HIP REPLACEMENT

Structural Yoga Therapy
Research Paper

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1a. Initial intake, review of symptoms, subjective pain level

Toni is the caretaker of a local estate. In the past she has worked in several factories, and her jobs have always been physically demanding. She is sixty-one years old with two grown children. She raised the children alone as her two marriages were unhappy and ended in divorce. Toni says that she only eats once a day in the evening. She takes St. John's Wort for depression, and codeine for pain. The following notes describe her hip surgery and the resulting problems. Toni had pain in her right knee and low back for 5 years before she had the hip replaced on the right side in 1995. By then the hip joint had become badly deteriorated. According to her doctor, the joint crumbled during surgery. This led to nerve damage that affected the right foot and toes. Her toes were numb, and she had limited movement in her foot. She also had "foot drop" in which the foot was always in plantar flexion. Toni's doctor told her she might not walk again. She used a wheelchair and a walker for two months, and she feels that through sheer determination she was able to walk again. The disintegration of the joint during surgery required that the doctor put a longer shaft into the femur. This resulted in Toni having a right leg that is a fourth inch longer than the left. The doctor also misjudged the size of the prosthetic acetabulum making it too large for the head of the femur. As a result, the head of the femur came out of the acetabulum 13 times during the first year. In 1996 the doctor realized that he had made a mistake, so Toni had surgery again to correct the size of the acetabulum.

She still can barely lift her toes on the right side. At this time Toni takes codeine because of bursitis in the right heel. The heel is swollen and red. The pain level varies from a 4-7 depending on her workload. Balance is always an issue for her because her right leg is noticeably longer than the left. When standing, she is on her toes on the left foot while the right foot is flat on the floor. When she came to me, she had just fallen and had landed on her right shoulder. Her shoulder was very painful. She also has bursitis in the left hip, and it is very painful .When we began the assessments, it became clear that Toni was in pain in so many places that I had to discontinue the assessments and instead gave her a table Alexander Technique session. We continued in this manner for six sessions until I was able to begin the assessments in early April. We have met a dozen times now, and all the sessions include doing the JFS together, some Alexander work, and a great deal of "listening to the story."

Recommendations made before assessments began Feb.2005-April 2005

All exercises are done in a chair and even then some were modified for comfort. She is not comfortable getting on all fours or doing the exercises on the floor. Getting up from the floor is difficult for her. We practiced getting up and down from the floor, and she realized that part of the problem is fear of falling.

SI exercise done in a chair to stabilize SI joint.
Focus on breath awareness for vata imbalances.
Joint Freeing Series (JFS) in a chair for kinesthetic awareness, diminishment of pain throughout the body, for ROM, strength, and for relieving vata.

Alexander Technique to work on kinesthetic awareness, freeing tension in her body, and for some release of the arthritic left hip: Take some time to lie in semi-supine on the floor (legs up on sofa or knees bent with feet on floor) and practice getting up and down from floor. Ten-fifteen minutes of semi-supine daily helps the discs expand, and the back muscles to relax.

Try using heel lift in left shoe to balance out leg lengths.
Especially work on dorsiflexion of right foot to help with bursitis.
Eat more than one meal a day, especially since taking codeine and Advil during the day.
For better balance, stand with the shorter leg firmly planted on the floor and the knee slightly bent on the longer side. Often she stands with the foot of the longer leg on the floor. Then she is on her toes on the shorter leg.

Results of Initial Recommendations

The fact that I was able to begin the assessments with Toni is evidence of her improvement. We had worked on breathing and the JFS for six sessions before I began the assessments. She practiced the JFS at home, also. Her outlook had become much brighter by then, and she had made some lifestyle changes on her own, e.g. she had begun an hour's daily walk with her dog.

b. Physical Assessment.

Bodyreading: Toni's head is forward, shoulders are raised. Her body leans forward as the hips are slightly flexed. The right leg is longer, and she stands on her toes on the left foot. There is an excessive lumbar curve. She has high arches in her feet. The sacro-iliac joint moved down on both sides.

Numbers in bold type are not within normal ROM, differ greatly on the two sides, or are weak.

ROM Tests

	May 2005 L/R		Oct. 2005 ROM L/R
Ankle			
Dorsiflexion	minus**15/4(left couldn't dorsiflex)**		**10/9**
Plantar flexion	**76/74**		**64**/50
Eversion	**15/3**		**15/8**
Inversion	**45/65 (feet naturally inverted**)		45/**40**
Knee			
Flexion	**135/120**		**132/140**
Hip			
External Rotation	**30/15**	**Seated**	**39/28**
Internal Rotation	**19/12**	**Seated**	**30/29**

Prone

Knee Flexion	**110/90**	**100/100**
Hip Extension	**15/20**	**15/15**

Muscle Tests

Ankle

Dorsiflexion	**2/1.5**	**2/2**
Plantar flexion	**2.5/2**	**2.5/2**
Eversion	**1.5/1(pain)**	**1.5/1.5 (no pain)**
Inversion	**2/1(pain)**	**2/1.5 (no pain)**

Hip

Sartorius	**can't do**	**1/1**
Flexors-abdominis rectus	**1**	**2**

Left hip ¼ inch higher than right

Hip-Side Lying Position

External Rotators	**2.5/3**	**2.5/3**
Internal Rotators	**3/3**	**3/3**

Knee-Prone

Flexion	**2.5/2**	**2.5/2.5**

Hip-Prone

Extension	**1/1**	**1.5/1.5**
External Rotators	**2/2**	**2/2.5**
Internal Rotators	**2/2**	**2/2**

c. Summary of Findings-May

Weak muscles	**Tight**
1. Tibialis anterior	Gastrocnemius
2. Peroneus longus	Tibialis Posterior
3. Peroneus brevis	
4. Hamstrings	
4. Sartorius	
5. Gluteus maximus	
6. Hamstrings	
7. Abdominis Rectus	
8. External and Internal Hip Rotators	

d. Recommendations following the assessments of May 2005

Continue with daily walks for strength .
Continue with JFS (seated) and breath work.
Add the following for strength (all are done seated):

1. For the tibialis anterior:
   After doing the 6 repetitions in the JFS #1, dorsiflex and hold for three breaths to strengthen the tibialis anterior and to stretch the gastrocnemius. With right foot flat on floor, raise toes and hold for 3 breaths. (She can barely do this movement, and her foot slaps the ground after the heel strikes when walking).
2 .For the peroneus longus and peroneus brevis: JFS #2
   Eversion of ankle; hold for three breaths after doing the 6 repetitions in the JFS. .
3. For gluteus maximus and hamstrings:
   Hold onto a chair while standing and do hip extension. Repeat for 3 breaths.
4. For External and Internal Hip Rotators:
   JFS #5 modified. While sitting, lift right foot, knee bent, slightly externally rotate hip and touch the left ankle and calf. Do this 3 times each side. For the internal rotators, slightly internally rotate hip, lift off the floor and hold for 3 breaths
5. For the sartorius:
   Slightly externally rotate hip and hold leg a few inches off the floor for 3 breaths.
6. For the rectus abdominis:
   Spine flexion in JFS #6.
7. For External and Internal Hip Rotators:
   JFS #5 modified. While sitting, lift right foot, knee bent, slightly externally rotate hip and touch the left ankle and calf. Do this 3 times each side. For the internal rotators, slightly internally rotate hip, lift off the floor and hold for 3 breaths.

e. Results of Recommendations

	ROM	**L/R**
Ankle	Dorsiflexion	+25/+5 still below standard ROM, but improved
	Plantar flexion	-12/-24 L above standard ROM; R is standard ROM
	Eversion	same/+5 below standard ROM, but more balanced
	Inversion	same/-25 L standard ROM, R within 5 degrees
Knee	Flexion	-3/+20 more closely balanced
	Flexion- prone	-10/+10 balanced
Hip	External rotation	+9/+13 improved
	Internal rotation	+11/ +17 improved
	Extension	same/-15 both standard ROM and balanced

Most muscle tests improved.
All ankle tests on the right side, the side of the hip replacement improved.
The sartorius improved from 0 to 1.
The abdominis rectus improved from 1 to 2.
Knee flexion improved from 2 to 2.5.
Hip external muscle tests improved on the right side from 2 to 2.5.
Internal hip muscle tests were somewhat weaker.
Hip extension muscle tests improved from 1 to 1.5.

Oct. 2005: Toni's heel pain has diminished. Her feet are more balanced. She is making plans to leave her present situation. She has found that her job as caretaker of the estate and the owners of the estate are part of her problem. Her work load has increased there, and she feels that she is "under the thumb" of the estate owners. Some of her muscle tests were weaker because she has not had as much time to do the exercises. On her own she decided to drink more water and to take magnesium for leg cramps. She is still walking her dog. I gave her the JFS videotape and will check in with her from time to time to see how she's doing. A key element in her improvement was having someone to "listen to the story."

Recommendations after October assessments

Toni needs to continue with the program. She needs to continue doing the JFS for mobility and strength, continue walking, lie in semi-supine on the floor for back alignment and relaxation, and work on breath awareness.

2a. Name and Description of Condition

Over 238,000 total hip replacements are performed each year in the United States. Two-thirds of those requiring this surgery are over 65 years of age. Women need hip replacements more often than men because of the greater risk of osteoporosis and fracture. Most hip replacements occur because of severe osteoarthritis. One considers hip replacement because ordinary activities of daily living have become limited, the joint is very stiff, and pain cannot be relieved by more conservative methods.

The hip joint is protected by the synovial membrane, a thin delicate membrane of connective tissue. This membrane secretes synovia, a transparent fluid that acts as a lubricant in the joint. When there is friction in a joint, the synovial membrane secretes an unusual amount of fluid, which turns viscous and milky and restricts the movement of the ball and socket joint. The synovial membrane is actually just doing its job of protecting the joint, but it creates swelling and inflammation.

According to Pete Egoscue, author of *Pain Free*, the irritation of the synovial membrane is not a disease, but, rather the problem is the misalignment of the shoulders, hips, knees and ankles. This misalignment causes the body to compensate in the hip joints, throwing off the relationship of the head of the femur to the other joints. This results in a grinding in the hip socket. The synovial membrane can protect the joint for an hour or even a week, but years of grinding are too much for the joint. The cartilage begins to deteriorate. Because articulation of the joint is extremely painful where the cartilage has worn away, a person's gait has to adjust to use what cushioning is left. This adjustment focuses the pressure of the femur in such a way that it damages the cartilage even more. Additionally, pieces of cartilage dislodge and cause even more interference in the joint. In such a way "hip movement becomes dependent on an increasingly intricate, restricted, and demanding series of muscular improvisations. For example, the muscles of the low back may get involved in flexing and extending the hip. …They'll simulate flexion-

extension by rotating the hip to avoid the restrictions in the hip socket. This means that instead of riding smoothly from front to back, the head of the femur will roll or rock in the socket. The muscles will be taxed beyond their design limits, putting stress on the structures of the low back, while at the same time, cartilage loss will continue to mount, since the gyrating femur is avoiding the worst spots of cartilage loss but is grinding a hole in a new place. …The muscles tend to get to a dysfunctional crisis first."(*Pain Free*, p.105). Hip pain can be difficult to assess because the muscle dysfunction and resulting pain can happen in many different places. More problems occur when these muscles stay contracted and are in spasm. The joint space narrows, more wear and tear occurs in the joint, and everyday activities become very painful.

Other causes of hip replacement are rheumatoid arthritis, a major injury to the hip bone, tumors, and injury to the blood supplying the femoral head. The latter causes the cells to die and the bone to disintegrate.

In hip replacement surgery the worn ends of the bones are resurfaced with metal, ceramic, or plastic implants. The socket of the acetabulum is reamed or shaped to accept a specifically sized hip prosthesis. The socket is often metal that is fitted with a plastic liner. A recent advance has been a ceramic acetabular liner. The end of the femur is removed and the canal of the femur is reamed and sized to fit the femoral stem component of the implant. This implant is either press-fit in place so that bone can grow into the implant or cemented in place with a polymer compound. An appropriately sized ball, mated with the acetabular liner, fits on the end of the femoral implant. The pictures beginning on page 8 are from http://my.webmd.com . They show the procedure for a hip replacement. Most artificial hip joints last 10 to 20 years, depending on the stress put on the joint. Over time, the components wear down or loosen. People having hip replacement today may expect the parts to last longer than joints replaced 10 to 20 years ago.

The risks of the surgery are as follows:

Blood clots may develop in a leg vein after surgery. They affect less than 5%.
Infection of the surgical wound or in the joint is rare in otherwise healthy people. Those at higher risk are those with diabetes, rheumatoid arthritis, chronic liver disease, or those on corticosteroids.
Deposits of bone in soft tissues around the hip joint, called heterotopic ossification, can decrease the range of motion in about 5% of people.
Hip dislocation after surgery occurs in fewer than 3 people in 100 (0.5% to 3%).
Nerve injury is rare, but can cause tingling, numbness or difficulty moving a muscle.
Problems with wound healing are more common in people who take corticosteroids or in those who have diseases that affect the immune system, such as diabetes.
There are the usual risks of general anesthesia.
Death from hip replacement surgery occurs in 0.1% to 0.3% (1 to 3 in 1000).

Long-term risks of hip replacement surgery are as follows:

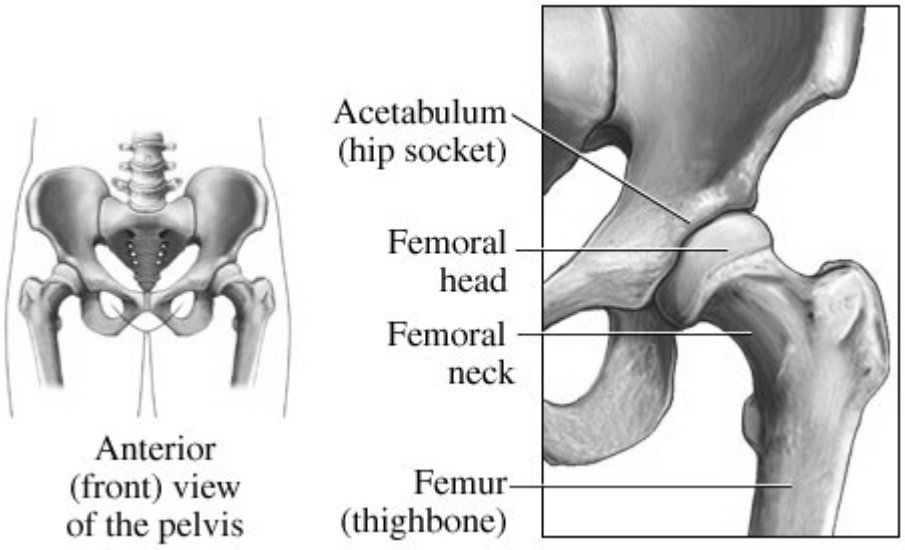
Loosening of the hip replacement is the most common problem. Tissue may grow between the parts and the bone, causing loosening. Usually it causes no symptoms and is only seen on x-rays.
Fracture of the femur may occur in 1 to 3 percent of cases.
Infection is a risk, and using antibiotics before dental work and other surgeries is advised.

Sample of exercises given by physical therapists after hip replacement:

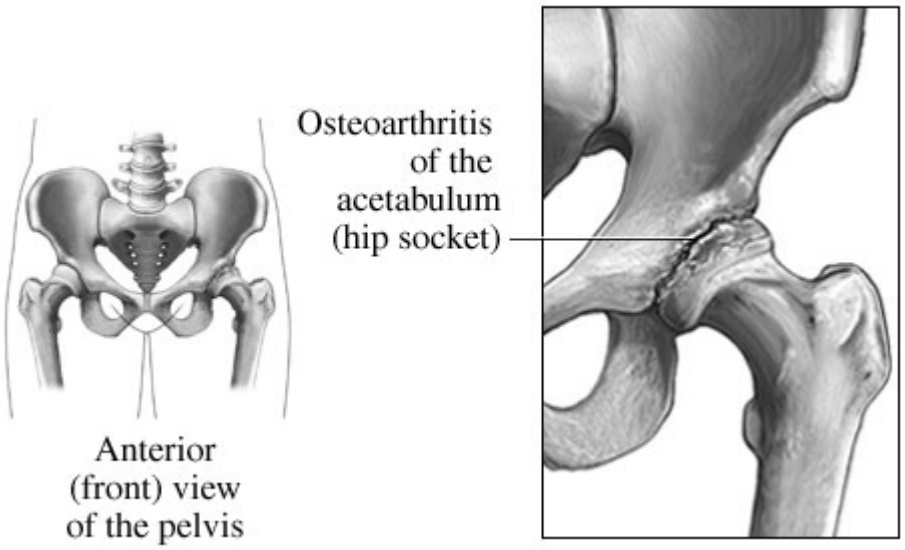
1. Quad Sets: Extend affected leg and tighten quadriceps so the kneecap moves towards the hip. Hold and count to 10. Do 2-3 sets of 10 repetition 2-3 times a day.
2. Gluteal Sets: While flat on back, tighten buttocks muscles by squeezing your seat together. Hold for count of 10. Do 2-3 sets of 10 repetitions 2-3 times a day.
3. Hip and Knee Flexion: With legs extended slide the heel on the affected side up to buttocks. Do very slowly and carefully, making sure not to flex the hips more than 60 degrees. Do 2-3 sets of 10 repetitions 2-3 times a day.
4. Abduction: With legs extended slide the leg out to the side and then back again. Dorsiflex the ankles. Do 2-3 sets of 10 repetitions 2-3 times a day.

Recovering from surgery will take 3-6 months, depending on the person's health and the success of rehabilitation. Learning to move with ease is an important factor after surgery. For 4-6 weeks following surgery, weight bearing is 50% on the affected side. This will allow the joint to heal and to stabilize. At the appropriate time it is important that the client move the hip joint in all directions to prevent problems such as stiffness, muscle shortening, and to reduce joint pain. A well-designed program of physical activity can increase the strength of the muscles that may have become weak as a result of the surgery. Postural imbalances can occur as tight muscles begin to compensate for those weakened by surgery. The client will need to recover the body's lost proprioception.

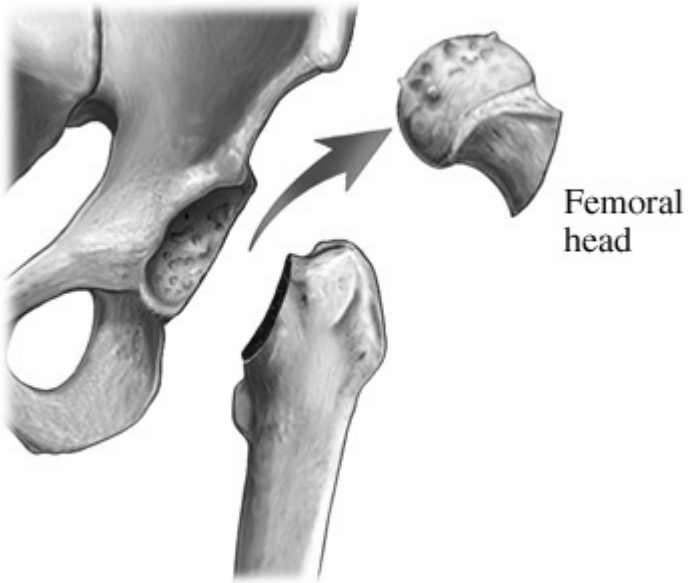
Normal Hip Joint



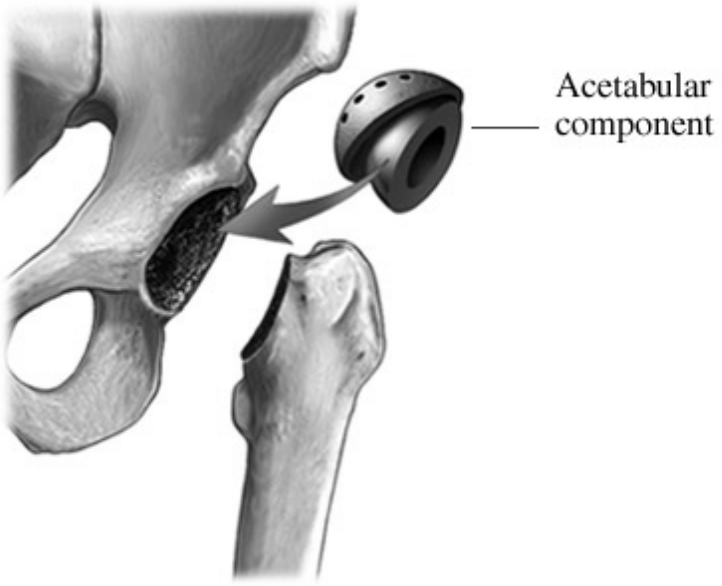
Hip Joint with Osteoarthritis



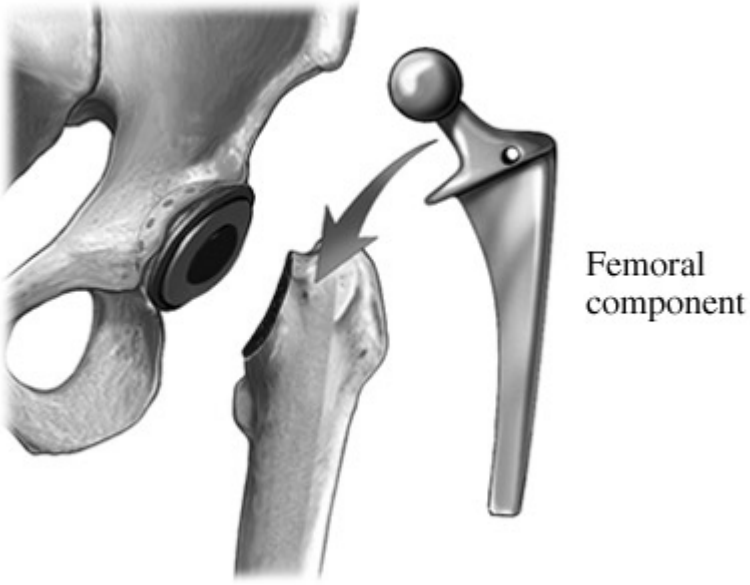
Removal of Arthritic Cartilage from Acetabulum and Upper End of Femur



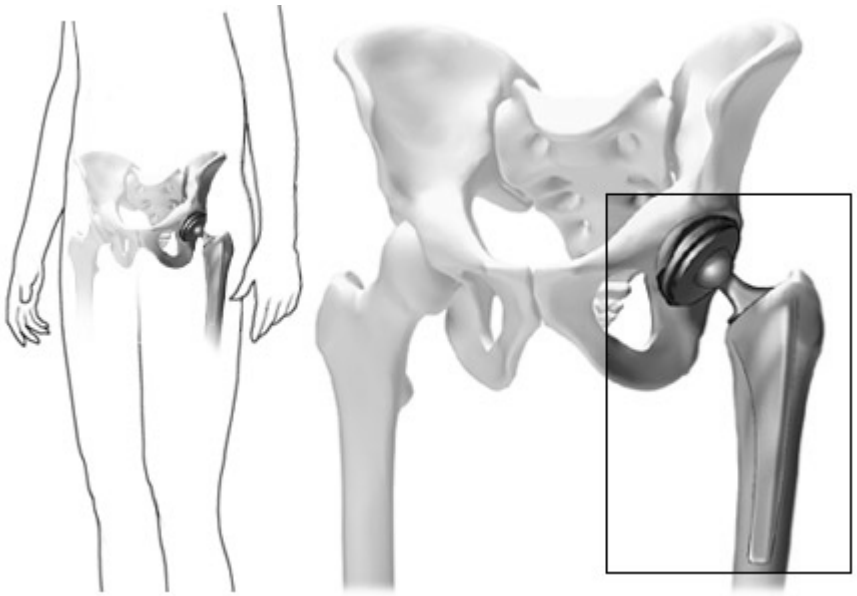
Placement of Metal Acetabular Component



Placement of Metal Femoral Component



Completed Hip Replacement



2b. Gross and Subtle Body Common Symptoms

Pain performing everyday activities is the most common symptom before surgery. The pain can be in the hip, knee, or lower back. Weakness in the leg on the affected side is common. The doctor will ask how often you require pain or anti-inflammatory medications, how often the condition causes you to miss out on activities, and whether or not you feel unstable and have fallen as a result of the hip. The doctor will watch how you move, and then move your hip to determine ROM, pain, grating sensations and lack of smooth movements. An x-ray will usually be the only test ordered. Sometimes a CAT scan or MRI will be ordered.

After hip replacement surgery the patient has an IV of antibiotics for about a day. She will also receive pain medications and a special leg stocking that inflates and compresses the veins to improve circulation. Anticoagulants will probably be prescribed. Generally, most people get out of bed with help the day after surgery. PT starts, and the patient learns how to walk with a walker or crutches. The hospital stay is usually a few days to ten days. Those who don't have someone at home to help them may go to a rehabilitation center. Total rehabilitation after surgery takes at least 6 months.

Subtle Symptoms

According to Louise Hay in *You Can Heal Yourself*, the hips carry the body in perfect balance. They represent a major thrust in moving forward. Hip problems represent fear of moving forward or having nothing to move towards. The joints in general symbolize

changes in direction in life and the ease with which one moves towards these changes. Arthritis is the manifestation of feeling unloved, harboring criticism, and resentment.

2c. Related Challenges

Immediately after surgery these are some of the precautions:
1. Avoid sitting in low chairs. Sit with the hips higher than the knees. Use a pillow to sit on if needed.
2. Do not put your foot on a stool when sitting.
3. Lean back and allow the operated leg to slide forward when sitting.
4. Do not lean forward while sitting.
5. When getting up or down, be sure the hip is not bent more than 60 degrees.
6. Transfer to the side of the unaffected leg.
7. Use an elevated toilet seat.
8. When standing, don't pivot.
9. Never be in a hurry. Think before moving.
10. Pick sturdy chairs for sitting, not one that will slide.
11. Use crutches or a walker for the first 6-12 weeks.
12. Do not cross your legs when sitting, lying, or standing.
13. Keep the affected leg facing front at all times.
14. Put a pillow between your legs when lying on your unaffected side.
15. Do not bend down to reach in drawers or pick up things from the ground. Get a "grabber" for picking up items.
16. Sit only in chairs that have arms. To get up from a chair, move to the edge and use the chair arms to help you stand. Place your affected leg in front of the other leg. Push up with the good leg, keeping your affected leg in front while getting up. To sit up from a chair, stand with the backs of the legs touching the chair. Bend the knees slightly and hold on to the arm of the chair. Come down into the chair slowly by continuing hip and knee flexion.
17. Swimming, golf, walking, and bicycling are acceptable activities. Activities that repeatedly jar the hip joint, such as tennis and jogging, are not recommended.

3. Ayurvedic assessment

According to Robert Svoboda in *Prakriti*, emotion is a significant factor in arthritis. The body is absorbing the conflict or repressed feelings that the mind cannot face. "If you can admit to yourself that you may have such an internal conflict and express to yourself the willingness to eventually deal with it you have taken the first step toward cure. Then you can use physical therapies to control the physical effect of the disease, confident that the hidden causes of your condition will not aggravate it while the physical housecleaning is going on." (*Prakriti*, p.147).

A person with arthritis has ama (toxicity) in her joints. Improper diet, exhaustion due to overwork, excessive exercise, and emotional disturbances can create ama. When food is improperly metabolized in the colon, ama arises and moves to the joints. The membrane that lines the colon is closely connected with bone nutrition. Ama is absorbed by this

membrane and easily reaches the joints. The immune system attacks the, and the inflammation becomes chronic.

Allergies to food are a common factor in producing ama. Svoboda recommends "Fasting, sweating, and the bitter and pungent tastes, all to enkindle the digestive fire" (*Prakriti,* p. 147), and thus to remove ama.
Fasting: Food should be light, little, and liquid. Weak ginger tea, rice or barley gruel, thin mung bean soup, and mung kichadi are recommended. Fast for a week or longer, or until symptoms subside. After fasting, introduce two or three foods a day to determine allergic responses. Take your pulse before and after eating. If your pulse increases by 5% after eating, then there is probably a reaction to one of the foods. Eliminate all fried foods, dairy, animal fats, all refrigerator cold food, white sugar, nightshades, alcohol. Cut down on the use of salt. Make sure that there is no aluminum in your diet, i.e. in cookware, baking powder, or in deodorants.

Sweating: Apply castor oil to the inflamed joint before using dry heat, such as a heating pad on the joint. Sunbathing is good for arthritic joints; it provides heat and vitamin D, which is vital for bone and colon health.

Bitter and Pungent Tastes: Bitter tastes help reduce inflammation, and pungent rekindle the digestive fire. Bitter substances help reduce one's tendency towards allergies. Bitter substances include: alfalfa, aloe vera, chickweed, chicory, Echinacea, Golden seal, Yarrow, Yucca. Pungent herbs include: basil, fennel, garlic, ginger, parsley, peppermint, spearmint, turmeric, valerian. Castor oil is pungent, and is especially used in rheumatoid arthritis. Give 2 to 4 Tbsp. of castor oil and a strong ginger tea to flush the colon.

Breathing exercises and simple yoga postures help with the elimination of ama. Meditation helps people with chronic pain by separating emotions and thoughts from physical sensations. "Love and compassion for yourself are the strongest remedies that exist for any disease, and the best nourishment for your immune system" *(Prakriti,* p.152).

4. Common body reading

Balance may be compromised by having one leg longer.
Hips slightly flexed while standing.

5. Contraindicated yoga practices

Hip replacement can be performed from the front (anterior) or the back (posterior) of the body. While most surgeries are posterior, the yoga therapist needs to ask which approach was used because the contraindications are different. If the surgery was a posterior one, the client needs to avoid hip flexion past 90 degrees and crossing the legs or ankles beyond the mid-line of the body. For the first couple of months after surgery, the client needs to avoid internal and external hip rotation. Later on, s/he needs to be cautious in external and internal hip rotation. S/he should not try to regain full range of motion in

these two hip movements. With the anterior approach, the client avoids external rotation, abduction, and extremes in hip extension. Eagle, gomukhasana, and some twisting poses are asanas to avoid for both approaches.

Getting up and down from the floor may be difficult. The client should avoid sitting in a cross legged position for a prolonged period of time, as would occur in a workshop. S/he should sit in a chair.

6. General Recommendations
a. Therapeutic/Free of pain

After hip replacement helps one become pain free, the new hip will have a satisfactory range of motion, and normal activities can resume. However, the new hip does not have the full range of motion of a normal hip. Because vigorous work or recreation can accelerate wear and tear on the hip replacement, one needs to engage in activities that are lower stress, such as walking, swimming, and bicycle riding.

Ideally, a person about to have a hip replacement will work on strengthening the muscles around the hip before, as well as after the surgery. One will need to strengthen the hip flexors, abductors, adductors, hip extensors, and the knee muscles. As always, assess comfort level with any recommended postures. Soon after surgery, the JFS, alone, in a chair will be enough.

After six to eight weeks or more, poses to strengthen the hip and knee muscles are as follows:
Setubandhasana-strengthens gluteus maximus, hamstrings
Parsvottanasana (not beyond 90 degree hip flexion)-strengthens psoas, adductors
Virabhadrasana I- (not beyond 90 degree hip flexion)-strengthens adductors, quadriceps
Virabhadrasana II-(Using caution with hip rotations) strengthens external rotators, abductors
Urdhva Prasarita Padasana-strengthens psoas, rectus femoris, quadriceps
Paripurna Navasana-strengthens psoas, rectus femoris
Bhujangasana-strengthens adductors, gluteus maximus
Half-Squat-strengthens quadriceps; squat on toes strengthens gastrocnemius
Tadasana on toes-strengthens gastrocnemius, helps balance, alignment, stability

Always adapt yoga practices to the client's physical condition. Use the wall or a chair for standing poses as needed. Each client will be different, and the program of instruction will be individually based. Because of impaired proprioception, the client may not be aware of alignment and postural imbalances, so ongoing feedback from the yoga therapist is necessary.

The following asanas for post hip replacement are from an article by Libby Ribold and Patty Bauer, "Yoga and Hip Replacement Surgery," in the *International Journal of Yoga Therapy*. The client can start this program after the recommended period of post-operative exercise and physical therapy.

1. Supported shavasana: Rest in the corpse pose and release tension in the body by observing the rhythm of the breath. Soften areas that may be tense.

2. Reclining extension or tadasana on your back: Activate the legs and flex the ankles. Extend the arms into the air in line with the shoulders or overhead in line with the ears. Keep the hips and legs muscularly activated. While in this pose, take 3-5 breaths.

3. Open the Gate: On your back with the arms in a T position (or lower), extend the right leg. Then on an inhalation, flex the left knee and open the left leg, using a small external rotation in the hip. On the exhalation return the leg to tadasana. Do this 6 times on each side.

4. Pendulum Swing: Lying on the back in semi-supine (knees bent at 45 degrees), create a pendulum movement in the pelvis. Slide the left iliac crest towards the left shoulder; then slide the right iliac crest towards the right shoulder. The back stays on the floor, maintaining its natural curves. Press the feet into the floor.

5. Diaphragmatic breath in makarasana (crocodile pose): Lying prone on the stomach, cup the elbows the hands and rest your forehead on the top forearm. Slightly rotate the thighs externally by turning your feet outward. Notice the flow of the breath and feel the pressure on the navel center. This pressure is calming. This position allows the diaphragm to work more efficiently and the breath to fill the thoracic cavity more fully.

6. Extension from the front side of the belly. While on the stomach, be aware of your breath as you stretch through the arms and legs. Do this 3-5 times.

7. Cat/Cow pose: While on all fours, exhale and round the spine (cat); then allow the spine to relax into a neutral pose on the inhalation (cow). Do this 6-8 times.

8. Leg Extension: While on all fours extend the right leg back, pressing through the heel. This may be done with the leg extended and the foot on the floor. The ankle is still in a strong dorsiflexion, toes curled under, while the foot is on the floor.

9. Standing, move into tadasana (mountain pose): While standing with a block between the upper thighs, stand in tadasana and extend the spine. With the upper thighs draw the block back and the tailbone towards the block.

10. Standing ardha-canddrasana (half moon pose): Stand in tadasana with the block between the upper thighs. Move the arms overhead and cup the elbows. While bending from the top of the hip, move sideways to the right. Face forward and keep the chest and left armpit open. Extending is more important than the sideways bend. After 3-5 breaths, repeat on the other side.

11. Forward facing trikonasana: Stand with your back to a wall and separate the feet. The buttocks touch the wall, and the feet are facing forward. On the exhalation, bend to

the right. The right arm moves down the right leg, and the left arm reaches overhead. Try to keep the upper body in the same plane as the legs. Take 3-5 breaths, and then repeat on the left side.

12. Upright dog pose: Facing a wall, stand 5-6 inches away from it. Move the arms up the wall, while pulling the tail away from the wall. Stretch for 3-5 breaths.

13. Natarajasana (dancer's pose): Face a wall and stand a foot away from it in tadasana. Bend right knee so that you can hold the right foot (behind you) in your hand. Put your left hand on the wall for stability. Move the right foot towards the buttocks on the exhalation. Release on the inhalation. Exhale and repeat. Do 6 times on each side.

14. Modified virabhadrasana I (warrior I): Stand in tadasana and face a wall. Press both hands into the wall as you step back with the right foot into warrior I pose. Extend the spine through the chest, yet allow the tailbone to release down. Press back with the right thigh and take 3-5 breaths. Repeat on the other side.

15. Virasana (hero pose): While sitting on the heels or a block, place hands on thighs. Palms are open and heart lifted. Do this for 5-8 breaths.

16. Hip sling: Sit in dandasana with a block on either side. Press onto the block and lengthen the spine, lift the heart, and allow the hips to relax towards the floor. Release any tension in the lower back. Extend through the legs. Hold for several breaths. Repeat twice more.

17. Baddhakonasana (bound angle pose): Sit against a wall with several blankets under buttocks and hips. Place the soles of the feet together and put a blanket or other support under the knees to limit range of motion. Hold the toes or ankles if that is comfortable. Lengthen the spine. Omit this one if external rotation is not desired.

18. Upavishtakonasana (seated wide angle pose): Seated against a wall, open the legs to about a 45 degree angle. Make certain that the feet are centered on the heels, feet squared with the little toe drawing back towards the head to keep the little toe in line with the big toe. Press through the legs and lengthen the spine. If desired, place a belt around the ball of either foot or around both feet at the same time. Press through the legs and out the feet. Hold for 3-5 breaths.

19. Bhujangasana (cobra pose) variation: Lie in prone position with the balls of the feet on the wall. Arms are alongside the body. Extend the spine and press the balls of the feet into the wall, inhale, and lift the upper arms towards the ceiling. In a variation the sphinx pose may be used for a less intense pose. Think about moving the skin of the stomach towards the sternum. At the same time press the forearms into the floor and back towards the body. Continue for 3-5 breaths.

20. Modified ardha-salabhasana (half locust pose): In prone position place the arms alongside the body, palms down. While pressing the hands in the floor and feet into the

wall behind, lift the right leg on the exhalation. Hold for 3-5 breaths. Repeat on the other side.

21. Cat/Cow pose: Repeat no. 7 here.

22. Suptabaddhakonasana (reclining bound angle pose): Use a strap around the top of the hips and around the feet. Rest on blankets and support all joints. Use a small lift under the wrists and arms, blocks under the knees and a pillow under the head. Rest and breathe for 3-5 minutes.

23. Shavasana: Use support under the head and the knees.

b. Stabilize situation and lifestyle change recommendations

Maintain optimal weight as this will help with longevity of the hip replacement. This will also decrease stress on all the joints. Diet changes consistent with alleviating arthritis are recommended. Eliminate red meats, dairy, refined sugar, fats, salt, and caffeine, as well as nightshades. Vitamin D is required for efficient absorption of dietary calcium. Vitamin D deficiency has been found in 50% of women with life-threatening hip fractures. The NIH recommends 400 IU of supplemental vitamin D for those between 51 and 70, and 600 IU for those older than 70. Other supplements Dr. McLanahan recommends are as follows: calcium and magnesium for underlying arthritis; vitamin C and pantothenic acid for cartilage repair; evening primrose oil for its antioxidant activity; fish oil, glucosamine and chondroitin sulfate.

c. Maintenance and long term considerations

The muscle dysfunctions will still exist even though the hip has been replaced. Unless the hips are aligned, the other hip or knee may need to be replaced. If the hips are out of their proper position under the shoulders and over the ankles, the proper flexion and extension of the torso and lower half of the body is unattainable. The pelvic girdle must be able to do four things simultaneously, i.e. hold the body upright, and allow for joint rotation, flexion and extension. Pete Egoscue (*Pain Free*, p. 114) says that we have become a nation of people in hip flexion. He has four exercises that are shown in Appendix II, page 24. He says that these "E-cises", as he calls them, will help align the hips as well as alleviate pain in that region.

The following are general principles from the *International Journal of Yoga Therapy* for yoga students with a hip replacement:

Learn to regulate the breath and the body.
Feel the rhythm of your breathing; relax, and be still.
Become aware of excess muscle tension around the hip joint; try to release it.
Practice sensing the body as a whole, noticing the hip in relation to the whole.

Support the hip with the wall or props when exercising the non-injured areas, so that those areas can still move with balance.
Use restorative poses to balance internal energy.
Exercise the muscles around the prosthesis.
Breathing practices steady the mind, relax the body, and make it more receptive to therapy.
A regular meditation practice enhances awareness which will help with the detection of any shift in the body's balance. Then one can become aware of unhealthy movement patterns before they become habits.

7. Q and A from www.yogaforums.com

Q. (March 16, 2005) I have a student who had her hip replaced 6 yrs ago. They told her at the time to always keep her legs together; should she ever sit with her ankles crossed she could pop her hip out and should that happen a terrible pain would occur. That thought alone created extreme tightness in her hips and lower back. I've had students with hip replacements in the past, but none were told such a thing, and they experienced pretty good range of motion. I would guess this student to be in her mid 50's, large boned and meaty in muscular structure. She has been fairly inactive since the hip replacement, but I see reasonable movement in her hips as we move through your joint freeing series (which I do with every class now as a 'warmer' for deeper asana work). But she has overall stiffness in moving her body, say, from a seated asana to hands and knees. I believe it is more in her mind, than the reality of her freedom of movement. But then again, I wish to honor where she is at this point in time. My question: What is your knowledge regarding hip replacements, and what approach should I take in assisting her in developing more mobility and freedom of movement? My teaching style (Indra Devi) is slow with breath and attentiveness to the inner workings of body and mind. I do no fast movements nor do I teach beyond the classes capabilities. Thank you for your response. Kat

A. There are valid cautions to be concerned with; they are external hip rotation which is crossing the legs and/or ankles. In general these mild motions need little caution if the range of motion (ROM) is measured first and found to be near normal. External hip rotation should be 45 degrees; internal hip rotation 35. Safest way to assess this is with client lying prone (on belly) and knees bent feet in the air ask them to widen the feet towards wall (internal hip rotation) and assess angles then reverse so feet are crossed with knees wider than hips width (external hip rotation). By doing these tests first you can see what they are capable of without pain. Be sure to ask though, they may be in pain and not volunteer this information.

IF the ROM is ok or close to normal then definitely proceed with my joint freeing series motions (especially #5 for hip rotation tone). You can look in my book for more examples of asanas for hip tone in the kinesiology strength not stretch is the way to go. It will develop ROM without the danger associated with over stretching. Indra Devi's method is great for this situation and in general her teaching style is optimal for yoga therapy. Namaste Mukunda

Q. (April 27, 2002) I have a question about people with hip replacements: Have a client who did yoga before having 2 hip replacements, she wants to return, any suggestions about what she cannot do? Her doctors say no forward bending! Thank you for any insight you can give to me regarding this.

A. For persons just returning from surgery I would keep the program simple, just warm up motions or my Joint Freeing Series and no more. After 4-8 weeks or when they are comfortable at sustained walking then I would add regular poses with the exception of forward bends beyond 90-degree angle, in other words nothing more than dog or stick pose. Focus more on the development of strength rather than flexibility for as long as possible.

Q. (May 19, 2003) Thanks for information regarding the Arthritis Diet by Indra Devi. My question today concerns the student I am working with. She has arthritis/diabetes/high blood pressure and recently had a hip replacement (8 months). Could you please give me cautionary advice for postures that I need to be aware of for this combination. We are using the Joint Freeing series (JFS) and lots of breathing, relaxation and meditation.

A. For arthritis the JFS is a good idea. In general contraindications with this combination would be to make sure she is comfortable in all motions that she is doing, if not they should be modified to be effective at increasing circulation and minimizing stress/pain. For hip replacement the main contraindication would be to avoid cross legged poses (sitting on the floor), full flexion (go half way in forward bends) and in general external hip rotation poses. In other words, do not try to stretch her hamstrings or deep gluteal region, except in a mild fashion. Most people with high blood pressure are monitored and taking medication that controls the pressure. Rarely is there someone with high blood pressure that is unregulated if that is the case then we avoid moderate and strong back bending as it can stimulate the barroreceptor to elevate heart rate and blood pressure.

Q. (April 24, 2002) My recovery is long. I still work at home two days a week because of emotional trauma. It's great because it's like working part-time. I was plagued with hip pain since the accident that turns out to be osteoarthritis in my right hip that all my battery of body workers believes was aggravated by the car accident (I was knocked over and landed on my right hip). With the help of an excellent physical therapist, I am trying to manage the pain and prolong the life of my hip. I'm not ready for the inevitable hip replacement yet.

I walk with a cane now to get the weight out of my hip. I have to lose 25 lbs. Hopefully, I won't need the cane after that. I've gone from an exerciser to a person who takes exercise on days when I'm not in pain. Fortunately my PT wants me to continue to do yoga and swim with the understanding that when it hurts I stop. I am learning a lot about modifying yoga. When the pain flares up, as it is this week, I can't do any activity. Some of the simplest movement is the biggest pain like putting on shoes and underwear.

When it gets really bad, I can't even get comfortable enough to sleep without pain. So, it's a new life. Actually, I'm pretty cheerful all things considered.

A. For pain I have found that regular practice of my joint freeing series as described in my book can work wonders. No special adaptation needs to be given except to be sensible for painful motions and do what feels tolerable. A key for relieving pain is to learn to direct prana into the specific joint that you are moving. Prana is said to be stuck in joints and this series mobilizes the prana so that it can return to proper sites in the subtle body and restore your natural state of peace.

There is a gentle hands on healing technique for relieving trauma from accidents, the basic formula is from L. Ron Hubbard and is called Contact Assist. A small pamphlet on this method is sold for $3 from Scientology Centers to explain the technique which works wonders even when event was sometime in past. I have modified it based on yogic concepts of pranayama and have been able to release emotional trauma that was from early childhood. (NOTE-I do not endorse Scientology, but this method is quite beneficial).

Losing weight can certainly help make the arthritis more manageable. My teacher Indra Devi has a 10 day diet she recommends for arthritis. She claims that people who follow it diligently get free of symptoms. She is a glowing example of health at 102! Eat 90% basmati rice and 10% any type of squash only. The food is to be chewed thoroughly. Plenty of water is to be drunk and herbal teas for keeping the bowels moving. Nothing else is to be eaten but you can eat as much as you want. No condiments or other spices. I can give more details of other supplemental advice should you want to follow this suggestion.

8. References

Books

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Ribold, Libby and Bauer, Patty, "Yoga and Hip Replacement Surgery," *International Journal of Yoga Therapy*, No.15 (2005).

Stiles, Mukunda, S*tructural Yoga Therapy*, Weiser Books, Boston, 2000.

Svoboda, *Prakriti*, Lotus Press, Twin Lakes, WI, 2003.

Websites

http://www.totallyhip.org/
This site includes member discussions with advice about hip replacement, personal stories, and a support group for those with hip replacement. It also has many links, including those for arthritis foundations and The American Academy of Orthopedic Surgeons. I used the hip education link and the Links page.

www.courses.vcu.edu/DANC291-003/
This is a dance course taught by a physical therapist and a dance instructor. It has many pictures of dancers and anatomy in addition to the pages teaching about movement and the anatomy associated with the movements. I used the Unit6.htm link to reach "Unit VI- The Hip." The picture on page 24 is from this site.

http://my.webmd.com
"Questions and Answers about Total Hip Replacement" by NIAMS from NIH. This page answers basic questions about hip replacement in a clear and comprehensive way. "A-Z Health Guide from WebMD: Medical Tests." This is another informative page with links for the pictures on pages 9-11 in this paper.

http://n2.bioeng5.bioeng.aukland.ac.nz/ontology/images/HipFlexorsAndAddu
This is a site from the Bioengineering Institute at the University of Auckland. It has detailed information about anatomy. This is the URL for the specific page used for the picture on page 23.

www.yogaforums.com
This is a forum for questions and answers on yoga practices and yoga therapy with Mukunda Stiles. The page used was "Mukunda Stiles Q &A".

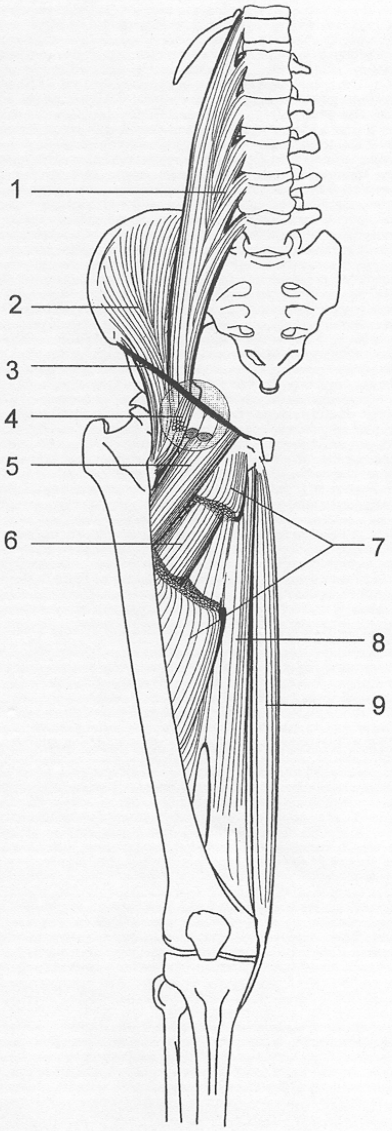
Other

Jim Schmidt, PT. Advanced Center for Physical Therapy, Charlottesville, VA.

9. Appendix I

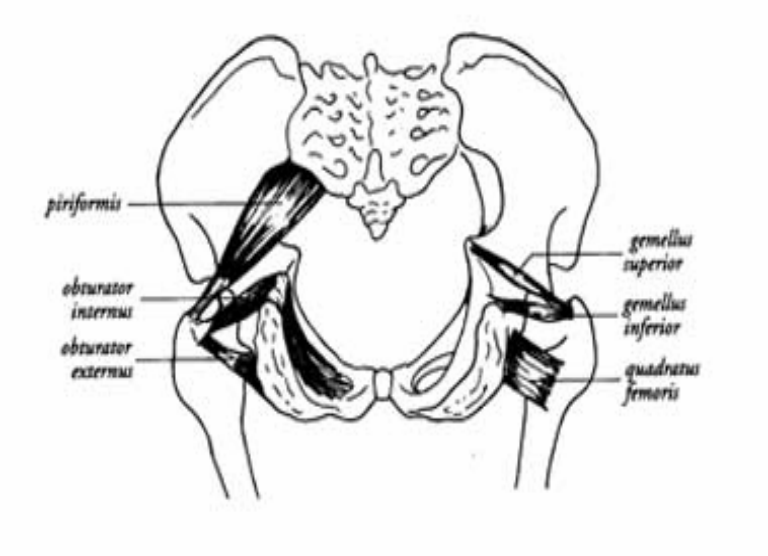
HIP FLEXORS AND ADDUCTORS

1. Psoas major
2. Iliacus
3. Inguinal ligament
4. Femoral nerve, vein, artery
5. Pectineus
6. Adductor brevis
7. Adductor longus (cut)
8. Adductor magnus
9. Gracilis



Hip and thigh—anterior view

Deep External Rotators



Appendix II

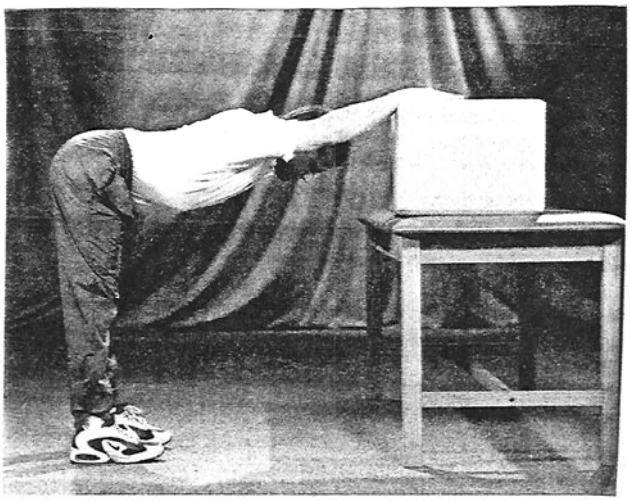
These exercises are from *Pain Free* by Pete Egoscue. Pictures follow.

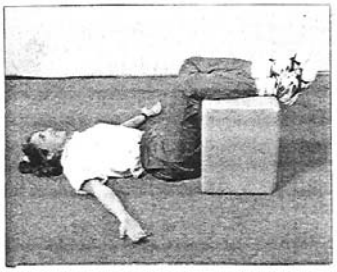
In the Counter Stretch place palm on a counter or tabletop that is approximately waist high. Bend at the hips with arms outstretched. Your head is between your arms, and your feet, ankles, and knees should be aligned directly under the hips. Inch your feet back to fully extend. The hips will be tilted forward and the thighs tight. Hold for thirty seconds. This exercise takes the hip out of flexion, forces the shoulders to disengage from their compensating position, and restores the spine's S-Curve.

The next exercise is called Sitting Floor. Sit against the wall, legs out in front of you. Contract the thigh muscles, squeeze your shoulder blades together, and flex the feet. Hold for four to six minutes. This establishes a shoulder, hip, knee and ankle link.

In Static Back lie on your back on the floor. Bend the knees at right angles and place the calves on a chair. Rest your hands below shoulder level with palms up. Let your back settle into the floor. Hold for five to ten minutes. The hips will settle into the floor and release muscles.

In the Supine Groin Stretch lie on your back with one leg resting on a chair with the knee bent at a right angle. The other leg is extended out on the floor and propped upright so that it does not roll to one side. Legs should be aligned with the shoulders. Relax here for ten minutes to release the inner thighs.





From *Pain Free* by Pete Egoscue

Appendix III

The Alexander Technique

F.M. Alexander was born in 1868 in Tasmania. He became an actor who recited monologues from Shakespeare. Because there was no electronic amplification at that time, he had to rely on the strength of his voice to be heard by the audiences. Unfortunately, he began to have problems with his throat and voice. Sometimes, during a performance, he would lose his voice altogether. Alexander consulted medical experts to no avail. So Alexander decided to take responsibility for his voice problem. Concluding that it must be something he was doing during a performance, Alexander set out to observe himself while reciting. What he noticed was that he was pulling his head back, lifting his chest, stiffening his legs and generally arching and narrowing his back. He had been previously unaware of these habitual movements that occurred before he began to recite. Alexander realized that habitual tensing of the neck muscles produced tension throughout the body. Over many years Alexander observed himself in the mirror and in such a way changed the habitual pulling down in his head, neck, and spine. Whenever he observed the misuse in his body, he would stop, release tension in his neck and back, and consciously allow his head to go forward and up so that his back could lengthen and widen.

Alexander found that the health and functioning of not only his voice, but of his entire body improved. One benefit was that his breathing during performances was effortless and noiseless. He soon realized that many people, not just actors, suffered from breathing problems. So Alexander began to help others improve the "use" of their bodies. By using his hands to gently guide his students through everyday activities, such as sitting and standing, he taught them to release tension and to move with more ease. Soon he became known as "the breathing man" and was in demand as a teacher of his technique.

We all move in habitual ways because we know how to move and don't have to think about it. That, however, is the problem. We already know how to sit at a desk and use the computer, so our mind is on the screen and what it says, and we forget about our body. We may be sitting with a head that is back and down, hunched shoulders, tight flexed wrists, and a compressed spine. Over the years we develop habitual movement patterns that decrease our ease of movement. As tense muscles use more energy than relaxed ones, we not only tire more easily, we squeeze our internal organs and hold tension around our joints. Changing a habit that has been repeated many times over the years can be difficult. In order to change a habit we need an awareness of it. That is what an Alexander teacher can do, help with this awareness.

According to Alexander, inhibition and conscious direction are the principles one applies to change habits. Inhibition in the Alexander world means to pause and think before performing an activity. We think about how we want to move into the activity instead of moving automatically. Inhibition helps us to consider whether we're using unnecessary muscular tension as we approach our activity. Just as Alexander noticed his body

stiffening before reciting, we might notice how the phone ringing can cause a startle reflex, a slight pulling back and down of the head, and an automatic rush to pick up the receiver with a stiff arm. Instead, let's consider letting the phone ring again as we pause, think about releasing the neck, so that our shoulder muscles can release and lengthen, as the arm extends towards the receiver. The startle reflex, so useful for early man who needed to decide whether to fight or to flee in his battle for survival, often causes unnecessary tension today. We go into the startle reflex, and many times, maintain that tension for much too long without even noticing it. If we are aware of our bodies, we will release this startle reflex. Better yet, if we use inhibition, we'll realize before stiffening that the extra muscular effort is unnecessary. In *Use of the Self* Alexander said "….if I was ever to be able to change my habitual use and dominate my instinctive direction, it would be necessary for me to make the experience of receiving the stimulus to speak and of refusing to do anything immediately in response."

After inhibiting an automatic response, Alexander then repeated the following directions to himself: I want my neck to release so that my back can lengthen and widen so that my head can go forward and up. Many of us tighten the neck muscles and pull the head back and down to do a simple activity like sitting or standing from sitting. We contract the flexor and extensor muscles of the trunk inappropriately and use more effort than necessary. This is an example of an established habit that needs to be inhibited. By releasing the tightening of the neck and preventing the pulling back and down in the head and spine, the extensor muscles of the spine work to our advantage. The Alexander student becomes "lengthened" because the "pulling down" of the flexor muscles in the front of the body has been inhibited, and an appropriate amount of tone has been used in the neck and back extensors.

Another principle in the Alexander Technique is "end-gaining. This means unthinkingly proceeding to the end result in any activity without inhibiting the old, automatic ways of moving and using the directions to lengthen the body. If trying to achieve a "correct" posture by taking a short cut and sitting straighter, most likely you will be end-gaining and stiffening instead of directing and allowing change to happen.

Primary control, another of Alexander's principles, refers to the relationship of the head, neck, and back. Alexander discovered that the state of the neck muscles determines the relationship of the head to the trunk and affected muscles throughout the body. Research since Alexander's time has shown that there are more nerve receptors in the neck muscles than in other muscles. The importance of the neck muscles on posture and balance is comparable to the organs of balance in the inner ear.

The Alexander student tries to become more aware of his or her mental state and thought processes because of its effect on the body. Alexander used the word "psychophysical" to explain his idea that the integration of mind and body is unavoidable. We not only use thought to inhibit and direct during activity, but we must be aware of our thinking in order to change habitual movements. This is where an Alexander Technique teacher helps a student by giving directions and helping to establish new patterns of movement which will restore the dynamic and fragile balance of the head on the spine and among

the reflexes of the postural muscles. The increase in the rotation of the axis of the head and the lengthening of the back muscles facilitate the extension of the spine in all activities, increase the space between the vertebrae, and improve circulation and respiration. Thus all mental and physical activity improves.

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Appendix IV

Arthritis Diet
from Indra Devi

For ten days eat a diet consisting only of 90% whole grain (brown or basmati) rice and 10% of any type of cooked squash. Cook one cup of rice for two cups of water. Every spoonful of rice is to be chewed at least 50 times until only a watery gruel remains in the mouth. Every two hours between meals have a relaxing non-caffeine tea. During the diet consume no other foods—no coffee, sugar or condiments. Drink as much water as you can. For those with hypoglycemia who need more protein, add soybeans or tofu to this diet.

Be prepared for your body's release of toxins that are the cause of the arthritis. This may take the form of headaches, body pains, constipation, moodiness, irritability, etc. Practice being present to yourself and do not medicate yourself to avoid your feelings with addictive substances—sugar, caffeine, food cravings- nor avoid your true feelings by watching excessive TV or seeking other sensory stimulation. Take plenty of water and herbal teas. You might consult an herbalist or take a Bach flower remedy to assist with the emotional or mental difficulties that may arise.

If there is pain from the arthritis symptoms, take a raw potato and slice it to the size of the painful area. Lay the flesh of the potato against the painful site and tie it there with gauze. Let it stay until the potato becomes hard and then replace it with another. This can be done during the day though it is especially good for overnight use.

If there is inflammation, apply a milk compress (a small towel soaked in milk) at room temperature. For fever apply a vinegar and water compress on the shin and calf area

down to the foot. Wrap your lower legs fully to retain the moisture then lay in a warm bed and within four hours the fever will be gone.

If you become constipated take an enema or one tablespoon of castor oil just prior to bed.

Following this anti-pitta regimen (to lessen heat and inflammation) is recommended for your regular routine—eliminate all night shades (potato, tomato, eggplant, bell pepper, and tobacco) and spicy foods. This will help you to identify the most likely aggravating foods and activities. More details can be found in *Ayurvedic Healing* by David Frawley or other Ayurvedic books.

Appendix V

Hip Resurfacing

On November 15, 2005, *The Washington Post* carried an article entitled, "As Boomers Age, Hip Resurfacing is Back in Vogue" by Alicia Ault. Hip resurfacing is a decades-old procedure that is becoming popular again because of advances in technique and metallurgy. It is an alternative to hip replacement and is available in this country only as a part of clinical trials at this time. However, this article predicts that within a year the FDA will approve a hip resurfacing device that will make this alternative available in this country. In hip resurfacing, surgeons sand down and smooth out the surfaces of the acetabulum and the head of the femur. Then they recover both with smooth metal caps. Cecil Rorabeck, a surgeon in London, says he generally does hip resurfacing in patients under 60 years old, and he does not perform the operation in post-menopausal women who have severe osteoporosis. This is because the peg of the resurfacing device is inserted into the head of the femur, and this increases the risk of fracture. The covering for the head of the femur can be closely matched to the size of the patient's bone, so this reduces the risk of dislocation. Hip resurfacing requires the same incision as a total hip replacement, but generally, is less traumatic because the head of the femur is left intact. This procedure also appears to give patients a more normal range of motion.

10. - **Biography**

Sara O'Hare teaches yoga and the Alexander Technique in Charlottesville, VA.
She has certifications in the Integral Yoga and Structural Yoga styles of instruction.
She completed the two year Structural Yoga Therapy course taught by Mukunda Stiles of the Yoga Therapy Center in Boulder, CO. She is a graduate of the Virginia School for the Alexander Technique. Sara has a Master of Education Degree from the University of Virginia, Charlottesville, VA and a Bachelor of Arts Degree from Salem College, Winston-Salem, NC.