

The Treatment of Hip Osteoarthritis

by
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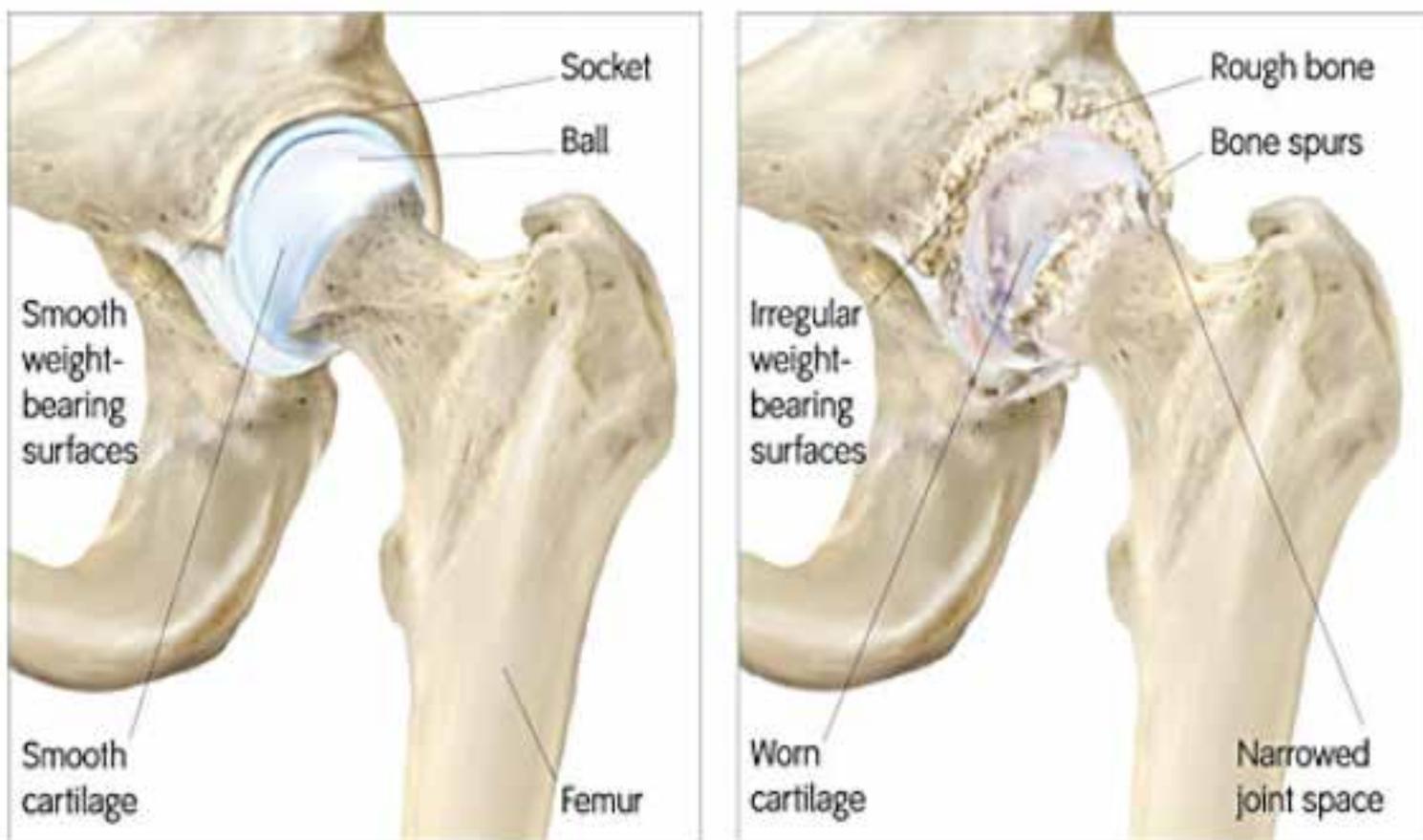
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What is Hip Osteoarthritis?

Osteoarthritis (OA), also known as osteoarthrosis or degenerative joint disease (DJD), is a disorder of the joints caused by progressive loss of hyaline cartilage, sclerosis of subchondral bone, and the formation of bone spurs and cysts at the margins of the joint.^{1,6,9,11,17,22,42} OA of the hip joint occurs between and around the head of the femur and the acetabulum of the pelvis.



How big of a problem is it?

OA is the most frequent cause of musculoskeletal disability in developed countries and one of the most common causes of disability resulting in limited activities of daily living in the general adult population.^{9,22,27} In addition to the individual's personal pain and disability, OA has a huge financial impact on both the individual and the federal health care system as a whole. In the United States alone, it is estimated that the number of individuals with OA in any part of the body will increase from 43 to 60 million by 2020, resulting in an estimated cost of over 100 billion healthcare dollars per year.^{4,8,34,44}

Studies investigating prevalence of Hip OA, specifically, have cited between 10-25% in aging populations and 0.7 to 4.45% of the population overall.^{5,6,12,23,25,31,39} A systematic review by Dagenais et al in 2009, yielded 23 studies reporting 39 estimates of overall prevalence ranging from 0.9% to 27% of populations with a mean of 8.0% and a standard deviation of 7.0%.⁹ According to research presented at the 2006 American College of Rheumatology annual meeting, about 25% of Americans can expect to develop osteoarthritis of the hip during their lifetime.² Based on this research and the age and population of our country, there are between 18-24 million individuals suffering from some form of personal disability related to hip osteoarthritis.

The prevalence of Hip OA is rising dramatically and expected to continue to rise sharply in the next 20-30 years. Reasons for this dramatic increase stem from the aging of large groups of the population including the “baby boomers”, people living much longer with higher expectations and the increase of obesity rates among western populations.^{6,9,32} Iorio et al. found that obese individuals suffered twice the rate of hip and knee arthritis as compared to adults with healthy body weight. Nearly 32% of obese adults have arthritis, as opposed to 16% of those of normal weight and 22% of people who are overweight but not obese.²¹

What are the Signs and Symptoms?

The physical signs and symptoms of Hip OA are significant and occur as a result of the secondary changes to the joint. These secondary changes include, but are not limited to, capsular restriction, loss of mobility at the joint, weakness and tightness of surrounding musculature, increased pressure within the joint, general de-conditioning, loss of balance and proprioception, and an overall increase in stress on surrounding joints including the knee, pelvis, and lumbar spine. As the OA progresses, many individuals will eventually have intolerable pain, lose their overall functional ability, independence, and quality of life.

The social and economic effects of Hip OA on the individual, and society

as a whole, may be just as significant as the physical signs and symptoms. Overall, OA is the sixth leading contributor worldwide to total years lost to disability, or disability adjusted life years (DALYs).⁴ The direct and indirect societal costs attributable to OA are enormous. For example, individuals with OA are more likely to reduce work hours or stop working all together resulting in lost wages and income. Older adults with symptomatic arthritis report greater medical utilization and health care costs compared with people not reporting arthritis.³⁸ Individuals with hip OA lose interest in participating in some of the most common leisure activities such as walking with friends, going to a dinner party, and engaging socially in fear of the pain involved. Rates of depression are higher in individuals with long-standing pain and loss of overall function.^{28,29}

What can we do about it?

The Old Approach:

There is no cure for OA and it continues to progress throughout one's life. So what can we do about it? The good news is that there are treatments for the secondary changes that occur with OA. As stated earlier, it is these secondary changes that directly cause the pain, loss of function, and decreased quality of life.

The traditional model of medical treatment of OA included pharmaceuticals/medications, exercise, weight management, and waiting for it to get painful enough to warrant surgical intervention. Medications can be used to manage pain and inflammation, but they do not restore strength, flexibility, proprioception, and joint mobility; the root causes to the pain and functional disability in the individual. They also become very expensive and carry their own risks generally associated with long term use such as gastrointestinal bleeding, cardiovascular disease, and addiction.¹⁶

Many studies have shown that non-pharmacological treatment options, such as therapeutic exercise programs, can be very effective and emphasized^{6,7,14,15,16,18,30,33,35,41,45} Therapeutic Exercise, when used alone,

has been found to help biomechanically unload intra-articular pressure from within the hip joint leading to decreased pain response. This unloading occurs through improved flexibility, increased strength, and decreased overall weight of the individual.

However, utilization of commonly recommended self-management strategies such as exercise and weight loss have demonstrated questionable compliance among patients and clinicians alike.^{20,37,46} If many studies have proven these effective, why would compliance and referral by physicians be so poor?

One important reason for this poor compliance begins with one of the most significant secondary effects of Hip OA which is a progressive **Capsular Pattern of Restriction**. The hip joint is surrounded by a deep connective tissue called the joint capsule. The joint capsule, in addition to ligaments, helps to stabilize and control the range of motion of the hip joint. As hip OA progresses, the joint capsule becomes inflamed and very tight causing the femoral head to migrate superiorly and severely restricting normal movement of the hip. This capsular tightening and loss of range of motion increases pressure within the joint which causes immediate increased pain.

Many individuals show poor compliance with an exercise program because of the progression of the capsulitis or pain and joint restriction by the capsular tissue. The exercises cannot specifically target the progressive capsular restriction. The pain becomes so great that they are not able to tolerate exercise to lose weight, improve flexibility, and improve biomechanical strength as prescribed to them. The OA continues to progress, causing more pain and disability, until finally the person cannot tolerate it any further and they seek total hip replacement surgery.

The Current Approach:

Newer studies that have investigated the combination of manual therapy techniques, focusing on increasing capsular mobility of the hip, and therapeutic exercise have shown excellent results.^{6, 8,17,19,26}

Manual therapy techniques are defined as those in which a medical provider, such as a physical therapist, osteopathic physician, or chiropractor, perform skilled hand movements intended to improve tissue extensibility, increase range of motion, induce relaxation, mobilize or manipulate soft tissues and joints, modulate pain, and reduce soft tissue swelling, inflammation, or restriction.³ There are a variety of manual therapy techniques that target the hip joint capsule with the goal of increasing its extensibility (See Figures 1,2 below).

The first and most widely used manual therapy technique to improve general hip joint capsular mobility and decrease pain immediately is termed Long Axis Hip Traction.^{6, 10,17,19,40,42} The patient is lying supine while the practitioner grasps the patient's leg near the ankle. The practitioner then places the leg in approximately 15-30 degrees of flexion, 30 degrees of abduction and slight external rotation for the most relaxed position of the hip joint. The practitioner then begins to pull at a certain force to distract the hip joint, stretch the joint capsule, and decrease intraarticular pressure.

This technique immediately decreases pain and begins the process of increasing hip joint capsule extensibility, leading to decreased pressure within the joint, increased range of motion, and relaxation of surrounding muscles. Alternating varying amounts of compression and decompression are also thought to be one of the mechanisms by which lubrication is enhanced within the joint. This technique is followed by many other specific techniques performed by the practitioner to target specific parts of the joint capsule and surrounding soft tissues of the hip joint. It is important to note that greatest benefit will come from combining all of these joint and soft tissue techniques, not just long axis traction. Long Axis traction is the first technique used because of its immediate pain relief and general capsular stretching. Oftentimes the patient will not tolerate more specific directional techniques initially.



(Figure 1,2: Physical Therapist performing Hip Long Axis Traction and Belt Lateral Distraction)

Combining manual therapy with specific therapeutic exercises shows the greatest promise for conservative treatment of the secondary effects of hip osteoarthritis. By increasing the patient's mobility and decreasing their pain, they are better able to perform their long-term exercise routine for decreased weight, increased flexibility, and increased biomechanical strength. These conservative measures can decrease the need for medications, improve patient morale, improve functionality, and most of all, improve quality of life.

Even though conservative treatment does not prevent surgery, the common belief is that if you can lose weight, gain strength and keep moving, you have a greater chance of delaying surgery until it is absolutely necessary. Every 6 months you can delay surgery is another 6 months of improved surgical techniques, surgical experience, improved surgical components and cost savings by the patient and the insurance company.

Individuals with hip OA, who seek conservative care such as physical therapy, usually receive manual therapy, exercise instruction, and education 1-2 x per week for 3-8 weeks depending on their specific level of dysfunction. Manual therapy is most effective by accumulating the effects of one treatment on another consistently. It is similar to how an antibiotic medication works on an infection. In order to effectively eliminate the infection, the person must consistently, and for the entire duration, take the antibiotic medication. Likewise, one session of mobilization on the hip joint is ineffective for mobility change, but by accumulating the

treatments consistently for a certain period of time, it has longer term effects.

After discharge from a formal treatment program, the individuals are instructed to continue exercising to maintain their mobility, strength, and appropriate weight loss as possible. We know that hip OA is progressive and their hips will eventually begin to worsen despite their best efforts. Many individuals can maintain an improved quality of life for at least 6 months and some longer following discharge.¹⁷ They may also return for annual re-assessments to ensure that they are maximizing their functionality and quality of life. In this way, an individual can work to more comfortably delay total hip replacement for as long as possible.

What are the costs of NOT providing conservative care?

Manual therapy and therapeutic exercise are covered expenses under health insurance plans and are far less expensive than the overall costs associated with NOT providing this care. In other words, by NOT treating the hip OA with manual therapy and therapeutic exercise:

1. Patient will be in more pain requiring more costly and risky medication.
2. Medication side-effects can lead to expensive treatments related to gastrointestinal disorders, cardiovascular problems, and/or addiction.
3. Patient will worsen in overall fitness and conditioning potentially leading to more expensive treatments related to diabetes, obesity, heart disease, cancer, or stroke.
4. Psychosocial costs of not participating in life activities and socializing including lost wages from inability to work and treatment of depression.
5. Progression of physical weakening, capsular restrictions and inability to move normally resulting in advancing degenerative changes around hip and

sooner hip replacement surgery.

What are the costs of NOT providing conservative treatment as above? Ask the insurance companies. They fully understand how much osteoarthritis is currently costing them. It is in the billions of dollars and this is why they support treatments that can reduce medication use, decrease rates of obesity, and get people exercising.

What happens when conservative measures are exhausted?

As the disease progresses, many people, even with delayed surgery, greater quality of life and decreased co-morbidities such as obesity as a result of conservative care, will still require surgical intervention. Joint replacement surgery has been shown to be very effective in improving pain and function. If there are no contraindications or limiting factors, it is the premier choice of treatment once conservative measures have been exhausted.

There are, however, some obstacles to having surgery. It is very expensive, carries its own risks associated with surgery under general anesthesia, and may have to be repeated depending on the age of the individual. Historically, it has been reserved for individuals older than 65, but there are more and more individuals seeking out surgery at a younger age. Studies indicate that by 2030, 52% of patients needing primary hip replacements and 36% of those needing revision hip replacements will be younger than 65 years old.¹³

According to the American Academy of Orthopaedic Surgeons, those who do have the surgery, a primary total hip replacement will cost approximately \$40,000 and a secondary revision will cost about \$50,000. These figures do not include costs associated with rehabilitation services following the surgery and adaptive changes made to one's home.

Several studies have investigated the impairments and function in patients with hip OA, such as lower extremity muscle strength, hip range of motion (ROM), and aerobic capacity. Although surgery is very effective once conservative measures have been exhausted, it is important to note, data indicate that only 12% of the patients seeking help for hip pain ended up having hip replacement within 3 years and 22% within 6 years. Therefore, the patient group not candidates for surgery represents the majority of patients seeking primary care for hip pain, including patients with hip OA.³⁶ The take home message is clear: We need to exhaust conservative measures first because most patients are not candidates for surgery for at least 3-6 years.

Main conclusions from the Research?

There are 6 main conclusions to be drawn from this research:

1. There is, and will continue to be, a massive increase in the number of individuals suffering from OA secondary to aging and obese populations.
2. More and more active and younger individuals are seeking treatment. More than 50% are younger than 65.
3. There will be a huge financial burden to the individual and federal healthcare system with over \$100 billion dollars spent per year related to OA treatment.
4. The majority of individuals seeking treatment for hip pain will not actually need surgery, but will need some form of conservative care. However, there will still be a huge increase in the number of individuals requiring hip replacement surgery overall.
5. There will still be a massive increase in the number of people needing surgery, but there will be a significant shortage of surgeons able to perform these surgeries in the near future.

6. Combining a variety of Manual Therapy techniques such as Long Axis Hip Traction and Therapeutic Exercise shows the greatest promise for conservative treatment of Hip OA.

Even though we can predict that the overall healthcare costs will be far less with this newer model of treatment that combines manual therapy with therapeutic exercise, costs associated with OA will still become staggering due to the dramatic increase in individuals overall seeking treatment in the next 10-20 years. Both the individual, private insurance company and Medicare will be looking to reduce expenses, yet still expect excellent outcomes.

There is currently, and will continue to be, an enormous demand for any conservative treatment that can provide positive treatment effects while reducing costs for the patient, insurer, and federal government.

Manual Therapy at Home?

My name is Tony Rocklin and I am a Doctor of Physical Therapy certified in Orthopaedic Manual Therapy and CEO of MedRock, LLC. I am a clinician of 15 years and partner in a large privately-owned physical therapy company. I am certified in Orthopaedic Manual and Manipulative Therapy by the North American Institute of Orthopaedic Manual Therapy.

I have seen, and continue to see first-hand, the positive effects of manual therapy and therapeutic exercise on mild and moderate hip OA as well as some individuals with more severe OA. Patients are able to return to social, leisure and work activities that they previously avoided due to pain, immobility, and fear of worsening their condition. They are able to be much more comfortable and functional in their delay of surgery, when possible and/or necessary, and push it back when it is more appropriate based on their surgeon's recommendation and general health condition.

Having been in the trenches of orthopedic rehabilitation for 15 years now and seeing these positive effects, I have always theorized that if the patient

had some way of independently performing manual therapy at home, they would better accumulate and maintain increased mobility between visits and after discharge from therapy, have greater pain relief, and have greater compliance with their independent home exercise program to progress strength, flexibility, and weight loss. Before now, there have not been any simple devices or easy techniques that could be used independently by the patient at home.

Introducing the HipTrac™

The HipTrac™ is a durable, portable, and light-weight hip traction device that is easily and independently used by the patient at home. Because most individuals that require use of this device will range from 30-90 years old, it was important to design it with the idea that it had to be extremely portable and simple to use, without the assistance of another person.





The HipTrac™ is safe, effective, and empowers the individual to work independently towards their own well-being. It has been cleared by the FDA for immediate use and sale beginning in 2012. The HipTrac™ is simply simulating the same evidenced-based Manual Therapy Technique of Long Axis Hip Traction that was described earlier in this paper. This technique is used in all medical, physical therapy and chiropractic clinics across the world to decrease pain and generally increase hip mobility.

As stated earlier, beginning conservative treatment with manual therapy by a health care provider, such as a physical therapist, works best by accumulating the effects 1-2 x per week for 3-8 weeks. The patient's mobility increases from one visit to the next, however there is a slight rebound or stiffening between visits. This is not abnormal and occurs regularly at varying amounts depending on the individual. Using the HipTrac™, at home and between visits, will continue the capsular mobilization and stretching, lessening the rebound effect and decreasing pain. This will lead to improved outcomes sooner and more comfortably. It is extremely important to understand that the HipTrac™ does not replace manual therapy and therapeutic exercise, it only complements them. Best

results are obtained by receiving all of the specific soft tissue and joint mobilization techniques from the appropriate medical provider, learning an appropriate home exercise program AND continually using the HipTrac™. Upon discharge from treatment, the individual will continue to independently use the HipTrac™ to maintain capsular mobility while performing their therapeutic exercise program at home. We believe, and studies are underway, that the effects will last longer than 6-12 months when combined with regular use of the HipTrac™.

A way to think about manual therapy and the HipTrac™ is similar to what happens when your car breaks down. You need to push your car off the street and down to the mechanic. It takes a lot of energy and specific force to *get* the car moving, but once you get it moving, gain some inertia, it takes a lot less energy and specific force to *keep* it moving. Likewise for hip OA, it is best to see your healthcare provider to *get* your hip moving, then use the HipTrac with your independent home exercise program to *keep* it moving after discharge from a formal program.

Think about what occurs historically, as we have discussed above, when someone seeks help for their hip pain. They will go to their primary care physician who may or may not prescribe medications or exercises. The medications cost money, mask the problem and have long term gastrointestinal, cardiovascular, and addictive side-effects. What are the costs of these side-effects in addition to long term medication use? Also think about the lack of exercise by the individual because they are in too much pain or even increased pain if they do try to exercise with capsular restrictions. What are the costs of side-effects related to obesity, diabetes, heart disease, cancer and de-conditioning? What are the costs of depression and other mental health issues because the person is suffering with chronic pain, not engaging socially with friends or family, and not able to work? What are the costs of lost wages alone? This may seem dramatic, but this is the reality that millions of individuals are faced with every day around this country.

I am not suggesting that conservative treatment combined with the HipTrac™ is going to save every single one of these individuals, no single

treatment can. I am suggesting that use of the HipTrac™, in combination with manual therapy and therapeutic exercise, can make a huge difference in many individuals' lives while saving millions of dollars for the individual, private insurance company and the U.S. healthcare system overall.

The HipTrac™ is not going to eliminate the need for surgical intervention. As stated earlier, surgery is the premier choice once conservative care is exhausted and the demand for surgery is going to rise sharply in the next few decades. We are working to improve the level of conservative care and quality of life during the gap between diagnosis and surgery. Most individuals are diagnosed years before surgery is necessary or desired. In some cases, surgery is not an options due to contraindications for surgery. If we can improve individuals' quality of life and physical health prior to surgery, we would argue that we are able to save a great deal of money, improve physical health while eliminating risk for co-morbidities, and better preparing individuals for surgery, if needed.

The idea of a home traction device for treating various orthopedic conditions is not new. There are tens of thousands of home Cervical and Lumbar Traction units disbursed every year in the United States for treating OA of the spine as well as a myriad of other spinal conditions. They are popular in the medical community and routinely covered by most insurance plans, including Medicare.

Similarly, the HipTrac™ will help provide the same opportunity to the millions of Americans who are suffering from OA of the hip. What separates the HipTrac™ from the spinal traction units in superiority for its intended use, besides the location of treatment, is the fact that it works on one specific problem; capsular restriction and pain at the hip joint. Spinal traction units are popular but they cannot be used for every cervical condition because they cannot exactly replicate manual traction by the provider in all cases. Oftentimes, there are slight variances and tweaks to how the provider has to manually traction the spine. The home device cannot do this and therefore the patient may not obtain relief. This will lead to poor compliance at home in some cases. However, the HipTrac™ does

replicate the manual technique at the hip exactly the way the provider does it. The provider can set the patient up at home with the HipTrac in the exact fashion in which the hip traction is provided in the clinic. This is why the insurance company will see greater compliance with the HipTrac for its intended purpose versus the spinal traction units overall.

Summary and Conclusions

Manual Therapy by provider and instruction in home exercise program



Consistent and Independent Hip Traction



Less Pain and Increased Mobility



Greater Compliance with Home Exercises



Decrease Weight and Increased Strength and Flexibility



Greater Functional Ability and Outcomes



Increased Patient Satisfaction and Decreased Overall Costs for the Patient and the Insurance Company

Current statistical analysis shows that there are already up to 18-24 million individuals in the United States with some form of personal disability related to hip osteoarthritis. The oldest of the “baby boomers”, which consist of 79 million individuals, turn 65 years old beginning January 1, 2011. In 2031, when the oldest will turn 85 years old, there will still be 51 million “boomers” remaining.⁴³ With these staggering figures predicted

in the next 20 years and the healthcare crisis that we are already facing, it is imperative that we create or expand any evidence-based, conservative treatment that can help improve outcomes and patient quality of life, while decreasing overall healthcare costs. The HipTrac™ is designed to do just that.



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