

**STRUCTURAL YOGA THERAPY
RESEARCH PAPER**

Rotator Cuff and Similar Shoulder Injuries

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I examined and followed two female clients, one with a diagnosed rotator cuff injury, and the other with a more general shoulder injury. Shoulder injuries are of particular interest to me because I have suffered from a neck injury that has involved chronic shoulder pain over the past several years. I have had an assessment with Mukunda Stiles that focused on this type of injury. As these case studies bear out and I have seen with myself, these types of injuries often entail strengthening surrounding upper/middle back and arm muscles to alleviate the pain and give the injured tendons and muscles a chance to rest and recuperate.

Case Studies

1.a. Case Study One – Initial Interview - (Nancy) February 4, 2006

Nancy is a highly active fifty-seven year-old woman who skis, backpacks, hikes, bikes, fly fishes, quilts, knits, and reads. She is divorced and has one son and two grandsons (all in San Francisco – Nancy tries to see them quarterly). Thirteen years ago, Nancy was overweight and lost over 100 lbs. She is now at an appropriate weight for her height and has maintained that balance for over twelve years. Nevertheless, Nancy has an addictive personality and works hard to keep it in check (she attends various self-help groups). She calls herself “a controller in recovery.” I have known Nancy for almost 13 years, when we both worked at Prudential Insurance Company. She has been regularly promoted during that time to manager of a corporate division, a stressful and high-level job. Intelligent and kind-hearted, she organizes a once-a-week Friday noon yoga class at her job that she regularly attends (Iyengar based). She enjoys yoga and also works out at a gym once or twice a week but her primary physical activities are sports of all kinds. She would prefer to do rather than watch.

Nancy’s shoulder issues date back to 1969 when she was jumping on a trampoline at college and did a stomach bounce with her arms in cactus pose (arms abducted and in external rotation with elbows bent). She dislocated her right shoulder and over the next year or so, dislocated it another 20-25 times. She finally had surgery and a screw was put in somewhere between her sternum and shoulder (Nancy points to the middle of her clavicle bone when asked where it is but does not know the exact location or what it does). After the surgery Nancy had physical therapy and returned to her regular activities but avoided using that arm for any heavy lifting. She used her left arm instead with which she never had any problems until she went backpacking for 4 days around July 4, 2005.

Having backpacked many times before, this trip she and her friend decided to try bushwhacking. After several hours, they gave up and found a trail. They trail-hiked for the rest of the trip, but afterwards Nancy noticed her left shoulder was in continuous pain. By September, she could hardly move her left arm. An MRI showed she had a torn supraspinatus. She went into physical therapy for six weeks, three times a week, and also did the Joint-Freeing Series for hands, arms and shoulders that I gave her during that time (she was also experiencing carpal tunnel pain). At the end of physical therapy she tested in the normal range of motion and felt much better (no carpal tunnel pain). However, Nancy still experienced pain in her shoulder, particularly when abducting her left arm away from her body (until it was parallel to the floor, a normal range of motion). She also had pain when lying supine with bent knees to the right (in a twist) with her left arm extended and slowly circling it (counter-clockwise from 6 to 3 to 12 pm). She had pain from 3-12 pm.

While Nancy enjoys yoga asanas and their benefits, she does not regularly practice Pranayama or meditation. She derives her spirituality from nature, and refers to God as “the big guy in the woods.”

1.b. Physical Assessment

As Nancy was my first formal SYT client, I did almost an entire body reading of her, testing ROM and muscle strength. However, for this paper, I will present only the information that is relevant and related to her most pressing concerns.

Postural analysis revealed a right shoulder slightly higher than the left. When standing, Nancy's right shoulder, foot, and indeed, the entire right side of her body, was forward of the left. Her right arm was internally rotated. The scoliometer reading indicated her right hip was higher by about 2 degrees and that she has a large right thoracic curve of about 7 degrees (21 degrees in real terms) starting about C6 to T10. Her right leg was 1/4 inch longer than the left. Lying on her back, Nancy's external hip rotation was good and her left internal hip rotation was less than the right.

The SI test showed both sides of the sacroiliac joint going down.

RANGE OF MOTION	NORMAL ROM	2/04/06	4/23/06
Shoulder		Left/Right	Left/Right
Flexion	180	170/180	170/180
Extension	50	65/60	80/45
External Rotation	90	60/52	85/90
Internal Rotation	80	80/80	80/80
Adduction	130	130/130	130/130
Abduction	40	45/40	50/50
Neck			6/14/06
Extension	55	39	35
Flexion	45	45	51
Lateral Flexion	45	20/10	32/15
Rotation	70	80/47	74/55

MUSCLE STRENGTH	2/04/06	4/23/06	6/14/06
Shoulder	Left/Right	Left/Right	
Flexion	4/4	4/3	
Extension	1/2	3/3	
External Rotation	4/4	4/4	
Internal Rotation	3/3	3/3	
Adduction	4/4	4+/4	
Abduction	2/3	3/3	
Scapular Adduction	3/3		3/3
Latissimus Dorsi			1/0*
Neck			
Extension	3		3
Flexion	2		2
Lateral Flexion	3/2		3/2
Rotation	1/1		1+/1

* The right Latissimus Dorsi did not engage on its own, only after I pointed it out to Nancy and she focused on it.

1.c. Summary of Findings – Nancy

Strengthen	Stretch	Release
Latissimus, Teres Major, Triceps	Pectoralis, Anterior Deltoid	Left Pectoralis
Middle Deltoid		
Posterior Deltoid		
Bilateral Upper Trapezius	Left Upper Trapezius	
Left SCM	Right SCM	

Notes:

Due to pain in shoulders, it is uncertain if flexion ROM is inhibited by tight muscles or from shoulder injuries.

For external rotation in right shoulder, it is difficult to know how much ROM there truly is due to screw in client's right clavicle.

Client has some strong muscle groups in shoulder movements but shows weakness when muscles more isolated, i.e. deltoids.

Client has weakness in neck that might be related to shoulder difficulties.

1.d. Recommendations

February – March 2006

I made recommendations after the initial interview and after the second assessment (on 3/12/06). I then followed up with the client weekly. She talked to a trainer at her gym and researched on the Internet additional exercises to strengthen her deltoids, particularly the posterior deltoid. (I commented on the additional exercises Nancy found as to which I thought would work best and which might not.)

From the Joint Freeing Series (JFS):

I gave Nancy the entire JFS to do after the initial interview was completed for two reasons: to balance vata and also because she showed weakness in her lower body and could benefit from the entire series. She started at 4 repetitions for each movement, increasing to six. Since Nancy tends to overdo (she asked if she should do them twice a day), I recommended she do them every other day or three times a week, whichever fit into her schedule so that she wouldn't strain and possibly re-injure her shoulder. I particularly had Nancy employ the Wave Breath for this (see below). On my second assessment, I refined the shoulder adduction/abduction movement with elbow circles (rather than elbows moving forward and back in the same vertical plane, Nancy made circles with her elbows, keeping her fingertips on her shoulders). For the entire JFS, I also brought Nancy's awareness to the bottom tips of her shoulder blades by putting my thumbs there and asking her to push against them. I asked her to continue this pressing down of her shoulder blades into her middle back for all JFS exercises, citing that this would help her strengthen her lower trapezius (and help bring her high shoulder down).

Breathing:

I emphasized the Wave Breath with Nancy, asking her to do it during JFS. Although Nancy practices yoga on a fairly weekly basis, the class she takes is Iyengar-based and only an hour long and she reports that there is little focus on the breath. I explained how the Wave Breath would help balance vata and that pain is a vata imbalance. Specifically, vata regulates breathing and also the movement of muscles (*Ayurvedic Concepts* excerpt, Mukunda Stiles). By doing this, Nancy would bring awareness to what muscles she is using for different movements. Indeed, Nancy reports her pain feels muscular (supported by the MRI which showed a tear in the supraspinatus). Since muscle pain is specifically a pitta

imbalance, it can be brought into balance with strengthening (increasing kapha) and not going for the burn in the stretch (which would aggravate vata – see the asana section for the strengthening aspect of these recommendations). On our last visit, I spoke with Nancy about reigning in her desire to work at her maximum level but to maintain a balance between stretching and strengthening.

Asanas:

To help strengthen Nancy's shoulder extensors, I gave her Cat Bow (from *Structural Yoga Therapy*, Mukunda Stiles, see References.) She was to do that 4-6 times with the Wave Breath after having done the JFS.

For her neck, I gave her the Neck Strengthener (from *Structural Yoga Therapy*, Mukunda Stiles, see References). I had her do only 4 repetitions as the neck can be more easily fatigued and possibly strained.

After the second assessment, we worked on how Nancy held her arms in Warrior II. I wanted her to have more awareness of her deltoids so I had her lift her arms straight out in front of her, parallel to the floor, as if she were going into Warrior I. Then I asked her to plug her arms into the shoulder sockets (pull the humerus into the clavicular glenoid), draw her shoulder blades down her back, and open her arms to the traditional Warrior II position. I also had her adjust her arms to a height lower than her shoulders to maintain a pain-free state for her.

For the posterior deltoid, I gave Nancy Locust (*Structural Yoga Therapy*, Mukunda Stiles, 24 Poses) with her arms lifted out to the side like an airplane.

In an interim visit in March I tried the anterior deltoid/pectoralis release per Mukunda's workshop in New York City, November 7, 2004. Nancy thought it felt good but did not get significant benefit from it. It may be that since she is still feeling pain, her vata is imbalanced and she does not perceive her body experiences clearly. I will try a release once more at the end of our sessions to see if it has any greater effect on Nancy.

As for Nancy's scoliosis, it does not appear to present a specific problem. She doesn't experience any pain in her back so it makes sense to confine treatment to getting her shoulder out of pain. Future work will include asana practices to work on her scoliosis, as it may be that the scoliosis contributes to the weakness in her neck and contributes to the neck pain she experiences periodically.

1.e. Refinement of Initial Recommendations and Results of Recommendations

April – June 2006

Refinements were given to Nancy during this period.

April, 2006

Nancy shows improvement in a few areas. Of particular note, her ROM for external shoulder rotation has improved considerably, something she herself noticed before I measured her for the second time.

As for muscle strength, Nancy has shown improvement in shoulder extension and also in shoulder abduction, two areas I focused her on over the initial period.

With respect to the pain Nancy was feeling in abducting her left arm out to the side, she no longer feels pain with that movement, a major improvement.

In particular, two days before we met, Nancy attended her regular Friday noon yoga class and worked extensively on handstand. Her teacher (who knows about her shoulder injury) said she might not be able to fully participate and to take it easy (good advice). To Nancy's (and my) surprise, she was able to participate in the entire class without any shoulder pain. Her only remark post-class was that her deltoids were sore from the hard work, a sign I took as good given that it was her deltoids I wanted to see strengthened. She is using the right muscles for the job.

Both Nancy's shoulder extension and abduction increased. I am not overly concerned with this as she is building up strength, especially in her shoulder abductor muscles so it is okay she is showing an increased ROM.

Based on these results the following recommendations were made on April 23.

From the Joint Freeing Series:

I had Nancy continue her Joint Freeing Series. I believe the breathing coupled with the movement is keeping Nancy aware of her body and how hard she is working it.

Asanas:

I had Nancy continue with Cat Bow and also showed her the variation with fingertips turned toward each other and elbows bending out to the side of the body (perpendicular to torso). She found this variation too easy so I recommended she continue with Cat Bow as she had been working with it.

Then I showed Nancy another variation of Cat Bow per Mukunda's workshop (See Appendix). It is a more challenging version that will continue to strengthen triceps, latissimus dorsi, and biceps, but also adds in pectoralis. This variation will begin work in an area where Nancy shows more-than-needed ROM, namely in her shoulder extensors. I'd like to see her strengthen both sets of her pectoralis and anterior deltoid muscles. While Nancy could not do this variation, she agreed to try it periodically in the future if she feels ready for it.

In the meantime, I showed Nancy another shoulder strengthener to focus on the pectoralis and anterior deltoid. I had her hold her arms straight out in front of her, bend her elbows to 90 degrees, and press her forearms together. (This is a variation of Garudaasana or Eagle arms for those familiar with yoga poses.) With her upper arms as parallel to the floor as possible, I then asked her to lift her elbows while keeping her shoulder blades down. Nancy found this difficult but doable and such a reaction leads me to believe it is an area that needs work. For further consideration, as Nancy builds strength, she could consider working with more challenging asanas, namely arm balances to strengthen the entire shoulder girdle. I would recommend she work with a certified yoga teacher in such case.

Nancy continues to do the Neck Strengthener. She visits a chiropractor who routinely adjusts C1, 2, 3 4, and 6. Nancy would like to work at strengthening her neck.

June, 2006

I did not test Nancy's entire shoulder/arm this last time since she is out of the pain she initially came to me for, but instead focused on her neck where she says she still feels weak. Interestingly enough, Nancy

has made progress in her neck ROM results, flexion and lateral flexion both increasing. However, she says extension is still difficult and indeed her muscle strength testing showed no change from the initial results. I suggested she try the Neck Strengthening Exercise lying prone, on her abdomen, as recommended by Charlotte Chandler Stone (Hamsa) (See Appendix). Nancy immediately felt that the first part of the exercise, face down (head not rotated) and lifting her head worked the exact area she says feels weak. She also self-adjusted her effort saying the first time she did it, she felt it in her lower back. She tried it a second time not going so high and doing it more mindfully and said it was exactly what she was looking for. This self-adjustment for overexertion is a good indication that Nancy is beginning to use her pitta correctly in a discernment way rather than overdoing it as she has been used to.

Nancy continues to find Cat Bow difficult so I also did a specific muscle test for Nancy's latissimus dorsi (an arm extensor). These two muscles are very weak, especially the right side where Nancy had to concentrate to engage it. We worked with Bridge Pose (*Structural Yoga Therapy*, Mukunda Stiles, 24 Poses) but put the focus more on her arms and chest rather than the hips. I had Nancy press her entire arm down into the floor (palms up) to push her chest toward her chin and focus on using the latissimus dorsi to achieve this. She tried it and understood but found it difficult to engage those specific muscles. She said she would continue to work with it in her weekly yoga class. I also suggested she could request help at her gym for a specific machine to strengthen her latissimus dorsi. She agreed to try that also.

Lastly, I offered to do the shoulder release I first did with Nancy and she enthusiastically agreed. She told it felt very good last time, an indication that she is becoming more in tune with how her body feels.

When I asked Nancy to sum up her experience with Structural Yoga Therapy, she wrote this to me in an email:

I think the yoga regimen you developed has resulted in more flexibility (well into normal ranges) and less discomfort (almost none). Both of these were high priorities for me when we began. I plan to continue with the program and believe it will also lead to greater strength, particularly for the rear deltoids and triceps. I am convinced I dodged surgery with the combination of PT and structural yoga [therapy]. Thanks!

1.a. Case Study Two – Initial Interview (Natalie) – February 23, 2006

Natalie is 34 and works as a product/package designer with computer graphics, but her real love is painting. From Spain originally, Natalie has been in the states for over 10 years. In her twenties, she became a vegetarian and began meditating. Only in the last 5 years has she begun practicing yoga. Natalie told me she has pain in her right shoulder (she points to the upper trapezius). She could not name a precipitating event, though after she went skiing in January 2006 (Natalie is an avid skier, grew up skiing in Europe and is an expert) she first felt the pain then. She took baths and went for massages and soon the pain went away. Then Natalie began to paint more, and the pain returned. She did many homeopathic rubs and Reiki but neither helped. She stopped doing yoga but kept painting. After one massage, she felt so bad the next day she didn't get out of bed (that was two weeks before I saw her). A week later, she saw an orthopedic surgeon who told her she had an inflamed biceps tendon. Natalie points to the right anterior deltoid for where she has felt pain before. Now it is back in the right upper trapezius.

1.b. Physical Assessment

Natalie is a very serene and grounded person. She is slender with highly mobile joints that tend to hyperextend and a long, graceful neck. She is currently taking Advanced Teacher Training at Integral Yoga and is modifying her postures to resist aggravating her shoulder.

Postural analysis indicates that the right shoulder is only very slightly higher, indicating the right upper trapezius and levator scapulae need to stretch or release and should be accompanied by strengthening the lower right trapezius and latissimus dorsi. Otherwise, Natalie appears very balanced physically. The scoliometer reading indicates a small right curve of 3 degrees from L 2 to T 2. The SI test shows the left side dropping while the right stays even.

RANGE OF MOTION	NORMAL ROM	2/23/06	6/21/06
Shoulder		Left/Right	Left/Right
Flexion	180	180/170	180/180
Extension	50	90/85*	80/80
External Rotation	90	90/85	90/90
Internal Rotation	80	100/90*	90/90
Adduction	130	130/120	130/130
Abduction	40	50/45	45/55
Neck			
Extension	55	55	60
Flexion	45	70*	56
Lateral Flexion	45	40/40	44/48
Rotation	70	85/75*	93/73

MUSCLE STRENGTH	2/04/06	6/21/06
Shoulder	Left/Right	Left/Right
Flexion	4/4	4/4
Extension	2/1	3/2
External Rotation	3†/2	3/3
Internal Rotation	2/2	2/1+§
Adduction	3/2§	3/2+
Abduction	3/2†	3+/3+
Latissimus Dorsi		4/2
Neck		
Extension	4	4
Flexion	4	4
Lateral Flexion	4/4	3/3+
Rotation	1/1	2/2
Spine		
Erector Spinae	1+	3

* ROM exceeds normal range.

† Natalie moved her arm to help with this test.

§Natalie recruited for this test.

1.c. Summary of Findings – Natalie

Strengthen	Stretch	Release
Right and Left Latissimus Dorsi, Triceps, Posterior Deltoid Right and Left Lower Trapezius	None*	Levator Scapulae† Upper Trapezius
Right External Rotators		
Right and Left Pectoralis, Anterior Deltoid, Teres Major		
Right and Left SCM		
Erector Spinae		

* With Natalie's extended ROM, she needs to strengthen and not stretch.

† We found this muscle and its chronic tightness after our second formal assessment.

1.d. Recommendations

February – March 2006

I made recommendations to Natalie after her initial assessment. Since she and I were in the same Advanced Teacher Training program at Integral Yoga for 2 1/2 months, I was able to check in with her twice a week. She was always happy to talk about how her shoulder felt that day.

From the Joint Freeing Series:

Natalie was already familiar with the JFS and found it beneficial so we simply reviewed it and modified the shoulder series to keep her out of pain. However, I asked her to focus on the strengthening aspects, i.e. to feel what muscles were contracting to produce the movement. Since Natalie has a formal everyday practice, I recommended she insert these practices everyday, 4-6X.

Asanas and Other Strengthening Exercises:

I started with Natalie's weak erector spinae and suggested Cobra (*Structural Yoga Therapy*, Mukunda Stiles, 24 Poses) for her. She confessed that she hated doing Cobra so I asked her to show me how she did it. In Cobra, Natalie hunched her shoulders and lifted her chin to be parallel to the floor, thereby compressing her cervical spine. I demonstrated how to come up the next time, to keep her chin down to lengthen both the anterior and posterior of her cervical spine, and to pull her shoulder blades down into the middle of her back. On Natalie's first try, she immediately felt the difference in the pose and experienced a great relief. She has repeatedly told me how much she loves Cobra now.

To strengthen Natalie's arm and shoulder girdle, I gave her Cat Bow. After a week, she told me it was too much, so instead I asked her to simply press into her hands while in Cobra and lift up one or two inches (Cobra Variation, see Appendix). I explained she would work similar muscle groups as in Cat Bow with that variation. She was happy with the change.

I also gave her the Neck Strengthening Exercise (from *Structural Yoga Therapy*, Mukunda Stiles). Natalie has a very slender, graceful neck that is probably adding to the strain on her shoulders. She enjoys this exercise and believes it is helping her.

1.e. Refinement of Initial Recommendations and Results of Recommendations

April 8, 2006

Natalie had a doctor's appointment with another orthopedist a few days before our second formal meeting. After pulling her right arm past her pain-free range of motion, the doctor declared her ROM was better in her right shoulder than in her left. The doctor also diagnosed her with bursitis and told her to rest the shoulder. Natalie found this less than helpful.

Natalie continues to take hot baths and showers as she finds relief with this kind of treatment when her shoulder is particularly aching.

At this second meeting, I asked Natalie to do a Sun Salutation round for me so I could watch and adjust each of the positions to make sure she was not overusing her trapezius and levator scapulae. There were four places where Natalie was doing just that. On initially lifting her arms to be next to her ears, Natalie would hunch her shoulders and once the arms were alongside the ears, she would then pull her shoulder blades down. In lunge, Natalie would reach her chin out and up, squeezing the back of her head toward her shoulders (like in Cobra). In Downward-Facing Dog, Natalie hunched her shoulders again and diminished the space between her arms and head (essentially hugging her ears with her shoulders). On going into chin-chest to the floor (8 pointed Pose), Natalie once more hunched her shoulders.

I went through the Sun Salutation one more time with Natalie, pointing out these places. She was amazed to feel the hunched shoulders while lifting her arms in Tadasana. I instructed her to keep her

shoulders and shoulder blades down while lifting her arms and to go only as high as she could without the shoulders moving. She agreed she would have to stop sooner than usual and work toward getting her arms next to her ears over time. In lunge, I asked Natalie to focus on lengthening the back of her neck as much as the front, along with lengthening her spine, and to keep her chin down and relaxed. In Downward-Facing Dog, I instructed Natalie to again feel her shoulder blades pull into her middle back, thereby employing her lower trapezius to keep her upper trapezius relaxed. She did so and felt the difference and the ease in her shoulders. Natalie found it difficult, however, to keep the shoulder blades stationary in the chin/chest-to-floor-movement. She thought she would start working on Cat Bow again to help with this.

I then brought in an anatomy book to show Natalie how the upper trapezius and levator scapulae work to either lift the shoulder blades or extend the neck. Natalie found the pictures helpful in identifying where she felt her pain and which muscles were responsible for it.

June 21, 2006

I met with Natalie to take her final measurements. She showed increased (normal) ROM in her shoulder flexion and external rotation; a decrease in ROM in her shoulder extension and her neck flexion; and an increase in strength in her shoulder extension and abduction, and in her erector spinae. All were positive results.

I asked Natalie how everything was going. We hadn't seen each other since we graduated our Advanced Teacher Training on May 22, 2006. Natalie reported that her shoulder was feeling very good and that she wasn't having the pain like she used to. However, she also said she hadn't been doing a lot of yoga in the past few weeks as she was getting ready to go to Italy for two months to work on her Masters Degree in Painting. Natalie beamed at this prospect when she told me. I mentioned that such a great opportunity might have something to do with her pain disappearing and she agreed, saying she felt "as if a great weight had been lifted off her shoulders."

Natalie also told me that while she hadn't been doing her Structural Yoga Therapy routine this past month, she still did the Neck Strengthening exercise as she felt she didn't want to skip that even if she didn't do everything else. From the results of her muscle testing this last time, it appears the exercise is beneficial to her.

Lastly, I asked Natalie if she was still aware of her shoulders during Sun Salutation and she said she was and appreciated the changes we had made to the different postures. I mentioned she might take a look at how she paints, how she uses her arm and her shoulder, and to try to keep the shoulder, specifically the upper trapezius, relaxed (she uses her right hand/arm to paint), and rely on the deltoid and biceps to move her arm. Natalie promised to look at that and also assured me she would get back to her Structural Yoga Therapy routine once she was over in Italy. I asked Natalie if she had time before she left for Italy if she would send me an email summarizing her experience. Here is what she wrote:

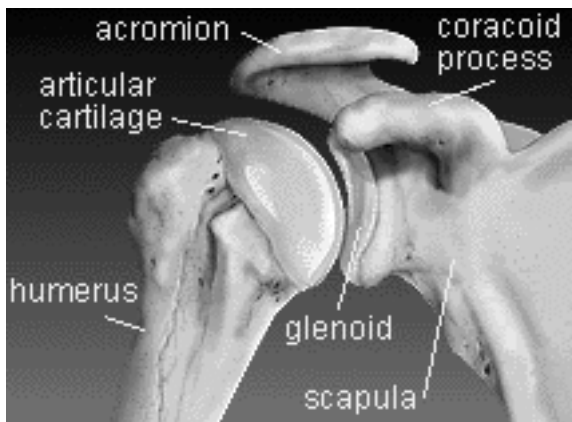
The Structural Yoga exercises were a great help to my shoulder condition. Beth's assistance was caring, knowledgeable and efficient throughout the time of my injury. I would recommend this practice to anyone interested in deepening the understanding of their physical ailment and returning to a healthful condition in an easeful manner.

2.a. Name and Description of Condition

The shoulder is the most flexible joint in the body, allowing humans to do a multitude of activities and without which most of our sports would not be possible. Because of this mobility, it is also one of the most injured joints in the body, specifically from sport activities. In particular, rotator cuff injuries are generally from a micro-tear to a muscle or tendon due to repetitive movements, such as baseball pitchers throwing a ball. Tears can also come from simply putting out a hand to stop a fall. It is the only ball and socket joint that can easily become dislocated, primarily because the major supports for it are tendons and ligaments. With this being the case, the shoulder is also susceptible to injury from simple wear and tear and the passing of years. Someone can hear a popping or feel a tear in the shoulder area as a precipitating factor to a shoulder injury, immediately feeling pain. Or a person could begin to feel a nagging discomfort only with certain movements that then escalates into pain and an inability to move the arm, eventually resulting in a frozen shoulder if not identified and worked with immediately. Shoulder injuries are one of the more common reasons people in their 50s and 60s go to an orthopedic surgeon.

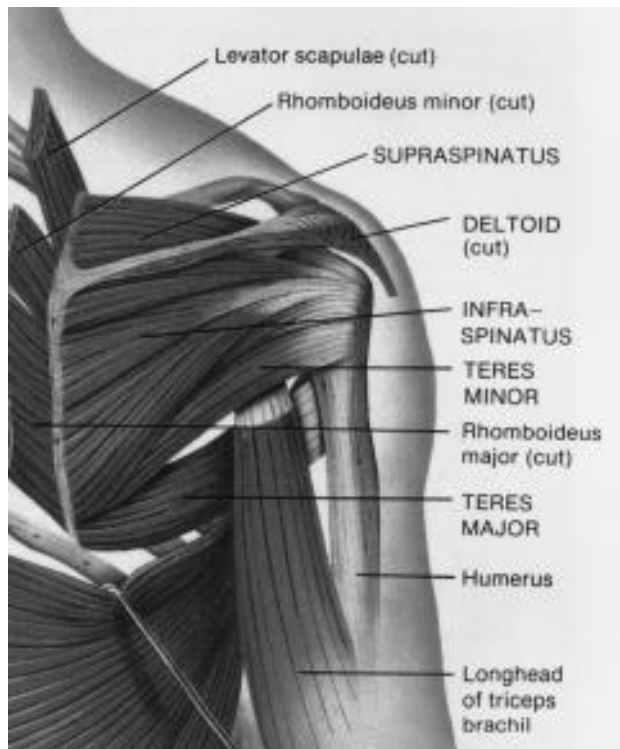
2.b. Gross and Subtle Body Symptoms

The shoulder joint is made up of three bones, the humerus, the scapula, and the clavicle. The joint itself is very shallow, with the humerus fitting into the scapula (at the glenoid), resembling the fit of a golf ball sitting on a tee.



© Primal Pictures

The joint is then held together with several ligaments and the tendons of four muscles: the subscapularis, the supraspinatus, the infraspinatus, and the teres minor. Collectively, these muscles are referred to as the rotator cuff. Together with the deltoid, they place the arm in the overhead position essential in many sports (baseball, football, swimming) and daily activities such as putting on a pullover shirt, taking a shower and washing your hair, or doing Warrior I in yoga class.



Courtesy of The Stretching Handbook

Individually, the subscapularis is an internal rotator of the arm. The supraspinatus helps the deltoid abduct the arm, with its greatest contribution being the initiation of abduction. The infraspinatus and teres minor muscles both externally rotate the arm. Together, these muscles abduct and externally rotate the arm.

To avoid injury to the rotator cuff, or to rehabilitate from an injury, the muscles supporting the shoulder should be strengthened, particularly in a way to assist the injured muscle(s), providing a better chance for it to rest and recuperate. In particular, the deltoid and each individual part of the deltoid should be strengthened, along with the latissimus dorsi and pectoralis, both bigger muscles that can do much of the work of the smaller muscles that tend to get injured.

Once the injured muscle has rested and begun to repair, care must be taken in changing behaviors that use the shoulder muscles in an incorrect way. How the arm is lifted is of great consequence to keeping the shoulder free from injury. Bringing awareness to the client's overuse of the smaller muscles and getting them in touch with the bigger muscles that can bear more of the burden is imperative.

2.c. Related Challenges

Athletic and physically active people are the most likely to suffer from a rotator cuff injury. However, a simple fall and using the hand to catch one's self can result in this injury. Once injured, typical challenges are completing everyday tasks such as, putting on a coat, washing one's hair, reaching up to a shelf for a box of pasta. It is this challenge in everyday activities that makes the recovery from this injury particularly difficult.

The initial treatment involves a common acronym, RICE (Rest, Ice, Compression and Elevation). During this period, it is best if one can keep the injured shoulder relatively sedentary. This is likely to be challenging for "Type A" people and impatience will lead to over-use of the injured arm/joint, making recurrent injuries common. Unfortunately, most people cannot stop using their arm or hand, especially if it is the dominant one, for even short periods of time.

However, encouragement to use the opposite arm, even if it is the non-dominant one, can be a great exercise not only in learning ahimsa (non-hurting of the injured shoulder), but also in one of balance and concentration. One example is learning to brush the teeth with the opposite arm, or use the computer mouse with the opposite hand. By off-loading the demands of the injured arm onto the other one, the body learns balance between the two arms. And in order to do that, it requires great focus and concentration of the mind on the task at hand while the non-dominant or uninjured arm/hand is learning a new task. Again, patience is required with this technique and may be lacking in the client.

3. Ayurvedic Assessment

Joint weakness and injury, and the resultant joint pain, is characteristic of imbalanced vata. The bones and joints are a target site of ama deposits in those with vata imbalances. During the initial injury phase there may also be inflammation, which involves a pitta imbalance. To avoid re-injury, strength needs to be increased, thereby introducing a kapha balance.

While neither of my clients had formal ayurvedic readings of their constitutions, my guess is that Nancy is of a pitta/kapha constitution and Natalie is vata/pitta. For Nancy, her shoulder initially had a kapha imbalance as it was frozen. Physical therapy with hands-on manipulation got her past that. When she came to me, her ROM was still limited, an indication of a vata imbalance. To balance vata, I gave her Joint Freeing Series and breath-work to do, which also gave her a chance to move her shoulder without going into pain, something she was not used to. While Nancy did not show any signs of inflammation or heat in her shoulder, she felt pain in her muscle, indicating a pitta imbalance. I had her focus on the strengthening aspect of the JFS to help her build kapha and dampen the pitta fire. We looked at how she was moving her arms, especially with the awareness to having her shoulder blades down her back and "plugging" her arms into her shoulder sockets. This allowed Nancy to employ her pitta discernment when she moved her arms in different yoga poses and in everyday activities.

Natalie was already doing the JFS when I first saw her. I did not get the sense she had a vata imbalance since her ROM was not limited. In addition, she also has a very strong yoga practice with an emphasis on Pranayama and meditation. It was also notable that heat made Natalie's shoulder feel better, thereby leading me to believe she has little or no inflammation or pitta imbalance. Where Natalie most needs to work is building up kapha, strength and grounded-ness. This would help balance her extended ROM and would be particularly helpful for her painting where she stands for long periods of time and uses the same arm/shoulder movements on her right side to paint.

3.a. Ayurvedic-based Yoga Recommendations

The Structural Yoga course of treatment is balancing vata, pitta, kapha and vata again. Nancy’s initial reading conveyed a vata and pitta imbalance and so introducing the wave breath and the JFS with a strengthening emphasis was appropriate. This particularly helped strengthen and stretch the muscles of her shoulder. For Natalie, who already had a solid breath practice, the JFS worked at strengthening her shoulder joint muscles to build kapha in the gross body. Both clients then worked on pitta discernment with respect to how they were using their arms/shoulders in various yoga practices. This helped to deepen the work in the asanas where both clients could begin to build strength and kapha.

While I have not delved past the gross body with Nancy, I believe Natalie has experienced some balancing at a deeper level. It is interesting to note that Natalie’s pain diminished greatly after her decision to pursue her passion, painting, by going for her Masters Degree in Italy.. It could be a combination of resting the shoulder completely by not doing yoga for several weeks, but I believe it is also very much the renewed devotion (kapha) to something she loves to do. I believe her continued Pranayama and Meditation practice will keep rebalancing any vata imbalance.

4. Common Body Readings/Findings

Relevant muscle imbalances revealed by posture include muscles supporting torso, shoulders and neck. Relevant common body readings from *Structural Yoga Therapy*, page 103 are:

Postural Change	Tight Muscles	Weak Muscles
Round Shoulders	Pectorals, serratus anterior	Middle and lower trapezius, latissimus dorsi
High Shoulder	Upper trapezius and levator scapula	Lower trapezius, latissimus dorsi, pectoralis sternal
Palm Turned Forward	Teres minor, infraspinatus	Pectorals, latissimus dorsi, teres major
Palm Turned Back	Pectorals, latissimus dorsi, teres major	Teres minor, infraspinatus
Winging Scapula	Middle trapezius, rhomboids	Serratus anterior, pectorals, anterior deltoid
Forward Head	SCM	Upper trapezius

5. Contraindicated – Modify or Eliminate

For an injury of this type, all movement is contraindicated in the first few days immediately following the trauma event. Since the shoulder is made up of many ligaments, ligaments repair best with rest. However, after those first few days (or weeks; this will be a subjective decision depending on the injury, the fitness and age of the client, and any medical assessment) it is important to get the client’s arm and shoulder moving again so it doesn’t tend toward a frozen state, a common side effect of a rotator cuff injury. Good indications for trying movement again will be reduction of any swelling and disappearance of chronic pain. Then the client can begin working with a modified asana practice or JFS (see “Therapeutic/Free of Pain” section below for suggestions). Challenging asanas such as inversions and arm balances should be eliminated from the initial recovery period. The JFS, however, is a good substitute in the beginning for a regular yoga practice since it can be used to safely strengthen and

stretch the muscles surrounding the shoulder. As movement returns, awareness to the position of the shoulder can be developed, including depression of the shoulder blades and keeping the humerus in a stable relation to the shoulder socket (i.e. “plugging” the upper arm into the shoulder.)

As recovery continues (the shoulder regains most of its ROM and there continues to be no pain), the client can return to a regular asana practice and poses can include simple shoulder strengtheners like the lifted arm positions in Warrior poses, with emphasis on the upper arms being plugged into the shoulder sockets. The client can also do mild weight-bearing asanas such as Cat Bow and Downward Dog. Eventually, once the shoulder has full range of motion with no pain for several months, more complicated asanas, such as inversions, can be added back in under the supervision of a certified yoga instructor so long as the client has developed a strong awareness of which shoulder muscles should be working and which should not.

6. General Recommendations

Long-term maintenance of shoulder stability requires a regular program of arm, shoulder, back and possibly neck strengthening exercises and asanas. Shoulder extension, adduction and external rotation are all movements vital to recovery. In addition, an evaluation of the client’s habits and use of the arm/shoulder is also required to make re-injury less likely.

Therapeutic/Free of Pain:

- Immediate Post-Traumatic period – reduce joint swelling (pitta imbalance) if any: Rest, Ice, Compress and Elevate (R.I.C.E.) the shoulder.
- Address vata imbalance –work on joint ROM and regaining initial joint strength: Do JFS with emphasis on slow, aware movements using the breath and emphasizing the shoulder and arm exercises. Bring awareness to shoulder blades and their position in JFS (down and stable).
- Modify all arm positions so there is never pain! This is especially true in JFS. Arms can be held below shoulders for the entire series. Arms in standing yoga poses can also be held below the shoulders, with hands on hips or simply in Anjali Mudra. Any poses with the hands on the floor can be avoided or modified (i.e., substituting Child’s Pose for Downward Dog).
- Keep overhead arm movements and arm abduction to an absolute minimum. Work on maintaining upper back posture and shoulder blade awareness. This will begin to address any underlying pitta imbalances (discernment).

Stabilize the Situation:

- Begin strengthening the muscles below where the pain was initially. For the shoulder, this would be a program to tone middle and lower trapezius, pectoralis major and latissimus dorsi muscles. The following yoga asanas (*Structural Yoga Therapy*, Mukunda Stiles) would be beneficial for all these muscles: Bridge, Camel, Cat Bow, Spinal Twist, Stick and Shoulderstand. The variations on Cat Bow as outlined in the Appendix would also help.
- Consider the strength of the client’s neck. Many times the weight of the head can cause shoulder issues if the client’s neck muscles cannot support the head.
- Evaluate the client’s work habits and use of shoulder/arm in everyday activities. If the client throws a baseball overhand when playing with kids, have the client toss it underhand. If the client consistently needs to reach overhead (at home in cabinets, or at work), suggest the use of a stepstool. If the client keeps using the injured arm/shoulder for a certain task that does not need

extraordinary dexterity, ask the client to use the other arm. This would bring further discernment to the client's body awareness and build focus and concentration.

Maintenance:

- Deeper work on kapha and vata imbalances should be addressed. Since the shoulder is the most malleable joint in the body finding a grounded-ness for it will be vital. An evaluation of the client's life at this point may lead to a determination if the "weight of the world" is resting on his or her shoulders. In such a case, it might be time to make a life change, find a new job, a new mate, a new city, or a new calling.

7. Questions and Answers from www.yogaforums.com

Torn Rotator Cuff

Posted: Thu Aug 11, 2005 8:20 pm

In general I would do all my joint freeing series but not do shoulder abduction motions shown in page 147 #13. That is the specific motion of the supraspinatus. Massage especially with BF & S ointment is of great benefit. This can be bought from wholesale at Emerson Ecologics 800-654-4432 if you have resale license. If not I can bring to Yogaville for you or you can buy direct by mail for \$25 to me. I owned a massage school in Sacramento in early 80s and found this to be a wonder linament formula. In 25 years of use I have found nothing better. Definitely combination of glucosamine and chondroitin plus vitamin A & E are helpful supplements but this linament is best. I can show you self massage or do to you with a friend observing who can help you. Other forms of energetic healing can be done in person. namaste mukunda

Rotator Cuff Injury

Posted: Fri Oct 31, 2003 7:56 pm

I have written a series of articles on yoga therapy for knees and shoulders, published in *Yoga International* magazine. You can buy reprints from me for \$5 or from *YI*. They have much more details than I can convey here.

For such an injury to the rotator cuff best is to learn to differentiate sensations of the external musculature from the deeper muscles. Working with strength in the deltoids, latissimus dorsi, triceps, biceps and pectorals is optimal for recovering mobility. By learning to feel these muscles independently that can help speed recovery time. This is most easily done with the help of my joint freeing series in my book it shows which movements isolate which muscles.

Rotator Cuff

Posted: Mon Jul 14, 2003 4:31 pm

There are many different motions of the rotator cuff. Primarily it is internal and external rotation but when you add other possibilities – extension, flexion, abduction, adduction it complicates the process. To be on the safe side I would recommend just doing my Joint Freeing Series alone for 7-10 days and no asanas. Then take up asanas and do those which gradually extend the ROM slowly. I cannot make specific ethical recommendations about this injury without seeing you. It is too likely to be irritated without adequate professional assessment. Where are you from? If possible consider a personal visit to me, my travel schedule (on website see workshops) is extensive enough to likely be close to you at some point. Best wishes in your healing. Mukunda

Pitta – Shoulder Pain

“Also, rotator cuff is still injured. Both issues seem to be pitta inflammations. She will come next week,

and I suggested she do some "homework" to prepare. 1) Wave breath with focus on following the complete wave, allowing (not forcing/controlling) exhalation to lengthen. This to be done first lying, then sitting, and if she feels up to it, 2) Joint Freeing Series with focus not on full ROM but rather on maintaining wave breath as given above. When she comes, I will see how she is doing and review breath -- making sure she is not efforting OR straining but rather releasing and letting go. I will also do ROM analysis for shoulder joint -- lying down on back seems easier for me than when sitting up.

I will give her review of JFS and pranayama -- would also like to offer a soothing mind focus or more active releasing movement for her as the slow pace of the things could irritate her I have in mind."

Posted: Tue Nov 19, 2002 3:01 pm

I can see that you understand Ayurvedic concepts as they apply to making Yoga recommendations. Great you have given an excellent series of homework for this lady. If you have not purchased David Frawley's Yoga and Ayurveda then that may assist you at have more material for this combination of studies. You can also inquire into diet and lifestyle more effectively with that information. I would also recommend she do an anti-pitta diet and regulate her stimulating substances and lifestyle to having more time in nature and getting to bed earlier. Massage with soothing oil like sesame would be soothing too. For the shoulder the recommendations you have cited are fine and show the principle of adapting to this individual. Allow her to stay in charge your advice is only suggestions that she could try. Pitta predominant people need control until they are ready to relinquish it. Blessings. Mukunda

Rotator Cuff

Have encountered a couple of people in my classes with a similar complaint. They feel pain when they rotate their arm in a full circle, 360 degrees. The specific pose is a reclining twist (parivartanasana) with the extended arm moving in full circles (a Bartenieff Fundamentals exercise). I assume this might be some sort of rotator cuff problem, maybe an inflammation that causes them pain when their arm goes up and rotates above their head? I always suggest that they stop anything if it hurts but I wonder if continuing to take the humerus through its full range of motion might be beneficial? Or maybe its best to do less? What would you suggest?

Posted: Fri Apr 26, 2002 10:07 pm

This motion is likely to be problematic as you are moving from external rotation to internal rotation above your head. By having the arm be passive as you move there is more likely a tendency to stress the rotator cuff and brachial plexus nerves. Safer is to have the entire arm actively turning as a unit. The motion is not a problem provided you are warmed up for it. Suggest you do the individual motions of the shoulder joint first, as in my book.

Four Questions

4. (Two) students have damaged their rotator cuff muscles (infraspinatus, supraspinatus, teres minor and subscapularis). They want to re-begin practice but don't know how to (nor do I without trial and error and creating pain for them). We need a practice that is safe, strengthening, and also encourage healing and not over-doing.

I would recommend my joint freeing series (pg. 121-153) in my book, Structural Yoga Therapy. The key is to do the entire series not just the motions related to the rotator cuff motions (147-148). In the

ideal way of practicing the series for injuries the student needs to be cautioned to move slowly and thus keep the motions at a slower than regular breathing rate. This will heighten sensitivity and aid in promoting lymphatic circulation.

8. Appendix

Cat Bow Variation



Figure 1



Figure 2



Figure 3

Figure 1.

Have client begin in tabletop position with hips just forward of knees and hands just forward of shoulders.

Figure 2.

As client begins to bend both elbows, ensure that the arms are staying in line with the shoulders and elbows are not bending out to the side. Elbows should be bending back toward the knees.

Figure 3.

The final pose is elbows on the floor. However, if client is unable to do this, Cat Bow is recommended. From here, have the client push back up to tabletop. For a more challenging version, have client begin in Downward Dog and then drop elbows to the floor, making sure they don't wing out but drop in line with the shoulders.

Neck Strengthening – Charlotte Chandler Stone (Hamsa) Variation



Figure 1



Figure 2



Figure 3



Figure 4

Figure 1.

Have client lay in a prone position, with arms perpendicular to body and elbows bent at 90 degrees. Forehead should be on the floor.

Figure 2.

Client begins to lift the head off the floor, using the arms for balance and support (some weight in arms but not much). Both front and back of neck should be long and client should not feel this in the lower back (not a Cobra Variation). Have client return the head to the floor before next position. (Photo exaggerates pose for emphasis.)

Figure 3.

Have client turn the head to one side (either the side that does not hurt to do so or side of client's choice), and lay cheek on the floor. Then have client lift the head while keeping the head turned to that side.

Figure 4.

Repeat turning the head to the other side.

Cobra Variation



Figure 1



Figure 2



Figure 3

Figure 1.

Have the client start in preparation for Cobra, forehead on floor, elbows bent and palms down on floor at mid-chest level. The forearms should be close to the ribs. Ask the client to begin to pull both elbows toward the heels to draw the shoulder blades down the back.

Figure 2. Have the client lift into Cobra. The palms are on the floor but no weight should be on them. The client should keep the chin parallel to the floor so as to not overarch the cervical spine. Emphasize the idea started in Figure 1, namely to pull the elbows toward the heels and keep the shoulder blades moving into the middle back.

Figure 3. Have the client begin to put weight in the palms, allowing the torso to lift several inches further away from the floor. The client should feel the triceps and latissimus dorsi both working, in addition to the erector spinae. Again, both the front and the back of the neck should remain long.

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10. Biography

Beth Hinnen began practicing yoga in 1996. She received her first teacher training in 2002 from Integral Yoga Institute in New York City.. She is currently certified to teach Intermediate, Advanced, Prenatal and Postpartum Hatha Yoga. This work is part of her certification to become a Structural Yoga Therapist. While she professes to be a jnana yogini, she is working hard at developing her devotional side. Prior to teaching yoga, Beth worked in the financial world and wrote fiction in her spare time. She lives in New York City with her husband and Sambhava (source of Eternal Bliss), their beloved Tibetan Terrier.