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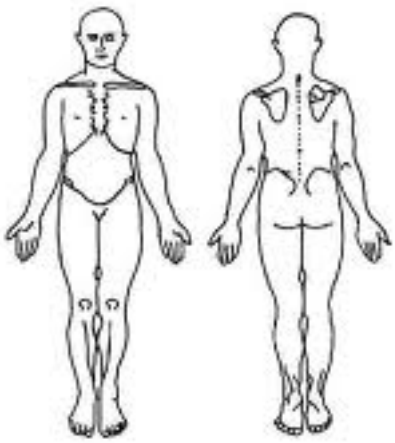
KNEE CASE 2

Orthopaedic Manual Physical Therapy Series
Charlottesville 2017-2018



Body Chart--**Initial Hypothesis**:

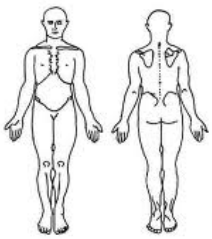
Subjective Exam

**** Subjective Asterisks Signs/Symptoms ****

(Aggravating/Easing Factors, Description/Location of symptoms, Behavior, Mechanism of injury)

- 69 year old man with 5year history of knee pain which worsened over the last 6mo
- No specific MOI, resumed gym program due to recommendation by MD due to HTN and borderline diabetes
- Dull/Achy pain
- Pain surrounding knee, mostly at infrapatellar and posterior
- Intermittently will radiate down outside of leg
- No catching or locking or giving way
- Agg: first thing in morning, stairs, prolonged standing/walking
- Easing: rest with bolster under knee, ice
- Long history of low back pain, diagnosed with DDD about 10years ago. Had PT which helped and continues HEP which helps to manage.

STRUCTURE at Fault:

Joints in/refer to the painful region	Myofascial tissue in/refer to the painful region	Non in/r regi		ral tissue efer to the ful region	Other structures that must be examined – non MSK

Primary HYPOTHESIS after Subjective Examination:

Differential List: (List in ranking order to screen/clear - Rule out)

Physical Exam

**** Physical Exam "Asterisks" Signs/Symptoms ****

(Special Tests, Movement/Joint Dysfunction, Posture, Palpation, etc.)

- Gait: Maintains knee flexion and hip ER throughout
- Posture: forward flexed, maintains knee flexion in standing right>left
- Functional Movement: Squat- unable to past 90deg, weight shifts forward and to the left; SLS- pain, knee valgus, hip drop; Rotation-pain and limited both directions
- (+) Thessalys, Ege's
- Lumbar Clearing: limited ROM and (+) pain reported, (-) reproduction of knee symptoms or pain referral past lumbar spine
- Palpation: tender at joint line bilaterally right, (-) warmth, (-) swelling
- ROM: left 0-125deg; right -20-105deg, pain at end range flex/ext and firm end feel
- Hip: limited all planes right>left no pain
- (-) SLR bilaterally
- Passive physiological/accessory motion: Right tibiofemoral limited all planes, patellofemoral restricted all planes
- Muscle Length Testing: (+) limitation quad, hamstring, gastroc, soleus

Severity Non Min **Mod** Severe

Interfering with ADL's, work, sleep

Irritability Non **Min** Mod Severe

Pain elicited easily, resolves quickly

Stage & Stability?

Acute Subacute Chronic **Acute on chronic**

Stable Improving Worsening Fluctuating

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Are the relationships between the areas on the body chart, the interview, and physical exam consistent?

"Do the "Features Fit" a recognizable clinical pattern?" – If "Yes" – what :

Yes; OA of tibiofemoral joint

If "NO" : Please explain areas that may need clarification _____

Identify any potential risk factors (Yellow, Red flags, non MSK involvement, biopsychosocial)

Red Flags: None

Yellow Flags: low back pain, long history of symptoms

Knee Osteoarthritis

- Primary diagnosis in 11.1 million ambulatory care visits in 2004
- Estimated 9.3 million adults had symptomatic knee OA in 2005
- Leading cause of lower extremity disability in the older population of the US
- Ranked in top 10 of noncommunicable diseases for global disability
- Lifetime risk of suffering symptomatic knee OA is 44.7%
- 1 in 11 people are diagnosed with knee OA by age 60
- 2009: > 600,000 TKA due to OA

- Risk Factors
  - Incidence increases with age
  - Women > Men
  - Genetics
  - Excess body mass
  - Occupation
  - Family history

Common Presentations

- Osteoarthritis
  - Criteria (American College of Rheumatology 2012)
    - >50yo
    - Knee stiffness for less than 30min
    - Crepitus
    - Bony tenderness
    - Bony enlargement
    - No palpable warmth
  - Four criteria present: Sens 84% Spec 89%
  - Three criteria present: chance of OA = 62%

Common Presentations

- Osteoarthritis
  - Elderly
  - Previous injuries to knee common
  - Gradual onset of pain
  - Deep ache
  - Worse after activity or prolonged stationary positions
  - Morning pain and stiffness which improves after ~30min
  - Loss of motion extension > flexion

Classification

- Kellgren-Lawrence
  - Most widely accepted radiological classification system for knee OA

Table 1

Kellgren-Lawrence Grading System for Osteoarthritis

Grade	Radiologic Findings
I	Doubtful narrowing of joint space and possible osteophytic lipping
II	Definite osteophytes and possible narrowing of joint space
III	Moderate multiple osteophytes, definite narrowing of joints space, some sclerosis, and possible deformity of bone contour
IV	Large osteophytes, marked narrowing of joint space, severe sclerosis, and definite deformity of bone contour

Treatment

AAOS
American Academy of Orthopaedic Surgeons

TREATMENT OF OSTEOARTHRITIS OF THE KNEE

EVIDENCE-BASED GUIDELINE
2ND EDITION

Adopted by the American Academy of Orthopaedic Surgeons
Board of Directors
May 18, 2013

RECOMMENDATION 1
We recommend that patients with symptomatic osteoarthritis of the knee participate in self-management programs, strengthening, low-impact aerobic exercises, and neuromuscular education; and engage in physical activity consistent with national guidelines.
Strength of Recommendation: Strong

RECOMMENDATION 3C
We are unable to recommend for or against manual therapy in patients with symptomatic osteoarthritis of the knee.
Strength of Recommendation: Inconclusive

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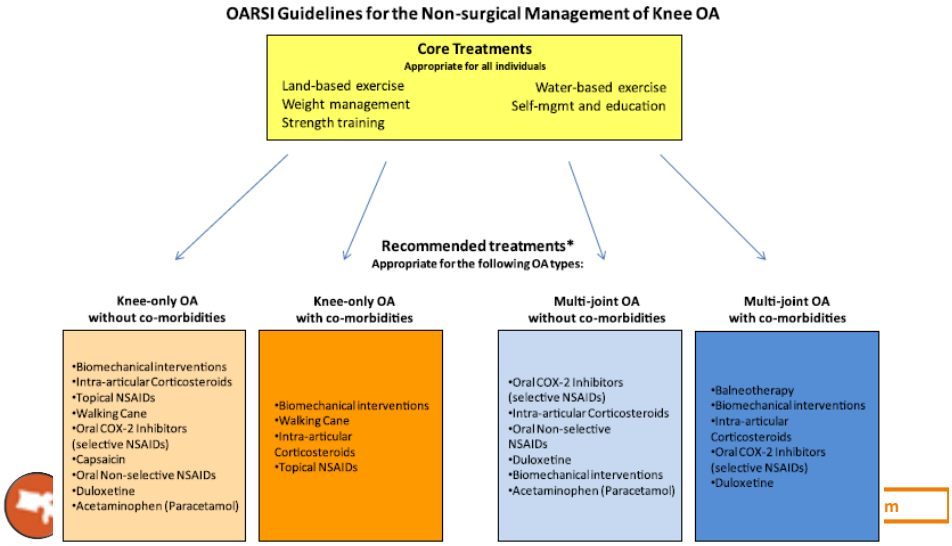
RECOMMENDATION 2
We suggest weight loss for patients with symptomatic osteoarthritis of the knee and a BMI ≥ 25.
Strength of Recommendation: Moderate

- As BMI increases, symptoms and severity of joint pain increase
- Every 5kg of weight gain, 36% increased risk of OA
- OA severity greater in obese vs normal weight
- Obesity associated with faster progression of OA

OARSI guidelines for the non-surgical management of knee osteoarthritis

T.E. McAlindon †*, R.R. Bannuru †, M.C. Sullivan †, N.K. Arden ‡, F. Berenbaum §||, S.M. Bierma-Zeinstra ¶, G.A. Hawker #, Y. Henrotin ††‡‡, D.J. Hunter §§, H. Kawaguchi |||, K. Kwoh ¶¶, S. Lohmander ##, F. Rannou †††, E.M. Roos ‡‡‡, M. Underwood §§§

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL
Osteoarthritis and Cartilage 22 (2014) 363–388



PICO Question

	Patient or Problem	Intervention	Comparison Intervention	Outcomes
Tips for Building	Starting with your patient, ask "How would I describe a group of patients similar to mine?" Balance precision with brevity	Ask "Which main intervention am I considering?" Be specifiic	Ask "What is the main alternative to compare with the intervention?" Again, be specifiic	Ask "What can I hope to accomplish? Or What could this exposure effect?"
Example	In patients with lateral epicondylitis....	Would adding manipulation to modalities or injection alone....	When compared to modalities or injection alone	Reduce the number of visits to return to pain free function.
Your Patient	In a patient with OA	is manual therapy beneficial	vs exercise or a HEP alone	to decrease pain and improve function

Treatment effectiveness and fidelity of manual therapy to the knee: A systematic review and meta-analysis

Musculoskeletal Care 2016; 1–11

Paul Salamh[1] | Chad Cook[1] | Michael P. Reiman[1] | Charles Sheets[2]

- Large effect size for self reported function vs no treatment
- Large effect size for adding MT to another treatment
- Significant difference for pain when adding MT to another treatment

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CAROL A. COURTNEY, PT, PhD[1] • ALANA D. STEFFEN, PhD[2] • CÉSAR FERNÁNDEZ-DE-LAS-PEÑAS, PT, PhD[3,4]
JOHN KIM, PT, DPT[5] • SAMUEL J. CHMELL, MD[1]

Joint Mobilization Enhances Mechanisms of Conditioned Pain Modulation in Individuals With Osteoarthritis of the Knee

- Reduced pain pressure threshold following grade II tibiofemoral mobilizations
- Local and global PPT

The Incremental Effects of Manual Therapy or Booster Sessions in Addition to Exercise Therapy for Knee Osteoarthritis: A Randomized Clinical Trial

J. HAXBY ABBOTT, DPT, PhD, FNZCP[1] • CATHERINE M. CHAPPLE, PT, MManipPhty, PhD[2] • G. KELLEY FITZGERALD, PT, PhD, FAPTA[3]
JULIE M. FRITZ, PT, PhD, ATC[4] • JOHN D. CHILDS, PT, PhD[5] • HELEN HARCOMBE, BPhty, MPH, PhD[1,6] • KIRSTEN STOUT, RN[1]

- 4 groups
  - 12 consecutive visits
  - 12 sessions of exercise spread over a year
    - 8 consecutive sessions in the first 9 weeks; 2 sessions at 5 months; 1 session at 8 months; 1 session at 11 months
  - 12 consecutive sessions of manual therapy and therex
  - 12 sessions of exercise and manual therapy spread over a year

JOURNAL OF ORTHOPAEDIC & SPORTS PHYSICAL THERAPY | AHEAD OF PRINT

The Incremental Effects of Manual Therapy or Booster Sessions in Addition to Exercise Therapy for Knee Osteoarthritis: A Randomized Clinical Trial

- Improved outcomes at 1 year in "booster" groups vs consecutive visit group
- Better outcomes when manual therapy added to treatments

Knee Extension and Stiffness in Osteoarthritic and Normal Knees: A Videofluoroscopic Analysis of the Effect of a Single Session of Manual Therapy

ALDEN L. TAYLOR, PT, DPT, DSc, OCS, FAAOMPT[1] • JASON M. WILKEN, PT, PhD[2]
GAIL D. DEYLE, PT, DPT, DSc, OCS, FAAOMPT[1] • NORMAN W. GILL, PT, DSc, OCS, FAAOMPT[3]

- After a single 30 min session of manual therapy pt's with knee OA had significant increase in knee extension ROM and reduced stiffness at end range compared to matched controls

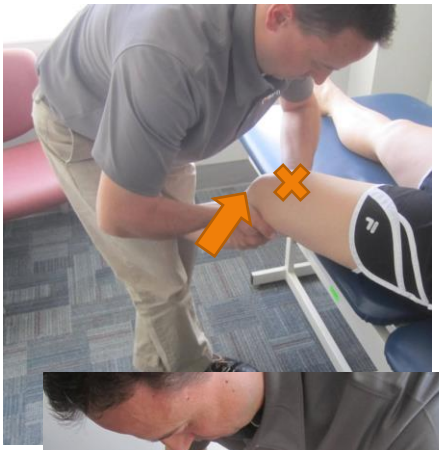
JOURNAL OF ORTHOPAEDIC & SPORTS PHYSICAL THERAPY | VOLUME 44 | NUMBER 4 | APRIL 2014 | 273

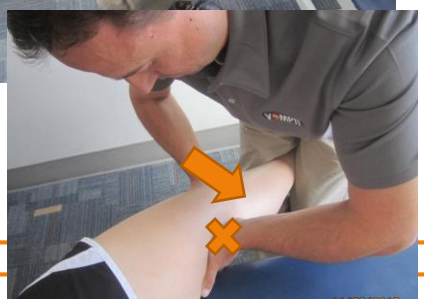
Extension Glides

Sustained Valgus Glide With Extension Glide

Extension Glide

Lateral/Medial Glide of Tibia on Femur





Lateral Tibial Glide MWM

Seated Distraction Mobilization

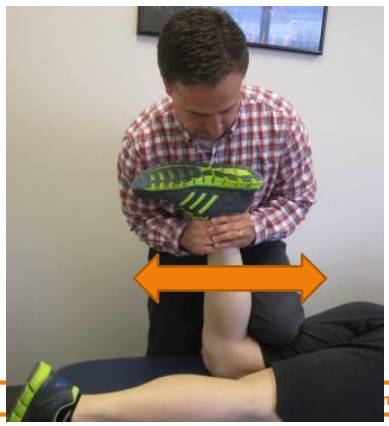
The effect of tibio-femoral traction mobilization on passive knee flexion motion impairment and pain: a case series

Sara Maher[1], Doug Creighton[1], Melodie Kondratek[1], John Krauss[1], Xianggui Qu[2]

[1]Program in Physical Therapy and [2]Department of Mathematics and Statistics, Oakland University, USA

Journal of Manual and Manipulative Therapy 2010 VOL. 18 NO. 1

- Increase in knee flexion ROM of 25.9deg following 2min of technique
- Decrease in pain following technique



Functional Patellar Glides

- Inferior Glide

Functional Patellar Glides

- Superior glide at patella to prevent it from gliding inferior during knee flexion

Exercise Techniques

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Exercise for osteoarthritis of the knee (Review)

Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL

THE COCHRANE COLLABORATION®
published in Issue 1, 2015.

- High quality evidence that exercise moderately reduced pain rating and improves quality of life
- Moderate quality evidence that exercise moderately improved physical function

The Ottawa panel clinical practice guidelines for the management of knee osteoarthritis. Part two: Strengthening exercise programs

CLINICAL REHABILITATION

Clinical Rehabilitation
1–13

DOI: 10.1177/0269215517691085

The Ottawa panel clinical practice guidelines for the management of knee osteoarthritis. Part three: Aerobic exercise programs*

- Strengthening programs showed significant improvement for pain, physical function and quality of life
  - Same result when combined with other types of exercise (balance, coordination)
- Aerobic exercise program demonstrated significant imiprovement for pain, physical function and quality of life
  - Improved when combined with strengthening exercises

Impact of Exercise Type and Dose on Pain and Disability in Knee Osteoarthritis

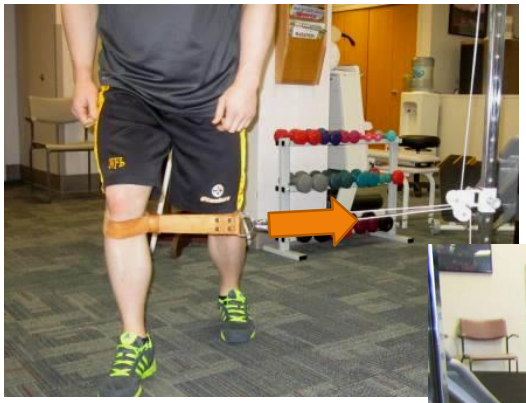
A Systematic Review and Meta-Regression Analysis of Randomized Controlled Trials

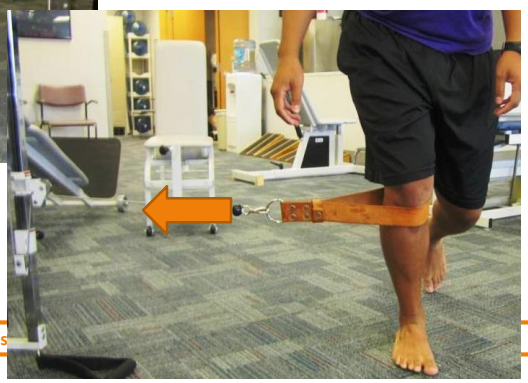
C. Juhl,[1] R. Christensen,[2] E. M. Roos,[3] W. Zhang,[4] and H. Lund[3]

ARTHRITIS & RHEUMATOLOGY
Vol. 66, No. 3, March 2014, pp 622–636
DOI 10.1002/art.38290

- Exercise is effective therapy for knee OA regardless of age, sex, BMI, radiographic status or baseline pain
- Increase frequency of exercise (3x/wk) showed significant effect of pain and disability

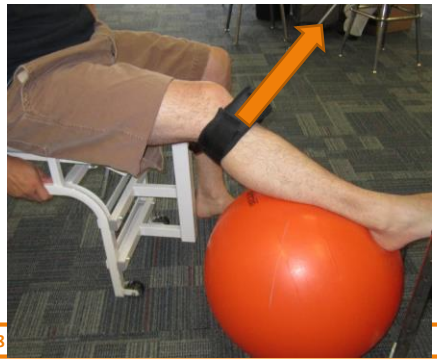
Medial/Lateral Glide From Pulley with Lunge





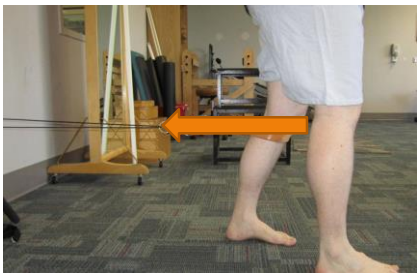
Tibial Anterior Glide with Active Knee Extension

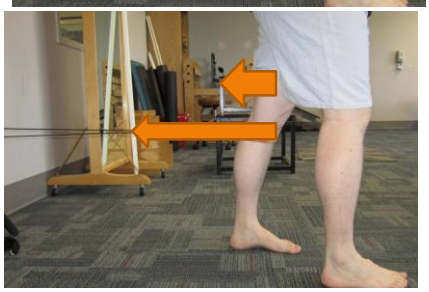
Open Chain



Assisted TKE

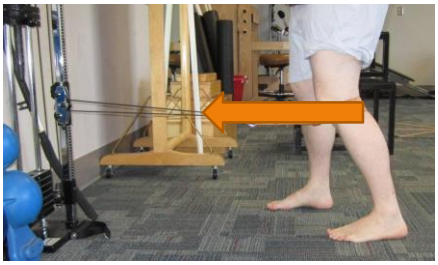
Attached Above Knee

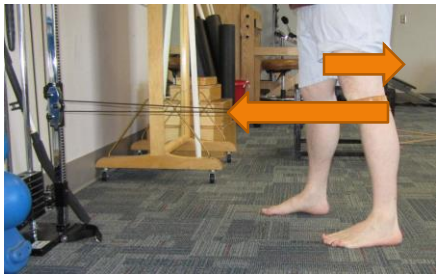




Resisted TKE

Attached Below Knee





Posterior Tibial Glide With Lunge