

Office Orthopedics in Primary Care

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Disclosure

I have no financial interests or relationships to disclose.

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“Fortune favours the prepared mind.”

Sir Almroth Wright

1867 – 1947, British bacteriologist and mentor of Sir Roger Bannister,

Famed neurologist and first to break the 4 minute mile

The purpose of this talk is to facilitate the ortho side of your practice. Make it easy for you and rewarding for those for whom you provide care



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Agenda

- Demographics of recent CEC attendees 11/2023
- 42% Nurse Practitioners, 38% Physicians, 19% PAs
- I hope that each of you feels this lecture is directed at you



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Agenda

- Warm up MSK ARS questions
- Answers and discussion of these ARS questions
- 7 questions asked to me by 2023 attendees
- 10 “things I can use on day 1” – Positive attendee comments from the 2023 critiques that maybe you can use also
- Attendees requested these future topics
 - *Knees, diagnoses and injection/aspiration*
 - *Dental prophylaxis after total joints, where do we stand*

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ARS Questions

- OK Post, so explain the answers please
- Women’s swim start, IRONMAN HAWAII



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CTS, Carpal Tunnel Syndrome

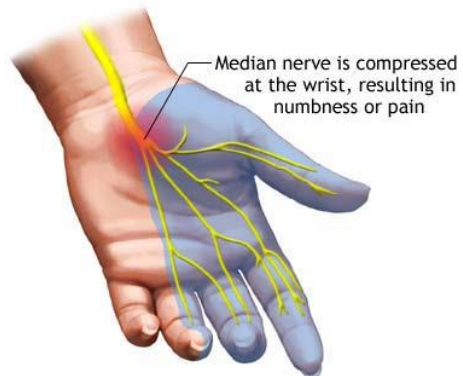
What does the blue shading represent in the hands to the right?



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CTS, Carpal Tunnel Syndrome

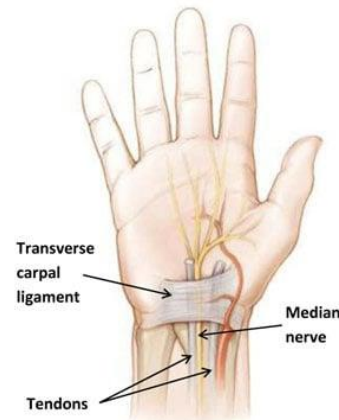
- Median nerve sensory distribution



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CTS, Carpal Tunnel Syndrome

- Very common
- Numbness, pain and weakness in median n. distribution, hand and forearm
- Early diagnosis usually prevents nerve damage and worsening of symptoms
- The “pinky” is not generally involved



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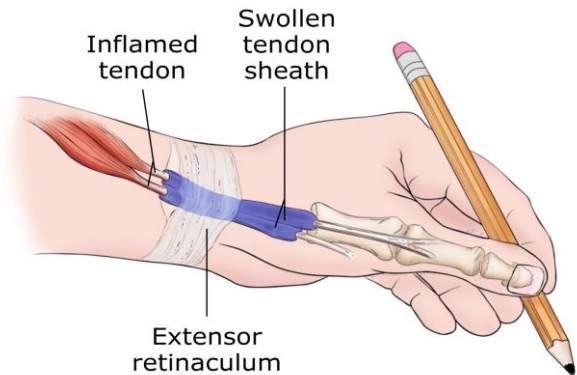
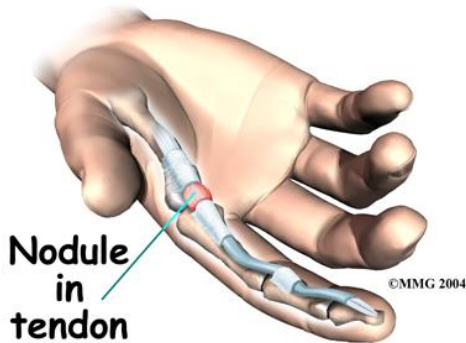
CTS, Carpal Tunnel Syndrome

- The carpal tunnel, or carpal canal, is a tube thru the wrist
- The bottom and sides are made by the wrist bones
- The deep transverse carpal ligament makes up the roof
- The contents include hand/finger flexor tendons and the median nerve
- While commonly found in laborers or those with a hand intensive job, it can be found in anyone
- Frequency increases with age
- Heredity, pregnancy, DM, RA, alcoholism, hypothyroidism
- 3X more common in women than men

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CTS, Carpal Tunnel Syndrome

- Your differential could include Dequervains tendinosis, trigger finger, arthritis



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Carpal Tunnel Syndrome 2024

- Electrodiagnostic studies EMG – “usefulness for the routine dx of CTS questionable at best.”
- “58% of patients randomized to corticosteroid injection for CTS needed no further treatment in the six year period.”
- There is strong evidence for the use of corticosteroid injection in the treatment of CTS.”
- **JBJS Am. 2023;105:428-34**

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Carpal Tunnel Syndrome

- Physical findings
- Numbness in thumb, index, long and often half the ring finger
- Numbness worse during sleep
- Positive Phalen’s test (wrist flexion)
- Occasional thenar eminence atrophy, often a late finding
- Positive Tinel’s sign
- Loss of two point discrimination!
- X-rays are often ordered for loss of motion or anything “fishy”
- Video of Phalen’s and Tinel’s

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Carpal Tunnel Syndrome

- An interesting grading scale

**CTS-6
Carpal Tunnel Syndrome Evaluation**



Symptoms and History		
1. Numbness predominantly or exclusively in median nerve area Sensory symptoms are mostly in the thumb, index, middle and/or ring fingers	___	(3.5)
2. Nocturnal numbness Symptoms are prominent when the patient sleeps; numbness wakes patient from sleep	___	(4)
Physical Exam		
3. Thenar muscle atrophy and/or weakness The bulk of the thenar muscle area is reduced or manual motor testing shows strength of grade 4 out of 5 or less	___	(5)
4. Positive Phalen test Flexion of wrist reproduces or worsens symptoms of numbness in the median nerve distribution	___	(5)
5. Loss of 2-Point Discrimination A failure to discriminate two points held 5 mm or less apart from one another, in the median nerve innervated digits	___	(4.5)
6. Positive Tinel sign Light tapping over the median nerve at the level of the carpal tunnel causing radiating paraesthesias into the median innervated digits	___	(4)
TOTAL		___ (26)

A score of 12 or greater is associated with 80% probability of carpal tunnel syndrome
Higher total values increase the probability of carpal tunnel syndrome
Reference: Graham, B. J Bone Joint Surg Am. 2008;90:2587-93.

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Carpal Tunnel Syndrome

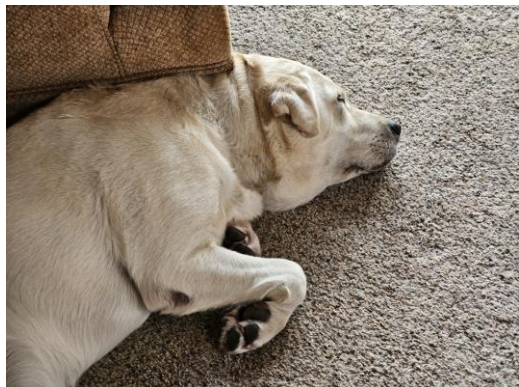
OK, You've Dx'd CTS, What Do You Recommend?

- Non-surgical
- Cock up wrist splint, Nsaids
- Workplace mods, raise/lower chair, move computer keyboard
- Sleep position? Wrists flexed?
- Splints, exercise, heat treatments from hand therapist
- Reduce vibration/hand insults
- Corticosteroid injection
- Surgical
- Release ligament
- Local anesthesia (IV sedation?)
- MAC like colonoscopy
- 4-6 week recovery
- Full strength 6 – 12 months
- > 90% full recovery (except in severe, long standing cases)

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Carpal Tunnel Syndrome

- Last thoughts
- CTS isn't an emergency but can really bother some of the folks who have it
- Eliminate sleeping with flexed wrists
- This is our dog Cora



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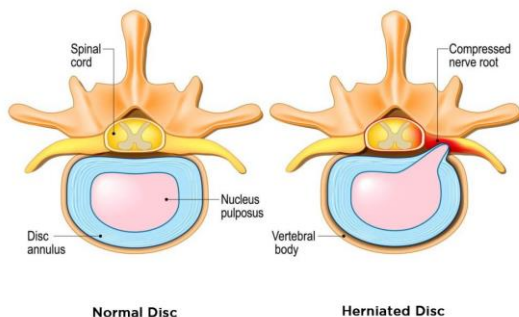
Recent Dx of HNP

- Disc herniation basics
- What is it?
- Who gets it?
- Sx, Dx and Rx
- Spine – Vertical stack of bones
 - - Vertebrae
- In between, small rubbery discs which act as cushions
- Sometimes the exterior of the rubbery discs (annulus) can tear and the soft inside (nucleus) slips out -HNP
- This is a herniated disc (slipped disc, ruptured disc)

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Recent Dx of HNP

What is a Herniated Disc?



- This disc injury can irritate nearby nerves causing pain
- Numbness, or weakness
- Some with a slipped disc never experience pain!
- Surgery is rarely necessary to eliminate pain
- Range of treatments to help reduce suffering

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Recent Dx of HNP

- Causes of slipped disc
- Wear and tear (disc degeneration) Disc become less flexible. More prone to tears and ruptures
- Frequently patients are unable to identify “the cause”
- Use of back muscles instead of leg/thigh muscles lifting
- Awkwardly twisting or turning
- Obesity increases the strain on the lumbar discs
- Genetic predisposition in some
- Physically demanding job
- Smoking decreases oxygen supply to the discs causing them to degenerate more rapidly

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Recent Dx of HNP

- Possible to have a herniated disc without symptoms
- Diagnosis made while undergoing testing for unrelated issue
- Classic Sxs – sharp or shooting leg pain, buttock, thigh, calf or foot pain accompanied by numbness or tingling
- Diagnosis most often made on PE
- Reflexes, muscle strength, light touch, pin prick, vibration
- Testing: one or more of the following – x-ray, CT scan, MRI, rarely a myelogram

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Recent Dx of HNP

- Initial recommendations
- Rest, eliminate offending movements, pain meds
- Acetaminophen, ibuprofen, naproxen all good choices for mild to moderate pain
- Severe pain – corticosteroid, taper or injection
- Rare cases, short term opioids
- Gabapentin helpful with acute sxs, not so much chronic pain
- Muscle relaxers
- Physical therapy- manage pain with positions, stretches, exercises
- Few people ever need surgery
- Most find a way to manage their pain and return to nl activity

McCue service scripts T3, Vicodin

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Clavicle Fx in the Adolescent

- Most commonly broken bone in the body
- 5% of all adult fractures
- Fall onto the shoulder or outstretched hand
- Quite painful
- Both surgical and non-surgical care



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Clavicle Fx in the Adolescent

- Anatomy
- Connects the sternum to the scapula (acromion)
- Several important nerves and vessels are just deep to the clavicle but rarely injured with a fracture
- Most common break is midshaft
- Can be broken anywhere



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Clavicle Fx in the Adolescent

- Symptoms
- Sagging of the shoulder
- Inability to use arm due to pain
- Grinding sensation with motion
- Deformity over clavicle
- Bruising, swelling, and/or tenderness over clavicle



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Clavicular Fractures in the Adolescent



- 14-year-old elite golfer with completely displaced right midshaft clavicle fracture who underwent surgical fixation.
- Adage “in the same room and it will heal.” Nope.

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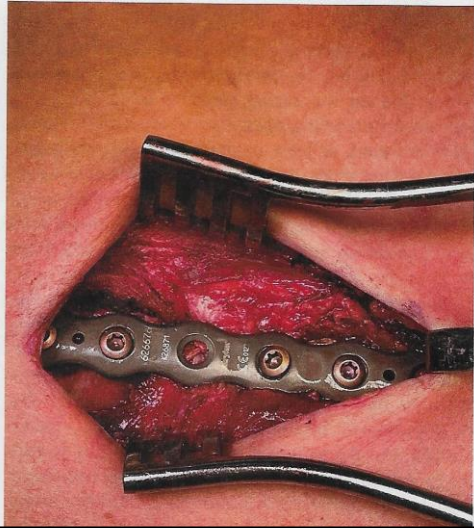
Clavicular Fractures in the Adolescent



- Obvious asymmetry and inferior displacement of the right shoulder

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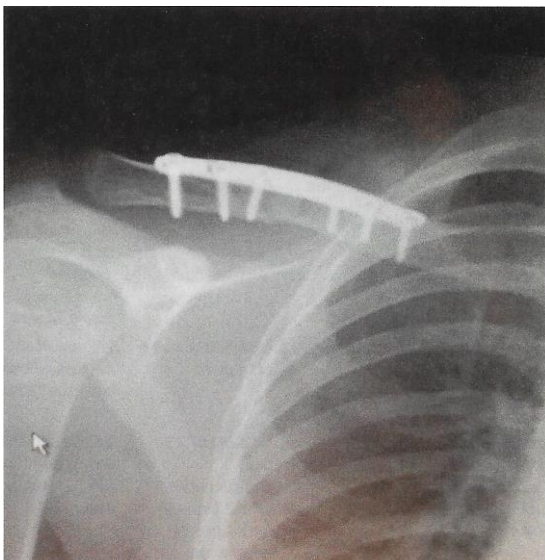
Clavicular Fractures in the Adolescent



- Intraoperative photo showing reduction of the medial portion of the clavicle and plate fixation across the joint

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Clavicular Fractures in the Adolescent



- X-ray immediately following surgical fixation of precontoured plate

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Clavicular Fractures in the Adolescent



- Two weeks post op. Note improved posture and alignment of the right shoulder, now more symmetrical compared to the uninjured side
- At 5 weeks postoperatively, the patient competed in a golf tournament
- JBJS.org Volume 105-A- Number 9. May 3, 2-23

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Clavicle Fx in the Adolescent

- Absent significant displacement, many can be treated with a sling
- Pain medication like acetaminophen can be helpful
- Physical therapy-although there will be some pain, maintaining shoulder and elbow ROM with mild exercise can begin immediately
- After a clavicle Fx, it is common to lose some shoulder and arm strength
- Once the bone begins to heal pain will begin to decrease and gentle shoulder exercises may commence. Intensity increases once healing is complete.
- Source, Orthoinfo.org

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Clavicular Fractures in the Adolescent

- Summing up:
- Medial and lateral clavicular fractures are distinct entities and should be treated as such. Medial fractures should be evaluated with CT imaging and treated on the basis of displacement and chronicity.
- Lateral fractures may require operative management because of soft tissue compromise or entrapment requiring open reduction.
- Fix displaced fractures, older pts with less remodeling potential, athletes who want to return to sport quickly.

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Students

- One of the great things about living in a college town is that when you are busy with so many things in life, you occasionally run into a student with something that reminds you of the simple joys of life...

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Attendees Asked Me This

- OK, seven questions the audience asked in 2023
- I figure if they didn't know the answer, you might not either

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Q#1 What Do I Do with Thumb Arthritis?

- When people refer to thumb arthritis, they are generally referring to the base of the thumb, the carpometacarpal joint or CMC joint



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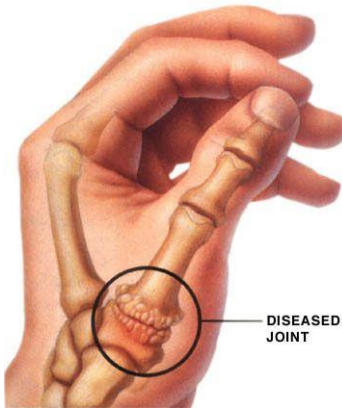
Thumb Arthritis?

- This one



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Thumb Arthritis?



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Thumb Arthritis?



- Commonly occurs with aging
- Pain, swelling, decreased strength and ROM
- Opening jars, turning doorknobs become very difficult
- May be sequelae of prior trauma
- Often see a lumpy joint secondary to heterotopic bone

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Thumb Arthritis?

- Risk factors include:
 - Female sex
 - Age over 40
 - Obesity
 - Previous fractures, sprains
 - Ligamentous laxity
- Diagnosis:
 - Swelling or bone spurs
 - Decreased motion
 - Pain with pressure against the trapezium
 - Gritty feeling with ROM
 - X-rays with joint space narrowing, spurs, sclerosis

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Thumb Arthritis?

- What can you recommend?
- Modify hand tools, jar openers, key turners, and large zipper pulls
- Replace traditional door handles
- Heat often helps



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Thumb Arthritis?

- Rx:
- Topicals, capsaicin, diclofenac
- OTC, acetaminophen, ibuprofen, naproxen
- Scripts celecoxib, tramadol
- Splints part time or at night can be very helpful
- Corticosteroid injections
- Surgery, outpatient



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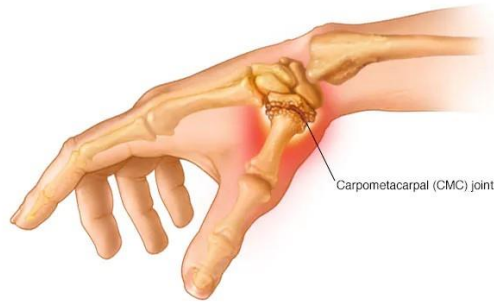
Braces



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Thumb Arthritis?

- Well that's all fine, what do I tell my patients in the office?
- "There's no rush"
- Let's look at a 2023 study that measured long term outcomes of nonsurgical treatment
- [JBJS 12/2023](#)



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Thumb Arthritis?

- Multicenter prospective study
- Patient reported pain at 12 months and 5yrs following nonsurgical Rx
- Range 5 – 9 yrs. Pain subscale did not differ significantly from that at 12 months
- Deal with it
- Conclusions "support nonsurgical treatment as the first treatment of choice and suggest that the treatment effects are sustainable."
- J Bone Joint Surg Am. 2023;105:1837-45

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Q#2 Do Knee Braces Do Any Good?

- Yes. The explanation is far from clear. And, yes, there must be a power of suggestion component to it.
- Case report
- Millicent
- 90 year old WF lives at retirement home
- Early dementia
- Dx years ago with knee DJD. Not symptomatic enough to consider “intervention”
- Given brace for intermittent use

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Q#2 Do Knee Braces Do Any Good?

- We’re not talking about specific braces
- Following MCL tear
- Post op ACL reconstruction
- Unloader braces in unicompartmental OA

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Knee Braces

- One example
- Pt c/o Knee pain
- The family lives out of state. They are called and told M has knee pain and wants to go the ER.
- Consider the choices
- Yes? Takes the pt out of her environment. More confused?
- The ED medical team is unsure how aggressive to get or even desired outcome
- In the end, shipping to ED may lead to accentuation of situation

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Knee Braces

- Family remembered patient had brace “in the drawer”
- Said brace applied, Tylenol given
- Staff happy, family happy, patient happy, ED not involved
- ED happy



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Knee Braces

- Yes, this is a bit atypical but it is every bit the phone call you get while on call
- The point is that a well fit, off the shelf, store bought brace can provide years of inexpensive relief in many situations
- <https://my.clevelandclinic.org/health/treatments/21034-knee-brace>



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ARS# 4 – **How Long Will a Total Knee Replacement Last?**

- A. 10 years
- B. 20 years
- C. 30 or more years in a few patients
- D. Depends in part on the activity and body weight of the patient

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ARS Question #4

- The longevity of an implant will vary from patient to patient, due to differing physical conditions, activity, weight, skill of the surgeon in placing the implant and more.
- In other words, whom do you want replacing your mother's hip? The surgeon who does one a month or the one who does 20/month?

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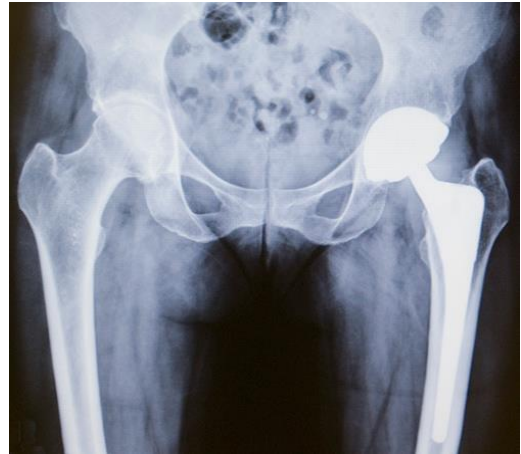
Q3.1 How About Total Hips?

- There are many ways to judge success/failure of a procedure
- Return to work (RTW) and sports (RTS) are critical gauges to improvement among patients after total hip arthroplasty (THA).
- Most patients RTW and RTS after THA in an increasing manner as time passes with rates more than 85% after 1 year.

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Q3.1 How About Total Hips?

- These rates may be greatly affected by various factors, most notably age, the intensity of the sport, and the type of work performed
- In general, young patients, low-demand work or sports can be resumed as soon as 4 to 6 weeks after surgery, but with increased restrictions as the intensity increases.



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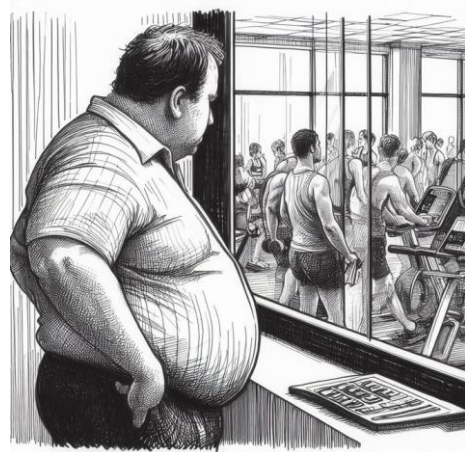
#4 Mechanical Weight Loss Tips



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Mechanical Weight Loss

- “You should fear the consequences of being sedentary far more than the risk of injury due to exercise”
- Howard Luks, MD



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Diet Water



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Mechanical Weight Loss

- Perhaps part of a handout given to your patients



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ARS Q#5 - Mechanical Weight Loss Tips

These Mechanical Weight Loss Tips That Come from the Triathlon Community. If You'd Like to Reduce Your Caloric Intake:

- Use smaller plates. Don't use regular 10" dinner plates. Try 9" ones.
- Don't "clean your plate" like Mom taught you. Always leave one bite of food remaining at meal's end.
- If you eat cookies, Oreos as an example, take a few from the bag, spray the rest of them with Raid, and throw them in the trash
- You can often satisfy that post-prandial sweet tooth with a couple sticks of gum until the "need" passes in 15 or 20 minutes. Then go for a walk.
- All of the above

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Mechanical Weight Loss Tips

- A) Use smaller plates. Don't use regular 10" dinner plates. Try 9" ones.
- B) Don't "clean your plate" like Mom taught you. Always leave one bite of food remaining at meal's end.
- Gwen Jorgenson, Olympic Gold Medalist

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Mechanical Weight Loss Tips

- D) You can often satisfy that post-prandial sweet tooth with a couple sticks of gum until the "need" passes in 15 or 20 minutes. Then go for a walk.
- Matt Fitzgerald, World known Tri coach

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Mechanical Weight Loss Tips

- C) If you eat cookies, Oreos as an example, take a few from the bag, spray the rest of them with Raid, and throw them in the trash
- C) Unknown website poster who then offered....
- **But be careful as Oreos with Raid on them don't taste all that bad!**

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Q#5 A Lot of My Athletes, Especially in the Winter, Get Cracks at the Tips of their Fingers and Thumbs. Are You Familiar with How to Stop This?

- Answer in 2023. "Uh, no."
- So 1 asked a UVA dermatologist and got this answer



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Q#5 Finger Tip Dry and Crack Open in Winter

- “This is a common and frustrating problem. It’s really a problem of moisture. Have your athletes soak their hands at night in warm water for a few minutes. Then, while they’re still damp, moisturize them with Vaseline or Aquaphor. If they’re too greasy, I like Norwegian hand cream. Then sleep in thin cotton gloves that you can get at most drug stores or online like on Amazon. A couple of days of that every week should keep them hydrated, but you can ramp it up to daily when things get bad.”
- Hal Flowers, MD Dermatology Division. UVA

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Q#5 Finger Tip Cracks in Winter

- These are the white cotton gloves.
- Boxes of 30/60 easily obtained online
- Some find that simple finger cots also work well.



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Q#6 I Don't Know Enough About PRP

- What should we know about PRP and the new biologic Orthopedic treatments?
- PRP – platelet rich plasma
- Blood is withdrawn from the patient, spun down, and the platelet rich portion injected into the patient

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Q#6, Biologic Orthopedics 2024

- Also know as regenerative medicine
- Therapy developed from biologic (natural) substances
- Relieve pain in early OA, delay need for surgery
- Enhance the body's ability to heal from repetitive injury, tendon strain, cartilage injury or fracture
- In some cases, improve healing following Orthopedic surgery



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Q#6, Biologic Orthopedics 2024

- Biologics are taken from a variety of natural sources – human, animal, micro-organisms
- Sugars, proteins, or nucleic acids
- Living entities such as cells or tissues
- Examples
- Blood products like platelet rich plasma (PRP)
- Stem cell treatments (as part of an FDA approved trial)
- Viscosupplementation injections to treat arthritis

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Q#6, Biologic Orthopedics 2024

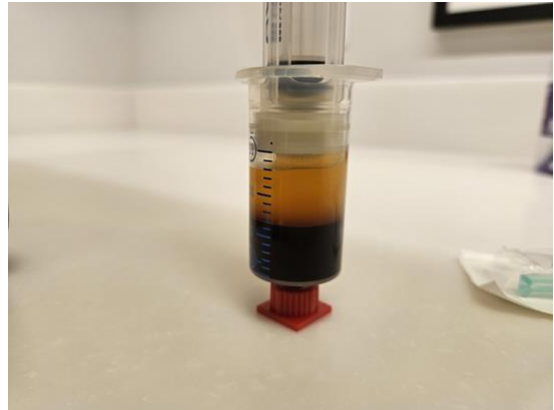
- Current use
- Tendinopathies – lateral epicondylitis – tennis elbow
- Knee arthritis
- Rotator cuff tears
- Avascular necrosis (bone death due to loss of blood supply)
- To stimulate healing responses with the body's own cells and tissues



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Q#6, Biologic Orthopedics 2024

- For example, PRP has been used widely in TE, delivering healing factors (contained in the platelets)
- Promotes healing
- Decreases pain
- Speaker's personal experience



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Q#6 Biologic Orthopedics 2024

- Orthobiologics have been tested for many Orthopedic problems
- Preliminary results are encouraging
- BUT, rigorous testing on the effectiveness of biologics in most Orthopedic conditions is lacking
- NFL team doc video. Widely used. Reality in our practices?
- Safety concerns- taken from the patients own body
- Safe enough to use without extensive FDA approvals

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So, Does It Work?

Craig Bowron, MD 10/18/23 (Copied from Mayo Clinic website)

- It depends on who you ask: the science or the testimonials. The testimonials, of course, are giving a resounding yes. But the science is less enthusiastic.
- If you read the [American Academy of Orthopaedic Surgeons \(AAOS\) website](#), you'll see it isn't exactly trumpeting the benefits of PRP. It's more of a cautious woodwind sound, noting that lingering questions remain, and that "although it is **not exactly clear** how PRP works ... PRP **may potentially** speed up the healing process" (emphasis mine).
- The AAOS website contends that PRP is effective for low to moderate grade knee osteoarthritis, and for certain chronic tendon injuries. It recommends more research to see if PRP therapy is truly effective for other conditions.

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So, Does It Work?

- According to Shane A. Shapiro, M.D., medical director for [Mayo Clinic's Regenerative Medicine Therapeutics Program](#), the work on orthobiologics is just getting started.
- "We recognize that our first-generation orthobiologics just scratch the surface in terms of using cells to treat orthopedic disease. The future of orthopedic cell therapy is going to require much more sophisticated versions of these cell therapies," Dr. Shapiro points out. "Treatment using orthobiologics that's not based in sound orthopedic science is not likely to help people. Mayo Clinic is committed to advancing the science of regenerative medicine, to harness its potential and to provide evidence-based treatments for patients."

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Q#6, Biologic Orthopedics 2024

- However, “Unproven stem cell therapies can be particularly unsafe”
FDA
- Ask your doctor is the stem cell Rx they offer is part of an FDA approved trial? (MSC- mesenchymal stem cells)
- We don’t want to get too far into stem cells...unless we want to go to India or the Caymans for treatment
- In short, there may be a legitimate use for stem cells but it’s a least questionable. Desperate pt looking for relief?
- Cost? Up to \$50,000, not covered by insurance

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Q# 7 What Are Your Thought on Opioids?

- First year Ortho resident JP
- Hand and upper extremity service
- ALL patient’s scripts were written the day before
- Carpal tunnel release, trigger finger, Dupuytren’s, whatever
- 30 Tylenol #3, 30 hydrocodone
- For example
- Opioid Analgesia Compared with Non-Opioid Analgesia After Operative Treatment for Pediatric Supracondylar Humeral Fractures
- **Shah, et al JBJS 2023;105:1875-85**

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Q# 7 One Thought on Opioids

- Conclusions
 - “Non-opioid analgesia following CRPP for pediatric supracondylar humeral fractures was equally effective as opioid analgesia.”
 - “When oxycodone was prescribed, 84% of children took 0-3 total doses, and opioid use fell precipitously after. POD 2”
- Conclusion
 - “To improve opioid stewardship, providers and institutions can consider discontinuing the routine prescription of opioids following this procedure.”

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Q# 7 One Thought on Opioids

- Commentary, R. Dale Blasier, MD, FRCS(C), MBA
 - “The liberal prescription of pain meds after surgical procedures is partly tradition and partly bad habit. US physicians prescribe alarmingly high amounts of opioid meds postoperatively. “
- Yes, I know that most of us prescribe opioids because we suspect patients might have pain.
 - In other words, being aware that liberal use of narcs may only contribute to the problem.

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I Regretted Buying the Escher GPS



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7 Things I Can Use on Day 1

- Speakers are given the guidance that due to the high rate of attendees coming year after year, try not to repeat topics from the previous year.
- I'm going to break that. But just a little. I have taken attendee comments from last year's talks of tips that can be used day 1 back in your office. I would appreciate your critique comments, good or bad, if it was a good idea. I'll try for two minutes each.
- Thanks

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7 “Things I Can Use on Day 1” – Positive Thoughts from the 2023 Critiques That Maybe You Can Use Also

- 1) loved the recommendation on immediate ortho resource
- 2) arm squeeze test
- 3) diagnose RCT?
- 4) Shoulder ROM
- 5) Advocating for your patients
- 6) Total joint clearance – dental and urinary
- 7) Knee arthritis – what not to say

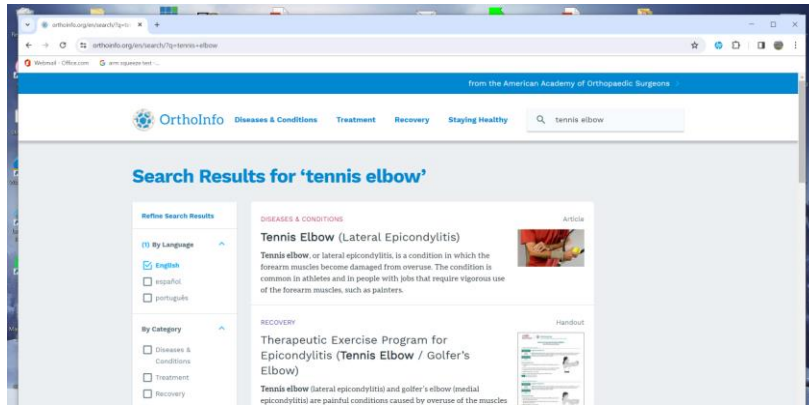
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Orthoinfo.org

- You're sitting at your desk, fending with Epic
- *&\$%#@* Epic
- What? No scribe? No one to call in your prior auths?
- No one to answer that 3rd call from crotchety Mrs. Jones?
- No one to fill out that 8 page Nursing home admit form?
- OK, you're sitting at your desk and your assistant sticks his head into your office and says, “I think the new patient in room 2 might have tennis elbow.”
- Quick. You need to be World's Expert on Tennis Elbow
- **Orthoinfo.org to the rescue!**

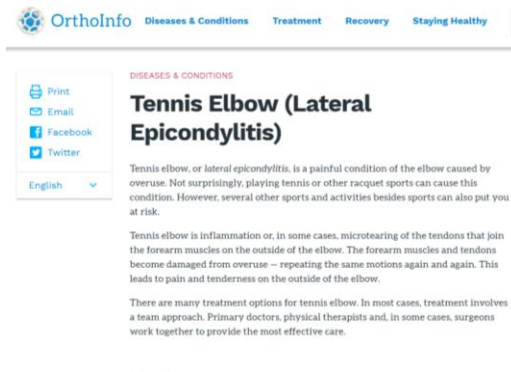
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81

Orthoinfo.org Tennis Elbow



82

OrthoInfo.org Tennis Elbow

The screenshot shows the OrthoInfo.org website's 'Anatomy' section for Tennis Elbow. The page title is 'Anatomy'. The text reads: 'Your elbow joint is a joint made up of three bones: the upper arm bone (humerus) and the two bones in the forearm (radius and ulna). There are bony bumps at the bottom of the humerus called epicondyles, where several muscles of the forearm begin their course. The bony bump on the outside (lateral side) of the elbow is called the lateral epicondyle.' Below the text is an anatomical diagram of the elbow joint. Labels include: Humerus, Epicondyles, Elbow Joint, Radius Bone (CRB), Lateral epicondyle, Olecranon, and Ulna. A red area on the diagram highlights the ECRB muscle and tendon. A caption states: 'The ECRB muscle and tendon is usually involved in tennis elbow.' Below the diagram, it says: 'Reproduced and modified from The Body Atlas: © American Academy of Orthopedic Surgeons, 2013.' At the bottom of the page, it says: 'Muscles, ligaments, and tendons hold the elbow joint together.'

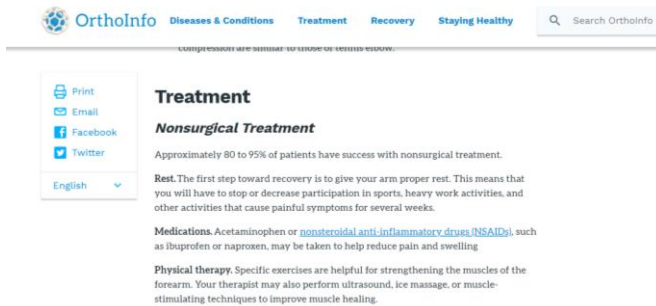
83

OrthoInfo.org Tennis Elbow

The screenshot shows the OrthoInfo.org website's 'Cause' section for Tennis Elbow. The page title is 'Cause'. The text reads: 'Recent studies show that tennis elbow is often due to damage to a specific forearm muscle. The ECRB muscle helps stabilize the wrist when the elbow is straight. This occurs during a tennis groundstroke, for example. When the ECRB is weakened from overuse, microscopic tears form in the tendon where it attaches to the lateral epicondyle. This leads to inflammation and pain.' Below this, it says: 'The ECRB may also be at increased risk for damage because of its position. As the elbow bends and straightens, the muscle rubs against bony bumps. This can cause gradual wear and tear of the muscle over time.' The section is titled 'Activities' and reads: 'Athletes are not the only people who get tennis elbow. Many people with tennis elbow participate in work or recreational activities that require repetitive and vigorous use of the forearm muscle or repetitive extension of the wrist and hand. Painters, plumbers, and carpenters are particularly prone to developing tennis elbow. Studies have shown that auto workers, cooks, and even butchers get tennis elbow more often than the rest of the population. It is thought that the repetition and weight lifting involved in these occupations leads to injury.'

84

OrthoInfo.org Tennis Elbow



The screenshot shows the OrthoInfo.org website interface. At the top, there is a navigation bar with the OrthoInfo logo and links for Diseases & Conditions, Treatment, Recovery, and Staying Healthy. A search bar is also present. Below the navigation bar, there are social media sharing options for Print, Email, Facebook, and Twitter, along with a language dropdown menu set to English. The main content area is titled "Treatment" and includes a sub-section for "Nonsurgical Treatment". The text states that approximately 80 to 95% of patients have success with nonsurgical treatment. It describes "Rest" as the first step toward recovery, involving stopping or decreasing participation in sports, heavy work activities, and other activities that cause painful symptoms for several weeks. It also mentions "Medications" such as Acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) like ibuprofen or naproxen to help reduce pain and swelling. Finally, it discusses "Physical therapy" as helpful for strengthening the muscles of the forearm, with a therapist potentially performing ultrasound, ice massage, or muscle-stimulating techniques to improve muscle healing.

85

OrthoInfo.org Tennis Elbow

- So you've become the World's Expert in 1 minute



86

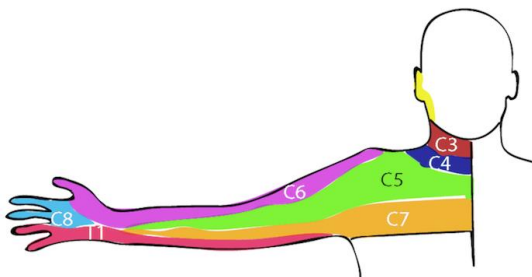
Is There Some Way to Easily Distinguish Neck Pain from Shoulder Pain?

- Arm Squeeze test



87

Cervical Pain vs Shoulder Pain



88

2) Arm Squeeze Test – Very Useful

- Cervical root vs shoulder origin
- 1,567 patients
- 350 healthy volunteers
- 903 RCT, 155 adhesive capsulitis, 55 calcific tendonitis, 48 glenohumeral DJD, and 305 with cervical root compression C5 to T1



89

Arm Squeeze Test

- “The test was positive when a score on a VAS Scale was 3 points or higher compared to the acromioclavicular (AC) joint and antero-lateral-subacromial area.”
- The test was positive 295/305 (96.7%) cervical root compression
- 35/903 RCT, 3/155 Ad Caps, 0/101 AC joint arthropathy, etc.
- **Gumina, et al. Eur Spine J. 2013 Apr 21 Department of Orthopedic and Traumatology, Sapienza University of Rome, Rome, Italy**

90

3) Diagnosis of Rotator Cuff Tears

Empty the can

• Blocked External rotation

1. Supraspinatus Strength



2. Strength in External Rotation



91

4) Thanks for the Hip Pain Diagram. I Didn't Know

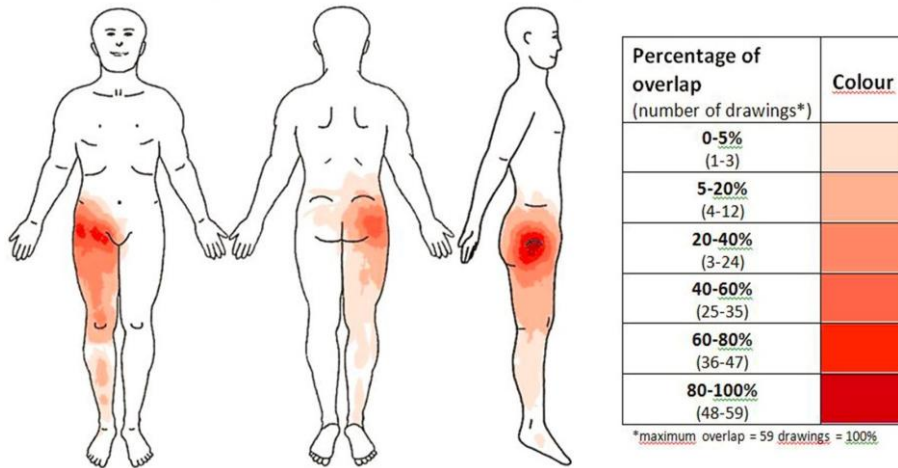
Cumulative pain drawing demonstrating pain location and pain distribution of 109 patients with unilateral OA

Not exactly what we were taught is it?

92

Hip Arthritis – Patient Hx Pain Location

Figure 1. Cumulative pain drawings demonstrating pain location and pain distribution of 109 patients with unilateral hip OA.



93

5) Appreciate the Pendulum Swing; Something I Plan to Implement

- OK, let's learn how you can teach your patients how to do pendulum exercises to restore or maintain shoulder range of motion.



94

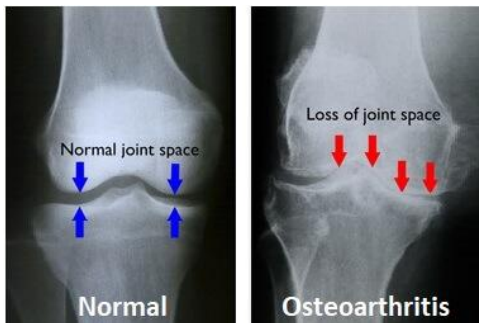
6) Great Advice on Advocating for my Patients



- Although joint replacement surgery is shifting from “three midnights” inpatient stay toward outpatient, not all of your patients are comfortable with the change
- This is where you come in

95

7) Knee Arthritis

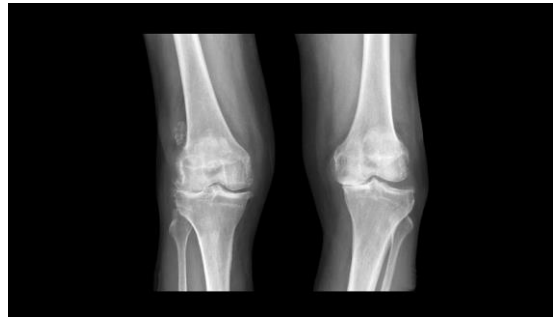


- What not to tell your patients

96

7) Knee Arthritis – What NOT to Tell Patients

- They shouldn't hear:
- You have bone on bone
- You have the knee of a 90 yr old
- You should stop exercising
- Rest, or you'll need a TKR
- Come back in 3 months for another injection



97

7) Knee Arthritis – What NOT to Tell Patients Thank you

- Every knee arthritis patient needs to hear:
- Pain does not always imply harm
- It's OK to run/walk/weight train
- Yes, PT can be helpful
- Be cautious with steroids
- It's helpful to remain active
- Ignore the x-ray and focus on remaining active
- I doubt that stems cells are the answer

98

Dental Prophylaxis



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November 2023

Antibiotic Prophylaxis for Total Joint Replacement Patients

Although controversial, we recommend that all total joint replacement patients receive antibiotic prophylaxis for lifetime for any dental procedures, including cleanings, dental extractions, periodontal procedures, dental implant placement and root canals.

In patients who are not allergic to penicillin, we recommend:

1. Amoxicillin: 2 grams taken 30 minutes before each dental procedure.

In patients who are allergic to penicillin, we recommend one of the following:

1. Clindamycin: 600 mg taken 30 minutes before each dental procedure.
2. Erythromycin: 750 mg taken 30 minutes before each dental procedure.
3. Keflex: 1000 mg taken 30 minutes before each dental procedure.

Please inform all of your health care providers that you have undergone joint replacement surgery.

Christopher W. Olcott, M.D.

Daniel N. Bracey, M.D., Ph.D.

Arvind Narayanan, M.D.

101

AAOS CPG – Limited Recommendation

- Moderate strength evidence finds that dental procedures are unrelated to implant infection and that antibiotic prophylaxis prior to dental procedures does not reduce the risk of subsequent implant infection.
- There is no direct evidence to support otherwise. High strength evidence suggests that antibiotic prophylaxis reduces the incidence of post-dental procedure related bacteremia, but there is no evidence that these bacteremias are related to prosthetic joint infections.

102

9) Preop Dental and Urinary Clearance

- And while we're on the subject""
- If there's any thought toward prostate instrumentation in your elderly male patients, a clean "urinary bill of health" well before surgery reduces the potential for post op joint infection

103

10) What Is the Most Important Thing to Preop from the Patient's Perspective?



- Easy
- **Constipation**
- **Obstipation**, enemas and all that
- In some practices, everybody gets a stool softener
- Low threshold for MiraLAX bid or your favorite regimen

104

The Cantankerous Patient

- My wife has a patient that is incredibly demanding. Complaint list as long as your arm. Pushing, pushing, pushing. So many ailments.
- BUT!
- She came in a while back with a cough. Just wanted to get it checked before flying to Europe that afternoon.
- The history just sounded a little funny. So my wife wanted a chest x-ray.

105

The Cantankerous Patient

- You know where this is going.
- The patient protested. “I have too much to do before the flight.” “In fact, if I don’t leave soon, I won’t get it all done.”
- But Barbara persisted and the x-ray was obtained.
- Big RU lobe mass.

106

The Cantankerous Patient

- Hmm. Now what?
- Trip cancelled. Oncology eval obtained; despite high mortality with this tumor, treatment successful.
- Two years later, my wife is at the supermarket with our son Ben. This same woman comes up to them with profuse thanks and says, “If it weren’t for your Mom, I wouldn’t be here.”
- Without hesitation, our son Ben says, “Me too!”

107

Ben



108

Ben Today (with Meredith and Winnie)



109

ARS #6

- Mary, a 45-year-old teacher, and one of your favorite patients, slipped in the garden and twisted her knee. “It seemed like it got swollen right away,” she says.

110

To Your Exam, There's an Obvious Effusion and She's in Pain. You Think She May Have Torn Her ACL (Anterior Cruciate Ligament) If You're Right, and the ACL Is Torn –

- A. Reconstruction is likely
- B. At her age reconstruction is unlikely
- C. Lots of knees are a little loose and the effusion will dissipate



111

Let's Talk About Knees

- OBJECTIVES
- Diagnose and treat acute and chronic knee conditions
- Talk about degenerative knee joint disease, understand the treatment algorithm
- Physical exam/injection/aspiration
- Anatomy review
- Hey, it's Ortho. What would it be without a smattering of anatomy?

112

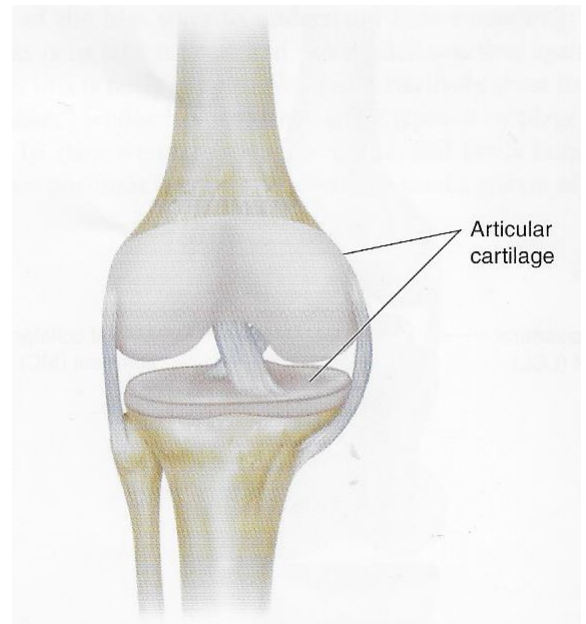
Knees, Diagnoses That You Can Make

- Knee pain/injury is the single most common Orthopedic complaint
- Followed by back and shoulder problems
- With great thanks to Ted Parks, MD
- Since we have a pretty diverse audience, let me talk about the basics briefly
- Take the knee apart and put it back together. 4 bones, 2 tendons, 4 ligaments and 2 types of cartilage

113

Knee Structure

- Think femur, tibia and fibula coated with a thin layer of glistening articular cartilage (probably the most important)
- It's essentially a bearing surface without nerves or sensory innervation
- But one without the capacity to heal or regenerate



114

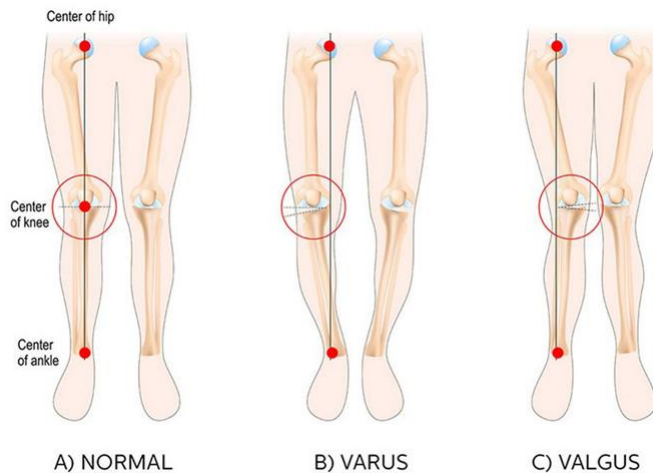
Knee Structure, Articular Cartilage

- As a result, the articular surfaces in all of our joints wear with daily use and the passage of time.
- What can hasten this process?
- Infection! In hours or days can destroy a layer of cartilage that would otherwise take a lifetime to wear away naturally
- Is this rt knee varus or valgus?
Hmm?



115

Varus - Distal Segment Angles Toward the Midline.
Valgus – Distal Segment Deviates Away from the Midline



116

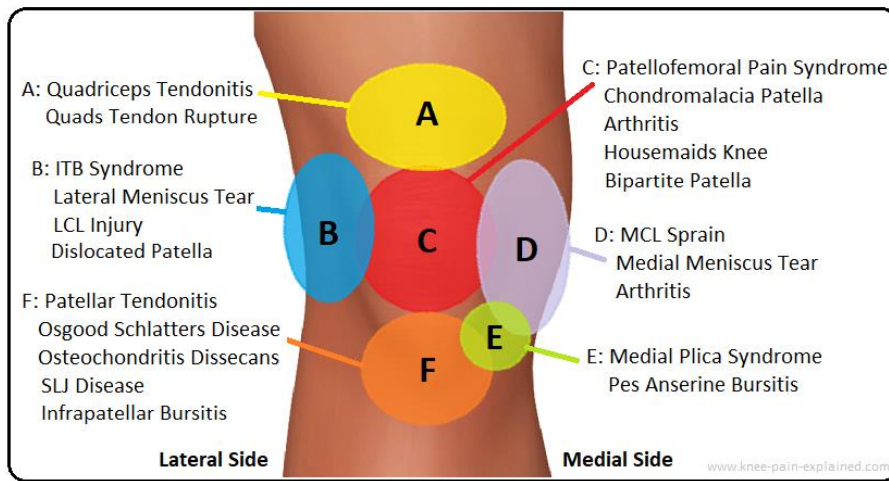
Knee structure

- General categories
- Injuries
- To the cartilage itself
- To the bones or ligaments that alter the loads
- Which leads to areas of rapid wear
- Rheumatologic conditions



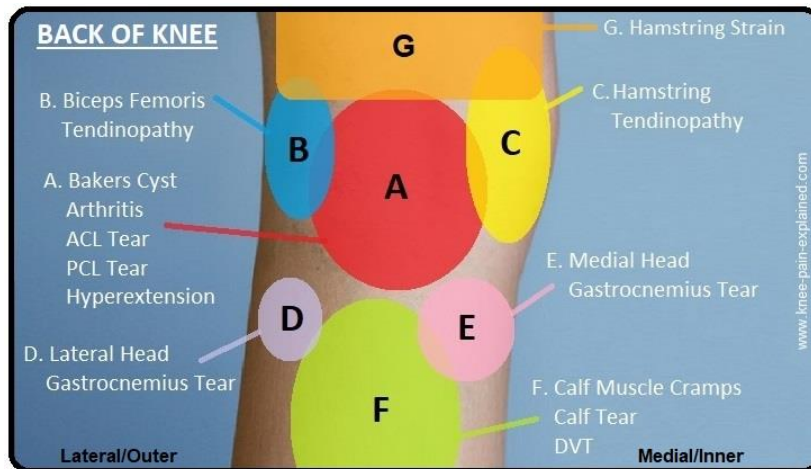
117

Knee Pain (Rt, Front)



118

Knee Pain (Lt. Knee, Back)



119

Meniscus (Menisci)

- They do reside between the femur and tibia...
- And it is true that if a meniscus is damaged or surgically removed, the articular surfaces will wear out faster
- The usual illustrations are somewhat misleading



120

Menisci

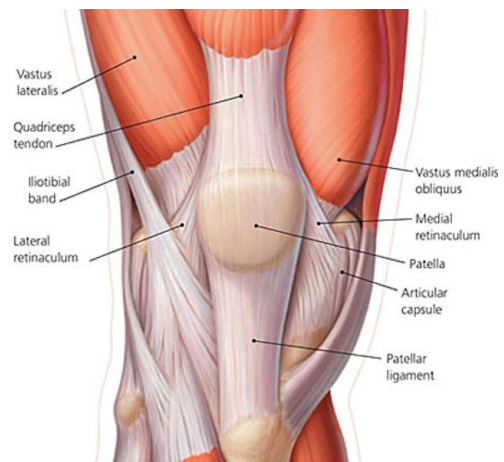


- Rubbery, horseshoe shaped pads on the surface of the tibia

121

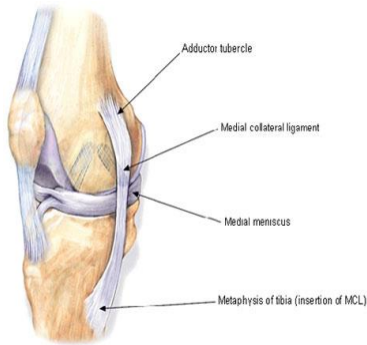
Extensor Mechanism

- Patella, quadriceps muscle, quad tendon and patellar tendon
- Allow you to forcibly straighten (extend) our knees



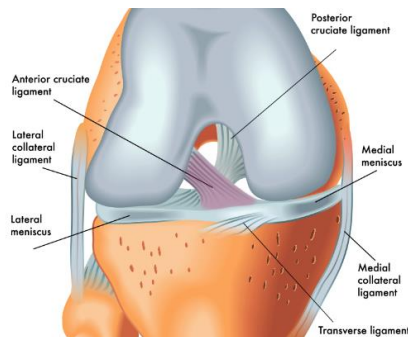
122

Ligaments, Medial and Lateral Collateral



123

Cruciate Ligaments, Anterior and Posterior



124

What's New?

- UKA
- Computer-Guided Joint Replacement
- ACL Reconstruction
- Cartilage transplant, autograft, allograft, etc.



125

Unicondylar Knee Arthroplasty



126

UKA



Advantages of UKA

- Less surgery
- Decreased blood loss, shorter hospitalization
- Better range of motion
- ? long-term success

127

UKA

Advantages of UKA

- Done as an outpatient
- 20 plus year track record
- May result in closer to normal kinematics of the joint
- Not for everyone

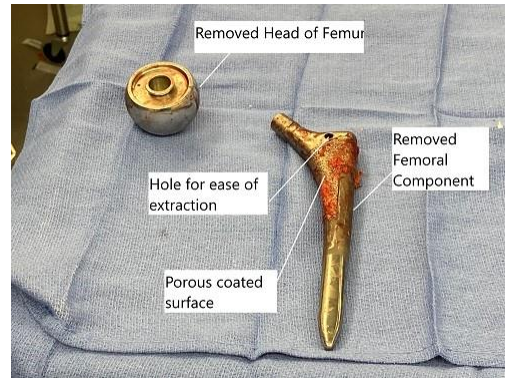
The Ideal Patient

- 50 to 70 year old with unicompartmental OA
- Intact ACL
- Prefer under 200 pounds with minimal patellofemoral DJD

128

UKA

- Remember that obesity is a negative predictor for longevity of a prosthetic joint by a significant amount
- This is hip prosthesis removed as part of a revision procedure



129

Clinical Evaluation in Your Office

Chronic Worsening Atraumatic
Pain

vs.

Injury

- Able to continue to play?
- Onset of swelling
Hours = ACL tear
Overnight = Meniscus tear
- “Pop”

130

Clinical Evaluation - Injury

- Mechanism of injury
- Prior injury?
- Treatment before your evaluation?
- Acute Hemarthrosis - ?
Differential?
- *Don't let the skin stand between you and the diagnosis.**
- *"But it's not infected now."*
- ACL 70%
- Patellar dislocation
- Osteochondral fracture
- Meniscus tear, peripheral
- * not same as arthritic joint injection prior to TKR

131

Meniscus Tears

- Anatomy and Function
- Stress Transfer Across the joint
- Secondary Stabilizers to Shear Forces
- Vascular Supply: Outer 2 – 4 mm's
Important for decision to repair
- Meniscus Tears –
Mechanism of Injury
- Twisting of a loaded joint
- Degenerative tear – previously weakened meniscus, "minor" precipitating event
- Acute tear – previously healthy meniscus, associated ligamentous injury

132

Meniscus Tears - History

- Moderate pain in back and side of knee
- Effusion over 24 hours
- Buckling, catching, giving way
- “Locked knee” – early surgery



133

What Do Patients Who've Torn Their ACL Tell You?

- 1) There I was, just sitting in my man cave watching the Patriots, when all of a sudden my knee began to hurt.
- 2) At the end of the local 5K, I sprinted a little and my knee began to hurt
- 3) I was walking out the mailbox to get my package from Amazon when I slipped on an icy patch, twisted my knee, and heard it make this pop! It swole up right away.

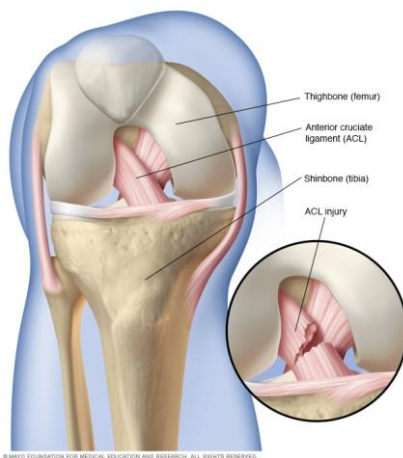
134

What Do Patients Who've Torn Their ACL Tell You?

- 3) Swole (Swoled?) up right away

135

ACL Injury Update 2024



- What are the most common causes of ACL injuries?
- "I was playing basketball and I landed funny."
- "I was playing soccer and tried to dodge an opponent and my knee gave way."
- "I was skiing and my bindings didn't release."
- These are very frequently non-contact injuries

136

ACL Update

- ACL injuries have sidelined many athletes
- Some permanently
- ACLT victims: Tom Brady, Megan Rapinoe, Klay Thompson, J.J. Watt, Rob Gronkowski, Robert Griffin III, Teddy Bridgewater
- But unlike in the past, with 2024 surgical techniques and aggressive rehab, athletes are usually out for only one season.
- Restores normal knee kinematics

137

Anterior Cruciate Ligament

- “Pop”
 - Immediate effusion – hours
 - Unable to continue play
 - Pain
 - Sense of instability
 - Females 7 times incidence of males
- Diagnosis is made on physical examination and confirmed with magnetic resonance imaging (MRI)
- Surgical treatment of the ACL usually involves reconstruction rather than repair. (So far!)

138

Makes You Pause

- According to NFL.com, 2/2/2024, Judy Batista
- Football – multibillion dollar business – accurate injury records
- There were 52 ACL tears suffered in the 2023 season
- Also
- 219 concussions (281 few years ago)
- Guardian Cap helmet will absorb 11% of the force. Helmet to helmet, force is reduced by 20%



139

Anterior Cruciate Ligament Injury

- Pivot – foot planted, knee twists to change direction
- Deceleration
- Hyperextension
- Contact
- Exam
- Effusion
- Lachman at 30 degrees
- Anterior drawer at 90 degrees
- Pivot shift
- Laxity graded 1 to 3+

140

Anterior Cruciate Ligament Injury – Incidence of Associated Injuries

Meniscus tears – 60 to 90 %

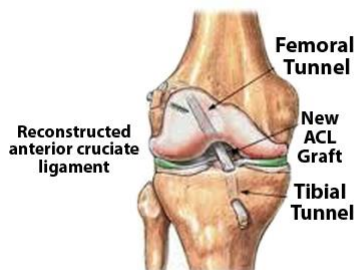
Collateral ligament injury – 20 to 40 %

Osteochondral fracture – 10 to 20 %



141

ACL Update



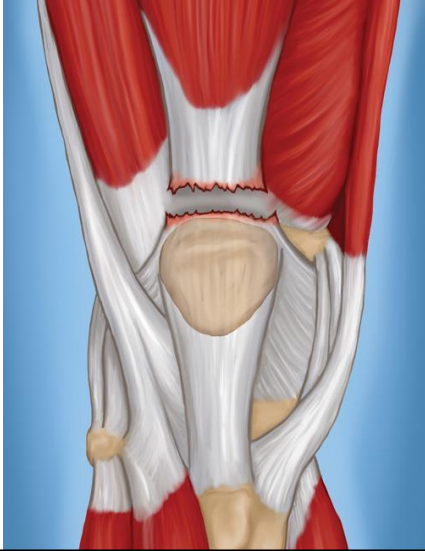
- Reconstruction involves using a portion of one of the tendons from the patient's own knee (autograft) or donated tendon (allograft) to replace the ACL. Autografts are strongly preferred for young patients because of a higher failure rate of allograft.

- Typically, the grafts are patellar tendon, quadriceps tendon or hamstring tendons and delivered into tunnels using arthroscopic techniques. They are secured with screws or buttons. Return to sport 6 months.

142

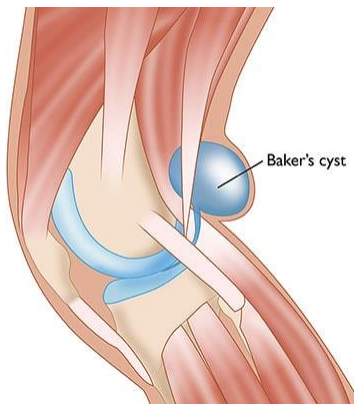
Quadriceps Tendon Tear

These all get fixed. Let's feel your quad tendon



143

Baker's Cyst

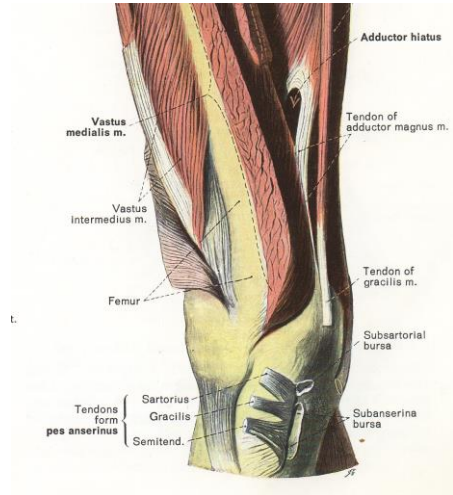
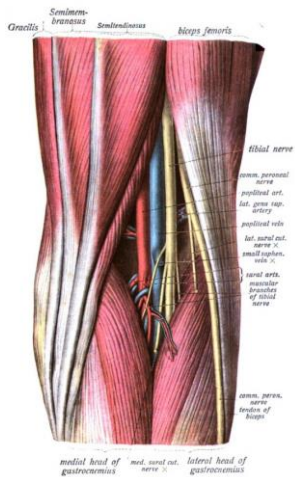


144

Baker's Cyst/ Pes Anserine Bursitis

Complication potential

3 pes tendons



145

Pes Anserine Bursitis

Typically, responsive to RICE



146

Imaging

- Rule #1 – Never order an orthopedic MRI without getting plain films first.
- Rule #2 – Never forget Rule #1



149

Best Knee X-rays to Order

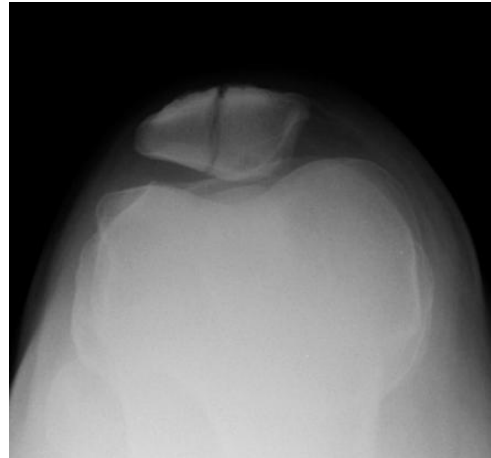
- Routine
- Minor trauma
- Anterior pain? Consider a sunrise view



150

Best Knee X-rays to Order

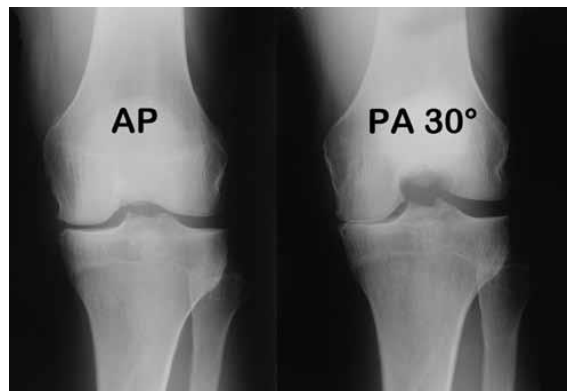
- Sunrise view



151

Best Knee X-rays to Order

- Degenerative change
- Arthritis
- Standing 45 degree PA & lat
- Note the difference!



152

Examination

- After remainder of slides

153

Initial Treatment – Acute *Meniscus Tear*

- Ice, rest, elevation, consider brief NSAID's
If improves and no mechanical symptoms, follow symptomatically
- Surgery – associated ligamentous injury, further mechanical symptoms, failure to improve

154

Initial Treatment – *ACL Tears*

- Ice, rest, elevation
- Knee immobilizer for comfort, early motion
- Non-operative treatment
 - PT for ROM, return to sports when at equal strength, activity modification

155

Brace Treatment – *ACL Tears*

- No proven benefit to custom vs. “off the shelf”
- Not effective at high loads
- Function as “reminder” in pivot situations (proprioceptive feedback)
- Cannot prevent giving way episodes

156

Arthritis – *The Problem*

- 5 million Americans with knee “injuries” per year
- “Bad knees” are second-most common health complaint of young people
- Americans want to have it all
- Knee replacement

157

Articular Cartilage Options in the New Millennium

- Non-surgical – “lube it,” brace it, orthobiologics
- Surgical – wedge it, debride it, grind it, shrink it, plug it, transplant it, implant it, wait

158

Supplements

- Chondroitin sulfate, Glucosamine

No evidence that cartilage heals

Not FDA regulated

Causes no harm (except \$\$\$)

*Do You Believe in Magic?** Paul A. Offit, MD

Vitamins, supplements and all things natural: a look behind the curtain

159

Surgery for Arthritis

- High Tibial Osteotomy
- Arthroscopy, debridement, microfracture, RFE, OATS, allograft, chondocyte autotransplantation

160

Last Resort

Total Knee Replacement

vs.

Unicompartmental Knee Arthroplasty

161

Knee Examination



162

Injections

- Corticosteroid injections are not an instrument of the devil

163

Corticosteroids Plus (?)

- Local Anesthetic?
 - Lidocaine
 - Bupivacaine
 - Toxic effect on all cell types

164

Knee Injection

- Left knee
- Anterolateral approach

165

Skin Sterility

- Ethyl chloride spray
- picture
- Although ethyl chloride is not sterile . . . did not alter the infection rates of shoulder or knee injections
- Can really make injections a pain free experience – use it

166



167

Right Knee Aspiration

- Superior Lateral
- Aspiration Site

168



169

Now Let's Do Those

- Knee injection and aspiration

170

What Do I Want You to Leave Here with?

- 1) to diagnose Dequervains, try the Finkelsteins test. Thumb in palm, ulnarly deviate. Rest, inject, release
- 2) Trigger finger is a popping or snapping of the digit. Nodule on the flexor tendon. Inject, inject, release
- 3) Clinical dx of carpal tunnel, Tinel's (tapping) and Phalen's (inverted "prayer.")
- 4) If you make the diagnosis acute herniated disc, most patients start with a trial of NSAIDs and rest. However, if you're really nervous about a particular patient call Ortho and ask.
- 5) A well done joint replacement done in 2024 should last the patient's entire life unless they're quite young or really heavy

171

What Do I Want You to Leave Here with?

- 6) Your Apixaban (Eliquis) patients need to lay off NSAIDs
- 7) If you're thinking your patient might be a candidate for joint replacement surgery, no injections in the 3 months prior to surgery. Some say 6 months. Infection prevention is very important.
- 8) non-contact, twisting knee injury with swelling? Think ACL
- 9) Orthoinfo.org – your musculoskeletal friend
- 10) Your arthritic patient needs to hear – ignore the xray and concentrate on remaining active

172

ARS #1 – Carpal Tunnel Syndrome
Which One of These Is True?

- A. EMG (electromyography) has been the best way to dx CTS for years and remains so today
- B. There is strong evidence for the use of corticosteroid injection in the treatment of CTS.
- C. Carpal tunnel syndrome is slightly more common in men than women.



173

ARS #2 –
**When You See a Patient with Some of the Symptoms
You Might Expect to See with an Acute Lumbar Disc
Herniation, Your First Step Is?**

- A. Urgent, not necessarily emergent, MRI examination.
- B. Consultation with Neurosurgery or Orthopedics informing the patient and family that urgent surgery is frequently considered in these cases.
- C. Inform them that loss of bowel or bladder control is often a part of the picture
- D. Treatment will often begin with a period of rest and anti-inflammatory medications



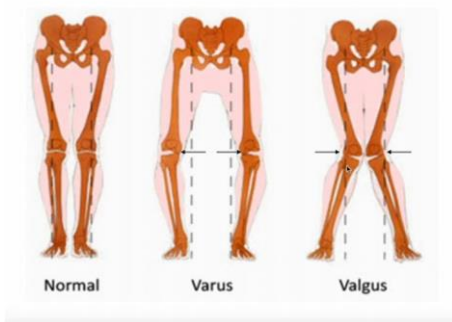
174

ARS #3 Clavicle Fractures (True or False)

Current Evidence Suggests That, for the Best Long-term Results, the Majority of Clavicle Fractures in Adolescents Can and Should Be Treated Operatively.

- A. True
- B. False

Left Male Knee. Varus or Valgus?



Yepper, Valgus. Angled Away from the Midline

- You got it!
- Critiques – One thing you learned today that you can apply day 1
 - - One thing you' like to hear in a future Ortho talk