

Living With Arthritis - What Can You Do? *The Impact of Treatments and New Technology*



RIO® Robotic Arm Interactive System



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Disclosures/Conflicts of Interest

■ External Advisory Role:

- none

■ Research Support:

- none



Overview

- General overview of arthritis
- Clinical evaluation of the Arthritic Hip and Knee
- Treatment Options
 - Nonoperative
 - Total Joint Replacement
- Impact of New Techniques and Technologies
- Impact of Reform and Defining Value in Delivery of TJR



Arthritis—Background

- Arthritis is the second most common chronic condition in the US
 - Most common among elderly
 - 20-30% of people over age 70 suffer from osteoarthritis (OA) of the hip
 - Seeing increased demand in patients 40-60 yo
 - Technology and Delivery Improvements
 - Patient Demand and Lifestyle
 - Direct To Consumer Advertising (DTCA)
- 80% of patients with OA have some limitation of movement
 - 25% cannot perform major daily activities



Causes of Degenerative Arthritis

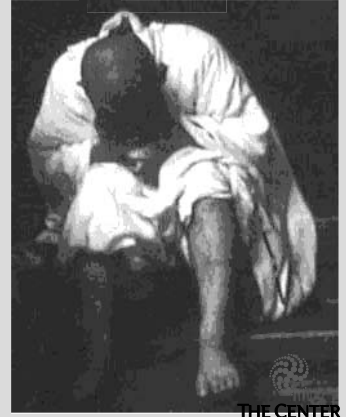
- **Primary**
 - “Idiopathic” (Unknown)—80%
 - Hereditary
- **Secondary**
 - Post-traumatic
 - Developmental dysplasia
 - Inflammatory arthritis
 - Osteonecrosis
 - Infection
 - Metabolic Disorders
 - Hemoglobinopathies and other blood disorders
 - Autoimmune disorders



Diagnosis—History

- Location:
 - Hip
 - Pulled Groin
 - Thigh
 - Buttocks
 - “Right on my hip”
 - Knee
 - Back vs. Front
 - Inside vs Outside
- How intense?
- How long has it hurt?
- What makes it worse:
 - Activity-related pain
 - Position related

■ *Pain!!!*



Diagnosis—History (cont.)

- Stiffness/swelling
- Mechanical symptoms/giving way
- Limitation in function
 - ADL's
 - Walking tolerance (confounded by co-morbid conditions)
 - Use of assistive devices (cane, walker, wheelchair)
 - Threaten Recreational and Social Activities

Impact on Quality of Life!!!

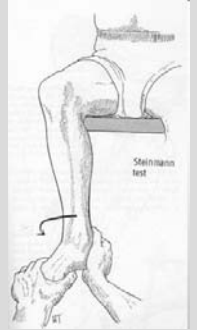
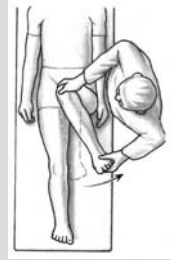
- Helps us tailor treatment recommendations
- Improved outcomes and patient satisfaction

Physical Exam: Hip and Knee

- Limping
- Can you lift your leg?
- Does it hurt when it rotates?
- Leg lengths
- Nerves
- Inspection
 - Limping
 - Bowing or knock-kneed
 - Swelling or Effusion
- Palpation
 - Crepitus
 - Warmth
 - Tenderness
- Range of motion
- Ligaments
- Meniscus



Provocative Maneuvers



Diagnosis: Radiographic Evaluation

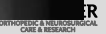
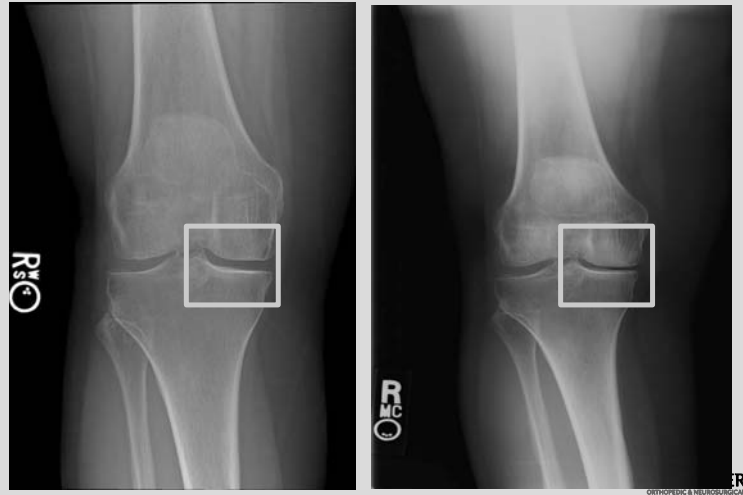


Do you have arthritis?

- Yes
 No

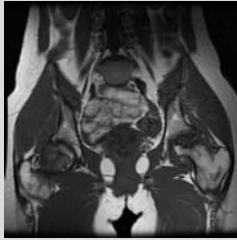


Diagnosis: Radiographic Evaluation



Diagnosis: Advanced Imaging Studies

- **MRI**
 - Soft Tissue Pathology
 - Stress Fracture
 - Limited usefulness in OA
- **Bone scan**
 - Cancer, infection, bone deterioration
 - Limited usefulness in OA
- **CT**
 - Helpful to assess bone definition
 - Rarely required in OA
- **Ultrasound**
 - Diagnosis of fluid collection/aspiration
 - Functional studies
 - Limited usefulness in OA



Differential Diagnosis: Hip

■ Intrinsic

- *Primary or Secondary Osteoarthritis*
- *Bursitis (greater trochanteric, iliopsoas)*
- **Labral tear/intra-articular loose body**
- **Femoral Head/Neck Pathology**
 - Aseptic Necrosis
 - Neoplasm
 - Occult or Stress Fracture



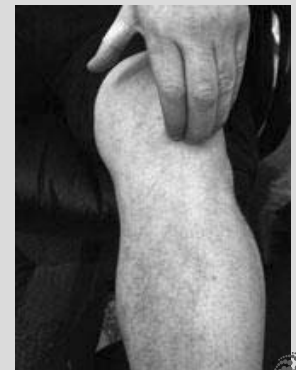
Differential Diagnosis (cont.)

■ Extrinsic

- *Lumbosacral spine disease*
 - *Stenosis*
 - *Disc herniation*
 - *Spondyloarthropathy*
- **Peripheral vascular disease/Vascular Claudication**
- **Nerve injury/irritation (sciatic, femoral, meralgia paresthetica)**
- **Metabolic disease (Paget's disease, osteomalacia)**
- **Malignancy/metastases**
- **Hernia (femoral, inguinal, obturator)**
- **Causalgia/Complex Regional Pain Syndrome**
- **Other Referred pain**

Differential Diagnosis: Intrinsic Knee

- **Primary or Secondary Osteoarthritis**
- **Tendonitis/bursitis**
 - *Pre-patellar*
 - *Patellar*
 - *Pes Anserine*
- **Meniscal/chondral injury**
- **Ligamentous injury**
- **Symptomatic Popliteal Cyst**
- **Occult or Stress Fracture**



Differential Diagnosis (cont.)

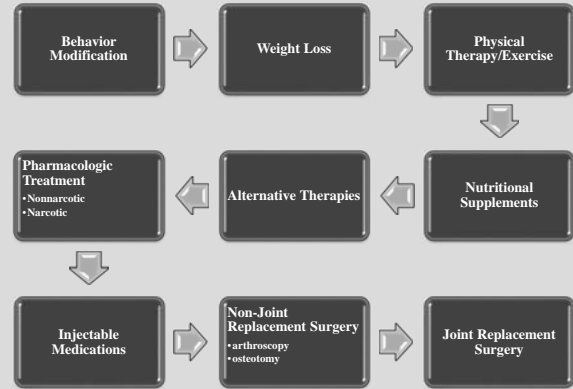
■ Extrinsic

- *Lumbosacral spine disease*
 - *Stenosis*
 - *Disc herniation*
 - *Spondyloarthropathy*
- **Referred Pain from Hip Osteoarthritis (Medial Knee)**
- **Peripheral vascular disease/Vascular Claudication**
- **Nerve injury/irritation (saphenous)**
- **Primary Tumor or Malignancy/metastases (RARE)**
- **Causalgia/Complex Regional Pain Syndrome**
- **Other Referred pain**



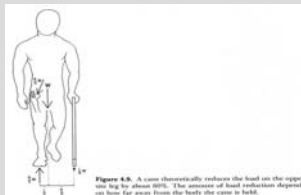
Treatment Options

- **Control Symptoms**
- **Restore an acceptable quality of life to the patient**



Treatment Options—Non-operative

- **Activity Modification**
- **Self Management**
- **Weight Management**
- **Bracing**
- **Cane/walker**
- **Physical Therapy**



Treatment Options—Medications

- Anti-inflammatories
 - Ibuprofen, Advil, Naprosyn
- COX-2 Inhibitors
 - ~~Bextra, Vioxx, Celebrex~~
- Acetaminophen
 - Liver toxicity
 - Highly underutilized in pain
- Nutritional supplements
 - Glucosamine/Chondroitin Sulfate
 - Turmeric



Treatment Options – Medications

The Comparative Safety of Analgesics in Older Adults With Arthritis

ARCH INTERN MED/VOL 170 (NO. 22), DEC 13/27, 2010 WWW.ARCHINTERNMED.COM
 Daniel H. Solomon, MD, MPH; Jeremy A. Rassen, ScD; Robert J. Glynn, PhD;
 Joy Lee, BA; Raisa Levin, MS; Sebastian Schneeweiss, MD, ScD

Table 3. Safety Events Among Propensity Score–Matched Older Adults With Arthritis Initiating Prescription Analgesic Treatment

Adverse Event ^a	HR (95% CI)		
	nsNSAIDs	Coxibs	Opioids
		Composite Safety Events	
Composite cardiovascular ^b	1 [Reference]	1.28 (1.01-1.62)	1.77 (1.39-2.24)
Upper or lower GI tract bleeding	1 [Reference]	0.60 (0.35-1.00)	1.07 (0.65-1.76)
Composite fractures ^c	1 [Reference]	0.96 (0.62-1.49)	4.47 (3.12-6.41)
Hospitalized adverse event	1 [Reference]	1.12 (0.91-1.38)	1.68 (1.37-2.07)
Death related to adverse event	1 [Reference]	1.12 (0.62-2.02)	1.11 (0.58-2.10)
All-cause mortality	1 [Reference]	1.16 (0.85-1.57)	1.87 (1.39-2.53)



Treatment Options—Injections

■ Corticosteroid

- Brian J. Cole and H. Ralph Schumacher, Jr.

Injectable Corticosteroids in Modern Practice
J. Am. Acad. Ortho. Surg., January/February 2005;
13: 37 - 46



■ Viscosupplementation

(proposed anti-inflammatory, anabolic, local analgesic, and chondroprotective effects)

■ Conclusion:

- Support exists for VS and CS injections for the temporary management of symptoms of OA
- AAOS Clinical practice guidelines



Treatment Options—Injections

■ PRP (Platelet Rich Plasma)

- High local concentration of platelets with associated growth factors

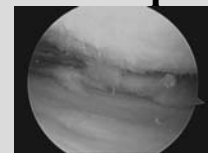
■ Prolotherapy

- As a local irritant causes an inflammatory reaction and recruits growth factors to site of injury
- Support pending



Surgical Treatment Options

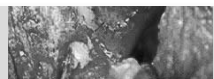
■ Joint preserving operations



- Arthroscopy
- Osteotomy

■ Autologous chondrotransplantation

- Nanosphere particles



Surgical Treatment Options

■ Joint Replacement Options:

- Partial
- Total
- Resurfacing



Goals of Osteoarthritis Treatment

- ***Relieve pain!!***
- Preserve function, mobility



Nonoperative or Operative?

- All treatments have a common goal:
 - To control a patient's symptoms to permit them an acceptable Quality of Life

1) When pain or dysfunction is unable to be controlled by nonoperative measures

and

2) A patient's quality of life is compromised

TJR becomes a predictable alternative

When Should You See Your MD?

Anytime you wish to further your education on your options, both nonoperative and operative

Results following Hip and Knee Replacement

W The operation of the century: total hip replacement

Ian D Learmonth, Claire Young, Cecil Rorabeck

- About 90% of total hip and knee replacements are successful in terms of *pain relief* even after ten years following surgery.
- What percentage fail?
- The average hip or knee replacement probably lasts >20 years, depending on:
 - Making the right diagnosis
 - Technical Job of Surgeon
 - Material Science
 - Patient Age
 - Mechanical Factors



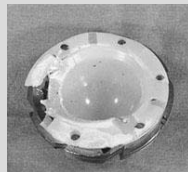
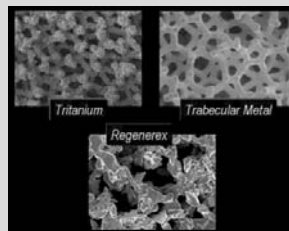
TJR – Improvements in the last 10-15 years

- Technology
 - Implant Design and Engineering of Materials
 - The Concept of MIS
 - Computer and Robot Assisted Surgery
- Delivery
 - ANESTHESIA, ANESTHESIA, ANESTHESIA
 - Operating Room and Hospital Efficiencies
- Patient Safety
 - Clinical Care Pathways



Prosthesis Design

- Implants That Your Bone Grows Into
- Improved Ability to Revise Components
- Bearing Surface Improvements
 - Highly Cross-Linked UHMWPE
 - Ceramics
 - Metal on Metal ?????



What is Minimally Invasive Surgery?

- A Direct Anterior THA? NO
- A Shorter Hospital Stay? NO
- Using a robot or computer? NO
- A Smaller Incision? NO
- A Smaller Implant? NO
- Unique to Total Joint Replacement? NO

A CONCEPT OF WELL-PLANNED,

WELL-DESIGNED DELIVERY OF CARE

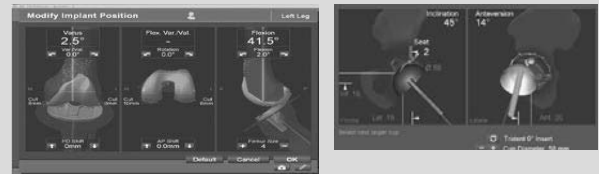


Goals of “Minimally Invasive” TJA

- Limit Biologic Footprint
- Minimize blood loss
 - Lower transfusion rates
- Better postoperative pain control
- Decreased Infection Rates
- Shorter inpatient stay (≤ 2 days)
- Earlier return to function
- Lower overall cost of care
 - Value = Quality/Cost
- Improve Patient Education
- Higher Patient Satisfaction

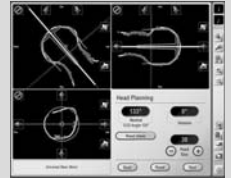


Computer Assisted Surgery



- An intraoperative tool to provide a surgeon with real time feedback

- Cost effective? (Novak et al, 1997)
 - Depends on cost of equipment (-), better alignment (+) and implant longevity/revision rate (?)
- More accurate?
 - Improved limb alignment (Molli et al, 2011; Dutton et al, 2008, Picard et al, 2007)
 - Improved soft tissue balance (Lee et al, 2010)
 - Improved short term recovery (Lutzner et al, 2010)



Robotics, Custom Patient Blocks and Other Hot Topics



Custom Positioning guides are matched precisely to your anatomy

- Marketing driven
- Evidence limited
- Possible future improvements



The Direct Anterior Hip

- The Original Approach
- Anterior Approach of this Millenium
 - Quicker early recovery in the right hands and the right patient
- If I make a guess?
 - Will play a more prominent role in hip surgery by 2025



The Robot

- **Haptic Technology**

- A precise way to map and remove bone
- Extent of Application in orthopaedic surgery not yet defined
 - Will have a future in joint replacement and bone tumor resection



Patient Specific Knee Replacement

- **Future Potential Application to Reduce Cost and Equipment in OR**
- **Goal is a “Green” Knee**
- **Not a technology that increases precision**



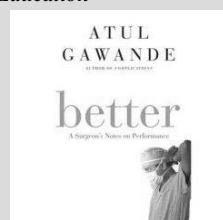
The Future of Total Joint Replacement

Michael E. Porter
Elizabeth Olmsted Teisberg

Redefining Health Care

Creating Value-Based Competition on Results

- Value = Quality/Cost*
- Standardized Delivery Pathways*
- National Joint Registry*
- Treatment Efficacy*
- Patient Safety*
- Physician Accountability*
- Patient Education*



The Future of US Healthcare



- **Patients will have to:**
 - Demand the “best” care from their hospitals and physicians
 - Have the education and tools/data to make their decisions
- **Physicians and Hospitals will have to:**
 - Increase focus on patient needs
 - Increase value
 - Decrease cost
 - Increase access to care
 - Increase safety
 - Increase Transparent Reporting



What's Happening in Bend?

- Musculoskeletal Home
 - Patient Centered Care
 - Shared Decision Making
 - Problem Resolution
 - Mutual Accountability
- Reform of the Episode of Care of the TJR
- COOP, LLC



Summary

- Osteoarthritis of the hip and knee are common and often severely disabling conditions that affects millions of Americans



Summary

- Osteoarthritis is a common, well understood patient ailment
- Patients have a number of successful choices to help reduce pain and preserve function



Summary

- Total hip and knee arthroplasty using conventional techniques, instrumentation, and implants have provided excellent clinical results in terms of pain relief and improvement in QoL



Summary



- Long-term data is needed before we can adequately judge the impact of these new techniques and technologies on patient outcomes and quality of life
- Favorable Trends on the Horizon for Continued Patient Success



Summary

- Greatest Gains in Patient Care will Come with...

Patient-Centered Health Care Reform and Transformation

Stay Tuned to A Hospital and Community Near You



Thank You!!!

