

# **FLEXIBILITY**

## **ACTIVE AND ASSISTED STRETCHING**

Aaron L. Mattes

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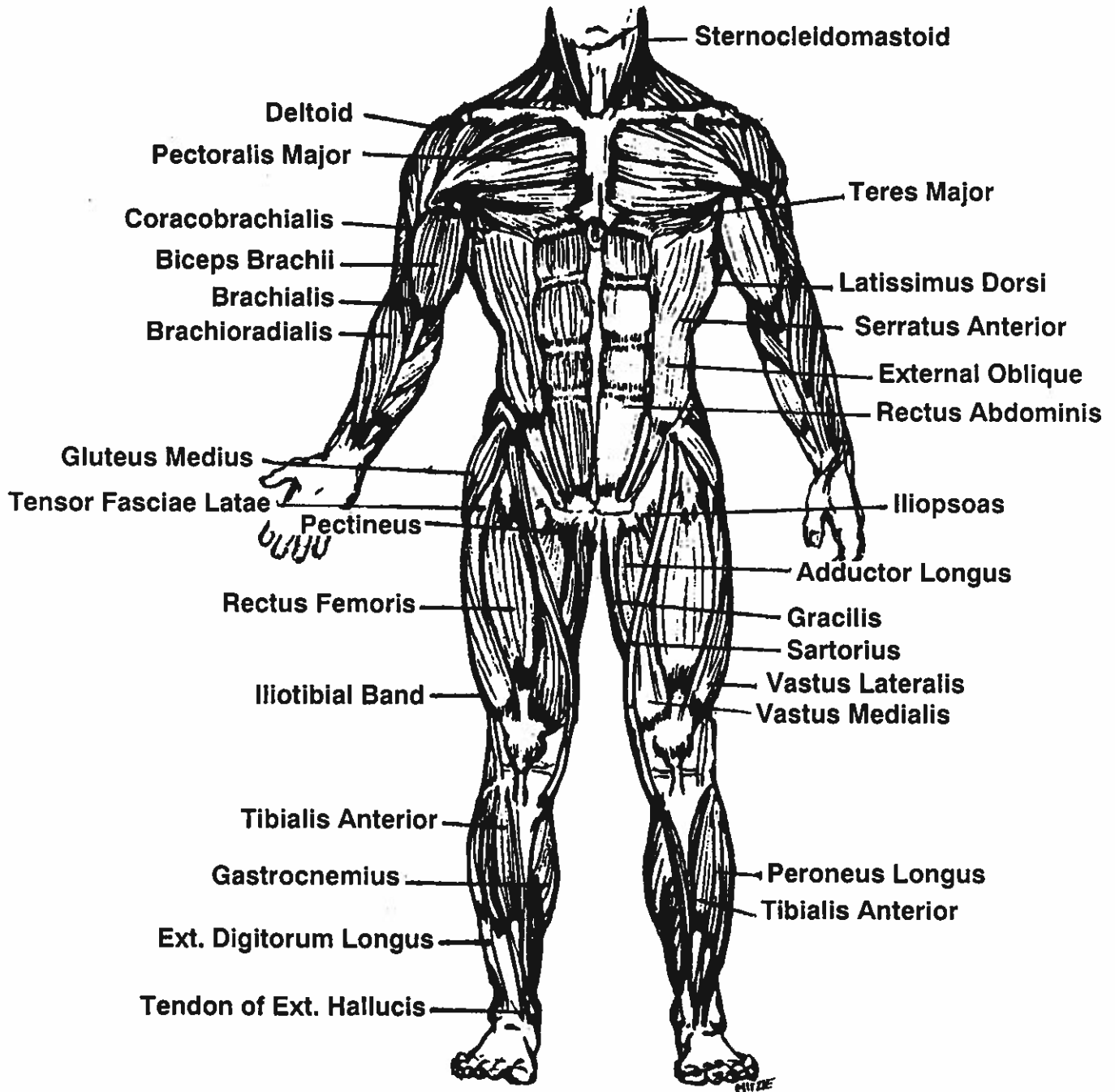
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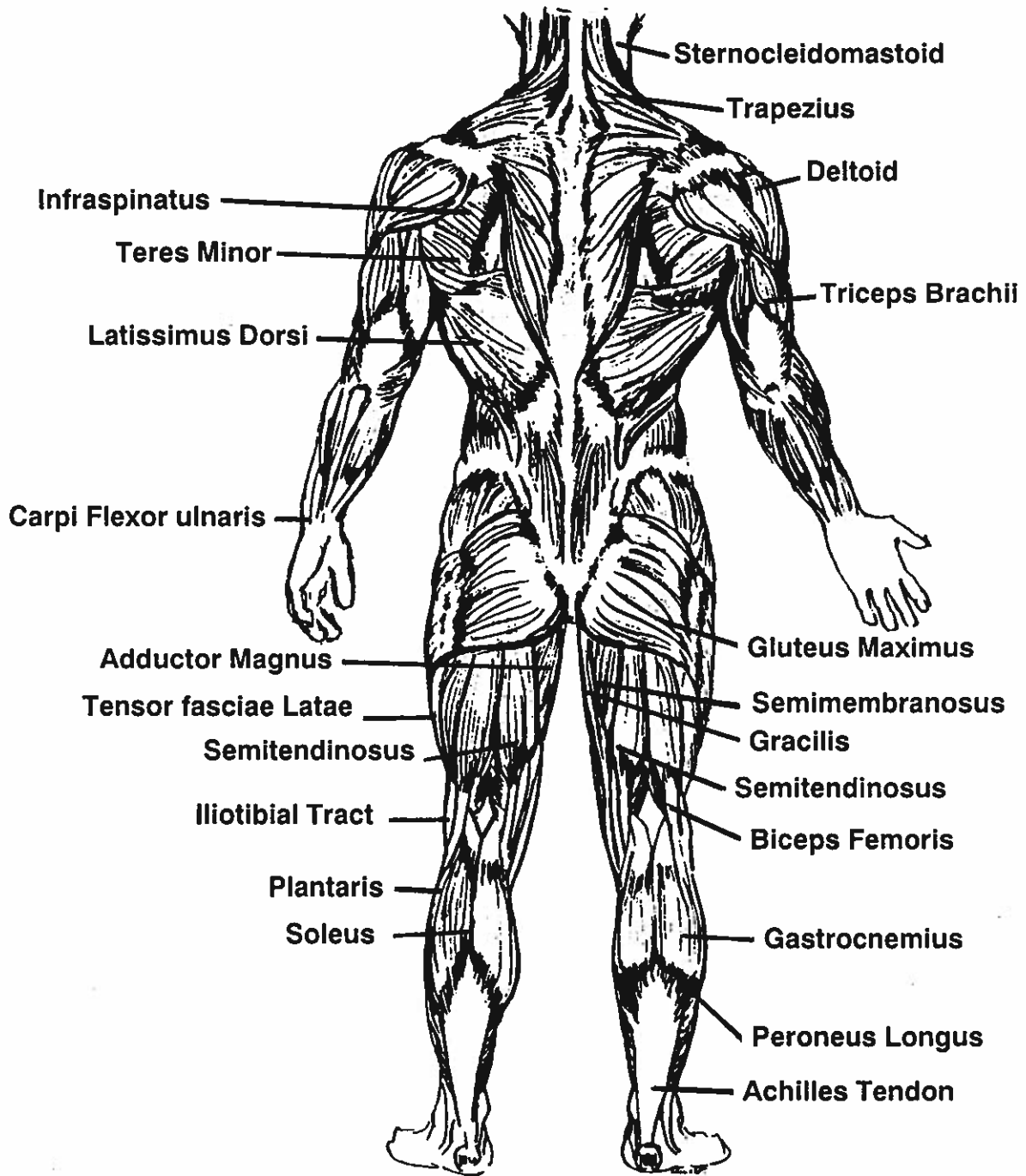
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# MAJOR ANTERIOR MUSCLES



# MAJOR POSTERIOR MUSCLES



# NECK FLEXIBILITY - STANDING

To insure maximum range of motion as a preventive measure for sports, improve range of motion and provide relief of cervical muscle tension. The standing neck flexibility series allows the subject to move the head in a

given direction actively and assist the movement with the hands.

## CIRCUMDUCTION

Circumduction is a gentle general warm-up exercise to increase circulation prior to the specific fundamental movements of the neck. Employ a relaxed, circular motion moving the head in small circles progressing to larger circles. Move head in one direction 6-8 repetitions and repeat in opposite direction.



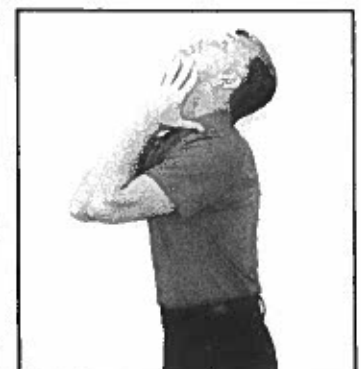
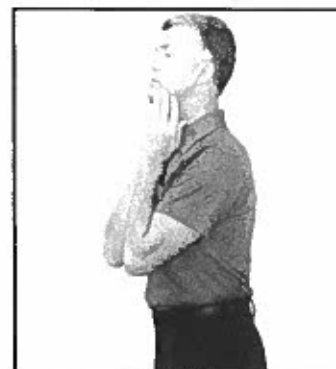
## FLEXION

Purpose of exercise is to stretch cervical extensor muscles. Contract anterior cervical flexor muscles, tuck chin as close to neck as possible, assist terminal movement with hands on back of head. Release and return to neutral position. Repeat the exercise 8-10 repetitions.



## HYPEREXTENSION

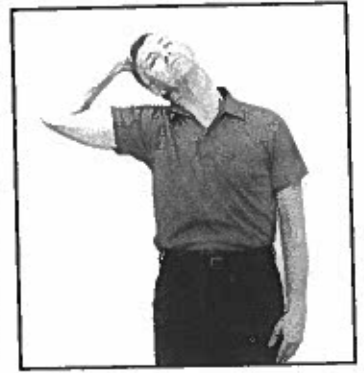
Extend head backward by contracting the extensor muscles. Assist at the end of the movement with the hands under the outer borders of the jaw or on the forehead. Stretch the cervical flexors, release to the neutral position and repeat. 8-10 Repetitions.





## LATERAL FLEXION RIGHT

In order to stretch the lateral muscles on the left side of the neck, contract cervical lateral flexors on the right side of the neck. Move head to the right, assist at end of movement with right hand placed on left side of head. Stretch and return to neutral position. Repeat stretch 8-10 repetitions.



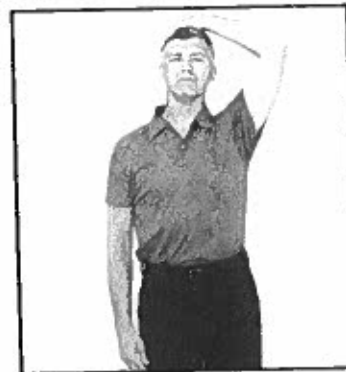
## ROTATION RIGHT

In order to stretch the left side neck rotators, rotate head to the right by contracting right side cervical rotators. Assist at end of movement by placing right hand on left side of jaw and left hand on right side of head toward back end. Stretch and release to neutral position. Repeat 8-10 repetitions.



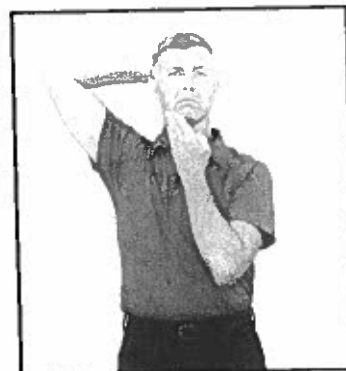
## LATERAL FLEXION LEFT

To stretch the lateral muscles on the right side of the neck contract cervical lateral flexors on the left side of the neck. Move head to the left. Assist at end of movement with left hand placed on right side of head. Stretch and return to neutral position. Repeat stretch 8-10 repetitions.



## ROTATION LEFT

In order to stretch the right side neck rotators, rotate head to the left by contracting left cervical rotators. Assist at end of movement by placing left hand on right side of jaw and right hand on left side of head toward back end. Stretch and release to neutral position. 8-10 Repetitions.



## NECK FLEXIBILITY - ACTIVE GRAVITY

Proper warming of neck musculature and normal fundamental joint range of motion may help reduce muscle strain and the possibility of severe injury such as nerve damage, fracture or paralysis. This is especially important

in sports such as football, wrestling, lacrosse and combative sports. The following localized movements of the cervical spine help improve flexibility, strength and endurance of the musculature.

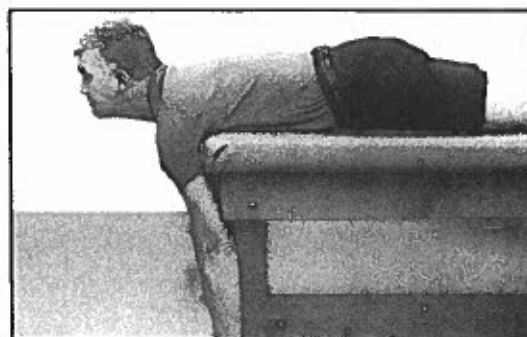
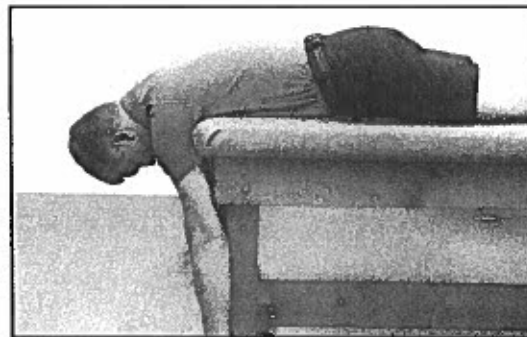
### CIRCUMDUCTION

Circumduction is a general warming exercise initiated from a standing or leaning position. A relaxed, circular motion is employed moving the head in small circles progressing to larger circles. Move head in one direction 6-8 repetitions and repeat in opposite direction.



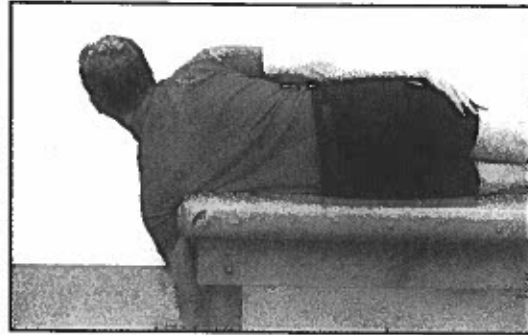
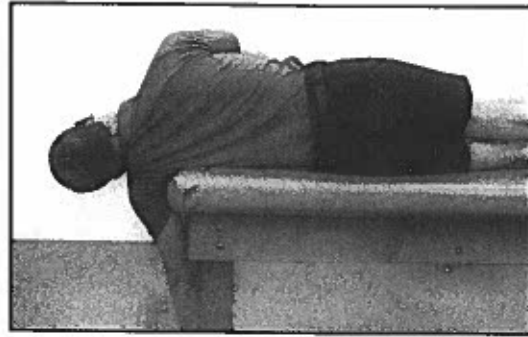
### HYPEREXTENSION

Hyperextension is an exercise to strengthen the upper erector spinae, splenius cervicus, splenius capitus, semispinalus cervicus and capitus, and stretch the sternocleidomastoid and prevertebral muscles. The exercise is performed in a four point position on hands and knees or prone with the head extending beyond the edge of a table or bed. Initiate exercise by lowering head toward supportive surface and extend head upward as far as possible without extending middle (thoracic) or lower (lumbar) spine. Exercise should be performed slowly with gentle assistive stretch at end of movement. 10 Repetitions.



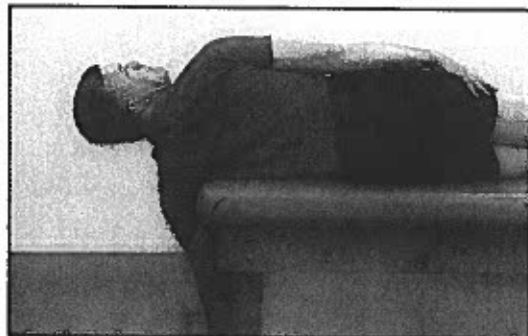
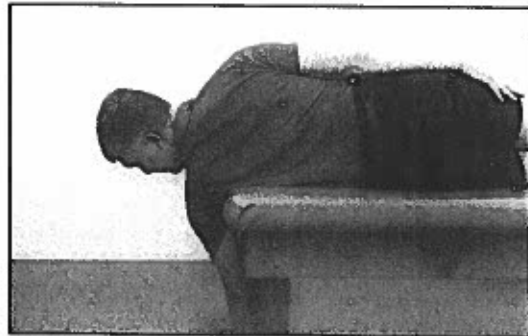
## LATERAL FLEXION - RIGHT

Purpose is to strengthen the 3 scaleni, sternocleidomastoid, erector spinae and prevertebral muscles and stretch the opposite side of the same group of muscles mentioned. Subject assumes a side lying position moving head downward toward lower shoulder and upward toward top shoulder giving gentle stretch to muscles at that point. Release and repeat. 10 Repetitions.



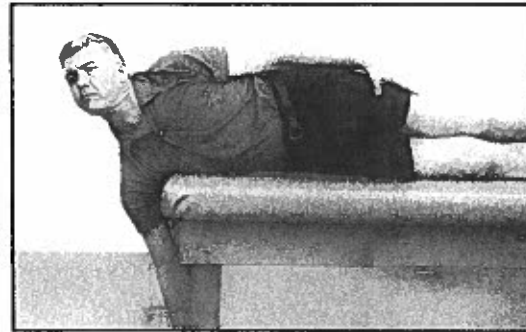
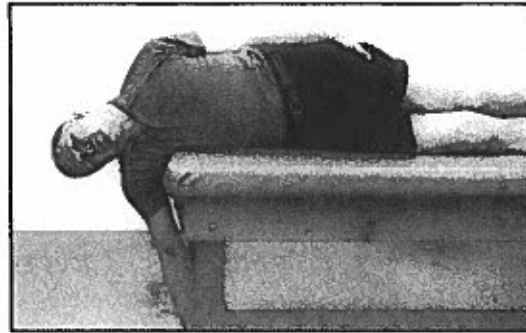
## ROTATION - RIGHT

Purpose is to strengthen the right sternocleidomastoid, deep posterior spinal muscles, longissimus cervicis, splenius capitis and cervicis and erector spinae muscles stretching their counterpart on the opposite side. In a side lying position, exercise is performed from a downward rotated position. Rotate head upward (right) slowly and stretch gently at top of motion. Release and return to starting position. 10 Repetitions.



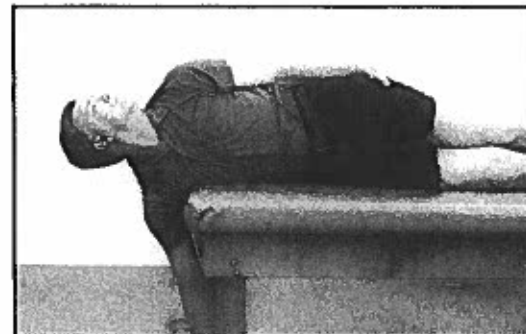
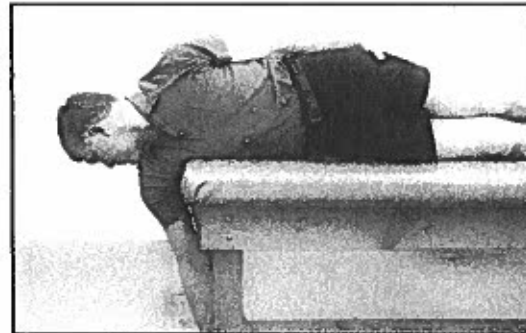
## LATERAL FLEXION - LEFT

Purpose is to strengthen the 3 scaleni, sternocleidomastoid, erector spinae and prevertebral muscles and stretch the opposite side of the neck, previous muscles mentioned. Subject assumes a side lying position moving head down toward right shoulder and then upward toward left shoulder giving gentle stretch to muscles at that point. 10 Repetitions.



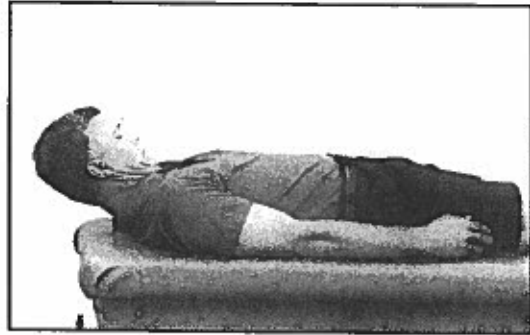
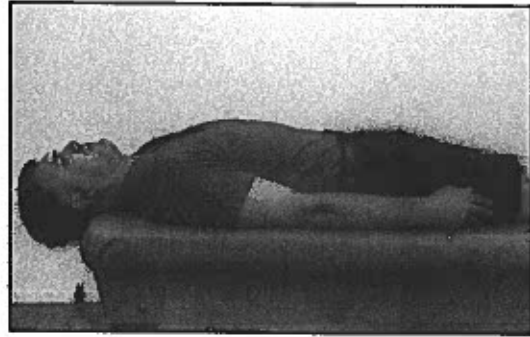
## ROTATION - LEFT

Purpose of rotation is to strengthen the left sternocleidomastoid, deep posterior spinal muscles, longissimus cervicis, splenius capitis and cervicis and erector spinae muscles, stretching their counterpart on the opposite sides. Exercise is performed side lying from a downward rotated position. Rotate head upward (left) slowly and gently stretch at end of movement. Return to starting position and repeat. 10 Repetitions.



## **FLEXION**

Flexion of the neck will strengthen the sternocleidomastoid and prevertebral muscles and stretch the cervical erector spinae muscles. Exercise is performed in a supine position. Retain shoulders on table throughout exercise. Tuck chin as close as possible to neck, lift head as far as possible in a close tuck. May assist at end of movement with gentle assistance of hands. Return to starting position and repeat. 10 Repetitions.



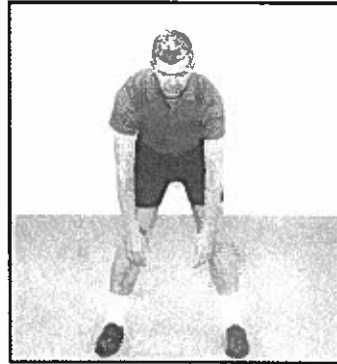
# SHOULDER FLEXIBILITY

The following exercises are specifically designed to stretch glenohumeral, acromioclavicular, sternoclavicular and scapular musculature and connective tissue. It is intended to help prevent muscle strains, joint sprains and dislocations and help improve performance of the shoulder

regions. Include for post injury and post surgery recovery. The following flexibility exercises will include every muscle fiber in the shoulders and should be done in the order presented in this book for maximum results.

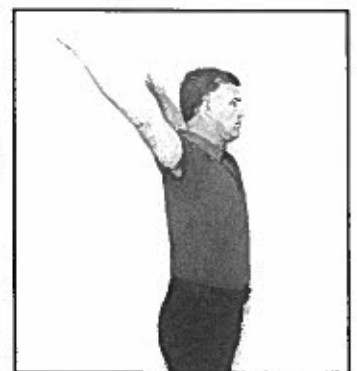
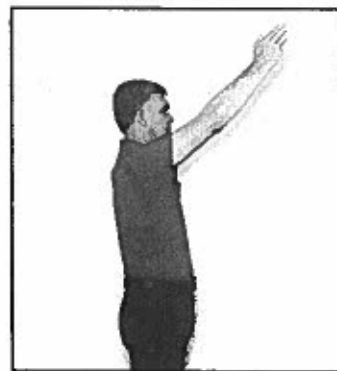
## CIRCUMDUCTION

The purpose of circumduction is to increase circulation in the glenohumeral joint. Arm circles toward and away from body midline. Arm should hang like a wet noodle when doing bent over circumduction. Lean body forward, bend knees and tighten stomach muscles. May also do giant (circumduction) arm circles from standing position if shoulder is not sore or injured. Begin with small circles and increase in size 10-15 repetitions in each direction.



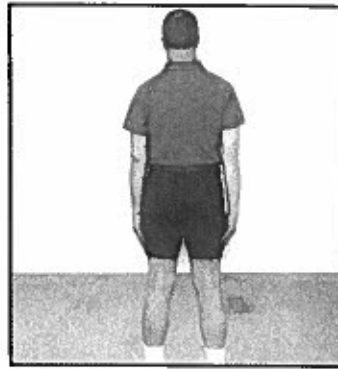
## HORIZONTAL ABDUCTION

To stretch the pectoralis major, teres major and anterior deltoid by contracting the trapezius, rhomboid major and rhomboid minor muscles. Palms facing forward, arms shoulder high. Reach backward, keep arms straight, draw shoulder blades as close together as possible. Return to palms together position. Repeat exercise raising level of arms with each repetition to include the upper pectoral fibers. To stretch anterior chest and shoulder muscles. 6-8 Repetitions.



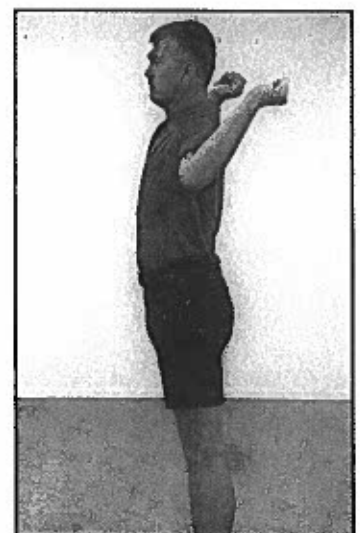
## **HYPEREXTENSION**

To stretch biceps brachii and anterior deltoid muscles by contracting the triceps brachii and posterior deltoid muscles. Stand straight, reach both arms back as far as possible for 6-8 repetitions. Then clasp hands, keep elbows locked and reach back as far as possible without bending trunk forward. Release and return to starting position. 8-10 Repetitions.



## **EXTERNAL ROTATION**

Keep arms (elbows) level with shoulders, elbows bent at 90 degree angle. Palms facing downward as exercise begins. Rotate shoulders backward (externally) as far as possible by contracting the supraspinatus, infraspinatus and teres minor muscles. To stretch internal shoulder rotators which include the teres major, subscapularis and pectoralis major muscles. Slow steady stretch at end of movement. Release at starting position and repeat. 8- 10 Repetitions.



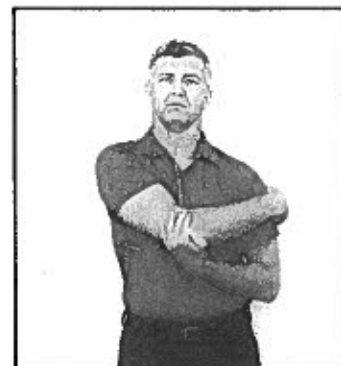
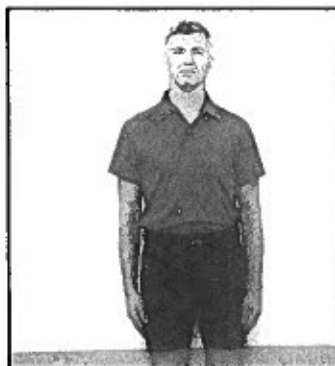
## INTERNAL ROTATION

The most frequent injury to the shoulder involves the rotator cuff muscles. Considerable attention must be given to the thorough stretching of this area. The important exercises include internal rotation, horizontal flexion I and horizontal flexion II. Elbows bent at 90 degree angle, level with shoulders palms facing forward. Rotate shoulders forward (internally) as far as possible by contracting the teres major, subscapularis and pectoralis major muscles. Keep scapula from compensating upward for best stretch of supraspinatus, infraspinatus and teres minor. May need assistance to stabilize scapula and affect best maximum stretch. Athletes are often limited in internal rotation sometimes resulting in rotary cuff injuries in throwing or from a severe blow or fall. Slow steady stretch at end of movement, release and return to starting position and repeat. 10-15 Repetitions.



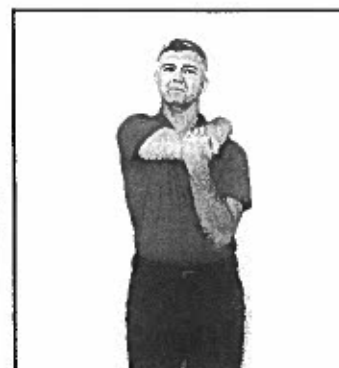
## HORIZONTAL FLEXION I

Arm level with shoulder, fingers reach around far outside corner of opposite arm midway between the shoulder and elbow, contracting pectoralis major, anterior deltoid and coracobrachialis muscles. Use opposite hand on elbow to assist with stretch at end of movement. Return the arm to side after each repetition. The purpose of this exercise is to stretch external shoulder rotators, especially supraspinatus and infraspinatus muscles (rotator cuff). 8-10 Repetitions.



## HORIZONTAL FLEXION II

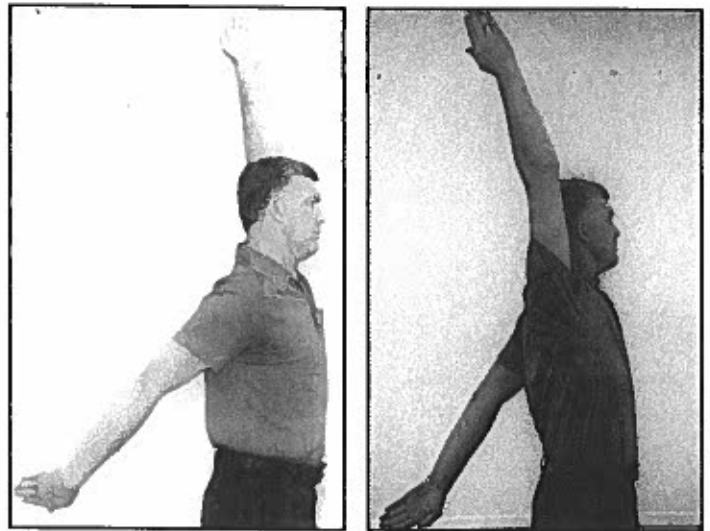
Reach around to opposite shoulder. Fingers walk down spinal column as far as possible. Contract pectoralis major, anterior deltoid and coracobrachialis muscles. Place free hand on elbow of exercising arm for gentle assistance at end of movement. Return the arm to side after each repetition. Good for rotator cuff stretching, especially infraspinatus and teres minor muscles. 8-10 Repetitions.





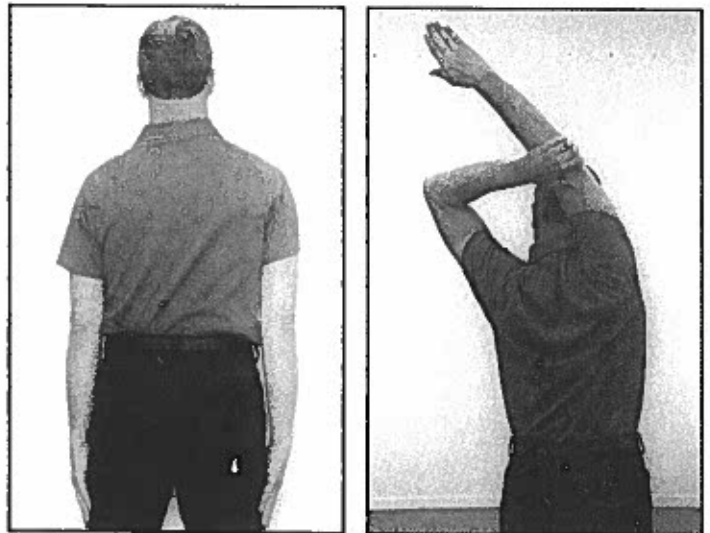
## FORWARD ELEVATION

Lack of full forward elevation contributes to many shoulder problems. The arm should be able to reach a complete vertical position without bending the elbow. Keep palms facing body, elbows locked throughout movement. Reach one arm forward as far as possible contracting the upper biceps brachii and anterior deltoid muscles. Counterbalance spinal extension compensation by contracting the abdominal muscles and reaching the other arm back as far as possible. Complete the exercise without rotating upper torso, arching back, or allowing elbows to bend. Alternate left and right arms. Purpose is to gain greater forward elevation of the shoulder. It may be necessary to do the triceps stretch in order to achieve maximum forward elevation. 8-10 Repetitions.



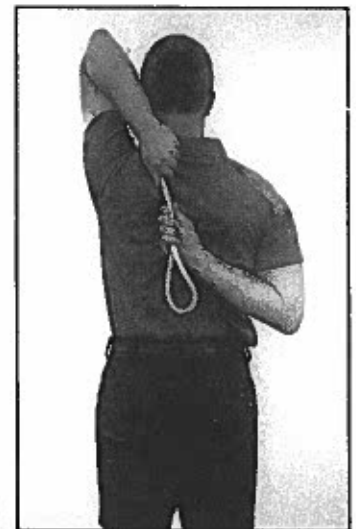
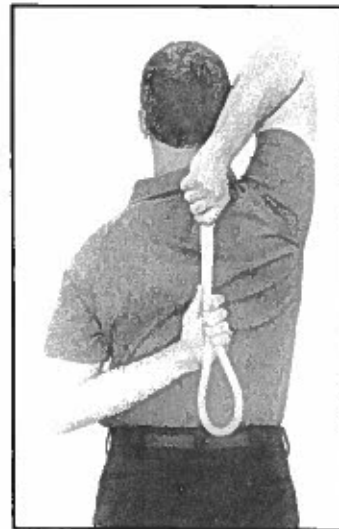
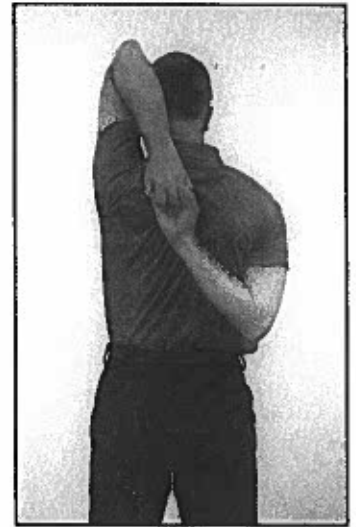
## SIDEWARD ELEVATION

Palm of hand facing forward. Keep elbow locked throughout movement. Reach upward as far as possible by contracting the deltoids and rotator cuff muscles, stretching the teres major, latissimus dorsi and serratus muscles. Cross arm in back of head. Assist by clasping elbow with opposite hand. Return to starting position after each repetition. A more advanced position is with the palm facing inward, elbow locked, fingers pointed toward the midline. Reach across midline, assist with opposite hand, elbow locked throughout movement. Purpose is to provide maximum upward rotation of the scapula, permitting maximum sideward elevation of shoulder complex. Alternate. 8-10 Repetitions.



## POSTERIOR HAND CLASP

Clasp hands or move toward joining hands. Upper arm in vertical position in against neck, the opposite hand reaching up between shoulder blades attempting to clasp hands. For gentle assistance a rope or towel may be held in each hand to help gain range needed to clasp hands. Hand walks toward opposite hand. Do not assist without active effort. Stretch gently to increase range. It is not unusual that a person can do this well on one side but not on the other. Must work to equality or may result in greater percent of injuries when stressed in extended positions. Repeat 6-8 repetitions doing same for opposite shoulder.



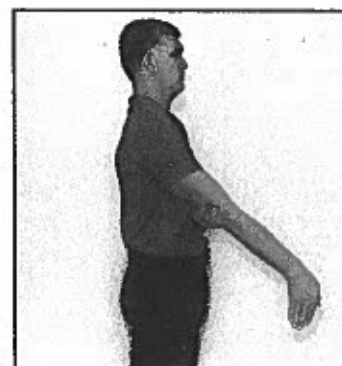
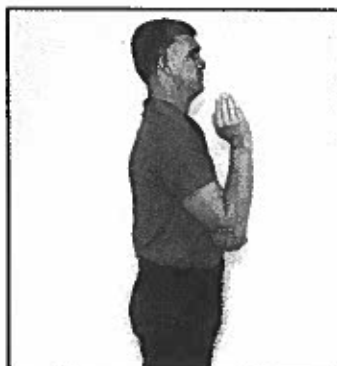
# ELBOW, RADIO-ULNAR, WRIST AND FINGER FLEXIBILITY

Stretching may help reduce the joint strain from weight bearing, sudden jolts, repeated stress from throwing, or torque which may result in injuries such as Little League Elbow, Tennis Elbow, wrist or forearm strain. These areas

are often neglected in sports preparation. These stretches are helpful in increasing circulation and helping reduce joint and muscle stress and pain in the elbows, radioulnar, wrists and hands.

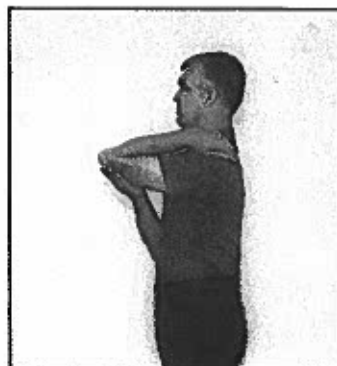
## ELBOW FLEXOR STRETCH

Stretching the elbow flexors (biceps brachii, brachialis, brachioradialis) helps insure maximum joint range and tissue extensibility to assist in reducing joint strain. Use free hand to stabilize elbow. Extend elbow with triceps brachii muscle to stretch biceps and brachialis muscles. With palm facing body midline, ulnar flex wrist (little finger toward same side of wrist) to stretch brachioradialis muscle. Return to starting position and repeat. 6-8 Repetitions.



## TRICEPS STRETCH

Purpose is to stretch triceps brachii muscle. Begin with elbow 90 degree from vertical position palm facing toward midline. With elbow flexed contract biceps brachii and anterior deltoid muscles. Extend arm upward as far as possible and assist stretch gently with opposite hand. Return to starting position after each repetition. 6-8 Repetitions.



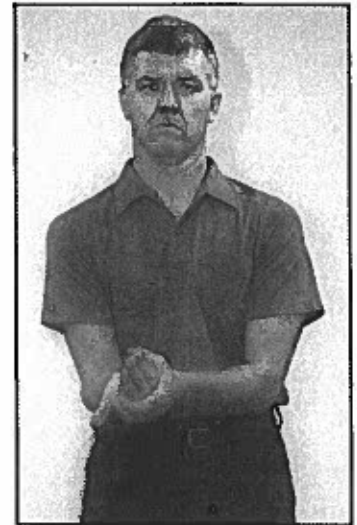
## RADIO-ULNAR PRONATION

Flex elbow, adduct shoulder and maintain elbow against side of trunk throughout movement from neutral position (thumb upward), rotate forearm inward to palm downward position. Use free hand for slight assistive stretch. Release and repeat. Purpose is to stretch the supinator and biceps brachii muscles by contracting the pronator quadratus and pronator teres muscles and help reduce elbow stress in movements causing torque, such as throwing, batting and racket sports. 6-8 Repetitions.



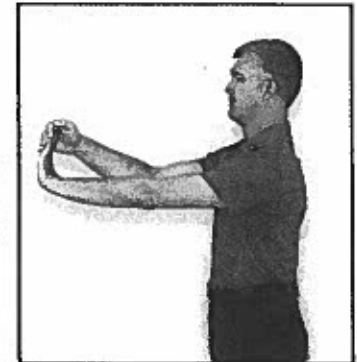
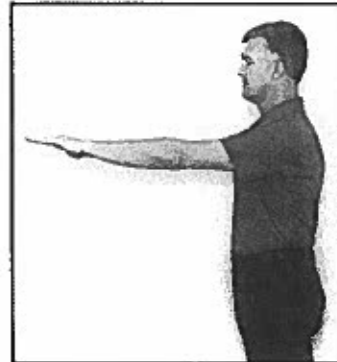
## **RADIO - ULNAR SUPINATION**

Flex elbow, adduct shoulder and maintain elbow against side of trunk throughout movement from neutral position (thumb upward), rotate forearm outward to palm upward position contracting the supinator, biceps brachii and brachioradialis muscles. Use free hand for slight assistive stretch. Release to starting position and repeat. Purpose is to stretch pronator quadratus and pronator teres muscles and help reduce elbow stress in throwing, batting and racket sports. 6-8 Repetitions.



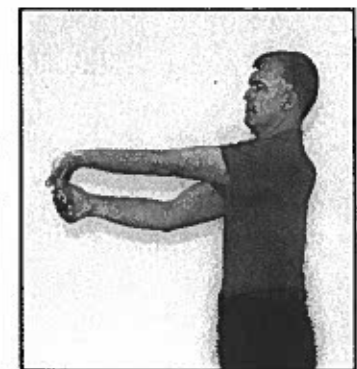
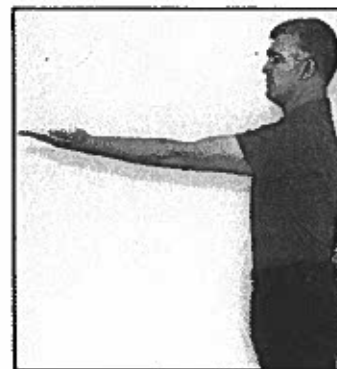
## **WRIST EXTENSION - PRONE**

Lock elbow, extend wrist backward as far as possible by contracting wrist extensors including the extensor carpi radialis longus, extensor carpi radialis brevis and extensor carpi ulnaris. Use free hand for gentle assistive stretch. To stretch wrist and finger flexors which include the flexor carpi radialis and flexor carpi ulnaris and help reduce wrist, forearm and elbow stress. 6-8 Repetitions.



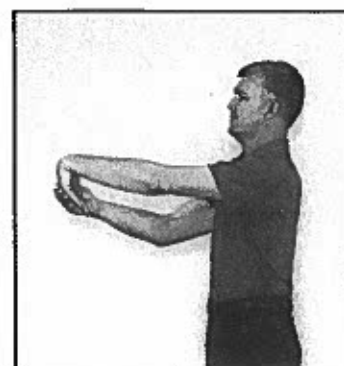
## **WRIST EXTENSION - SUPINE**

Lock elbow, extend wrist back through full range by contracting wrist extensors including the extensor carpi radialis longus, extensor carpi radialis brevis and extensor carpi ulnaris. Assist at end of movement with free hand. Purpose is to stretch wrist flexors including the flexor carpi radialis and flexor carpi ulnaris and help reduce wrist and forearm stress. Especially helpful to stretch at wrist flexor muscle origins. 6- 8 Repetitions.



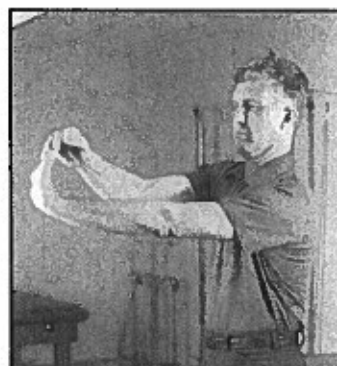
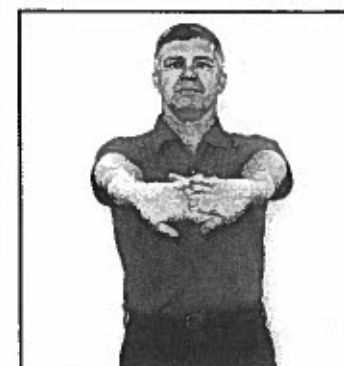
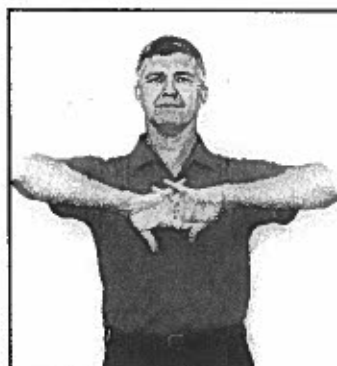
## WRIST FLEXION

Lock elbow. Slowly flex wrist downward by contracting wrist flexor muscles including the flexor carpi radialis and flexor carpi ulnaris. Apply gentle stretch with opposite hand. Purpose is to stretch wrist and forearm extensor muscles including the extensor carpi radialis longus, extensor carpi radialis brevis and extensor carpi ulnaris, helping reduce wrist, forearm and elbow stress. 6-8 Repetitions.



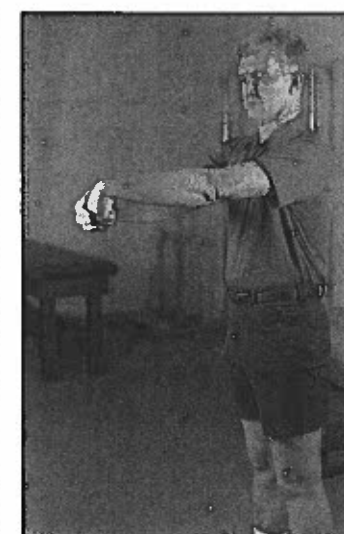
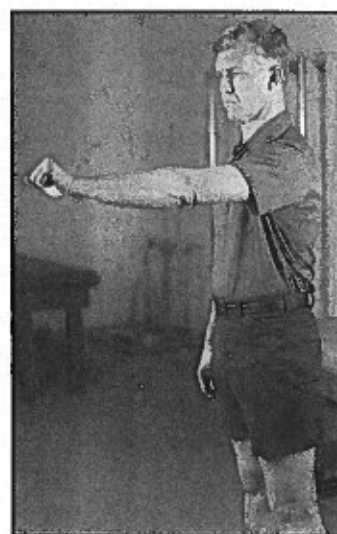
## FINGER FLEXOR STRETCH

Purpose of this stretch is to stretch the finger flexors including the flexor digitorum superficialis, flexor digitorum profundus and flexor digiti minimi. This stretch also involves the wrist flexor muscles including the flexor carpi radialis and flexor carpi ulnaris. Contract the working extensor muscles of the fingers include the extensor digiti minimi, extensor digitorum and extensor indicis. Contract the wrist extensor muscles including extensor carpi radialis longus, extensor carpi radialis brevis and extensor carpi ulnaris. From standing or sitting position. Begin with palms facing away from body and flex the elbows 90 degrees. To stretch the finger-wrist flexors, hyperextend the wrist, extend the fingers and elbows simultaneously. Release and repeat. This exercise may also be accomplished by extending the wrist and fingers backward and assisting with the opposite hand. Release and repeat. If the elbow is locked the wrist flexors receive a more complete stretch. 6-8 Repetitions.



## FINGER EXTENSOR STRETCH

From standing or sitting posture extend the elbow and make a firm fist. Flex the wrist downward by contracting the flexor carpi radialis, flexor carpi ulnaris, flexor digitorum superficialis, flexor digitorum profundus and flexor digiti minimi brevis. The muscles being stretched include the extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris, extensor digitorum, extensor indicis and extensor digiti minimi. Flex the wrist as far as possible and assist with the opposite hand. Release to starting position and repeat. 6-8 Repetitions.



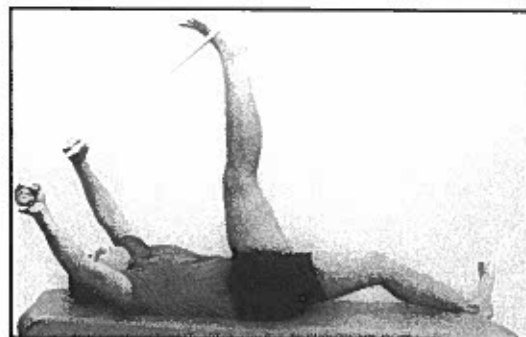
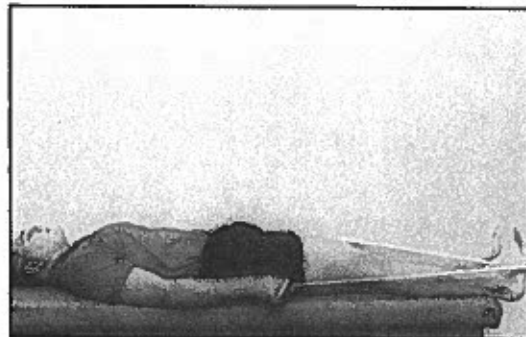
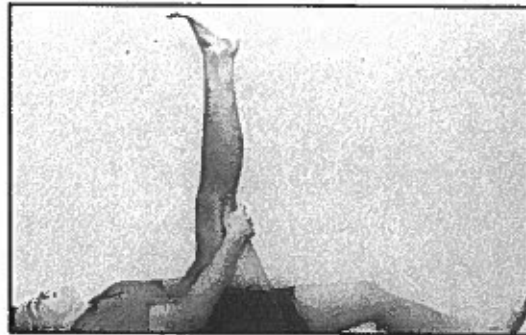
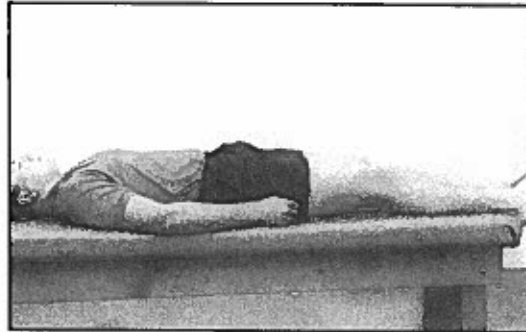
# HIP FLEXIBILITY

Muscles of the hip joint are among the most frequently injured in the body. Many muscles that flex and extend the hip are also part of the low back and knee. Inflexibility of

two joint muscles such as the hip flexors or hamstrings limit hip, pelvic girdle and low back movements.

## HAMSTRING STRETCH - SUPINE

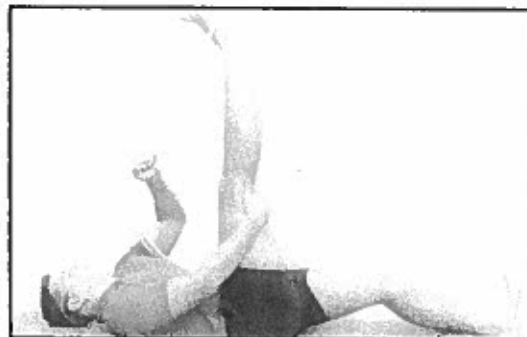
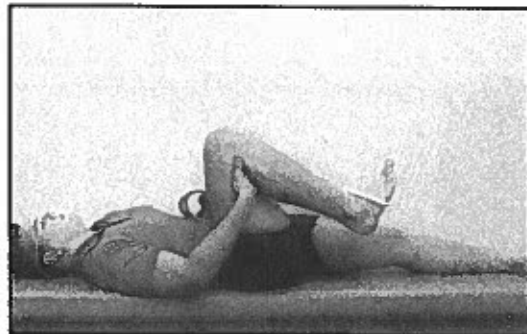
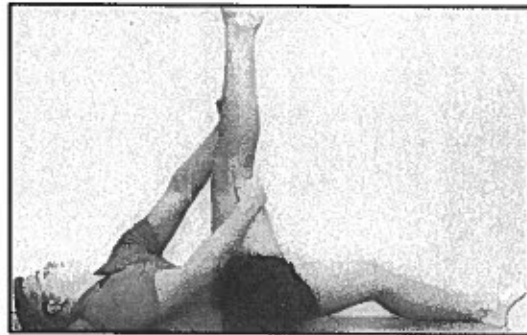
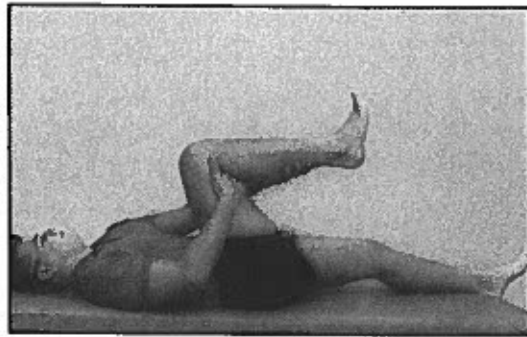
The hamstring muscles are stretched by a constant contraction of the quadriceps muscles. Flex non-exercising leg 25-50 degrees if there is a severe back consideration, otherwise non-exercising leg remains on the surface. Do not allow exercising leg to bend at any point in movement. Leg is lifted slowly by quadriceps muscles. Give gentle assistance with rope or hands at end of movement as quadriceps muscles continue to move leg. Release to starting position and repeat. Two sets of 10, alternating legs after each set.



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## HAMSTRING STRETCH - BENT KNEE

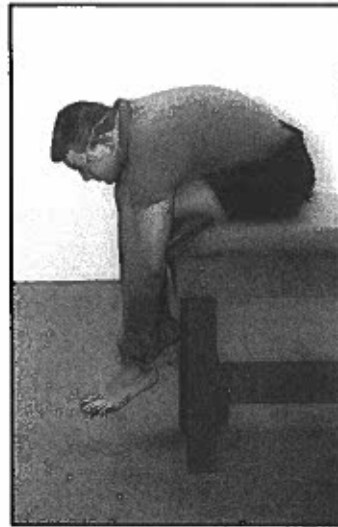
Especially good stretch for lower hamstrings (area above insertion). Flex uninjured leg if back is a problem. Place one hand under knee to help maintain flexed hip. Extend knee slowly as far as possible. Do not flex hip any further until knee can extend completely. Gradually flex hip more as lower hamstring flexibility improves. Gentle assistance is provided by rope or free hand as quadriceps muscles continue to move leg. Release and repeat. Two sets of 10, alternating legs after each set.





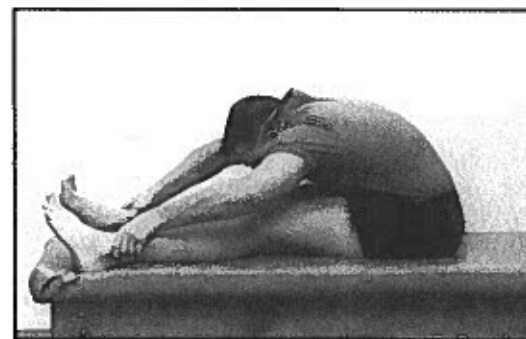
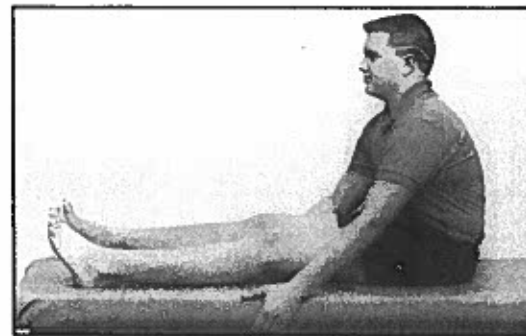
## HAMSTRING STRETCH-BENT KNEE SITTING

Good method for athletic persons having tight lower hamstrings and free of back problems. Lean body forward contract abdominal muscles and lift leg with quadriceps. Use hands and provide gentle assistance at end of movement, release and repeat. Lean trunk forward farther as flexibility increases. Eventually athlete should be able to touch chest on knees and lock knee in extension. 2-3 Sets of 10 repetitions each leg depending on range limitation.



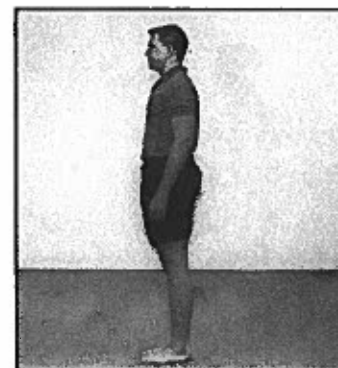
## HAMSTRING STRETCH SITTING - STRAIGHT LEGS

Advanced exercise to those who are quite flexible or for those athletes that require extreme flexibility in their sport. The hamstrings are stretched by contracting the quadriceps muscles locking the knees throughout the exercise. Starting from the sitting position, tuck the chin, exhale, tighten the abdominals firmly while leaning forward. Do not allow knees to bend. Do exercise slowly without bouncing. Use hands for light assistive stretch at end of movement. Resume sitting position and repeat. Best and safest to do this after stretching hamstrings and long back muscles previous to this stretch. 10 Repetitions.



## HAMSTRING STRETCH - STANDING

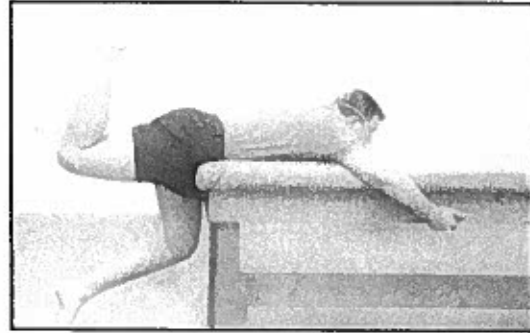
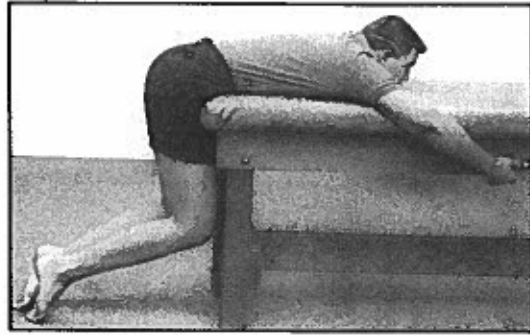
Contract the abdominal muscles so that the back muscles may be stretched passively without tension. Also contract the quadriceps muscles (front thigh) lean forward as far as possible to stretch hamstrings and low back. Release tension on back by assuming erect starting stance and repeating exercise. Do movement slowly without bouncing. Use hands for gentle assistive stretch. For use in between competitive moments as you feel the need to stretch the hamstrings and back because they become tight. 8-10 Repetitions.





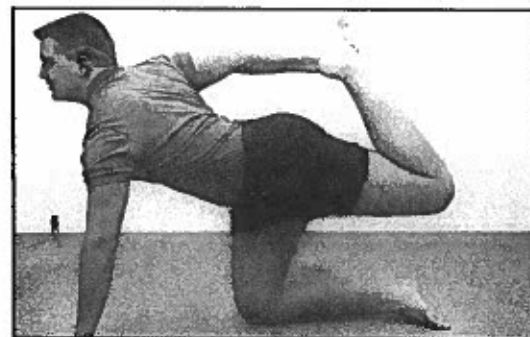
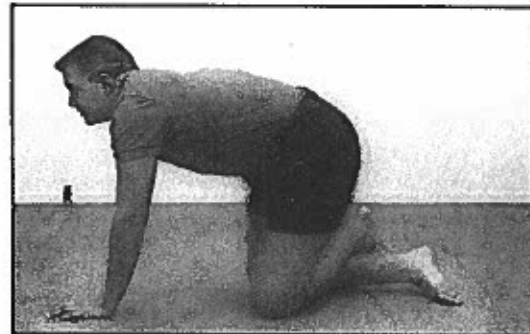
## PSOAS STRETCH - PRONE

Purpose is to stretch psoas and iliacus muscles by contraction of the hip extensors (gluteus maximus and hamstrings). Rest upper body and pelvis on table, no weight bearing on contralateral leg keeping resting leg against table. Flex exercising leg 90 degrees at knee and keep leg adducted against non-exercising thigh throughout movement. Extend hip stretching psoas at end of movement. The same exercise may be accomplished on the floor in a 3-point position. Stretch and release to starting position. 10 Repetitions.



## PSOAS STRETCH - KNEELING

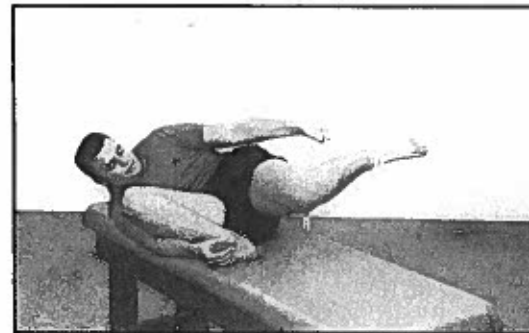
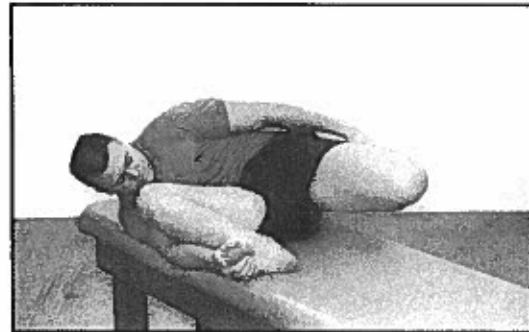
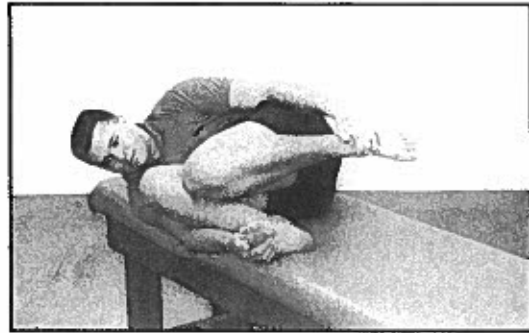
Using gluteus maximus and hamstrings to stretch iliopsoas muscles. In 3-point position clasp exercising leg at ankle with opposite side hand. Keep top of pelvis tilted backward throughout movement. Extend leg back as far as possible and assist with hand. Release and repeat. 10 Repetitions.



## RECTUS FEMORIS STRETCH - SIDE LYING

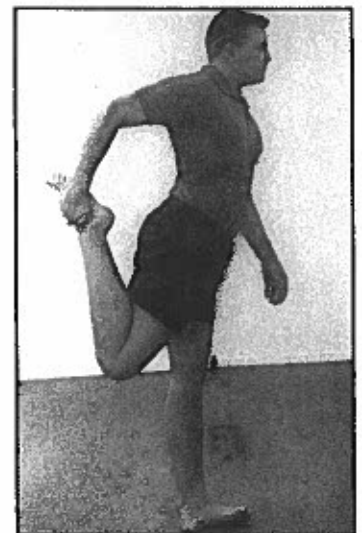
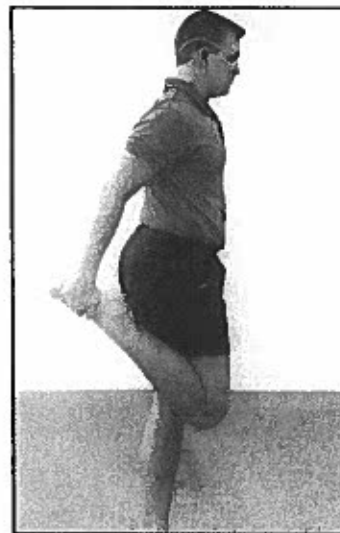
Purpose of exercise is to stretch rectus femoris muscle. Lower hip is flexed and thigh pulled close to chest. Maintain position with same side hand. Hand may be placed under foot of stabilized leg. Flex top leg and grasp ankle with hand. Contract abdominal muscles to help prevent forward tilt of pelvis. Maintain upper leg in adducted position toward body midline throughout movement. Contract gluteus maximus and hamstrings reaching backward with thigh. Use hand for gentle assistance at end of movement. Repeat 10 repetitions and alternate. 2 Sets, 10 repetitions.

NOTE: For extremely short rectus femoris muscle it may be necessary to decrease flexion of top leg and use rope to assist.



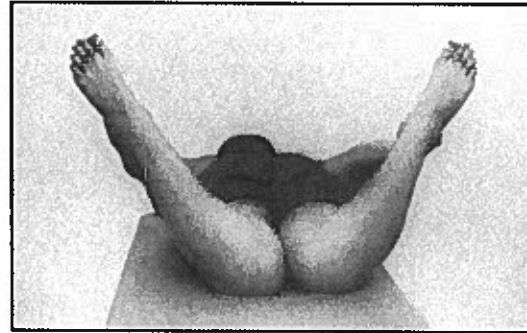
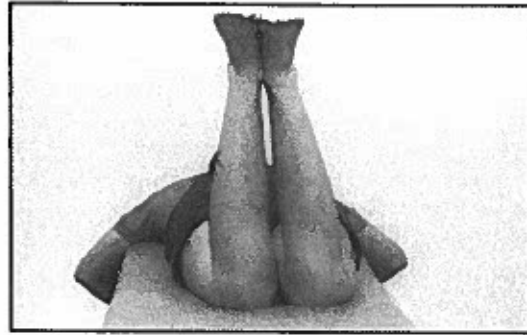
## RECTUS FEMORIS STRETCH - STANDING

When limited in time between periods of play, stretch hip flexors from standing position. Tighten abdominals to prevent back arching. Exercising thigh should be kept adducted against opposite thigh. Contract gluteus maximus and hamstrings extending thigh backward. Provide gentle assistance with hand at end of movement. Repeat 10 repetitions and alternate.



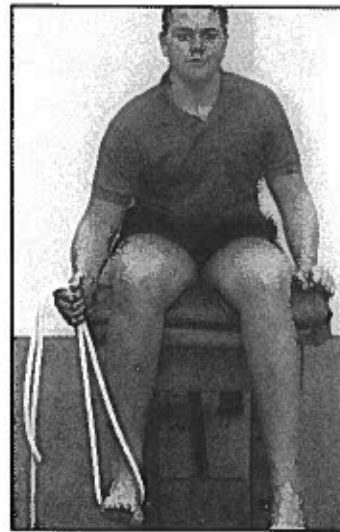
## HIP EXTERNAL ROTATOR STRETCH-PRONE

The ability to move laterally, pivot or change directions may be limited by the flexibility or strength of the hip rotators. The external rotators of the hip (six deep external rotators and gluteus maximus) are stretched by contracting the internal hip rotators (gluteus minimus, tensor fasciae latae). Exercise is performed in a prone position, knees together, rotate hips inward moving legs laterally away from midline as far as possible. Hands may be used for assistive stretch at end of movement. Repeat 10-15 repetitions.



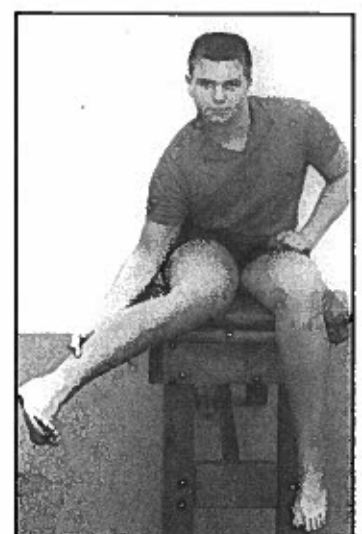
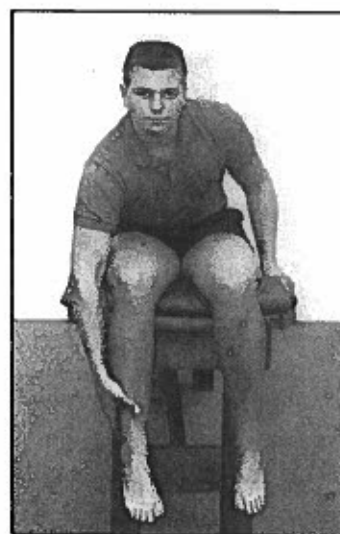
## HIP EXTERNAL ROTATOR STRETCH-SEATED

Rotation helps lateral movement and change of direction quickness. Contracting the gluteus minimus to help stretch the 6 deep external rotators and gluteus maximus. Keep buttocks on table throughout movement. Place pad under knee, move lower leg away from midline without hiking same side of pelvis and assist active movement with gentle assistance of rope. Release to neutral position and repeat 10-15 repetitions.



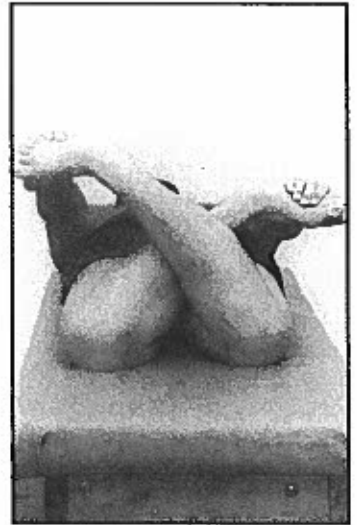
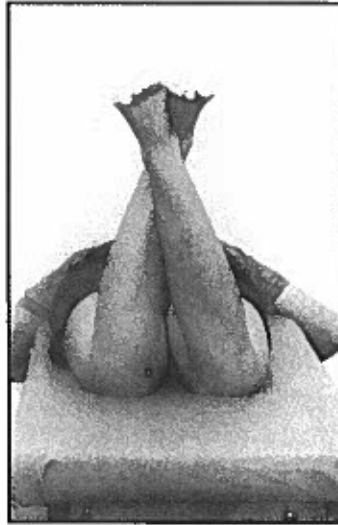
## HIP EXTERNAL ROTATOR STRETCH-SEATED

Rotation to assist warm-up. To increase lateral quickness and help prevent injuries. Keep buttocks flat on ground or floor Use internal rotators including gluteus minimus and tensor fascia latae to stretch six deep external rotators and gluteus maximus. Move lower leg away from midline without hiking the same side of the pelvis. Use hands to assist end of movement. Release to starting position and repeat. For back problems perform this exercise in a supine (laying) position. 10-15 Repetitions.



## HIP INTERNAL ROTATOR STRETCH-PRONE

The six deep external rotators and gluteus maximus are used to stretch the internal rotators; tensor fasciae latae and gluteus minimus. Exercise in a prone position, legs spread six inches apart. Cross legs as far as possible by contracting medial rotators. Hands may be used for assistive stretch at end of movement. Repeat 10-15 repetitions.



## HIP INTERNAL ROTATOR STRETCH-SEATED

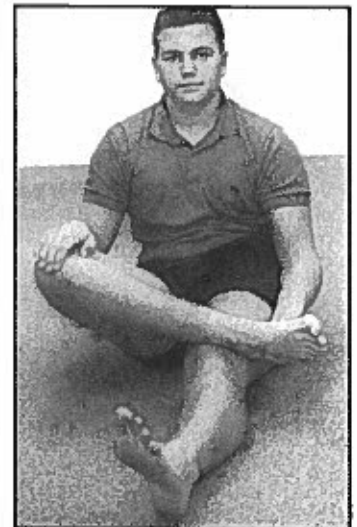
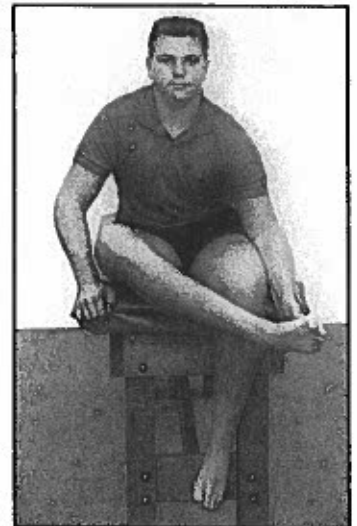
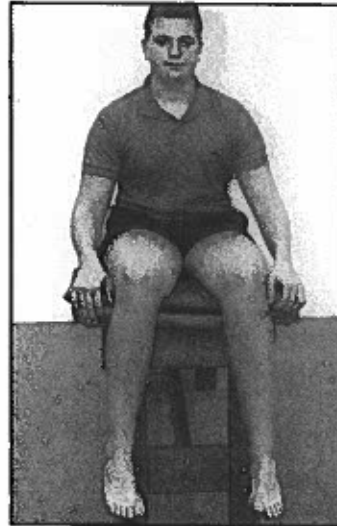
Helps assist in developing quickness and lateral movement. Using gluteus maximus and six deep external rotators to stretch gluteus minimus and tensor fasciae latae. Place pad under knee, move leg across midline as far as possible while keeping buttocks flat on table. Prevent opposite side of the pelvis from lifting. Use rope to assist at end with active effort. Return to neutral position and repeat. 10-15 Repetitions.



## HIP INTERNAL ROTATOR STRETCH-SEATED

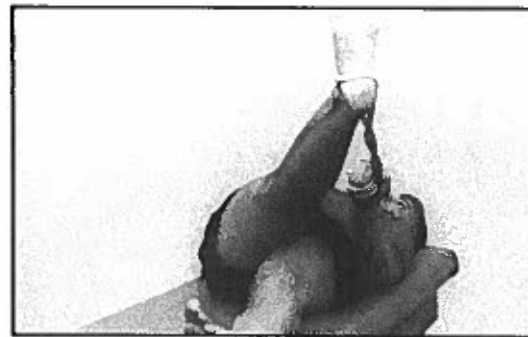
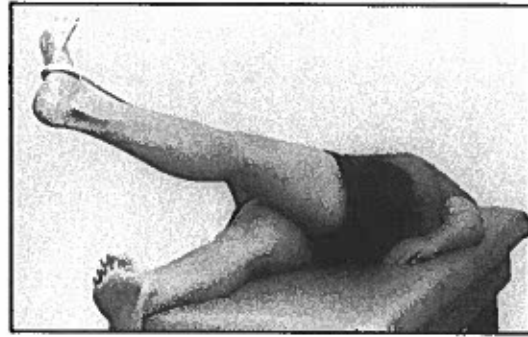
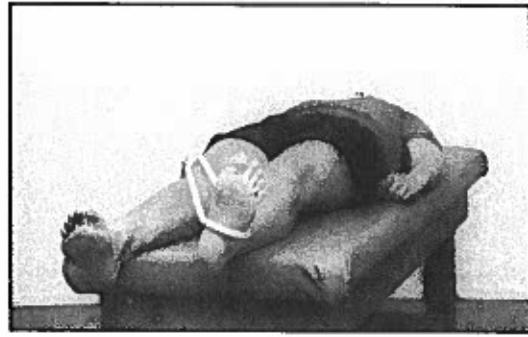
Excellent warm-up on floor or field for change of direction and general quickness help. In seated position move leg across midline. Do not hike opposite side of the pelvis. Contract gluteus maximus and six deep external rotators to stretch gluteus minimus. Use hands to assist end of movement. Release to starting position and repeat 10-15 repetitions.

NOTE: For relief of lower back problems perform this exercise in a supine position keep pelvis flat and assist stretch with same side hand or assistant.



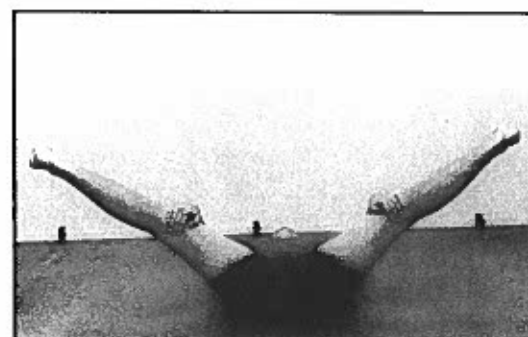
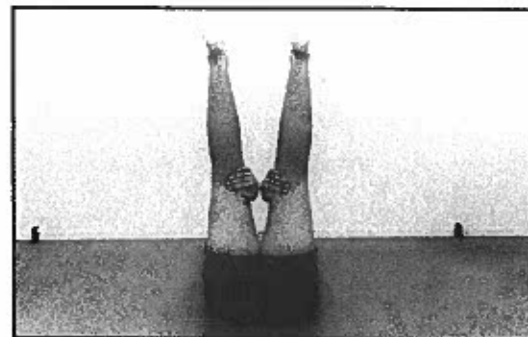
## HIP ABDUCTOR STRETCH

The muscles of the lateral hip and thigh may be tight and cause problems related to the back, hip or knee. In order to stretch the gluteus medius, vastus lateralis, tensor fascia latae and iliotibial band externally rotate femur 10 degrees. Contract pectinius, gracilis and adductor(s) magnus, longus and brevis and hyperadduct extended thigh across midline as far as possible without internally rotating leg. Assist active movement with rope. Release to starting position. Repeat 1-2 sets of 10 repetitions.



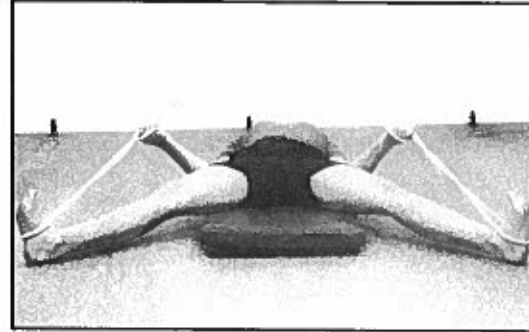
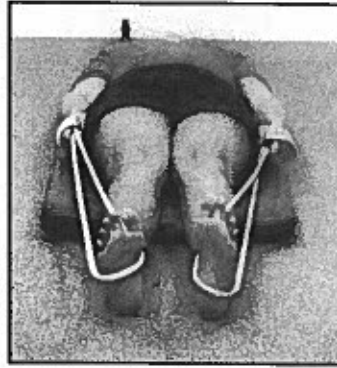
## HIP ADDUCTOR STRETCH (GROIN)

An outstanding stretch of the hip. Great for anyone involved in athletics. Adductors (groin) including the gracilis, pectinius, adductor magnus, adductor longus and adductor brevis is accomplished by contracting the hip and thigh abductors including the gluteus medius, sartorius and tensor fascia latae. Begin with knees extended in vertical position. Spread legs sideward as far as possible. Place hands on inside of knees for assistive stretch. Release and repeat 10-15 repetitions.



## HIP ADDUCTOR STRETCH (GROIN)

The hip abductor muscles, gluteus medius and sartorius are employed to stretch the hip adductors: Gracilis, adductor magnus, adductor longus and adductor brevis. Assume a supine position. Exercise with feet pointed upward spreading legs as far as possible and return to starting position, alternate with feet pointed inward as far as possible. Alternating foot position insures maximum stretch of adductors. Use of rope around each ankle for guidance and assistive stretch at end of movement. Exercise may be accomplished doing each leg individually. Repeat 10 repetitions.



## HIP ADDUCTOR STRETCH - SITTING - (GROIN)

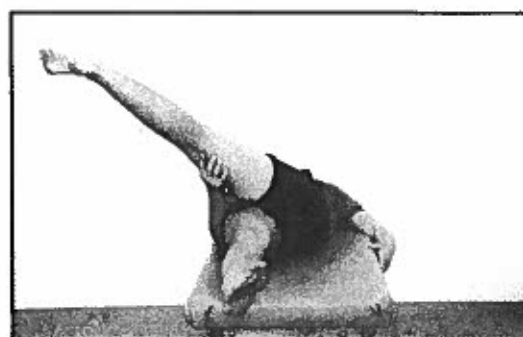
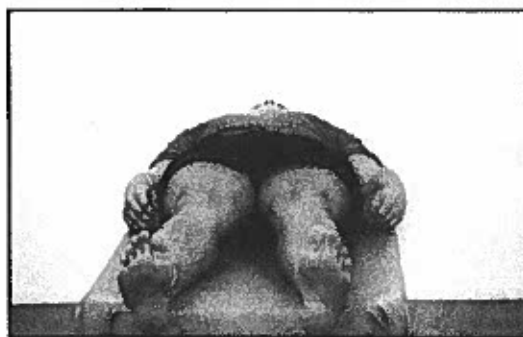
Hip abductors, gluteus medius and sartorius are employed to stretch the hip adductors; gracilis, pectinius, adductor magnus, adductor longus and adductor brevis. Subject assumes sitting posture, soles of feet placed together. Contract outside of hip spreading thighs as far possible. Return to adducted position and repeat. As more flexible move heels closer to the buttocks. Use hands for gentle assistive stretch at end of movement. Repeat 10-15 repetitions.



## FIGURE 4 ROTATOR STRETCH

Purpose is to provide maximum stretch of low back rotators, external hip rotators, gluteus maximum and gluteus medius musculature. Especially good stretch for piriformis muscle. From supine position rotate non-exercising leg inward as far as possible to help stabilize pelvis and isolate muscles to be stretched. Stretch opposite side muscles by locking knee, lift leg upward to near vertical position as possible, contract lower abdominals, internal hip rotators and hip flexor muscles and reach across body as far as possible with scapulae (shoulder blades) and pelvic girdle remaining in contact with surface. A pad and seatbelt may be placed across pelvis for greater stabilization. May assist stretch movement with opposite side hand or rope. Return to starting position and gently repeat. 2 sets 10 repetitions. Important stretch for those who wish to improve quickness and lateral movement.

\* See Assistive Hip Figure 4 Rotator Stretch on how to assist those with back histories, pelvic distortions and sciatic nerve involvement.





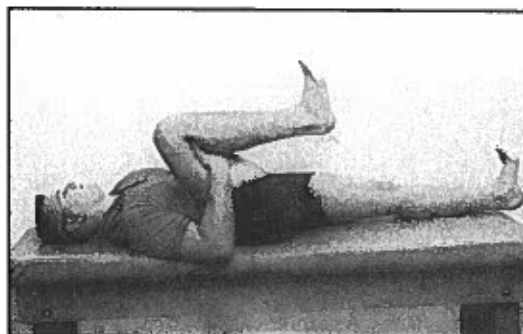
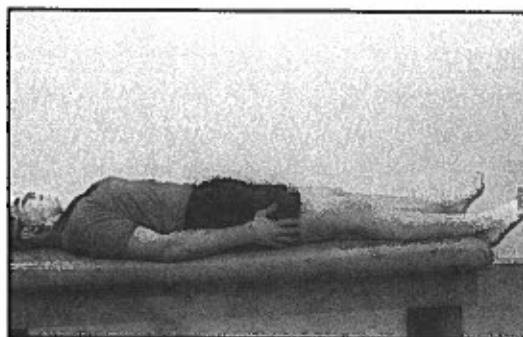
## TRUNK FLEXIBILITY

The spine allows movement in all planes and in terms of maximum strength and range of motion is often far below potential. Injury prevention, developing maximum power and quickness are sport priorities. Limited flexion, extension and rotation of the thoracic and lumbar (low

back) spinal tissues may lead to injuries such as muscle pulls or low back problems. Muscles of the trunk or hip also effect free pelvic movement. Restoration of trunk flexibility is important and must be administered carefully following an injury or surgery.

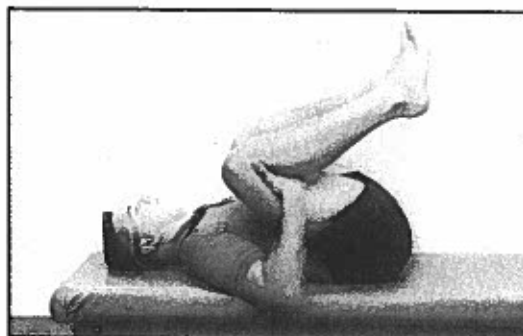
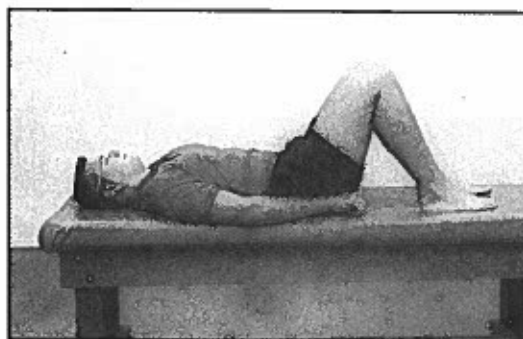
### SINGLE LEG PELVIC TILT

The purpose of this Williams Back exercise is to help attain maximum sacrospinalis (low back) and gluteus maximus flexibility. If the condition is post operative, disc involvement or other severe pain conditions, flex non-exercising knee 25-50 degrees as the situation dictates. Otherwise, the non-exercising knee should remain straight and in contact with the surface. The exercising knee is flexed and pulled toward the chest by contraction of the hip flexor and abdominal muscles. The hands are placed behind the thigh to prevent pressure on the knee and provide slight assistance at the end of free movement. Exercise may be done in standing position if there is no major back condition. 10 Repetitions.



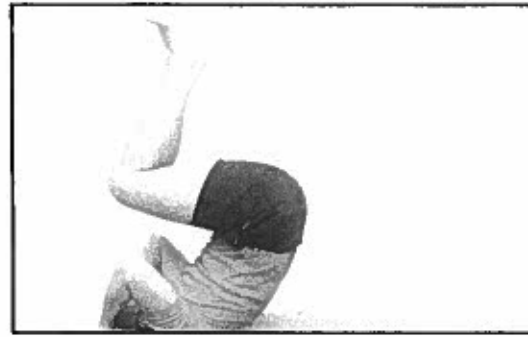
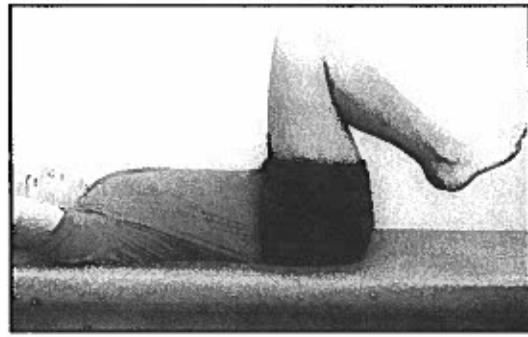
### DOUBLE LEG PELVIC TILT

Purpose is to help stretch gluteus maximus and sacrospinalis (low back) muscles. Begin with knees flexed 90 degree angle, feet flat on surface. Exhale, contract hip flexor and abdominal muscles pulling the thighs toward the chest. Place hands under the thighs and assist the contracting muscles in the stretching movement. Return to the starting position and attempt to move closer to the chest with each repetition. 10 Repetitions.



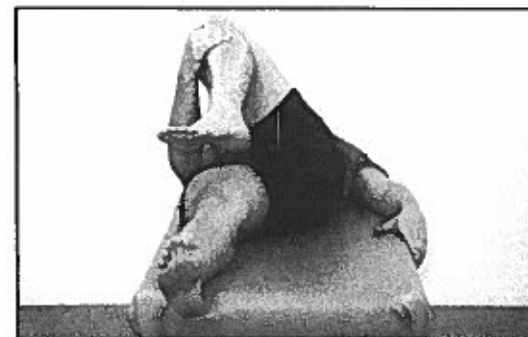
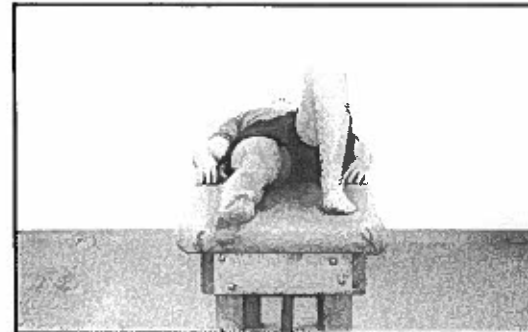
## REVERSE CURL

Stretching of the thoracic and lumbar extensor muscles is accomplished by flexing the knees and lifting the pelvis. Contract the lower abdominal and hip flexor muscles lifting until shoulder blades touch surface and immediately lower slowly until feet touch surface. Extending the legs on over until the toes are touching the floor in back of the head is contraindicated because the back muscles are placed in a state of contraction (lengthening) while stretch is attempted. Extreme pressure is also placed on the neck in the contraindicated position. 8-10 Repetitions.



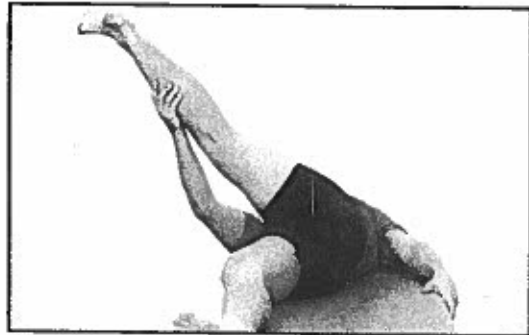
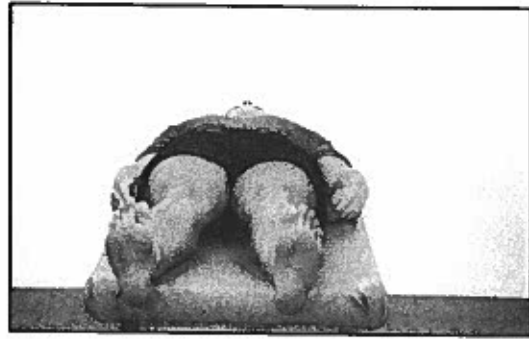
## MODIFIED - REVERSE TRUNK ROTATION

A gentle stretch for lower back problems. To stretch lower back rotator and lateral hip and buttock musculature. Contract abdominal and hip flexor muscles. Keep pelvis on surface. Move thigh at angle half way between opposite hip and shoulder. Assist stretch with opposite side hand. Return to starting position after each repetition and repeat, attempting to gently increase range with each repetition. 2 Sets 10 repetitions.



## REVERSE TRUNK ROTATION

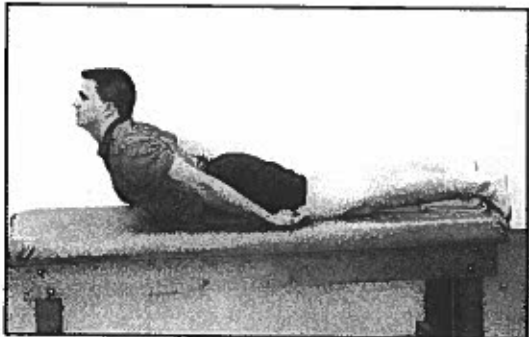
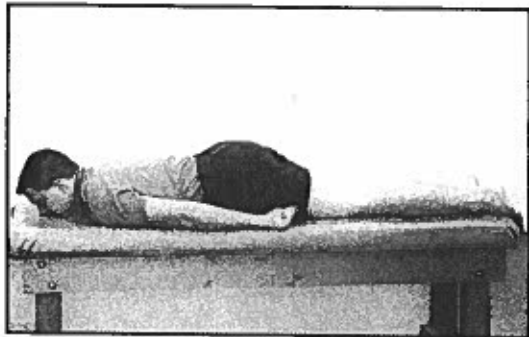
Purpose is to stretch lumbar and thoracic spine rotators which includes the erector spinae and deep posterior spinal group. Exercise begins in supine position. Extend leg and reach toward outside of opposite shoulder, keeping low back on surface as much as possible. Assist with opposite side hand or rope. Return to starting position after each repetition. Increase range as capable. Shoulder blades and pelvic should remain in contact with surface for maximum effect. 2 Sets 10 Repetitions.



## TRUNK EXTENSION

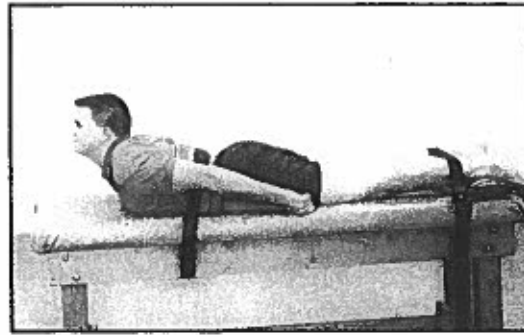
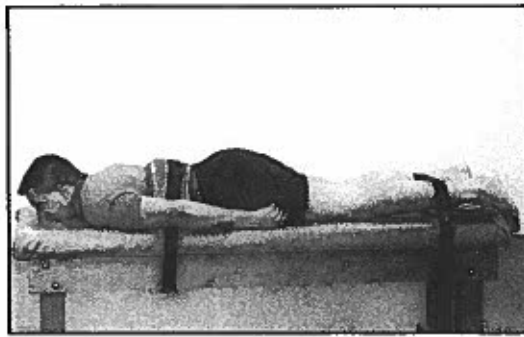
Purpose is to attain greater lumbar spine extension and abdominal flexibility. Stabilize lower body. Contracting erector spinae muscles lift head and shoulders off surface while lower body remains on the surface. Lower body immediately after reaching extension. Extending the upper and lower body simultaneously is a dangerous, contraindicated exercise (rocker or banana) and may result in muscle spasm or low back injury. 8-10 Repetitions.

\* Trunk extension may be contraindicated for those with back histories.



## THORACIC EXTENSION

To stretch dorsal thoracic spine, especially for those suffering from thoracic kyphosis (forward curvature). Place pad and strap across lower region of the thoracic spine and extend upper back and neck. Firm pressure of the assistant's hand in a forward-downward direction may be used as a substitute for the pad and strap. Repeat 2-3 series of 10 repetitions for more serious problems. Add sandbag resistance to increase thoracic strength.



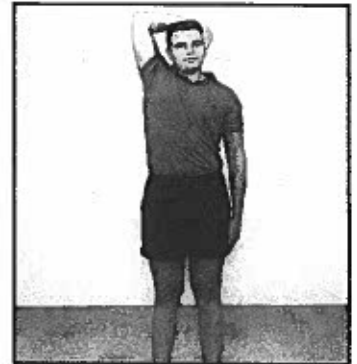
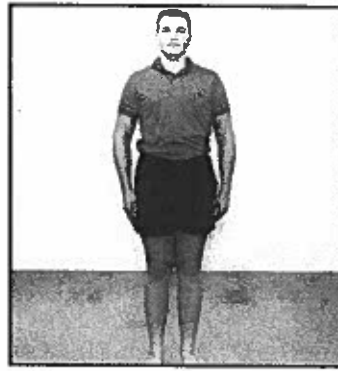
## UPPER TRUNK EXTENSION

This stretches the external obliques (sides of the stomach) the pectoralis major (chest), and the serratus anterior (rib cage). In seated or standing position contract erector spinae muscles clasp hands behind head, slowly extend trunk backward to point of maximum stretch. Release and repeat. 8-10 Repetitions.



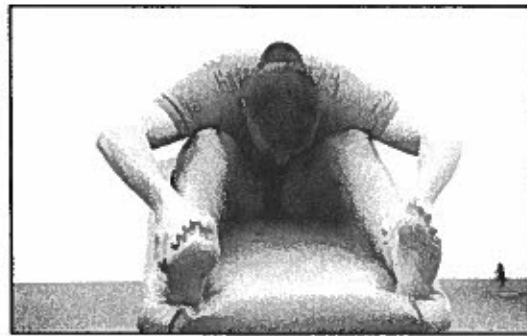
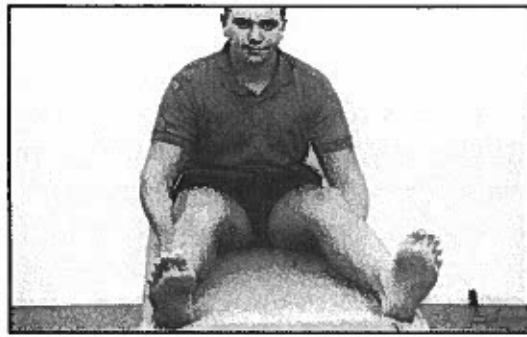
## LATERAL TRUNK FLEXION

Exercise may be accomplished in standing or seated position. To stretch lateral spine flexors quadratus lumborum (lateral), obliques and erector spinae muscles. Contract same side muscles and slowly reach laterally as far as possible. Alternate leaning laterally to opposite extreme. Note that with the same side arm in a sideward elevated position the proximal lateral trunk and lateral scapular muscles receive greater stretch. Repeat 6-8 times.



## BENT LEG TRUNK FLEXION

Purpose is to stretch erector spinae and sacrospinalis muscles. Exercise greater precaution if back has been surgically repaired, injured or quite inflexible. Begin from upright sitting position. Exhale, tuck chin, flex knees 2-3 inches, strong contraction of abdominals as body curls forward. No bouncing or rapid movement at terminal end of active movement. At that point use hands to provide assistive stretch for contracting stomach muscles. Release to starting position and repeat. Exercise may be accomplished in standing position if same principles are applied. 10-15 Repetitions.



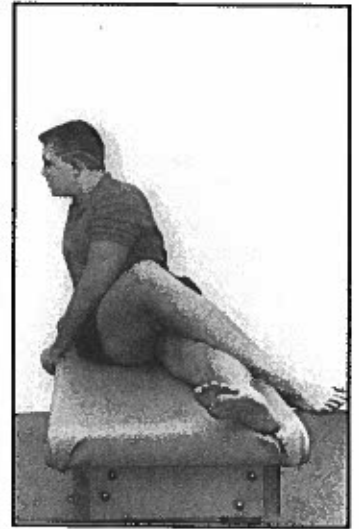
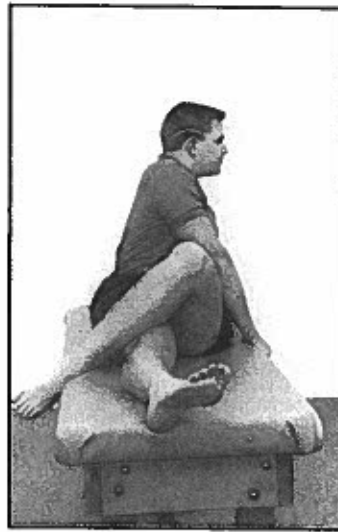
## THORACIC - LUMBAR ROTATION

Purpose is to stretch muscles and connective tissue that may limit rotation of the thoracic - lumbar spine. Exhale, tuck chin, flex knees 2-3 inches, contract rectus abdominus external and internal oblique muscles. The rotators, erector spinae and sacrospinalis muscles are stretched. Rotate trunk as far as possible in one direction then flex trunk forward bringing lead shoulder down toward the surface. Return to starting position and alternate in opposite direction. Repeat 10 times.



## ADVANCED TRUNK ROTATION

Purpose is to stretch cervical, thoracic and lumbar rotators. Sit with one leg straight. Flex opposite knee 90 degrees and cross foot over and rest to the outside of knee. Place opposite side elbow on outside of flexed knee. Rest opposite hand behind back. Turn head and trunk as far as possible away from midline and assist with elbow pressure against knee. Release and face forward. Change to opposite body posture and do same exercise in opposite direction. Repeat 8-10 times.



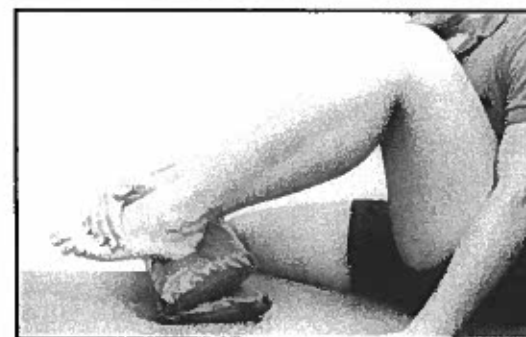
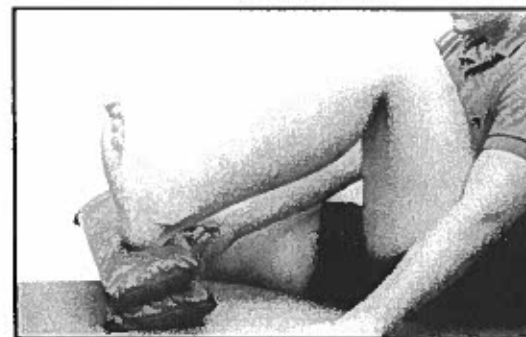
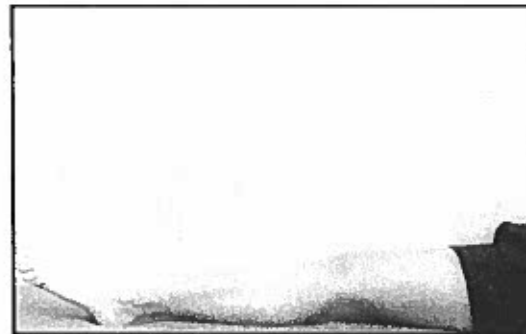
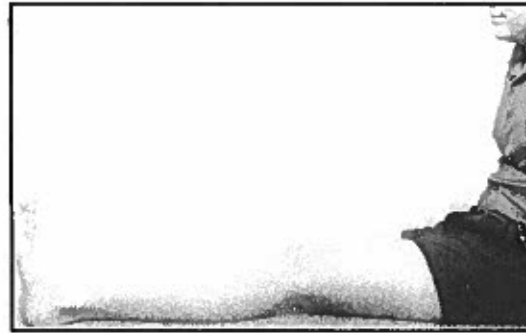
# ANKLE - FOOT FLEXIBILITY

Stretching will help establish full range of the ankle, subtalar and metatarsal-phalangeal joints and help reduce problems such as calf injuries, shin splints, achilles tendon injuries, foot stress, hammer toes, ankle and arch sprains

and strains. Flexibility exercises also help greater potential for increased performance of lower leg muscles to help improve foot quickness and lateral mobility.

## DORSAL ANKLE STRETCH

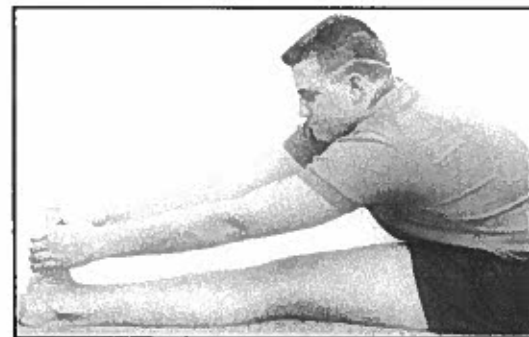
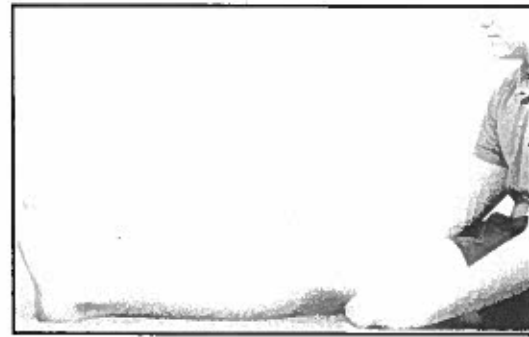
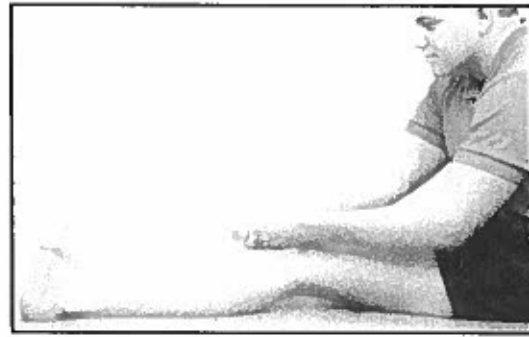
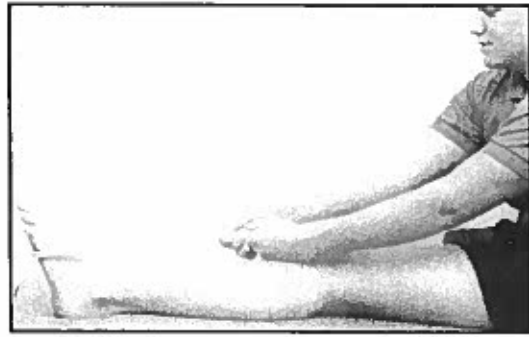
Ankle plantar flexion may be limited because of injury, conditions causing weakness of the plantar flexors or general lack of flexibility due to heredity, inactivity or soreness. Overstress may also cause shin splints or tendonitis. Limited plantar flexion may also be the result of a shortened tibialis anterior or tight fascia. The subject will plantar flex the ankle-foot downward contracting the plantaris, soleus, gastrocnemius and flexor digitorum muscles, stretching the tibialis anterior and extensor digitorum muscles. Subject may bend knee and assist stretch with hands. Release to beginning position and repeat. 10 Repetitions.





## GASTROCNEMIUS (CALF) STRETCH

The purpose of the heel cord stretch is to lengthen the two joint gastrocnemius muscle, reducing the possibility of shin splints, achilles tendon problems and foot-ankle injuries. Keep knee locked by contracting quadriceps muscles. Pull foot back with anterior foot - ankle muscles, including the tibialis anterior and extensor digitorum. Assist with strap, rope or hand. Do not pull with strap, rope or hand unless anterior muscles are contracting. Gradually lean trunk forward more before stretching calf to provide greater stretch. 10 Repetitions if only for warm-up purposes. 2-3 sets of 10 alternately for people with tight calves.



## **ACHILLES TENDON - SOLEUS STRETCH**

Infrequently we find the soleus muscle or achilles tendon is shortened. Having the knee flexed at 90 degrees or more enables stretching without interference of the gastrocnemius muscle. To stretch the soleus, flex knee to 90 degrees plus and lift the foot with the ankle-foot dorsal flexor muscles. Provide gentle assistive stretch with the hands. Release and repeat. For use as a warm-up exercise before activity or competition. 8-10 Repetitions.



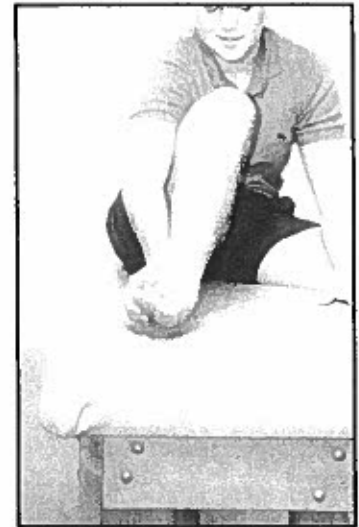
## **EVERTOR STRETCH**

When stretching the lateral tissue of the sub-talar and foot regions, employ the sub-talar and foot invertor, (medial) muscles including the tibialis posterior and tibialis anterior to stretch their evvertor (lateral) counter-parts. These include the peroneus longus, peroneus brevis, peroneus tertius and extensor digitorum longus. Begin with ankle dorsiflexed to near 90 degree angle and turn ankle inward as far as possible, gradually decreasing the degree of dorsal flexion to insure greater stretching of outer forefoot pronators. With knee bent 90 degrees turn foot-ankle inward. Apply gentle assistive stretch with hands positioned around heel and forefoot. Release and repeat. 10 Repetitions.



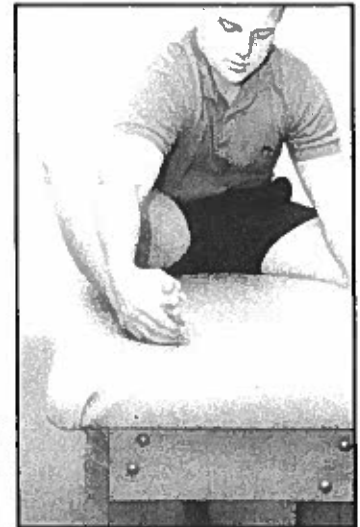
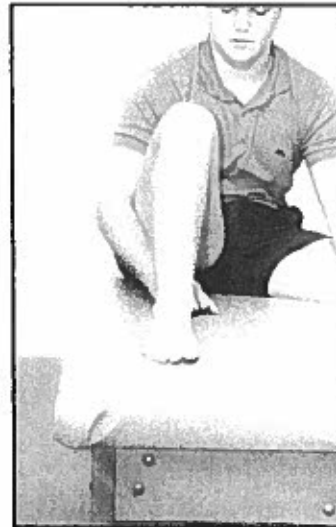
## INVERTOR STRETCH

In stretching the medial ankle muscles including the tibialis posterior and tibialis anterior, maintain slight dorsal flexion of foot-ankle. Turn sub-talar and foot outward as far as possible by contracting lateral sub-talar foot muscles including the peroneus longus, peroneus brevis, peroneus tertius and extensor digitorum longus. Bend knee 90 degrees, place hands around heel and forefoot and assist at end of active efforts. Gradually plantar flex ankle and pronate forefoot to stretch foot supinators. 8-10 Repetitions.



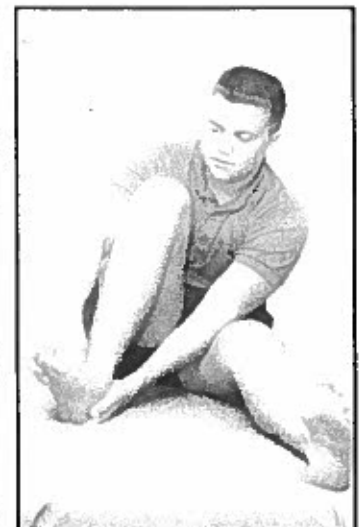
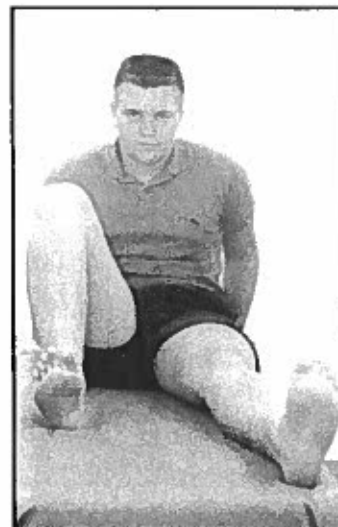
## FOOT PRONATOR STRETCH

In skills such as jumping and rapid starting maximum foot supination is important. To obtain maximal inward movement of foot, plantar flex ankle (flex downward) and turn foot inward as far as possible using medial lower leg musculature. Apply gently assistance with the hands. Release and repeat. 10 Repetitions.



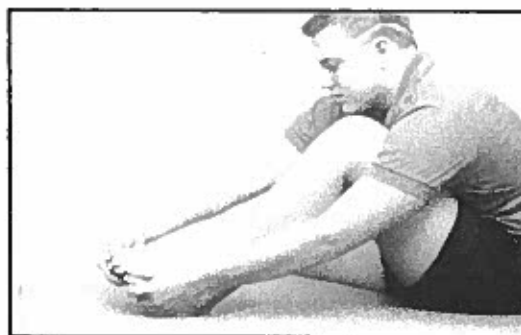
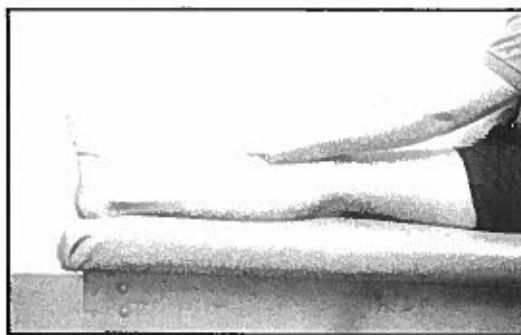
## FOOT SUPINATOR STRETCH

People with foot problems may have limited movement of the forefoot. If the foot cannot pronate outward because of limited range, foot posture will be affected, perhaps resulting in pain. With the knee, flex the ankle downward, turn the foot outward as far as possible. With the hands around the forefoot provide assistive stretch. Release and repeat. 10 Repetitions.



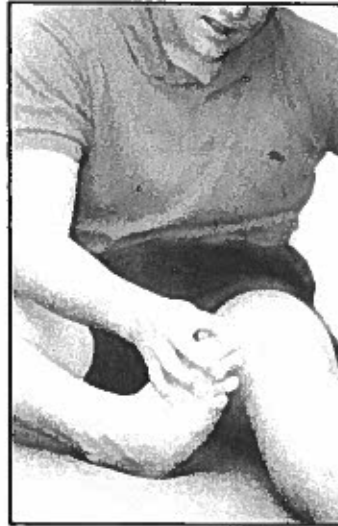
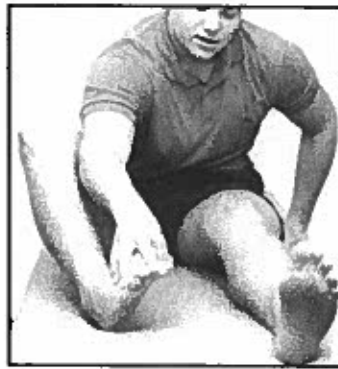
## METATARSAL ARCH STRETCH

In order to relieve the effect of hammered toes and tight dorsal metatarsal muscles and tendons, dorsal flex the ankle by contracting tibialis anterior muscle. Place rope just below metatarsal phalangeal joints and then attempt to flex toes around rope. To assist in greater movement bend knee 90 degrees, flex toes and manually assist stretch with hands. Release and repeat. 10 Repetitions for warm-ups. 2-3 Sets of 10 for therapeutic considerations.



## GREAT (BIG) TOE STRETCH

Frequently the Great Toe (BIG) posture displays inward angulation (hallux valgus). The strength of the adductor hallucis is often greater than the antagonist abductor hallucis. Also shortening of the extensor hallucis brevis and extensor hallucis longus contribute to the condition. If this posture is not corrected, pressure against the proximal phalanx will cause a bunion due to lateral pressure on such a small area. Pressure from tight or high heel shoes may also be partly responsible for this condition. To stretch the adductor hullucis and extensor hallucis brevis and longus, flex the knee, actively flex the big toe and also attempt to abduct (spread) the big toe. Run the big toe up the shin line of the opposite leg. Using the same side hand place the thumb around the outside of the big toe and the index finger at the lower inner border of the big toe. At the end of active movement assist the stretch with the index finger. Release and repeat. 10 Repetitions. 2-3 Sets of 10 repetitions for long standing problems.



## GREAT (BIG) TOE STRETCH

To stretch the adductor hallucis flex the knee. Actively attempt to abduct (spread) the big toe by contracting the abductor hallucis. Stabilize the four smaller toes with one hand and assist the stretch with the opposite hand. Release and repeat. 10 Repetitions.



## ACTIVE - ASSISTED STRETCHING

When joints, muscles and connective tissue are lacking complete range of motion it is sometimes advantageous to have assistance applied for greater accuracy and effectiveness.

This may be especially important following neurological damage, injury, post-fracture and post-operative conditions. Many movements are difficult to perform accurately or effectively without assistance. This is important to remember when the antagonist muscles are too weak to provide enough force to move the joints or pain is a significant factor.

The assistant accurately guides the movement and assists the stretching process for 1-2 seconds, releasing the external pressure as the stretch reflex signals by causing the movement to cease and al-

lowing return movement to the starting position. This movement facilitates voluntary neural stimulation of the agonist muscles and causes a shortening contraction of the muscles on the opposite side of the joint and tissues that are lengthened. Active movement insures maximum circulation, safety and reciprocal cooperation between agonist and antagonist muscle groups.

Concentration of the assistant is necessary in order that the movement is performed safely and accurately. The assistant will help insure successful stretching results by motivating the subject to give a maximum effort and provide constant verbal instruction and feedback. The assistant must be careful about the amount of force provided, preventing overstretching by releasing the movement when signaled by the tissues being stretched.

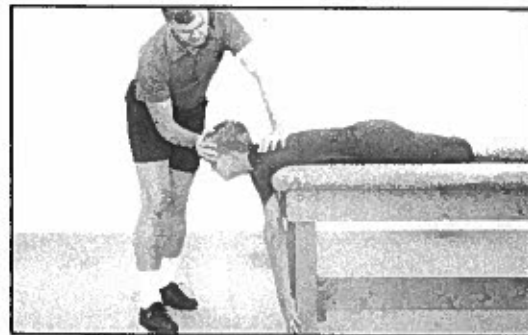
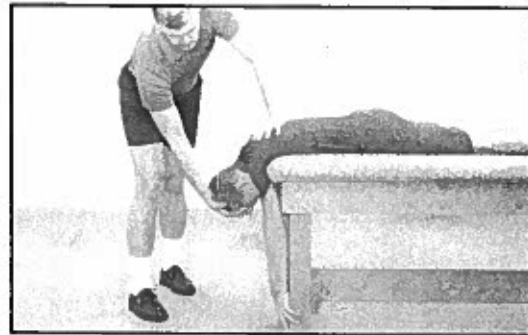
## NECK STRETCHING - ASSISTIVE

Assistive neck flexibility exercises are intended to aid people who have suffered a strain, sprain or post fracture that has healed properly and have obtained medical authorization to begin assistive neck flexibility exercises. The subject moves the head against gravity and is guided

by the therapist in the correct plane and gently assisted where necessary. The therapist will counterbalance whatever the patient cannot control without excessive muscle strain.

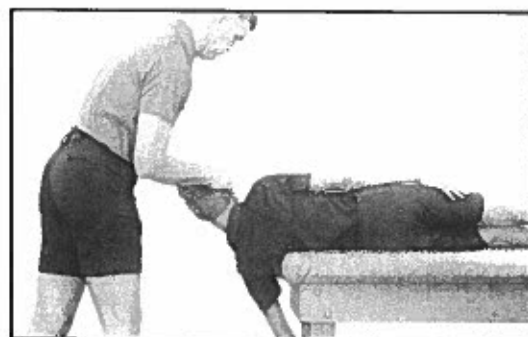
### CERVICAL HYPEREXTENSION

In the prone position with the neck extended beyond the end of the table the subject grasps the legs of the table to keep the movement localized in the cervical spine. The therapist stands at the side of the patient, placing one hand on the forehead and the other hand on the lower back part of the head to guide the head in the saggital plane and assist stretch at the end of active movement. Hyperextension is an exercise to strengthen the upper erector spinae, splenius cervicis, splenius capitis semispinalis cervicis and capitis and stretch the sternocleidomastoid and prevertebral muscles. Exercise through full range of motion, stretch gently and repeat. Begin 5-8 Repetitions and increase to 15 as capable.



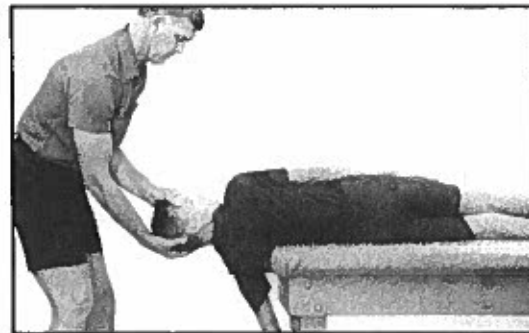
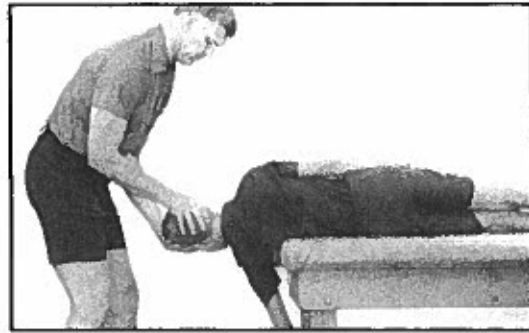
### CERVICAL LATERAL FLEXION - RIGHT

Subject assumes a side-lying position with neck beyond the end of the table, lower hand grasping a table leg. Therapist stands behind patient placing the hands on both sides of the head. The patient begins the exercise with the head near the left shoulder. The therapist guides the head to prevent forward movement, backward movement or rotation. The subject moves the head as far as possible contracting the 3 scalmi, sternocleidomastoid, erector spinae and prevertebral muscles and stretch the opposite side of the neck, same muscles mentioned. Gentle stretch assistance is provided by the therapist. Return to starting position and repeat. Begin 5-8 repetitions and increase to 15 as capable.



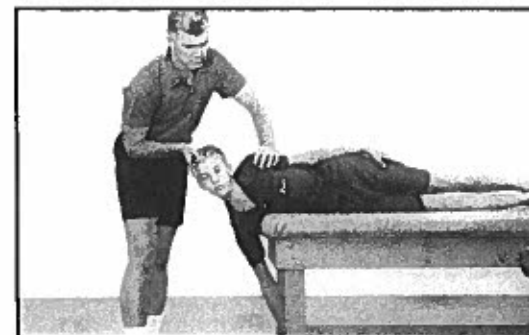
## CERVICAL ROTATION - RIGHT

In the side lying position the neck beyond the end of the table, subject will clasp a table leg with lower hand. Therapist stands in front of the patient's head placing the hands on the forehead and back of the head to help counterbalance the weight of the head and prevent flexion, extension or lateral flexion. The purpose of rotation is to strengthen the right sternocleidomastoid, deep posterior spinal muscles, longissimus cervicis, splenius capitis, splenius cervicis and erector spinae muscles, stretching their counterpart on the left side. Subject rotate head from downward position upward (right) slowly with therapist assisting stretch at end of active movement. Begin 5-8 repetitions and increase to 15 as capable.



## CERVICAL LATERAL FLEXION - LEFT

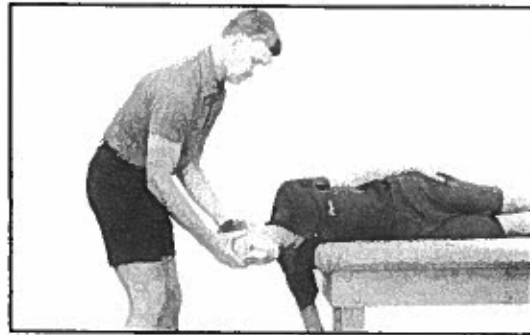
Subject assumes a side lying position with neck beyond the end of the table, lower hand grasping a table leg. Therapist stands behind patient placing hands on both sides of the head. The patient begins the exercise with the head near the right shoulder. The therapist guides the head to prevent forward movement, backward movement or rotation. The subject moves the head as far as possible contracting the 3 scalmi, sternocleidomastoid, erector spinae and prevertebral muscles and stretching opposite side antagonist muscles. Gentle stretch assistance is provided by the therapist. Return to starting position and repeat. Begin 5-8 repetitions and increase to 15 as capable.





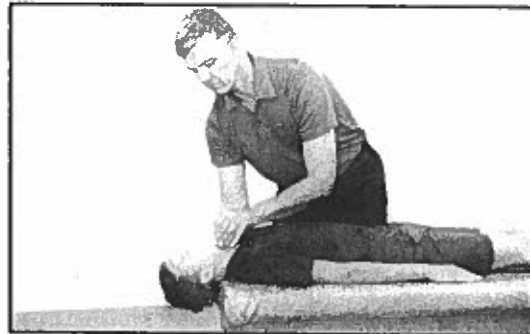
## CERVICAL ROTATION - LEFT

In the side lying position extend the neck beyond the end of the table. Subject grasp a table leg with lower hand. Therapist stands in front of the patient's head, placing the hands on the forehead and back of the head to help counterbalance the weight of the head and prevent flexion, extension or lateral flexion. The purpose of rotation is to strengthen the left sternocleidomastoid, deep posterior spinal muscles, longissimus cervicis, splenius capitis, splenius cervicis and erector spinae muscles stretching their counterpart on the right side. Subject rotate head from downward position upward (left) slowly with therapist assisting stretch at end of active movement. Begin 5-8 repetitions and increase to 15 as capable.



## CERVICAL FLEXION

Subject assumes a supine position with head on table, maintaining shoulders and upper back on table throughout movement. Therapist stands at side of patient's head with one hand behind the upper-posterior head and the other hand around lower border of jaw. From the neutral position tuck the chin as close as possible to neck and lift head as far as possible in a close tuck. Flexion will strengthen the sternocleidomastoid and prevertebral muscles and stretch the upper erector spinae, splenius cervicis, splenius capitis, semispinalis cervicis and semispinalis capitis. Therapist will assist subject in tucking chin and counterbalance weight of head and provide gentle stretching assistance at end of active movement. Return to starting position and repeat. Begin 5- 8 repetitions and increase to 15 as capable.



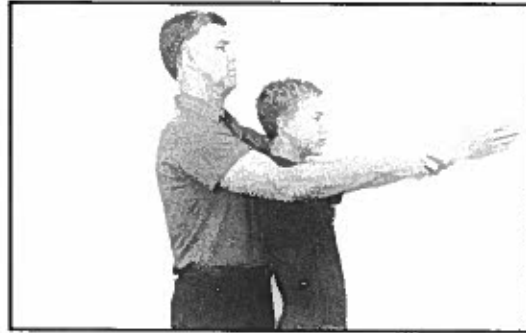
## SHOULDER FLEXIBILITY - ASSISTIVE

Assistive shoulder flexibility exercises will stretch the glenohumeral, acromioclavicular, sternoclavicular and scapular musculature and connective tissue. Greater flexibility will help prevent injuries, aid post-injury or post

operative recovery and enhance performance of the shoulder region. The following exercises are included in the active shoulder stretching section and demonstrate where and how assistance may be beneficial.

### HORIZONTAL ABDUCTION

Important for full horizontal shoulder range. Purpose is to stretch pectoralis major and pectoralis minor by contracting rhomboid and trapezius muscles. Begin with palms together and elbows locked in front of chest. Reach back as far as possible with gentle assistance. Release and repeat. As muscles loosen raise arms higher to stretch upper clavicular fibers. Especially important in throwing and overhead striking movement. 10-15 Repetitions.



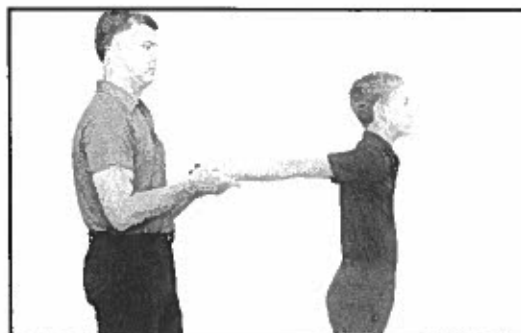
### HYPEREXTENSION - SINGLE ARMS

Especially for post surgery, post injury or extreme tightness. Purpose is to stretch long head of biceps, anterior deltoids and pectoralis major and minor. Stand or sit without bending body forward, elbows locked, reach back as far as possible contracting triceps and posterior deltoids. Provide gentle assistance, release and repeat. 10 Repetitions.



## **HYPEREXTENSION - HANDS CLASPED**

To stretch upper biceps brachii, pectoralis major and minor, anterior deltoids. Stand without bending body forward elbows locked, reach back as far as possible with triceps and posterior deltoids. Provide gentle assistance. Release and repeat 10 repetitions.



## **SHOULDER EXTERNAL ROTATION**

Purpose is to stretch internal shoulder rotators including the pectoralis major, subscapularis, and teres major. Elbow bent 90 degree angle and shoulder height if possible. Externally rotate shoulder with rotator cuff muscles. At end of movement assistant provide gentle assistance, release to starting position and repeat. Do not allow subject to arch back or rotate upper body in opposite direction. 10 Repetitions.



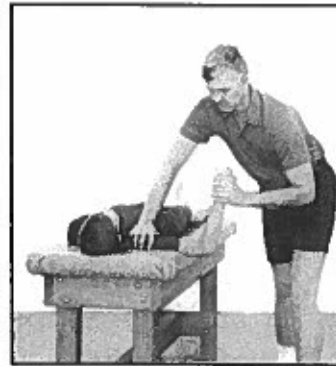
## SHOULDER EXTERNAL ROTATION - PRONE

For treating frozen or post-operative shoulders lacking external rotation, assume a prone position. Elbow is bent 90 degree angle parallel to shoulder. Contract supraspinatus, infraspinatus and teres minor muscles (rotator cuff) to stretch teres major, subscapularis and pectoralis major muscles. Therapist place stabilizing pressure on upper end of scapula with proximal hand. Place distal hand on wrist of patient. Patient reach hand upward as far as possible, therapist assist at end of active movement. Release to starting position and repeat. 2 Sets 10 repetitions.



## SHOULDER EXTERNAL ROTATION - SUPINE

For treatment of painful, frozen or post-operative shoulders with limited external rotation. Subject assumes a supine position. Elbow is bent 90 degree angle parallel to shoulder. Subject contract supraspinatus, infraspinatus and teres minor muscles (rotator cuff) to stretch teres major, subscapularis and pectoralis major muscles. Therapist places stabilizing pressure on anterior - inferior portion of head of humerus with proximal hand. Place distal hand on wrist of patient. Subject reach lower arm back as far as possible, therapist assist at end of active movement. Release to starting position and repeat. Great care must be taken in this position so that the shoulder is not overstretched or dislocated. 2 Sets of 10 repetitions.



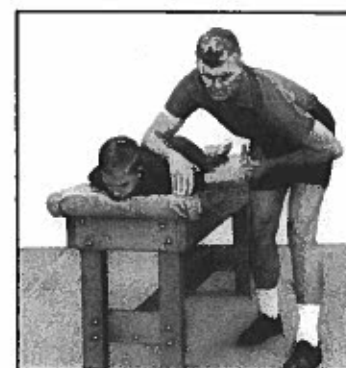
## SHOULDER - INTERNAL ROTATION

Purpose is to stretch external shoulder rotators (rotator cuff) including the supraspinatus, infraspinatus and teres minor muscles. Assistant should be in a position to stabilize scapula by placing top hand over shoulder and clasp at subject's axilla. Stabilize scapula with forearm and assist active stretch with opposite hand. Release to starting position and repeat. Also do horizontal flexion I and horizontal flexion II to insure maximum stretching of all rotator cuff fibers. 10 Repetitions.



## SHOULDER INTERNAL ROTATION - PRONE

For frozen or post-operative shoulders where internal rotation is limited. Have subject assume a prone position. Elbow is in a position parallel to shoulder bent 90 degrees. Contract teres major, subscapularis and pectoralis major muscles rotating shoulder inward. Therapist will place stabilizing pressure on lower border of scapula. Therapist assist movement with opposite hand on patient's wrist. Supraspinatus, infraspinatus and teres minor are stretched at end of active movement. Assist stretch, release to starting position and repeat. 2 sets 10 repetitions.



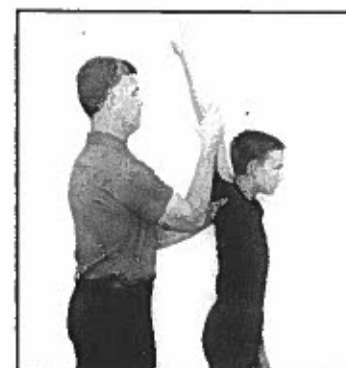
## SHOULDER INTERNAL ROTATION - SUPINE

Painful, frozen or post-operative shoulder frequently display limited internal rotation. Subject assume a supine position. Elbow is bent 90 degree angle parallel to shoulder. Subject contract teres major, subscapularis and pectoralis major muscles to stretch supraspinatus infraspinatus and teres minor muscles (rotator cuff). Therapist places stabilizing pressure on anterior-superior portion of head of humerus with proximal hand. Place distal hand on wrist of patient. Subject reach lower arm forward as far as possible, therapist assist at end of active movement. Release to starting position and repeat. Great care must be taken in this position so that the shoulder is not overstretched or dislocated. 2 Sets of 10 repetitions.



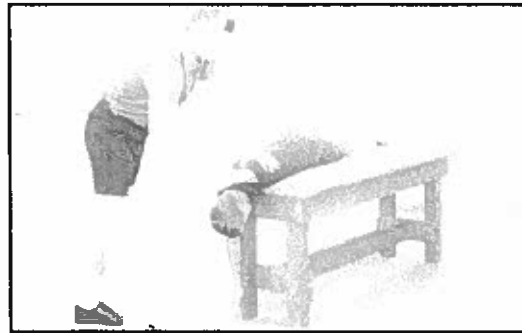
## SHOULDER - FORWARD ELEVATION

Must also have 90 degree plus external rotation in order to be able to achieve maximal forward elevation. Lock elbow and with palm facing body, reach arm as high as possible without bending elbow or arching back. Therapist assist and release. Arm returns to side after each repetition. Athletes such as swimmers, gymnasts and baseball players that require full forward elevation should also stretch with the palm facing forward. Triceps stretch should also be included to insure maximal forward elevation. 10 repetitions.



## SHOULDER FORWARD ELEVATION - PRONE

Especially for limited arm movement overhead. From flexed shoulder position lock elbow, palm facing body. Subject reach forward and therapist assist with one hand stabilizing on back of shoulder joint and assist stretch with opposite hand above elbow joint. Return to starting position and repeat. 10-15 repetitions.



## SHOULDER - SIDEWARD ELEVATION

Must have near complete forward elevation to do this exercise. Purpose is to stretch teres major, latissimus dorsi, serratus anterior and serratus posterior muscles by contraction of deltoids and rotator cuff muscles. With elbow locked and palm facing forward, subject reach as high as possible, provide gentle assistance. Release, and return arm to the side and repeat. For maximal result do not allow elbow to bend. For more advanced stretching, externally rotate shoulder as far as comfortable and without bending elbow reach behind head toward opposite shoulder. 10 Repetitions.



## HIP JOINT FLEXIBILITY - ASSISTIVE

Increased hip flexibility will help prevent injuries and improve performance. The hip joint muscles are often limited in total range and muscle strains are frequent. Performance is limited by lack of flexibility which affects

speed and agility. Muscles of the hip also relate to problems involving the knee and lower back. Assistive stretching is often important for full recovery of injuries and sports improvement.

### HAMSTRING STRETCH - BENT KNEE

The purpose is to stretch the lower thigh, hamstring area. Effective stretch for those too weak or suffering from a stroke or muscle disease. Important consideration for back, hip or hamstring histories, prevention, or performance improvement in early stages. Flexion of opposite side knee may be important to prevent back or hip irritation. For those with a back history have subject contract abdominals when nearing the stretch position. Stretch is accomplished by having subject contract the anterior thigh muscles (quadriceps) and extend the knee as far as possible with gentle assistive stretch by the therapist or assistant. As flexibility improves move thigh closer to the chest. For maximum stretch the knee must extend completely. Release to starting position and repeat. 2-3 series of 10 repetitions. Alternate legs after each set.



## HAMSTRING STRETCH - STRAIGHT LEG

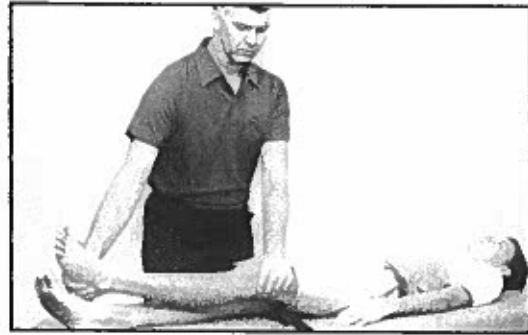
The purpose is to provide greater upper thigh, hamstring flexibility. For those with a back history flex opposite knee. This exercise may be contraindicated for acute or more severe back problems. Effective stretch for those too weak or suffering from a stroke or muscle disease. Important consideration for back, hip or hamstring histories, prevention or performance improvement. In early stages flexion of opposite side knee may be important to prevent back or hip irritation. Exercise is executed by contraction of anterior thigh muscles (Quadriceps). Assistant will help maintain a locked knee by placing near side hand just above patella. Assist at end of active movement with other hand placed in back of lower leg. Release and return to starting position. It may be necessary to strap down opposite side leg above knee to prevent pelvic hyperextension. Also be aware of subject compensation by externally rotating femur while executing lifting movement. 2-3 Sets of 10 repetitions. Alternate legs after each set.





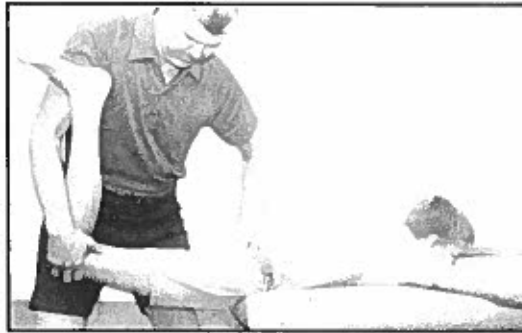
## LATERAL - HIP, THIGH STRETCH

The muscles of the lateral hip and thigh may be tight and cause problems related to the back, hip or knee. Stretching the lateral muscles which include the gluteus maximus, vastus lateralis, tensor fascia latae and the iliotibial band. While maintaining an extended knee, subject externally rotate femur 10 degrees, contract pectineus, gracilis, adductor magnus, adductor longus and adductor brevis. Assistant help maintain thigh angle as subject rotates non-exercising leg inward as far as possible. A pad and seatbelt may be used to stabilize the pelvis and prevent pelvic compensation for subjects with limited hip hyperadduction movement. Hyperduct thigh across midline with assistant aiding the stretch. Return to starting position and repeat. 2 sets 10 repetitions.



## PSOAS STRETCH

From the prone position have subject lean across table. With upper body and pelvis supported on table, release pressure from non exercising leg. Bend exercising leg 90 degree angle and keep adducted toward resting leg. Therapist will assist in keeping resting leg against table to prevent lumbar hyperextension. Therapist places near side hand across top of pelvis to help stabilize. Opposite hand guides leg through motion helping maintain 90 degree angle and adducted position. Subject contracts gluteus maximus and hamstrings throughout movement. Subject is careful not to push on the resting leg for assistance. Therapist will assist stretch at end of range, release to starting position and repeat. 1-2 Sets of 10 repetitions depending on improvement of psoas tension.



## RECTUS FEMORIS STRETCH - SIDE LYING

Subject assumes side lying position and moves lower knee up against chest and maintains this position by placing hand under the foot or cradling lower arm around knee. Exercising leg is in an adducted position throughout movement. If rectus femoris is very tight subject may release pressure by using a rope to extend angle between ankle and buttocks. Standing behind the subject the assistant places near hand across back of top hip and opposite hand in front of top thigh. Subject moves thigh backward with hamstrings and gluteus maximus and contracts the abdominal muscles to prevent back hyperextension. Use hand of subject and additional help from assistant to assist muscle stretch. Release and repeat. Alternate legs after each set. 2 Sets of 10 repetitions.



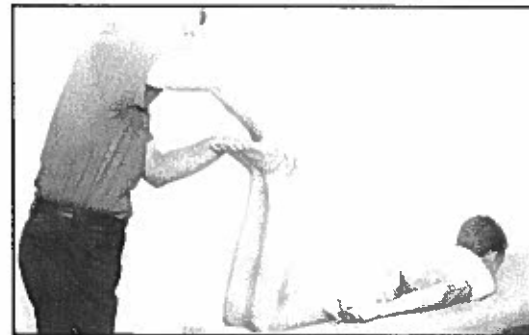
## RECTUS FEMORIS PRONE

Serving both the knee and hip joints the rectus femoris often becomes a shortened muscle. From the prone position the subject will lean over a table placing the resting leg as far forward along the side of the table as possible, weight free, with the upper body and pelvis resting firmly on the surface. Exercising leg is flexed far as possible and adducted toward the opposite thigh. Subject clasps ankle contracting gluteus maximus and hamstrings to move thigh backwards. Assistant helps assist stretch with controlled guidance and aid. Release and repeat. Alternate legs after each set. 2 Sets of 10 repetitions.



## HIP EXTERNAL ROTATOR STRETCH - PRONE

Intended primarily to prepare athletes for participation when external rotators of hip are tight. Lateral quickness may be limited. Knees are flexed 90 degree angle and adducted together. Contracting the internal rotators (gluteus minimus, pectineus, tensor fascia latae) and move lower legs laterally away from midline to stretch the deep external rotators and gluteus maximus. Assistant places hands along inside of ankles and helps affect gentle stretch. Use precaution so knees are not strained or hips overstretched with too much pressure. Return to starting position and repeat. 2 Sets 10 repetitions.



## HIP EXTERNAL ROTATOR STRETCH - SITTING

For increased lateral movement and quickness the gluteus maximus and 6 deep external rotators may be stretched in a sitting position by contracting the gluteus minimus, pectinius and tensor fascia latae. Place a pad or firmly rolled towel under the knees, keep buttocks on table throughout movement. Do not allow same side of pelvis to hike upward. Subject move lower leg away from midline having assistance applied at end of movement. Release and repeat. Alternate legs after each set. 2 Sets 10 repetitions.



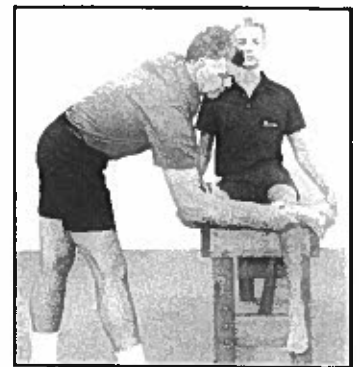
## HIP INTERNAL ROTATOR STRETCH - PRONE

For use primarily as preparation for athletic performance the subject assumes a prone position with the legs spread 4-6 inches apart. The gluteus minimus, pectineus and tensor fascia latae are stretched by the gluteus maximus and 6 deep external rotators. Subject begins exercise by crossing legs as far as possible. Assistant places hands on outside of ankles assisting stretch. Release to starting position and repeat. Alternate so that opposite leg is in front after each repetition. 1-2 Sets of 10 repetitions.



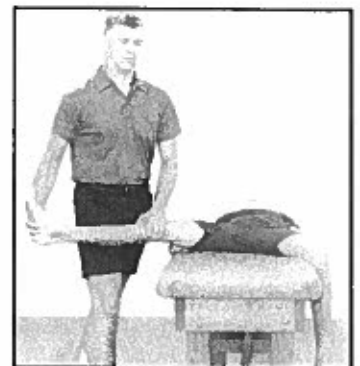
## HIP INTERNAL ROTATOR STRETCH - SEATED

Medial rotation may be limited following an injury or from inactivity. Place a pad or firmly rolled towel under the knees, keep buttocks resting on table. Do not allow opposite side of pelvis to hike upward. Gluteus minimus, pectinius and tensor fascia latae will be stretched by the gluteus maximus and 6 deep external rotators. Exercise by having subject move one leg across midline with help supplied by assistant at end of active movement. Release to starting position and repeat. Alternate legs at end of each set. 2 Sets 10 repetitions.



## HIP ADDUCTOR (GROIN) STRETCH-SINGLE

For situations involving extreme tightness of the groin, following a fracture or injury to the hip. Stretch the adductor muscles cautiously, one leg at a time. The gluteus medius, gluteus minimus and sartorius abduct the hip to facilitate stretching the gracilis, adductor magnus, adductor longus and adductor brevis. Have subject lock knee and rotate entire leg slightly inward, spread the leg outward as far as possible with gentle guidance and assistance provided by the therapist. Therapist may prevent opposite leg from sliding by strapping leg above knee with a seatbelt or draping over side of table. Return the leg to the midline and repeat. 2 Sets 10 repetitions both legs.



## HIP ADDUCTOR (GROIN) STRETCH - BILATERAL

Both groins may be stretched effectively from a supine position. Place both legs in a vertical position. Contract the lower abdominals to help stabilize the pelvis and prevent back strain. Keep the knees extended and abduct the legs away from the midline. The exercise is accomplished by contracting the gluteus medius, gluteus minimus and sartorius to stretch the adductor magnus, adductor longus, adductor brevis and gracilis muscles. Assistant will aid active movement carefully. Release and repeat. 2 Sets 10 repetitions.



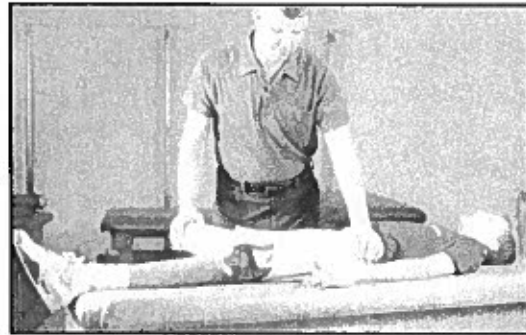
## FIGURE 4 ROTATOR STRETCH

Purpose is to provide maximum stretch of low back rotators, gluteus maximus, gluteus medius and external hip rotator muscles. Especially good stretch of piriformis muscle. From supine position rotate non-exercising leg inward as far as possible to help stabilize pelvis and isolate muscles to be stretched. Stretch opposite side by locking knee, lift leg upward to near vertical position as possible. Contract lower abdominals internal hip rotators and hip adductors. Reach across body as far as possible with scapulae (shoulder blades) and pelvis remaining on surface. Assistant places one hand above knee on non-exercising leg to maintain maximal internal hip rotation and pelvic stabilization. A pad and seatbelt may be placed firmly across the top of the pelvis for additional stabilization. The opposite hand assists the exercising leg to maximal stretch. Release and return to starting position and repeat. 1-2 Sets of 10 repetitions depending on individual need. Important stretch for those with back histories and to help release pelvic distortions and pressure on the hip and sciatic nerve plexus. It is also important for those who wish to improve quickness and lateral movement.



## MEDIAL HIP MUSCLE STRETCH

Especially important movement to evaluate those with lower back involvement. The purpose of this stretch is to help free pressure on the lumbar spine. From the supine position have patient flex one knee 90 degree angle. Normally the lateral region of the flexed leg should be able to touch the surface without moving the far side of the pelvis off the table. In order to stabilize the pelvis strap a pad firmly into position or have the assistant hold down on the opposite side of the pelvis with a hand. Instruct the patient to attempt moving the thigh toward the surface contracting the six deep external rotators, gluteus medius and gluteus maximus. The purpose of this exercise is to stretch the gluteus minimus, pectinius, psoas, iliacus, gracilis, adductor magnus, adductor longus and adductor brevis. The movement is carefully assisted at the end of movement, released to starting position and repeated for 10 repetitions. Alternate sides. 2 sets of 10 repetitions. When exercising instruct the patient to contract the abdominals preventing lumbar spine hyperextension.



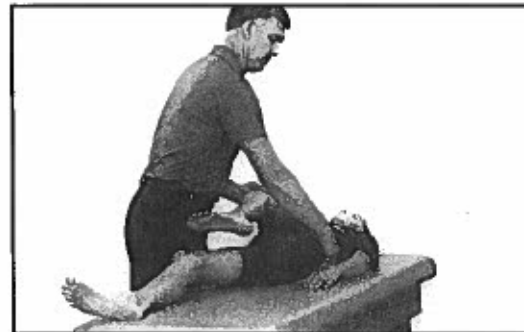
## TRUNK FLEXIBILITY - ASSISTIVE

Trunk flexibility restoration is important following an injury or surgery and must be administered carefully. Injury prevention and developing maximum power and quickness are sports priorities. Movement limitations of the thoracic (mid back) and lumbar (lower back) including

flexion, extension, lateral flexion and rotation may limit spinal posture and lead to muscle pulls or more serious spinal injuries. Shortened muscles of the trunk and hip limit free pelvic movement.

### REVERSE TRUNK ROTATION: MODIFIED

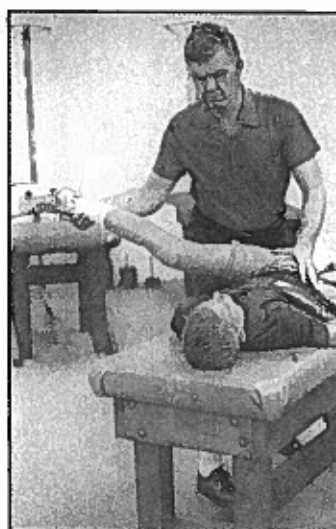
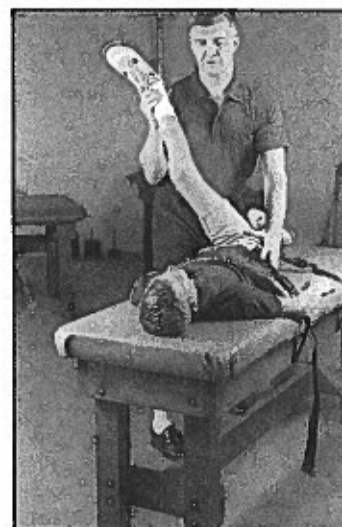
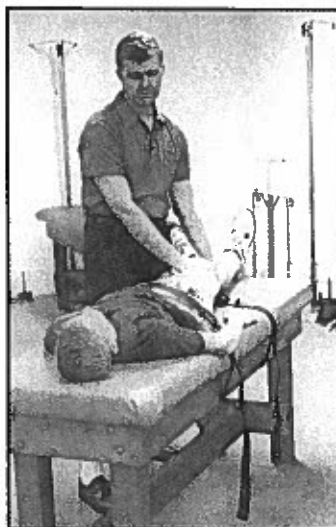
Especially for those with lower back history, to increase pliability of gluteals, low back and pelvic rotators. With knee flexed slowly reach across midline toward opposite shoulder by contracting hip flexors and abdominals. Bend and provide supportive pad under knee of relaxed side to free back of added stress. Assist at end of movement with patients opposite hand and gentle non-sustaining assistance of therapist. Return leg to starting position across midline and repeat movement. Therapist will help patient keep pelvis and lower back on surface by placing non-involved hand on pelvis. 10 Repetitions. 2 sets 10 repetitions if quite inflexible.





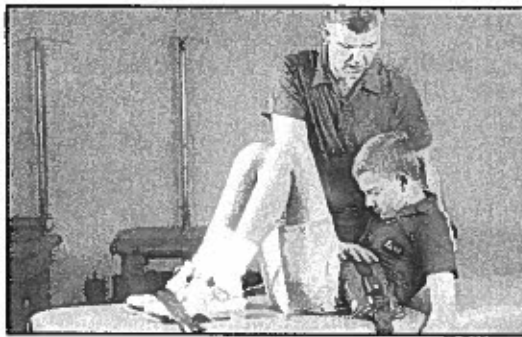
## REVERSE TRUNK ROTATION

Purpose is to stretch lower thoracic and lumbar rotators. Hamstrings, gluteus maximus, piriformis and other lateral thigh muscles should first be stretched to assure maximal stretch with least compensation and interference. Subject contracts hip flexor and abdominal muscles. Keeping knee extended and lower back on surface. Reach across midline toward opposite shoulder, assist with opposite side hand. Assistant will hold down on movement side of hip-pelvis. A pad and seatbelt may be placed firmly across the top of the pelvis for additional stabilization. Assist stretch by placing non-involved hand on subjects moving leg and helping at end of movement. Release and return leg to starting position. Repeat 10 repetitions, 2 sets 10 repetitions if quite inflexible.



## LUMBAR SPINE STRETCH

In order that the lumbar spine might be stretched safely and effectively the pelvic girdle should be stabilized by tilting the top of the pelvis back. This movement is maximized by firmly strapping a pad across the top-anterior portion of the pelvis. Instruct the participant to contract the lower abdominals to help stabilize the pelvis. The stretch is accomplished by tucking the chin, exhaling and flexing the cervical, thoracic and lumbar spine. Contract the cervical flexors, upper rectus abdominus, internal and external oblique muscles. The muscles to be stretched include the erector spinae and sacrospinalis muscles. The therapist or assistant may help stretch the back muscles by gentle pressure of the hand on the back. The patient may provide active assistance with the hands by clasping the table or placing the hands under the posterior thigh. This stretch may be used in a gentle manner for post-operative backs, backs with disc involvement and other lower back disorders. 2 Sets of 10 repetitions.



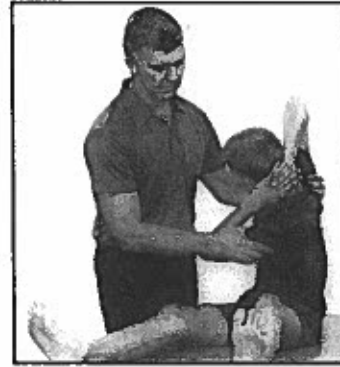
## BENT KNEE TRUNK FLEXION

For stretching sacrospinalis and erector spinae muscles. Subject is in seated position, knees flexed 2-3 inches, exercise is executed by tucking chin, exhaling moving forward slowly by contracting abdominal muscles and assisting at end of movement with hands. Therapist may assist by placing hand on upper mid- back and gently assisting 1-2 seconds. Dangerous to use entire body weight of assistant, bouncing or sustaining stretch for period of time. Repeat 10-15 repetitions as required.



## THORACIC - LUMBAR ROTATION

Purpose is to stretch opposite side thoracic - lumbar rotators, erector spinae and sacrospinalis muscles. Begin exercise by flexing knees 2-3 inches, rotate trunk as far as possible, tuck chin, exhale, contract abdominals, obliques and hip flexors and flex trunk forward as far as possible without bouncing. Assistant helps keep trunk rotated and assists gently at end of movement. Release, return to sitting position and alternate direction. Subject may do all movements in one direction and then do opposite side. Repeat 10 repetitions. May require additional set of 10. Especially important for swimmers, golfers, baseball, tennis, combatatives, wrestling, football and track field events.



## THORACIC EXTENSION

The purpose is to stretch the shortened anterior portion of the thoracic spine (kyphosis or hump back) by contracting the posterior erector spinae muscles. It is necessary to prevent as much lumbar extension compensation as possible. Therapist will accomplish thoracic spine stretching by placing far hand across T10 - T12 region with a firm down and forward pressure. Another method is to stabilize this area with a pad and seatbelt. Execute caution for those who may be suffering from osteoporosis. Also place strap across ankles to provide greater stabilization. As stabilized, have subject raise trunk as far as possible. Assist with hands under shoulders or ideally having an assistant place hands under shoulders and assist as primary assistant maximally prevents lumbar substitution. May increase strength to this area by placing a sandbag across shoulders during the effort. 2-3 Sets of 10 repetitions.



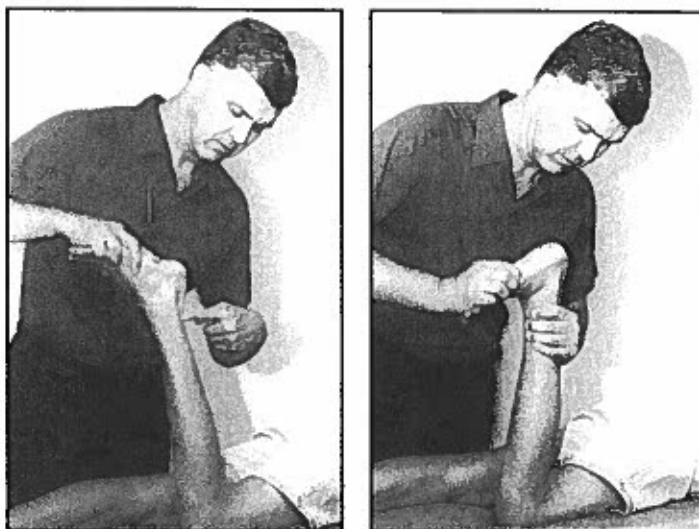
## ANKLE FOOT FLEXIBILITY - ASSISTIVE

Full range of motion of the ankle, sub-talar and metatarsal-phalangeal joints will help prevent injuries such as joint sprains, muscle strains, and help relieve the effects of foot postural problems, post surgical, and aging factors. Improved flexibility will help reduce recovery time in

rehabilitation and increase sports potential. Assistance may be necessary due to aging, paralysis, surgery, injury or other limitation not capable of being solved on an active basis.

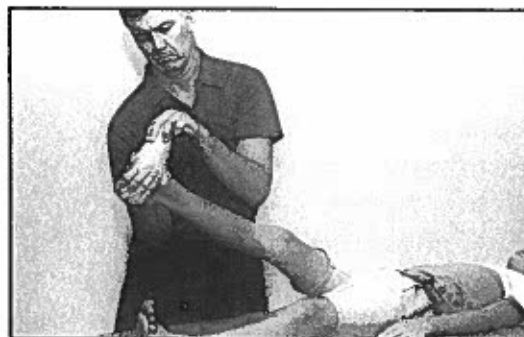
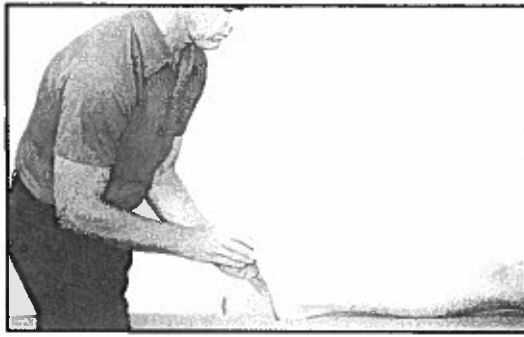
### ACHILLES - SOLEUS

Due to injury, muscle disease, temporary or permanent paralysis the achilles tendon or soleus muscle may become shortened. Patient assumes a prone position with the knee bent 90 degree angle to prevent interference from the two joint gastrocnemius muscle. Have patient dorsal flex ankle with anterior tibialis and foot extensors. Assist patient at end of active movement or if dorsal flexors are unable to move, passively stretch the achilles. Exercise caution with post achilles tendon problems or situation affected by paralysis. 2-3 Sets of 10 repetitions



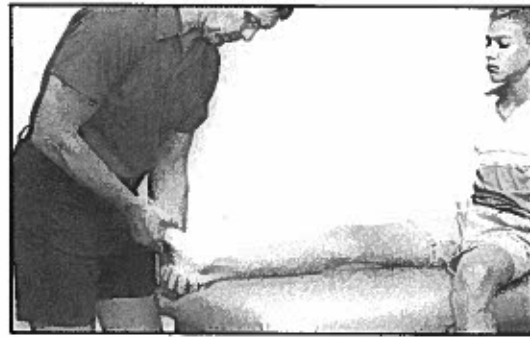
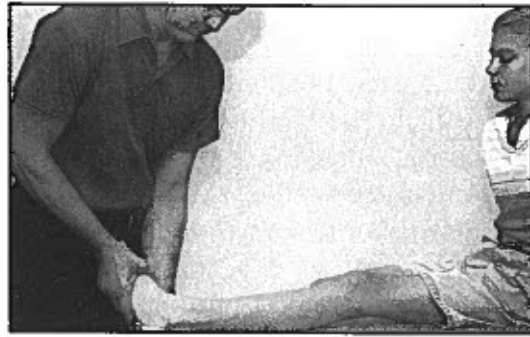
## GASTROCNEMIUS (CALF) STRETCH

From the supine or seated position the subject will receive assistance in stretching the large calf muscle. Keeping the knee fully extended have subject dorsal flex foot - ankle with anterior tibialis and foot extensors. Assist subject in pulling back the foot beyond current active range. Release and repeat. Encourage subject to do frequently on their own or with additional assistance. Alternate legs after each set. 2-3 Sets of 10 repetitions.



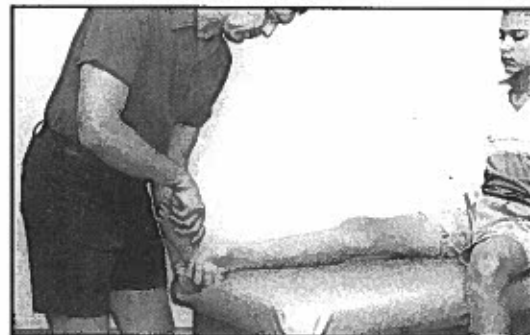
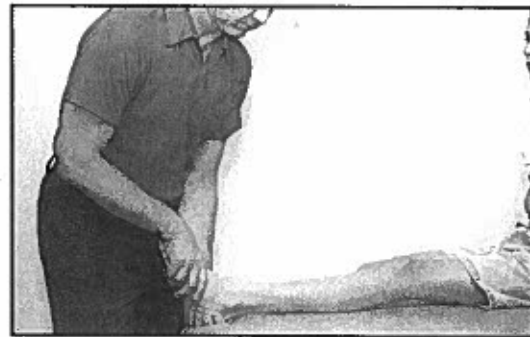
## ANKLE INVERTER STRETCH

Having had injuries, surgery or various muscle diseases or problems where movement becomes difficult or impossible following periods of immobilization assistance may be required. Subject may exercise from a seated, supine, or side-lying posture. With the ankle at a near 90 degree angle as possible, attempt to turn sub-talar joint (ankle-foot area) outward contracting the peroneus longus, peroneus brevis, peroneus tertius and extensor digitorum longus muscles, stretching the tibialis posterior and tibialis anterior muscles. Subject will attempt to turn sub-talar-foot outward and therapist will gently assist motion. Release and repeat from starting position. 2-3 Sets of 10 repetitions.



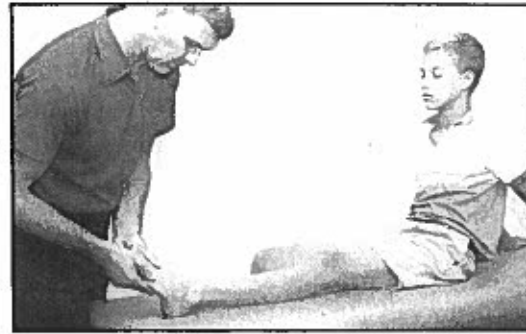
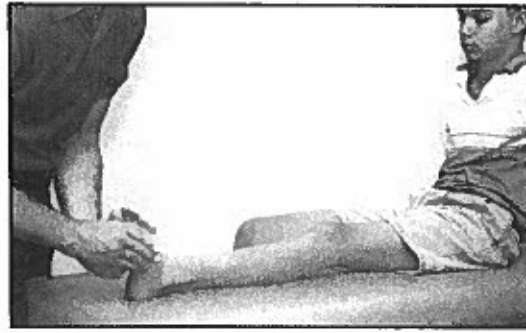
## ANKLE EVERTER STRETCH

Post fracture, surgery, strokes, muscle diseases or various reasons for limited movement or immobilization, assistance may be required. Patient may exercise from a seated, supine or side-lying position. Maintain ankle at near 90 degree angle as possible, attempting to turn the sub-talar (ankle-foot) inward contracting the tibialis posterior and tibialis anterior muscles stretching the peroneus longus, peroneus brevis, peroneus tertius and extensor digitorum longus. Subject will attempt to turn the foot inward as far as possible with gentle assistive stretch applied by the therapist. Release and repeat. 2-3 Sets of 10 repetitions.



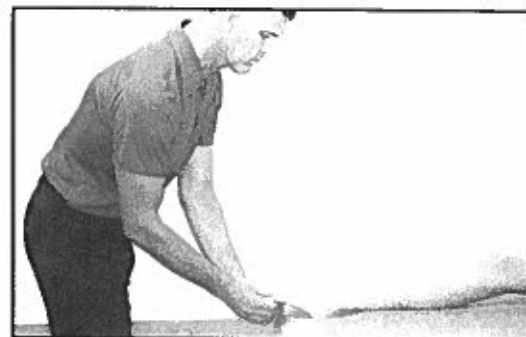
## FOOT PRONATION-SUPINATION STRETCH

Following surgery or injuries to the toes and feet which require a period of immobilization the metatarsal - phalangeal regions may lose pliability, resulting in greater foot stress or inadequate circulation. The foot will assume a mild plantar flexion position. Have the patient attempt to move the foot inward as far as possible with assistive stretch from the therapist hands, then turn foot outward as far as possible and provide assistive stretch. Patient may be stretched in a single direction for a series and then change directions if more advantageous. 2-3 Sets of 10 repetitions depending on condition of foot.



## DORSAL ANKLE STRETCH

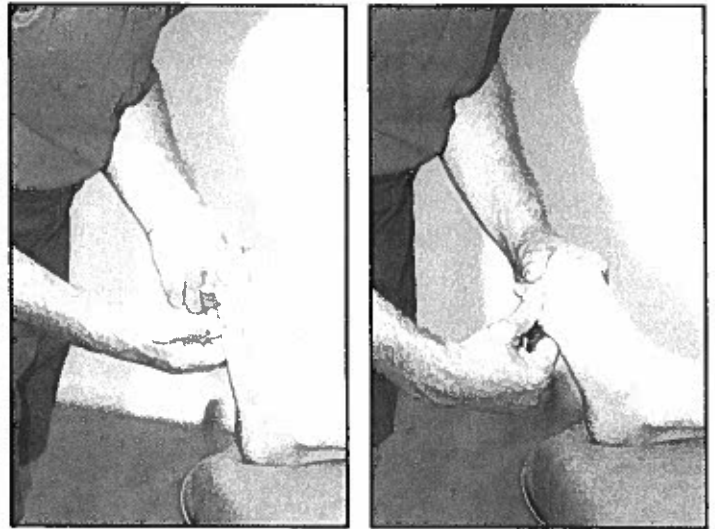
Ankle plantar flexion may be limited because of injury, conditions causing weakness of the plantar flexors or general lack of flexibility due to heredity, inactivity or soreness. Overstress may also cause shin splints or tendonitis. Limited plantar flexion may also be due to a shortened tibialis anterior or tight fascia. Coaches or trainers need to assist athletes for greater motion. The subject will plantar flex the ankle - foot downward contracting the plantaris, soleus, gastrocnemius and flexor digitorum muscles stretching the tibialis anterior and extensor digitorum muscles. Subject will plantar flex ankle-foot and receive gentle aid from the assistant. Release and repeat. 2 Sets of 10 repetitions.





## **METATARSAL ARCH STRETCH**

For those subjects with limited flexion of the toes (hammered toes) and metatarsal arch region due to shortening of the dorsal (top) tissue, assistance may be required. Have subject flex toes downward with active contraction of foot flexors. Provide gentle stretch with aid of assistant's hands. These muscles and tendons will probably be quite sensitive so proceed carefully. 2-3 Sets of 10 repetitions.



## **GREAT (BIG) TOE STRETCH**

Frequently we see a condition of the largest toe angle inward (hallux valgus). This condition may be uncomfortable and lead to formation of a bunion. The adductor hallucis muscle pulls the big toe towards the second toe. If the abductor hallucis is too weak to keep the toe in the normal neutral position it will angle inward, especially if aided by the force of the shoe. Placing slight pressure against the outside of the big toe have the subject attempt to spread the big toe, assist at end of active movement. Subject may be incapable of doing this movement actively without assistance. Assist, release and repeat. 2 Sets 10 repetitions.

