Perioperative Considerations for Joint Replacement

JOHN F. PARKER, MD

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Lowville, New York

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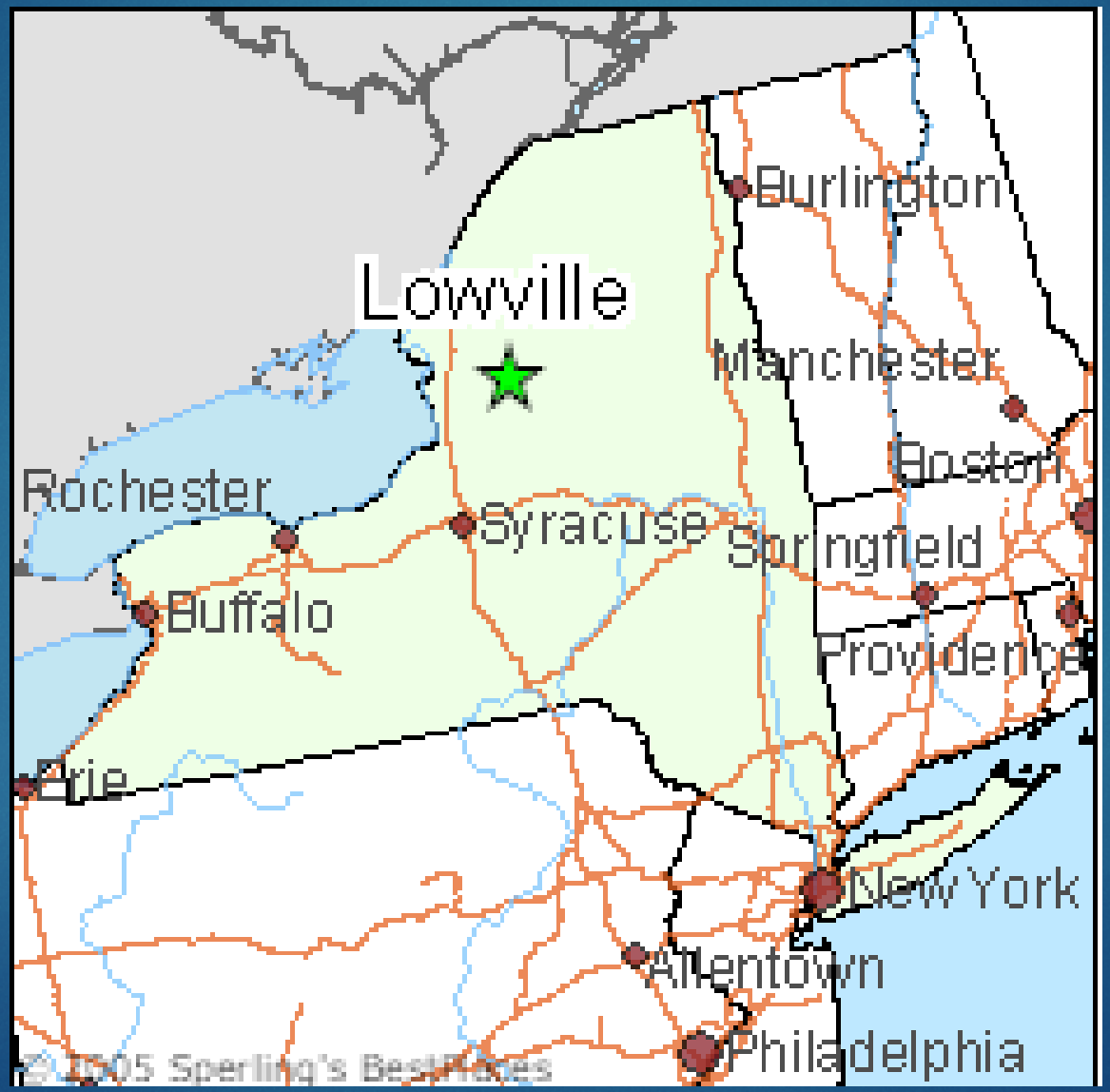
Lowville, New York



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Lowville, New York – "Best Places…"

Lowville, New York ♡

★★★★★

0 Reviews | Review This Place | Photos and Maps| Homes For Sale

Population	Median Income	Median Age
4,796	$43,925	41.8
-0.2% since 2020		
Unemployment Rate	**Median Home Price**	**Comfort Index (Climate)**
7.6%	$133,100	9.1 / 2.9
		summer / winter

Lowville, New York

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Amherst College – Amherst, MA

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Aspen Ski Company – Aspen, CO

SYRACUSE ORTHOPEDIC SPECIALISTS

Rice University – Houston, TX

YRACUSE
RTHOPEDIC
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University of Texas – Austin, TX

University of Rochester

SYRACUSE ORTHOPEDIC SPECIALISTS

Dartmouth Hitchcock

SYRACUSE ORTHOPEDIC SPECIALISTS

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The Current State of Joint Replacement

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Knee replacement

Partial knee replacement

Total knee replacement

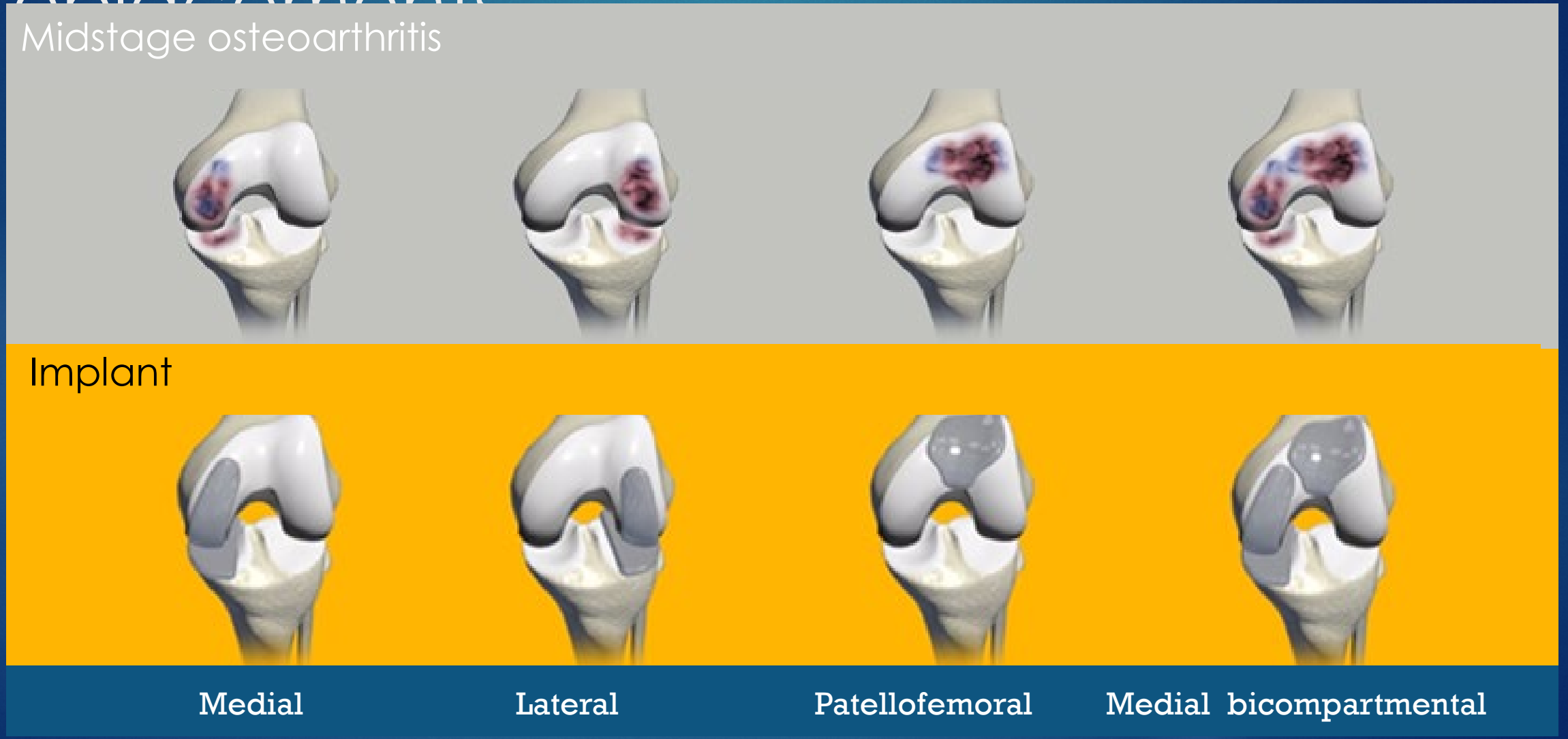
Femur

Knee implant

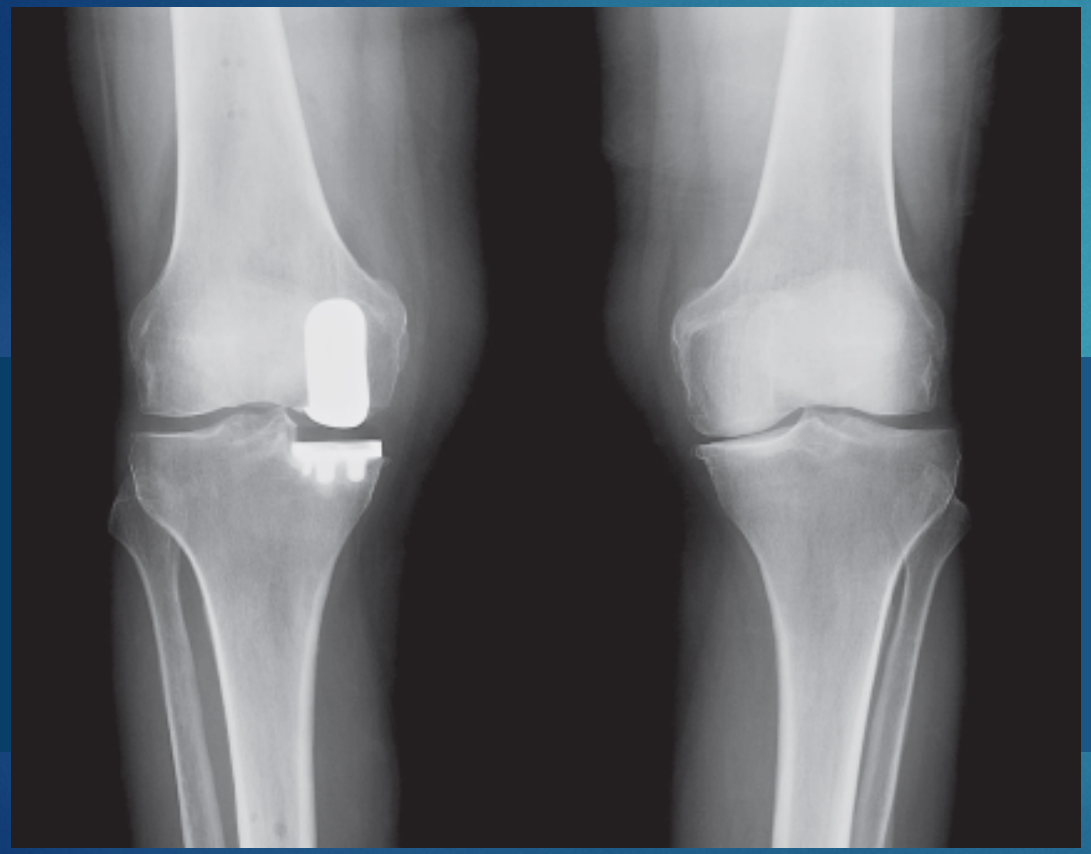
Tibia

600,000 **knee** replacen ach year in the U.S.[15]

Types of partial knee replacements

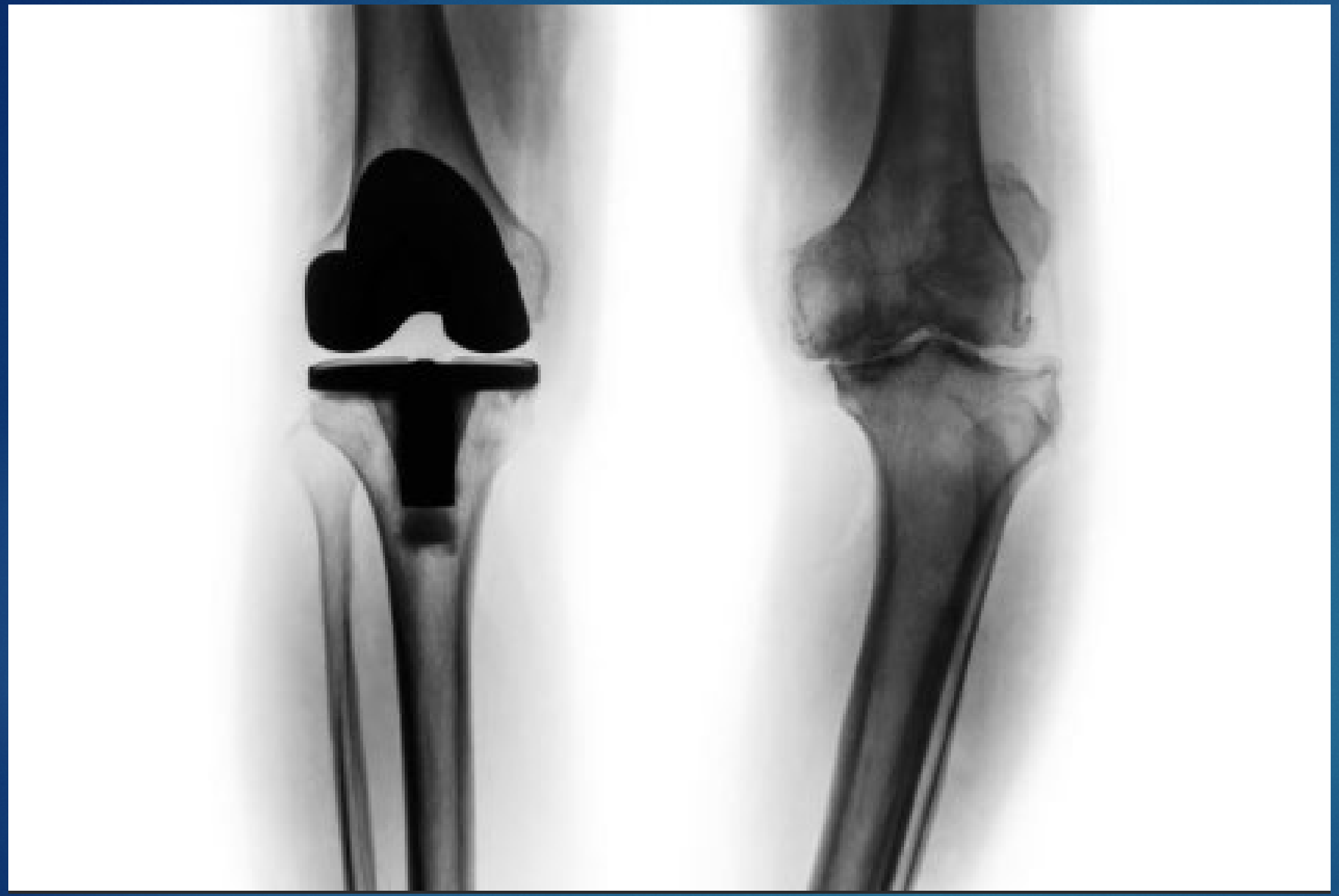


Replaced knee X-rays



Partial knee **replacement**

Total knee **replacement**



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Knee implants

MCK for
partial knees

Triathlon for
total knees

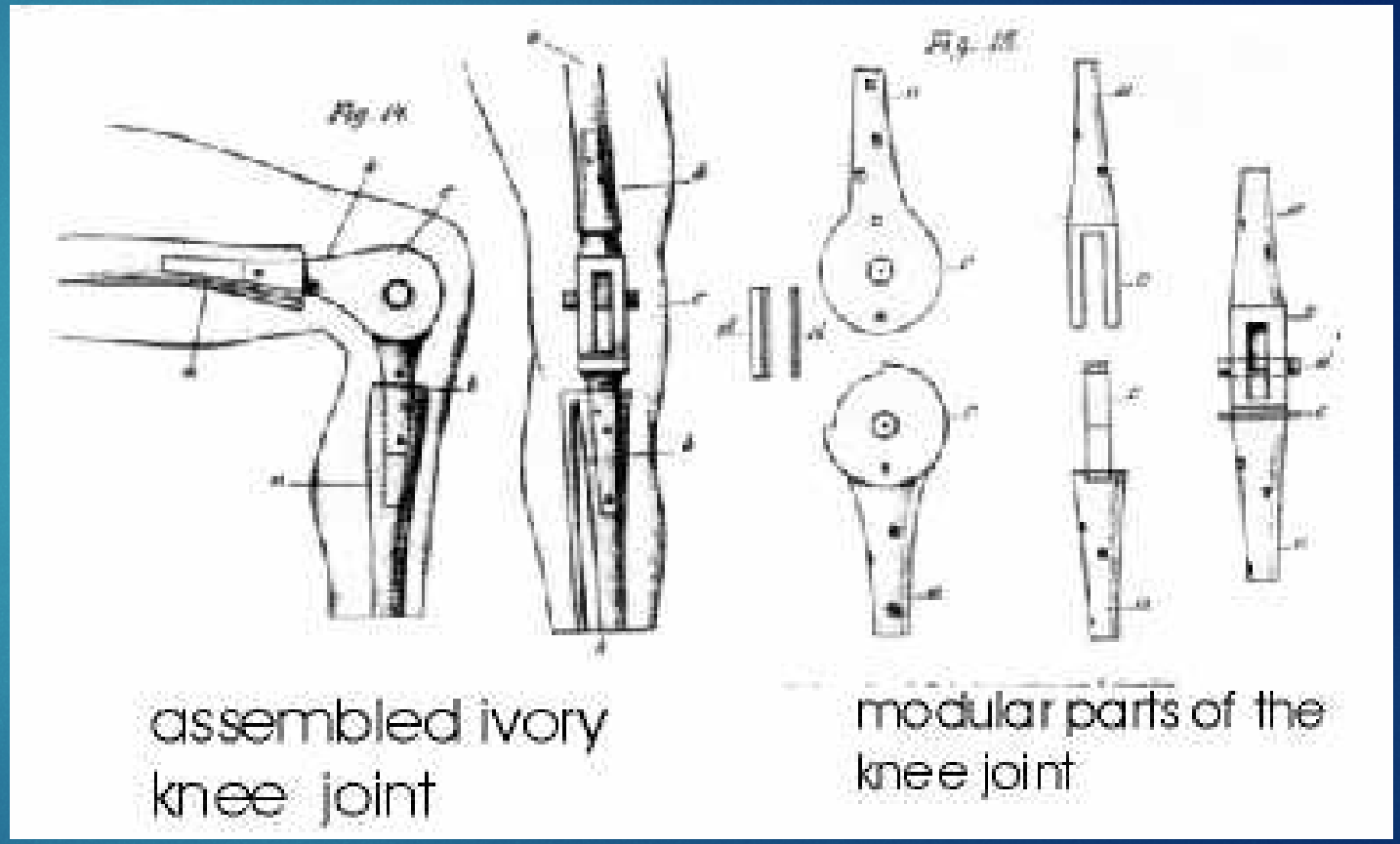
History of Knee Replacement

1890: Themistocles Gluck – Germany

History of Knee Replacement

1890: Themistocles Gluck – Germany

Hinged ivory

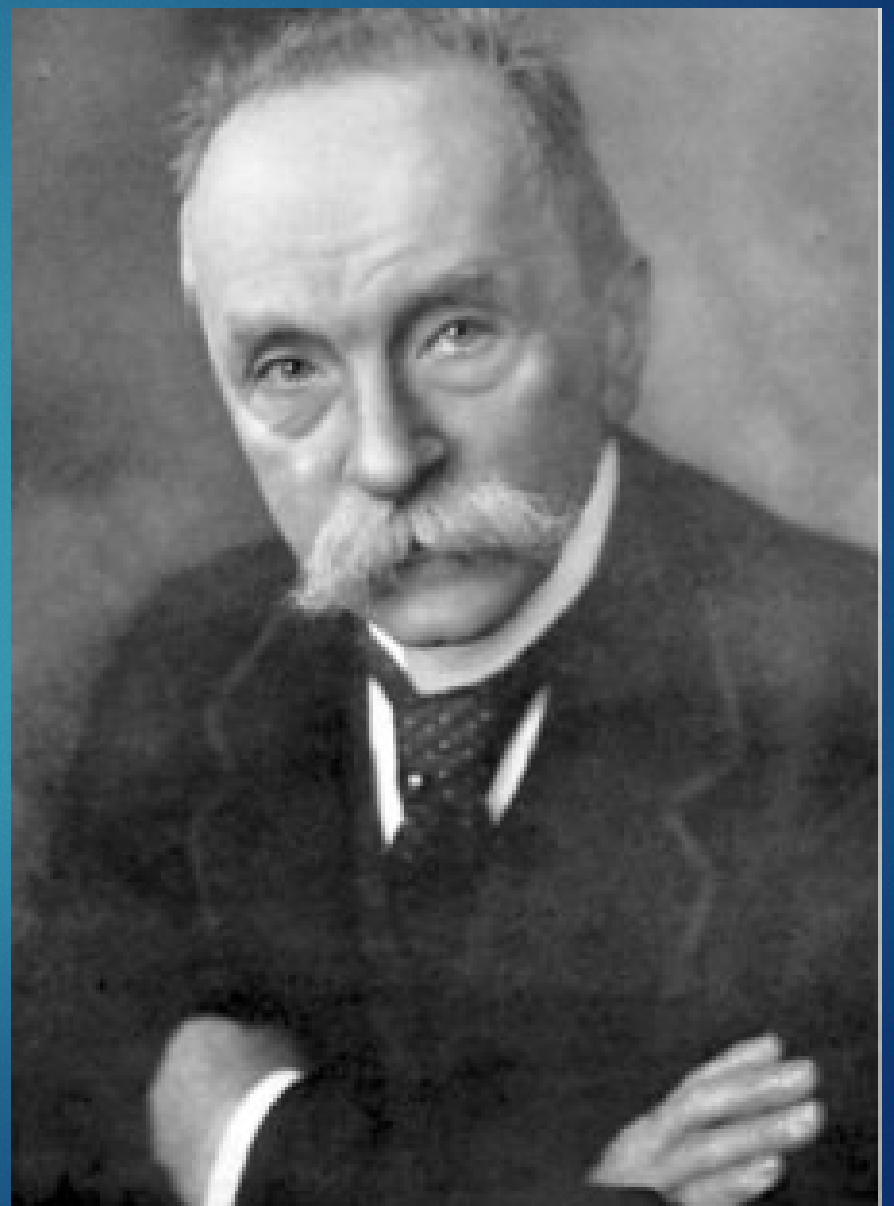


History of Knee Replacement

Prosthesis fixation (ivory pegs)

Asepsis

Cannot reimplant in the face of infection

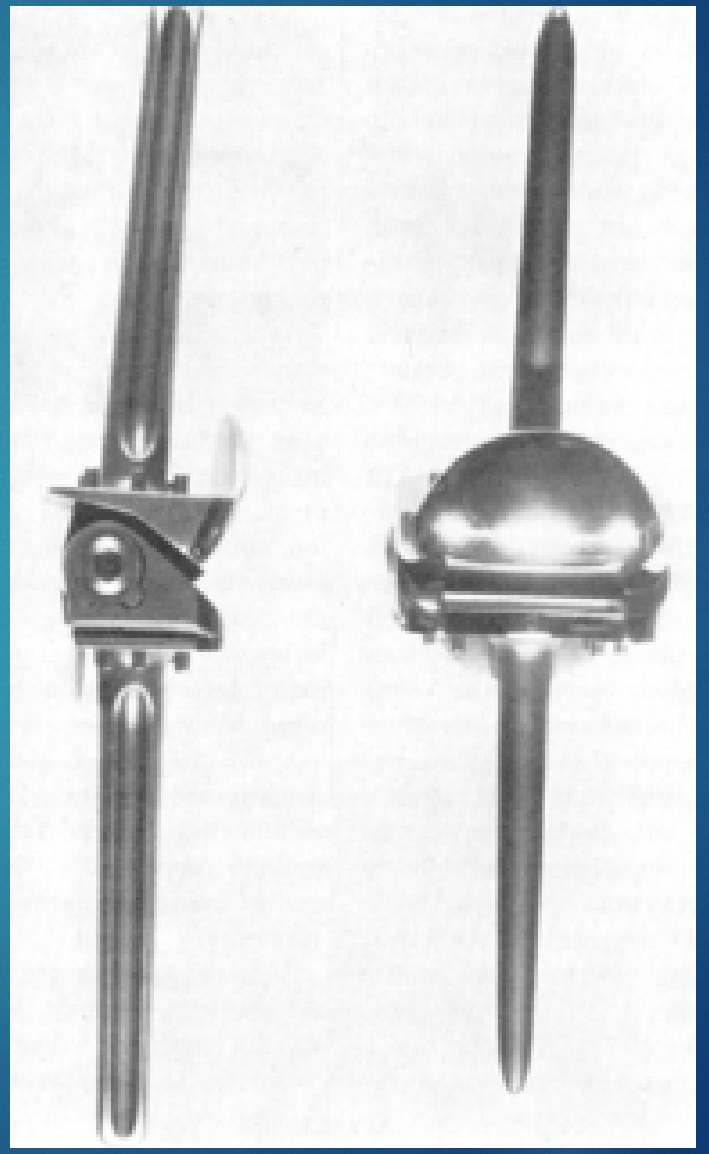


History of Knee Replacement

1950s

Walldius Hinge

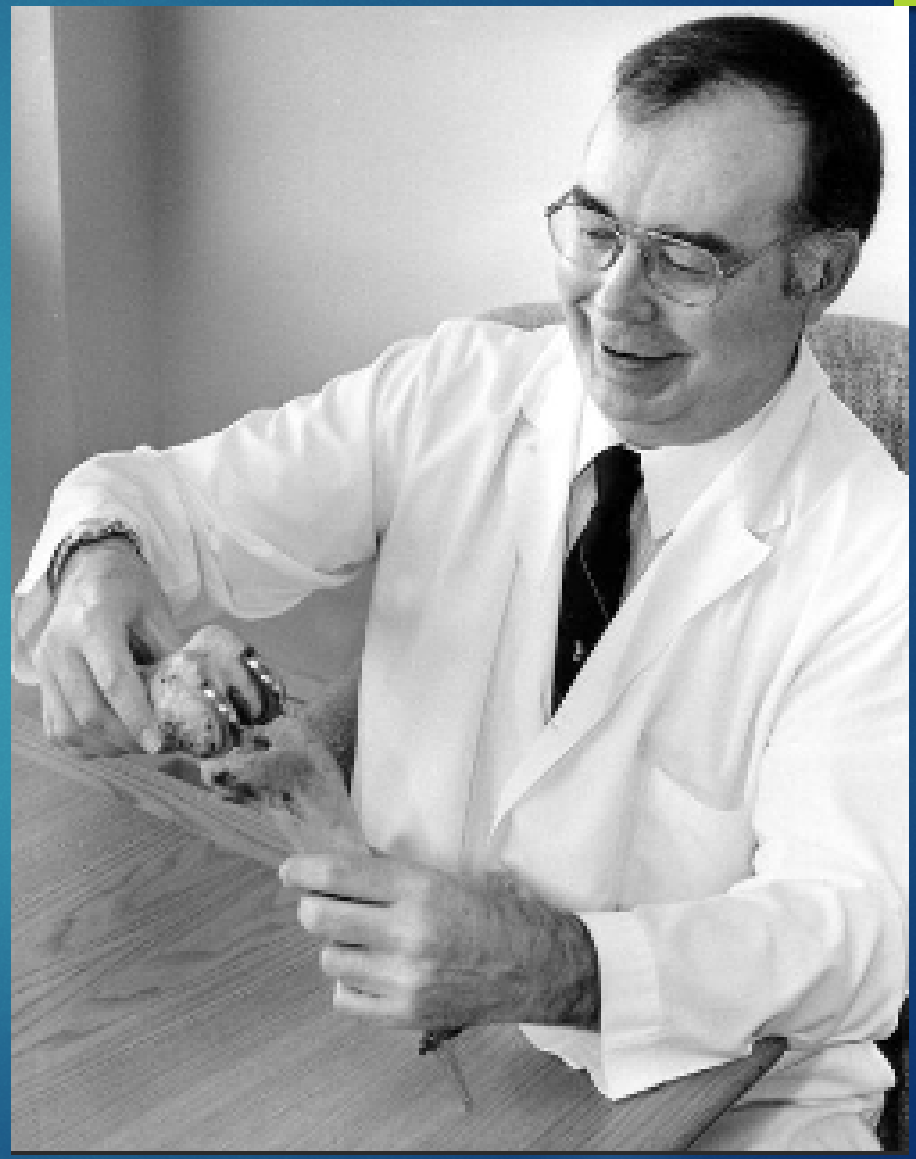
Acrylic → CrCo



History of Knee Replacement

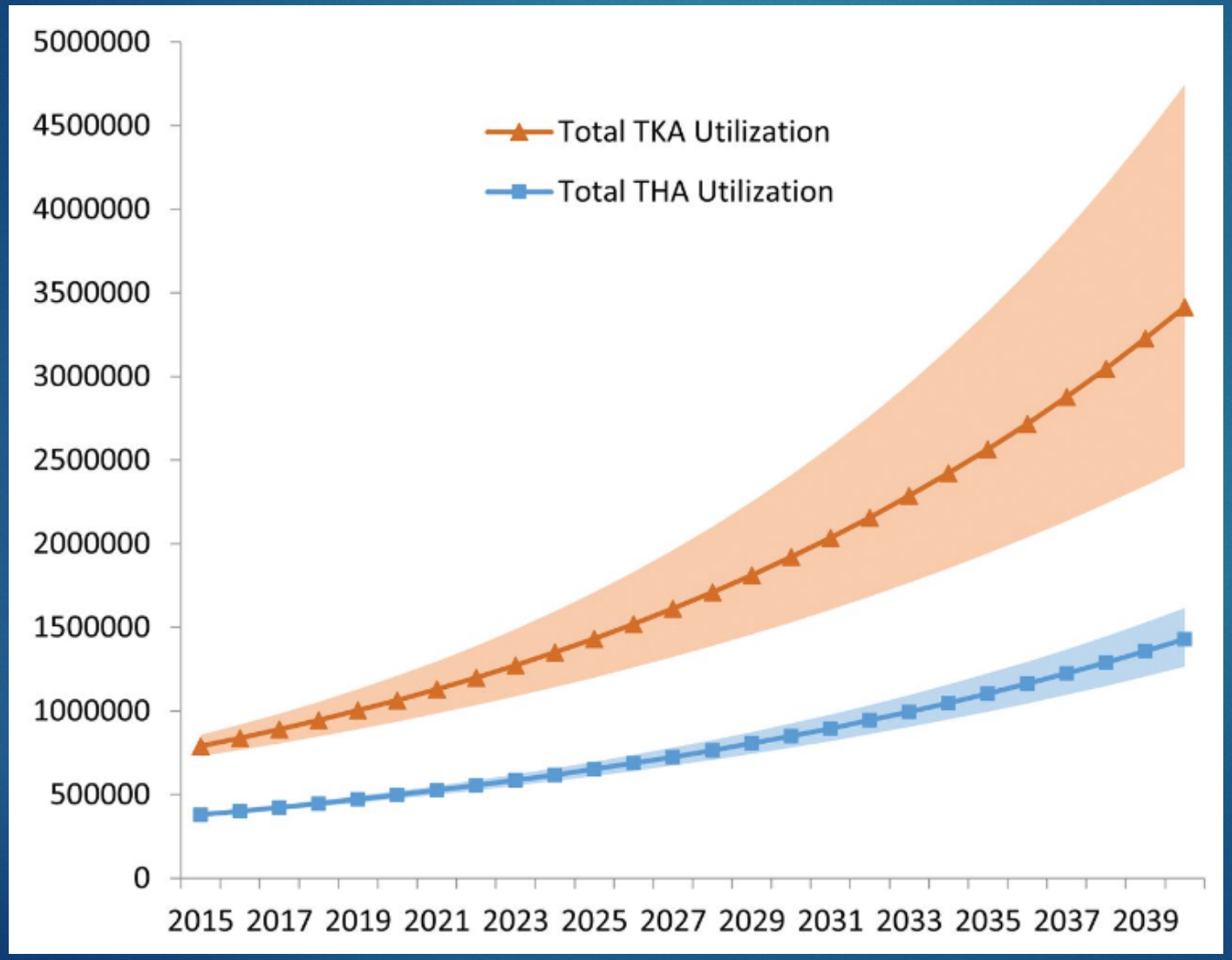
1960s: Dr. Frank Gunston

Unhinged prosthesis – left cruciates and collaterals intact



Projected TKA/THA Procedures

Journal of Rheumatology - Singh et al Sept 2021



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Results: On the basis of 2000-to-2014 data, primary total hip arthroplasty (THA) is projected to grow 71%, to 635,000 procedures, by 2030 and primary total knee arthroplasty (TKA) is projected to grow 85%, to **1.26 million procedures, by 2030**. Sep 5, 2018

National Institutes of Health (.gov)
https://pubmed.ncbi.nlm.nih.gov › ...

Projected Volume of Primary Total Joint Arthroplasty in the ...

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WHO is getting joints replaced?

WHERE are they getting them?

Patients are getting younger…

Hip and Knee Replacement Patients are Getting Younger

Derek R. Jenkins, MD

February 23, 2022

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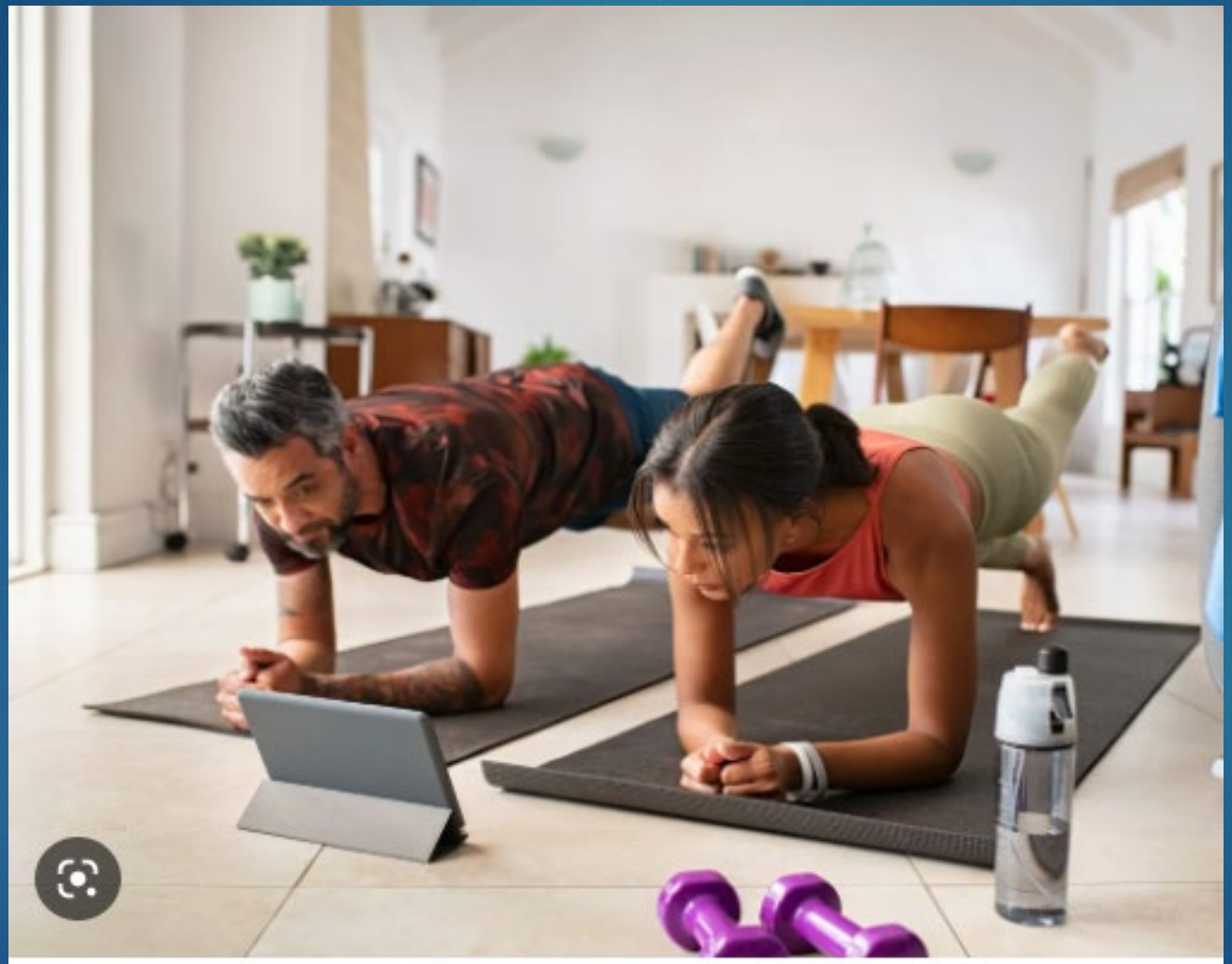
Patients are getting younger…



Hip and Knee Replacement Patients are Getting Younger - University Orthopedics Blog

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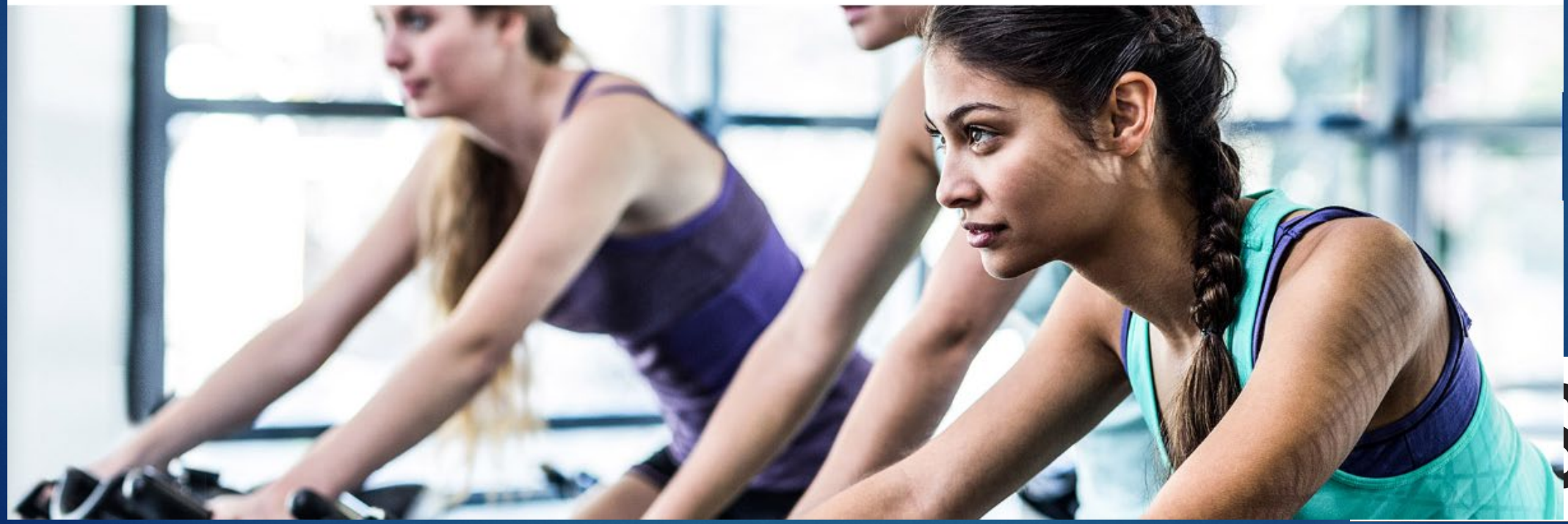
Patients are getting younger…

Why Younger Patients Are Opting for Joint Replacement

Recent years have seen a 188 percent increase in knee replacements and a 123 percent increase in hip replacements for patients age 45 to 64.



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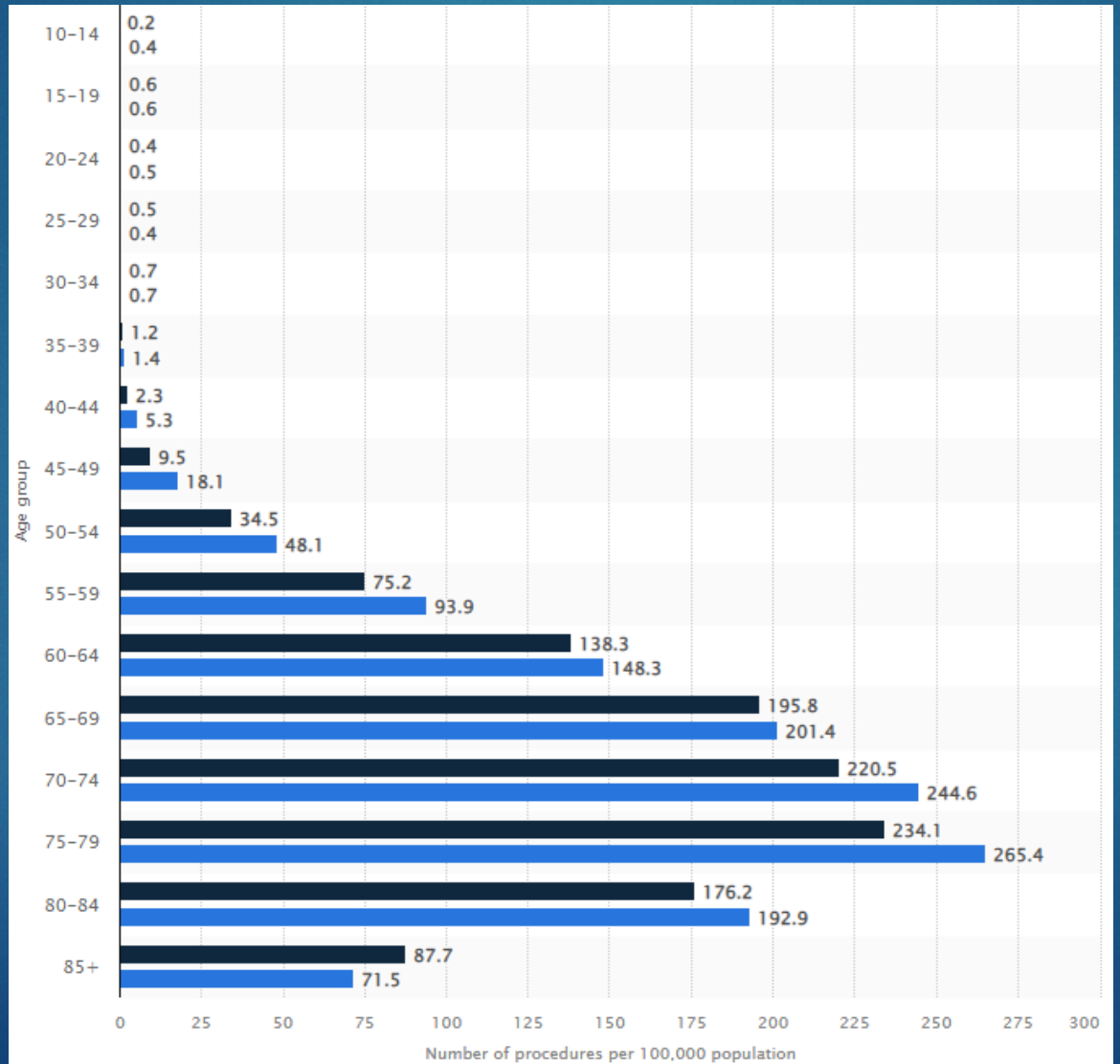
Patients are getting younger?

Lancet – Stuart, 2022



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U.S. Joint Replacement - 2021

1,000,000 joints

700,000 knee replacements
300,000 hip replacements

Demand is increasing

Patients are getting younger

Outpatient joints = New norm

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WHO is getting joints replaced?

WHERE are they getting them?

Outpatient joints = New norm

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“Centers for Excellence”

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J Am Acad Orthop Surg. 2022 Jun 1;30(11):e811-e821. doi: 10.5435/JAAOS-D-21-00946. Epub 2022 Feb 21.

Effects of Hospital and Surgeon Volume on Patient Outcomes After Total Joint Arthroplasty: Reported From the American Joint Replacement Registry

Ahmed Siddiqi [1], Vignesh K Alamanda, John W Barrington, Antonia F Chen, Ayushmita De, James I Huddleston 3rd, Kevin J Bozic, David Lewallen, Nicolas S Piuzzi, Kyle Mullen, Kimberly R Porter, Bryan D Springer

Affiliations + expand

PMID: 35191864 DOI: 10.5435/JAAOS-D-21-00946

Conclusion: Our findings demonstrate considerably greater THA and TKA complications when performed at low-volume hospitals by low-volume surgeons. Given the data from previous literature including this study, a continued push through healthcare policies and healthcare systems is warranted to direct THA and TKA procedures to high-volume centers by high-volume surgeons because of the evident decrease in complications and considerable costs associated with all-cause revisions, periprosthetic joint infection, instability, and 90-day mortality.

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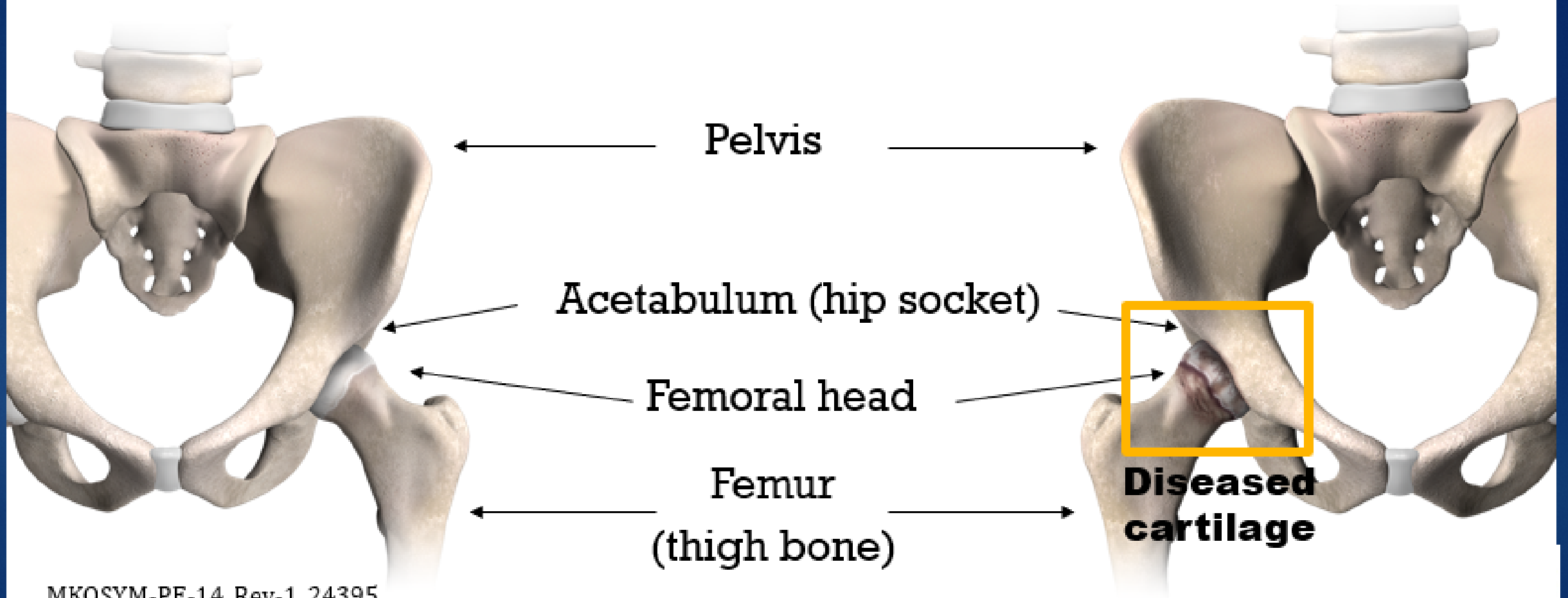
Hip anatomy

A **healthy** hip

An **arthritic** hip



MKOSYM-PE-14_Rev-1_24395

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Hip anatomy

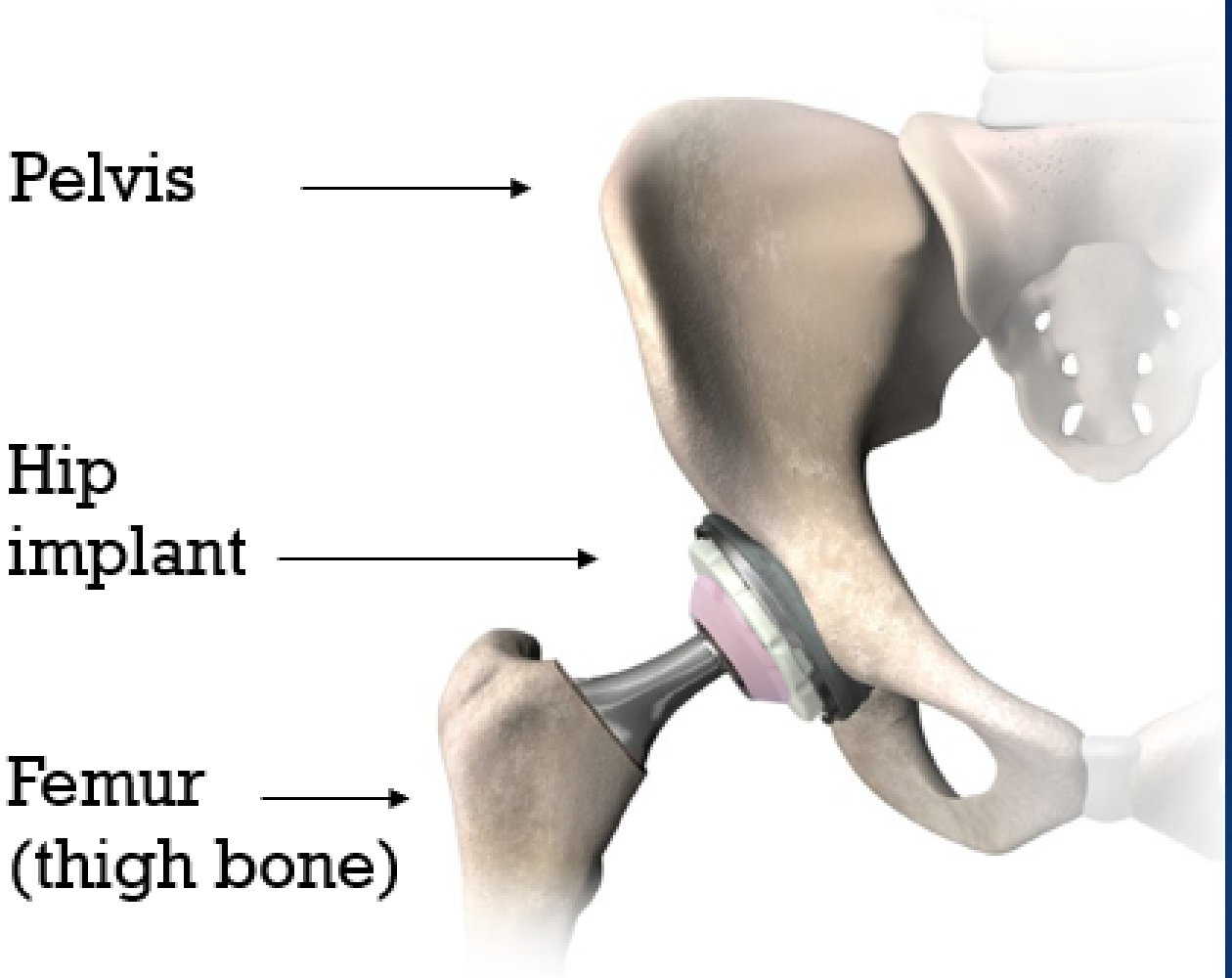
Normal hip

Arthritic hip

Hip replacement

How it works

Total hip replacement surgery involves the removal of arthritic bone and damaged cartilage. These are replaced by a hip implant made up of four primary parts: a stem, head, liner and cup.



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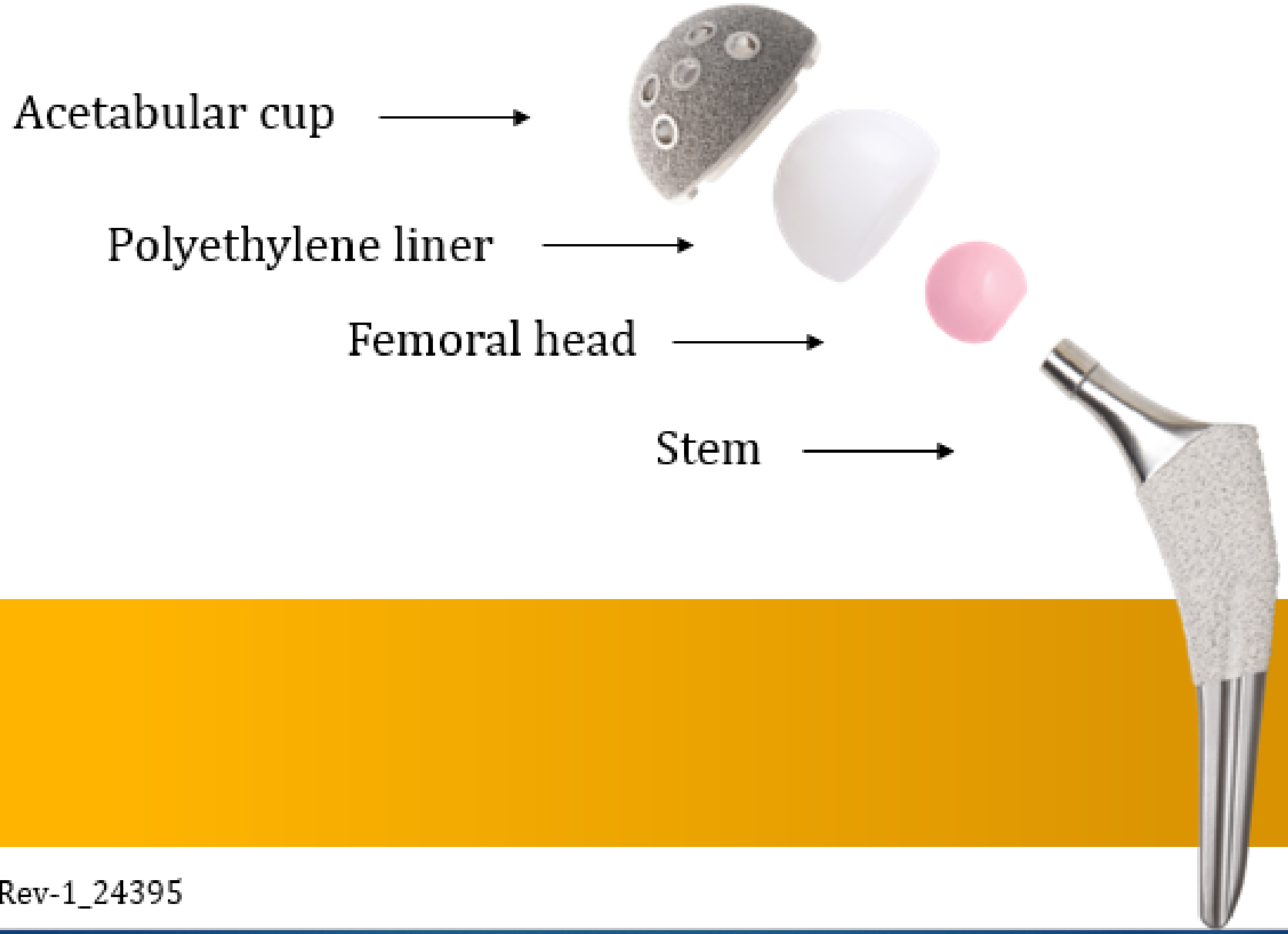
Hip implants



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History of Hip Replacement

1891: Themistocles Gluck – Germany

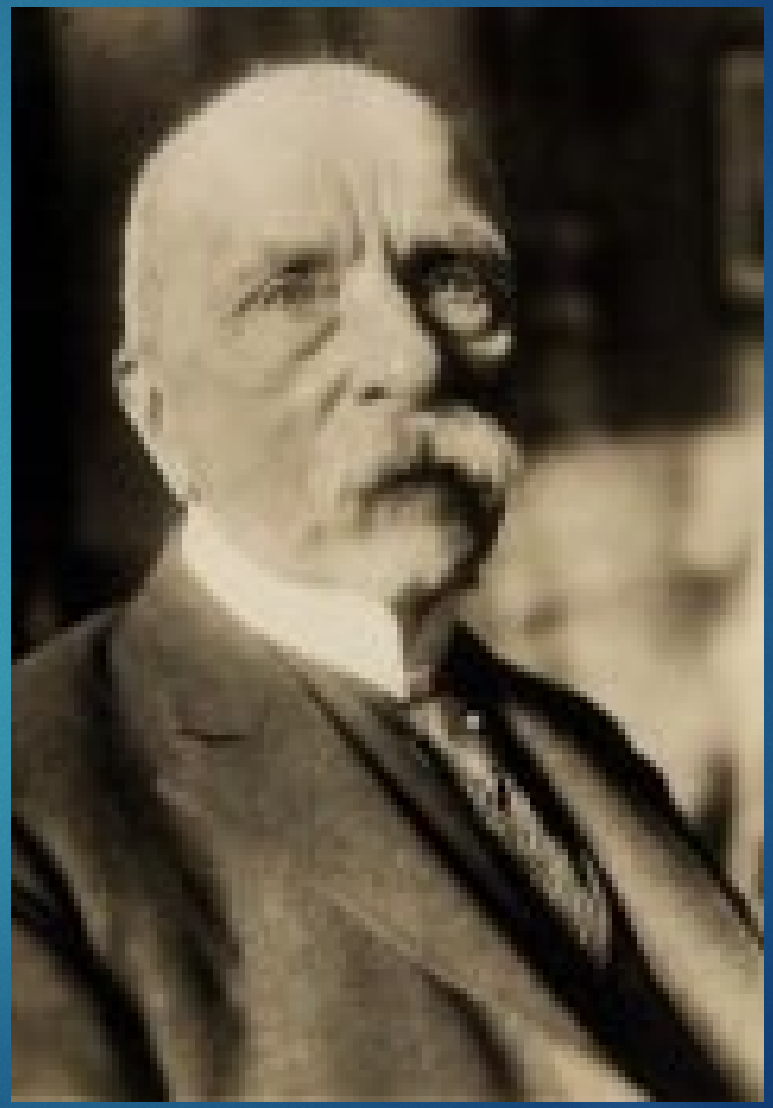
Ivory ball and socket

Plaster of Paris cement

History of Hip Replacement

"We must aim for smaller volume and lower weight, together with strength and the most efficient shape, basing our efforts on the structural principles of the human skeleton."

T. Gluck



History of Hip Replacement

1920s: Smith-Peterson

Glass ball

Plaster of Paris cement

History of Hip Replacement

1940: Dr. Austin T. Moore

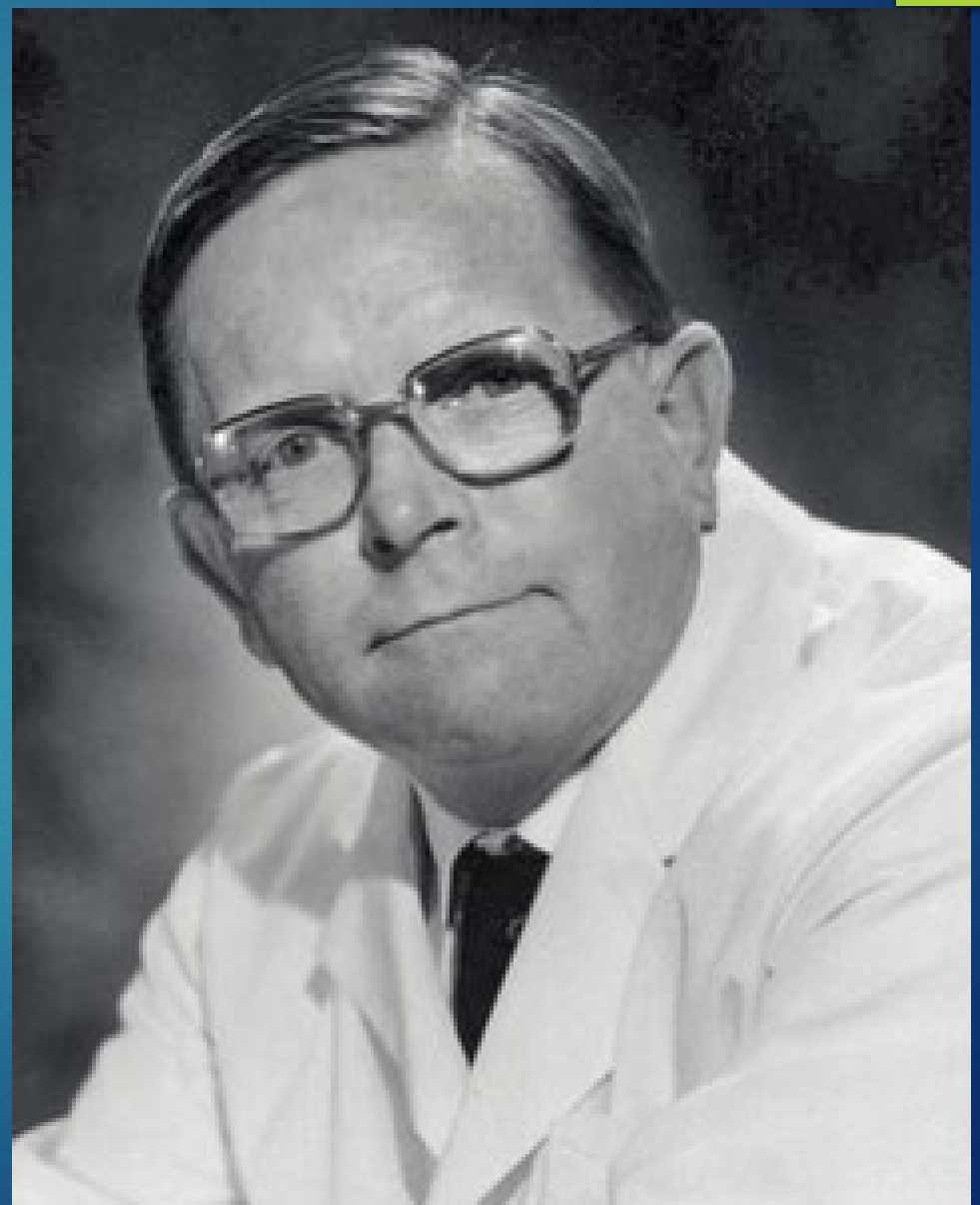
Cr-Co (steel)

Cemented

History of Hip Replacement

1960s: John Charnley

Metal-on-poly design



Surgical Approaches to the Hip

- Posterior
- Lateral (Hardinge)
- Direct Anterior
- Direct Superior

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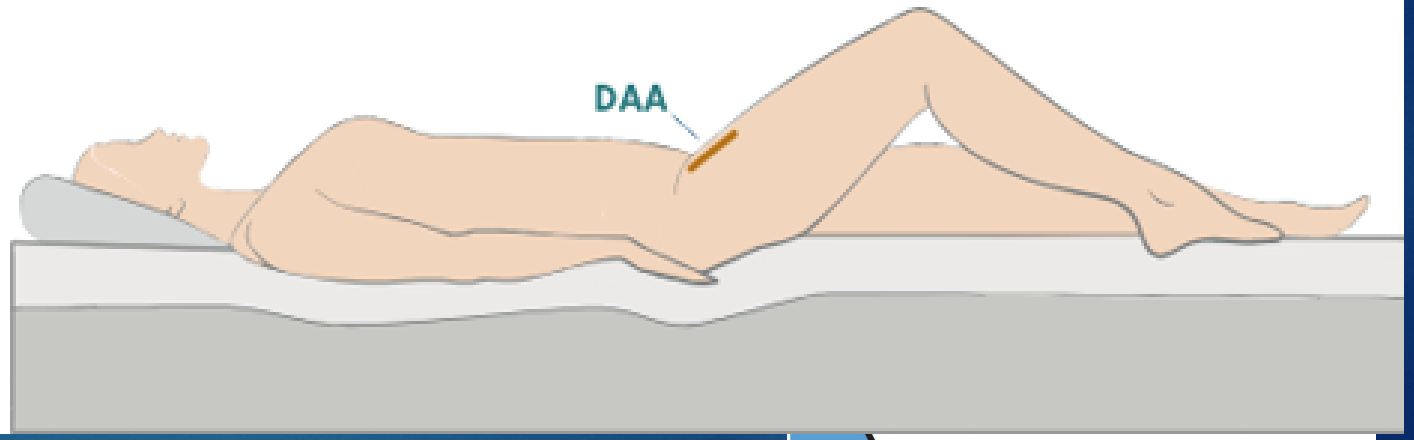
Direct anterior approach

Surgery is performed with the patient lying on his or her back. The incision is made on the front of the hip joint. This position may help your surgeon avoid detaching tendons or muscles.[11]

Potential benefits:

- Potentially minimizes soft tissue impact to help achieve positive functional outcomes[12-13]
- 3- to 4-inch incision[11]
- Reduces the chance of hip dislocation movement precautions after surgery[12]

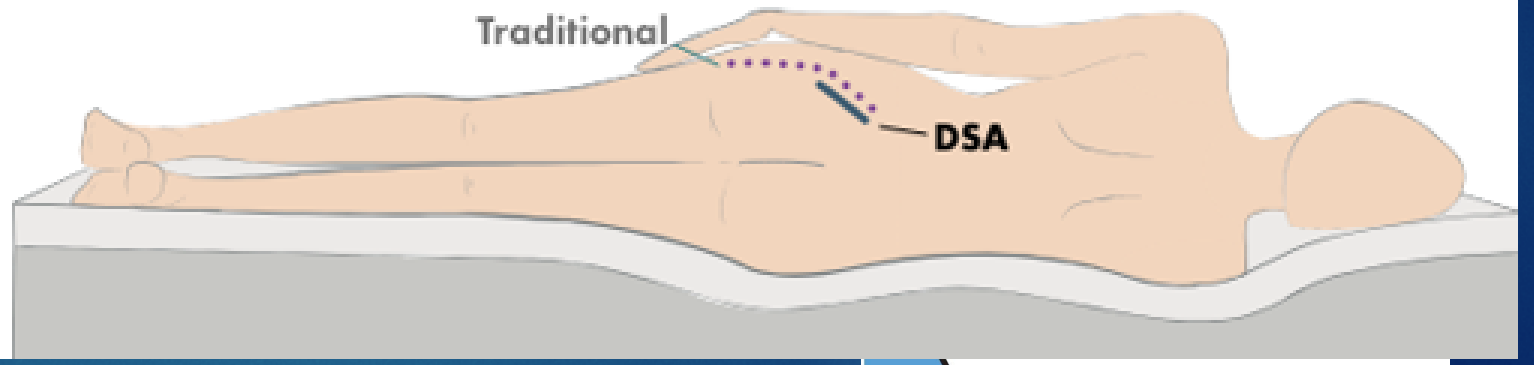


Direct superior approach

Surgery is performed with the patient lying on his or her side. The incision is made on the upper side of the hip, which helps the surgeon avoid cutting (and then reattaching) the key muscle group that enables you to walk and bend. [8]

Potential benefits:

- Helps the surgeon avoid cutting the IT band and muscles referred to as the external rotators[8]
- Potential for enhanced hip stability and recovery after surgery[8-10]
- 3- to 6-inch incision[8,10]



Surgical Approaches to the Hip

Q: What determines the long-term success of joint replacement?

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Surgical Approaches to the Hip

A: Correct alignment of the prosthesis components

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Anterior vs. Posterior Approach

2 weeks post-op: Anterior better

6 weeks post-op: No difference

Lifetime: no difference in outcome

- Anterior: higher likelihood of revision

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Surgical Approaches to the Knee

Standard

Minimally-invasive

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Surgical Approaches to the Knee

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Biomaterials

What are joint replacements made of ?

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Hips: Ceramic on Polyethylene

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Birmingham Hip Resurfacing (BHR)

Birmingham Hip Resurfacing (BHR)

Bone-sparing

Metal-on-metal design

Technically challenging

Hip Resurfacing: Still a Highly Compelling Option for the Younger Patient

Many can resume unrestricted activity within 1 year

SHARE

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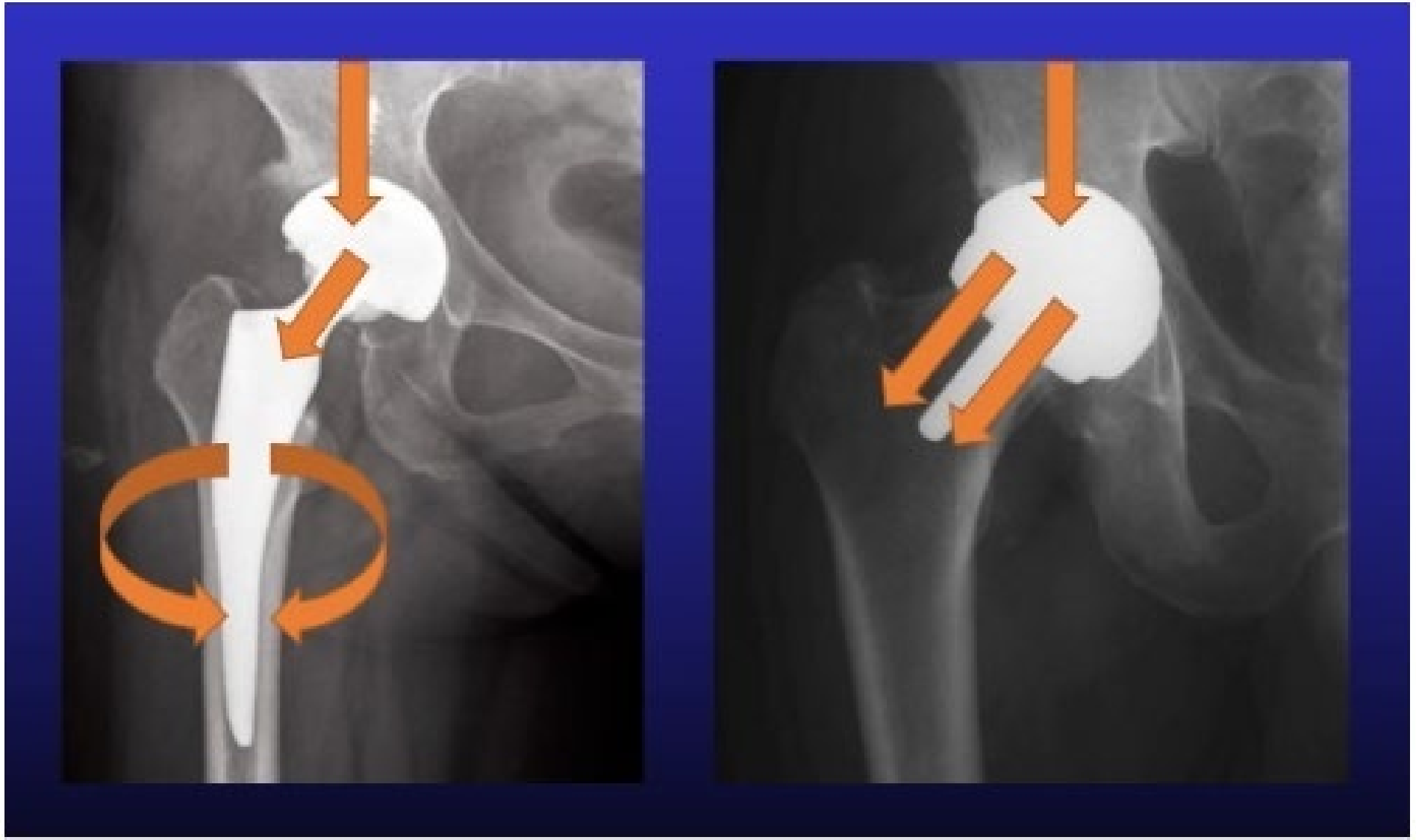

Total Hip Replacement

Hip Resurfacing

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Birmingham Hip Resurfacing (BHR)

Allows return to higher level of activity including impact/running

DISPOSITION

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Disposition after Joint Replacement

Most booked as "Outpatient"

Surgicenter vs Hospital

Discharge on day of surgery is the new normal

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Disposition after Joint Replacement

- Home Health Services
  - In-home PT
  - Home nursing

- Most achieve outpatient visit status by4-5 days post-op

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Recovery from Joint Replacement

Hips recover faster

Knees swell more and hurt more

Recovery times vary widely

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In-hospital recovery
1 to 4 days[33-35]

Daily activities
3 to 6 weeks following surgery[33-35]

Typical recovery
6 to 12 months[36-38]

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The first two weeks are tough

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Metal Allergy

Many patients report a metal allergy

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Metal Allergy

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Metal Allergy

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Ceramic-coated

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Polyethylene wear

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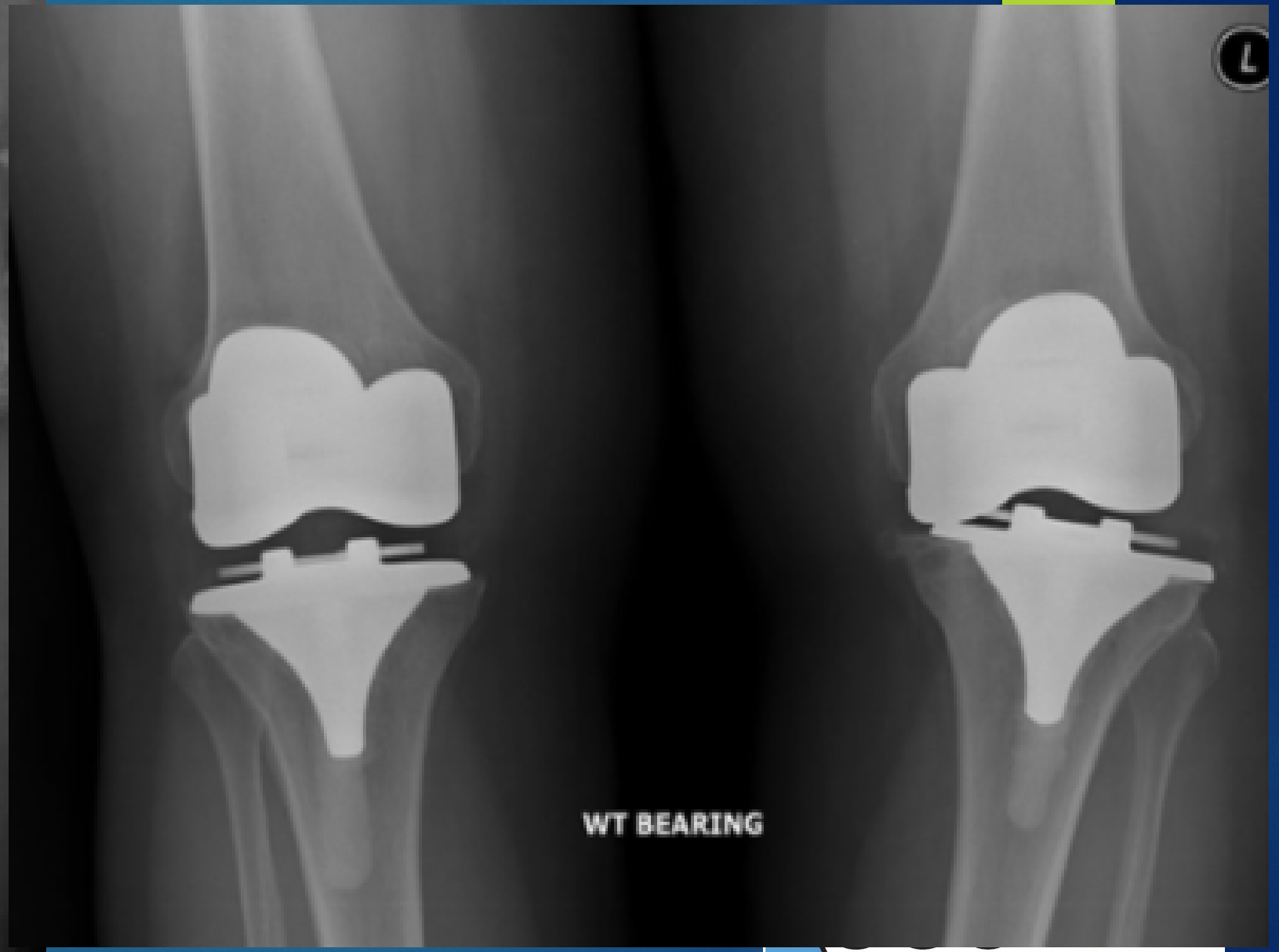
Polyethylene

UHMWPE


L
WT BEARING

SPECIALISTS

Negative-pressure Dressings

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Negative-pressure Dressings

Negative-pressure Dressings

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Negative-pressure Dressings

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Negative-pressure Dressings

Pre-operative Optimization

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Pre-operative Optimization

- Comorbidities
  - Diabetes
  - Cardiac history
  - Obesity/elevated BMI
  - Social impediments*

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Pre-operative Optimization

"Hard stops"

Hgb A1C > 8.0
BMI > 40
Untreated CAD

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Pre-operative Optimization

Hgb A1C:

Challenging to lower

Alternative: careful perioperative monitoring and treatment of blood glucose

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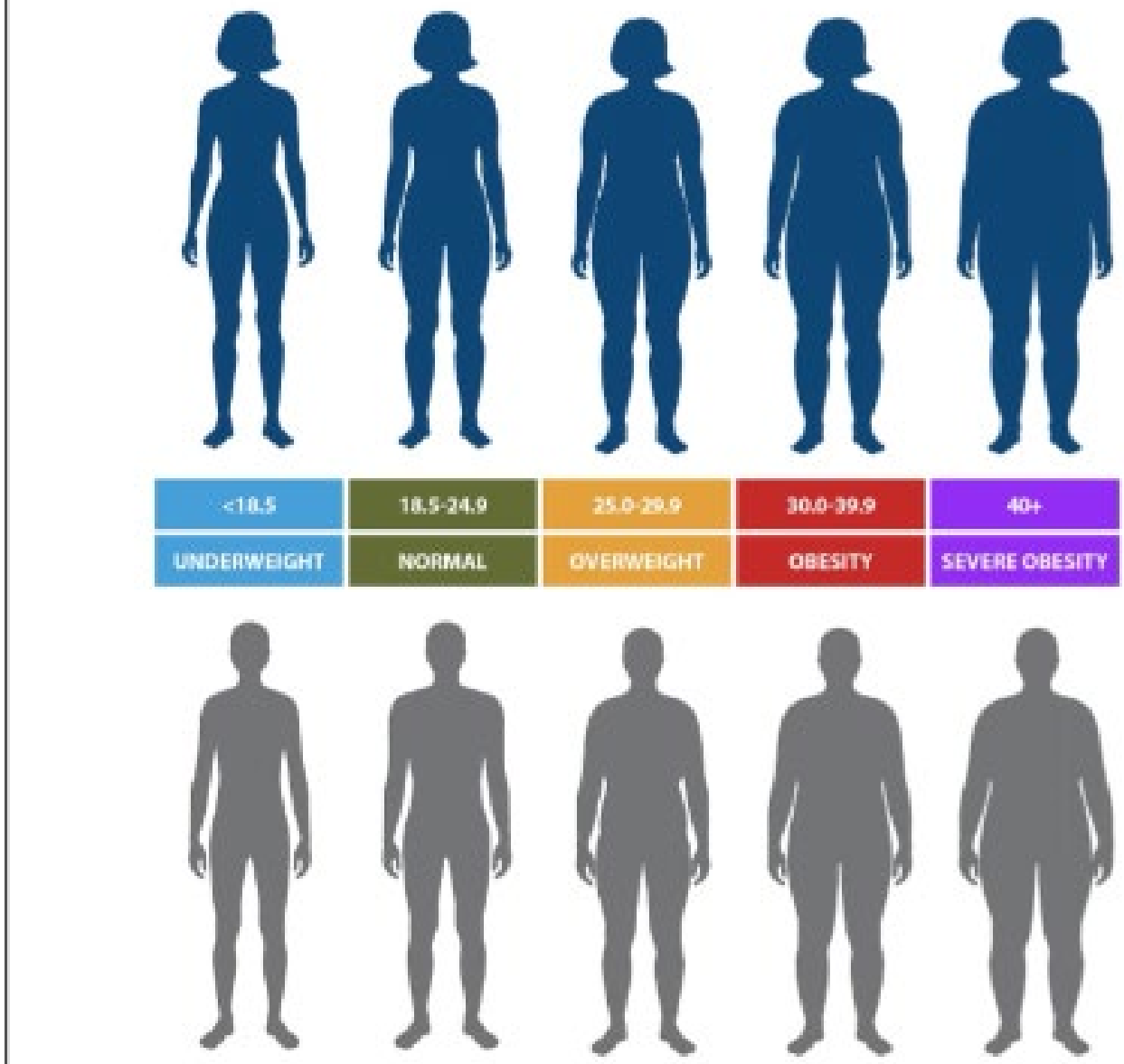
BODY MASS INDEX



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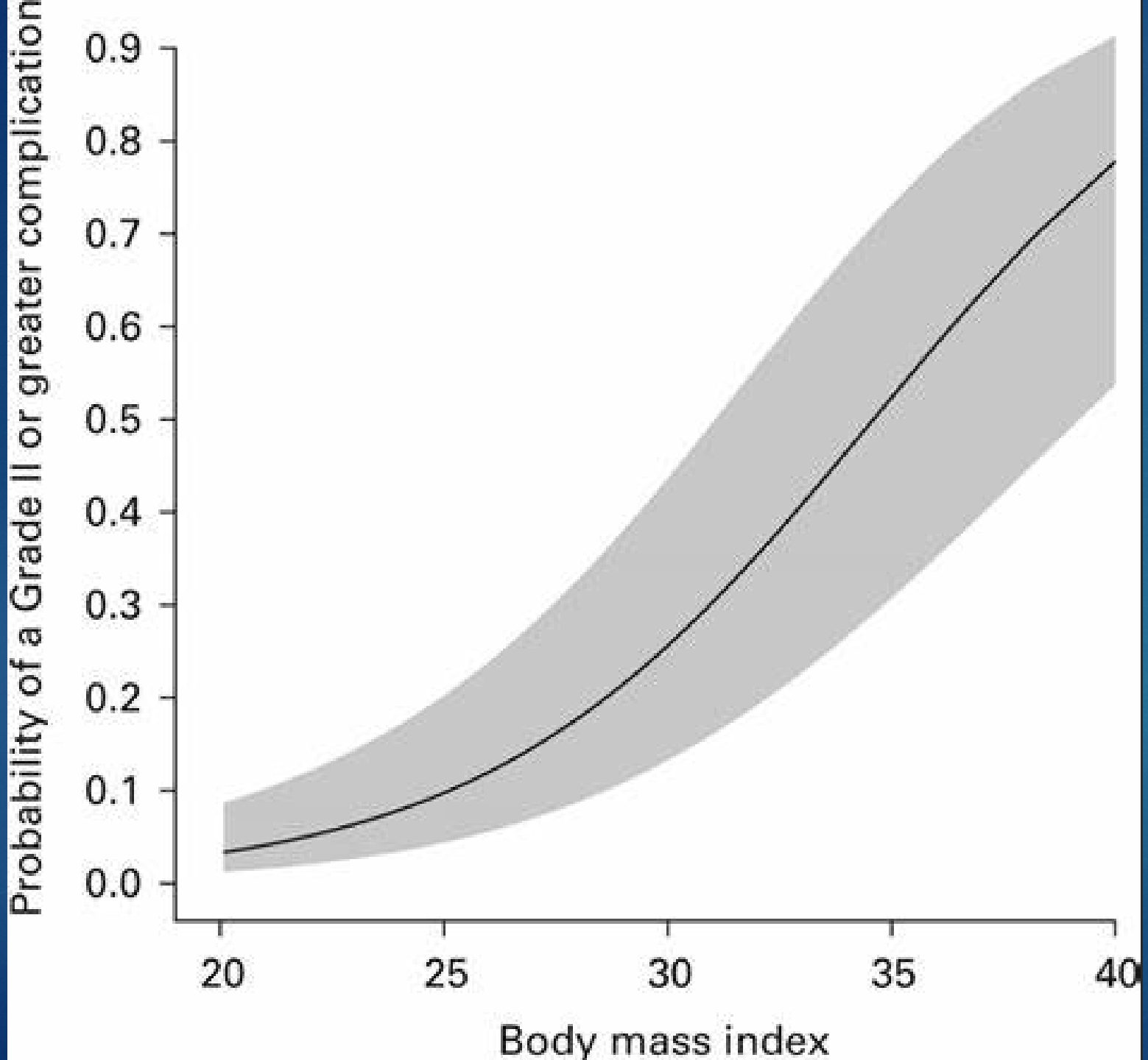

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Pre-operative Optimization

Obesity:

BMI > 35 correlates directly with all complications

- Especially INFECTION

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Pre-operative Optimization

Obesity:

Medical weight loss

- Surgical
- Non-surgical

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Pre-operative Optimization

Obesity:

Science is learning more about the physiological basis of elevated BMI

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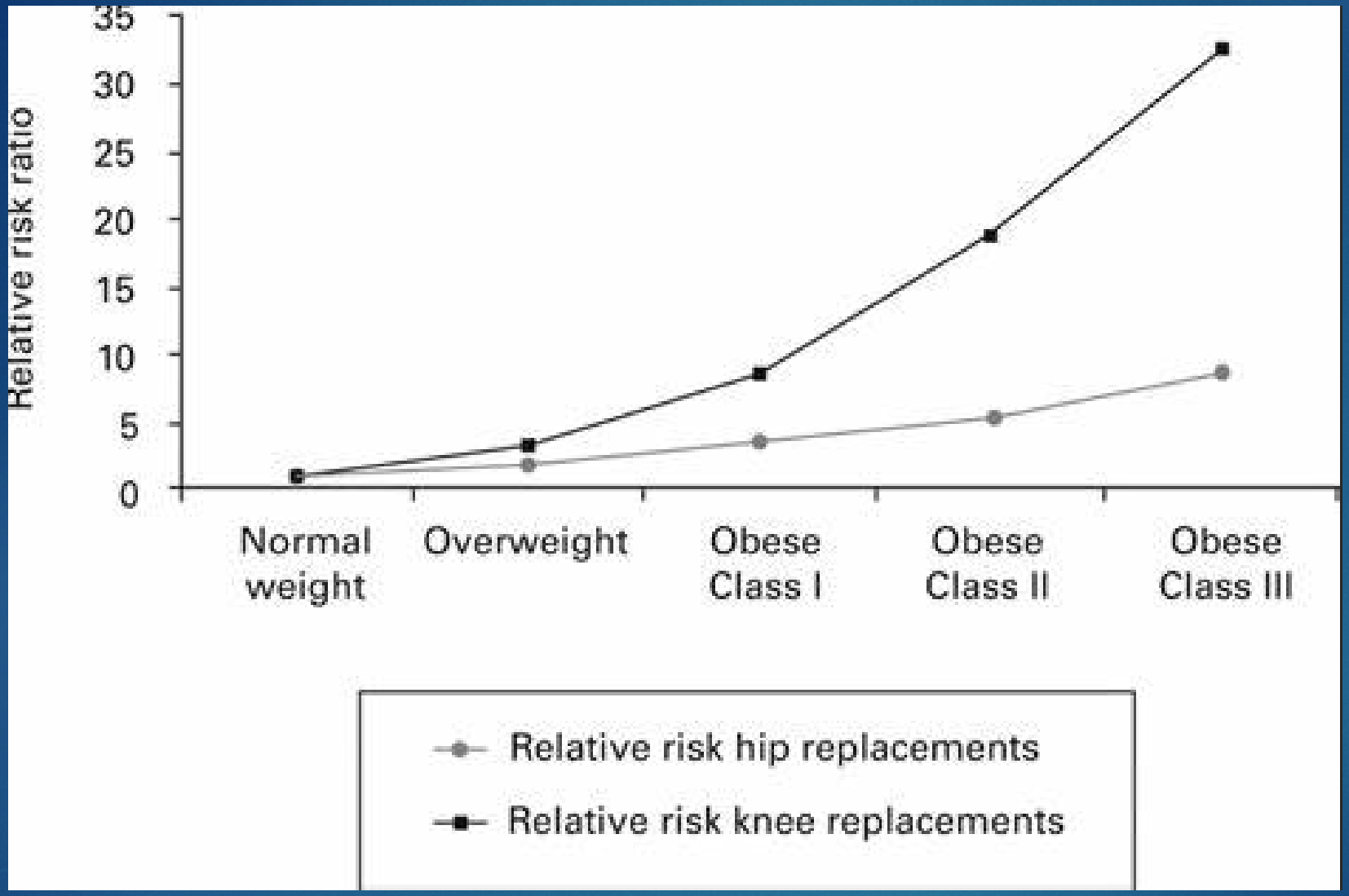

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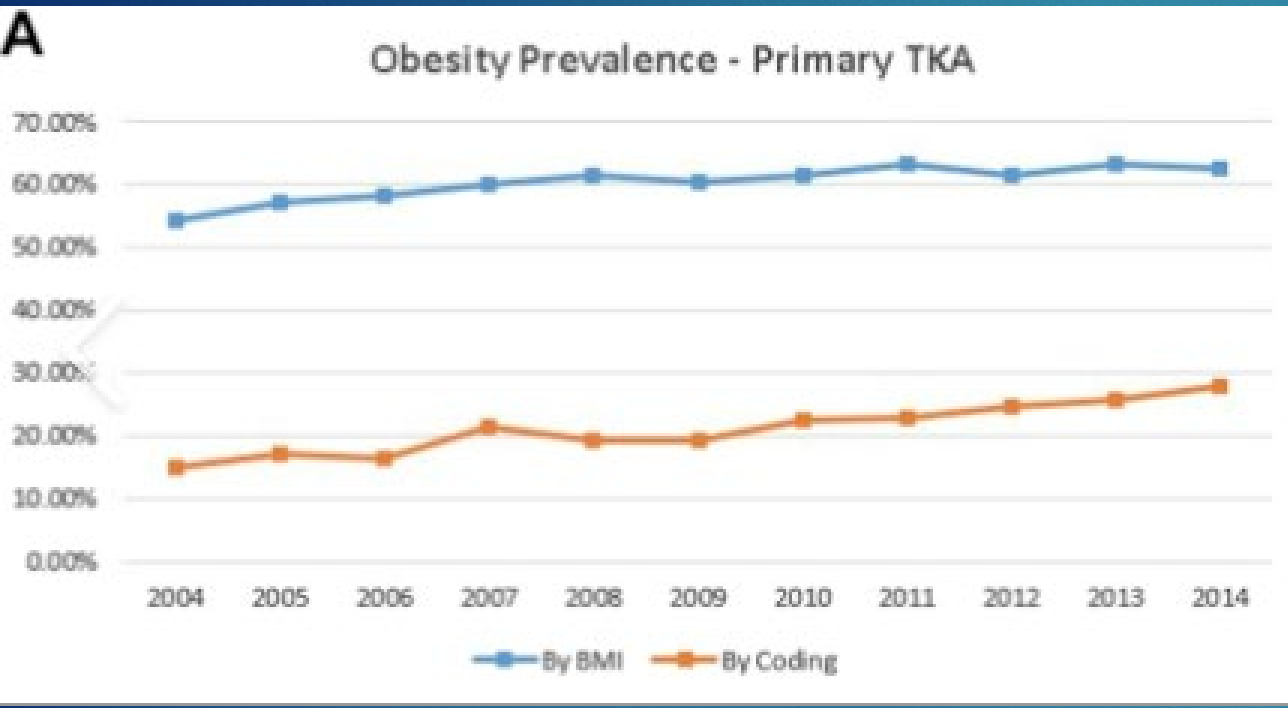
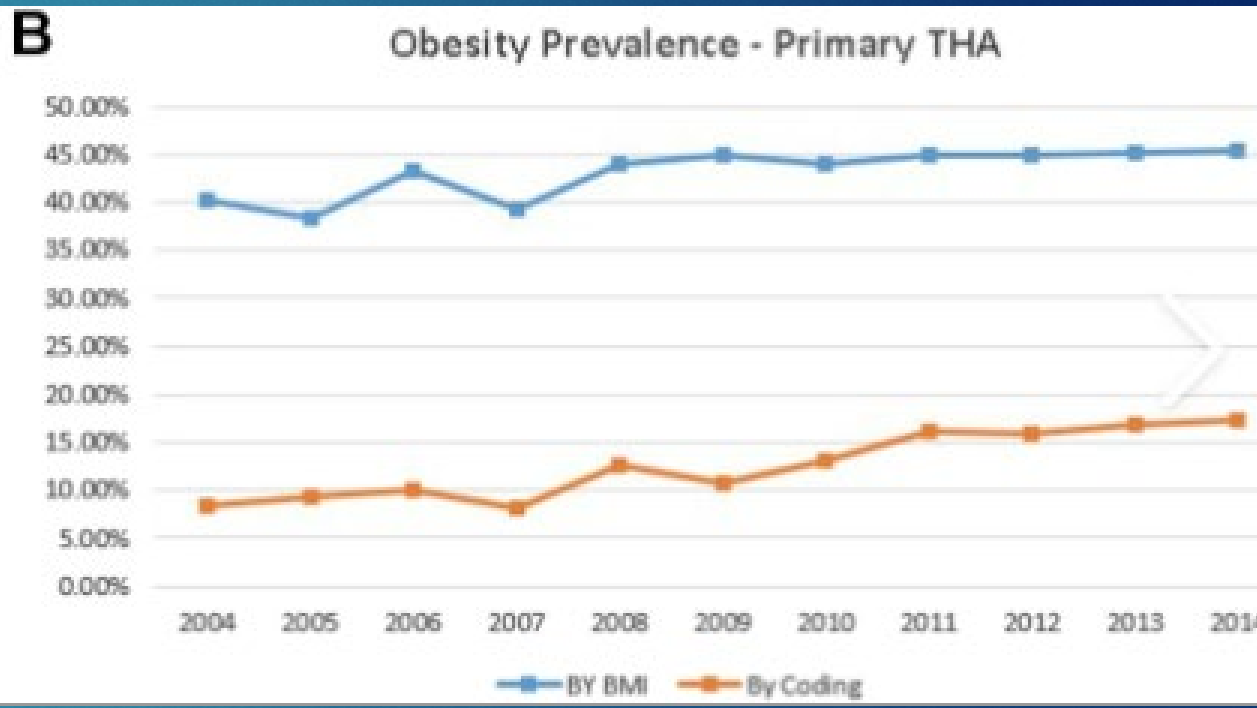
Obesity prevalence





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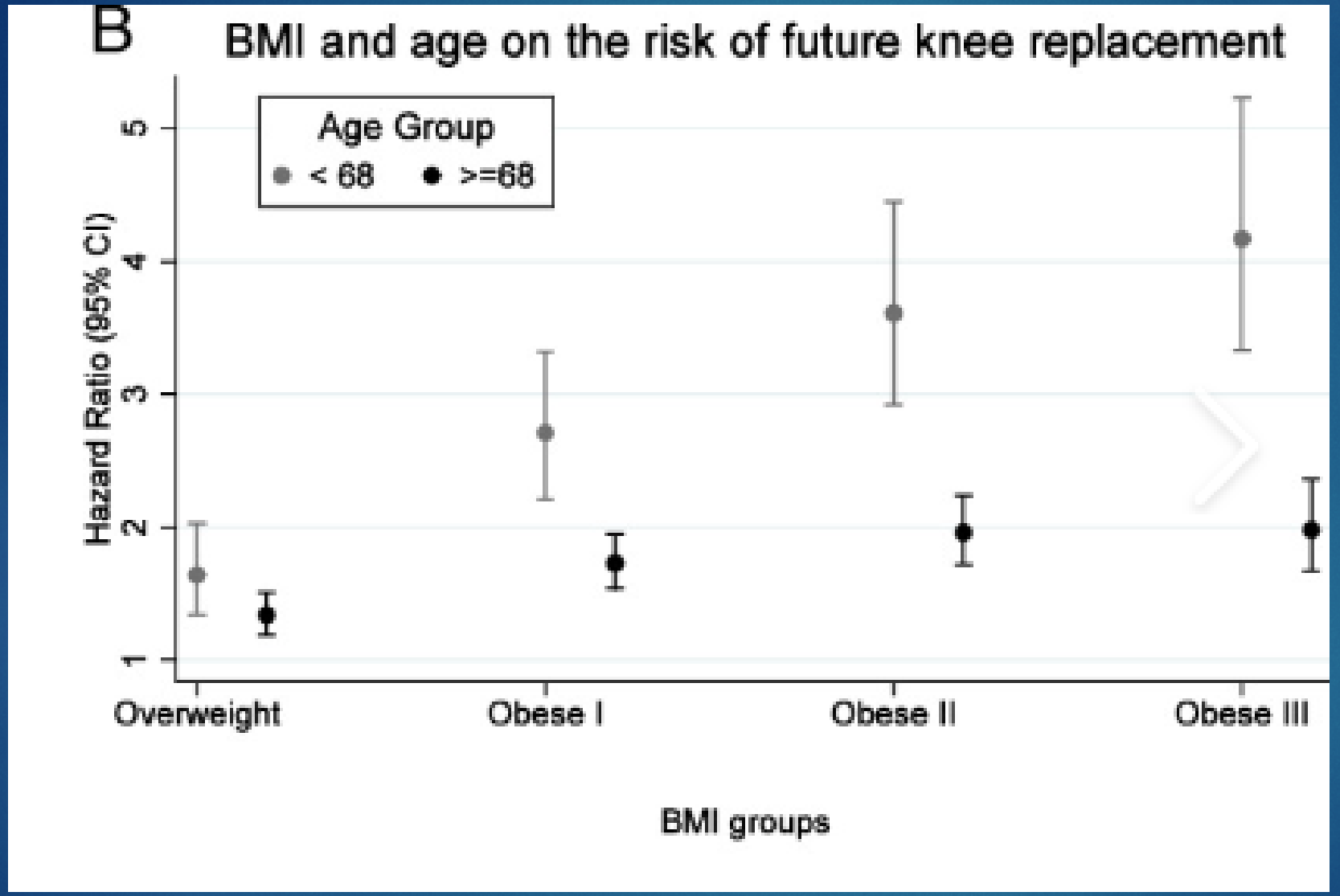

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“I’ll lose weight after surgery…”

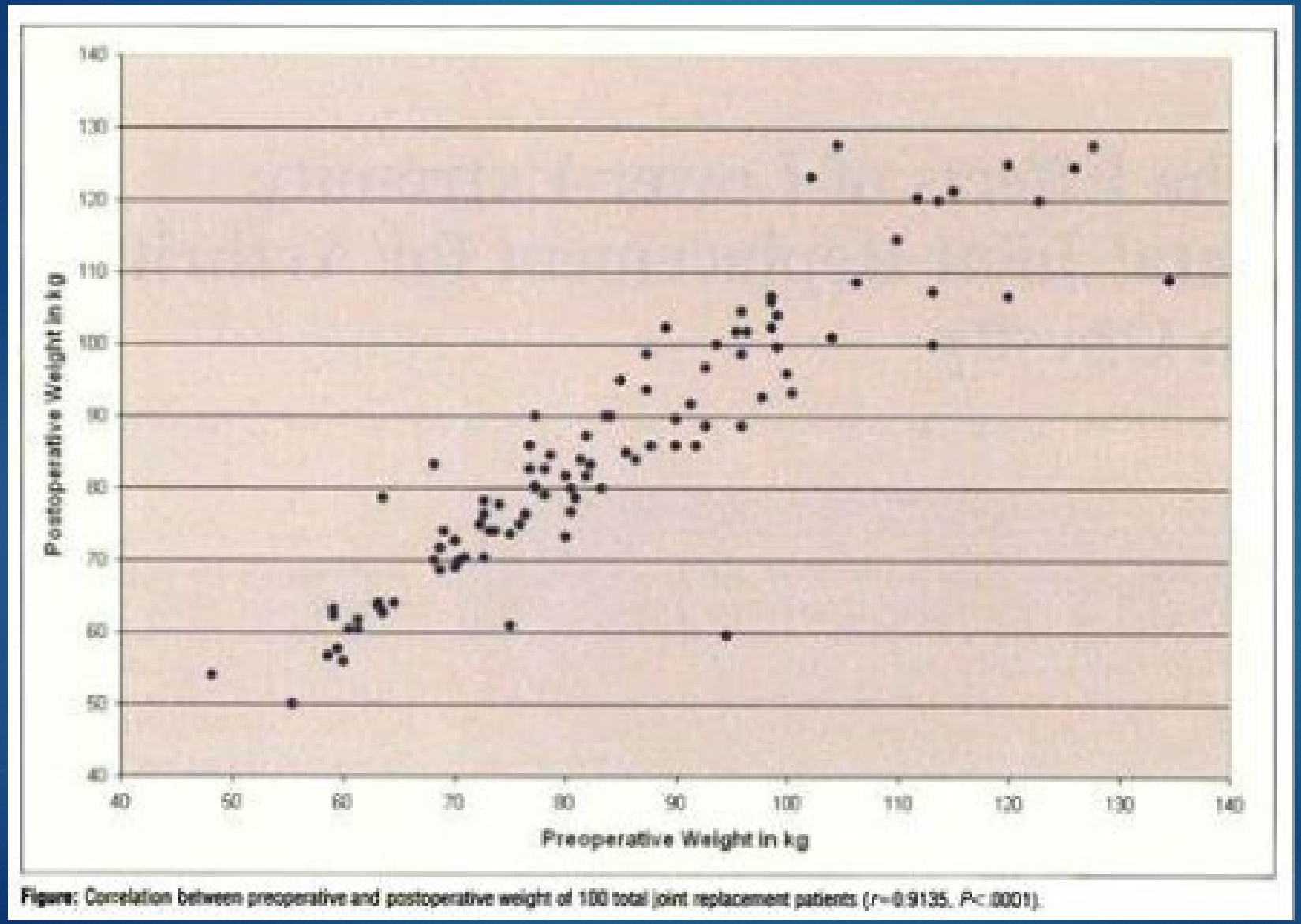

Figure: Correlation between preoperative and postoperative weight of 100 total joint replacement patients (r=0.9135, P<.0001).

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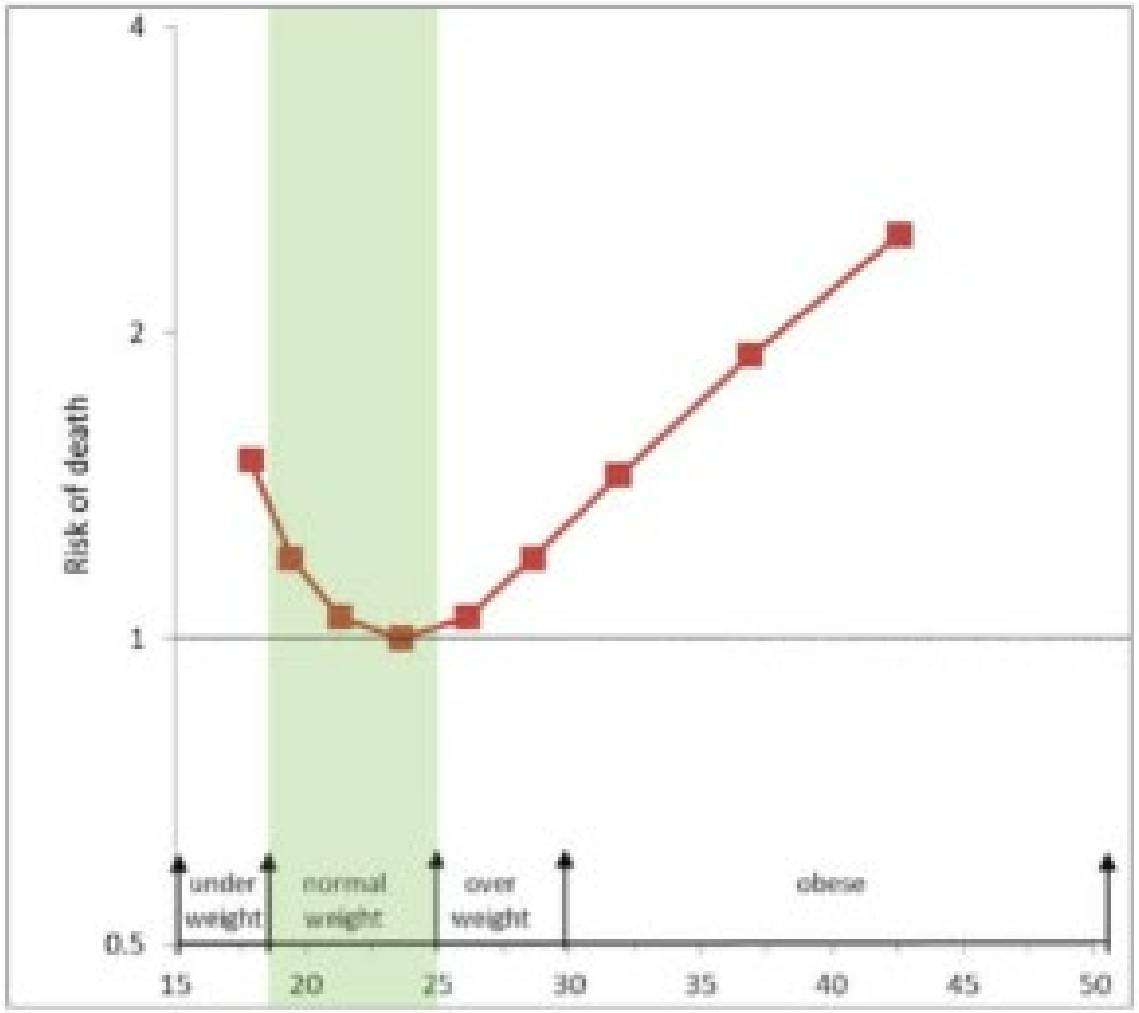
BMI vs. Death (all causes)



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Obesity prevalence

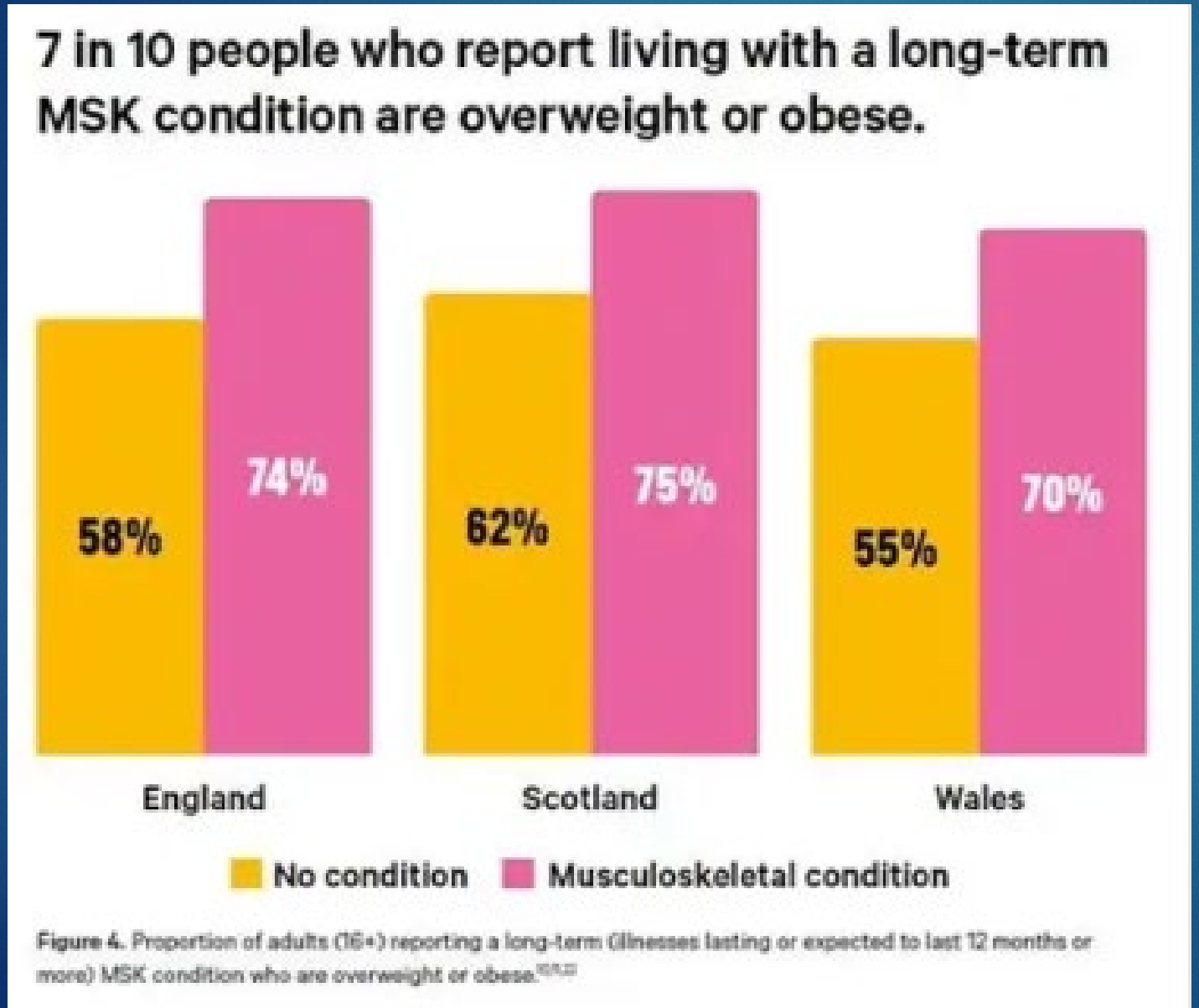

Figure 4. Proportion of adults (16+) reporting a long-term (illnesses lasting or expected to last 12 months or more) MSK condition who are overweight or obese.[10,11,22]

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OPERATION WALK
NEW YORK
operationwalksyracuse.org

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THANK YOU

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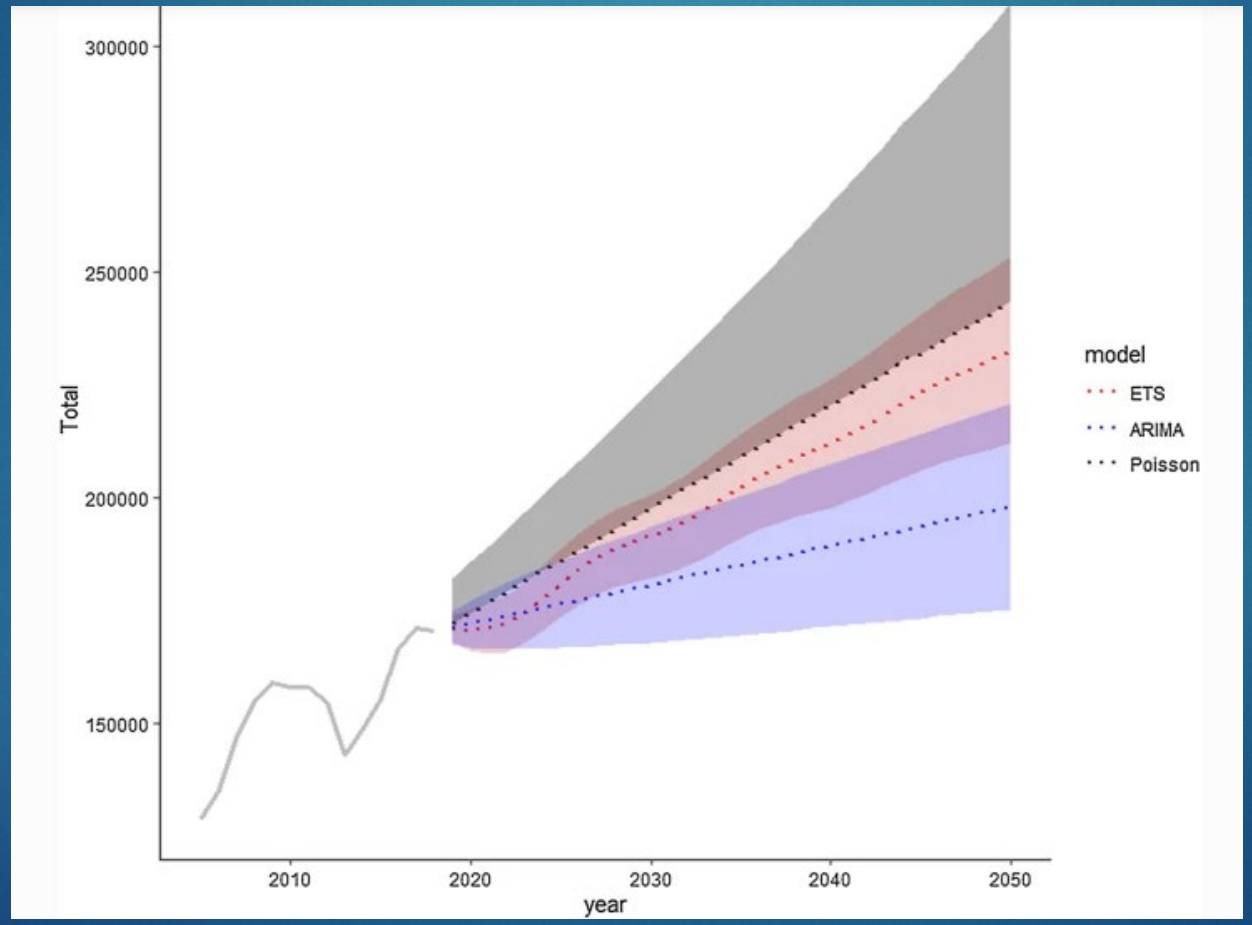
Projected TKA Procedures



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Inactivity

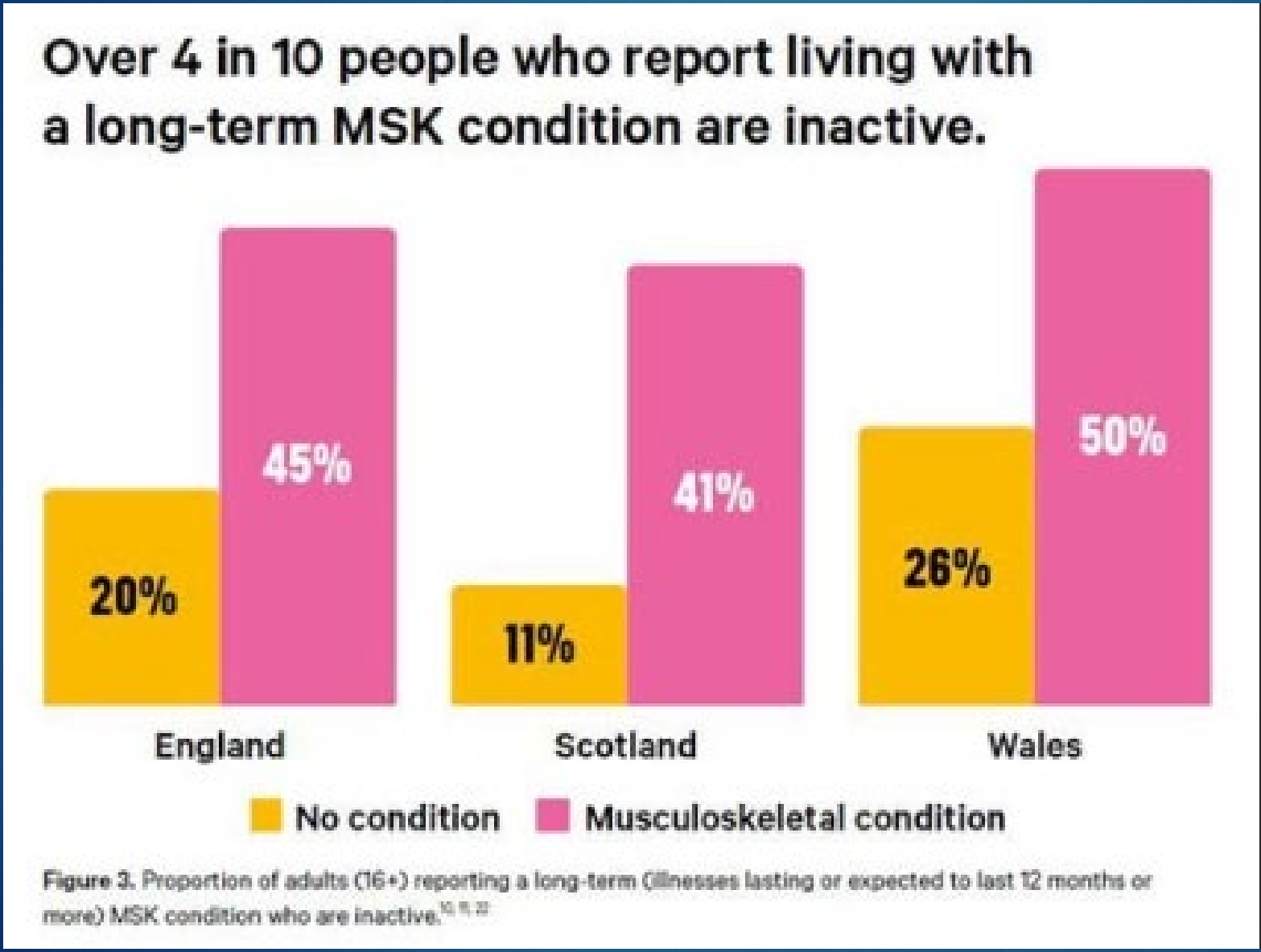
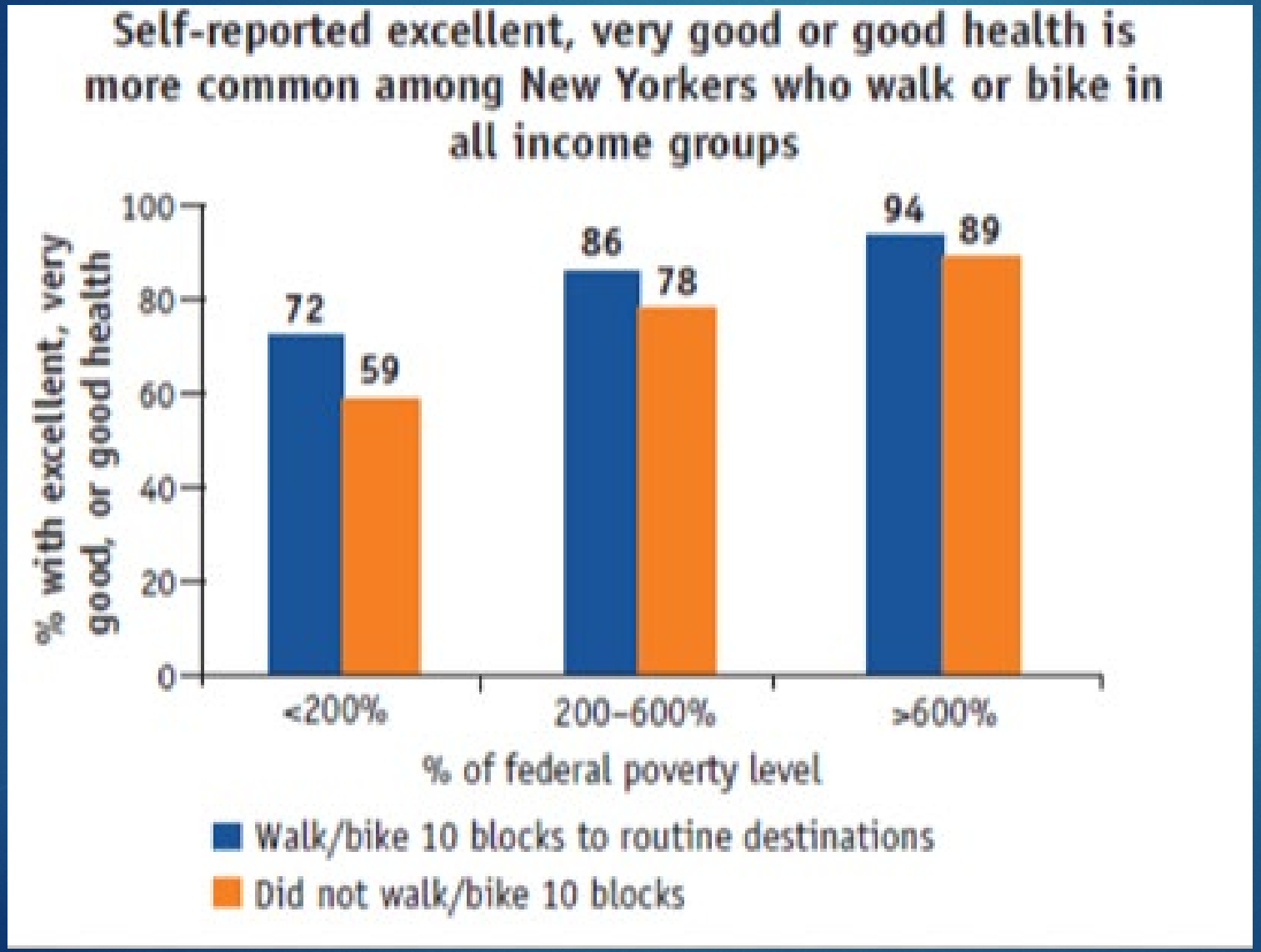


Figure 3. Proportion of adults (16+) reporting a long-term (illnesses lasting or expected to last 12 months or more) MSK condition who are inactive.[10, 11, 22]

SOS SYRACUSE ORTHOPEDIC SPECIALISTS

Health vs. activity



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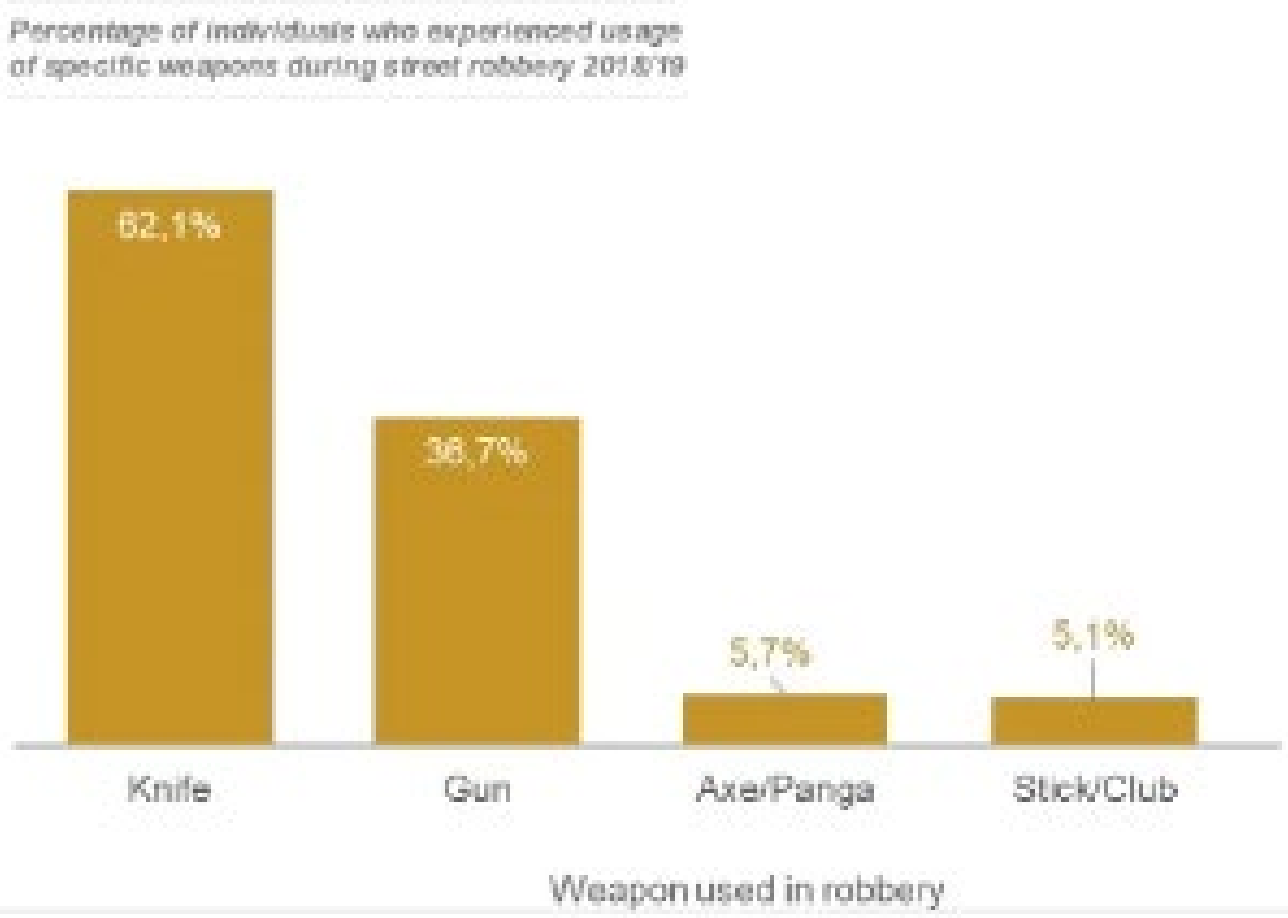
Knives and guns were used on 62% and 37% of individuals during street robberies, respectively.



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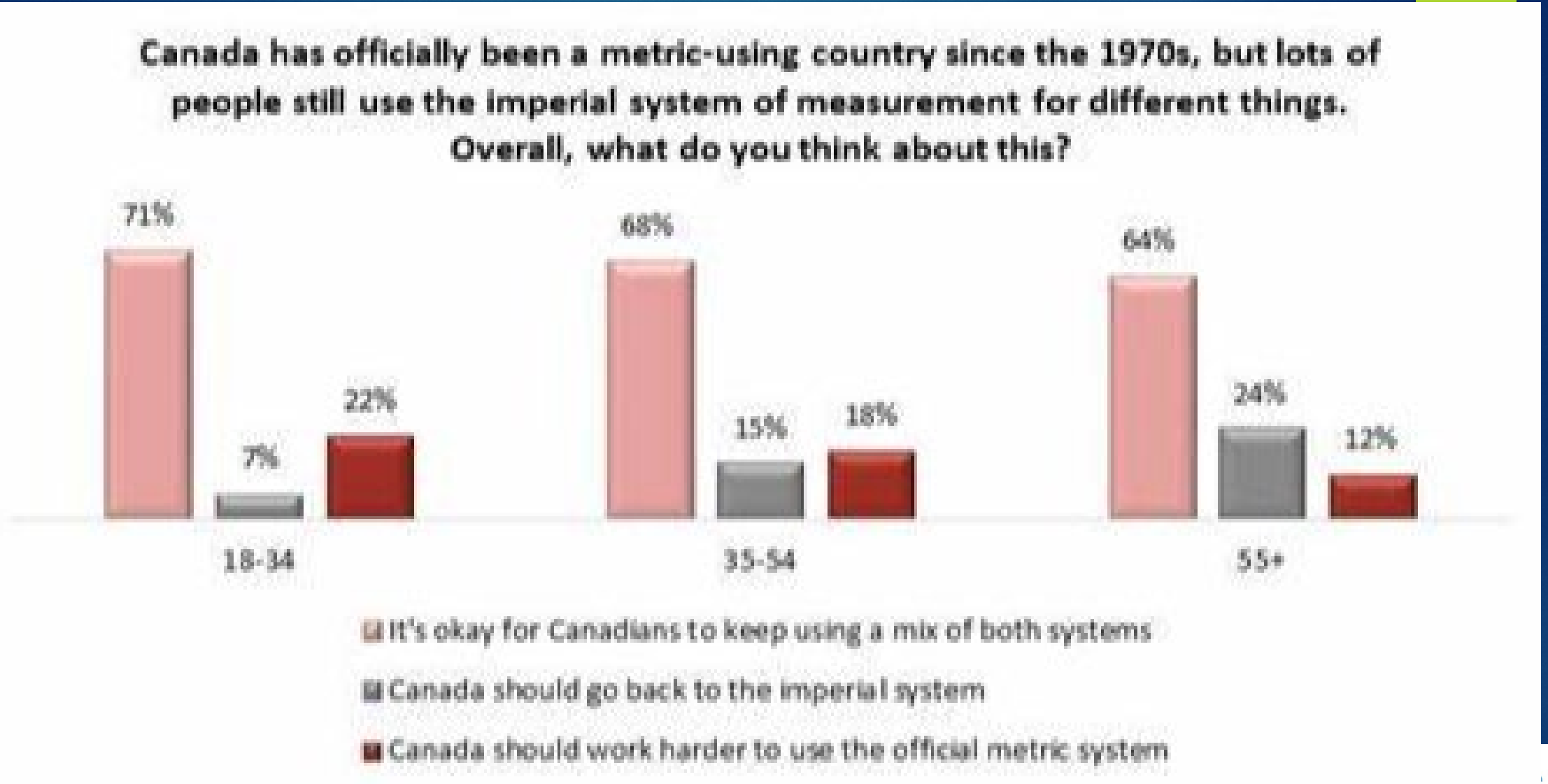

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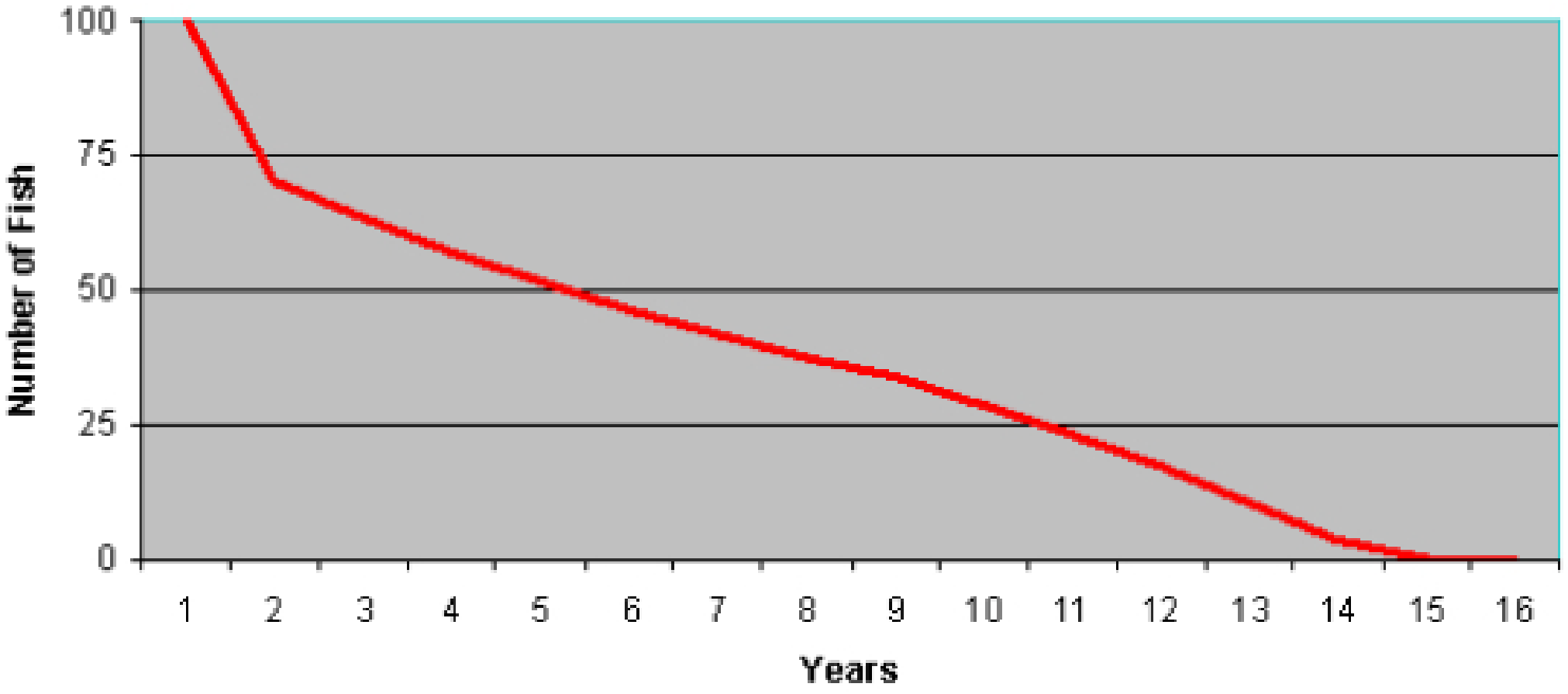
Mortality Rate Example - for a group fish that experiences a 30% mortality in the first year, with a maximum longevity of 15 years.



SYRACUSE ORTHOPEDIC SPECIALISTS