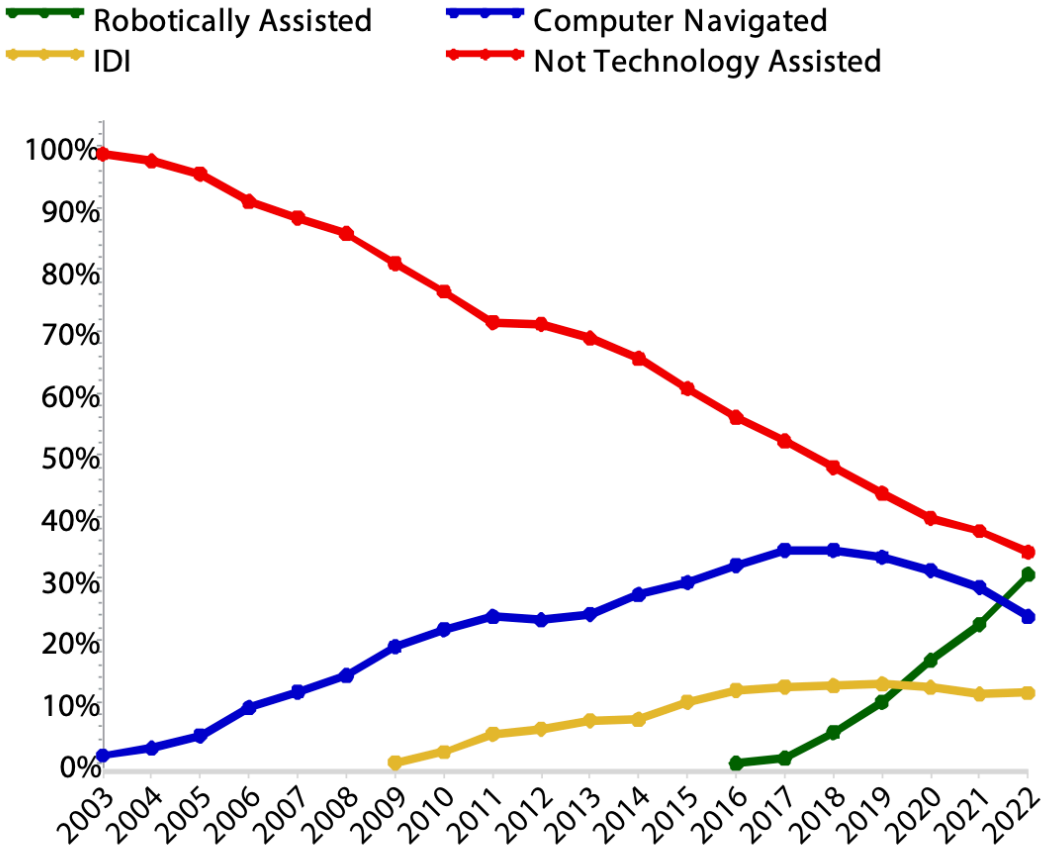
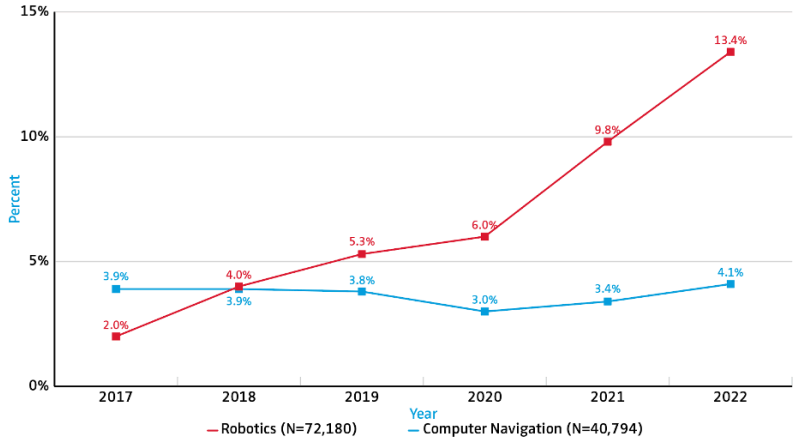


Figure 3.16: Rate of Technology Use for Assistance in Total Knee Arthroplasty, 2017-2022



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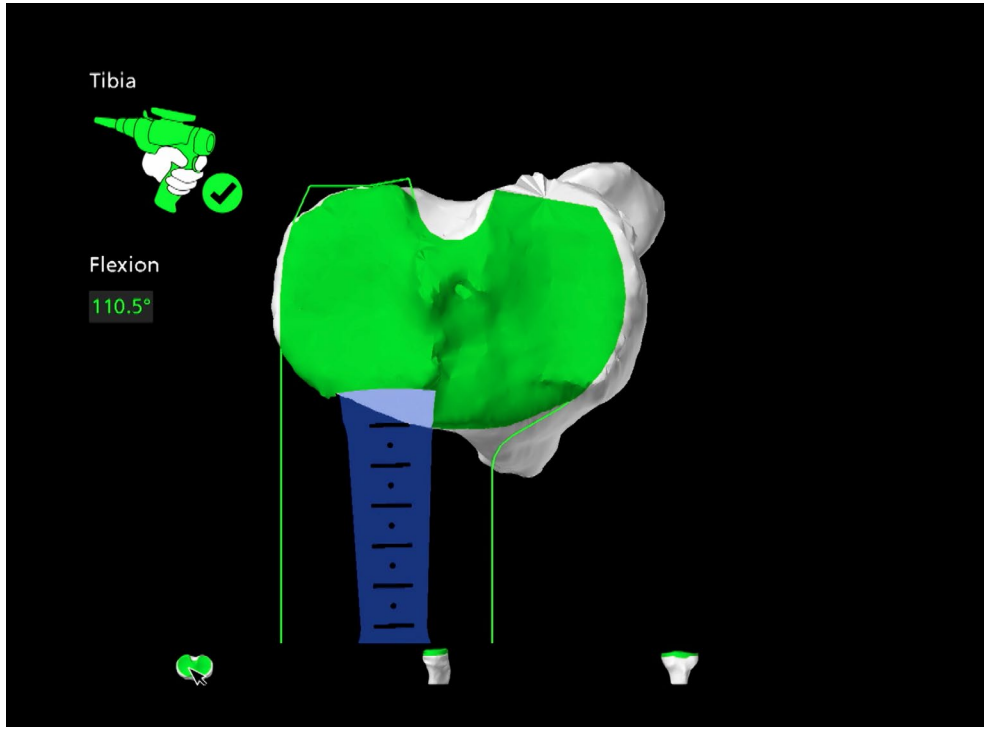
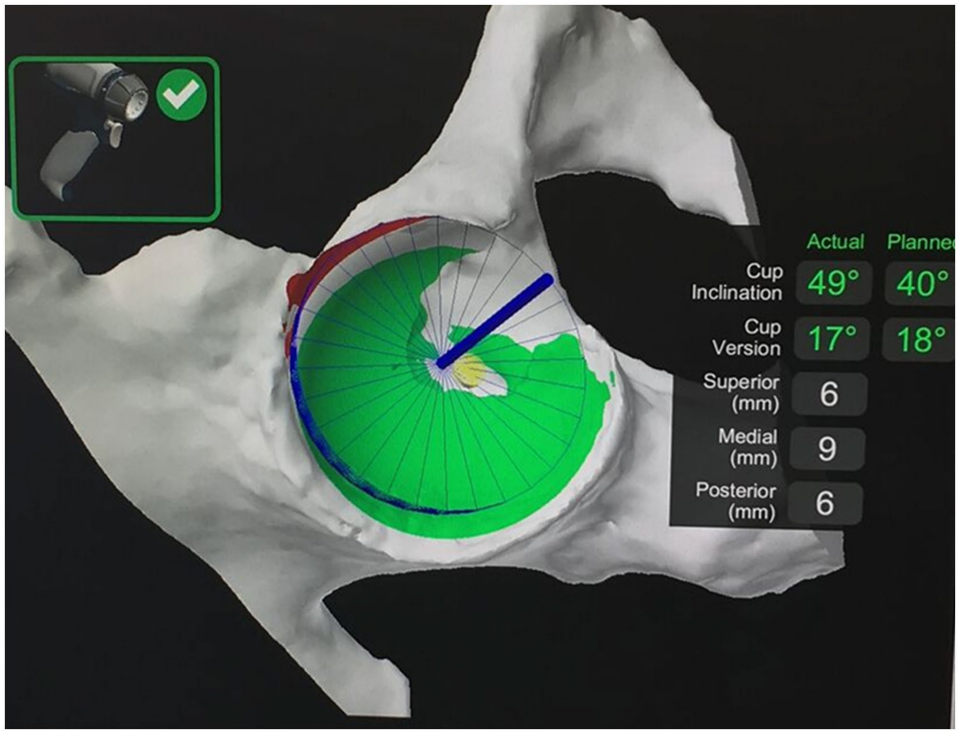
Summary

- Better polyethylene bearing (plastics)
- Better implant placement





Can you, or may you?

> Am J Sports Med. 1998 Jul-Aug;26(4):530-5. doi: 10.1177/03635465980260041001.

Participation in sports after total knee replacement

N Bradbury [1], D Borton, G Spoo, M J Cross

Affiliations + expand

PMID: 9689373 DOI: 10.1177/03635465980260041001

- 77% return to sports
- More likely to return to low impact sports
- Only about 20% were able to do high-impact sports

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journal homepage: www.arthroplastyjournal.org

Systematic Review and Meta-Analysis

Sport and Physical Activity Following Primary Total Knee Arthroplasty: A Systematic Review and Meta-Analysis

Carola Hanreich, MD, Luca Martelanz, Cand. Med, Ulrich Koller, MD, MSc, Reinhard Windhager, MD, Wenzel Waldstein, MD *

Department of Orthopedics and Trauma Surgery, Vienna General Hospital, Medical University of Vienna, Vienna, Austria

- Sports participation after total joint was around 70%
- Favored low-impact sports activities over high impact sports

The Journal of Arthroplasty 36 (2021) 2858–2863

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Primary Hip

Return to Competitive Level of Play and Performance in Regular Golfers After Total Hip Arthroplasty: Analysis of 599 Patients at Minimum 2-Year Follow-Up

Charles Pioger, MD [a, b, *], Christophe Jacquet, MD [a], Jonathan P. Bellity, MD [c], Jérôme Delambre, MD [d], Olivier Rouillon, MD [a], Rémy Nizard, MD, PhD [a], Didier Hannouche, MD, PhD [a, e, f]

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Primary Hip and Knee Arthroplasty

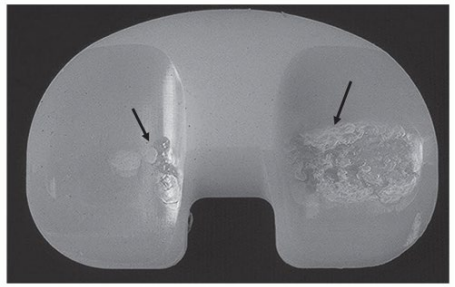
Can I Ski Doc?: Return to Skiing Following Total Joint Arthroplasty

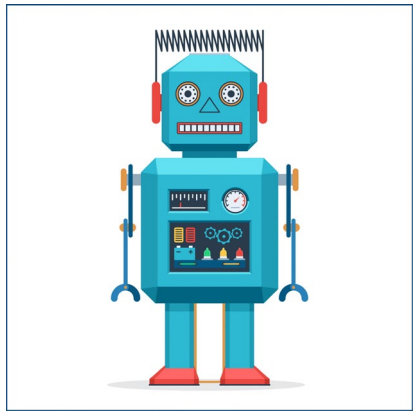
Alex Lancaster, MD *, Matthew Christie, MD, Brenna E. Blackburn, PhD, Christopher E. Pelt, MD, Christopher L. Peters, MD, Blake Dunson, Jeremy M. Gililland, MD, Lucas A. Anderson, MD

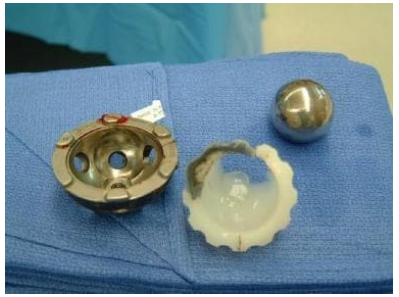
Department of Orthopaedic Surgery, University of Utah, Salt Lake City, UT

Return to sports after total joints

- Modern bearing surfaces
- Placement of implants
- 70% return to sports with only ¼ returning to high impact
- 6 months
- Bias towards lower impact activities







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LOCATIONS & DIRECTIONS

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REQUEST AN APPOINTMENT