Hip and Knee Arthritis: Evidence-Based Treatment

David DeMik, MD, PharmD

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Disclosures

- No financial conflicts of interest

- Editorial Board – Journal of Arthroplasty

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Overview

- Background
- What is arthritis?
- American Academy of Orthopaedic Surgeons (AAOS) Clinical Practice Guidelines for Osteoarthritis Treatment
  - Non-surgical
  - Surgical
- Common Questions/Myths
- Q&A

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Background

- Education: University of Iowa
  - PharmD 2012
  - MD 2017
- Residency: University of Iowa
- Fellowship: Rothman Orthopaedic Institute – Philadelphia, PA
  - Adult Reconstruction – Hip and Knee Replacement
- Board-Certified – American Board of Orthopaedic Surgeons
- American Association of Hip and Knee Surgeons (AAHKS) Health Policy Fellowship 2023-2025
- Total Hip Replacement, Total/Partial Knee Replacement, Revision Surgery
  - Anterior approach hip replacement
  - Robotic-assisted surgery

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Background

- Additional year of training in Hip/Knee Replacement at Rothman Institute (Philadelphia, PA)





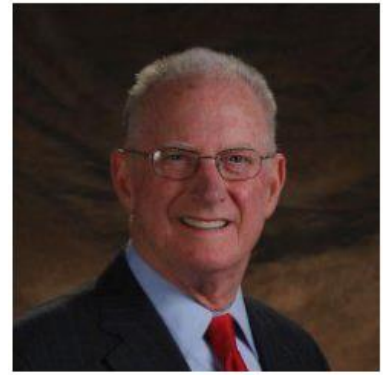


Javad Parvizi, M.D. Now President of AAHKS

by **Elizabeth Hofheinz, M.P.H., M.Ed.** April 5, 2023



Javad Parvizi, M.D. / Courtesy of American Association of Hip and Knee Surgeons



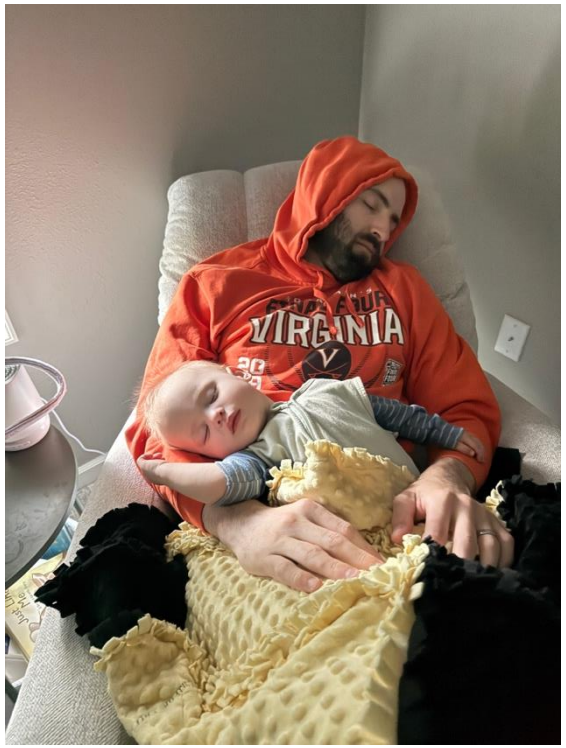
In Memoriam

1936 - 2018

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Background





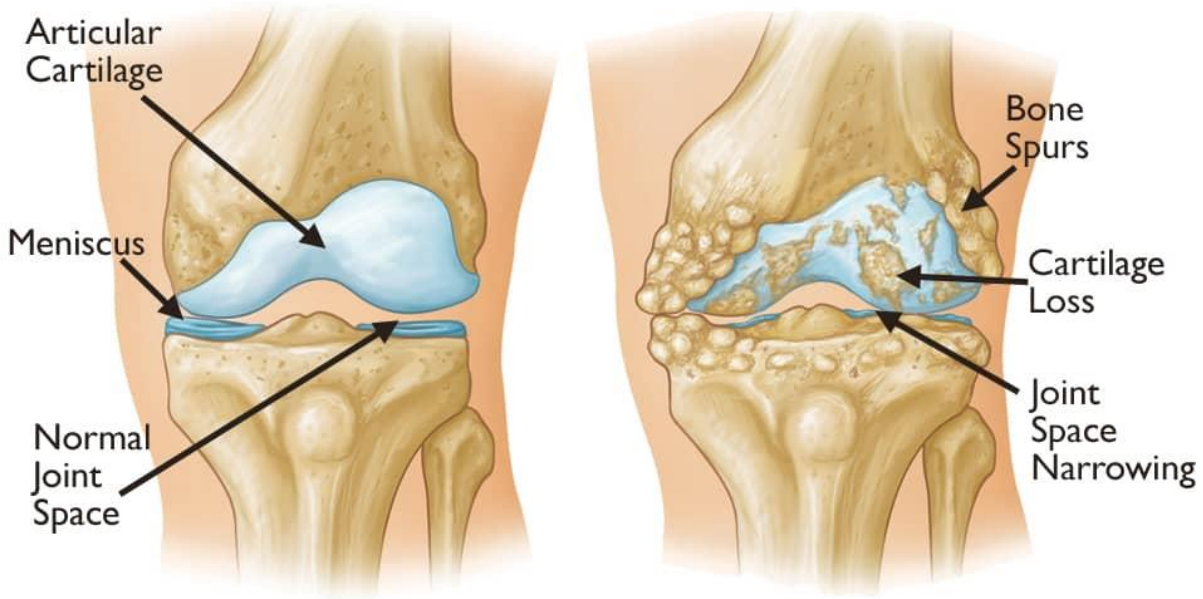




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What is Arthritis?

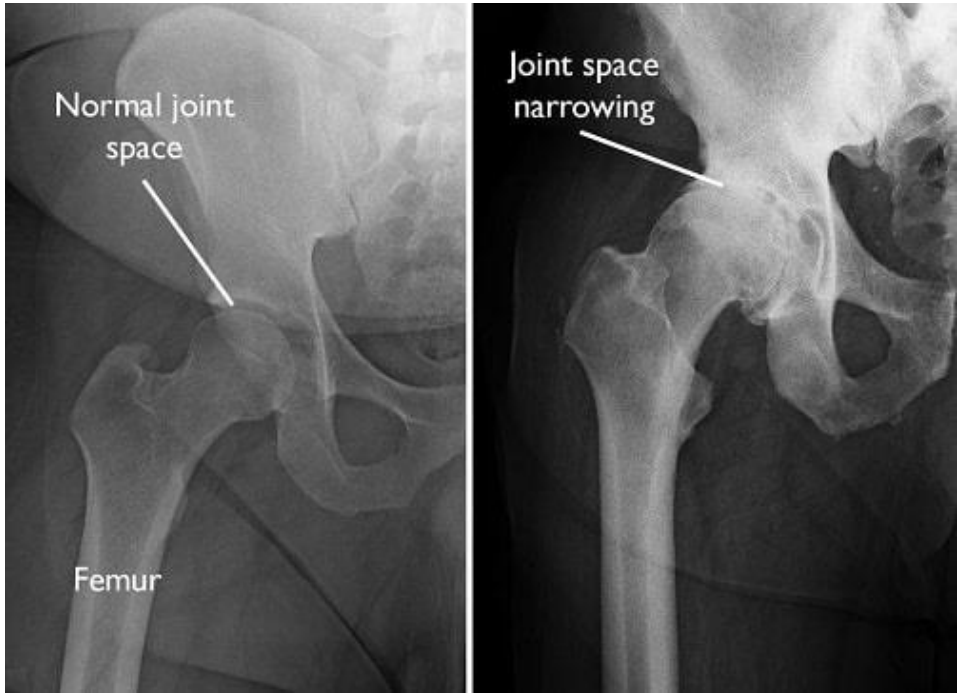
- Damage to joint cartilage
  - Smooth surface lining the joints
- Types
  - Osteoarthritis
    - ”Wear and tear” (most common)
  - Inflammatory arthritis
    - Over-active immune system
    - Rheumatoid arthritis, Psoriatic Arthritis
  - Post-traumatic from injury
- Leads to pain, stiffness/limited motion
  - Usually worse with activity

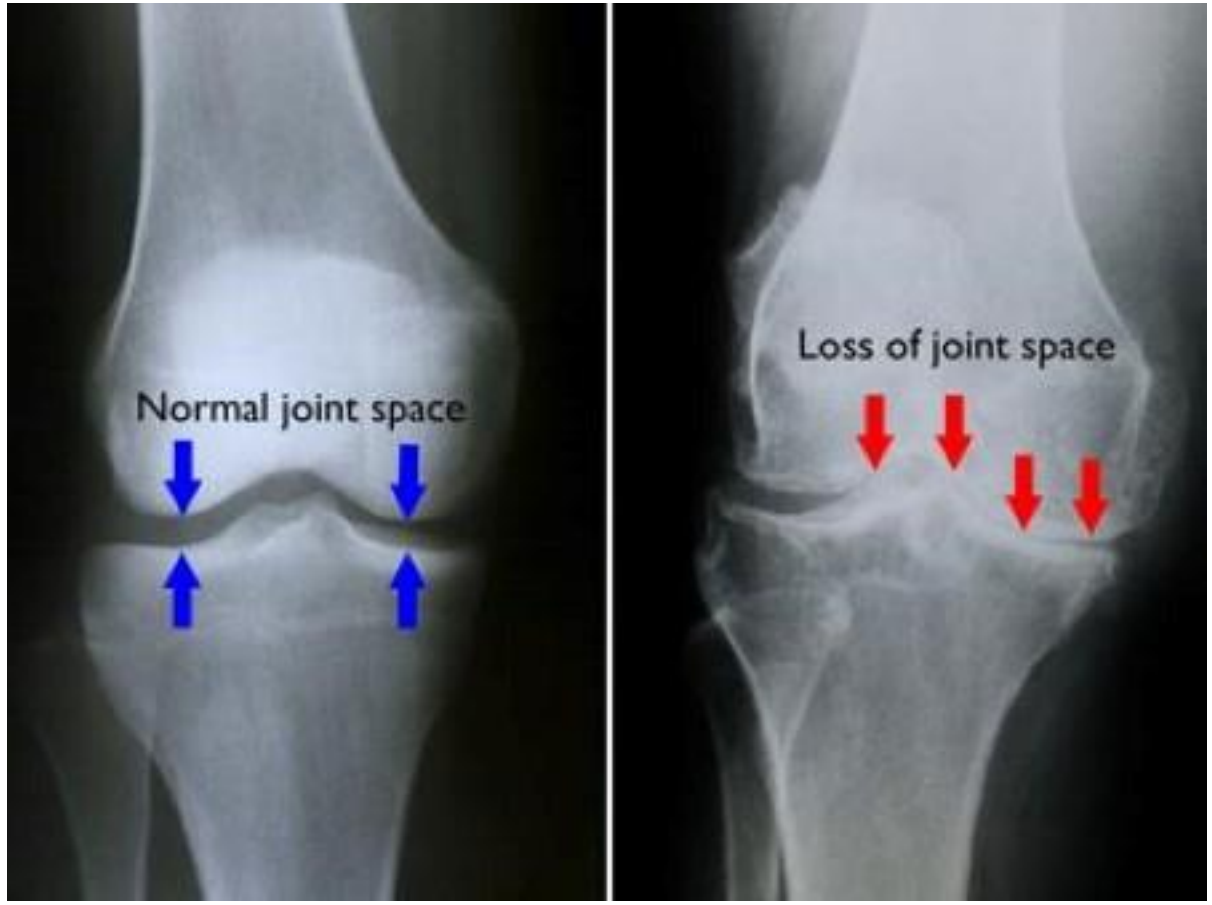


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What is Arthritis?

- Diagnosed on x-ray
  - Loss of joint space
  - Cartilage is clear on x-ray
  - Usually do not need MRI





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Clinical Practice Guidelines

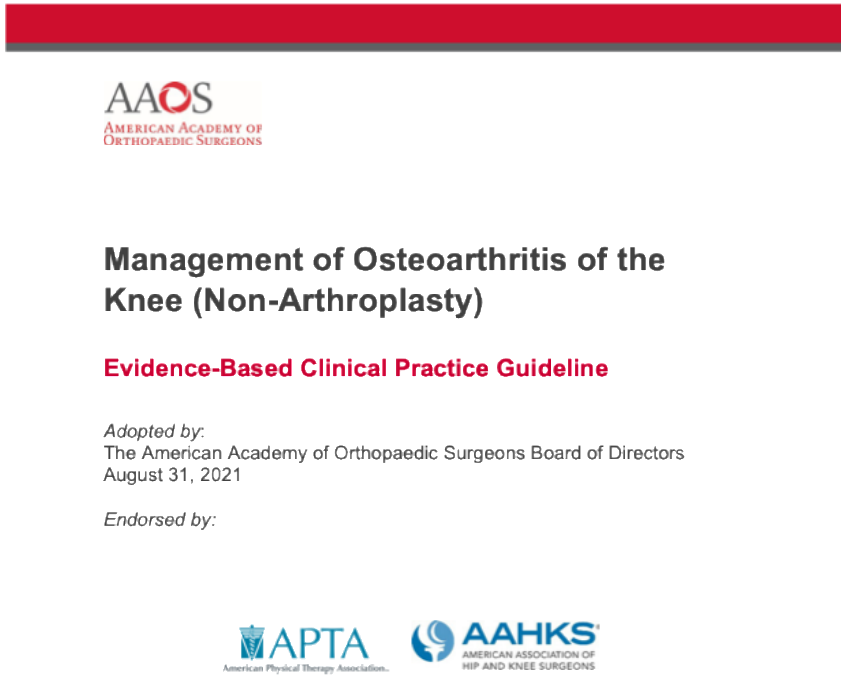
- AAOS Clinical Practice Guidelines
  - Group reviews available evidence and makes recommendations
  - Evidence-based medicine is good
  - Manage expectations

- Help to guide treatment
  - Individual circumstances vary and treatments may be appropriate or inappropriate
  - Clinical judgement, expertise

- This is general information, not medical advice

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AAOS CPG - Knee



Steindler Orthopedic Clinic

AAOS CPG – Medications: NSAIDs

Oral NSAIDs

Oral NSAIDs are recommended to improve pain and function in the treatment of knee osteoarthritis when not contraindicated.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

Topical Treatments

Topical NSAIDs should be used to improve function and quality of life for treatment of osteoarthritis of the knee, when not contraindicated.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

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AAOS CPG – Medications: Acetaminophen

Oral Acetaminophen

Oral acetaminophen is recommended to improve pain and function in the treatment of knee osteoarthritis when not contraindicated.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

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AAOS CPG – Medications: Opioids

Oral Narcotics

Oral narcotics, including tramadol, result in a significant increase of adverse events and are not effective at improving pain or function for treatment of osteoarthritis of the knee.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

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AAOS CPG – Injections: Steroid

Intra-articular Corticosteroids

Intra-articular (IA) corticosteroids could provide short-term relief for patients with symptomatic osteoarthritis of the knee.

Strength of Recommendation: Moderate  (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Injections: PRP

Platelet-rich Plasma

Platelet-rich plasma (PRP) may reduce pain and improve function in patients with symptomatic osteoarthritis of the knee.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Description: Evidence from one or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention. Also, higher strength evidence can be downgraded to limited due to major concerns addressed in the EtD Framework.

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AAOS CPG – Injections: Viscosupplementation

Hyaluronic Acid

Hyaluronic acid intra-articular injection(s) is not recommended for routine use in the treatment of symptomatic osteoarthritis of the knee.

Strength of Recommendation: Moderate  (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Exercise/Lifestyle

Supervised Exercise

Supervised exercise, unsupervised exercise, and/or aquatic exercise are recommended over no exercise to improve pain and function for treatment of knee osteoarthritis.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

Neuromuscular Training

Neuromuscular training (i.e. balance, agility, coordination) programs in combination with traditional exercise could be used to improve performance-based function and walking speed for treatment of knee osteoarthritis.

Strength of Recommendation: Moderate ★★★☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Exercise/Lifestyle

Self-Management

Self- management programs are recommended to improve pain and function for patients with knee osteoarthritis.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

Weight Loss Intervention

Sustained weight loss is recommended to improve pain and function in overweight and obese patients with knee osteoarthritis.

Strength of Recommendation: Moderate ★★★☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Manual Treatments

Manual Therapy

Manual therapy in addition to an exercise program may be used to improve pain and function in patients with knee osteoarthritis.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

Massage

Massage may be used in addition to usual care to improve pain and function in patients with knee osteoarthritis.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Manual Treatments/Procedures

Laser Treatment

FDA-approved laser treatment may be used to improve pain and function in patients with knee osteoarthritis.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

Acupuncture

Acupuncture may improve pain and function in patients with knee osteoarthritis.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Manual Treatments/Procedures

Transcutaneous Electrical Nerve Stimulation

Modalities that may be used to improve pain and/or function in patients with knee osteoarthritis include:

a. **Transcutaneous Electrical Nerve Stimulation (pain)**

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

Percutaneous Electrical Nerve Stimulation/Pulsed Electromagnetic Field Therapy

Modalities that may be used to improve pain and/or function in patients with knee osteoarthritis include:

a. **Percutaneous Electrical Nerve Stimulation (pain and function)**
b. **Pulsed Electromagnetic Field Therapy (pain)**

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Manual Treatments/Procedures

Extracorporeal Shockwave Therapy

Extracorporeal shockwave therapy may be used to improve pain and function for treatment of osteoarthritis of the knee.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

Denervation Therapy

Denervation therapy may reduce pain and improve function in patients with symptomatic osteoarthritis of the knee.

Strength of Recommendation: Limited ★★☆☆ (downgrade)

Description: Evidence from one or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention. Also, higher strength evidence can be downgraded to limited due to major concerns addressed in the EtD Framework.

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AAOS CPG – Manual Treatments/Procedures

Dry Needling

In the absence of reliable evidence, it is the opinion of the workgroup that the utility/efficacy of dry needling is unclear and requires additional evidence.

Strength of Recommendation: Consensus ★☆☆☆

Description: Evidence there is no supporting evidence, or limited level evidence was downgraded due to major concerns addressed in the EtD framework. In the absence of reliable evidence, the guideline work group is making a recommendation based on their clinical opinion.

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AAOS CPG – Medical Equipment

Canes

Canes could be used to improve pain and function in patients with knee osteoarthritis.

Strength of Recommendation: Moderate ★★★☆

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

Braces

Brace treatment could be used to improve function, pain, and quality of life in patients with knee osteoarthritis

Strength of Recommendation: Moderate ★★★☆ (downgrade)

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG - Supplements

Oral/Dietary Supplements

The following supplements may be helpful in reducing pain and improving function for patients with mild to moderate knee osteoarthritis; however, the evidence is inconsistent/limited and additional research clarifying the efficacy of each supplement is needed.

- **Turmeric**
- **Ginger extract**
- **Glucosamine**
- **Chondroitin**
- **Vitamin D**

Strength of Recommendation: Limited  (downgrade)

Description: Evidence from one or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention. Also, higher strength evidence can be downgraded to limited due to major concerns addressed in the EtD Framework.

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AAOS CPG – Non-Replacement Surgery

Lavage/Debridement

Arthroscopy with lavage and/or debridement in patients with a primary diagnosis of knee osteoarthritis is not recommended.

Strength of Recommendation: Moderate ★★★☆

Description: Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

Partial Meniscectomy

Arthroscopic partial meniscectomy can be used for the treatment of meniscal tears in patients with concomitant mild to moderate osteoarthritis who have failed physical therapy or other nonsurgical treatments.

Strength of Recommendation: Moderate ★★★☆

Evidence from two or more "Moderate" quality studies with consistent findings, or evidence from a single "High" quality study for recommending for or against the intervention. Also requires no or only minor concerns addressed in the EtD framework.

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AAOS CPG – Not Recommended

Lateral Wedge Insoles

Lateral wedge insoles are not recommended for patients with knee osteoarthritis.

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

Free Floating Interpositional Devices

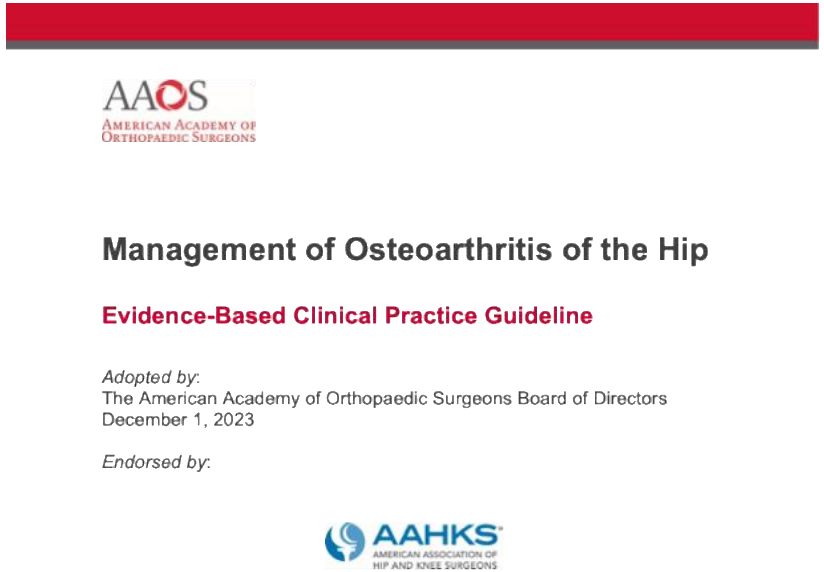
In the absence of reliable or new evidence, it is the opinion of the work group not to use free-floating (un-fixed) interpositional devices in patients with symptomatic medial compartment osteoarthritis of the knee.

Strength of Recommendation: Consensus ★☆☆☆

Description: Evidence there is no supporting evidence, or limited level evidence was downgraded due to major concerns addressed in the EtD framework. In the absence of reliable evidence, the guideline work group is making a recommendation based on their clinical opinion.

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AAOS CPG - Hip



AAOS
American Academy of Orthopaedic Surgeons

Management of Osteoarthritis of the Hip

Evidence-Based Clinical Practice Guideline

Adopted by:
The American Academy of Orthopaedic Surgeons Board of Directors
December 1, 2023

Endorsed by:

AAHKS
American Association of Hip and Knee Surgeons

Please cite this guideline as:
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AAOS CPG – Medications: NSAIDs

PHARMACOLOGICAL MANAGEMENT: NSAIDs

When not contraindicated, oral nonsteroidal anti-inflammatories (NSAIDs) should be used to reduce pain and improve function in the treatment of symptomatic hip osteoarthritis.

Quality of Evidence: High

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

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AAOS CPG – Medications: Acetaminophen

PHARMACOLOGICAL MANAGEMENT: ACETAMINOPHEN

In the absence of sufficient evidence, it is the opinion of the workgroup that when not contraindicated, oral acetaminophen may be considered to improve pain and function in the treatment of symptomatic osteoarthritis of the hip.

Quality of Evidence: Consensus
Strength of Option: Consensus ★☆☆☆

There is no supporting evidence, or limited level evidence was downgraded due to major concerns addressed in the EtD framework. In the absence of reliable evidence, the guideline work group is making a recommendation based on their clinical opinion.

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AAOS CPG – Medications: Opioids

PRESCRIPTION OPIOID AS CONSERVATIVE TREATMENT

In the absence of sufficient evidence, it is the opinion of the workgroup that oral opioids not be utilized for nonoperative treatment of symptomatic osteoarthritis of the hip.

Quality of Evidence: Consensus
Strength of Option: Consensus ★☆☆☆

There is no supporting evidence, or limited level evidence was downgraded due to major concerns addressed in the EtD framework. In the absence of reliable evidence, the guideline work group is making a recommendation based on their clinical opinion.

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AAOS CPG - Injections

INTRAARTICULAR CORTICOSTEROID INJECTION

Intraarticular corticosteroids could be considered to improve function and reduce pain in the short-term for patients with symptomatic osteoarthritis of the hip.

Quality of Evidence: High

Strength of Recommendation: Moderate ★★★☆ (Downgraded)

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Recommendation was downgraded based on EtD framework.

INTRAARTICULAR HYALURONIC ACID

Intraarticular hyaluronic acid should not be considered for treatment of symptomatic osteoarthritis of the hip as it does not improve function or reduce pain better than placebo.

Quality of Evidence: High

Strength of Recommendation: Strong ★★★★

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Also requires no reasons to downgrade from the EtD framework.

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AAOS CPG – Exercise/Lifestyle

PHYSICAL THERAPY AS CONSERVATIVE TREATMENT

Physical therapy could be considered as a treatment for patients with mild to moderate symptomatic osteoarthritis of the hip to improve function and reduce pain.

Quality of Evidence: High

Strength of Recommendation: Moderate ★★★☆ (Downgraded)

Evidence from two or more "High" quality studies with consistent findings for recommending for or against the intervention. Recommendation was downgraded based on EtD framework.

BMI: ADVERSE EVENTS

Limited evidence suggests that elevated BMI may increase the risk of adverse events in patients undergoing total hip arthroplasty for symptomatic hip osteoarthritis.

Quality of Evidence: Low

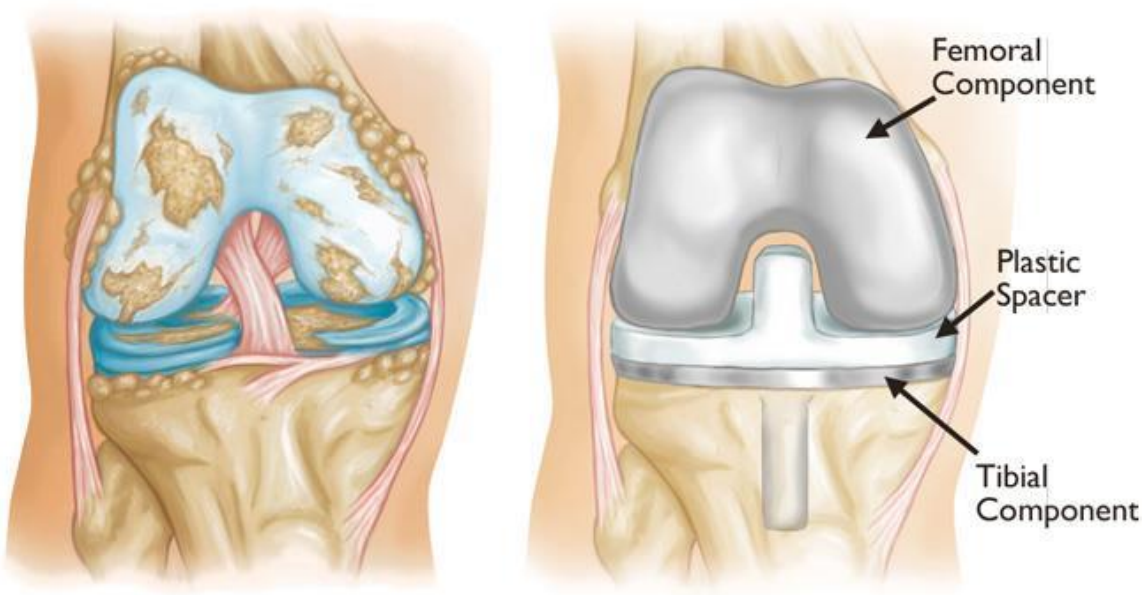
Strength of Option: Limited ★★☆☆

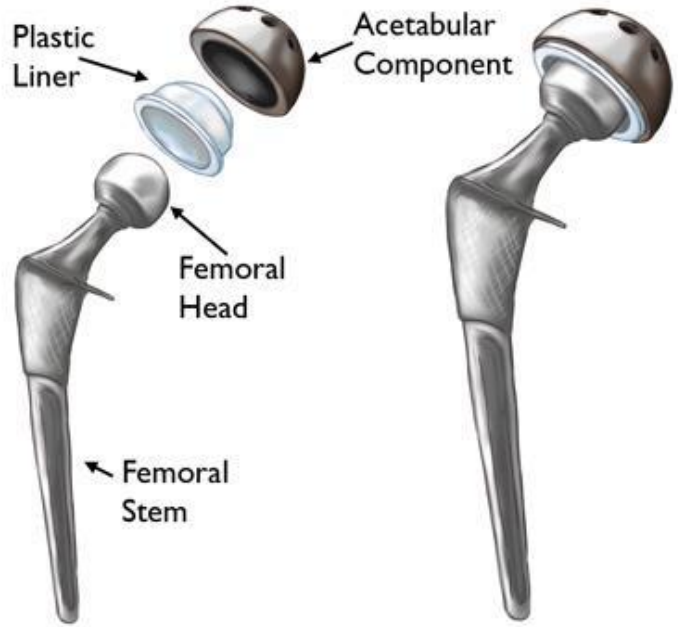
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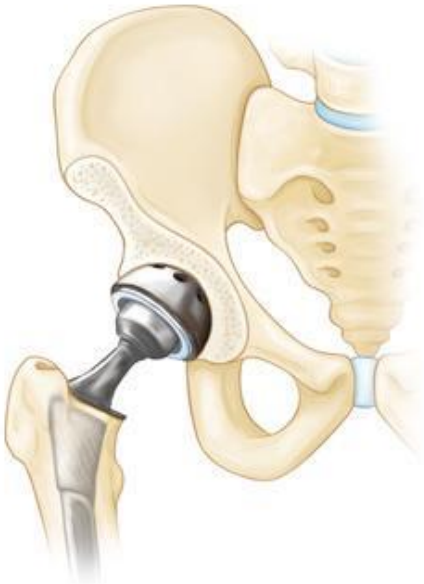
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Joint Replacement Surgery

- Considered when non-surgery treatments have been tried and do not work anymore
- Hip replacements sometimes done for hip fractures







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Joint Replacement Surgery

- High success rates
  - Knee replacement 85%
  - Hip replacement 95%
- Walking same day with walker
- Recovery
  - ”90 days, 90% better”
  - Full recovery 1 year or longer
- Significant improvements care over the last 10-15 years
  - Now: many patients go home on day of surgery
  - Before: day(s) in the hospital, need to go to Rehab/nursing facility
- Must be healthy enough to have surgery and participate in recovery

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Common Questions/Myths

- Can stem cells be injected to re-grow cartilage or reverse arthritis?

- In 2026, it is not proven and there are more questions than answers
  - How do stem cells know to change into cartilage cells?
  - How to they know where to go in the joint?
  - How would they be protected so they can grow?
- Problem → arthritis is too mechanical (joint deformed, cartilage gone)
  - You can patch a pothole on the highway, but you cannot patch the whole highway → need to rebuild it
- Beware the “wellness industry”
  - Ask questions about success rates, how it works

STEINDLER ORTHOPEDIC CLINIC

Common Questions/Myths

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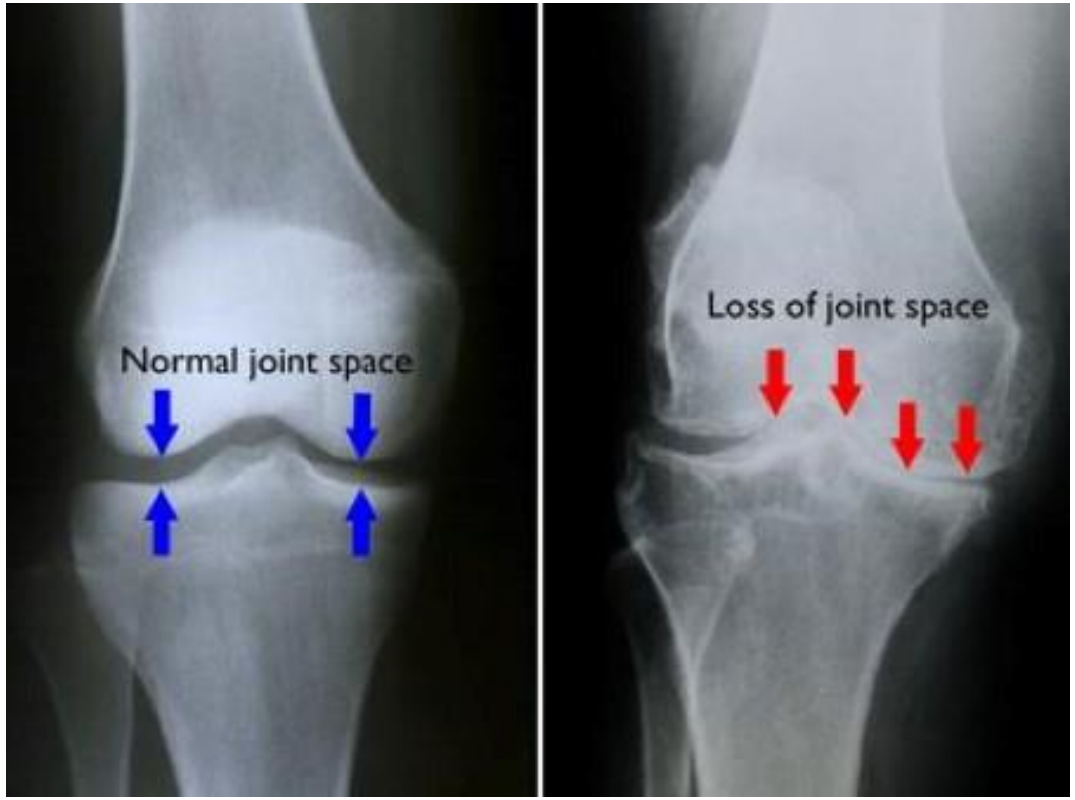
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Common Questions/Myths

- Problem → arthritis is too mechanical (joint deformed, cartilage gone)
  - You can patch a pothole on the highway, but you cannot patch the whole highway → need to rebuild it



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Common Questions/Myths

- I have arthritis on x-ray, do I need my hip or knee replaced?
- It depends on your level of function, quality of life
- Arthritis severity on x-ray does not always correlate with patient symptoms
  - Treat the patient, not the x-ray
- Replacement is when non-surgery treatments have been tried, do not work, and hip/knee pain is impacting quality of life

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Common Questions/Myths

- My hip/knee has some arthritis, should I get ahead of it and get it replaced now before it gets bad?

- Generally, surgery is not recommended when function is good, non-surgical treatments work, or symptoms are not bad enough to try non-surgical treatment
- Counterintuitive vs other things
  - replacing a roof before it leaks, replacing car tires before they are worn out

- Exception may be deformity or bone loss → progression may make surgery more complicated and worsen results

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Common Questions/Myths

- I had surgery a few days ago, shouldn't I be fully recovered by now?

- Recovery is a marathon, not a sprint
  - "90 days, 90% better"
  - Short term inconvenience → long-term benefit
  - Does require time off work and normal activities
  - Hips can be "easier" than knees, but everyone's recovery is different

- Surgery better than ever, but it is still a major reconstructive surgery
  - 10-15 years ago → day(s) in the hospital
  - Today → most patients go home on the day of surgery

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Common Questions/Myths

- I have pain somewhere other than my hip/knee, will joint replacement fix that because “it’s all connected”?

- Often there is more than one problem
  - Arthritis can run in the family so multiple joints can be worn out

- Joint replacement can help pain that comes from that joint, but it may not help pain coming from somewhere

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Common Questions/Myths

- Is robotic surgery better? Does the robot do the surgery?
- Research has not consistently shown superiority
- It is a tool that can used to assist with surgery
  - Robot does not do the surgery or replace the surgeon
  - May help with deformity, hardware from prior surgery

Common Questions/Myths

- Industry bias → they want to sell more products
  - Financially conflicted surgeons/researchers
  - Marketing
  - Hospital contracts

- Risks
  - CT scan
    - 2 hips, 2 knees = 4 CT scans
    - Radiation = cancer risk
    - Cost to patients
  - Pin site pain/fractures
  - Robot error

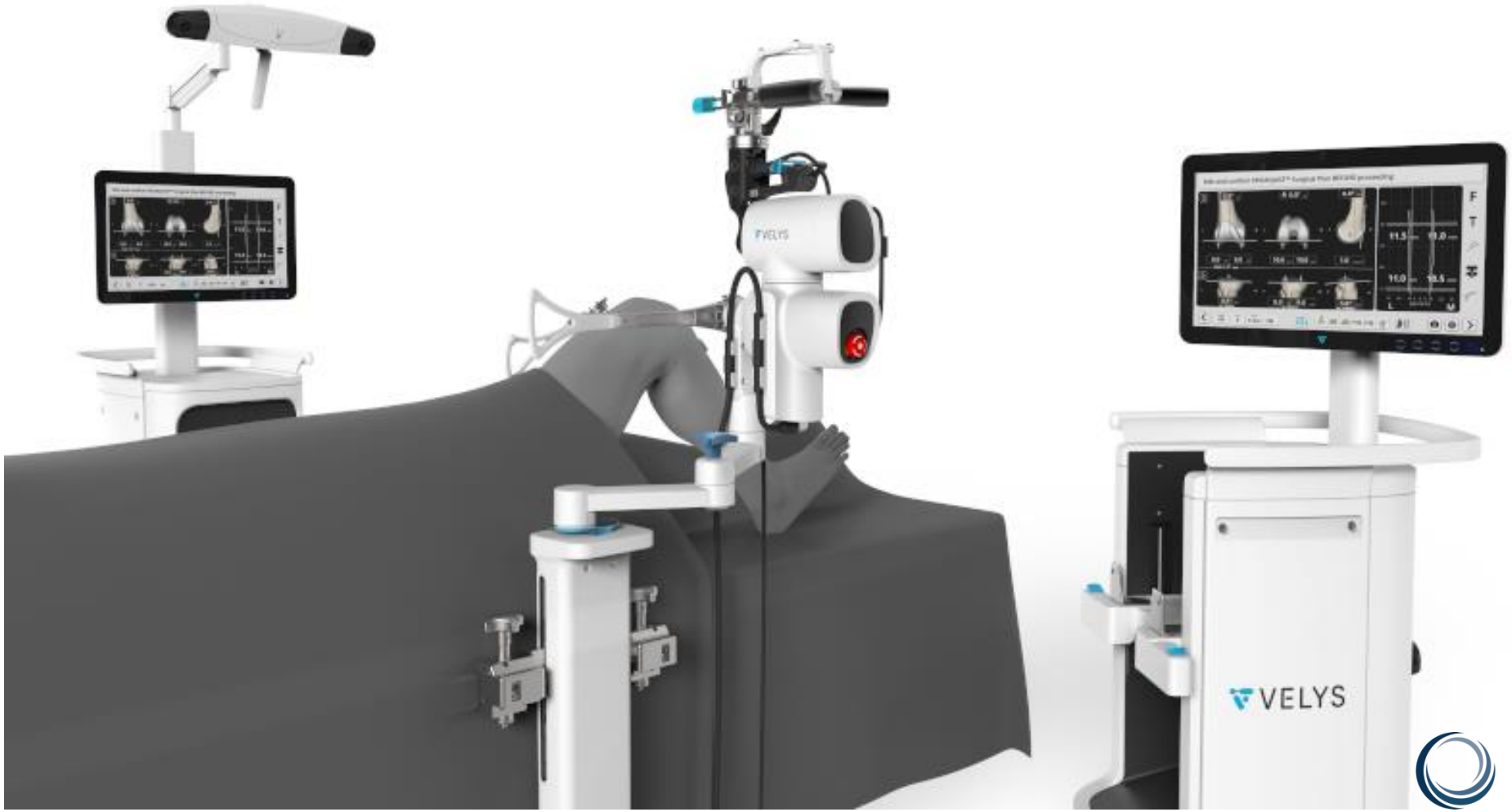
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Common Questions/Myths



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Common Questions/Myths



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Common Questions/Myths

- If I have a hip or knee replacement, can I still have pain?

- Some patients do experience pain after joint replacement
  - Success rates → Knee replacement 85%, Hip replacement 95%
- Sometimes re-do surgery can help if there is a problem that can be fixed (i.e. loose implant, infection, instability, worn out)
  - Exploratory surgery for ”pain” without an identifiable problem unlikely to help
- Pain may come from outside the joint
  - Spine, vascular, abdominal, muscle/soft tissue

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Thank you for your time

Questions?

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