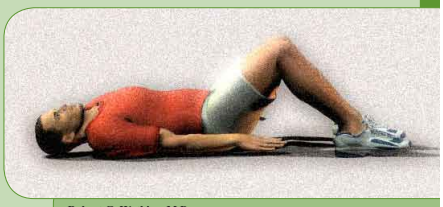
TRUNK STABILIZATION PROGRAM



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The coordinated core program is a system of exercises that produces a functional coordinated core strength for the body. Athletic functions such as throwing, swinging, and lifting, as well as, activities of daily living, require coordinated muscle strength in order to achieve maximum performance while protecting the spine. In testing of professional golfers, major league baseball hitters and pitchers and other athletes, it has been well demonstrated that it is the coordination of trunk muscles that produces maximum control of the spine.

Coordinated strength is more effective than uncoordinated strength. Each of the trunk muscles fire in an exact sequence in relation to each other for particular actions. This coordinated strength protects the spine from injury and produces the desired athletic result.

Our program is a five level strength and conditioning program. The patient or athlete progresses through eight different exercises rated one through five in difficulty. The entire program starts with finding a neutral pain free position for the spine and holding it in that position while performing the exercises. This makes it possible to begin postoperative conditioning earlier because it avoids the extremes of motion through the injured spine. The entire program can be performed with relatively simple exercise equipment: exercise balls, hand weights, and pulleys.

The rehabilitation of an injured athlete's begins with level one core stabilization training. The key is to learn the proper technique. It is a technique like learning to hit a baseball, ride a bicycle or other coordinated activities. It is not a matter of brute strength, it is a matter of doing the technique properly. Once the athlete has established proper technique at level one of the program, they are advanced through the five levels of increasing difficulty. After establishing mastery of level five, the athlete begins a series of sports specific exercises that we have developed for virtually every sport. Return to play depends on: 1). Achieving the proper level of the stabilization program; for recreational golfers and tennis players it is level three; for professional athletes it is level five. 2). Obtaining good aerobic conditioning; the key to aerobic conditioning is to diversify the aerobic exercise. 3). Performing the sports specific exercises. 4). Returning slowly to the sport. 5). Continuing the stabilization exercise once the athlete returns to sport.

Our trunk stabilization program has been divided into five levels of eight categories. The graduated nature of this exercise program allows a patient to go from a neutral, pain free position for the spine, in a very safe, controlled position, to very advanced strengthening exercises conducted in a somewhat precarious position, requiring balance and coordination. The therapist's objective is to teach the patient how to do the exercises. Questions such as "When can I return to sport?" is determined by when the patient can do a certain level in the program. Often one category will advance faster than another category. Patients may be doing Level 3 in dead bug exercises, yet only Level 2 in prone exercises.

The therapist will advance faster in exercises that the patient is better able to perform and has less pain doing. For example, in Category A, the sit-ups are done with the feet on the floor, the back in the neutral, pain free position, arms clasped across the chest, then with an elevation of the head and back, slight hold and returned to 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 fully sit up, having the legs extended nearly 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 hyper extension 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 extreme pain and hyper extension, the prone exercises are begun with a cushion under the stomach to allow a little less hyper extension when beginning the exercises. Again, the idea is holding the back in a neutral position, not hyper extending from the position. Alternate arm and leg extensions require good trunk control in order to prevent hyper extension.

The ball exercises are begun by balancing on the ball to get a feel for movement. Some people certainly 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 required, but also, the strengthening is done while balancing on the ball.

The wall slide exercises can begin with a gentle flexion of the knees and with no real lower extremity or back strain. This is an easy exercise, initially, that can be begun in the immediate postoperative period. Quadriceps strength is directly proportional to the ability to work in a bent forward position in a lifting job and most importantly, the quadriceps exercises are a reflection of the ability of a patient to use their legs for bending and lifting, rather than their back. Patients with weak quads lock their knees and bend at the waist, which is exactly the opposite of what we want for a back pain patient. The wall slide progresses through a full 90°, with longer periods of holding. The addition of weights and extended arms increase the difficulty of the maneuver.

The transition from the initial stage of identifying neutral position and maintaining that proceeds through a series of unsupported arm and leg motion exercises. With increasing weights on the arms and legs, increasing the time unsupported, and to finally unsupported bilateral lower extremities, where both legs were off the ground, it is a very difficult procedure to maintain lumbar spine support.

Partial sit-ups are begun with hands on chest, eventually with weights on the chest and unsupported weights over head and behind. The frequency and duration of the exercises increasing in duration and intensity, again, in the latter stages.

The quadraped begins with the patient on all fours, knees and hands. This is an unusual position to learn to do the trunk stabilization, to hold the neutral position. It is a very common area for relaxation of the trunk muscles. The patient must learn to hold the back in this position, with the trunk musculature tight, slowly lifting one arm, then one leg, then alternate arms and legs, then increasing weights with the final stages being with the body blade across the back, not letting that tip or bend in either direction while still maintaining good, tight trunk control.

The ball exercises begin with just balancing on the ball, trying to get the feel and the appropriate proprioceptive input to maintain good balance on the ball. The leg press begins with just a simple balancing exercise, rolling on the ball, and maintaining control of the ball throughout the motions. Eventually being able to do sit-ups on the ball and resistive use of pulleys and sticks evolves into many of the sport specific exercises such as using the baton with resistance from the therapist to pull through one direction and then pull through in the other direction.

The key to good aerobic exercise is diversification. That is someone who wants to run and jog and do one specific exercise, too often that produces a tendonitis or strain because of constant activity in one particular posture or body position. Diversification is the answer. That means walk on land or in water. Walking in water is a very common exercise. We begin patients walking in the pool as soon as three weeks Post-Op at times because of the body being unweighted and the water providing gentle resistance to forward and back motion. On the exercycle, the bent forward position usually can be very stable, progressing to swimming. Swimming, for some people, using swimming or Nordic Trac, especially requires that they know how to do it. That they have the balance and coordination to do it properly. A poor swimmer, flailing in the water, is hardly good exercise for a back, where as a good swimmer, or someone willing to take lessons and learn how to swim properly, can be a tremendous exercise for a spinal patient. The versiclimber and stepmasters, the key is to have the appropriate height step. We use the versiclimber with a very narrow step. The aerobic conditioning is there without getting the pelvic tilting that you get with too high of a step. The same is true with the exercycle. The seat should be low enough that the feet are not reaching down for the peddles, producing rocking of the pelvis on the seat. Running is important. Running is a stiffening exercise, prone to development of contractures and weaknesses in isolated areas that are not used. If running posture is bad, it can produce a constant period of time and abnormal posture. Good running technique is a 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 the is aerobic exercise can produce very tight trunk control while getting aerobic conditioning. The shorter the rope, the better, when you are able to.

The functional activities levels have been expanded from the original scales to include sports activity that allows a greater rating for return to full sports activity. The stabilization scores, likewise, have been increased. The original three stage scale used by Art White, M.D. and Jeff Saal, M.D. has been better adapted, we feel, to more intense training and stabilization exercises and allowing higher levels of accomplishment for advanced exercisers and advanced stage athletes.

WATKIINS-RANDALL SCALE

EXERCISE	1	2	3	4	5
A DEAD BUG	Supported Arms over Two minutes marching	Unsupported Arms over Head/one leg Extended X 3 min	Unsupported Arms 7 Min. Over alternate Leg. Extended with Weights	Unsupported UES #/LE 10 Minutes Alt. Leg Ext.	Unsupported Bil. LE ext. 15 min total Increased wts. Bil.UE w/ bil LE extension
B PARTIAL SIT-UPS	Forward – Hands on chest 1x10	3 X 10 Fwd Hands on Chest	3 X 10 Fwd 3 X 10 Rt. 3 X 10 Lt.	3 X 20 Fwd 3 X 20 Rt. 3 X 20 Lt. Weights on Chest	3 X 30 Fwd. 3 X 30 Rt. 3 X 30 Lt. Unsupported Weights Overhead & behind
C BRIDGING	Slow Reps Double Leg 2 x 10	Slow Reps Double Leg Weight on Hips 2 X 20	Single Leg 3 X 20 Hold Double w/ Wts. Double on ball	On Ball Single Leg 4 X 20 Hold Dbl on ball w/ wts., Feet on ball double bridge	On Ball Single Leg 5 X 20, w/ wts. Holding dbl w/ feet on ball & bil knees flex
D PRONE	Gluteal Squeeze Alternating arm or leg lifts 1 x 10 reps	Alternating Arm/Leg Lift 2 X 10 Hold	Ball Flys Swim Superman 2 X 10	Ball 10 X 20 Hold Superman w/wts Prayer Pushups Walkouts	Ball, All Exercises w/Weights 4 X 20 Body blade
E QUADRIPED	Upper Ext. or Lower Ext. Hold 1 x 10	Arm & Leg 2 X 10 Hold	Arm & Leg 3 X 20 Hold 5 Sec. w/Weights	Arm & Leg 2 X 20 Hold 5 Sec. w/Weights	Arm & Leg 3 X 20 Hold 15 Sec. w/Weights Body blade
F WALL SLIDE	Less than 90 degree Reps 10 X	90 degree Hold 20 sec 10 X	90 degree Hold 30 Sec. 10 X Lunges /no weights	90 degree Hold 15 Sec. w/ Weights X 10 Lunges w/wts.	90 degree Hold Arms Extended w/wts. X 10 Lunges w/wts. Hold 1 min.
G BALL	Balance on Ball Leg Press	Leg press w/ arms over head Sit-ups forward No hold Run	Ball sit-ups X 20 Fwd. Rt. Lt.	Ball, Sit-ups Fwd, Rt, Lt w/wts 3 X 20, Wand Manual Resistance Pulleys	Ball Overhead & Lateral Pull Through Sports Stick, Pulleys Body blade
H AEROBIC	Walk Land and Water	10 Min. Cycle Water	20-30 Min. Swim & Nordic Track	45 Min. Versiclimor also Step, Skip rope	60 Min. Also Run

FUNCTIONAL ACTIVITIES	CANNOT DO	PERFECT WITH CUEING	PERFECT WITHOUT CUEING	POINT SCALE
SIT < - > STAND	0	1	2	STAB 1: 6 – 12 pts
SIT < - > LYING	0	1	2	STAB 2: 13 – 18 pts
ROLLING	0	1	2	STAB 3: 18 – 22 pts
REACH OVERHEAD	0	1	2	STAB 4: 22 – 25 pts
BEND / STOOP	0	1	2	STAB 5: 25 – 27 pts
THROW	0	1	2	**STAB TOTAL: _____**
HIT	0	1	2	FUNCTION1: 1 – 4 pts
LIFT	0	1	2	FUNCTION 2: 5 – 7 pts
RUN	0	1	2	FUNCTION 3: 6 – 10 pts
				FUNCTION 4: 10 – 14 pts
				FUNCTION 5: 14 – 18 pts
				FUNCTION TOTAL: _____

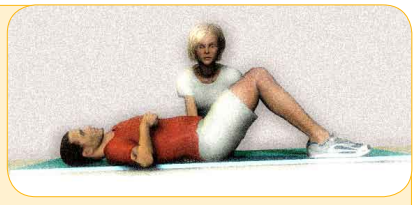
STABILIZATION EXERCISES

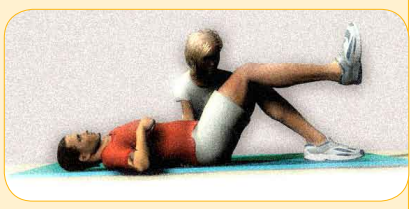
A1-1, 2, 3

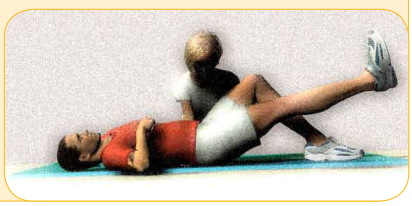
We begin our identification of the neutral spine position with the dead-bug exercises. Dead-bug exercises are done supine with the knees flexed and feet on the floor. With the assistance of the trainer or therapist, the player pushes his lumbar spine toward the mat until he exerts a moderate amount of force on the examiner's hand. This is not exaggerated, back flattening, extreme force, but a mild moderate amount of painless force on the examiner's hand. The player 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.

The same exercises can be performed with weights on arms or legs.

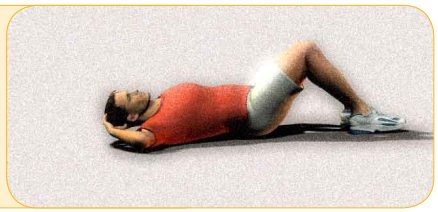






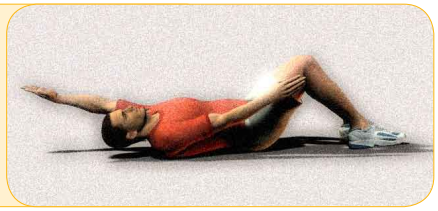
A1-4

Hold the spine in the pain-free neutral position. Maintain that for a count of 10 and relax. Abduct the arms in an extended position along side of the head and do the abdominal bracing maneuver by tightening into the pain-free neutral position. Isometrically, hold the trunk muscles for a count of 10 and relax.



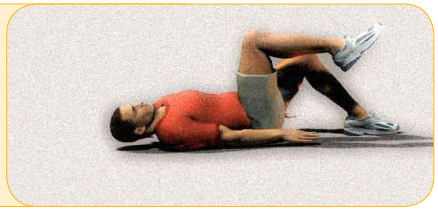
A1-5

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



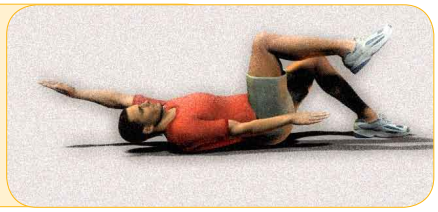
A1-6

Tighten the trunk musculature in the neutral, pain-free position 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. The arms may be positioned at the side with palms to the floor for balancing. Hold for a count of 10 and then reposition the foot to the floor. Alternate legs.



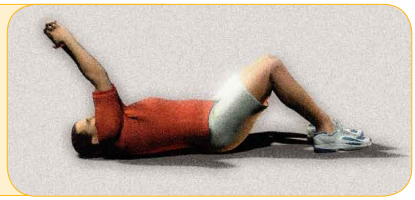
A1-7

Combine maneuver 5 and 6 with alternate arm extensions and hip flexion. Left arm-right leg, then right arm-left leg while maintaining tight trunk control in the neutral, pain-free position. Return the feet and hands to the floor after each maneuver.



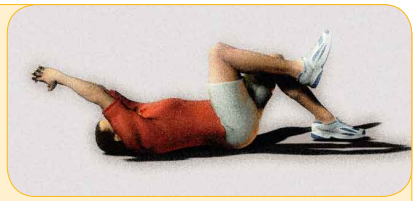
STABILIZATION EXERCISES

A1-8
Shoulder Flexion – 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 – return.

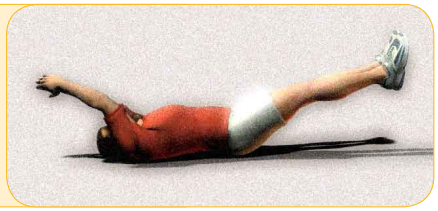


A1-9
Shoulder flexion with alternate lower extremity extension supported. The exercise can also be done with arms at sides with alternate lower extremity extension, supported.

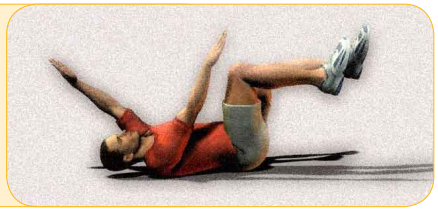
A2 & A3
Shoulder flexion with alternate lower extremity extension unsupported.



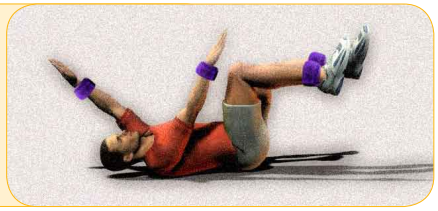
A5-1
Shoulder flexion with double leg extension; add – extend both legs when extending arms.



A5-2
Alternate shoulder flexion with alternate leg extension unsupported, feet off the ground, alternately extend each leg as opposite shoulder extends.



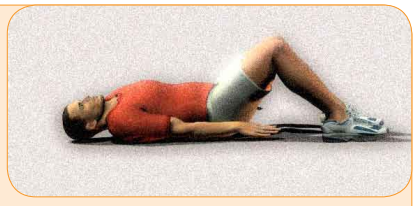
A5-3
Weights can be added to the wrists and ankles while performing A5-2.



PARTIAL SIT-UPS

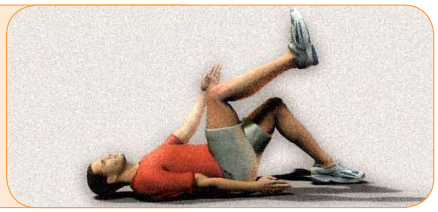
B1-A & B

The feet are placed firmly on the floor, arms beside the body with palms to the floor as 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 and 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.



B2

Maintaining the neutral spine position, with tightened trunk muscle control do 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.

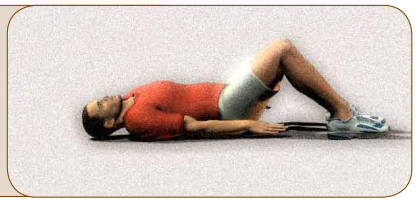


B3

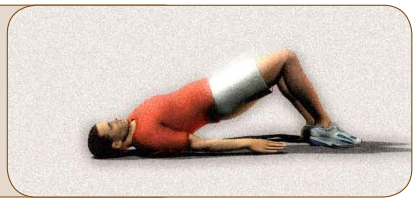
Maintaining the neutral spine position, extend the arms up over the body, holding a weight. Slowly extend the arms over the head. Hold for a count of ten then slowly bring back to start position.

BRIDGING

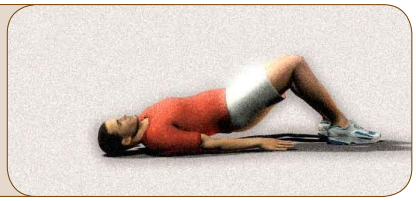
C1
Starting in the supine neutral position, raise the hips one inch off the floor and maintain the neutral, pain-free position for a count of 10 then return hips to the floor.



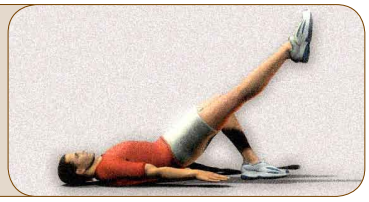
C2
Raise the hips further off the floor to the maximum height allowed while maintaining the neutral position and hold for a count of 10 then return hips to the floor. This is not meant to be a back arching exercise, maintain trunk control in the neutral, pain-free position throughout the exercise.



C3-1
Raise the hips off the floor approximately three inches and hold for a count of 10, then return the hips to the floor.

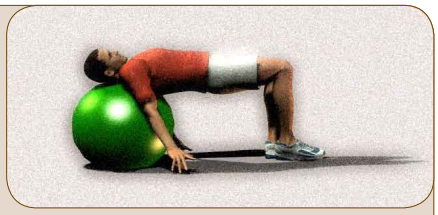


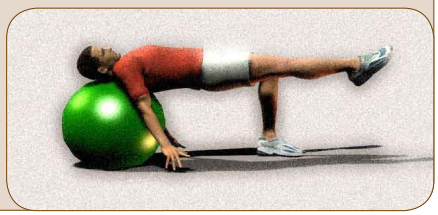
C3-2
Raise the hips off the floor approximately three inches and hold. Extend one leg while maintaining the back in the neutral pain-free position. Hold for a count of 10. Place the foot back on the floor and relax the hips to the start position. Repeat with the other leg. Weights can be added to the 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.



C4-5
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.

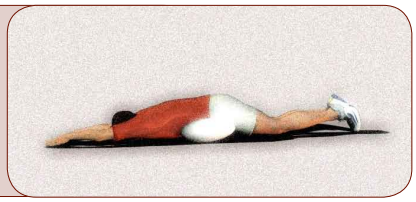
Add alternate extension of one lower extremity in bridged position. Hold for a count of 10 and relax.



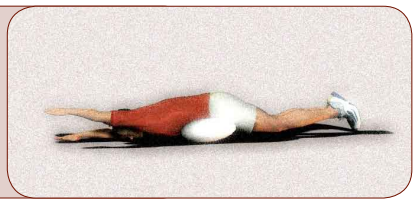


PRONE EXERCISES - floor

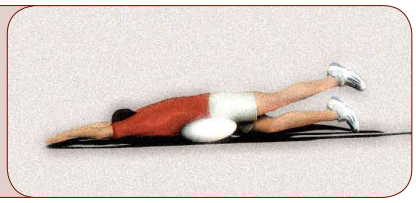
D1-1
Neutral position. Because the prone position may be painful in certain back conditions, it is suggested that the prone exercises begin with a pillow under the trunk to prevent too much lumbar extension. Rigidly tighten the trunk musculature into the neutral, pain-free position while maintaining the arms and legs in an extended position. Hold for a count of 10 and relax.



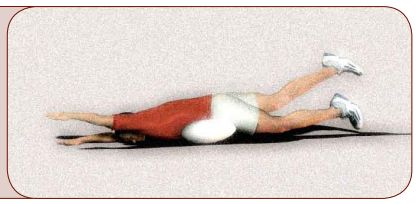
D2-1
Prone with single arm lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending one arm off the ground. Hold for a count of 10 and relax. Repeat with other arm.



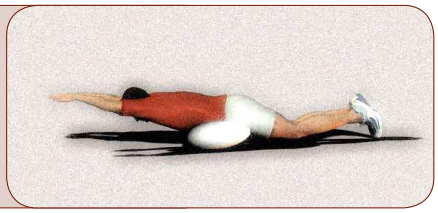
D2-2
Prone with single leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending one leg off the ground. Hold for a count of 10 and relax. Repeat with other leg.



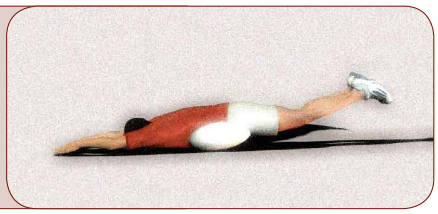
D2-3
Prone alternate arm and leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while lifting opposite arm and leg off the ground. Hold for a count of 10 and relax. Repeat with other arm/leg.



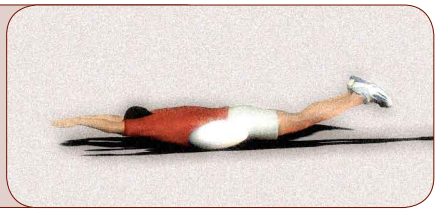
D2-4
Prone with double arm lifts. Maintain the original abdominal bridging position in the neutral pain-free position while extending both arms off the ground. Hold for a count of 10 and relax.



D2-5
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.

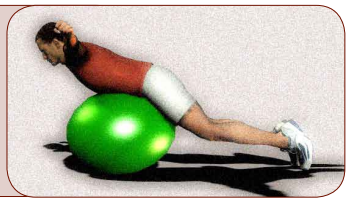


D2-6
Prone double arm and leg lifts. Maintain the original abdominal bridging position in the neutral pain-free position while lifting both arms and legs off the ground. Hold for a count of 10 and relax.

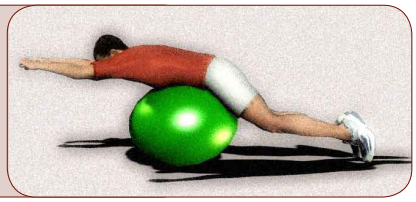


PRONE EXERCISES - ball

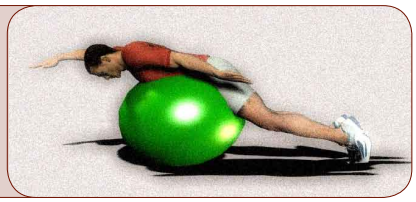
D3-1
Prone roll out with the abdomen resting on the ball, feet apart with toes on the floor in the pushup position. Arms flexed at the shoulder and down to the floor. Roll forward slowly, extending the trunk out into mid-air while maintain tight trunk control. Hold for 10 seconds then roll back to start 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.



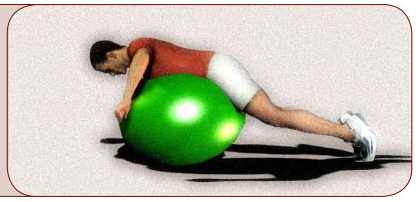
D3-2 Superman
Start prone on the kneeling position with the ball approximately at chest level. Spine locked in neutral position, elbows at 90 degrees. Extend the elbows, roll out on the ball, extend the elbows and knees at the same time. Roll out on the ball, hold, then roll back. Keep the neutral position tight and trunk in tight-control position throughout this maneuver.



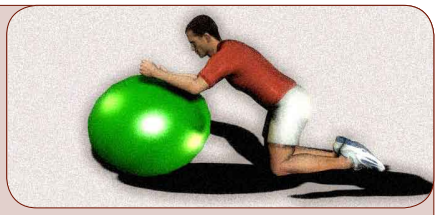
D3-3 Swimming
In the prone position, put the ball approximately under the abdomen. Lock the spine in the neutral pain-free position, feet and legs extended, toes on the ground. Alternate arm extension at the shoulder, full arm reach, first right and then left.

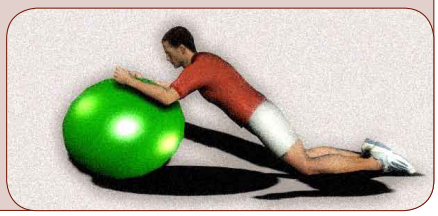


D3-4
Green ball shoulder abduction. Position the ball prone on your stomach, legs apart, toes on the ground. Elbows are at 90 degrees, extend the elbows back, hold and return to the original position.

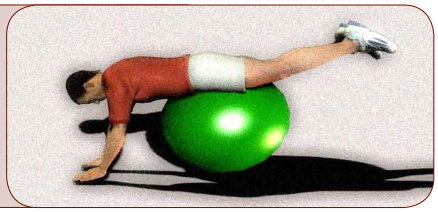


D4-1 Prayer
Kneel on the floor with your forearms on the ball. Keep the spine in a neutral muscle-control position. Rock forward, maintain spine position, rock back. Do not allow lumbar motion to occur with this exercise.



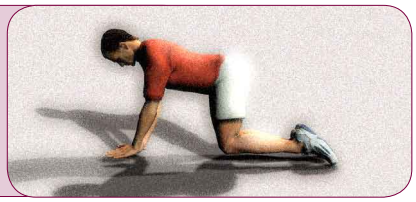


D4-2
Push-up prone on ball. In the prone position, put the ball approximately under the abdomen. Lock the spine in the neutral pain-free position, arms extended to the floor, palms down, feet and legs extended, toes off the ground. Slowly lower the upper body to the floor, maintaining neutral position trunk control, and then back up to start position.

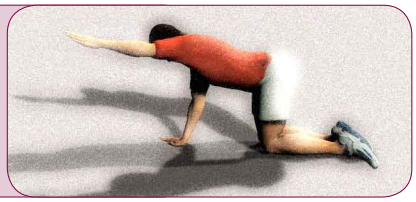


QUADRIPED EXERCISES

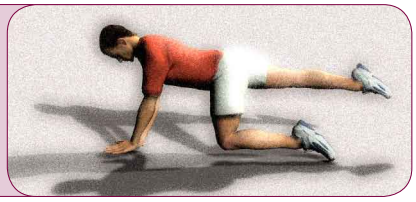
E-1
In the all-fours position, with the knees and hands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position for a count of 10 and relax.



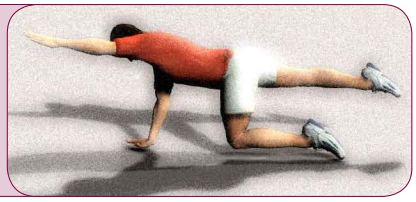
E-2
In the all-fours position, with the knees and hands on the floor, tighten the trunk musculature and hold the spine in the neutral, pain-free position, extend one arm, hold for a count of 10 and relax. Repeat with other arm.



E-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.



E-4
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 and opposite leg, hold for a count of 10 and relax. Repeat with opposite arm/leg.

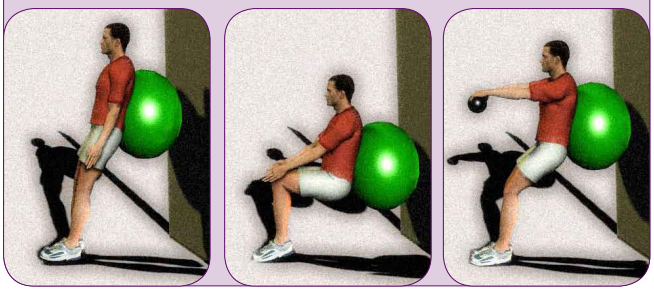


Difficulty of the above exercise can be increased with the use of weights on the extremities or the balancing of the bar across the back.

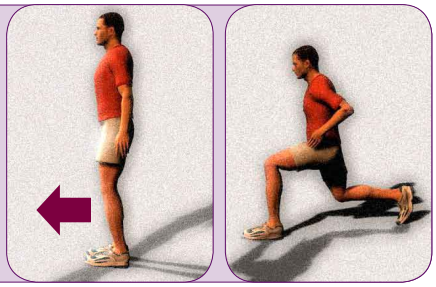
F-1 & F2
A green exercise ball is positioned behind the back against the wall, legs slightly apart, arms at the side. The body rolls down the ball into the sitting position and maintains this sitting position for a count of 10, returning to the initial semi-standing position. This exercise should begin 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 maneuver.

After being able to maintain a full 90/90 position for three sets of 30 time each, 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.



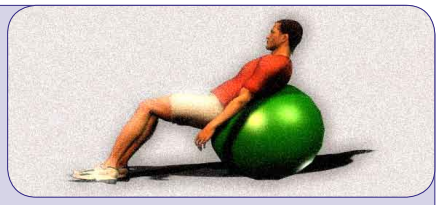
E-3 Lunges
Maintain neutral position, stride forward with one foot, bending the knee and partially kneeling with the opposite knee. Hold for three seconds and return to the start position. Repeat with the other leg. This can be done with added weights on arms or with stick across the shoulders. Maintain the neutral pain-free position.

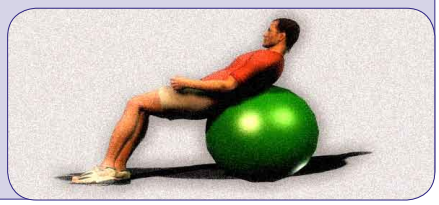


STABILIZATION EXERCISES with supine green ball

G1

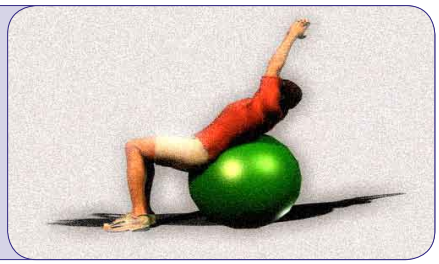
Supine quad press. Sit on the ball with the ball placed in the small of your back. Keep your chest and your stomach tight. Keeping your feet in the same position, roll back on the ball by straightening your legs. Keep your chin tucked in so as not to strain your neck. Keep your back in neutral and your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





G2

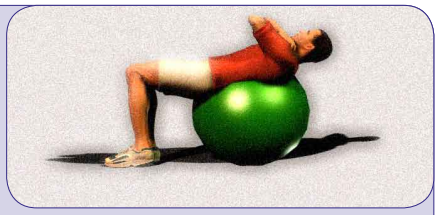
Tighten the trunk musculature in the neutral, pain-free position and bring one leg off the ground to the 90/90 position (hips at 90 degrees, knee at 90 degrees) while maintaining the neutral, pain-free position. The arms may be positioned at the side with palms to the floor for balancing. Hold for a count of 10 and then reposition the foot to the floor. Alternate legs.

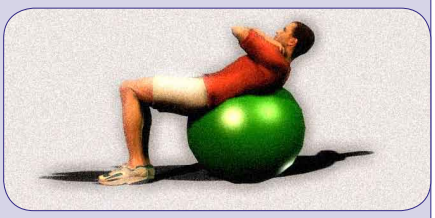


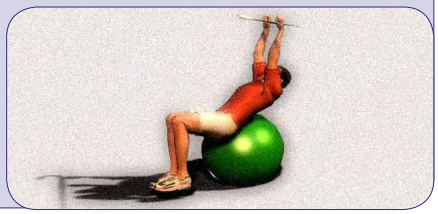
G3 Supine ball sit ups

Maintain a supine position with the low back on the ball, arms folded across chest and knees bent, 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, rigid trunk control.





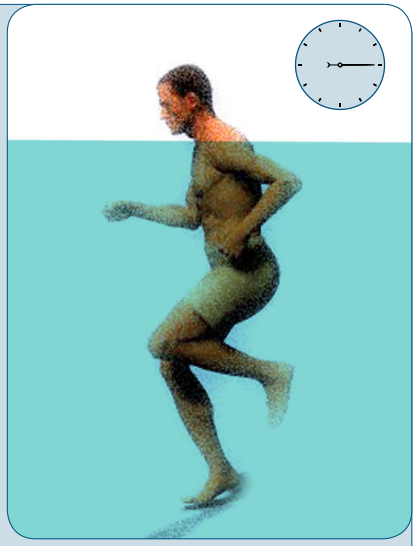


G4-5

Resistive exercises using a baton or a towel can be done with the aid of the trainer or therapist by pulling against the person on the ball and providing resistance for a count of 8-10. This resistance can be provided alternately across the chest, to the side, or over the head with a baton, weighted stick or with pulleys.

H1&2 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 of life jacket can be of great help. 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.

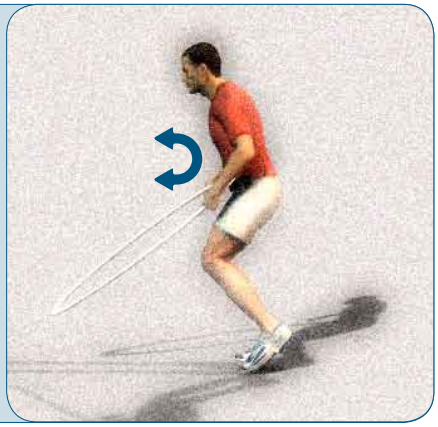
Week 2

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).

H3 Skipping Rope

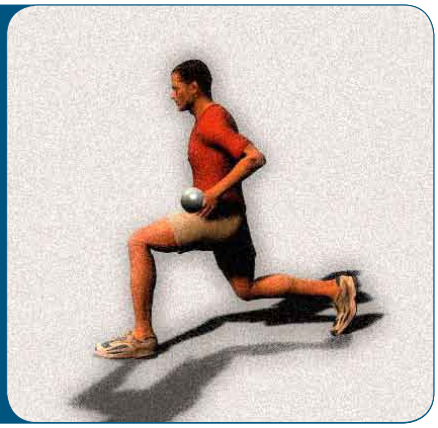
Rope will be skipped starting in a sequence using the 1-3 exercise levels of experience. Skipping rope is begun with a two-step jump and counting the number of jumps. This exercise progresses to an alternate step-jump and eventually to a shorter rope. The shorter the rope, the tighter the abdominal contraction is during the time of jumping the rope. Start by counting the jumps. 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 5 times
Level 2-50 jumps 5 times
Level 3-15 minutes of jumping



H3 Weight Training

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 lats 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 lunge. This 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

The slip-shouldered round-forward posture is probably the most typical cause or extenuating factor in delay of recovery for neck and arm pain. This physician produces a lever-arm effect to the head, from the weight of the head. It closes in the inter vertebral foramina because of extension in the cervical spine and closes the thoracic outlet.

The basis of our cervical treatment is the same as our lumbar spine treatment – The Trunk Stabilization Program. We start our cervical treatment with the same lumbar neutral position dead-bug exercises. You must be doing trunk isometric exercises in order to produce a chest-out posture. You cannot change an adult's posture without actively exercising to produce increased isometric trunk tone. The "chest-out" posture is done with the trunk.

The chest-out posture removes level-arm in the weight of the head, opens the thoracic outlet and opens an inter vertebral foramina. Exercises should be designed to produce the isometric strength necessary to maintain this position, as well as all upper strengthening exercises should be done with this position emphasizing this position. Do not start neck therapy by stretching or moving a painful neck. Use careful head control, positioning, modalities and posture realignment.

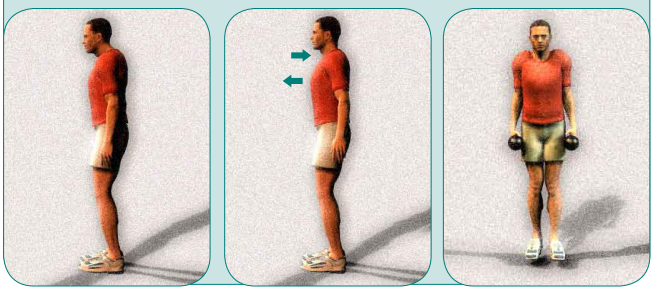
We frequently use a basic group of preventative exercises designed for neck and shoulder problems. The key to these exercises is emphasizing the chest-out posture. By emphasizing the chest-out posture during upper extremity, shoulder and neck exercises, proper head and neck alignment is enhanced. The chest-out posture does 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 arm.
2. It puts the weight of the head over the neck. This eliminates the lever arm effect of the distance from the center of gravity of the head to the spine and decreases the neck strain required to resist that weight.
3. It opens the inter vertebral 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. 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.

N1-3

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.



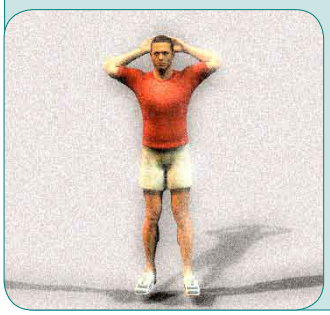
N4

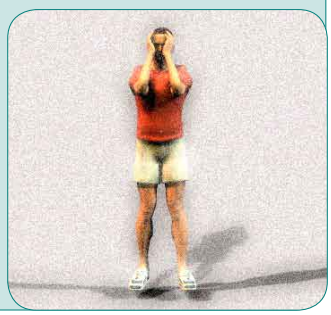
The arm roll. Standing in a proper-aligned spinal position, facing the mirror, the arms are extended out to the side and a fine arm roll is done with the arms; First, with the fingers pointed out; secondly, the thumbs pointed down; thirdly, the thumbs pointed up.

UPPER EXTREMITY POSTURAL EXERCISES

N5 A & B Elbow touch

The arms are at 90 degrees, elbows at 90 degrees with the hands pointing up and the elbows are brought together in front and then extended as far back posteriorly as possible. Then extend the elbows, touch the hands behind the back, hold the hands behind the back for the 10 second count.





N6 Arm abduction

Standing in the same legs-apart, spine-neutral position, touch the palms over the head. Repeat this 10 times then alternate with arms at 10 o'clock and 4 o'clock – rotate first clockwise, then counterclockwise, then alternate arms, first clockwise, then counterclockwise. Hold at the extremes for the 10 second count.

N7 Alternate arm-over

Touch the palms over the head. Repeat this maneuver 10 times, then rotate with the arms clasp to the right, then to the left.

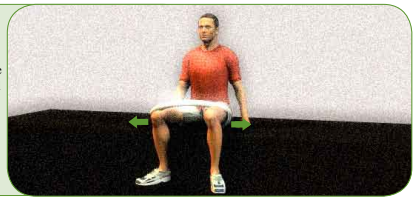
N8 A & B Chest-pull

Standing in the same position facing the mirror, the shoulders are 90 degrees, the elbows at 90 degrees, 90 degrees parallel with the ground, the arms touching. The arms are then spread apart to full maximum length and hands brought back together.

P1 Hip Abduction

Laying down supine with the knees bent, feet unhooked, or sitting up, the isoband is wrapped around the thighs and they are abducted apart as far as possible and held for a count of 8 seconds.

NOTE: Adduction/Abduction exercises should be performed with the adduction exercises first in a series of twenty and the abduction exercises in a series of ten; then, repeated.



P2 Hip Adductors

Laying down supine with the knees bent, feet unhooked, a soft, non-compressible roll, approximately 9 inches in length, is placed between the knees and is squeezed in adductor tension for a count of 8.

NOTE: Adduction/Abduction exercises should be performed with the adduction exercises first in a series of twenty and the abduction exercises in a series of ten;

P2 Hip Extensions

Grip the table and lean slightly over the table, hook the isoband from the leg of the table around the ankle and extend the hip, holding for a count of 4-8. Vary the position of the stance leg to comfort. This gives varying ranges of motion and resistance. It is not necessary to maximally hyper extend the back and leg to get strength. This may cause discomfort.

Level 1 Stand upright, pull back hold for 4-8 seconds.

Level 2 Bend forward 45 degrees, pull back for 4-8 seconds.

Level 3 Bend forward 90 degrees over the table, pull the leg back and hold for 4-8 seconds.

Alternate methods:

1. The isoband can be hooked around the stance leg.
2. A sling attachment to the universal gym can be used to lift increasing amounts of weights.