

# Trunk Stabilization

**Duane D. H. Pitt, MD FAAOS**

**Bermuda Spine Center**  
<http://northrockspine.com>

**441-295-3923**

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# Trunk Stabilization Program

Trunk stabilization is an old concept, which has been in existence for many years, but was revamped by Robert G. Watkins MD, and has been divided into five levels of eight categories. This program has been utilized safely and successfully without problems for all patients with cervical, thoracic, and lumbar spine issues regardless of their age or physical condition. Conservative management for the spine includes anti-inflammatory, muscle relaxants, injections, chiropractic, and physical therapy. Many including myself have found this program to be the best modality available today for the treatment of most spinal disorders, and many patients who aggressively implement this modality are able to avoid surgical management for their problem.

This program is intended to progress the patient through a gradual exercise program from a neutral pain free position for the spine, to a very safe and controlled level 5 advanced exercise program. The advanced exercise is conducted in a somewhat precarious position, requiring balance and coordination. Balance and coordination (proprioception) is the key to a healthy spine free from pain, but not intended to cure the underlying disease. The most common condition of the adult spine being arthritis is controlled using this modality.

The therapist's objective is to take the patient through a systematic and graduated exercise program in a neutral pain free position, and teach the patient how to perform the exercises and transition them to a home exercise program that should be done three times per week. Often one category will advance faster than others, but the overall goal is to progress the patient, athlete, or worker through a level that is appropriate to safely return them to their activity. Determining which level the patient must complete prior to returning to their recreation, sport, or work is customized based on the activity. Other exercise modalities must be cleared by me prior to there incorporation. Many of the other exercise programs are an excellent adjunct to the trunk stabilization program. It is ok for the therapist to advance a patient through one area and not another due to the patient response. Each area is advanced with the use of weights or difficulty with the goal of advancing the patient eventually through all 5 levels if possible, and exercises.

The **sit ups** are done with the feet on the floor or partially extended, the back in the neutral pain free position, and the arms clasped across the chest. The head, shoulders, and upper back are then elevated, followed by a slight pause followed by return to the neutral position. The exercise is then progressively increased; adding weights to the chest and then finally with arms extended forward. There is a minimal amount of back motion in this exercise. There is no need to perform a full military style sit up. Having the legs extended merely increases hip flexor strength, as well as hooking the feet increases hip extensor strength.

The **bridging** exercises are done by lifting the pelvis off the floor, but maintaining the neutral, pain free position. The lifting is done with the legs. The back is not arched into a hyper extended position. Holding this bridged position helps isolate trunk musculature in a different fashion than the dead bug exercises. Pain with this maneuver is often produced by too much hyperextension in the lumbar spine and not properly using the gluteal

muscles to stabilize the pelvis and back. This is progressed through a one-leg bridge on the ball and weights may be added to trunk and extended legs.

In patients with hyperextension pain, the **prone exercises** are begun with a cushion under the stomach to allow a little less hyperextension. Again, the idea is holding the back in a neutral pain free position. Alternate the arm and leg extensions will require good trunk control to prevent painful hyperextension.

Balancing on the ball to get a feel for movement begins the **ball exercises**. Some people have much more agility and ability to control their trunk on the ball than others. The leg press is the easiest way of improving balance on the ball. As these exercises progress through the ball exercises, it is easy to see that not only is strength improved, but proprioception (subconscious trunk control and special body position) is also improved and optimized. It is this proprioception that protects the spine from further injury during sports or activities of daily living.

The **wall slide exercises** can begin with a gentle flexion of the knees and with no real lower extremity or back strain. This exercise is easy and can be initiated in the immediate postoperative period. This exercise will strengthen the quadriceps muscle, which is important for those patients, whose jobs or activities require use of their legs for running, bending or lifting. Patients with weak quadriceps muscles will lock their knees and bend at the waist, which will do more to further aggravate the already painful spine. The wall slide progresses through a full 90 degrees at the hips and knees, with progressive longer periods of holding. The addition of weights and extended arms will appropriately increase the difficulty of the maneuver.

The transition from the initial stage of **identifying neutral position** and maintaining that neutral pain free position is important, while proceeding through a series of unsupported arm and leg motion exercises. This will eventually progress from increasing weights on the arms and legs, increasing the time unsupported, and finally to unsupported bilateral lower extremities when both legs and arms are off the ground. This last stage can be a very difficult procedure to perform while maintaining lumbar spine support. Achieving this will increase muscle tone and performance, and reduce back pain when performed correctly.

**Partial sit-ups** are begun with hands on chest. This program will eventually progress the individual through weights on the chest followed by unsupported weights over-head and behind the head. The frequency and duration of the exercises will increase as one progresses through the program, thus adding to trunk stabilization, strength, and endurance.

The **quadruped** begins with the patient on their hands and knees. This is an initially difficult position to learn to maintain a neutral pain free position, and will take effort on the part of the individual with back pain. It is an unfortunately, common position for back pain patients to relax their trunk muscles. The patient must learn to hold the back in a neutral pain free position while performing this task. This is done with the trunk musculature tight while slowly lifting one arm, then one leg, then alternate arms and legs with increasing weights on the arms and legs. The final stage of this program is performed with a long flat blunt object (body blade) balanced across the back, while

performing the above quadruped exercises. The objective is to not allow the blade to move in either direction while still maintaining good, tight trunk control.

The **ball exercises** begin with just balancing on the ball, while trying to get a feel for the appropriate amount of proprioceptive input to maintain good balance. Proprioception is the brains ability to finely control subconsciously balance and coordination. Without this function, we would constantly sprain or ankles or throw out our backs. Regaining normal proprioception is the reason why this program works to balance and strengthen the spine to reduce pain. There are a number of ball exercises that will help to finely tune and coordinate the muscles that help to support the spine. The leg press begins with just a simple balancing exercise, rolling on the ball, and maintaining a normal pain free neutral position. Once this is achieved, one should be able to do short sit-ups while on the ball, followed by resistive use of pulleys and a baton controlled by the therapist to improve your proprioception while on the ball. The therapist will pull you using the baton through different directions while you maintain balance on the ball.

The key to good **aerobic exercise** is diversification. That is someone 'who wants to run and jog and perform only one specific exercise too often, that produces a tendonitis or strain because of repetitive activity involving one muscle/tendon group. An example of diversification is walk on land and in water. Walking in water is a very common exercise. Allowing patients to walk in the pool as soon as three weeks post-op, in some situations, provides an unweighted environment and gentle resistance to motion. A poor swimmer, flailing in the water is hardly good exercise for the back, where as a good swimmer, or someone willing to take lessons and learn how to swim properly, can obtain an enormous amount of benefit in conditioning the muscles around the spine. There are a number of other exercise routines and equipment that is often very helpful in augmenting your aerobic program. These include bicycling, running, stair steppers or versiclimbers, etc. Good running technique is as critical as any sports activity in producing good aerobic running technique that gives you aerobic exercise. Skipping rope is an excellent technique for trunk strength. The slight bent forward flexion posture, locking the back in a neutral position, maintaining trunk control while producing this aerobic exercise can produce very tight trunk control while getting aerobic conditioning. To improve the workout of the abdominals and the quads, all one would have to do it work up to shortening the rope.

The original three-stage scale used by Art White, M.D. and Jeff Saal, M.D. has been modified into a 5-stage program that is better adapted, we feel, to more intensely condition and stabilize the higher end athlete. This program and the scale are used to benchmark the progress of all patients and athletes. For the professional athlete, they will not be released to practice until they are able to perform a level 3 trunk stabilization exercise program. Once they are able to complete across the board level 5 trunk stabilization, they are cleared to return to full competition. This is obviously modified for other patients, and works very well for the elderly as well as the recreational athlete.

I have provided a chart noted below that summarizes the program.

Level 1-5 Trunk Stabilization Program Summary								
Level	Dead Bug (page 7)	Sit-Ups (page 9)	Bridging (page 10)	Prone (page 11)	Quadruped (page 15)	Wall Slide (page 16)	Ball (page 17)	Aerobic (page 18)
1	Supported Arms over head. 2 min Marching	Forward (Fd) Hands on Chest. 1x10 (set x reps)	Slow reps double(dbl) legs 2x10	Gluteal squeeze alt arm or leg lifts 1x10	Arms or legs hold. 1x10	Less than 90deg 1x10	Balance on ball w/ leg press	Walking land or water 30min
2	Unsupp. arms over head/one leg extended. 3 min	Fd Hands on chest 3x10	Level 1 w/ wts on hips 2x20	Alt arms/legs lift 2x10 hold	Arms/Legs Hold. 2x10	90deg and hold 20sec x10 reps	Leg press w/ arms over head, Sit-ups fwd No hold	Running, swimming laps, Nordic Track, Versiclimor, Stair Steper, Skip Rope, etc.10min
3	Unsupp arms & alternate single leg with weights. 7 min	Fd-3x10 Rt-3x10 Lt-3x10	Single leg 3x20, hold dbl legs w/ wts or Legs on ball	Ball flies, swims, superman 2x10	Arms/legs. Hold 5sec w/ wts. 3x20	90deg hold 30sec w/ lunges x10	Ball sit ups x20 Fwd, Rt, Lt	Level 2 and 20-30min
4	Unsupp arms alternating w/ extended single leg. 10 min	Weights on chest Fd-3x20 Rt-3x20 Lt-3x20	On ball, single leg 4x20 Hold dbl on ball w/ wts. Feet on ball dbl bridge	Ball 10x20 hold, superman w/ wts, prayer, pushups, walk outs	Arms/Legs Hold 10sec w/ wts & body blade. 2x20	90deg hold 15sec w/ wts x10 then lunges w/ wts x10	Level 3 w/ wts. 3x20. Use baton & pulleys manual resistance	Level 2 and 45min
5	Unsupp both arms & legs alternating with weights. 15 min	Weights behind head & unsupported Fd-3x30 Rt-3x30 Lt-3x30	On ball single leg 5x20 w/ wts holding dbl w/ feet on ball and dbl knees flex	All w/ wts, and dbl blade 4x20	Arms/legs Hold 15sec w/ wts & body blade. 3x20	90deg hold arms extended w/ wts x10, lunges w/ wts hold 1min	Ball overhead & lateral pull throughs. Baton, pulleys, blade	Level 2 and 60min

## Neutral Pain Free Spine Position and Dead Bug Exercise: Section I

Fig 1.1

The “Neutral Pain Free Spine Position” is the basis for Trunk Stabilization. Finding your pain free position is very important and will allow the patient to perform the below exercises regardless of the amount of pain they are currently experiencing. The goal of this program is to train the body to maintain this pain free neutral position while engaged in sports, work, or any activity of daily living, and should be accomplished without the individual thinking about it. Once the patient has completed Trunk Stabilization with training regarding their neutral position, all activity will automatically place their spine in a neutral pain free position, thus the basis for improving “Spine Proprioception”. We begin our identification of the neutral spine position with the “dead bug” exercises. Dead bug exercises are started supine with the knees flexed and feet on the floor. With the assistance of the trainer or therapist, the patient pushes his lumbar spine toward the mat until he exerts a moderate amount of force on the examiner’s hand. This should not be exaggerated, back flattening, or extreme force; but a mild to moderate amount of force on the examiner’s hand while maintaining a neutral pain free spine position. The patient is then taught to maintain this same amount of force through abdominal and trunk muscle contraction while:

1. Raising one foot.
2. Raising the other foot.
3. Raising one arm.
4. Raising the other arm.
5. Raising one leg.
6. Raising the other leg.
7. Doing a leg flexion and extension with one foot.
8. Doing a leg flexion and extension with the other foot.

All of the above can be performed with weights on arms or legs to increase resistance.

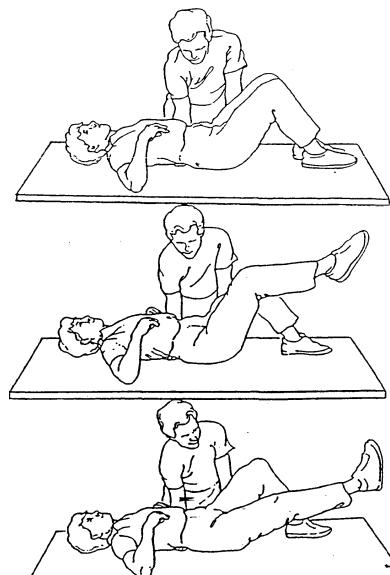
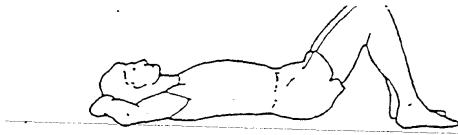


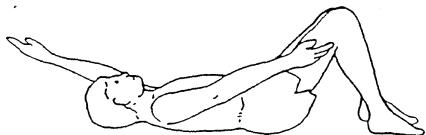
Fig 1.2



Hold your spine in a pain-free neutral position. Maintain that for a count of 10 and relax. Abduct the arms in an extended position

along side the head and do the abdominal bracing maneuver by tightening into the pain-free neutral position, then hold the trunk muscles for a count of 10 and relax.

Fig 1.3



Hold the spine in the pain-free neutral position with the feet firmly on the ground and alternately flex and extend the arms while maintaining the neutral, pain-free position. Slowly alternate the arms to a count of 10 and return to the neutral, relaxed position.

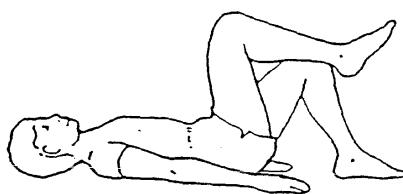


Fig 1.4

Tighten the trunk musculature in the neutral, pain-free position with the palms firmly placed against the floor, and bring one leg off the ground to the 90/90 position (hips at 90 degrees, knee at 90 degrees) while maintaining the neutral pain-free position.

Hold for a count of 10 and then reposition the foot to the floor. Alternate the legs.

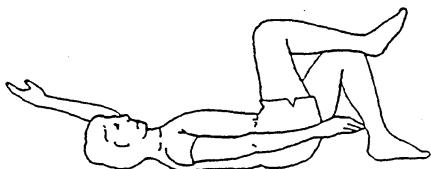


Fig 1.5

Combine maneuver 1.3 and 1.4 with alternate arm extensions and flexion. Left arm-right leg, then right arm-left leg. All while maintaining trunk control in the neutral, pain-free position, then returning the feet and hands to the floor after each maneuver.

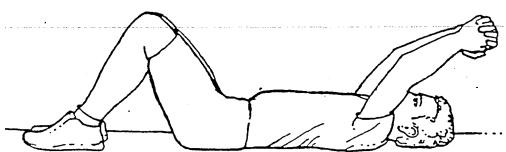


Fig 1.6

Shoulder Flexion in the supine position, back locked in neutral, hands clasped, arms extended over the chest, knees bent, feet on the ground. Extend the arms over the head, hold, and then return.



Fig 1.7

Shoulder flexion with alternate lower extremity extension supported. The extension can also be done with arms at sides while alternating lower extremity extension, supported.

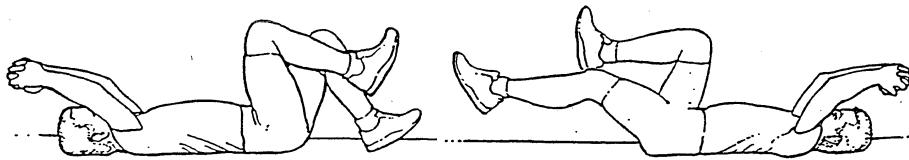


Fig 1.8

Shoulder flexion with alternate lower extremity extension unsupported.

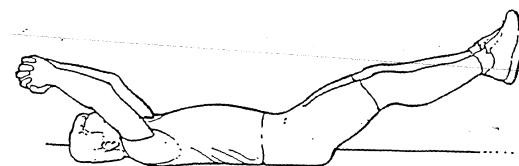


Fig 1.9

Shoulder flexion with double leg extension — add extend both legs while extending both arms.

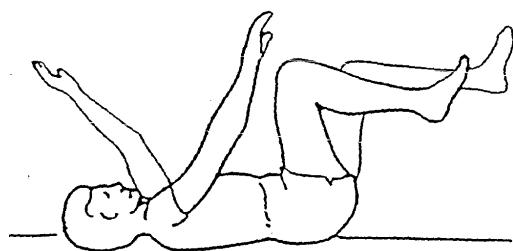


Fig 1.10

Alternate shoulder flexion with alternate leg extension unsupported, feet off the ground, alternately extend each leg an opposite shoulder extends. Weights can be added to the wrists and ankles while performing the above.

## PARTIAL SIT-UPS Section 2

Fig 2.1

The feet are placed firmly on the floor, arms beside the body with palms to the floor and the abdominal bracing is begun. Then the arms are placed across the chest and the shoulders and back are raised off the floor while maintaining the neutral pain free position of the spine. The shoulders are held off the ground for a count of 5 and then returned, the amount of time the shoulders are held off the ground may vary from two seconds to ten seconds. The speed with which the maneuver is done may vary from a resting count of one to two seconds. Repeat this in three sets of 30 times each. Weight may be added to the chest for additional contracture in the neutral pain-free position is the key to increasing abdominal tone and strength. This exercise may be done with the arms behind the head, alternating right elbow to left knee and left elbow to right knee.

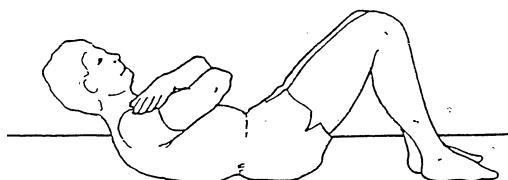
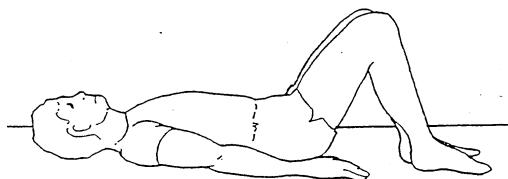
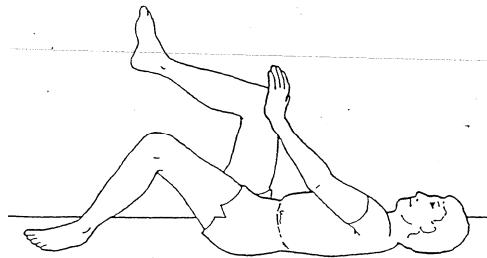
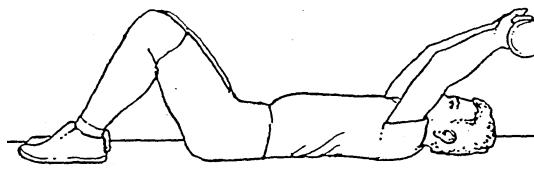


Fig 2.2



While maintaining a neutral spine position, with tightened trunk muscle Control, perform alternate knee pushes. Left hand against right knee, alternating with right hand against left knee. Hold the push for 10 seconds and return to neutral position, then alternating sides.

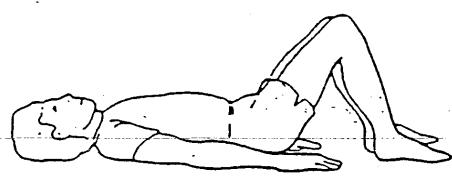
Fig 2.3



Maintaining the neutral spine position, extended arms up over the body while holding a weight, slowly extend the arms over the head. Hold for a count of ten then slowly bring back to start position.

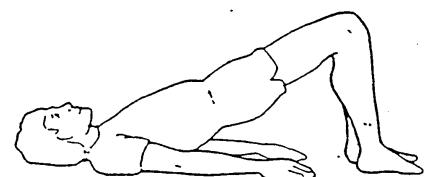
### BRIDGING Section 3

Fig 3.1



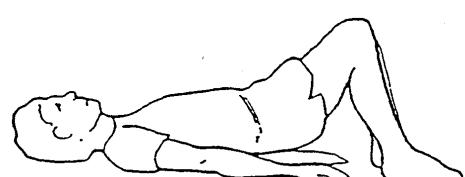
Starting in the supine neutral position, raise the hips one inch off the floor and maintain the neutral, pain-free position for a count of 10 then return hips to the floor.

Fig 3.2



Raise the hips further off the floor to the maximum height allowed while maintaining the neutral position and hold for a count of 10 then return hips to the floor. This is not meant to be a back arching exercise.

Fig 3.3



Raise the hips off the floor approximately three inches and hold for a count of 10 then return the hips to the floor.

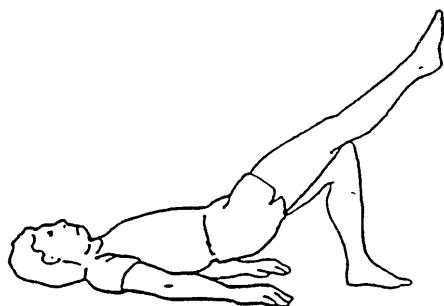


Fig 3.4

Raise the hips off the floor approximately three inches and hold. Extend one leg while maintaining the back in the neutral pain-free position. Hold for a count of 10. Place the foot back on the floor and relax the hips back to the start position. Repeat with the other leg. Weights can be added to the leg in this position and the legs may also be crossed over in a

flexion/abduction/external rotation of the leg while maintaining the neutral pain-free position.

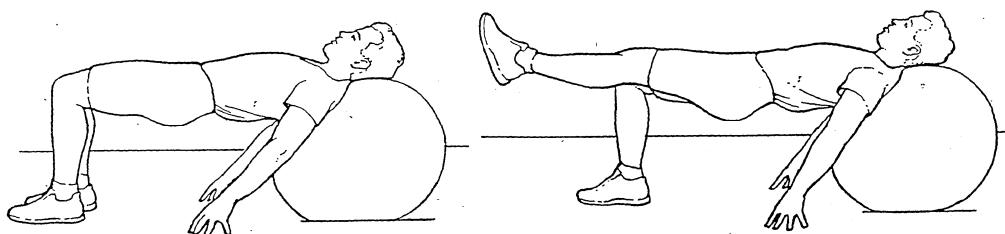


Fig 3.5

Supine green-ball bridging. Position the ball at approximately mid back position, chin tuck head up, knees at 90 degrees and feet on the ground. Bridge by bringing the pelvis up, locked in the neutral position, maintain, then relax. Add alternating extension of the lower extremities in bridged position. Hold for a count of 10 and then relax.

#### PRONE EXERCISES Section 4



Fig 4.1

Neutral position. Because the prone position may be painful in certain back conditions, it is suggested that the prone exercises begin with a pillow under the trunk to prevent too much lumbar extension. Rigidly tighten the trunk musculature into the neutral, pain-free position while maintaining the arms and legs in an extended position. Hold for a count of 10 and then relax.



Fig 4.2

Prone with single arm lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending one arm off the ground. Hold for a count of 10 and then relax. Repeat alternating the arms.



Fig 4.3

Prone with single leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending one leg off the ground. Hold for a count of 10 and relax. Repeat with other leg.



Fig 4.4

Prone alternate arm and leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while opposite arm and leg are off the ground. Hold for a count of 10 and relax. Repeat with other arm and leg.

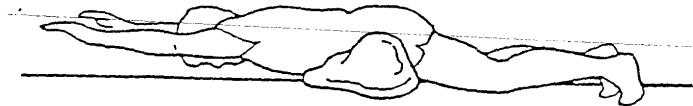


Fig 4.5

Prone with double arm lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending both arms off the ground. Hold for a count of 10 and relax.



Fig 4.6

Prone with double leg lifts. Maintain the original abdominal bridging position in the neutral pain free position while extending both legs off the ground. Hold for a count of 10 and relax.



Fig 4.7

Prone double arm and leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while lifting both arms and legs off the ground. Hold for a count of 10 and relax.

## PRONE BALL Section 5

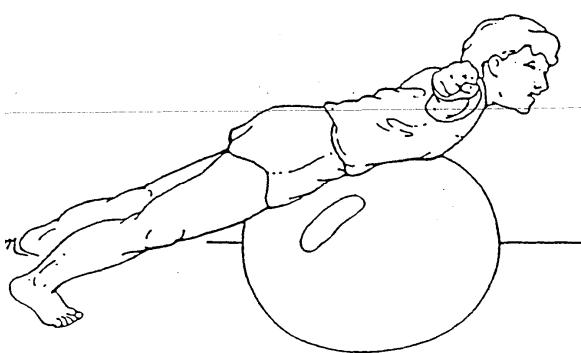


Fig 5.1

Prone roll out is performed with the abdomen resting on the ball, feet apart with toes on the floor in the pushup position. Arms flexed at the shoulder and down to the floor. Roll forward slowly, extending the trunk out into midair while maintain tight trunk control. Hold for 10 seconds then roll back to start position.

Extending the arms parallel to the shoulder can be added. Roll out slowly, hold for 10 seconds and roll back. Weights can be held in the hands to increase the difficulty of the exercise.

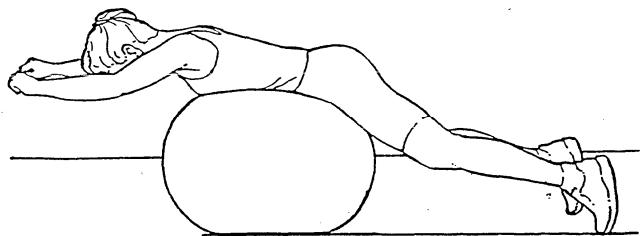


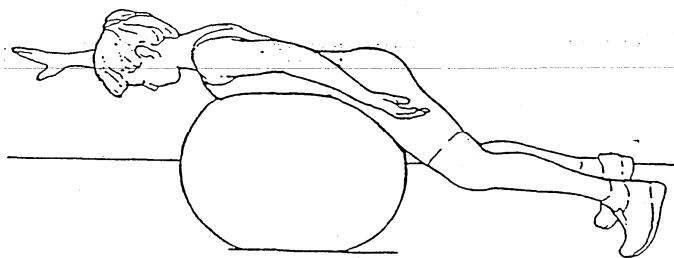
Fig 5.2

Superman. Start prone on the kneeling position with the ball approximately at chest level. Spine locked in neutral position, elbows at 90 degrees. Extend the elbows, roll out on the ball, extend the elbows and knees at the same time. Roll out on the ball, hold, then roll back. Keep the neutral position tight and trunk in a tight controlled position throughout this maneuver.



Fig 5.3

Prayer. Kneel on the floor with your forearms on the ball. Keep the spine in a neutral muscle-control position. Rock forward while maintaining a neutral pain-free spine position. Rock back, but do not allow lumbar motion to occur with this exercise.



at the shoulder, full arm reach, first right then left.

Fig 5.4

Swimming. In the prone position, put the ball approximately under the abdomen. Lock the spine in the neutral pain-free position, feet and legs extended, toes on the ground. Alternate arm extensions

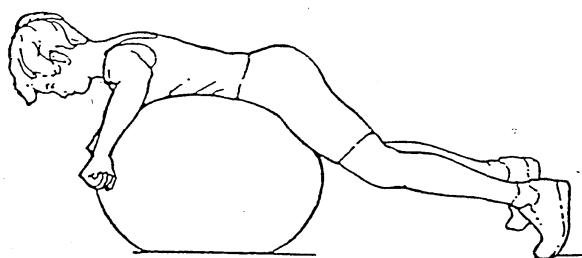


Fig 5.5

Green-ball shoulder abduction. Position the ball prone on your stomach, legs apart, toes on the ground. Elbows are at 90 degrees, extend the elbows back, hold and return to the original position.

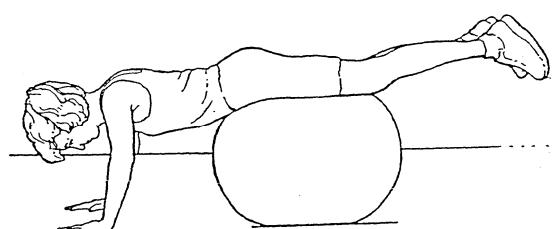


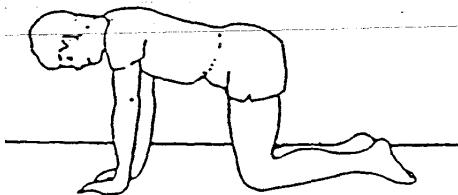
Fig 5.6

Push-Up prone on ball. In the prone position, put the ball approximately under the abdomen. Lock the spine in the neutral pain-free position, arms extended to the floor, palms down, feet and legs extended, toes off the ground. Slowly lower the

upper body to the floor, maintaining neutral position trunk control, and then back up to start position.

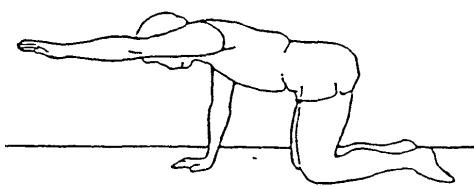
## QUADRIPED EXERCISES Section 6

Fig 6.1



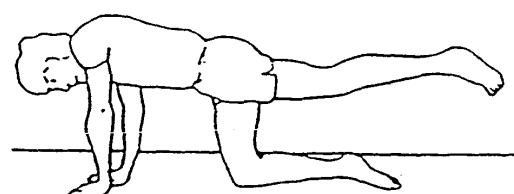
In the all four position, with the knees and hands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position for a count of 10 and relax.

Fig 6.2



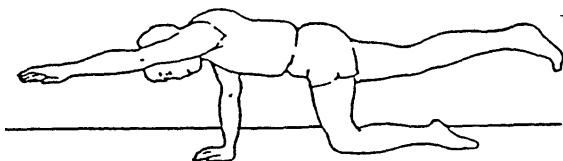
In the all fours position, with the knees and hands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position, extend one arm, hold for a count of 10 and relax. Repeat with other arm.

Fig 6.3



In the all—fours position, with the knees and hands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position, extend one leg, hold for a count of 10 and relax. Repeat with other leg.

Fig 6.4



In the all—fours position, with the knees and bands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position, extend one arm and one leg, hold for a count of 3.0 and relax. Repeat with opposite arm/leg. Difficulty of the above exercise can be increased with the use of weights on the extremity or the balancing of a bar (Blade) across the back.

## WALL SLIDES Section 7

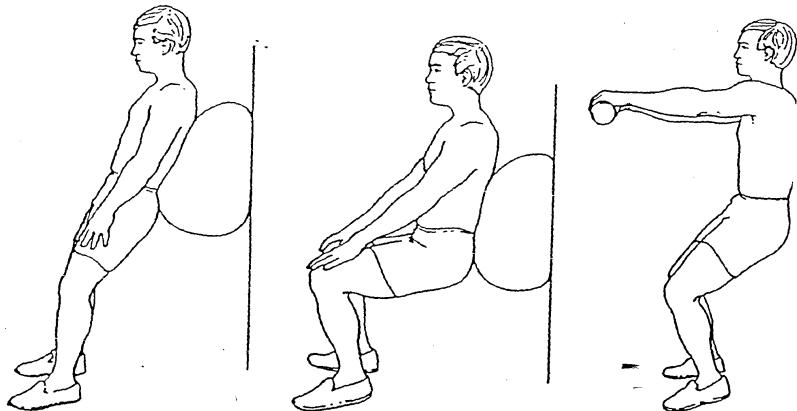


Fig 7.1

A green exercise ball is positioned behind the back against the wall, the legs are slightly apart, and the arms are at the side. The body rolls down the ball into the sitting position and maintains this sitting position for a count of 10, then returning to the initial semi-standing position. This exercise should begin with only a slight knee flexion, a partial squat, and eventually can proceed to a full 90/90 position (90 degrees of hip and knee flexion). Throughout the procedure the trunk should be maintained in the neutral, pain-free position with tight abdominal bridging. This exercise combines trunk strengthening with a functional quadriceps strengthening. After being able to maintain a full 90/90 position for three sets of 30 reps while holding the position for 10 seconds, the maneuver can be done while standing on the toes, and additionally can be done while holding a weight in the arms.

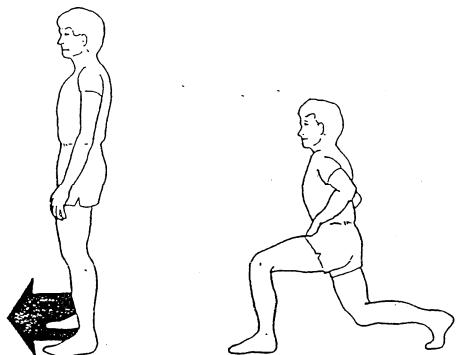


Fig 7.2

Lunges: Maintain neutral position; stride forward with one foot, bending the knee and partial kneeling with the opposite knee. Hold for three seconds and return to the start position. Repeat With the other leg. This can be done with added weights on the arms or with stick across the shoulders. Maintain the neutral pain-free position.

## SUPINE GREEN BALL EXERCISES Section 8

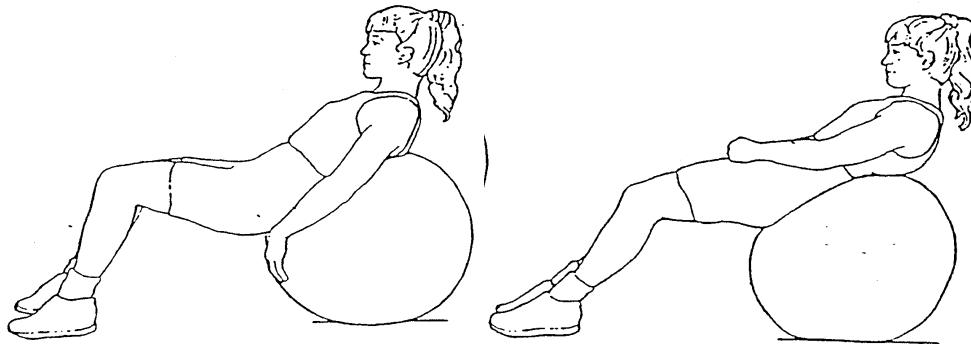


Fig 8.1

Supine quad press. Sit on the ball with the ball placed in the small of your back. Keep your chest and your stomach tight. While keeping your feet in the same position, roll back on the ball by straightening your legs. Keep your chin tucked in so as not to strain your neck. Keep your back in neutral and your chest off the ball. Return back to the starting position by bending your knees and rolling back down on the ball.

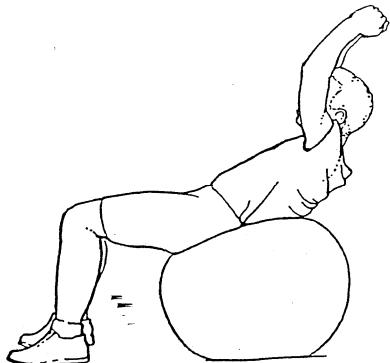


Fig 8.2

Supine green-ball shoulder flexion. Alternating flexing the shoulders with arms over the head, first right arm hold, then the left arm hold. Do this with or without weights.

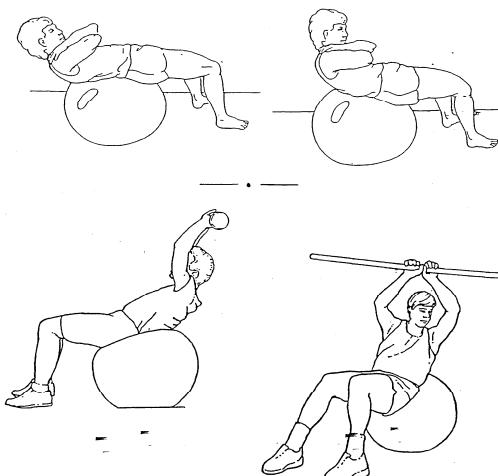


Fig 8.3

Supine ball sit-ups. Maintain a supine position with the low back on the ball, arms held across the chest and knees bent with the feet flat on the floor. Tighten the trunk into the neutral, pain-free position. Keep the pelvis stabilized and level using your abdominal and buttock muscles. Lift your shoulder blades and upper back off the ball keeping your lower back in a neutral position. Walk backward on the ball so that more of the trunk is off the ball, projecting out into the air. Hold for a count of 4-8 while keeping the trunk rigid. Weights may be held to

the chest to increase resistance. Repeat the maneuver of rolling the chest out off the ball, with arms positioned behind the head, rotate the left elbow toward the right knee. Alternate with the right elbow toward the left knee, again maintaining tight and rigid trunk control.

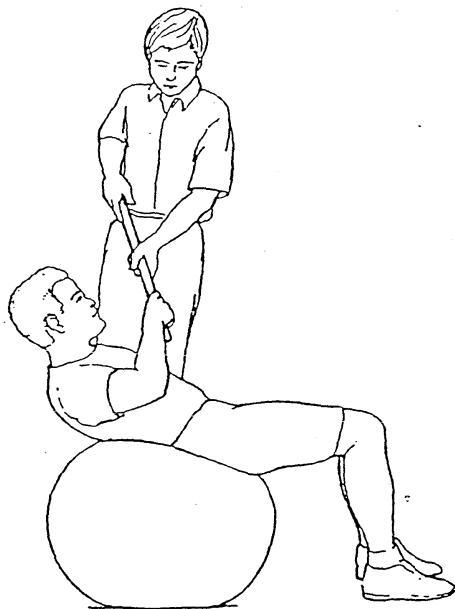


Fig 8.4

Resistive exercise using a baton or a towel can be done with the aid of trainer or therapist, by pulling against the person on the ball and providing resistance for a count of 9-10. This resistance can be provided alternately across the chest, to the side, or over the head with a baton, weighted stick or with pulleys.

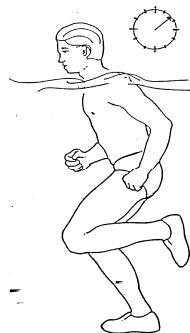
## AEROBIC CONDITIONING Section 9

### WATER RUNNING

Water running is a non-weight bearing activity done in 8-10 foot water. The stride is that of a full sprint. A pair of old tennis shoes can be worn. A kitchen timer is used right beside the pool. Begin with 15-second intervals, full out sprinting in the water. Usually a static position in the water can be maintained with the face out of the water. A buoyancy vest or life jacket can be of great help, and keep the back straight. Bring the knees up in a high step sprint. Water running allows no stress on lower extremities or the spine and should be an excellent conditioning method not requiring the jarring of running.

#### Week 1

1. Jog slowly for 15 minutes, run hard, for 30 seconds, sprint for 15 seconds.



#### Week 2

1. Jog slowly for 15 minutes (warm-up)
2. Run hard for 2 minutes and sprint the last 15 seconds.

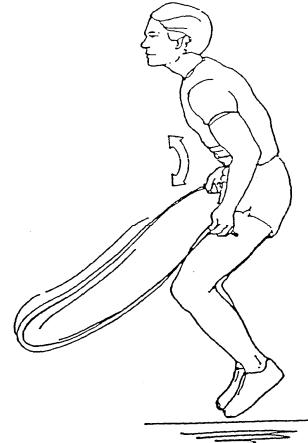
3. Run hard for 1.5 minutes and sprint the last 15 seconds.
4. Run hard for 1 minute and sprint for the last 15 seconds.
5. Run hard for 30 seconds and sprint the last 15 seconds.
6. Run hard for 30 seconds and sprint the last 15 seconds.
7. Run hard for 1 minute and sprint the last 15 seconds.
8. Run hard for 1.5 minutes and sprint the last 15 seconds.
9. Run hard for 2 minutes and sprint the last 15 seconds.
10. Jog slowly for 5 minutes (cool—down).

### **Skiping rope**

Rope will be skiped starting in a sequence using the 1-3 exercise levels of experience. Skiping rope is begun with a two step jump arid counting the number of jumps, progressing to an alternate step jump and eventually to a shorter rope. The shorter the ropes the tighter the abdominal contraction is during the time of jumping the rope. Start by counting, and with experience, one should be able to progress to skipping rope for specific intervals of time. Begin with 15-second intervals and progressively increase by 15-second intervals.

Level 1 25 jumps — S times Lev 2 50 jumps — 5 times

Level 3 15 minutes of jumping



### **WEIGHT TRAINING Section 10**

In the transition from the trunk stability exercises to the use of a weight—type machine, it is essential to maintain the neutral pain free position while using the different types of Weight machines such as pectoralis, latissimus dorsi or bench press machine. When using the machine, tighten the trunk in' the neutral pain free position, perform the particular type of machine and relax the position between sets. As for free weights, the control is a vital part of any free-weight program. One example of this can be seen in the forward lunges, which can be done with or without weights, but, obviously, maintenance of a proper neutral position is of paramount importance while performing this exercise.

### **UPPER EXTREMITY POSTURAL EXERCISES Section 11**

The slip-shouldered or round-back forward posture is probably the most typical extenuating cause in the delay of recovery for neck and arm pain. These positions's produce a lever arm effect to the head, from the weight of the head placed out over the center of gravity in the sagital plain. This will lead to poor sagital plain posture, which leads to a compensatory extension of the cervical spine to replace the head over the

pelvis, which closes the intervertebral foramina and the central cervical spinal canal and can also close the thoracic outlet.

The basis of cervical treatment is the same as it is for lumbar spine treatment, which is the Trunk Stabilization Program. We start our cervical treatment with the same lumbar neutral position dead bug exercises. You must be able to perform trunk isometric exercises in order to produce a chest out posture. This chest out posture will help to realign the head over the pelvis without hyper extending the cervical spine to accomplish this. You cannot change an adult's posture without actively exercising to produce increased isometric trunk tone.

Exercises should be designed to produce the isometric strength necessary to maintain a chest out posture. All upper extremity and neck strengthening exercises should be done in this position emphasizing this chest out posture. Do not start neck therapy by stretching or moving a painful neck. Use careful head control, positioning, modalities, and posture realignment.

We frequently use a basic group of preventative exercises designed for neck and shoulder problems. The key to these exercises is emphasizing the chest out posture. By emphasizing the chest-out posture during upper extremity, shoulder and neck exercises, proper head and neck alignment is enhanced. The chest out posture will accomplish three things:

1. It increases the thoracic outlet. This is the area through which the artery, veins and nerves pass from the trunk out the spinal cord.
2. It places the weight of the head over the neck and pelvis, thus eliminating the lever arm effect and strain on the neck.
3. It opens the intervertebral foramina and provides more space for the nerve as it leaves the spine.

A general exercise program could include the shoulder and rotator cuff exercises as well as dorsal glides, midline neck isometrics, shoulder shrugs, arm rolls and a weight program. Remember, just stick the chest out, and do not attempt to hold the shoulders back and or forcefully tuck the chin. Do it with your chest, abdominal and buttock muscles. The important factor is the chest out posture.

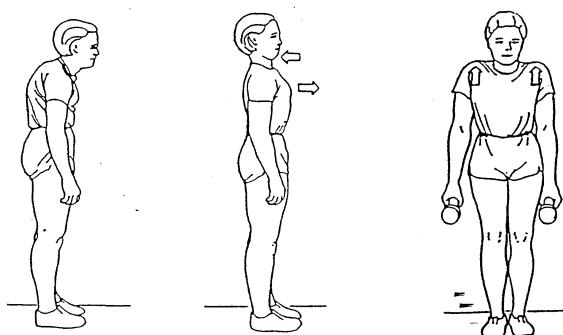


Fig 11.1

Shoulder shrugs and shoulder rolls—Shrug the shoulder and relax, shrug the shoulders and relax. Roll the shoulders and relax, roll the shoulders and relax. Weights may be added to increase - the difficulty.