ARTHRITIS & JOINT REPLACEMENTS

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OBJECTIVES

- Review the background of Arthritis and Joint Replacement
- Review treatment options
- Introduce surgical concepts
- Answer questions

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ARTHRITIS

- According to the CDC:
  - 52.5 million people affected by arthritis
  - 25% of people develop hip arthritis
  - 50% of people develop knee arthritis by age 85

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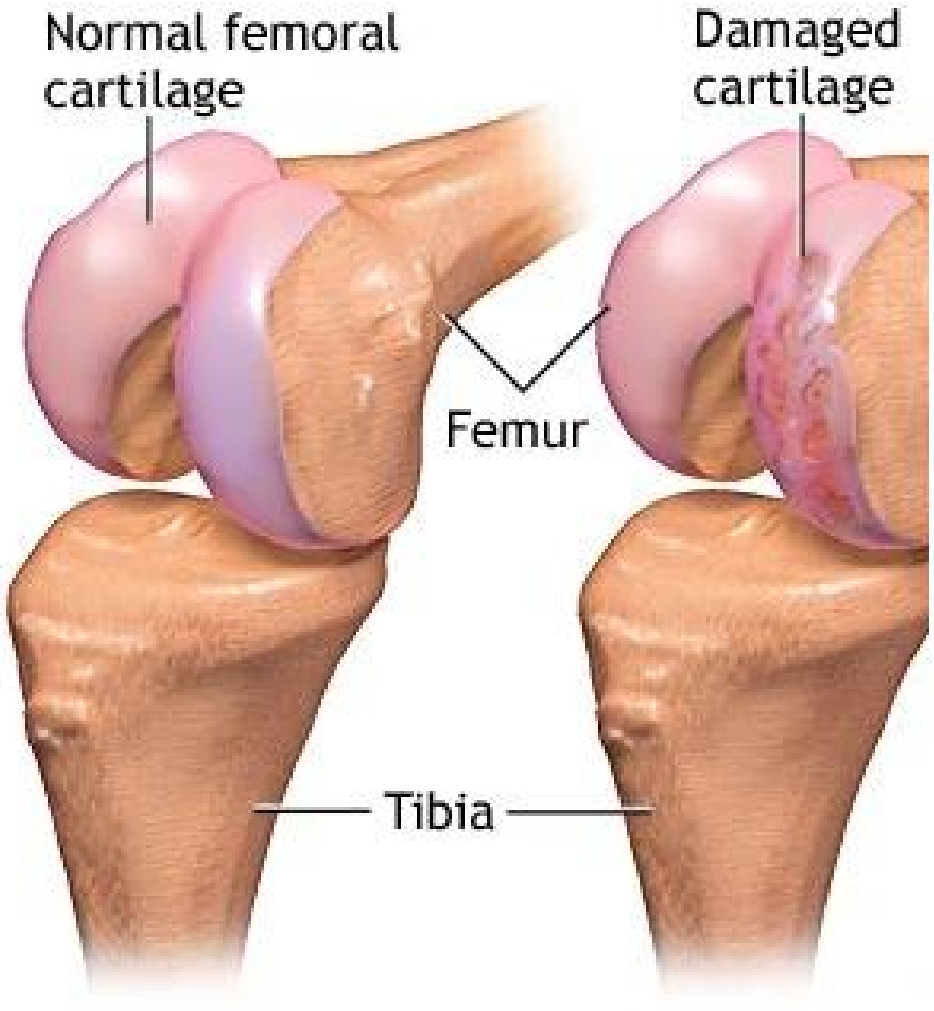
WHAT IS ARTHRITIS?

- Wearing out of cartilage inside joint
- Cartilage is the smooth coating of the bone surface inside joints
- Cartilage acts as a cushion for the bones and prevents bone rubbing against bone



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TYPES OF ARTHRITIS

- Osteoarthritis
- Inflammatory Arthritis
- Post-Traumatic Arthritis
- Avascular Necrosis

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OSTEOARTHRITIS

- Most common type of arthritis
- Slowly progressive, cartilage wears out
- "Wear & tear"
- Middle-aged & older people

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Osteoarthritis has a Strong Correlation with Obesity and Diabetes

- The overall age and weight of the US population are both increasing
- For adults with arthritis, obesity prevalence 54% higher than adults without arthritis
- 52% of adults with diabetes have arthritis

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INFLAMMATORY ARTHRITIS

- Rheumatoid arthritis (RA) is most common form
- Chronic inflammation of joints destroys cartilage
- Can affect any age, multiple joint involvement
- New medications have significantly helped limit joint damage

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POST-TRAUMATIC ARTHRITIS

- Arthritis following a fracture or bad injury near a joint
- Often develops many years after injury

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AVASCULAR NECROSIS (AVN)

- Common in hip
- Steroids (Prednisone)
- Trauma/Dislocation
- Alcohol abuse

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HOW YOUR HIP WORKS

Anatomy of the Hip

- Ball-and-socket joint
- Ball (femoral head) at the top of the thigh bone (femur)
- Hip socket (acetabulum) holds the ball

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Hip Anatomy

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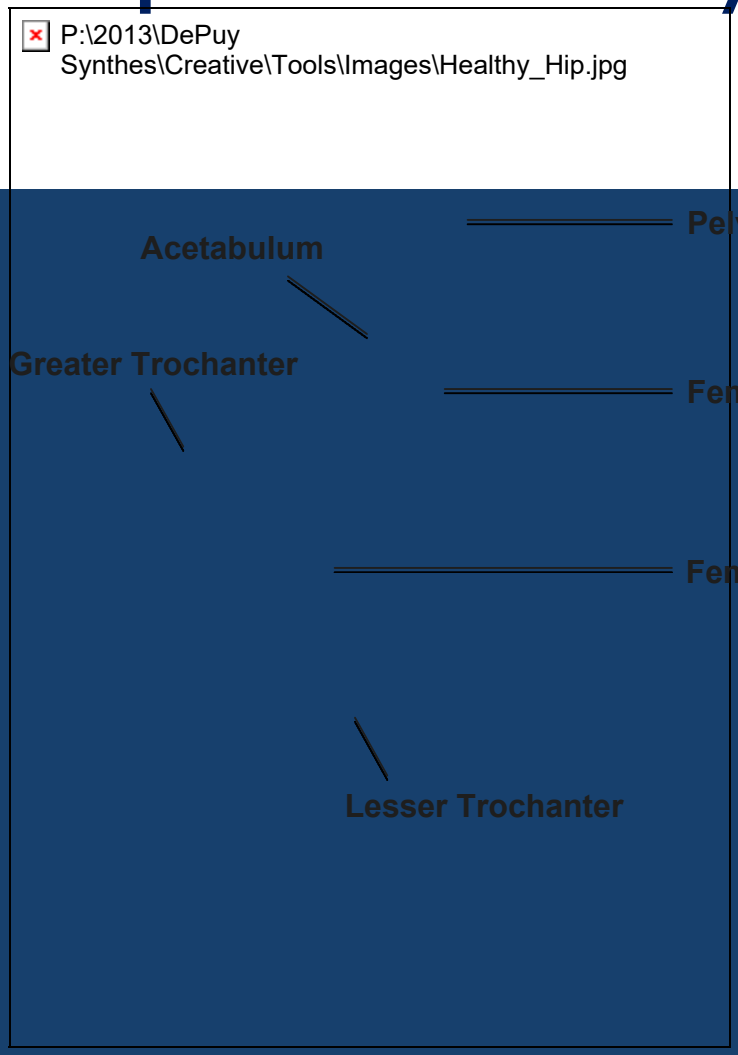

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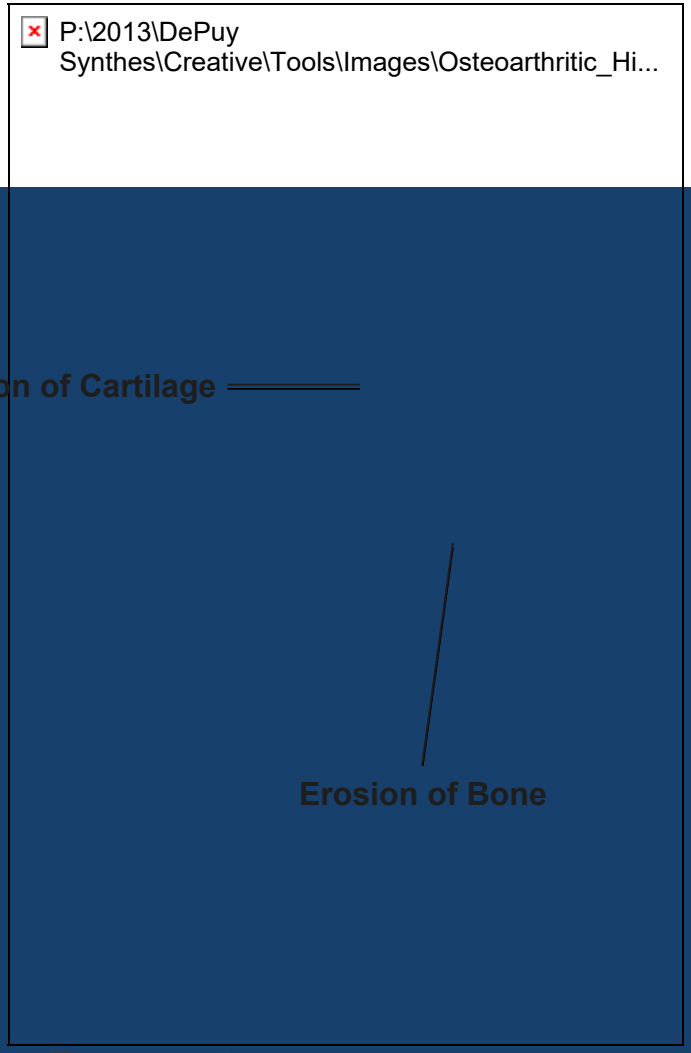

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HOW YOUR KNEE WORKS

Anatomy of the knee

- Largest joint in body
- Referred to as a *hinge joint* because it allows the knee to flex & extend; but the knee also has the ability to rotate (turn) & translate (glide)
- 3 bones
  - Shin bone (tibia)
  - Thigh bone (femur)
  - Kneecap (patella)

HIP ARTHRITIS

- How Can I Tell?
  - Limp
    - May feel one leg is shorter than other due to wearing out of cartilage
  - Pain
    - Groin most common site
    - Also side of hip, or buttock pain
    - May radiate to knee
  - Stiffness
    - Difficulty putting on socks & shoes

DIAGNOSIS

- History
- Physical Examination
- X-Rays

- MRI (AVN)

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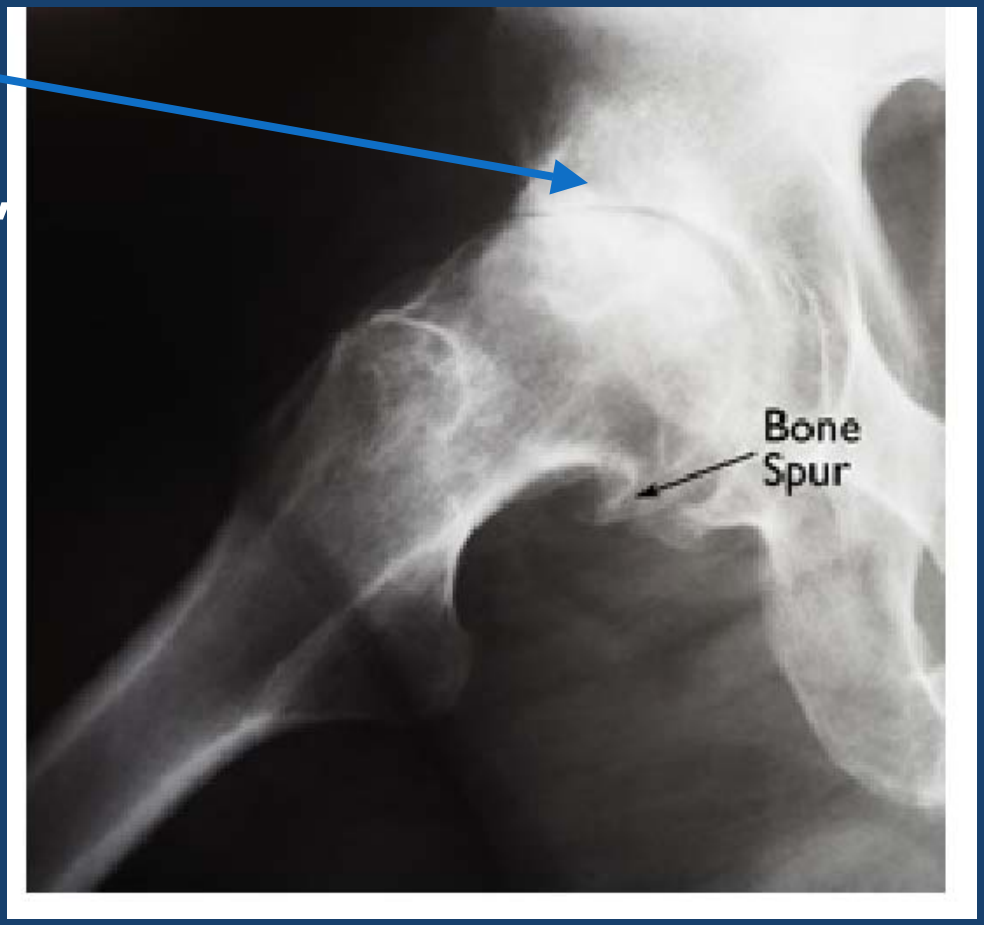
HIP OSTEOARTHRITIS

HIP OSTEOARTHRITIS

Joint Space Narrowing

"Bone on Bone"



Normal Knee

Osteoarthritis

"Bone on bone"

TREATMENT OF ARTHRITIS

- Medications (Nsaids/Anti-inflammatories)
- Injections (steroids or viscosupplementation/gel)
- Physical therapy or home exercise program
- Activity modification
- Weight loss
- Cane – use in hand opposite affected hip
- Joint replacement surgery

ANTI-INFLAMMATORIES (NSAIDS)

- Many varieties with little difference in results
- Discuss options with your physician
- Side effects: GI Upset, kidney damage, heart attack/stroke

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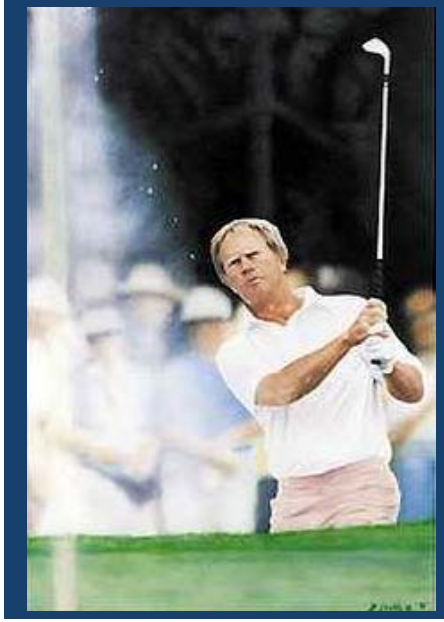
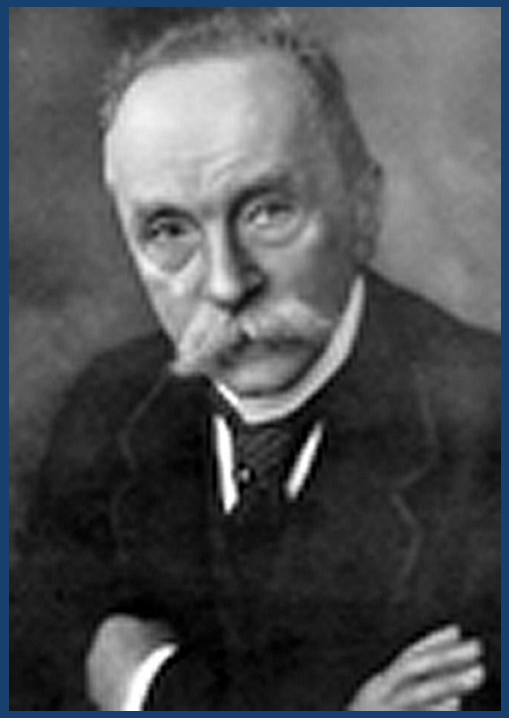
JOINT REPLACEMENT SURGERY



HISTORICAL PERSPECTIVE

Professor Themistocles Gluck (1853-1942)



- Earliest recorded attempts at hip replacement – Germany 1891
- Used Ivory to replace femoral heads destroyed by tuberculosis
- Achieved short term success but all ultimately failed because of chronic infection

HISTORICAL PERSPECTIVE

Mold Arthroplasty

- Dr. Smith-Peterson (Boston, 1920s-1930s)
- Tried multiple types of materials to fit over the ball of the hip joint
- "Interposition or Mold Arthroplasty"
- Also credited with 1st to describe anterior surgical approach to hip joint

SIR JOHN CHARNLEY (1911-1982)

- Served Royal Army Medical Corps during WWII and participated in British evacuation of Dunkirk
- Developed low friction arthroplasty concept
  - Low friction depends mostly on the coefficient of friction of two materials in contact

SIR JOHN CHARNLEY (1911-1982)

- Initially tested hip replacement with implant cemented into femur and Teflon socket
  - Teflon showed high wear rates and soft tissue reaction ~1 year after surgery
- A salesman introduced him to high molecular weight polyethylene which was first implanted in 1962
  - Mechanical failure rate of 1.3% at 4-7 years

SHOULD I HAVE THE OPERATION?

- No, if:
  - "My family/friends say I should have it"
  - "You're the doctor, whatever you think"
  - "I want to get it done before the arthritis gets too bad or I get too old"

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SHOULD I HAVE THE OPERATION?

- Yes, if:
  - You understand the procedure, the recovery process, and the risks for *your* case
  - You have advanced arthritis on x-rays and have not had relief with nonoperative treatments
  - Your quality of life has decreased so that the benefits >> the risks

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GETTING READY FOR SURGERY

- Evaluation/labwork by PCP
- Complete any significant upcoming dental work
- Weight loss
- Preoperative education class at hospital

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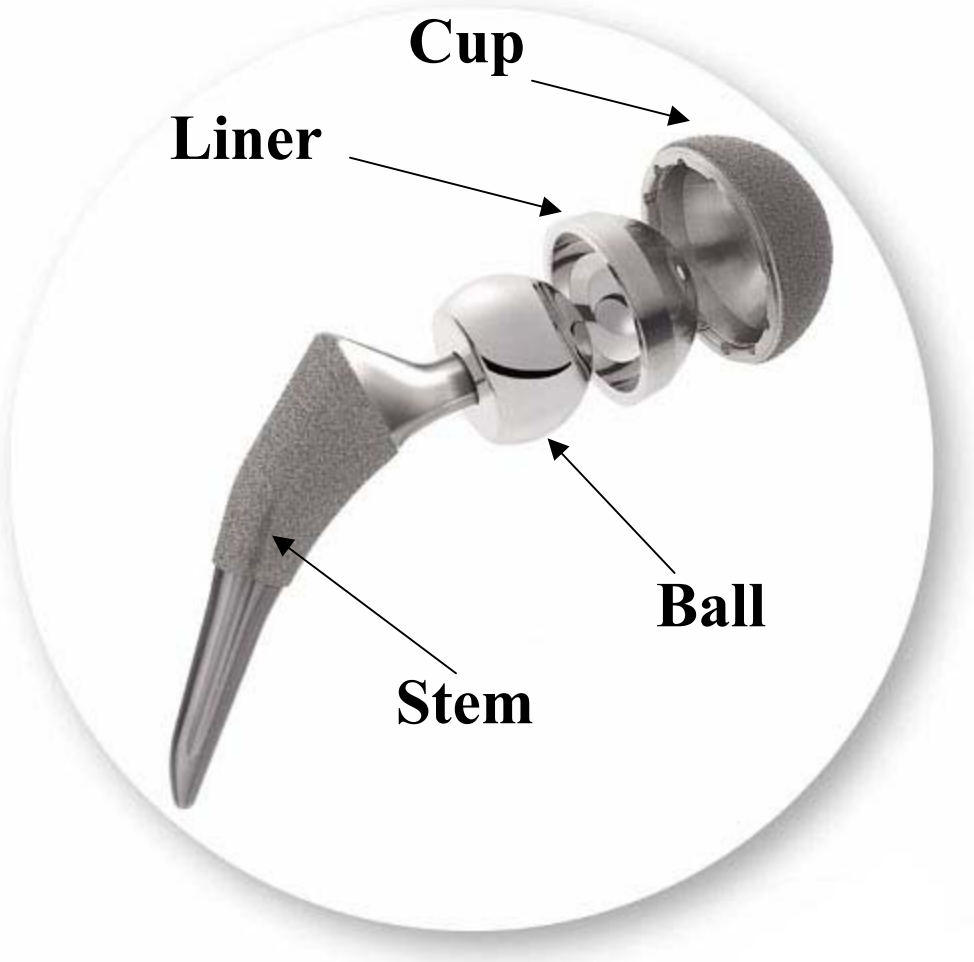
WHAT IS A HIP REPLACEMENT?

Surgical procedure that removes diseased joint surfaces and replaces with implants



BEARING OPTIONS

What is the bearing?
The bearing is the interaction of the ball and liner

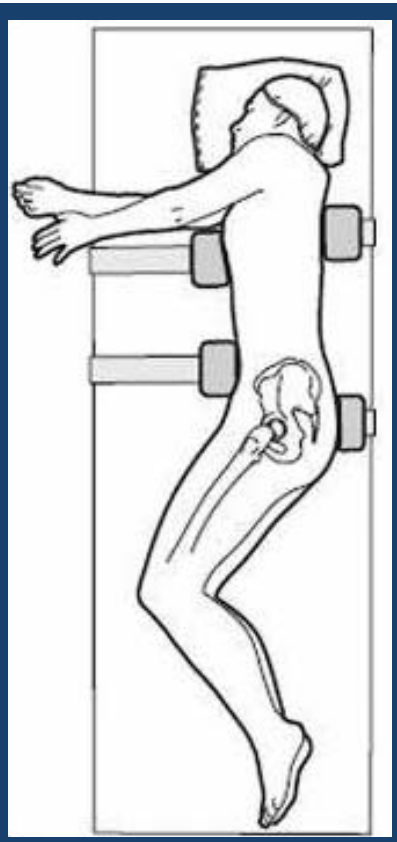
Metal-on-Metal not commonly used anymore because of adverse reactions

HIP REPLACEMENT

- Remove the head
- Make the socket a sphere
- Shape the thigh bone (femur)
- Check for stability and leg lengths with trial components
- Insert the final cup and stem (No Cement)

TRADITIONAL SURGERY

- Patients typically lie on side or front
- Incision on side or buttock
- Surgeon detaches muscles, disrupts tissue
- Surgeon relies on post-operative x-ray to check component placement and leg length



ANTERIOR APPROACH HIP REPLACEMENT

- Incision is made on the front of the leg rather than the side (lateral) or back (posterior)
- Surgeon can work between muscles/tendons without detaching them from the hip or bones
- Can be done with a specialized operating table and intraoperative x-ray to check for positioning of parts

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ANTERIOR APPROACH

Small incision in the upper thigh

Access to hip joint between muscle intervals-no cut required

ANTERIOR APPROACH

Why is it exciting?

- Potential for faster recovery
- Potential for less postoperative pain
- Likely lower dislocation rate
  - Less restrictions in movement/activity after surgery

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ANTERIOR APPROACH

Patients lie on back

Incision on front of leg

No detachment of muscles, minimal disruption of tissue

Surgeon can check component placement & leg length with x-ray during procedure

TOM WATSON

2nd Place finish at British Open in 2009 at age 59

Left hip replacement via anterior approach 9 months earlier

DOWNSIDES TO ANTERIOR HIP

- Relatively new procedure
- Possibility of numbness in the lateral thigh

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KNEE REPLACEMENT

- Shape bone ends
- Adjust ligaments
- This combination straightens leg
- Cement parts into place

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UNICOMPARTMENTAL KNEE REPLACEMENT

- "Uni", "Partial"
- Replace only damaged portion of joint
- Leave ligaments and other parts of knee without arthritis alone

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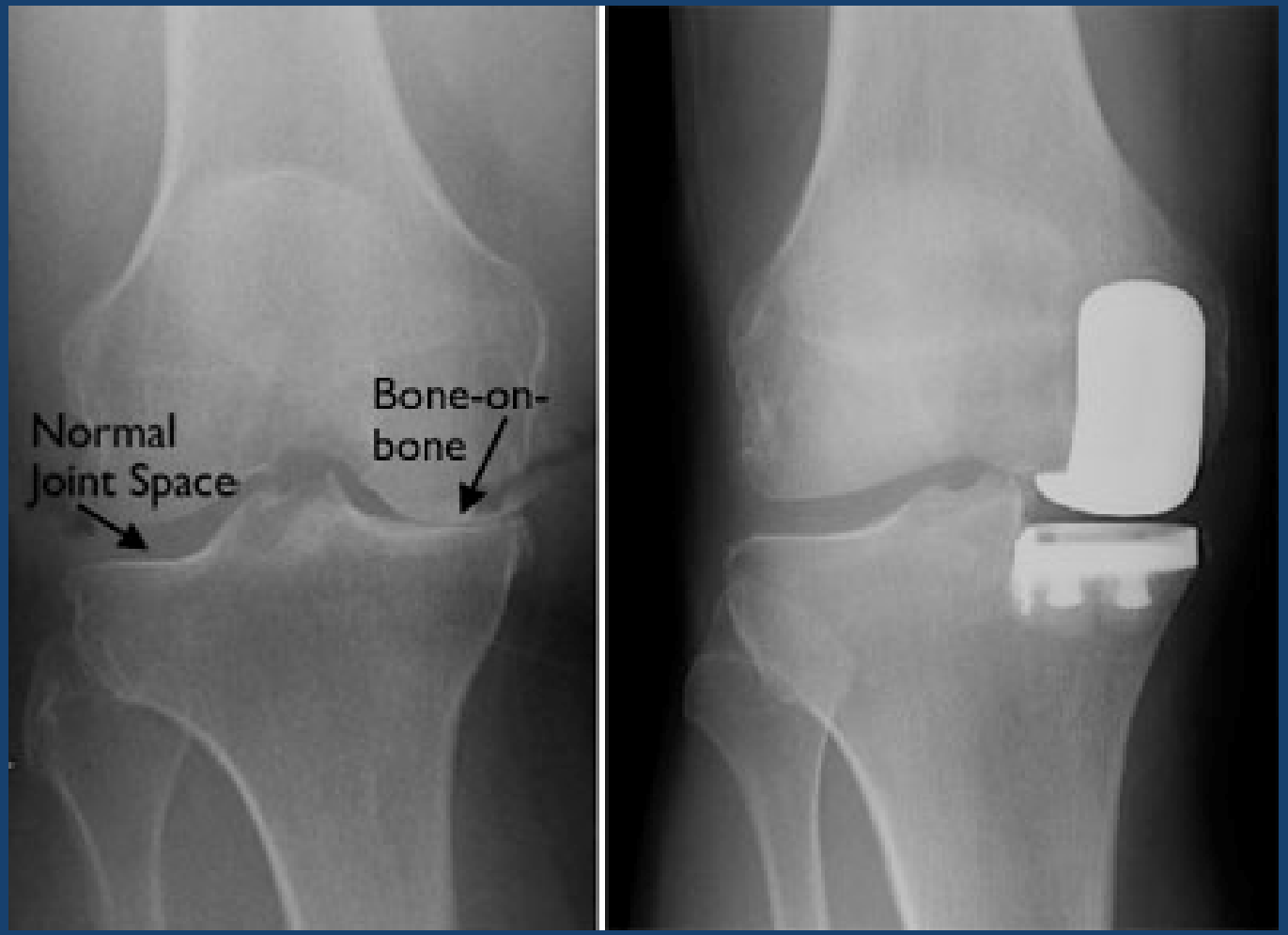
PARTIAL KNEE REPLACEMENT



PARTIAL KNEE REPLACEMENT

Pros

- Quicker recovery
- Potential for knee to feel more "normal"
- May allow for higher activity levels (running)

Cons

- Higher rate of implant loosening compared to total knee replacement
- Can develop arthritis in remaining parts of knee
  - May require additional surgery to change to full replacement

MAKOPLASTY - ROBOTIC ASSISTED PARTIAL KNEE

SURGERY EXPECTATIONS

- Out of bed on the day of surgery with physical therapy
- Progression of therapy as tolerated
- Length of stay in hospital 1-3 days
  - Some go home on day of surgery
- Home with walker/crutches/cane
- Transition to cane as tolerated

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COMPREHENSIVE RAPID RECOVERY PROGRAM

- Pre-operative education
- Spinal/Epidural anesthesia with twilight sedation
- Medications to help limit blood loss
- Injection around joint during surgery and anti-nausea meds
- Post-op multi-modal pain management using multiple different types of pain medicine
- Early (day of surgery) mobilization

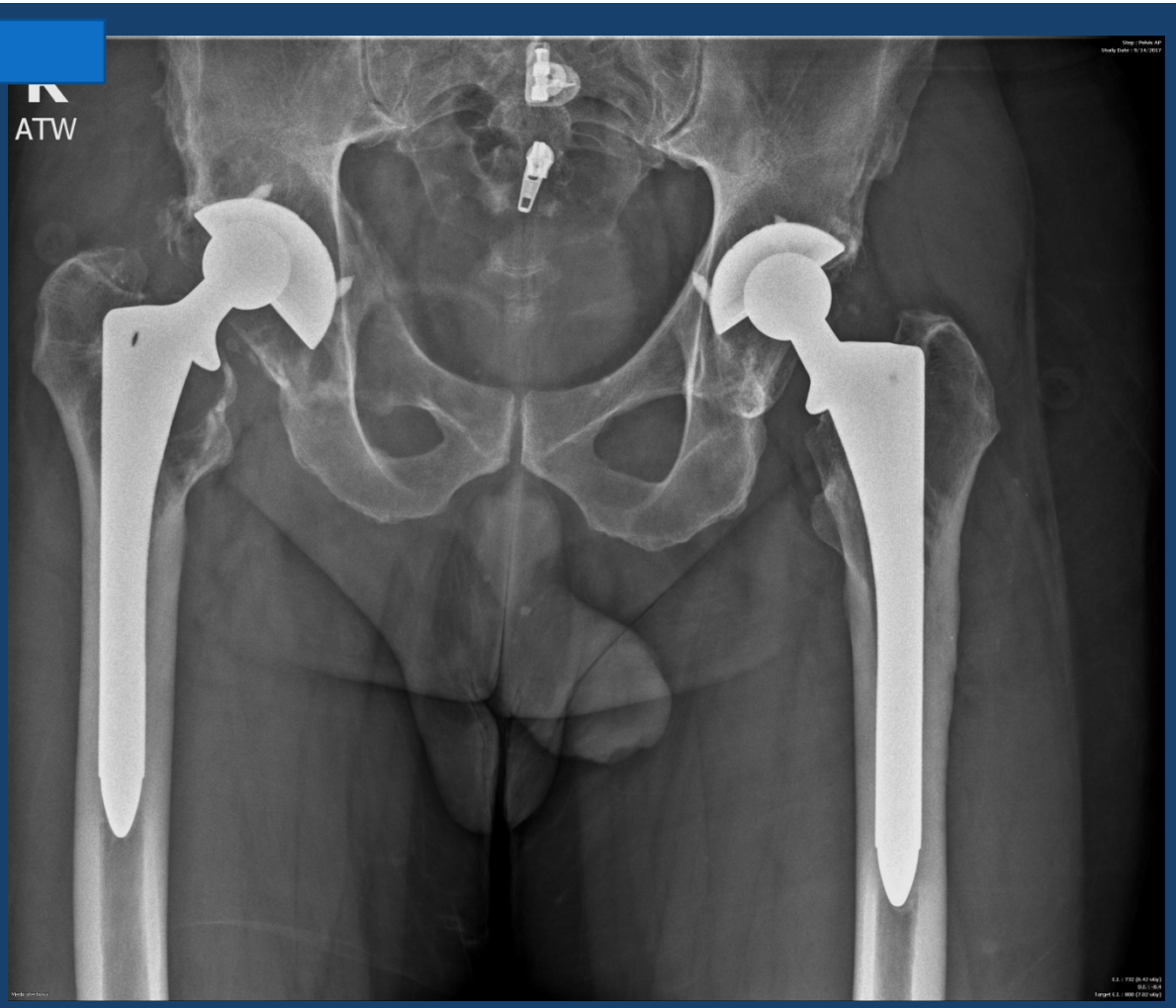
COMPREHENSIVE RAPID RECOVERY PROGRAM

- Walk with walker: 24hrs – 1 week
- Walk with cane: 1-4 weeks
- Walk unassisted: 2-6 weeks
- Drive: 4 weeks right leg, 2-3 weeks left leg
- Return to work: 2-6 weeks
- Ski/Hike/Run/etc: 4-6 months

WHAT HAPPENS AFTER 15-20 YEARS?

- Joint replacements do not fall apart after 15 years
- Can wear out, loosen, become infected, or cause persistent pain
- Historical data: ~1% failure rate per year
  - At 20 years, ~80% still have original implants in place & 20% required a revision surgery
- Current implants likely improve on those results
- Total hip & Total knee lower revision rate compared to Partial knee replacement

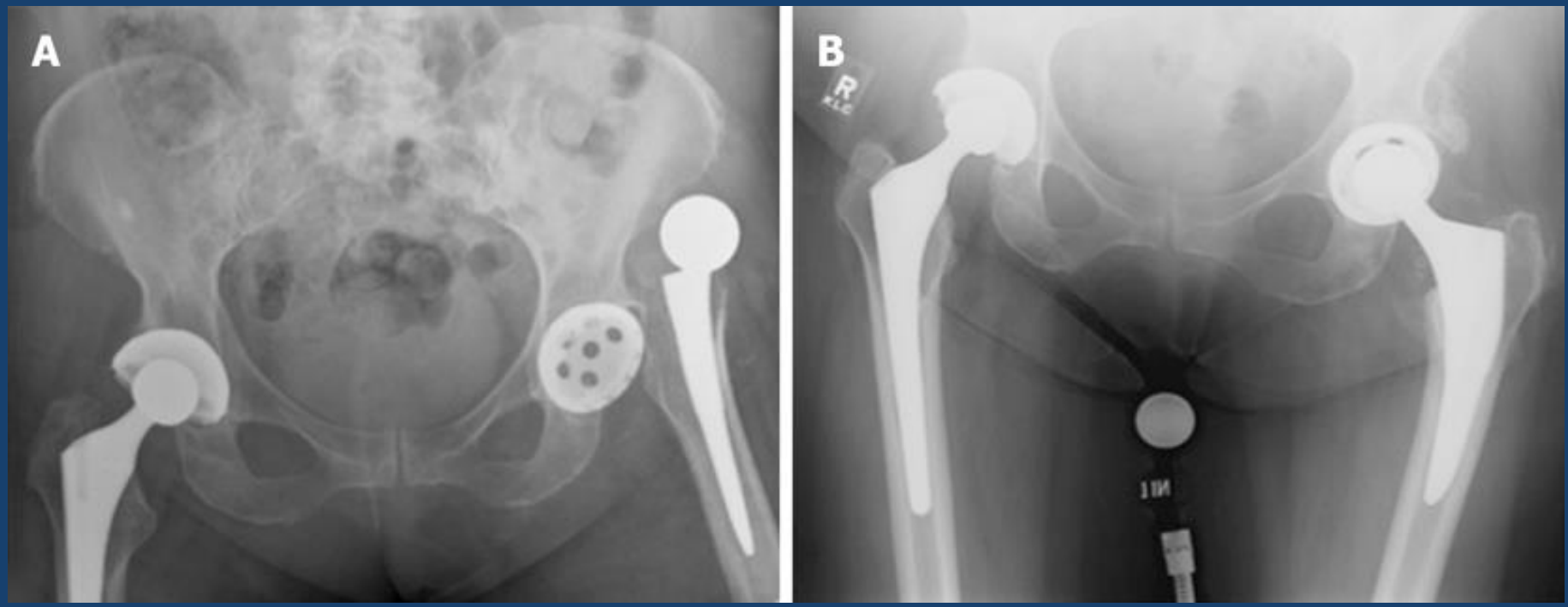
POLYETHYLENE WEAR



POSSIBLE COMPLICATIONS

- Infection: superficial (skin) or deep (joint)
  - Deep infection requires at least 1 or possibly multiple surgeries and long-term antibiotics
  - Risk factors: Diabetes, Obesity (BMI > 35), Smoking, +MRSA screen
- Blood clots: leg (DVT) or lungs (PE)
  - SCDs in hospital, Aspirin or other medication for ~1 month post-op
- Hip dislocation
- Leg-length discrepancy after hip replacement
- Fracture
- Persistent pain
- Medical complications

HIP DISLOCATION



SOURCES OF INFORMATION

- www.northernvirginiahipandkneereplacement.com
- Office: www.pwortho.com
- AAOS: www.orthoinfo.aaos.org

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