



Knee & Hip Osteoarthritis

Integrating Research into Practice:
Athlon Physical Therapy's Approach to Evidence-Based Practice

PROBLEM:	Knee & Hip Osteoarthritis
33%	The number of people 63 – 94 yrs old affected by knee OA resulting in pain and limiting their ability to rise from a chair, stand, walk, and use stairs ^{1, 2} Knee OA is frequently experienced in younger people as well (>30yrs). ^{3, 4}
30 – 40%	The number of people suffering from knee OA who have concomitant hip OA ^{5, 6} Significant quadriceps strength deficit in individuals with knee OA results in decreased stability and abnormal stress on the knee joint. ^{4, 7, 8} Knee OA is the most common form of disability in the United States and afflicts many in our own community. ⁹
Diagnosis:	Many patients often have symptoms of hip and knee OA early in its course without radiographic changes and 40% of patients with typical radiographic changes may be asymptomatic. Therefore, subject matter experts recommend the diagnosis of hip & knee OA not be based on radiographs alone. ^{10, 11}

Knee OA- Altman's criteria of knee pain with radiographic osteophytosis and at least one of following three findings has a sensitivity of 91% and specificity of 86%.¹⁰

- degrees
- age > 50
- morning stiffness < 30 minutes
- crepitus

Hip OA- Altman's criteria based on complaint of hip pain and the following clinical findings only has a sensitivity of 86% and specificity of 75%.¹²

- hip internal rotation (IR) <15
- hip flexion <115 degrees
- OR
- if hip IR painful & >15 degrees
- morning stiffness < 60 minutes

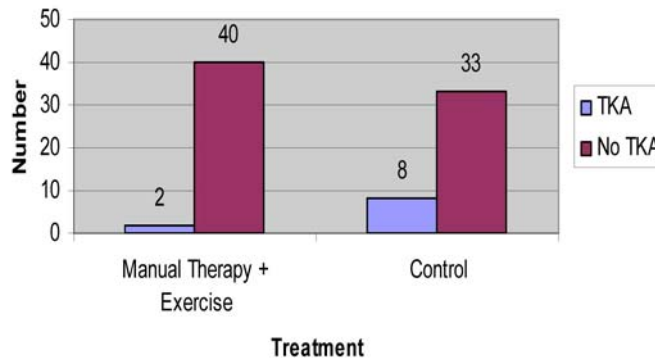
- INTERVENTION:**
- Manual Physical Therapy & Specific Exercise
 - Strengthening Exercise
 - Aerobic Exercise

In addition to physical therapy, glucosamine (1500mg daily) has been shown to be effective in the management of patients with knee OA,^{13, 14} in particular post-menopausal women¹⁵ and patients with moderate to severe knee pain.¹⁶ Benefits include not only a reduction in symptoms and improvement in function, but preservation of joint space has been demonstrated as well.^{14, 17}

EVIDENCE: Oxford Evidence Grade= A (level= 1a studies)

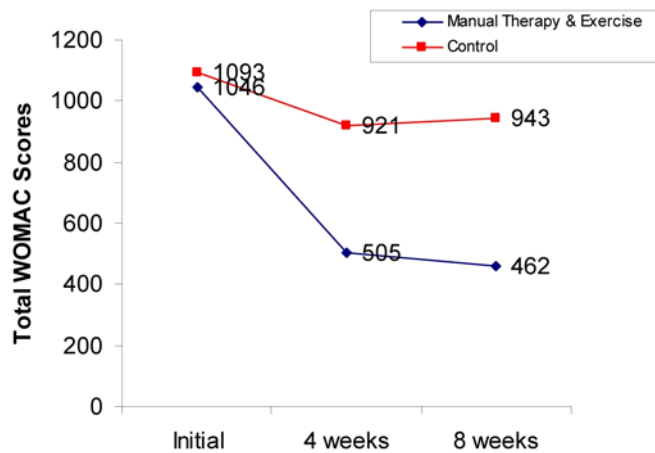
Using an innovative treatment approach consisting of manual therapy and exercise based on evidence published by our colleagues in the Annals of Internal Medicine¹⁸ and our own work,¹⁹ patients frequently report a 20-40% relief in their symptoms after only 2 – 3 sessions and some improvement is usually maintained for up to 1 year.^{18, 20}

Knee Joint Replacement at 1 Year



Number of patients requiring total knee arthroplasty at 1 year

Deyle G, Henderson NE, Matekel RL, Ryder M, Garber MB, Allison SC. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. A randomized, controlled trial. *Ann Intern Med.* 2000;132:173-81.



Reduction in disability

Deyle, G, Henderson NE, Matekel RL, Ryder MG, Garber MB, Allison SC. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. A randomized, Controlled trial. *Ann Intern Med.* 281 G, 000;132:173- 1046 505 462 1093 921 943 0 200 400 600 800 1000 1200 Initial 4 weeks 8 weeks **Total WOMAC Scores** Manual Therapy & Exercise Control

Number Needed to Treat (NNT):

7- for knee OA, the NNT with manual physical therapy and exercise to achieve one additional successful outcome (avoided total knee arthroplasty) – an outcome that would not have occurred if the patient had been treated with the control treatment (in this case placebo ultrasound treatment and a walking program).¹⁸ This means that only 7 patients need to be treated with manual physical therapy and exercise before realizing benefits above and beyond that compared to the control treatment group. Would further clarification be helpful? Let's consider 7 hypothetical patients with knee OA. If all 7 patients received the control group intervention one of them would not achieve a successful outcome. However, treating these patients with manual physical therapy and exercise would result in all patients achieving a successful outcome. Low numbers needed to treat imply that the benefits of manual physical therapy and exercise can be frequently realized when you see a patient with knee OA.

6- for hip OA, the NNT with manual physical therapy and stretching to achieve one additional successful outcome (classified as improved).²¹

10- for knee OA, the NNT with manual physical therapy and exercise to achieve one additional avoided injection.¹⁸

REFER: Patient's with hip & knee OA, especially those who meet Altman's criteria listed above. In addition, preliminary evidence suggests that knee OA patients treated with manual physical therapy (hip mobilizations, specifically) who demonstrate *any two* of the following findings have a 97% post-test probability of experiencing a $\geq 30\%$ reduction in pain and/or functional limitations at 48hrs.²²

- pain/paresthesia ipsilateral hip/groin
- pain ipsilateral anterior thigh
- pain with ipsilateral hip distraction
- ipsilateral passive hip internal rotation less than 17 degrees
- ipsilateral passive knee flexion less than 122 degrees

A manual physical therapy and exercise approach is helpful even for patients with hip and knee OA who have severe pain and/or deformities.^{18, 20, 21, 23, 24} While deformities won't improve, pain arising from the periarticular tissues and resultant disability may be significantly reduced resulting in your patients having less pain and disability and a higher quality of life.

Based on evidence from high quality clinical trials, our manual physical therapy and exercise approach will benefit many of your patients with knee pain.

CONTRAINDICATIONS:

Precaution is warranted in patients with poor bone density and suspected femoral neck pathology (stress fracture, avascular necrosis). In addition, patients with cardiovascular comorbidities should be monitored closely when participating in aerobic, strengthening, and endurance exercises.

MINIMALLY EFFECTIVE OR UNSUPPORTED INTERVENTIONS:

The advantage of oral NSAIDs (including COX 2 agents) over placebo for short term pain relief is small.²⁵ Because serious adverse effects are associated with oral NSAIDs use, only limited use has been recommended.²⁶

INTERVENTION

Typical care episode:

2 visits twice weekly for 4 weeks (average of 8 sessions).

Content:

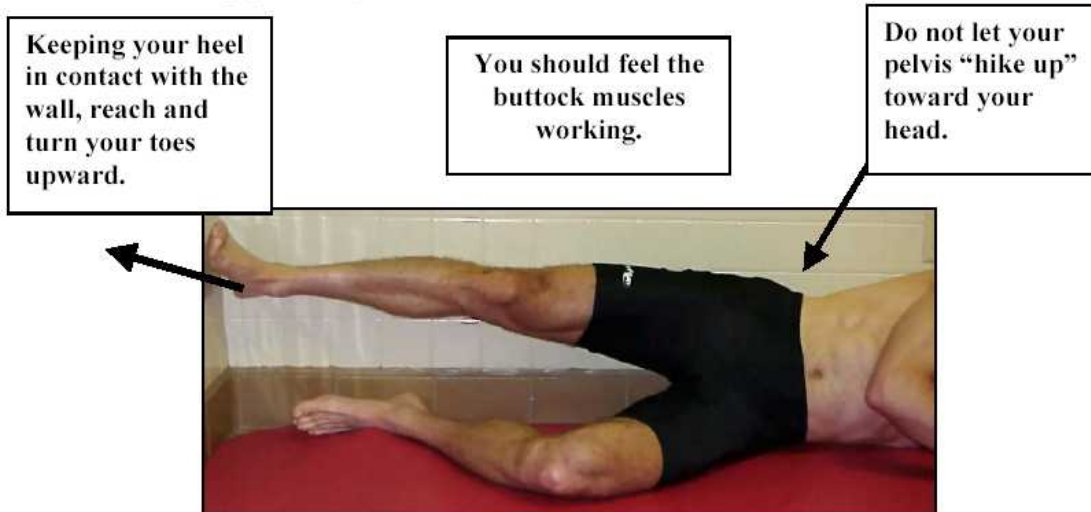
1. Impairment based examination of the lumbar spine and lower extremity joints.²⁷
2. Manual therapy directed toward identified impairments in the lumbar spine and lower extremities.^{18, 19}

Example:



3. Supervised stretching, progressive strengthening, and range-of-motion exercise

Example:



4. Home Exercise Program

References

1. Felson DT, Naimark A, Anderson J, Kazis L, Castelli W, Meenan RF. The prevalence of knee osteoarthritis in the elderly. The Framingham osteoarthritis study. *Arthritis and Rheumatism* 1987;30:914-8.
2. Felson DT. The epidemiology of knee osteoarthritis: results from the Framingham osteoarthritis study. *Arthritis and Rheumatism* 1990;20:42-50.
3. Mailliefert JF, Gueguen A, Monreal M, et al. Sex differences in hip osteoarthritis: results of a longitudinal study in 508 patients. *Ann Rheum Dis* 2003;62(10):931-4.
4. Felson DT. Epidemiology of hip and knee osteoarthritis. *Epidemiol Rev* 1988;10:1-28.
5. Aigner T, Dudhia J. Genomics of osteoarthritis. *Curr Opin Rheumatol* 2003;15(5):634-40.
6. O'Reilly SC, Muir KR, Doherty M. Occupation and knee pain: a community study. *Osteoarthritis Cartilage* 2000;8(2):78-81.
7. Birchfield PC. Osteoarthritis overview. *Geriatr Nurs* 2001;22(3):124-30; quiz 30-1.
8. Dieppe P. Osteoarthritis: time to shift the paradigm. This includes distinguishing between severe disease and common minor disability. *Bmj* 1999;318(7194):1299-300.
9. Schlesinger N. Osteoarthritis: pathology, epidemiology, and risk factors. *Physical Medicine and Rehabilitation; State of the Art Reviews* 2001;15(1):1-9.
10. Altman R, Asch E, Bloch D, et al. Development of criteria for the classification and reporting of osteoarthritis. Classification of osteoarthritis of the knee. Diagnostic and Therapeutic Criteria Committee of the American Rheumatism Association. *Arthritis Rheum* 1986;29(8):1039-49.
11. Balint G, Szebenyi B. Diagnosis of osteoarthritis. Guidelines and current pitfalls. *Drugs* 1996;52 Suppl 3:1-13.
12. Altman R, Alarcon G, Appelrouth D, et al. The American College of Rheumatology criteria for the classification and reporting of osteoarthritis of the hip. *Arthritis Rheum* 1991;34(5):505-14.
13. Towheed TE, Maxwell L, Anastassiades TP, et al. Glucosamine therapy for treating osteoarthritis. *Cochrane Database Syst Rev* 2005(2):CD002946.
14. Pavelka K, Gatterova J, Olejarova M, Machacek S, Giacovelli G, Rovati LC. Glucosamine sulfate use and delay of progression of knee osteoarthritis: a 3-year, randomized, placebo-controlled, double-blind study. *Arch Intern Med* 2002;162(18):2113-23.
15. Bruyere O, Pavelka K, Rovati LC, et al. Glucosamine sulfate reduces osteoarthritis progression in postmenopausal women with knee osteoarthritis: evidence from two 3-year studies. *Menopause* 2004;11(2):138-43.
16. Clegg DO, Reda DJ, Harris CL, et al. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *N Engl J Med* 2006;354(8):795-808.
17. Reginster JY, Deroisy R, Rovati LC, et al. Long-term effects of glucosamine sulphate on osteoarthritis progression: a randomised, placebo-controlled clinical trial. *Lancet* 2001;357(9252):251-6.
18. Deyle GD, Henderson NE, Matekel RL, Ryder MG, Garber MB, Allison SC. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. A randomized, controlled trial. *Ann Intern Med* 2000;132(3):173-81.