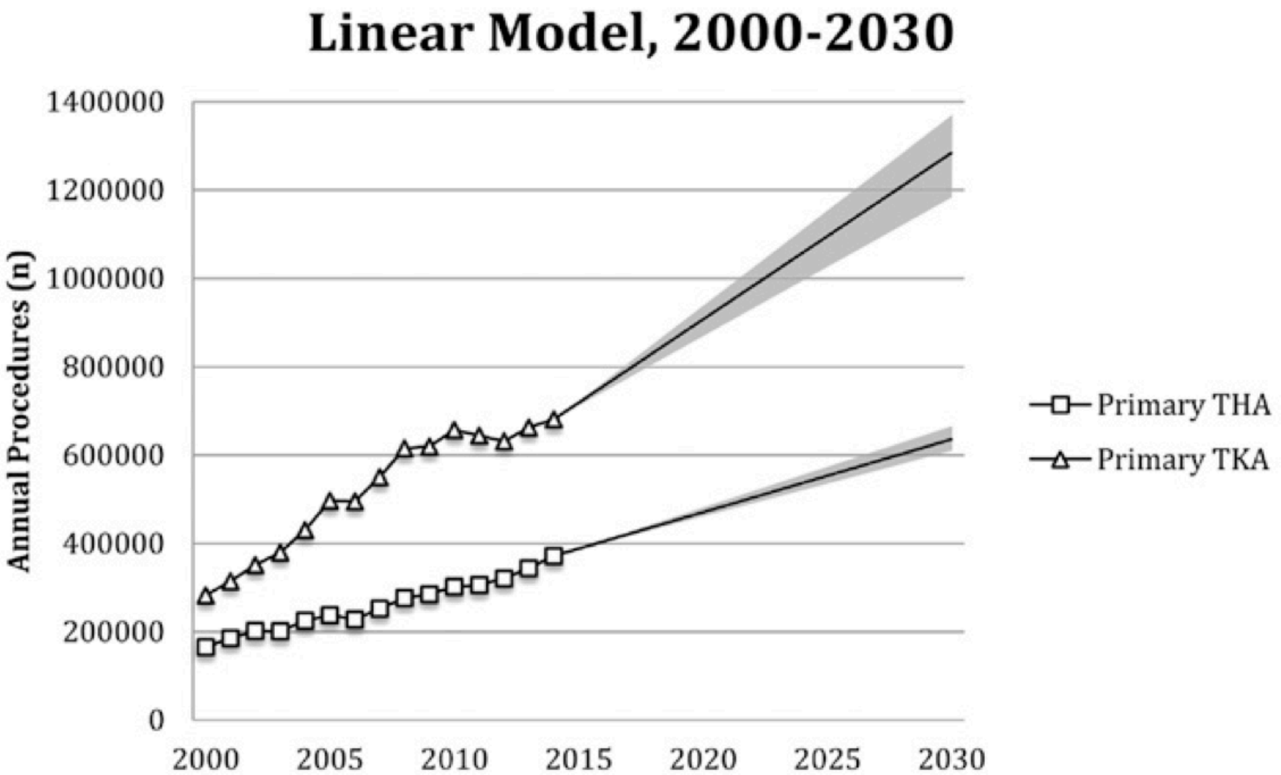
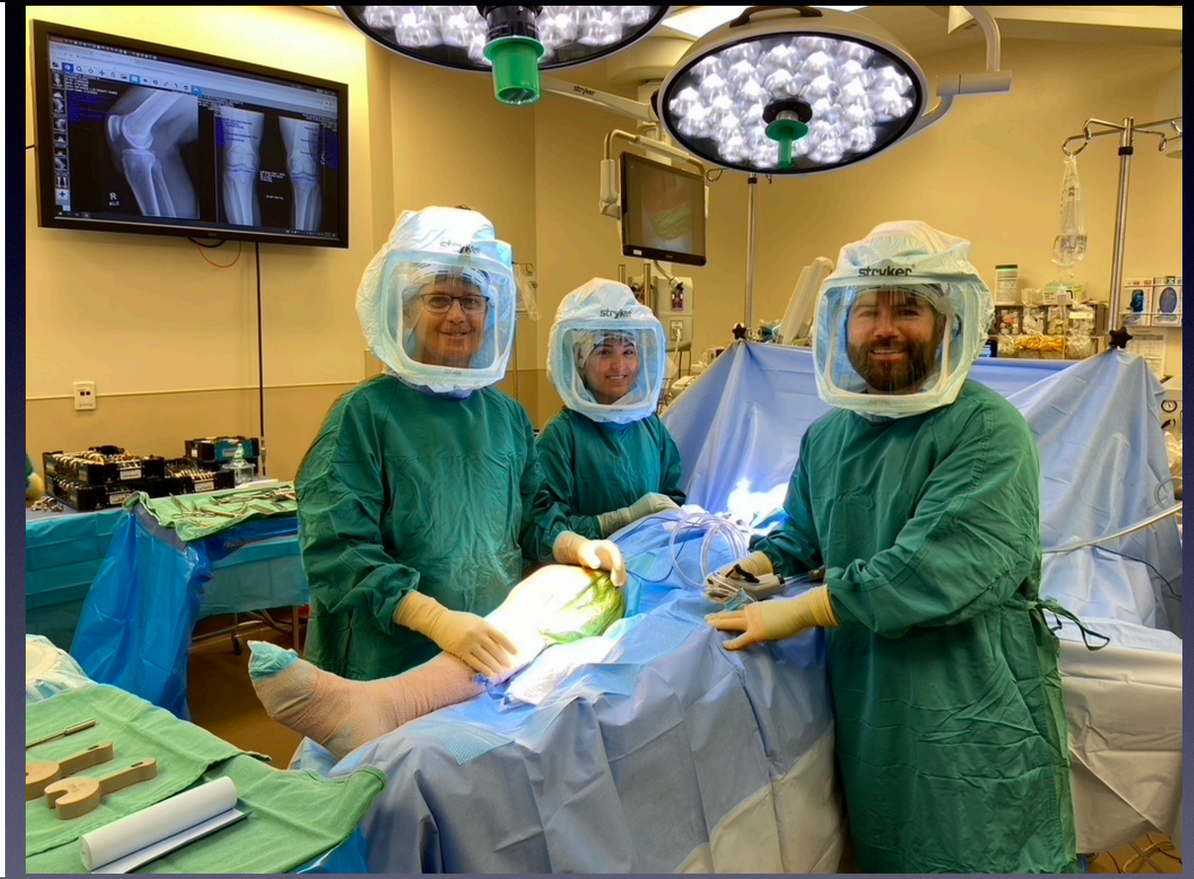
What Is New In Joint Replacement

Factors Affecting Outcomes


Linear Model, 2000-2030
Annual Procedures (n)
1400000
1200000
1000000
800000
600000
400000
200000
0
2000
2005
2010
2015
2020
2025
2030
Primary THA
Primary TKA


stryker

What Are Our Shared Goals?

* Improve the health of populations
* Improve the patient experience
* Reduce the per capita cost of health care

What Are a SURGEON'S Goals?

Holy Grail

* Unrestricted function
* Lifelong survivorship
* The forgotten joint

Complications

* Morbidity
* Mortality
* Readmissions
* Revisions

Collaboration In Our Community

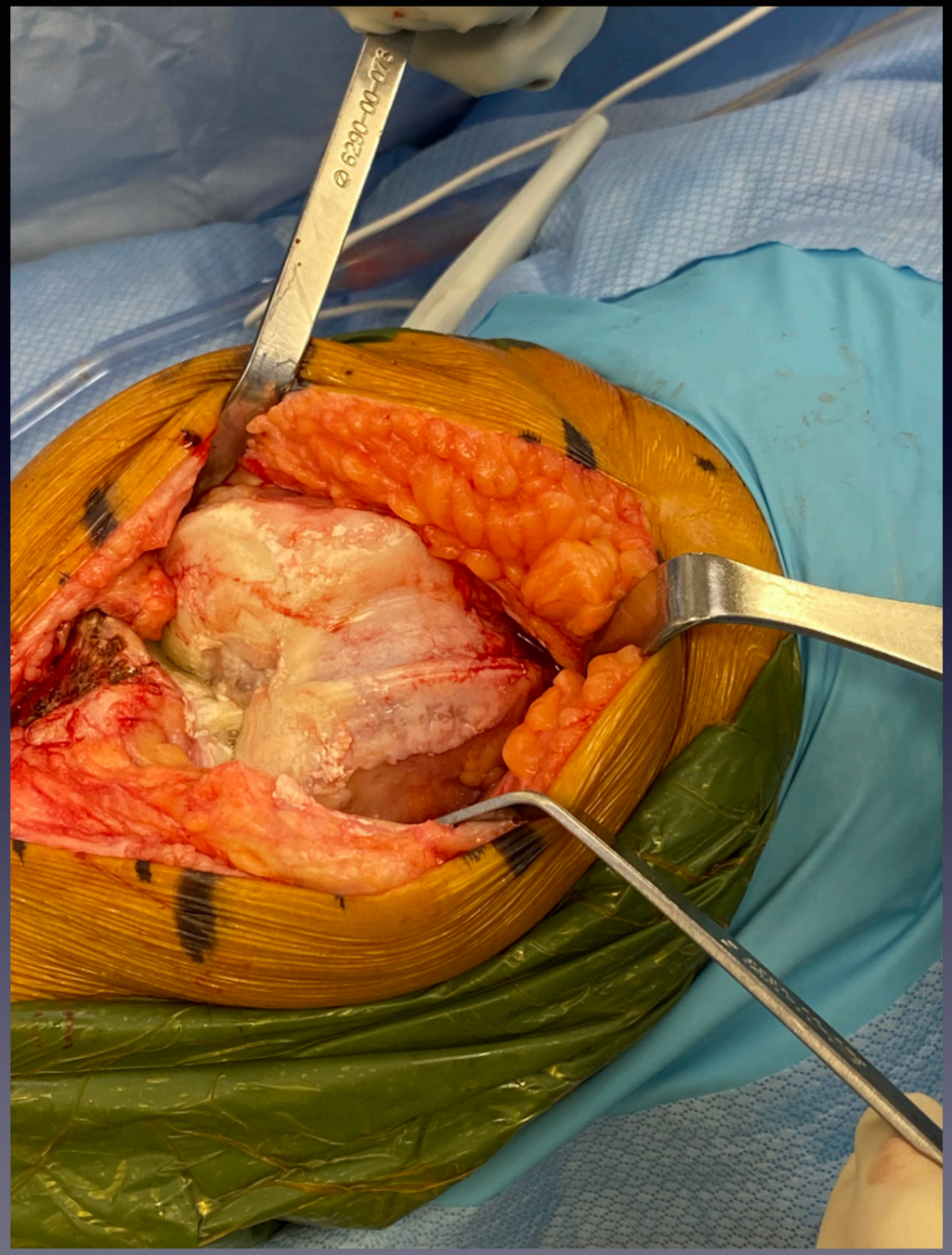
* Surgeon
* Primary care physician
* Hospital preoperative patient screening with anesthesia (education, NP or PA eval, labs, ekg, echo)
* A coach (family or friend)
* Online resources for patient education
  orthoinfo.org.
  hipknee.aahks.org

Where Can We Collaborate?

* Diabetes management
* Obesity
* Malnutrition
* Smoking
* Substance abuse
* Pain management
* Mental health
* Cardiovascular and stroke prevention
* Anemia
* Preoperative antiviral treatment
* Periodontal disease
* Frailty, frequent falls
* Recruit someone to be coach
* Provide a holistic approach to care
* Improve communication

Risk Stratification

* Charleston Comorbidity Index
* Elixhauser Comorbity Index
* OrthoCincy Readmission Tool
* Readmission Risk Assessment Tool (RRAT)
* Penn Arthroplasty Risk Score

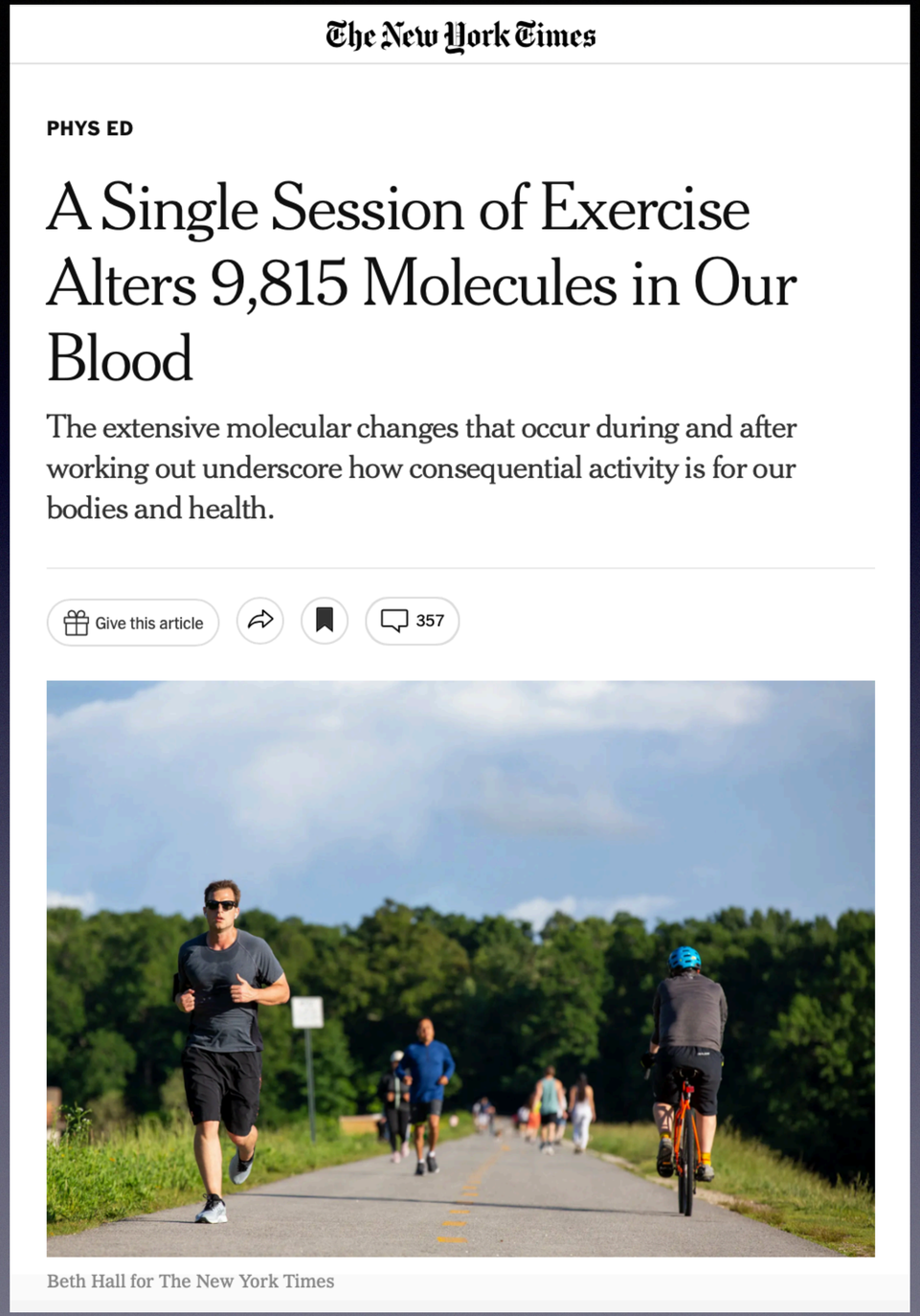


Who should be excluded from hip or knee replacement?

1. A patient on dialysis
2. A patient on 3 liters of oxygen
3. An insulin dependent diabetic
4. A fully anti-coagulated patient with a mechanical cardiac valve replacement
5. None of the above

“It hurts too much to exercise, doc”

* Pain relief - increases production of endogenous opioids. (enkephalins, endorphins, dynorphins)
* Articular cartilage and bone respond to exercise
* Improved mental health - coping mechanisms, decision making
* Prehab - improved strength, balance
* Weight loss, improved metabolic state
* startmovingstartliving.com



The New York Times

PHYS ED

A Single Session of Exercise Alters 9,815 Molecules in Our Blood

The extensive molecular changes that occur during and after working out underscore how consequential activity is for our bodies and health.

Give this article 357

Beth Hall for The New York Times

Routine preop labs:

* CBC
* BMP
* UA
* HbA1c if indicated
* PT/INR if indicated
* CRP/Sed rate for revisions

Consider comprehensive preop labs:

* CMP to include total protein, albumin, liver enzymes
* Electrolytes Mg, Ca, Phos
* Vitamins A, D, E, K

*And referral to a nutritionist 😀

Maximize Nutritional Status

JB&JS REVIEWS

Team Approach: Nutritional Assessment and Interventions in Elective Hip and Knee Arthroplasty

Ahmed K. Emara, MD

Matthew J. Hadad, MD

Michael Dube, BS

Alison K. Klika, MS

Bartolome Burguera, MD, PhD

Nicolas S. Piuzzi, MD

Investigation performed at the Department of Orthopaedic Surgery, Cleveland Clinic Foundation, Cleveland, Ohio

Abstract

» Nutritional assessment is a critical element of routine preoperative assessment and should be approached by an interdisciplinary team that involves the primary care physician, dietitian, and orthopaedist.

» Patients should be stratified on the basis of their nutritional risk, which influences downstream optimization and deficiency reversal.

» The scientific literature indicates that nutritional supplementation affords protection against adverse outcomes and helps functional recovery, even among patients who are not at nutritional risk.

» Published investigations recommend a sufficient preoperative interval (at least 4 weeks) to ensure an adequate nutritional intervention in malnourished patients as opposed to regarding them as nonsurgical candidates.

BMI Trends

* Patients requesting arthroplasty have a higher BMI than general population

* Rates of obesity in the general population have increased over the past decade

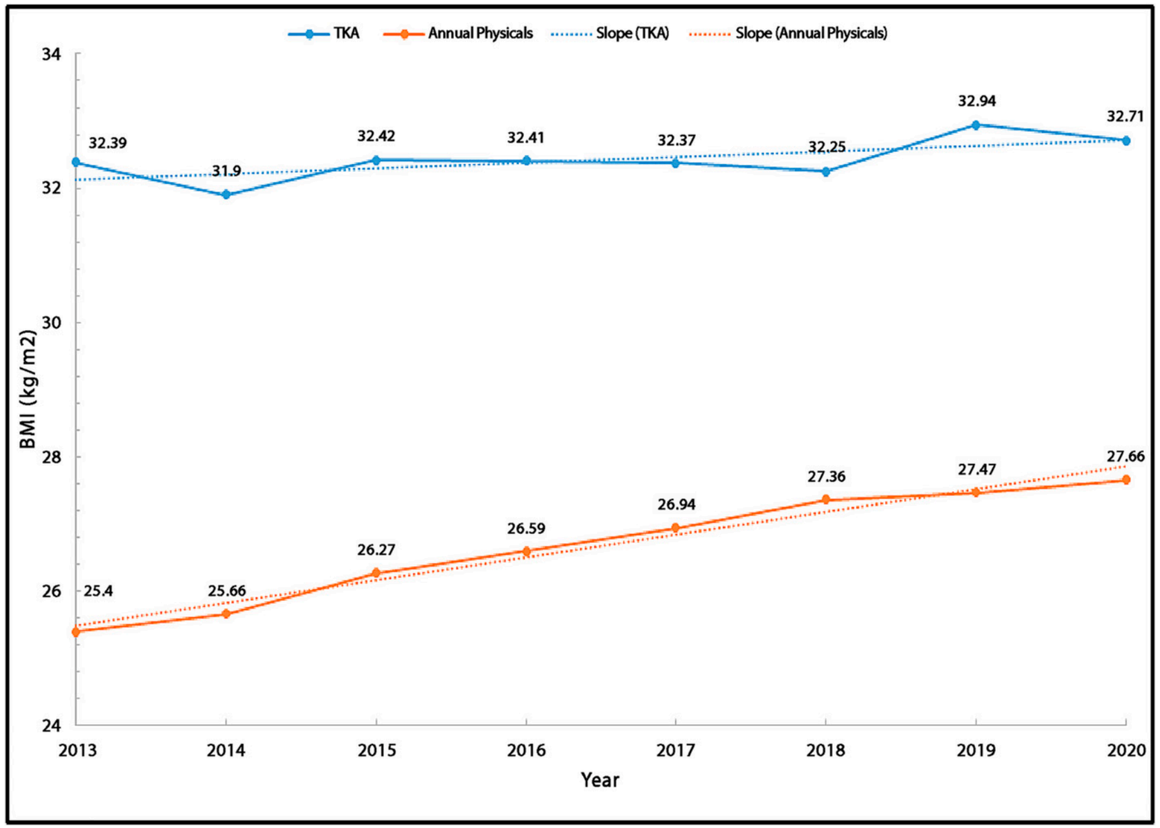


Fig. 1
Trends in BMI between the TKA group and the annual physicals group from 2013 to 2020.

Obesity Quiz

1. Are obese patients undergoing TKA or THA at increased risk of complications? Yes

2. Do obese patients who lose weight in the months immediately prior to hip or knee replacement decrease their risk of complications? No

3. Do obese patients lose weight after THA or TKA? Not often

4. Does bariatric surgery prior to arthroplasty decrease risk of complications?

It's complicated

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Proceedings of The Knee Society 2021

Does Bariatric Surgery Prior to Primary Total Knee Arthroplasty Improve Outcomes?

Sean P. Ryan, MD [a], Cory G. Couch, MD [a], Stephanie Q. Duong, MS [b], Michael J. Taunton, MD [a], David G. Lewallen, MD [a], Daniel J. Berry, MD [a], Matthew P. Abdel, MD [a, *]

[a] *Department of Orthopedic Surgery, Mayo Clinic, Rochester, MN*
[b] *Division of Clinical Trials and Biostatistics, Department of Quantitative Health Sciences, Mayo Clinic, Rochester, MN*

Bariatric patients have increased revision and re-operation rates, specifically for infection and instability, relative to patients with a naturally high or low BMI

THE AMERICAN ORTHOPAEDIC ASSOCIATION

Leadership in Orthopaedics since 1887

AOA Critical Issues

The Role of Emotional Health in Functional Outcomes After Orthopaedic Surgery: Extending the Biopsychosocial Model to Orthopaedics

AOA Critical Issues

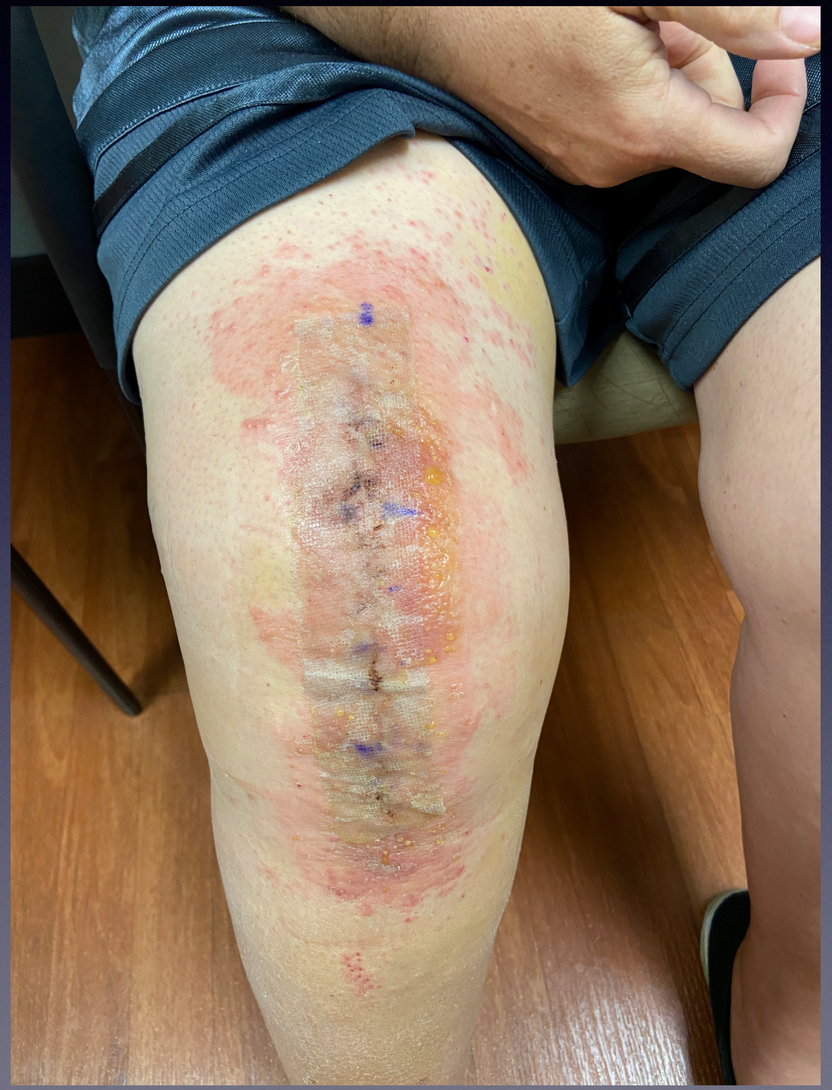
David C. Ayers, MD, Patricia D. Franklin, MD, MPH, MBA, and David C. Ring, MD, PhD

Poor Outcomes In Patients With Poor Emotional Health

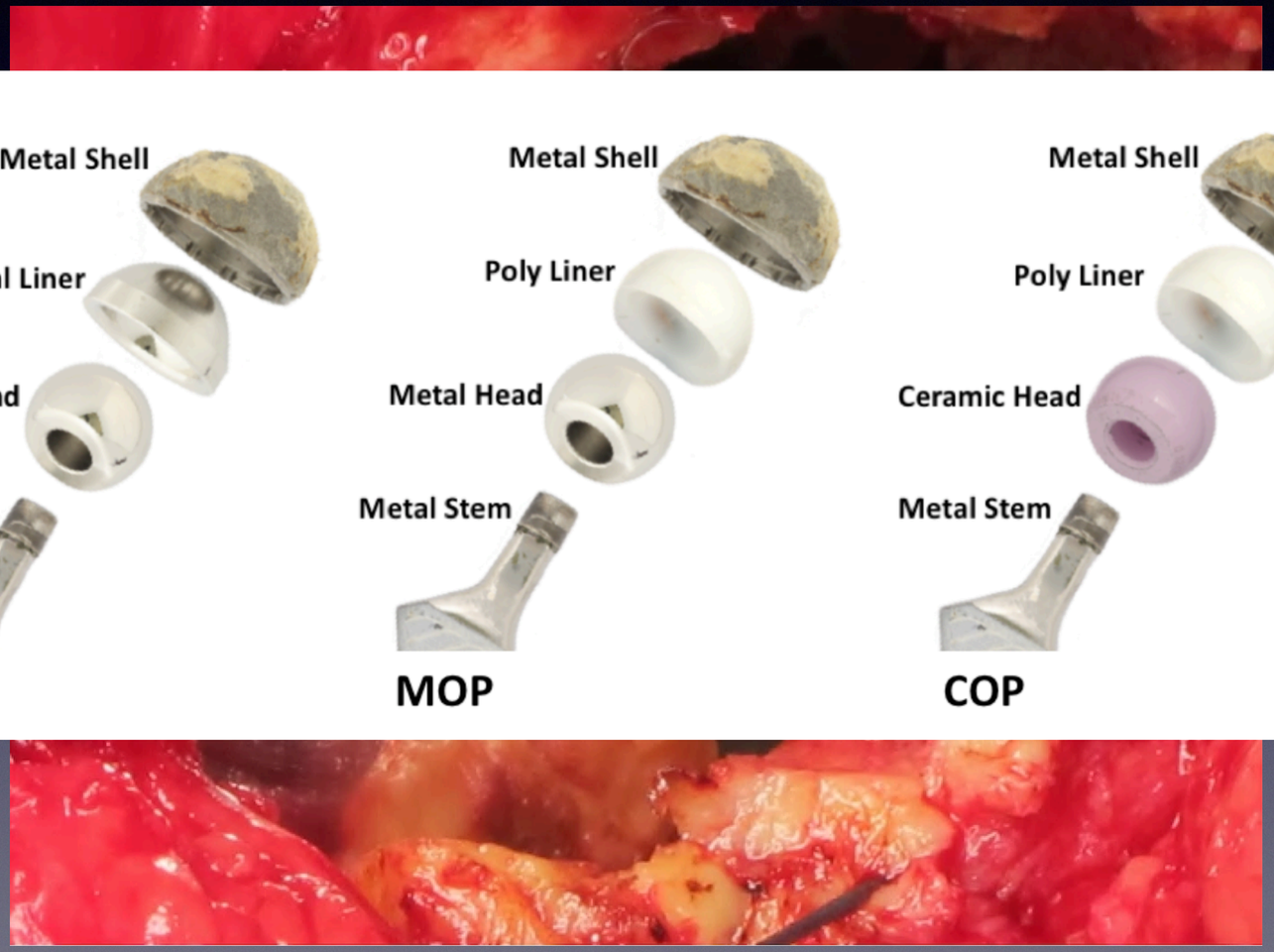
* Anxiety
* Depression
* Poor coping skills
* Poor social support
* Chronic widespread pain
* Sleep disturbance

Allergies

* Implant failure due to metal sensitivity is controversial



Allergy <——> Toxicity



Best Practices to Prevent VTE

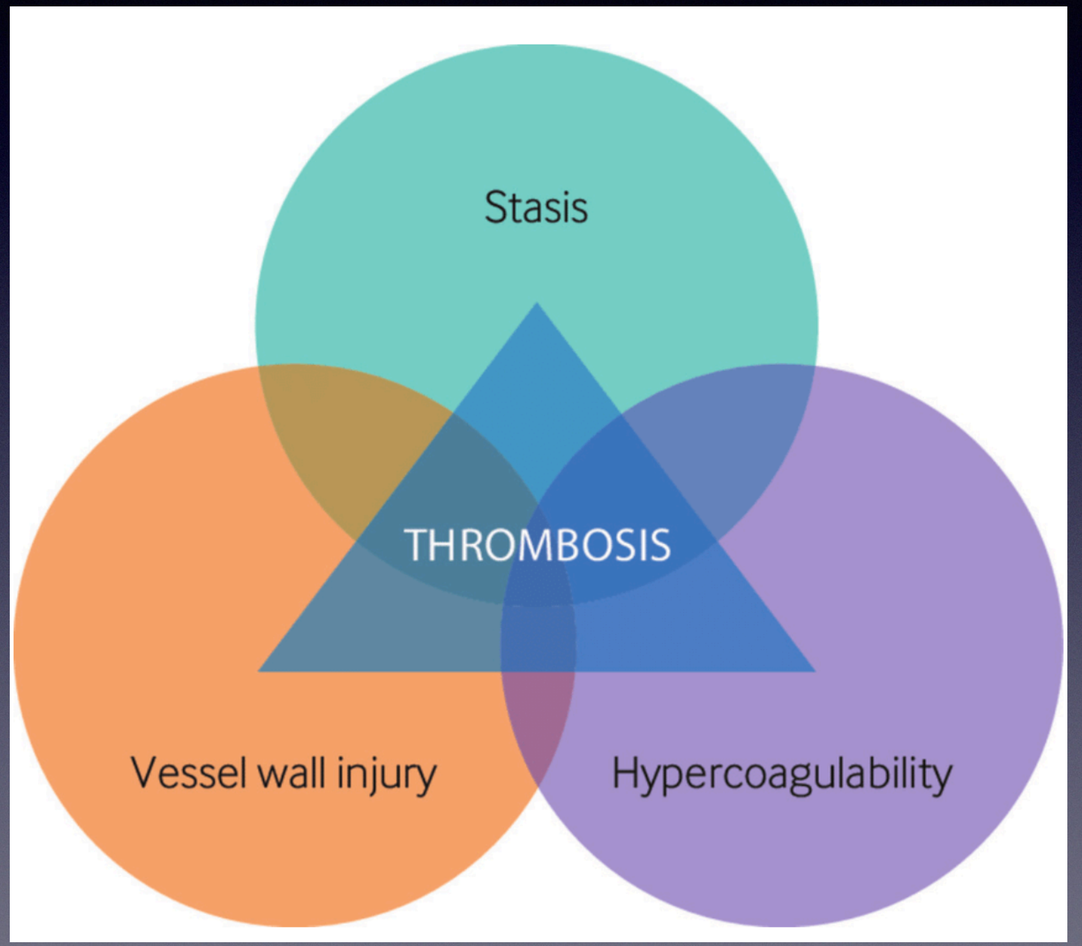
VTE prophylaxis is a balance of reducing thromboembolic disease while mitigating surgical complications associated with anticoagulants

Orthopedic Surgery and DVT

* John Charley 1962 -1973
  8,000 patients
  Nonfatal PE - 7.89%
  Fatal PE - 1.04%

* Current non fatal PE rate
  0.5-1%

* Fatal PE rate
  0.2-0.4%



Who is at risk for VTE

* Patients with a prior history of VTE
* Age >70
* BMI > 30
* Bilateral surgery
* Female patients
* Surgery duration > 2 hours - prolonged immobilization
* Varicose Veins
* Hx of MI, CHF, stroke
* Active malignancy

*Orthopedic patients - Intravasation of marrow fat is the strongest known stimulus of thrombogenesis

How to Decrease Risk of VTE

* Use risk stratification protocols to balance risk of medication
* Spinal anesthesia/hypotensive anesthesia
* Intermittent pneumatic compression devices
* Blood loss management programs
* Rapid rehabilitation protocols
* Tourniquet?

Current Concepts Review

Venous Thromboembolic Prophylaxis After Total Hip and Knee Arthroplasty

Jay R. Lieberman, MD, and Jennifer A. Bell, MD

Investigation performed at the Department of Orthopaedic Surgery, Keck School of Medicine, University of Southern California, Los Angeles, California

- The selection of an agent for prophylaxis against venous thromboembolism (VTE) is a balance between efficacy and safety. The goal is to prevent symptomatic VTE while limiting the risk of bleeding.
- The optimal agent for VTE prophylaxis has not been identified. The American College of Chest Physicians guidelines recommend that, after total hip or total knee arthroplasty, patients receive at least 10 to 14 days of 1 of the following prophylaxis agents: aspirin, adjusted-dose vitamin K antagonist, apixaban, dabigatran, fondaparinux, low-molecular-weight heparin, low-dose unfractionated heparin, rivaroxaban, or portable home mechanical compression.
- The use of aspirin for VTE prophylaxis has increased in popularity over the past decade because it is effective, and it is an oral agent that does not require monitoring. The true efficacy of aspirin needs to be determined in multicenter randomized clinical trials.
- Validated risk stratification protocols are essential to identify the safest and most effective regimen for VTE prophylaxis for individual patients. There is no consensus regarding the optimal method for risk stratification; the selection of a prophylaxis agent should be determined by shared decision-making with the patient to balance the risk of thrombosis versus bleeding.
- Patients with atrial fibrillation being treated with chronic warfarin therapy or direct oral anticoagulants should stop the agent 3 to 5 days prior to surgery. Patients do not typically require bridging therapy prior to surgery.

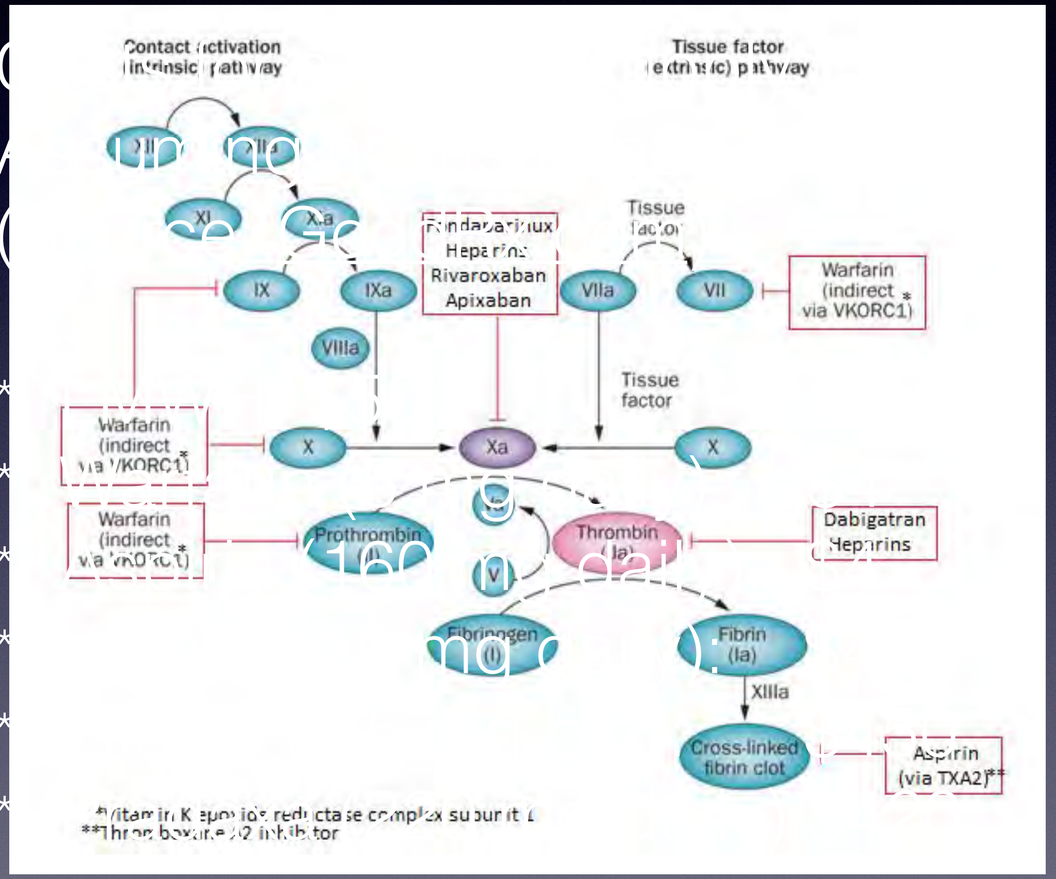
Contemporary Pharmacologic Agents

Vitamin K dependent
- Warfarin

AT-III binding
- Heparin, LMWH, Fondaparinux

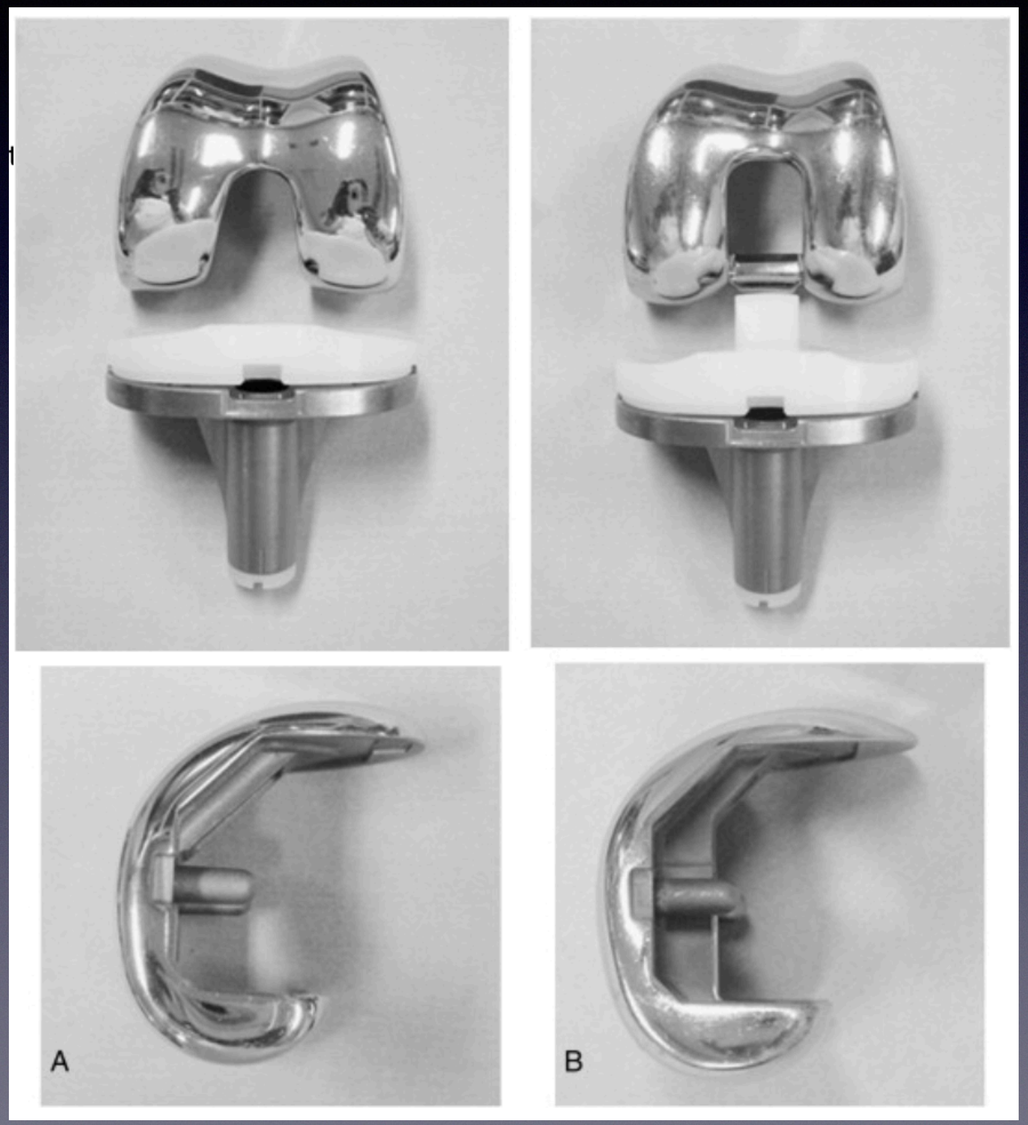
Selective direct inhibitors (DOAC)
- Xarelto, Eliquis, Pradaxa

Platelets
- Aspirin, Plavix

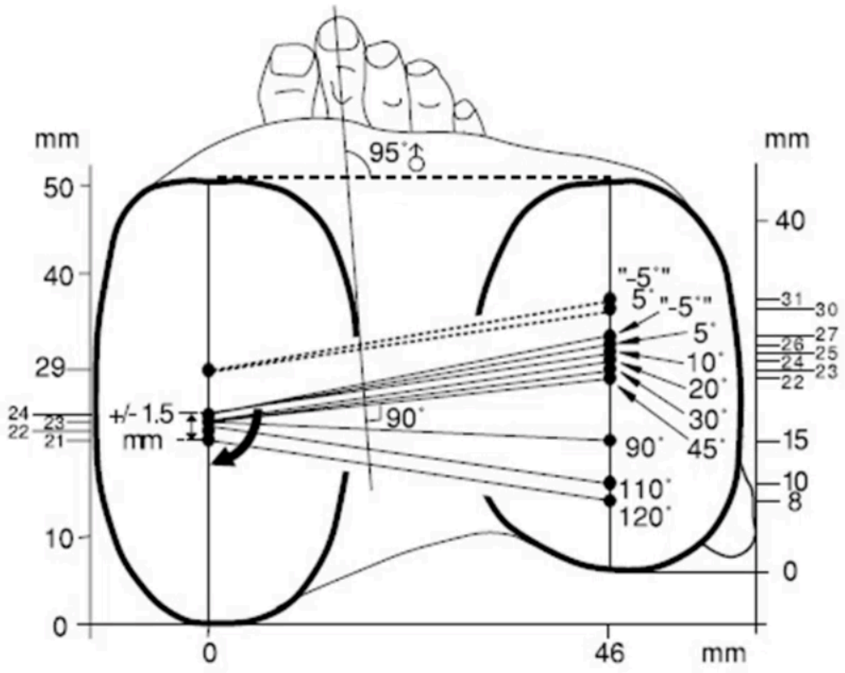


Traditional TKA Designs

* PCL sparing
* PCL sacrificing
* PCL Substituting



Medial Congruent Knee



Freeman MAR. J Bone Joint Surg (Br). 2000;82-B:1189-1195.

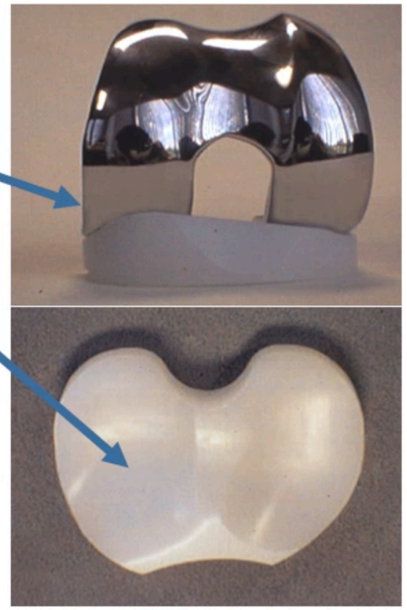
Medial Ball-in-Socket "Medial Pivot" TKA Prosthesis

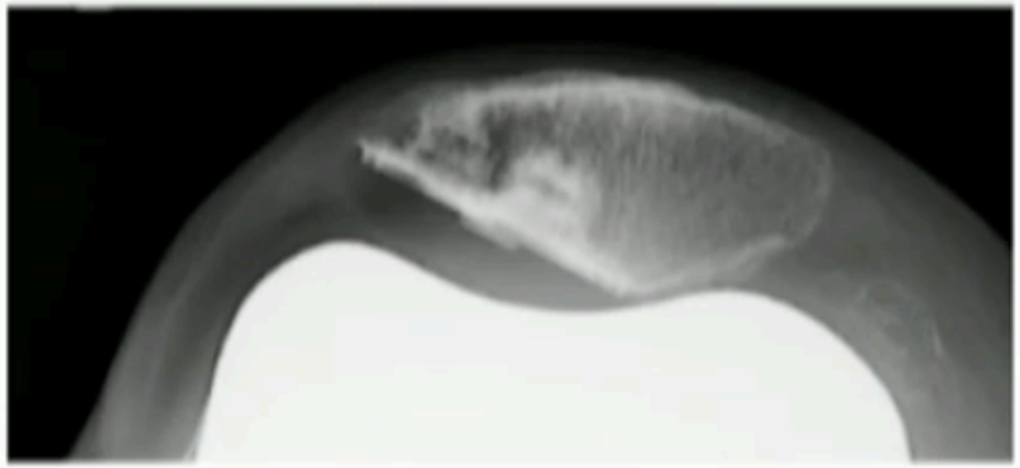
Medial ball-in-socket

Highly conforming

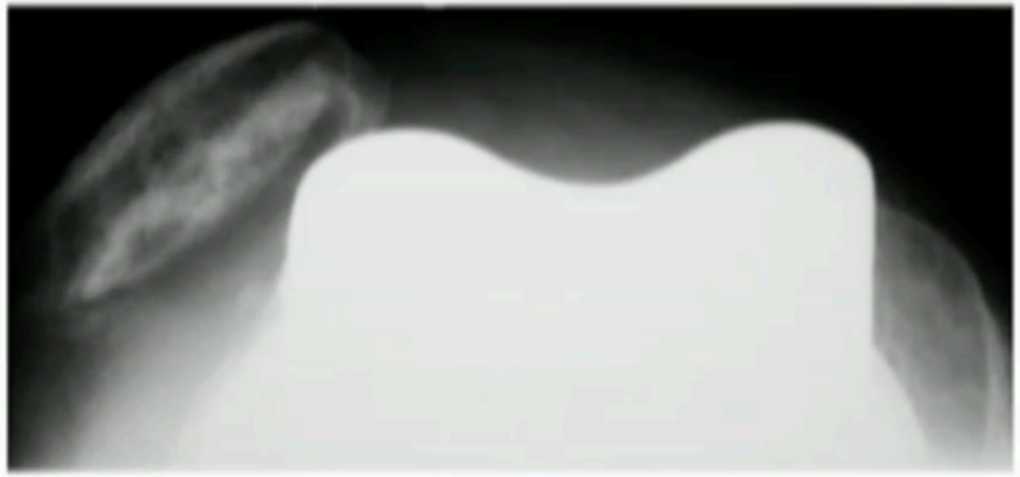
Large contact area

Low contact stress

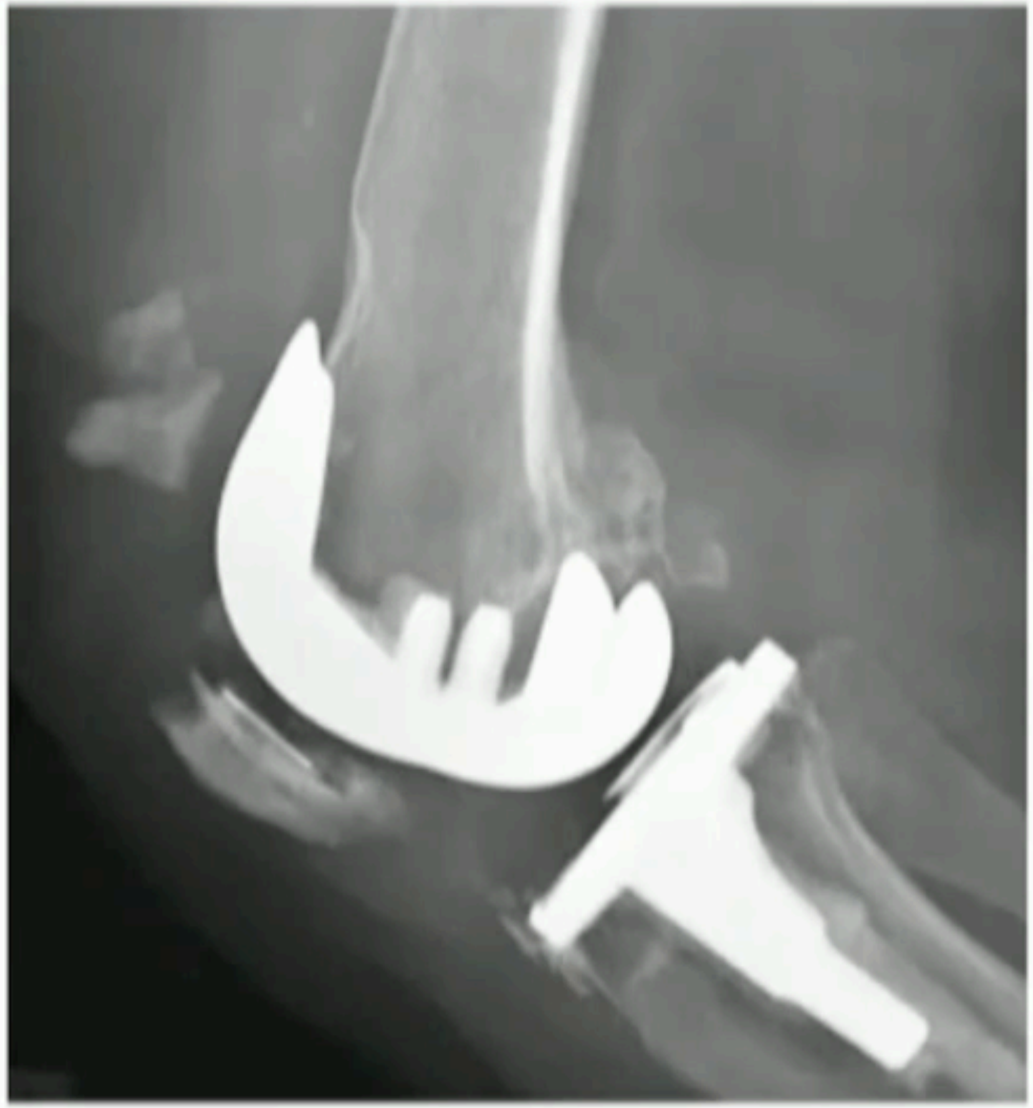




Poor Position

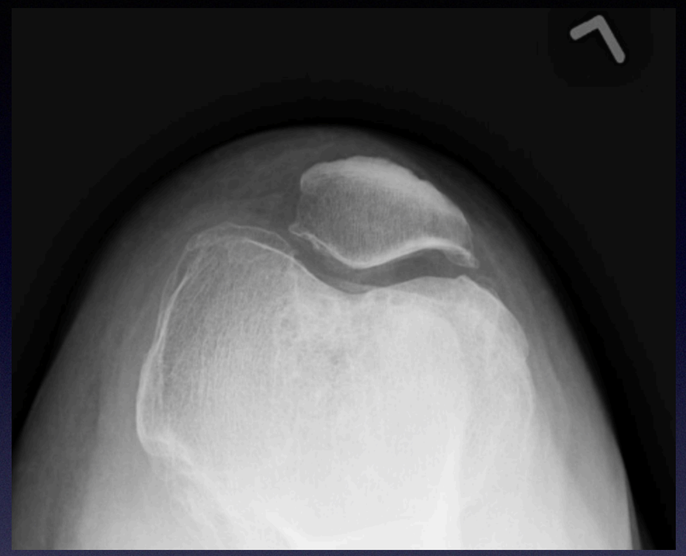


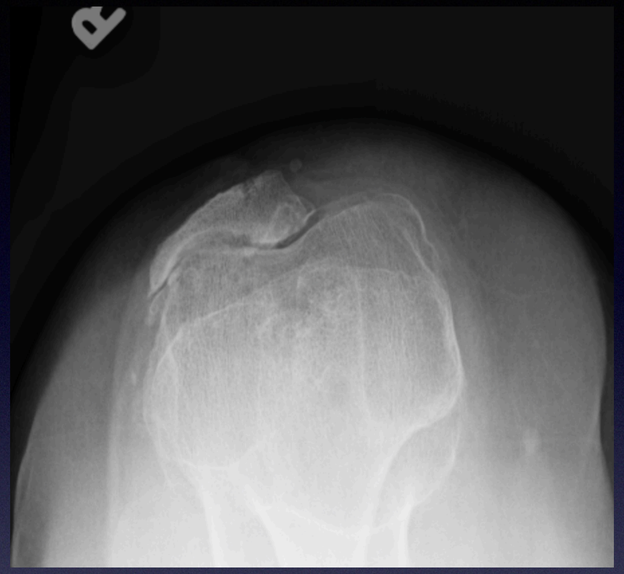
Dislocation

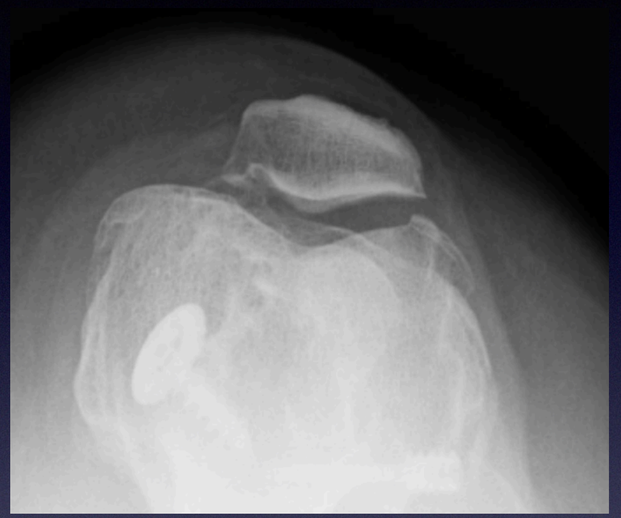


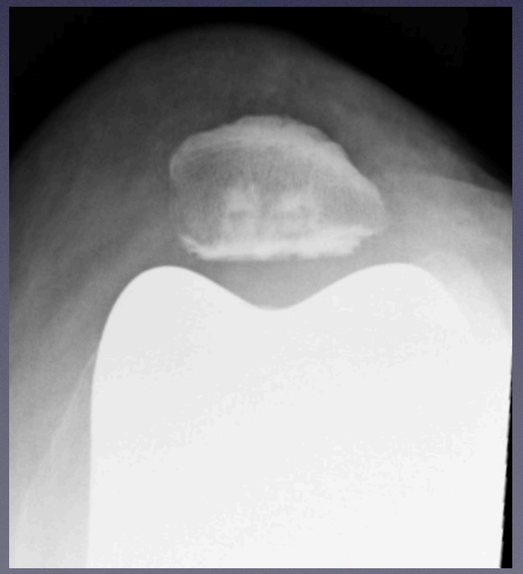
Fracture

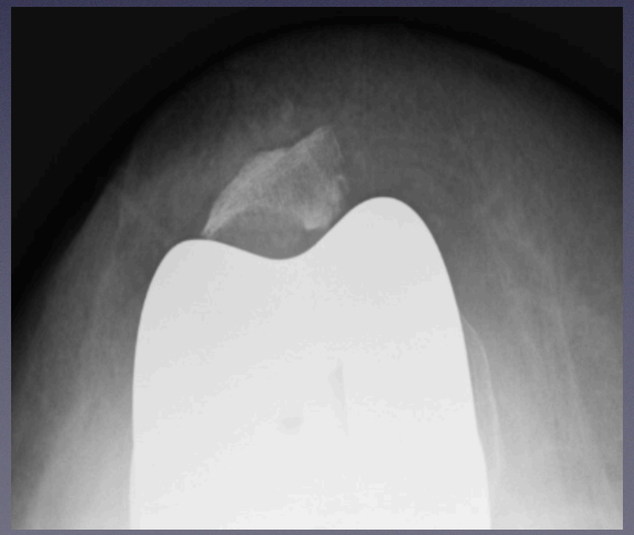
The Patella Conundrum

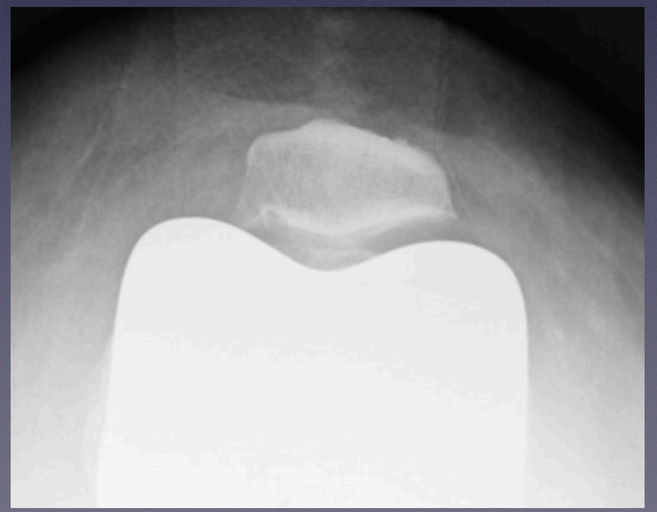












Anterior vs Posterior THA

Surgical Approaches for Primary Total Hip Arthroplasty from Charnley to Now

The Quest for the Best Approach

Vinay K. Aggarwal, MD

Richard Iorio, MD

Joseph D. Zuckerman, MD

William J. Long, MD, FRCSC

Investigation performed at the Department of Orthopedic Surgery, NYU Langone Orthopedic Hospital, New York, NY

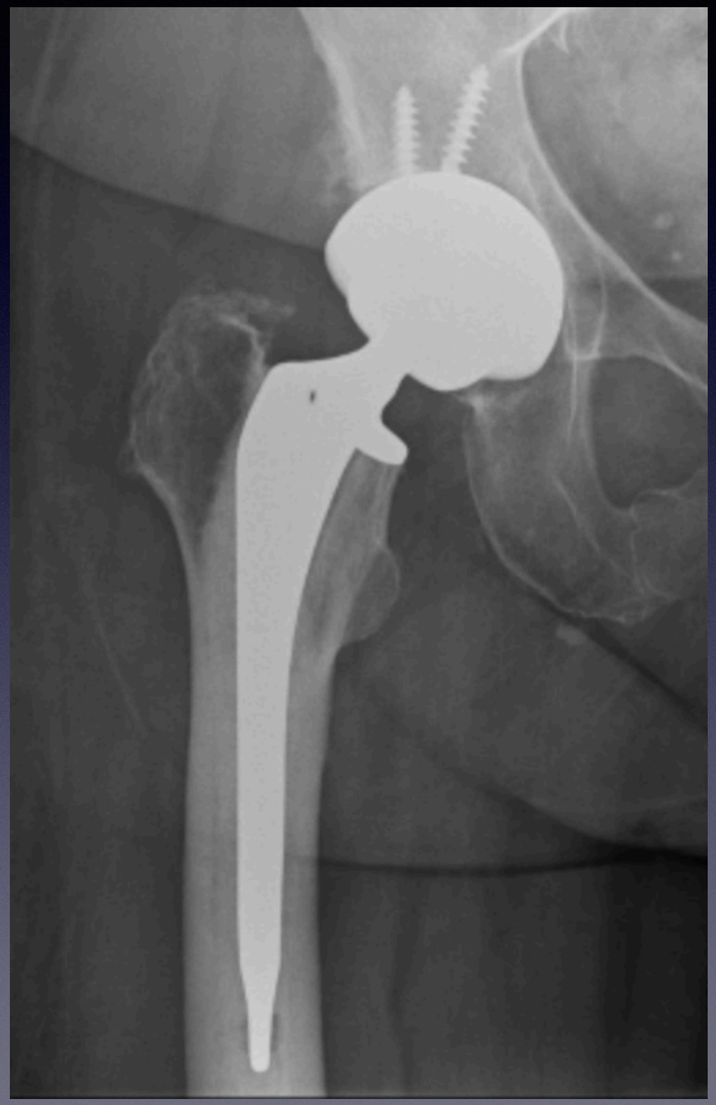
Abstract

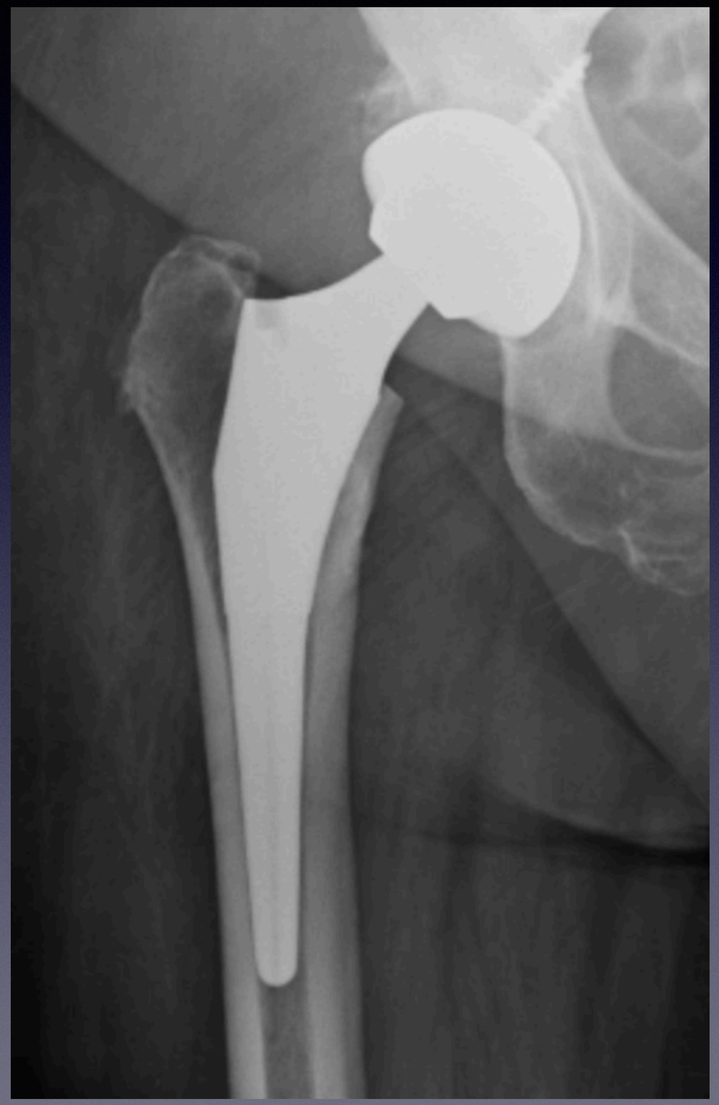
» Total hip arthroplasty is one of the most successful surgical interventions of the last century, yet questions remain as to the best surgical approach to use in order to achieve an optimal result. The main approaches to access the hip joint, which will be reviewed in this article, have a long history in the orthopaedic literature.

» The evidence behind the advantages and disadvantages of each approach also will be reviewed. In general, it can be said that the anterior approach affords the best early recovery as measured in the first 2 to 4 weeks after surgery. Lateral approaches have the lowest rates of dislocation. The posterior approach has the lowest rates of overall complications, and concerns regarding dislocation have been mitigated with the use of larger-diameter prosthetic femoral heads and advanced soft-tissue repair techniques.

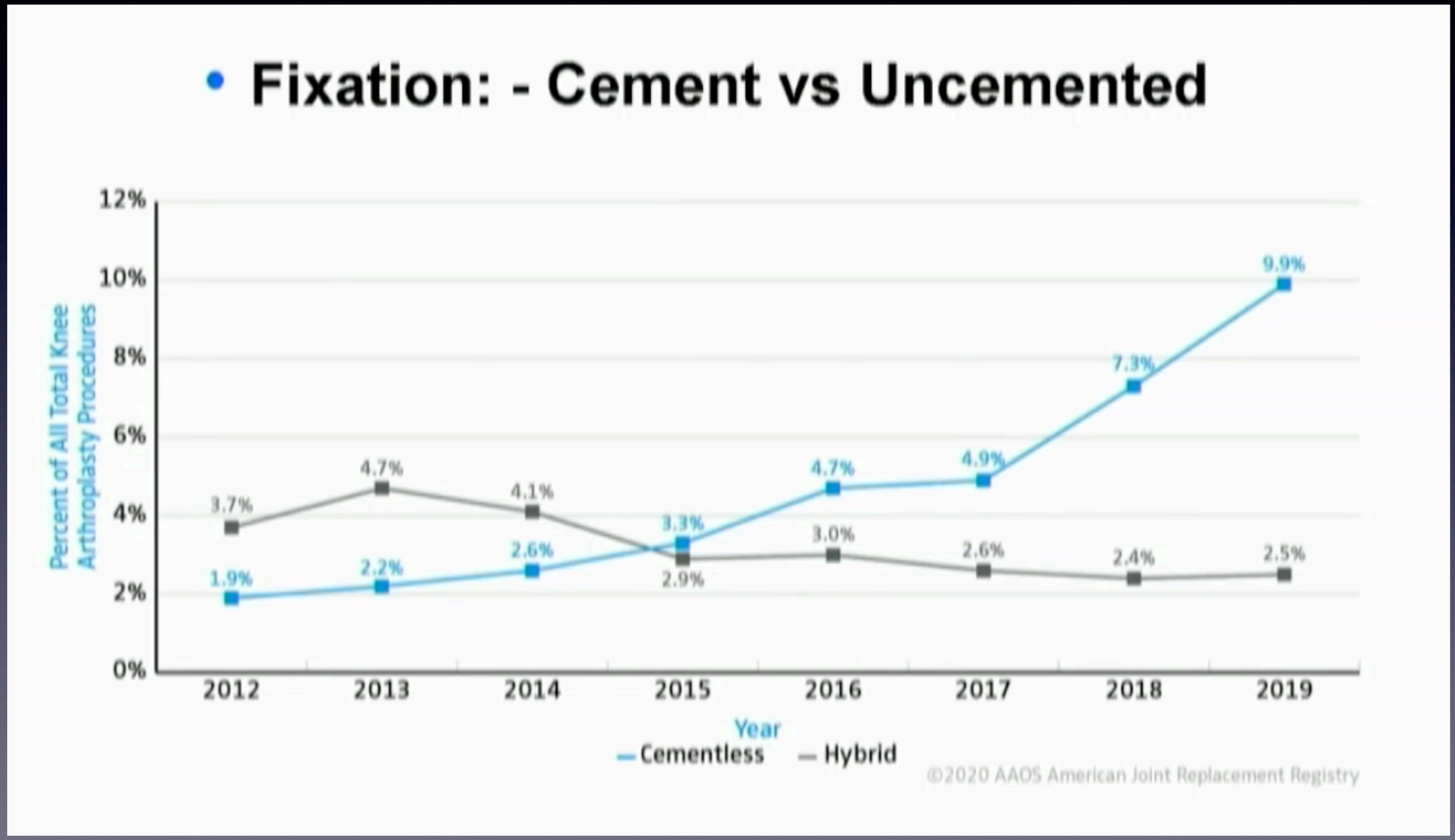
» In the end, the selection of approach for total hip arthroplasty should be based on surgeon experience and familiarity with the approach. The pros and cons of each approach seem to equalize by 6 weeks postoperatively. Overall, the reproducibility of the operation is a testament to its continued success.

Femoral Stem Fixation



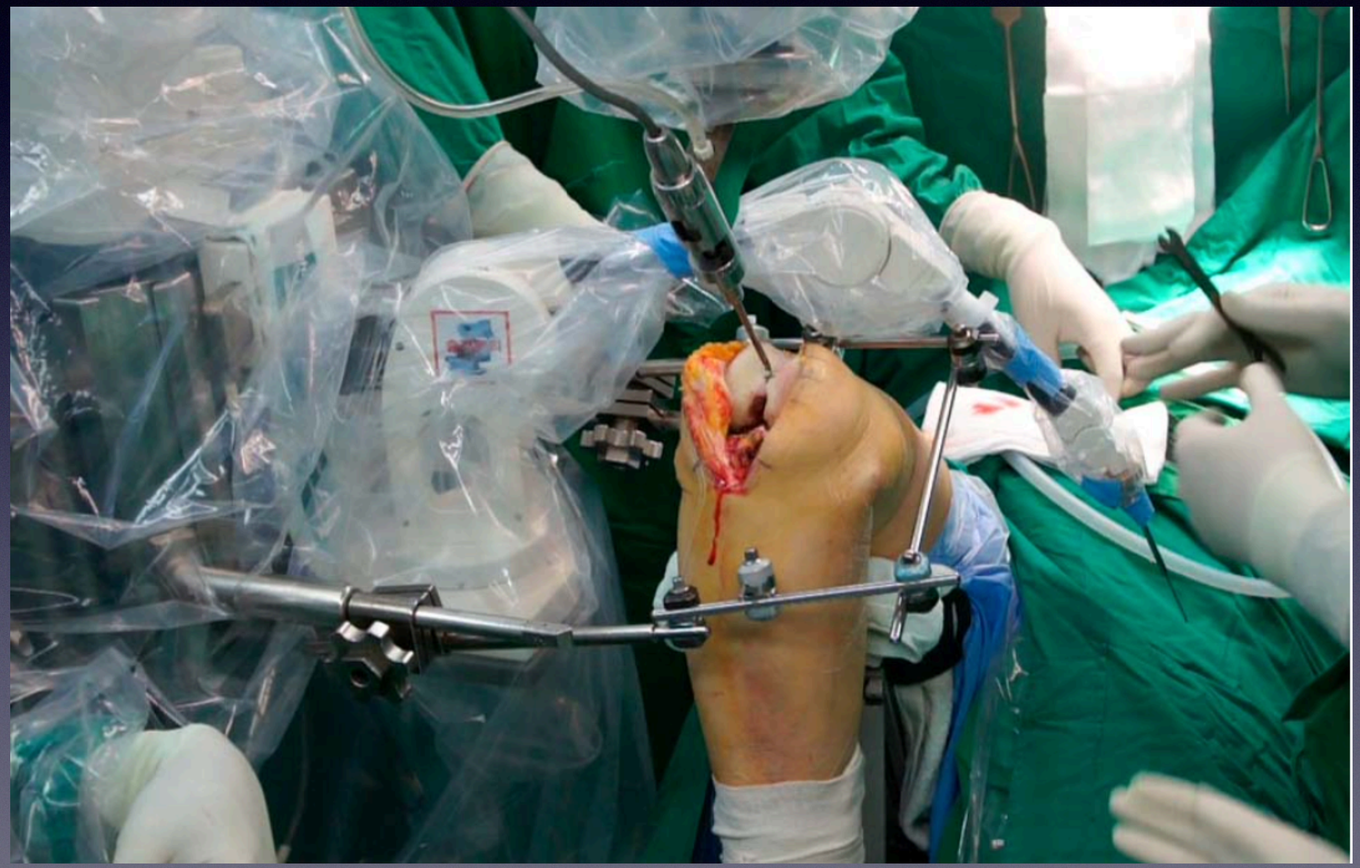


Cement In TKA, Friend or Foe?

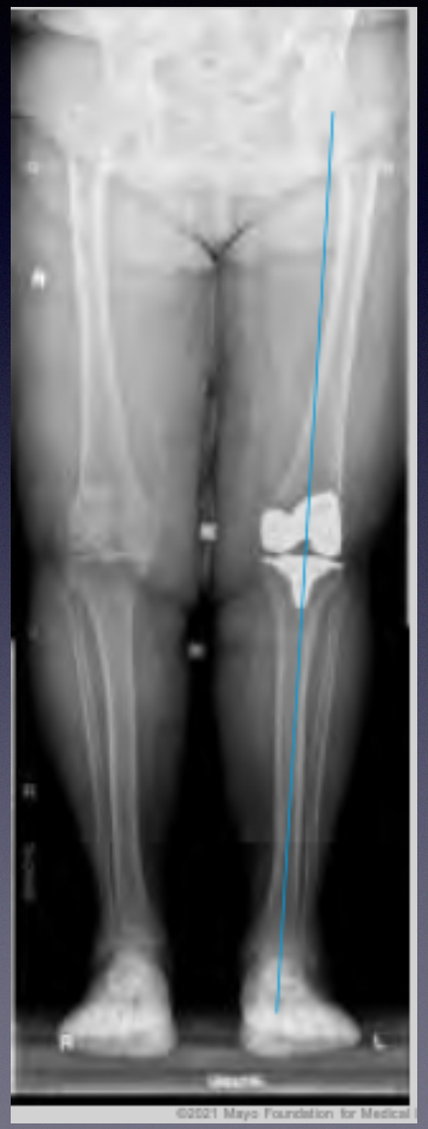


Technology assisted surgery

* Minimally invasive TKA & THA
* Patient specific cutting guides and implants
* Computer navigation
* Intraoperative x-rays
* Robots
* Virtual Reality
* AI/Machine learning



Why Robots? What Do They Do?

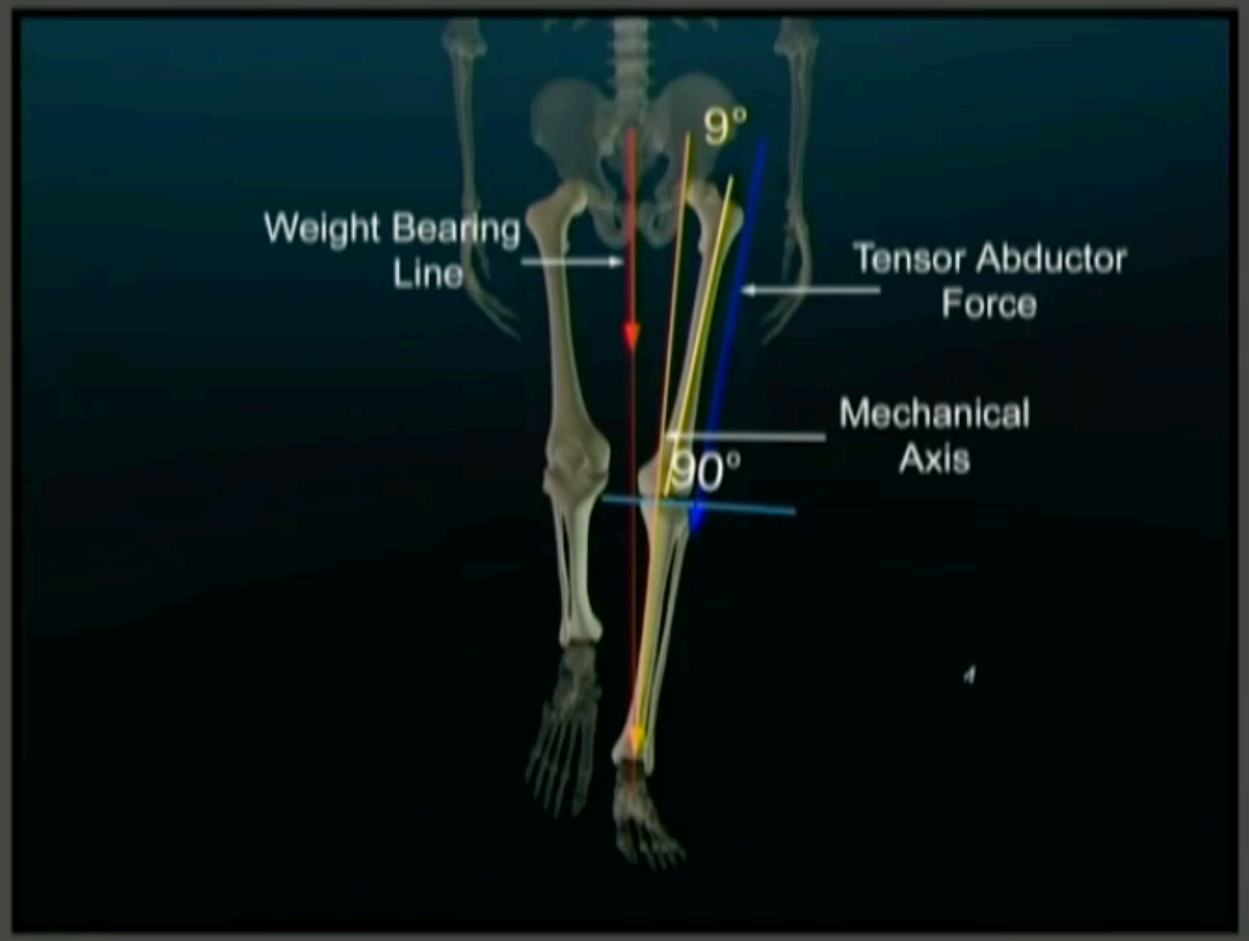


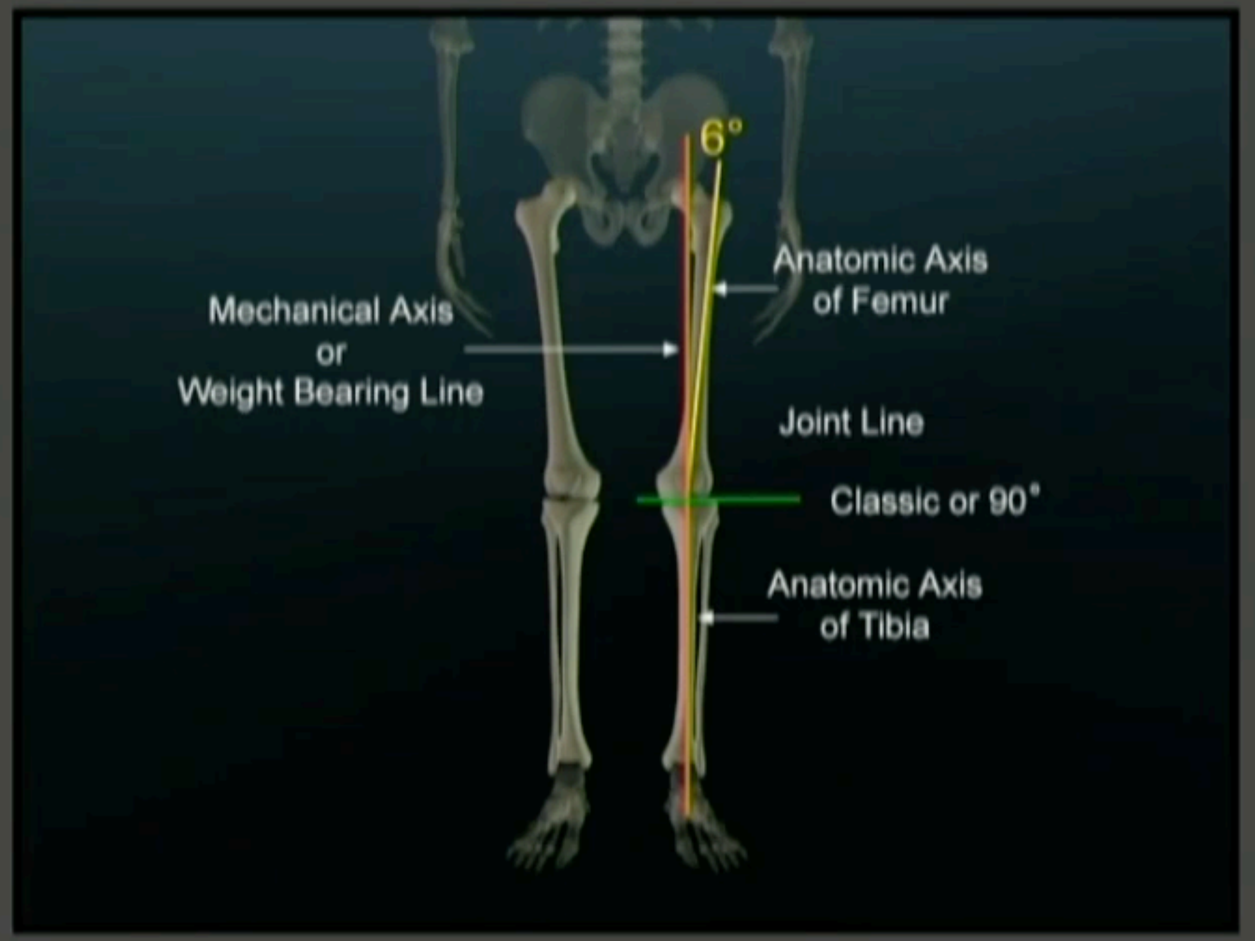
Goals:

- Reduce outliers
- Produce “The forgotten knee”
- Improve survivorship

(Rotation, flexion-extension)

What Is Your Preoperative Plan?





Clin Orthop Relat Res (2020) 478:266-275
DOI 10.1097/CORR.0000000000000916

Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

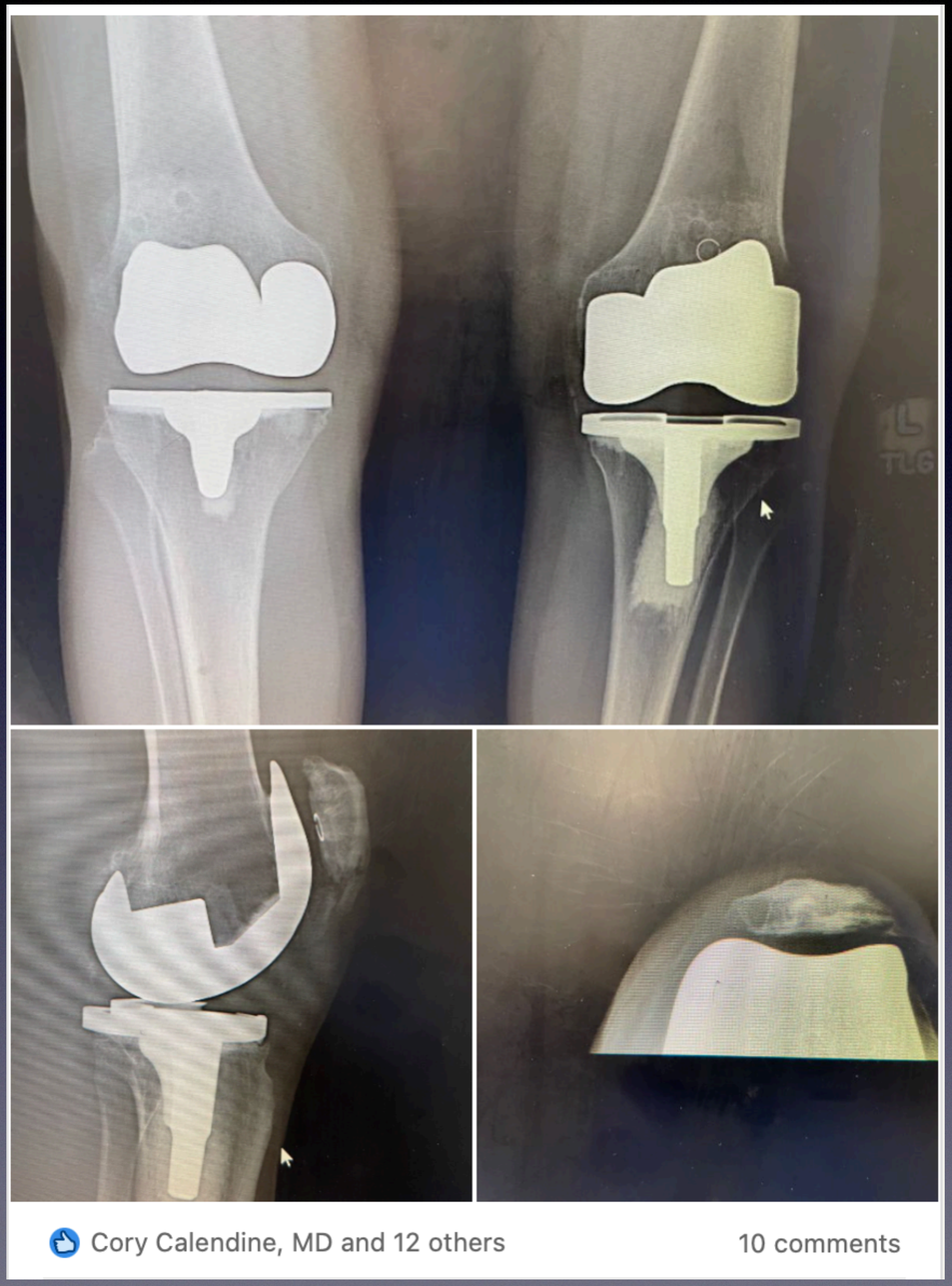
Clinical Research

Does Robotic-assisted TKA Result in Better Outcome Scores or Long-Term Survivorship Than Conventional TKA? A Randomized, Controlled Trial

Young-Hoo Kim MD, Sung-Hwan Yoon MD, Jang-Won Park MD

Conclusions At a minimum follow-up of 10 years, we found no differences between robotic-assisted TKA and conventional TKA in terms of functional outcome scores, aseptic loosening, overall survivorship, and complications. Considering the additional time and expense associated with robotic-assisted TKA, we cannot recommend its widespread use.

Level of Evidence Level I, therapeutic study.



Cory Calendine, MD and 12 others 10 comments

Brent Baranko, M.D., FAAOS commented on this

Moby Parsons, MD • 2nd
Joint Replacement Surgeon at The Knee, H...
5h • Edited •

+ Follow

This active 76 year old woman had her left TKA in 2005 by one of my former now retired partners. As anyone can see the tibia is in varus as is the overall limb alignment. There is lateral overhang of the baseplate and some late fragmentation at the inferior pole of the patella. She has done very well with it and just has manageable discomfort after a few days of skiing.

This knee was done before kinematic alignment was a thing so I ask the LinkedIn arthroplasty gurus:
1. Is her good result because of accidental KA?
2. Is this proof that there is little correlation between radiographic parameters of alignment and outcome?
3. ....Or does this just signify that there is much we still do not understand about how to achieve optimal and reproducible outcomes through patient-specific parameters and she got lucky that this worked out.

How To Reduce Infection

* Preoperative antibiotics
* Optimize host factors, decolonization
* Decrease number of persons in OR
* Tranexamic acid
* Eliminate minor breaches in sterile technique
* Antibiotic cement
* Betadine lavage
* Post operative dressings
* ? Extended postoperative oral abx in high risk patients?

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Hip

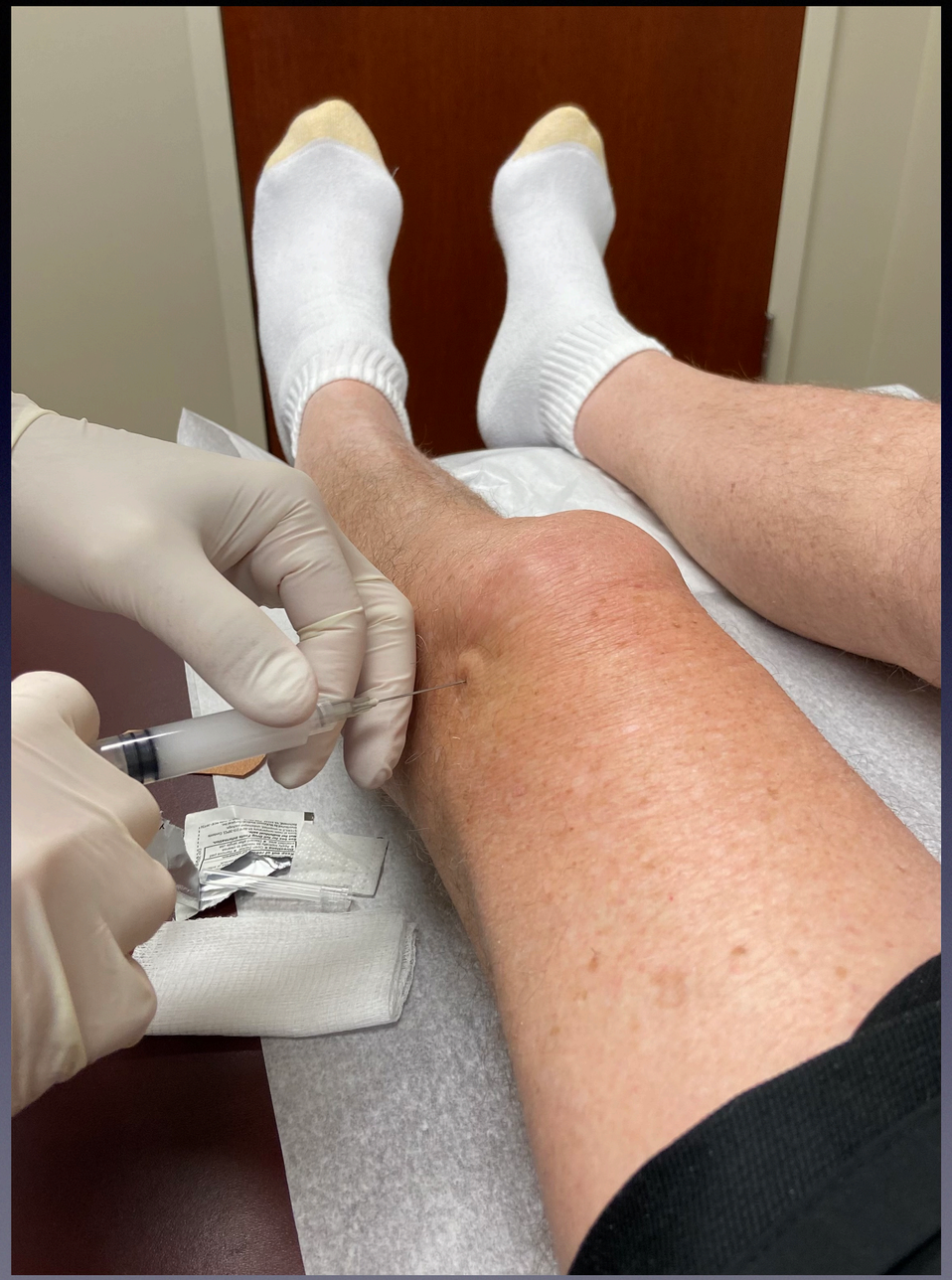
Preoperative Corticosteroid Injections Demonstrate a Temporal and Dose-Dependent Relationship with the Rate of Postoperative Infection Following Total Hip Arthroplasty

Enrico M. Forlenza, BS, Robert A. Burnett, MD, Avinaash Korrapati BS, JaeWon Yang, BS, Brian Forsythe, MD, Craig J. Della Valle, MD *

Department of Orthopaedic Surgery, Rush University Medical Center, Chicago, IL

Check for updates

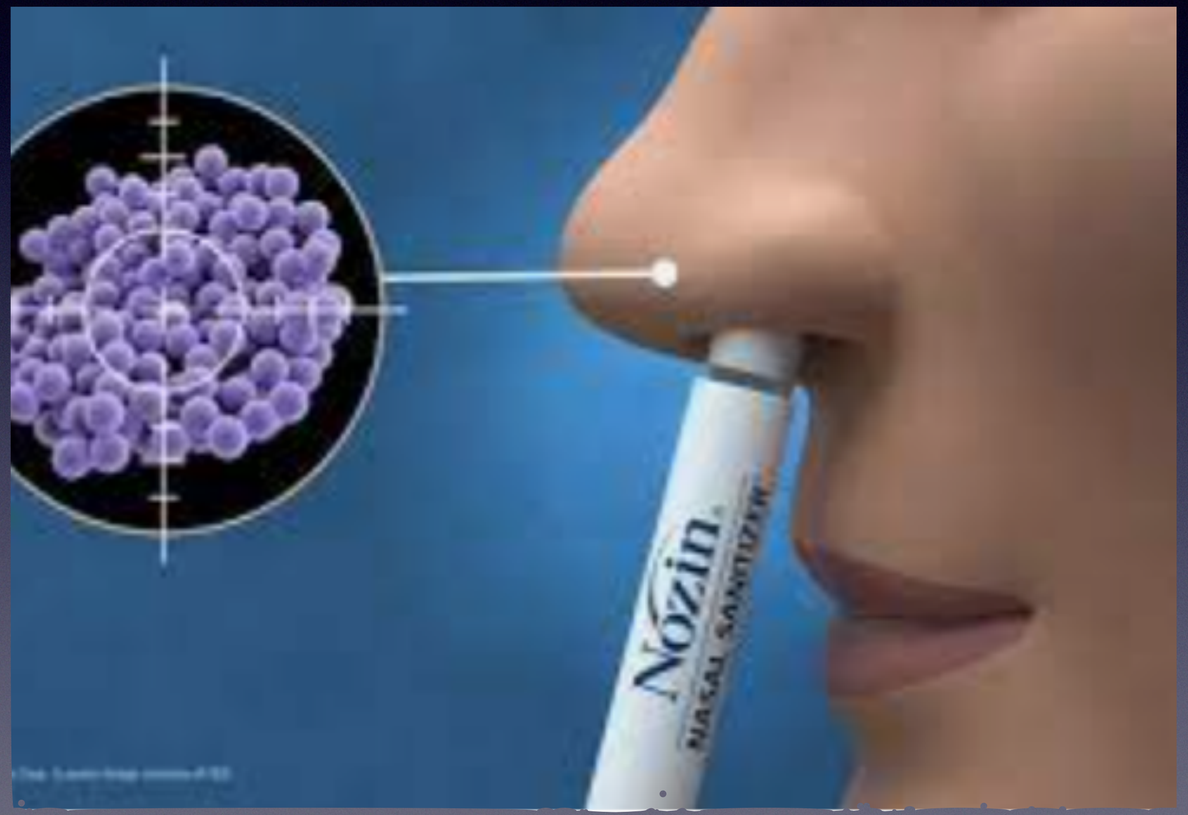
No intra-articular knee or hip corticosteroid injections within 3 months prior to arthroplasty surgery



Skin Microbiome

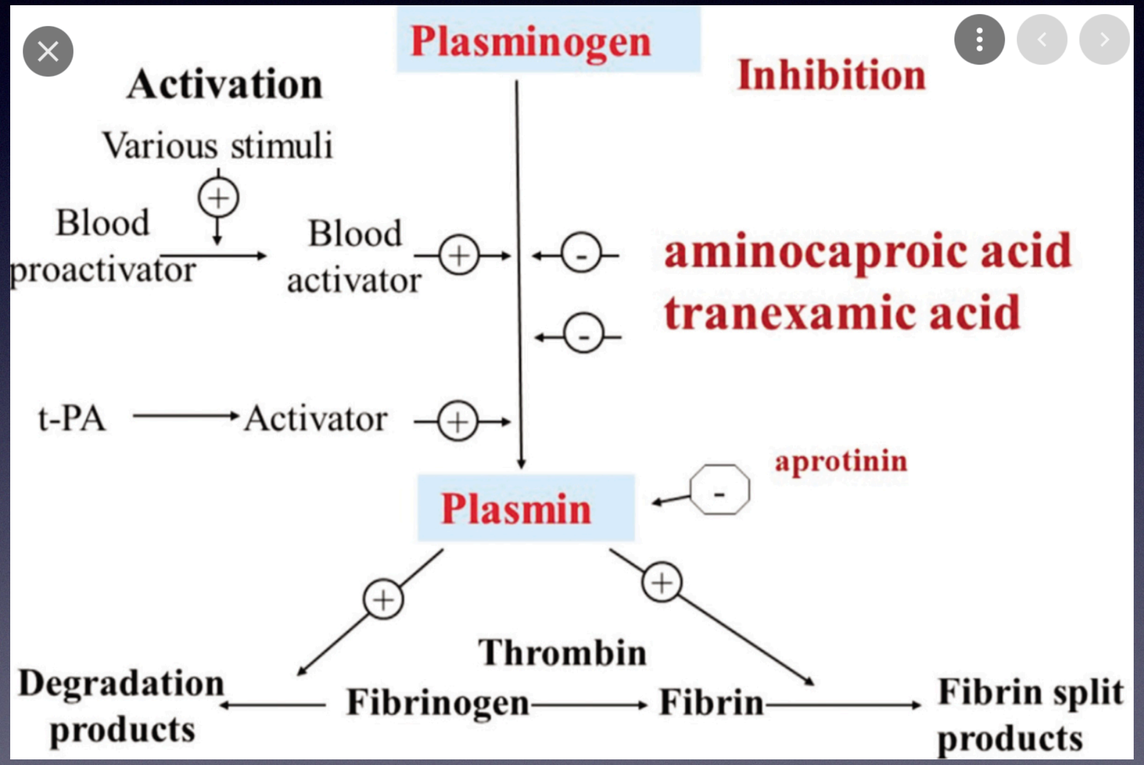
* Ancef 2-3 grams 30 minutes prior to surgery is the single best way to reduce post operative infection

* Standard universal decolonization program with chlorhexadine baths and Nozin



Tranexamic Acid

* May be administered preoperatively IV or PO. May apply topically in wound prior to closure.
* Associated with a reduction in blood loss AND
* Lower rate of infection



Dilute Betadine Lavage

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The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Hip and Knee Arthroplasty

Dilute Povidone-Iodine Irrigation Reduces the Rate of Periprosthetic Joint Infection Following Hip and Knee Arthroplasty: An Analysis of 31,331 Cases

Noam Shohat, MD [a,*], Graham S. Goh, MD [b], Samantha L. Harrer, MD [b], Scot Brown, MD [b]

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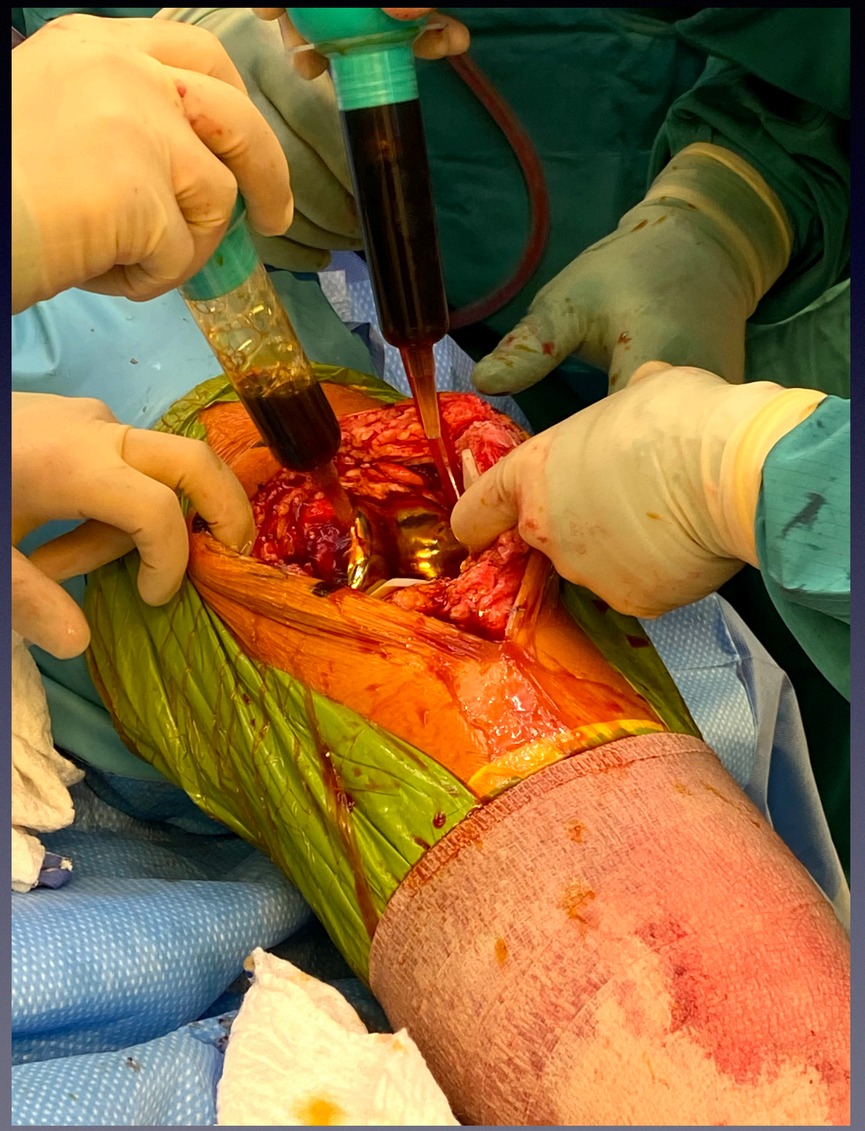
[b] Rothman Orthopaedic Institute at Thomas Jefferson University, Philadelphia, PA



Postoperative Dressings

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Revision Arthroplasty

The Effectiveness of Closed-Incision Negative-Pressure Therapy Versus Silver-Impregnated Dressings in Mitigating Surgical Site Complications in High-Risk Patients After Revision Knee Arthroplasty: The PROMISES Randomized Controlled Trial

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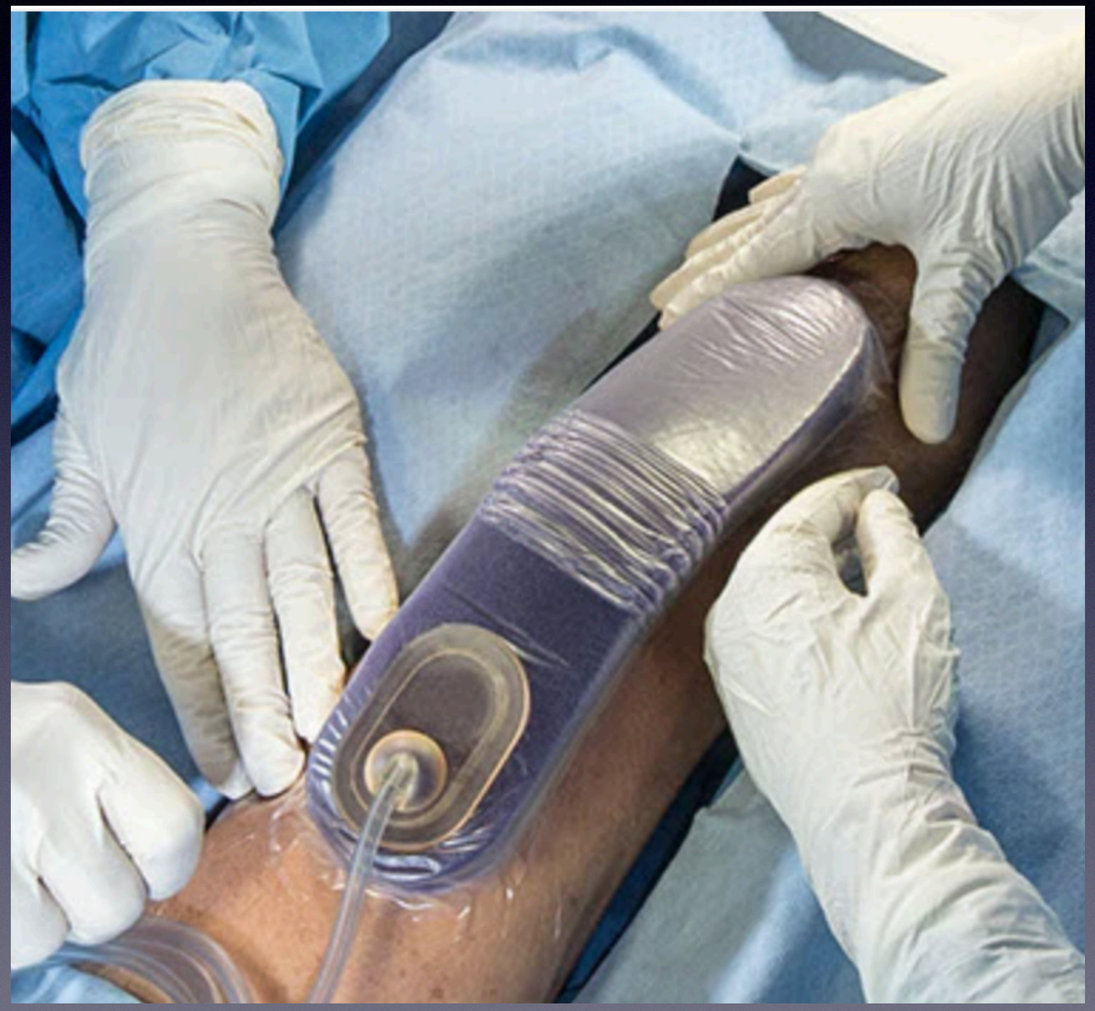
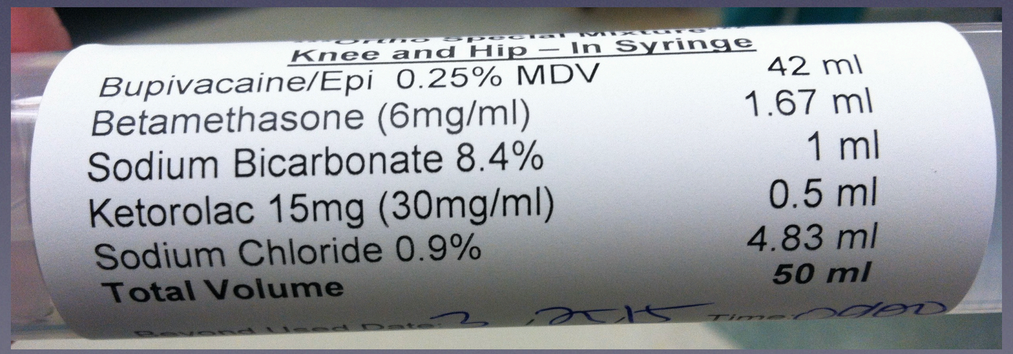


Outpatient Arthroplasty

* Enhanced surgical recovery
* Patient selection
* Multimodal analgesia
* Spinal anesthesia with Mepivacaine



Common Questions:

* Can I have both of my knees replaced at the same time? — Yes*
* Will I set off a metal detector? — Yes*
* How often should I follow up with my surgeon? — Every 3-5 years*
* Do I need to take antibiotics prior to dental procedures?

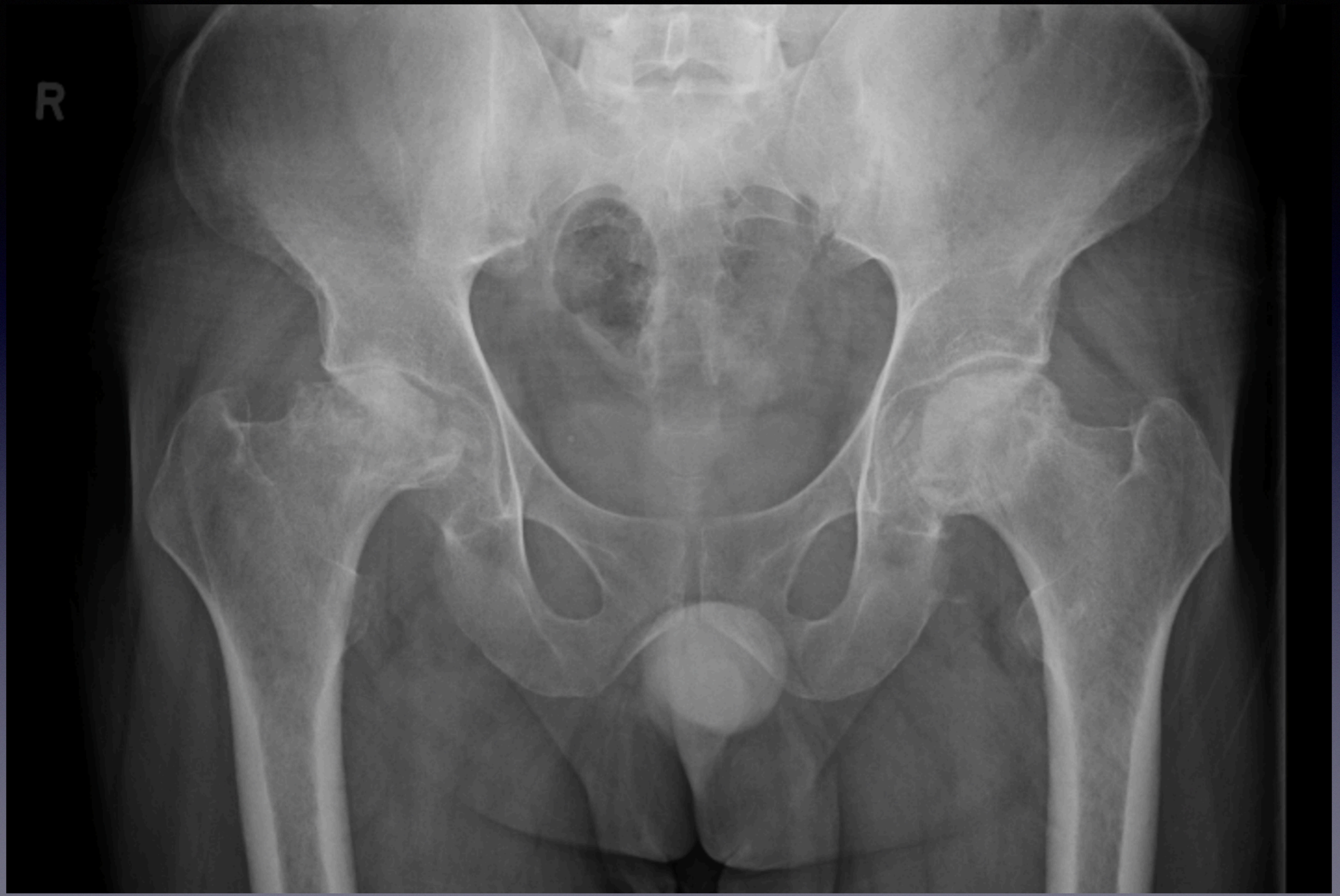
Antibiotics and Dental Work

PREFERRED RESPONSE: 4- No prophylaxis (a consensus statement does not exist)

YOUR RESPONSE: 4- No prophylaxis (a consensus statement does not exist)

DISCUSSION

The combined AAOS and ADA statement changed in 2003, 2009, and 2012. There is some criticism regarding these recommendations, and no case-controlled studies are available regarding this topic. Maintenance of routine oral hygiene is a requisite for all individuals. However, recommendations in favor or lifelong or 2 years of prophylaxis after joint arthroplasties have changed. Mutual decision making between patients and doctors is most important, and some patients may not need prophylaxis. The most accurate response is that no consensus exists because of the lack of quality studies.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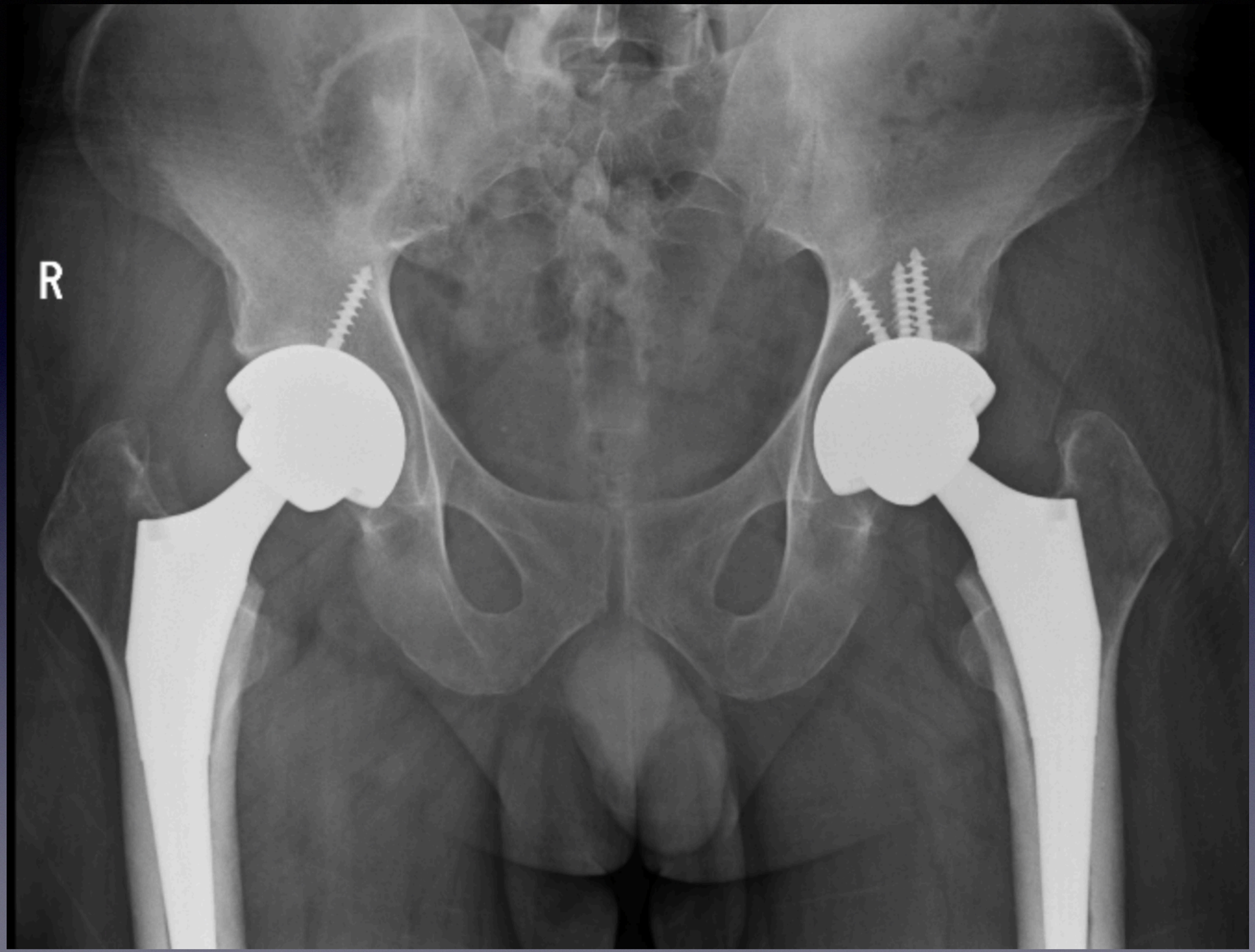
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* Improve the health of populations
* Improve the patient experience
* Reduce the per capita cost of health care

Donald Berwick, M.D.
The Tripple Aim
Institute for Healthcare Improvement

* >19% GDP
* 9.6% of U.S. citizens, 31.1 million peope are uninsured
* Many with health insurance are functionally uninsured due to deductibles, copays and coinsurance
* Healthcare costs are a significant contributor to personal bankruptcy
* We score poorly on many healthcare measures
* We are not receiving value for what we spend

I don’t regret anything I’ve ever done in life, any choice that I’ve made. But I’m consumed with regret for the things I didn’t do, the choices I didn’t make, the things I didn’t say. We spend so much time being afraid of failure, afraid of rejection. But regret is the thing we should fear the most.”

-Trevor Noah