

Steven Benson, Doctor of Chiropractic
202-821 Burdett Avenue
Victoria, B.C. V8W 1B3
Telephone (250) 480-7682: Fax (250) 384-5919, 480-7655
stevenbenson@shaw.ca

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**WORKSHOP FOR RCCO MEMBERS ON MUSCULOSKELETAL HEALTH
AND OPTIMUM NUTRITION**

Introductory remarks

The **first goal** of this workshop is to help you play in a relaxed manner with good body alignment, so that musicality can be expressed and overuse syndromes be avoided. The **second goal** is to teach you exercises that will help maintain lifetime optimum health in your muscles and joints, particularly of the shoulder, arm and hand. The **third goal** is to help make you aware of sources of tension that arise in your body, mind or spirit. Above all other things, please remember that **tension in the muscles** is the main cause of overuse syndromes, tendonitis, myofascitis, organist-itis, etc.

Sound bite number one - **just because you are not in pain does not mean you are playing at optimum level.** Chronic, mild pinched nerves, tight muscles and fatigue are not usually painful but they sap your energy and concentration, leading to lower performance levels, injuries and job dissatisfaction. Please notice that job dissatisfaction can **originate within your body**, when it is not healthy! Unhealthiness gradually drains away the joy in every aspect of life. Generally speaking, you will see improved relationships with family members and co-workers as you work to become healthier. To put this another way, the person who is a pain in your neck might actually be a reflection of a pain in your neck.

When we play the piano or pipe organ, our muscles are very active but are only shortening and lengthening a little. Since they are not going thru their full range of motion, the muscles gradually become shorter, weaker and lazier. This disrupts the normal nerve firing pattern between your brain and the muscles. Gradually and imperceptibly, balance is lost between the flexor and extensor muscles. (Flexor muscles push the fingers down and produce gripping. Extensor muscles pull the fingers up and open the hand.) The result of this imbalance is muscle tension somewhere in your body. Since the tight muscles are attached to bones, they pull the joints out of alignment, particularly in the hands, arms and lower neck. Your muscles then start feeling tight, and they have to pull harder to overcome the extra friction from all the tension. As this imbalance increases it produces decreased performance, irritability, inability to concentrate, insomnia, tendonitis, carpal tunnel syndrome and so on.

How do we restore the body to a balanced state? With Chiropractic adjustments to the spine, shoulder, elbow, wrist and hand; muscle release techniques, such as Active Release Technique, Muscle Energy Work, deep muscular vibration, professional massage, etc.; and with home stretches and exercises. I believe in a completely integrated health system where you have access to whatever doctor or therapist is best for you. And, there is simply no substitute for Chiropractic care. The treatment should be gentle enough to always feel comfortable, and you can ask for this kind of treatment from your Chiropractor.

Muscles used in playing

Please see the cream colored sheet, which shows all the muscles of your body, and remember that we should play with all the muscles shown in the two diagrams! Independence of the fingers should exist only within a context of using the large muscle groups. This will occur naturally as you play with proper alignment of the torso, arms and hands, ensuring that you are very relaxed.

-Try playing with a quarter on the back of your hand versus playing with freedom of movement in the wrist, elbow and shoulder movement.

Definitions

1. Muscle – highly contractile tissues that enable movement to take place
2. Tendon – tough rope-like tissues that attach muscles to bones
3. Ligaments – sheets of tough material that hold two bones together to create a joint
4. Cartilage – stiff material that caps the bones inside the joints, allowing them to glide smoothly across each other.

Body alignment for safe and effective playing

- “On Piano Playing” by Gyorgy Sandor. I recommend that every pianist and organist read this book and practice the techniques that are given.

- To play well, every part of the body depends on every other part of the body to be relaxed and in balance.

- What is the “Ideal” hand alignment? Essentially, the hand is in line with the forearm, without any deviation upwards, downwards or to the sideways.

- What is the “Ideal” Torso alignment?

View from behind

- Is your spine straight with your head centered on your shoulders?
- Are your shoulders level?
- Are your ears level?

- Are you centered at the keyboard so that you can sit without leaning to the side most of the time?
- Are your elbows hanging in a relaxed manner?
- Is your hair cut nicely, and curled if appropriate?

View from the side

- Is the bench positioned properly so that you don't have to lean back excessively while using both feet on the pedals?
- Is your chin drawn slightly in and the head slightly back over the shoulders, which pulls the breast bone slightly up, and the shoulder blades slightly backward, rather than having your head forward with slumped posture?
- When you need to lean forward, are you doing it without slumping?

You should be **active but relaxed** and **constantly modifying your alignment** as needed.

- Review of forearm muscles, i.e., flexion (downward) and extension (upward)
- Practice palpating for tension and tenderness. We all have certain areas of tension and inflammation. Find your areas and give them attention with gentle massage, ice or heat applications and stretching.
- Wrist flexion and extension should be 90 degrees. Anything less indicates muscle shortening.
- A tight muscle is shortened and is in a weakened state. Injury results when the weak, short muscle is used too much or is suddenly over-stretched.

Cumulative trauma also called repetition strain injury

Repetition strain injuries, also called Cumulative Trauma Disorders (CTD), come from movements that are repeated thousands of times over a period of months or years. When pain finally surfaces there is **acute inflammation** (swelling and pain) but it is actually the manifestation of a **chronic condition**. Therefore it takes longer to heal than a new, acute condition and more effort is required to recover. **Health professionals are always required**. Any pain that is substantial or persistent should be seen by a health care professional, usually a Doctor of Chiropractic or a Physiotherapist.

General Exercise for the entire body

This should be bilateral and symmetrical, regular and gentle, such as swimming, walking, rowing, cycling, circuit training in the gym, surgical tubing exercise device, shallow water aquafit, deep water aquafit, squeeze balls, and so on. 2 or 3 times per week is the minimum to maintain overall fitness.

Specific Exercises

Dynamic stretching – This means the muscles contract and relax without a sustained stretch. It is good to do this before Passive stretching.

Passive stretching – This means the muscles are stretched for a period of time, ranging from a few seconds to a few minutes. It is thought passive stretching is most effective after the muscles have been warmed from active exercising (dynamic stretching). This is why it is recommended that we stretch **20-30 minutes** after exercising. The best-known form of passive stretching is yoga.

Here is a 15-20 minute dynamic and passive workout for hands, arms, hips and legs. It can be used to prevent and treat Cumulative Trauma Disorders. Do these exercises very carefully if you are in pain or if you are not accustomed to stretching.

Dynamic stretching of hands/arms/shoulders– do each movement for about 30 seconds.

1. Shake hands
2. Circle wrists outward
3. Circle wrists inward
4. Circle hands, elbows and shoulders outward
5. Circle hands, elbows and shoulders inward
6. Throw arms side-to-side like a pendulum
7. Throw arms forwards and backwards in the same direction, like a pendulum
8. Alternately throw arms forwards and backwards, as in running, and as high as is comfortable

Passive aka static stretching – do each movement for about 30 seconds. If there is pain, try stretching more gently. If pain persists, seek help from a health professional. Passive stretching is the art of “being” or “doing nothing”. Once you begin the stretch all you have to do is breath and relax, and let the stretch take place. You must be in a relaxed state for passive stretching to work well.

Hand, wrist and forearm muscles

1. **Extensor muscles** - Place your left index finger on the right knuckles and gently pull the wrist into flexion (Toward the palm). Use the left hand fingers 3-4-5 to gently pull the right hand fingers into flexion. As you feel the forearm muscles relax

in 10 to 15 seconds, slightly increase the stretch. This is more effective with a straight elbow.

2. **Flexor muscles** - Place your left index finger on the palm side of the **right knuckles** and use it to gently pull the wrist into extension (backwards). Use left hand fingers 3-4-5 to gently pull the right hand **fingers** into extension (backwards). As you feel the forearm muscles relax in 10 to 15 seconds, slightly increase the stretch. This is more effective with a straight elbow. Experiment by pulling the right thumb backwards along with the fingers. This is a good stretch for the thumb muscles but should only be done if it is painless.

3. Repeat this process with the other hand.

Shoulders

4. Stretch the front of your shoulder and arm by interlacing your fingers behind your back and pulling the hands upward toward the ceiling. You can lean forward as far as is comfortable, if you wish. A variation on this is to stand with your arms at your sides, and then stretch them backwards as far as possible.

5. Try to touch your fingertips behind your back, with one hand reaching backward behind the head, and the other hand reaching behind the lower back. Repeat with the hands in the opposite positions.

Hips and legs

6. **Lateral hip and thigh (Ilio-tibial band aka ITB)** – Stand behind a chair and hold onto the back. Move your right foot behind your left foot. The soles of both feet should be firmly on the ground. Now, push your right hip outward (to the right). You should feel a gentle stretch across the outer hip and thigh. You can cross your right foot further to the left to increase the stretch. Now, release your right hand from the chair, and bend to the left while stretching your arm upwards, over your head, with the palm facing inwards. Gently bend to the left from the neck, shoulder and waist. Breathe and relax and the stretch will happen automatically.

Stretch the other side by placing your left foot behind the right foot, raising the left arm upward with the palm facing inward, and gently bending to the right from the neck, shoulder and waist.

7. **Quad stretch** – “Quad” is short for “quadriceps”, which are the four muscles on the front of your thigh. To stretch them, stand behind a chair and hold onto it with one hand. Bend the right knee and grasp the ankle, foot, or cuff of your slacks with your right hand. Gently pull your right knee comfortably close to the left knee, pull the right foot toward your buttock, and pull your belly button inward to reduce the curvature in the lower back. You should feel a gentle stretch on the front of your right thigh. This stretches some of the muscles that hold your thighs up while you play the pedals. The left quads will often be tighter because they are actively playing the pedals more than the right foot, which is often resting on the expression pedal.

Stretch the quads in the opposite thigh.

8. Hamstring/calf/shin stretching – There are dozens of ways to stretch the hamstring muscles, in standing, sitting or lying positions. They will be tight because we sit too much, resulting in bent knees, so the hamstring muscles adapt by becoming shorter. I suggest you stretch in the standing position, with both feet pointed straight forwards. Place one foot on a bench, chair or other object high enough to produce a gentle stretch but without discomfort. If your knee is slightly bent, that is good because you can gradually let it sink downward during the stretch. Intensify the stretch by gradually leaning forward. **Add the calf stretch by pulling your toes and foot backwards, toward your knee.** If you feel unstable, place a chair to one side and hold on to it while stretching. Remove your foot from the bench, and place it on the floor in front of you. **Add the shin stretch by pointing your foot and toes at the floor in front of you.**

Stretch the hamstring, calf and shin muscles on the other side.

Stretching can be done very effectively while sitting. Place one foot in front of you. To stretch the **calf**, pull your toes and foot backwards, toward the knee. To stretch the **shin**, point the toes and foot. You can do a **seated hamstring stretch** simultaneously, by straightening your knee and elevating the leg, while you perform the calf and shin stretches.

9. Jaw stretching – It is important to stretch the muscles of the TMJs (Temporomandibular joints). There is a TMJ on each side, where the jaw bone, or mandible, meets the head, or temple bone. One of the TMJ muscles, called the “temporalis”, covers the side of the head (the temple region). Most headaches on the side of the head are from excess tension in the temporalis muscle. The second muscle is on the side of the jaw bone (the mandible), and is called the “masseter” muscle. You will feel this muscle if you have “grinding” of the teeth or acute jaw pain. Whenever you feel tension or pain around the jaw joints both of these muscles will be **too tight**. The TMJ muscles are tight in most of us because they reflect the stresses of the **mind and body**. In most of us, these muscle are like a **thermometer or other measuring device**, in that they reflect the amount of mental, emotional and physical stress we are dealing with. This is a very valuable thing to know because often we think we are relaxed but our jaw muscles tell another story.

The jaw (TMJ) muscles can be easily stretched by opening your jaw as wide as is comfortable. Hold this until you need to swallow, then resume the stretch. I recommend two – three minutes of TMJ stretching at the end of each day. I do this in bed each night. My wife is thrilled by this commitment to health! You can use a wine cork between your front teeth but if it is too long, you can strain the TMJ muscles and cause jaw pain instead of relieving it. So, cut the cork a little shorter, if necessary. Remove the cork to swallow your saliva as often as is needed during the stretching period!

Ice and Heat

Generally speaking, with **acute pain** you use more ice than heat, i.e., 10 minutes of ice followed by 5 minutes of heat. This can be repeated several times in a row. Some

people don't like ice and some don't like heat, so suit the treatment to what feels the best to you. In **chronic tension, aching or pain**, use more heat, i.e., 10 minutes of heat followed by 5 minutes of ice, or use heat only.

Your body will use all your efforts to its advantage, so if you don't have both ice and heat, use whatever is available. But, don't over chill the tissues because you don't want frost bite. If you feel burning pain, it is too cold so put more toweling between the ice and your skin. And, don't fall asleep on a heating pad because it can result in blotchy discoloration of the skin which lasts for several weeks, or a nasty burn.

Self-massage of arms, hands and neck

This is wonderful! I highly recommend lotion massage toward the heart, for 15 – 20 minutes, for acute or chronic pain. Add some vegetable oil to hand lotion and the skin will stay slippery for quite a while. You can also practice deep massage with compression of any tender points, for 5 – 10 seconds. Use enough pressure to produce mild pain but not excessive pain; or use massaging devices designed to work on the upper extremities, which don't have very much flesh over the bones.

The crucial importance of exercising your shoulder blade muscles to avoid rotator cuff problems

Because we sit a great deal playing the piano and organ, and using the computer, the muscles between our shoulder blades become short and tight, resulting in a decreased range of motion of the shoulder blade. The small rotator cuff muscles have to compensate by working harder and harder. As they develop friction and inflammation, you will start to feel tension, followed by aching, between the shoulder blades, along the upper shoulder blade or around the shoulder joint. Painful tendonitis and a frozen shoulder are likely to be the end result. This demonstrates the principle I mentioned in the beginning, that the large muscles must be involved in every movement or and overuse syndrome and inflammation will occur.

Several times per week, exercise while moving your shoulder blades as far forwards and backwards as possible. This can be done with:

- surgical tubing wrapped around a door knob
- bent over rowing motions with a dumbbell
- shallow water or deep water aquafit
- power walking
- reverse shrugs
- do a web search for "Blackburn exercises". These were developed by Dr. Blackburn to keep the shoulder blade muscles working correctly. You Tube has several excellent video demonstrations of these exercises.

Exercises to strengthen the hands and arms

The Handmaster Plus is a simple and effective device to keep your hand and forearm muscles balanced by providing resistance during gripping and also when opening the hand and extending the fingers. I suggest you buy the 3-pack at handmasterplus.com (\$19.95) because you will need to use the squeezey **ball** and stretchy **cord** in both the **soft and medium resistance** and it costs far less to buy the 3 pack and to buy them individually. If you wear out the stretchy cords, replacements can be purchased separately. Those of you with very strong hands will be able to use the firm squeezey ball and stretchy cord safely, but this will not apply to most of us because the resistance is extreme.

Specific exercises can be done to further strength and stretch any weak or non-responsive areas, using weights, surgical tubing, theraband, cable machines, and so on. You should have instruction in their proper use by a Chiropractor, Kinesiologist, Athletic Trainer or Physiotherapist.

OPTIMUM NUTRITION FOR LIFETIME WELLNESS AND ANTI-AGING

We must use **instinct, intuition, common sense and experimentation** to find out what is best for each of us. Science can assist in this process but don't give away your power to technologies and science. You can make the best decision for yourself, with assistance from science. Remember that most of the "research" you read on the Internet is designed to sell you a product. Reputation health professionals who are well educated are very important in this arena because of its vast complexity and rapidly expanding knowledge base.

The sequence of priorities for optimum health:

1. Love and connectedness to other people and to your community. Tranquility. Do you want to get out of bed in the morning?
2. Exercise – about 30 minutes of aerobic exercise 5-6 days weekly. Resistance exercises to avoid osteoporosis. Stretching several times each week.
3. Diet –
 - A. High fibre – 30 to 40 grams daily, with hard and soft fibres.
 - B. Low fat, particularly low animal fat.
 - C. Low glyceemic diet (This means it doesn't raise the blood sugar too much)

D. 5-7 Servings of fresh fruit and veggies daily. Research shows this can reduce cancer risk by 50%!!! Serving size is based on a **weight** of 100 gms., 4 oz., ½ cup of fluid weight. This is one small orange, tomato, apple or banana; about 1-1/2 cups of chopped vegetables such as broccoli, green beans or celery, and a 9” plate of lettuce.

4. Supplementation – targeted nutritional supplements are very powerful to prevent and reverse disease, but the previous three lifestyle priorities are more important. Having said that, supplements can take us places we cannot go with diet alone. Most of us have several nutritional deficiencies. For example, we eat an average of 9 mg of zinc each day but we need 12-15 mg for optimum health. One third of North Americans eat less vitamin C than is provided by one orange! The list goes on and on. Even the best diet seems to be deficient in a few vitamins, minerals or trace minerals, and how many of us eat a really good diet?!?

- Make your life easy....use supplements! The **core package** from age 13 onwards is a good multi vitamin/mineral supplement; 1-3 capsules of Omega 3-6 oils; 1,000 I.U. of Vitamin D; and at least 500 mg of Calcium with 250 mg of Magnesium. This core package is the same from age 1 – 12, but the quantities are less. From age 39-40 onwards, there are genetic changes of aging that cause a need for increased supplementation.

The core supplements from age 13 onwards

1. High potency multi vitamin/mineral supplement
2. Essential oils, also known as essential fatty acids. These should include fish oil, flax oil and borage oil. Vegetarian should use flax oil, borage oil and Udo’s algae DHA oil.
3. Vitamin D3 – 1,000 to 2,000 IU daily
4. Calcium with magnesium. We want at least 1,000 mg of calcium daily, from diet and supplementation. If you are not using dairy products, you should supplement 500 mg calcium daily. This amount should be increased at age 40.

Age 38-40 onwards

5. Glucosamine sulphate with MSM. At age 38-40, the body gradually decreases production of glucosamine sulphate. Eventually, the cartilage starts flaking away in the joints. To prevent arthritis, start taking 500 mg of glucosamine with 300 – 500 mg of MSM. Chondroitin is not needed as the body can always make adequate amounts. Increase to 1,000 mg at age 50 and 1,500 mg at age 60.
6. Prostate formula, emphasizing saw palmetto. Increase the dosage at age 50 and age 60.

Age 45 onwards

7. Co Q10. Around age 45, the body gradually decreases production of CoQ10. This makes your heart, brain and immune system gradually become vulnerable to disease. Start with 30 mg of CoQ10. Anyone with a family history of disease affecting the heart and brain, or history of cancer, should take 60 mg daily at this age. Increase the dosage at age 50 and again at age 60. If you are on cholesterol lowering drugs, you should be using CoQ10. Discuss this with your pharmacist.

8. Female hormonal support formula to prepare your body for peri-menopause

Age 50 onwards

9. By age 50 the thymus gland is mostly inactive, so we lose the cancer preventing effect of killer T cells. This is the time to take powerful anti-cancer herbs such as Reishi mushroom, Astragalus, 3-indole-carbinol (from cruciferous vegetables), Curcumin (the pigment in turmeric) and milk thistle

10. Men and women need to gradually increase calcium/magnesium to prevent osteoporosis. It is recommended for women that around age 45, calcium supplementation be increased to 1,000 – 1,200 mg daily, with half that amount of magnesium. Those at higher risk of osteoporosis should increase the amount earlier in life. A man should reach this dosage around age 55.

11. From age 50 onwards, the brain is starting to age much more rapidly, and it can be kept healthy with exercise, a high potency multi-vitamin/mineral supplement, lots of essential oils, at least 1,000 I.U. of Vitamin D.

Endocrine disruptors and xenohormones

These are causing a global catastrophe of Biblical proportions. Fish and frogs are being born with male and female body parts. North American young men have only 25% of the sperm count of one generation ago. Cancer of the breast, uterus, ovaries and prostate are rising rapidly.

These chemicals mimic our sex hormones and include hundreds of different compounds, such as dry cleaning fluid, Bisphenol A (hardens plastic), some hair dyes, pesticides, fungicides, herbicides, DDT and phthalates. I will mention phthalates (pronounced “tal – ates”) because they are hidden in the fragrance added to soap, hand lotion and perfume. Phthalates cause fragrances to last longer. When you read the ingredient list and it says “Fragrance” or “Parfum” you are almost always getting phthalates. You want products that use Essential Oils only for their fragrance. Write to the manufacturers of the products you use and ask if they have phthalates in the formula.

Follow this topic in the news and with web searches. **It is extremely important to eliminate these endocrine disruptors and xenohomones from your home environment and your cosmetic cabinet.**

Good fats and oils are good, bad fats and oils are bad

Absolutely every cell of your body requires good fats and oils to be healthy. We are getting too much “bad” fat and oil, and not eating enough “good” fat and oil. This causes cell inflammation and **speeds up cell reproduction**, leading to things such as dry, flaky skin; acne, eczema and psoriasis; clogged arteries; heart disease; dementia and Alzheimer’s disease; and many forms of cancer. So, our goal is to start taking the good Omega 3-6-9 oils, and decrease the other fats and oils in our diet. In its simplest form, this means you should be taking 2 or 3 capsules daily of omega 3-6 oils, (fish, flax and borage oils) or take 1-2 tsp of flax oil (or a heaping tablespoon of **ground** flax seed) and one teaspoon of high yield fish oil each day, along with a capsule of borage oil. (90% of people prefer capsules). Eating oily fish twice weekly is a good way to get some Omega 3 oils but fish should not be eaten more than twice weekly because of the amount of mercury they contain. Vegetarians can get Omega 3 from flax oil or ground flax seed, Omega 6 from borage oil, and DHA from Algae Oil.

In addition, we must eliminate the “bad” polyunsaturated oils that are usually used for frying food. When cooking use **extra virgin olive oil, and expeller pressed peanut oil, canola oil, macadamia nut oil (Spectrum Naturals brand) or butter.**

Only virgin olive oil is truly “cold pressed”. When seed or nut oils are called cold pressed, it means they are heated to a high temperature while the oil is pressed out, and when the process is finished the seeds or nuts are cold. Seed or nut oils should say “expeller pressed”, meaning they are mechanically crushed. I recommend the Spectrum Naturals brand which is organic and expeller pressed. Delicate oils such as walnut oil, safflower oil and sunflower oil should not be heated!!! They are okay in a salad dressing, in reasonable quantities, but are often used to fry foods such as potato chips.

Polyunsaturated versus monounsaturated

We want to emphasize monounsaturated oils in our diet. These are the oils I listed for cooking.

Saturated versus unsaturated

Most of our fats and oils should be mono-unsaturated, meaning they come from vegetables such as olives, canola oil, peanut oil and macadamia nut oil. Coconut oil and palm oil are saturated but because they are of vegetable origin they are tolerated better than saturated animal fats that occur in meat, eggs and dairy products.

DHA

DHA is an omega three oil that feeds our brain. We get it in fish oil, and it is extracted from algae oil for vegetarians. All pregnant and nursing women should supplement it so the fetal and infant brain will develop properly. It is also imperative to supplement it to avoid dementia and Alzheimer's disease from age 50 onward. Lifetime supplementation is very appropriate as it is deficient in most carnivore and vegetarian diets.

The three main oils to supplement

- **Fish oil** gives us the **omega 3** oils **DHA and EPA**. A vegetarian consuming **algae oil DHA** will not ingest any EPA and their own body will have to manufacture the EPA. We want at least 200 mg daily of DHA.
- **Flax oil** gives us the **omega 3** called **ala**, or alpha linolenic acid. 1 tsp a day is enough for most people. A tablespoon of **ground** flax seed will provide this.
- **Borage oil, primrose oil or black currant oil** give us **gla**, or gamma linolenic acid which is the **omega 6** oil. Borage oil has a lot more gla than the other oils.
- A daily goal to strive for is 400 mg of DHA/EPA; 400 mg of ala (flax oil); and, 200
- 300 mg of gla (borage oil).

- A teaspoon is 5 gms, (5,000 mg) of fluid. So, 400 mg of oil is less than 1/10th of a teaspoon.