

# Chapter 5: Sports & Exercise

**80% of sports injuries are musculoskeletal disorders due to overuse and poor ergonomics.**

These non-medical terms describe a wide range of maladies...

- Runner's knees
- Tennis elbow
- Golfer's back
- Racket ball shoulder
- Ping pong wrist

Awkward postures, poor technique, repetition and ill-fitting equipment... *sound familiar?*



# Sports and Overuse Injuries



**Basketball Knee**



**Runner's  
Shin Splints**



**Runner's Knee**



**Tennis Tendinitis**



**Tennis Elbow**

**Golfer's Wrist**



It's estimated that 40% of recreational sports players suffer from overuse injuries due to repetition and forceful motions...which is what most sports are all about. Good technique, aerobic conditioning and the right equipment can keep you among the 60% who enjoy their sport of choice pain-free.

# Sports & Exercise and Ergonomic Risks

## The *Ergonomic Risk Factors*

- Improper technique
- Poor or inadequate physical conditioning
- Poor grip design or sports equipment that doesn't fit
- Repetitive and forceful hand/arm motions, particularly twisting the wrist and forearm as in a softball pitch or a tennis serve
- Repetitive impact on joints and soft tissue
- Forceful twisting/bending of the spine such as a golf swing or tennis backhand
- Failing to warm up before exercise or sports activity
- Failure to cool down and stretch afterward



# Sports & Exercise

## *Essential Tips & Techniques*

- Conditioning is essential for any sport and should include low impact aerobics like walking, running or cycling
- Always warm up *before* exercising but save stretching for *after* the warm up and during the cool down time
- Use good body mechanics & techniques – seek expert advice from a sports clinic or personal trainer at your local gym!
- Select equipment for best fit and protection
- Practice the sport or exercise more than once a week
- Drink lots of water – stay hydrated
- Don't be a weekend warrior – slow down – keep pace with your body
- Stay hydrated – *water, water everywhere!*



For some good health and performance tips on your specific sport or game, checkout this website and do a search for your sport: [www.knowledgehound.com](http://www.knowledgehound.com)

# The Importance of the Warm up



A proper warm-up will increase blood flow to the working muscles. A warmed muscle contracts and relaxes more quickly with less chance of a cramp. Warm muscles improve elasticity and the warm-up lubricates the joints. A warm-up should be relatively short (10 minutes) and include low impact aerobics like walking, running in place, skipping or swinging the arms.

Tailor the warm-up to the sport:

Runners- *running in place or running at a slow pace.*

Cyclist- *high-knee lifts and stepping or slow paced cycling*

Tennis- *skipping or running sideways and backwards*

Baseball- *swinging the arms and side-to-side running in place*

***Perform stretching after the initial warm up otherwise you increase the risk of pulls and tears of a cold muscle!!***

# Good Basic Body Mechanics for Sports



Whether you play golf, tennis, baseball, basketball or bowling, there are a few essential techniques to minimize wear and tear on your body that will also make you a better performer.

- Flex at your knees and hips instead of at your low back
- Substitute body motion and foot positioning for bending the spine or overextending the arms
- Substitute foot movement and pivot your body instead of twisting

*These techniques have been used in Asian martial arts and Tai Chi for centuries!*

Use body motion and positioning  
*...instead of bending the spine*



She's moving into the ball and her feet are well positioned to return the ball without excessive bending in her spine. Her back is straight and she's doing her weight shifting with her knees and hips.

# Pivot the body with your feet and toes *...instead of twisting the spine*



He's holding too wide a stance and his weight is on his front foot which will require him to twist as he returns the ball.



She's literally dancing on her toes and can return a shot placed anywhere without having to twist her spine.

# Flex at the knees and hips *...instead of bending the spine*

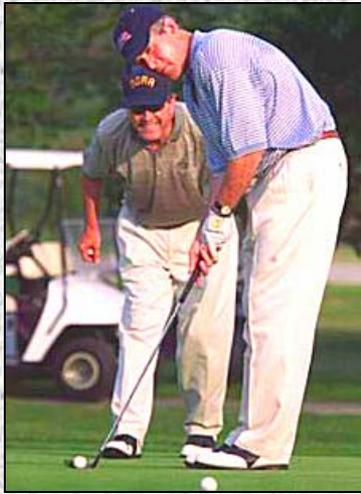


He's bending forward at the spine to return a ball that is low to the ground and although he is flexing at the hip somewhat, he ought to bend his knees more.

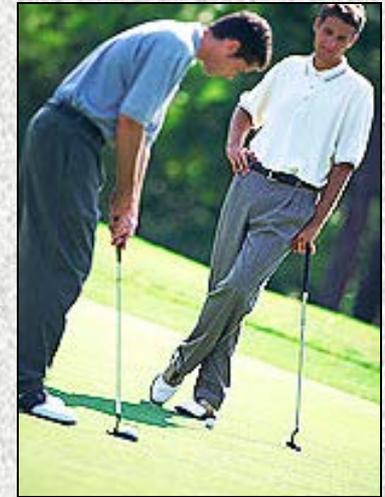


This guy can easily return a low ball without bending his spine because he's bending those knees and flexing forward at his hips. A good technique for volleying!

# Flex at the knees and hips *...instead of bending the spine*



George W and the fellow on the right are straight in their knees and are bending at their spines as evidenced by the “C” shape curvature in their backs.



These two golfers have their form and technique down, They have a little more bend in their knees and they’re flexing forward at their hips...each with a straighter spine.

*The power of their swing can be 20% greater.*

# Racquet Sports

## *Essential Tips & Techniques*

Racquet sports involve explosive arm strokes and repeated wrist snapping. The shock is born primarily by the wrist and elbows. Tennis elbow occurs in about 50% of recreational tennis players.



- Use a neutral grip and make sure the racket grip fits your hand
- Good footwork is 50% of the game and it can save 80% of the torque on your upper extremities and spine.
- Focus on exercises to master footwork, i.e., side-steps, run backwards or skip rope
- Flex with your knees and hips instead of bending your back
- Work on a 2-handed backstroke to avoid Tennis Elbow

# Get a good grip on your racquet

*...to minimize stress on your hand/wrist/elbows*



In sports such as tennis, squash and racquet ball, the hand and wrist is the last link in the kinetic chain that absorbs the brunt of the force. Proper equipment size and features and good grip technique is essential.

# Getting a Good Grip

Measure to tip of ring finger and that's your grip length (4.5" shown)



Align ruler with lowest lateral crease on palm

Grip Length



Grip Thickness

When you grasp the grip you should be able to fit one finger between the bulbous side of the palm and your ring finger- no more, no less. That's an ideal grip thickness

# Using the Right Grip

*...to minimize stress on your hand/wrist*



While there are a number of grip techniques for both forehand and backhand strokes, the most stable wrist position and least stressful wrist posture is the “Eastern Grip” shown at left. Note how the wrist is held fairly straight versus the “Western Grip” on the right where the wrist is rotated slightly around the handle grip, resulting in wrist bent back. Seek advice from a trainer to find a grip that’s ergonomic and suits your style.

# Golfers

## *Essential Tips & Techniques*

The body torque and twisting of the golf swing produces intense stress on the lumbar spine. The tendency to “grip” too tightly affects the hands, arms and shoulders.

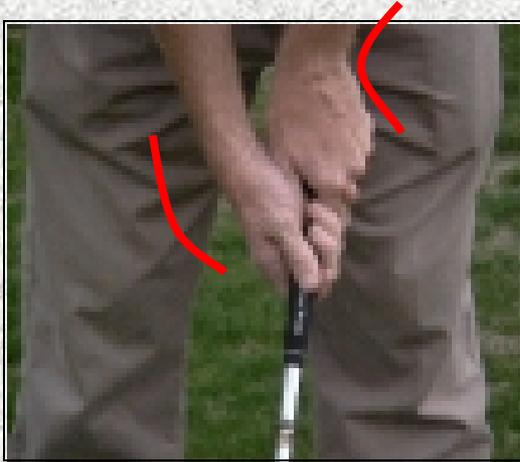


- Use a neutral hand grip on the club
- Make sure the club length fits your size to minimize bending
  - if you have minor back sensitivity, go for more length in the shaft
- If you have hand/wrist sensitivity, look for graphite, titanium or other force dampening shafts to absorb the impact and vibration
- If you have elbow or shoulder sensitivity, look for clubs with larger heads and “sweet spots” to dampen the impact
- Experiment with new “sneaker” type golf shoes with soft-spike or molded non-spike soles to reduce torque forces on the knees and hips
- Go for exercises that enhances strength and flexibility in the hips and knees

*If you suffer from Low Back Pain, give up golf and try bocce ball!*

# Get a good grip for golf

*...to reduce impact force and stress on your hand/wrist*

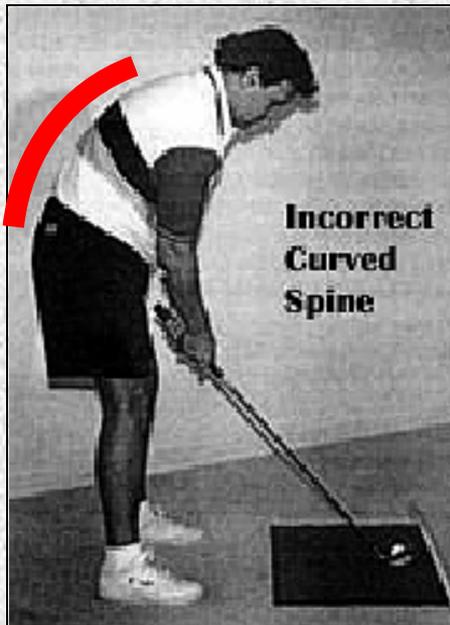


He's using a "Power Grip" with his left hand rotated around the club. While this is an OK technique for some, it results in a lot of stress on the hand/wrist as evidenced by the left wrist bent back and right wrist bent forward.



He's using the "Neutral Grip" with both hands centered on the club (thumbs in line if you could see them) results in straight right/left wrists. This is the most stable and balanced hand grip for golf and it's recommended for people with hand or elbow sensitivity.

# *Bend at the knees & hips to improve your swing*

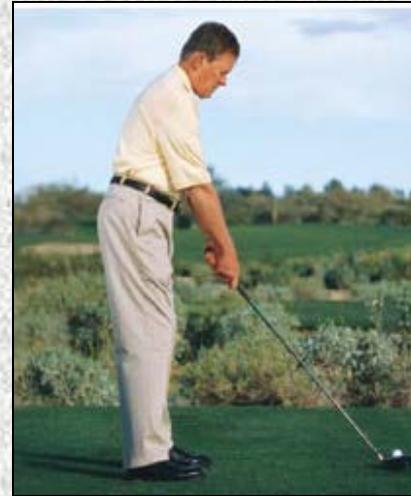
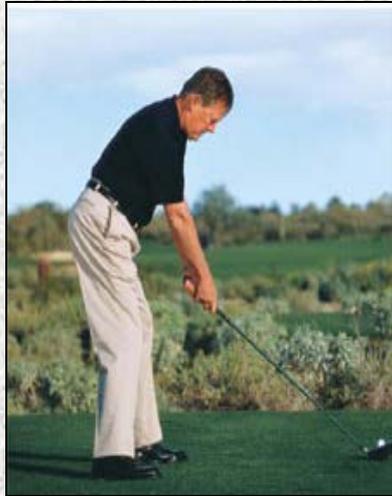


Notice how his knees are straight and he flexes forward by bending his back into a “C” shape



Using proper technique, notice how he’s bending at the hips and knees in order to keep his back straight. Not only is this less stressful, but his entire swing is improved by rotating about the hips rather than the low back.

# Do your clubs fit you?



These are both good stances for setting up their golf swing but notice the difference in the hip angle in each of these photos.

**Left-** his shorter club length requires that he bend farther forward as he leans in to connect with the ball which puts greater torque on the spine

**Right-** with a good shaft length, he can connect with the ball with a little less bending at the hips and less torque on his spine as he swings.

# Runners and Joggers

## *Essential Tips & Techniques*

Runners and joggers put 1000 pounds of force on each knee when moving at a full stride. This force can double when running down a steep hill.

- Wear good quality running shoes with proper arch supports and cushioning.
- Replace running shoes every 300 miles or every 6 months to ensure optimal cushioning of your joints.
- Always warm up before a run to get your muscles heated and elastic and your joints limber... stretch after your run to relieve tightness and cramping.
- Avoid running straight down a hill but if you must, tack downhill in a zigzag pattern
- Go for exercises/conditioning that enhances the strength and flexibility of your thighs.



# Stretching before or after exercise

Stretching is an essential part of any sport or vigorous exercise routine. Stretching extends the muscle length like a rubber band, enhancing its elastic qualities to keep your body limber and your athletic performance superior. It also prevents stiffness, soreness and cramping after a hard workout.

However, stretching alone without warming your muscles first before playing a sport or performing rigorous exercises could increase your chance of a joint injury.

The best time to stretch a muscle is *after* it has been warmed up since stretching a cold muscle increase the likelihood of pulling or tearing the muscle.

Stretching is sorely needed after your aerobic workout or sport so you don't tighten up and cramp your style.



# Stretching after a workout



*We all need to stretch those calf, quads, thighs & hamstring muscles!*

# Post Exercise Stretching

## *Essential Tips & Techniques*



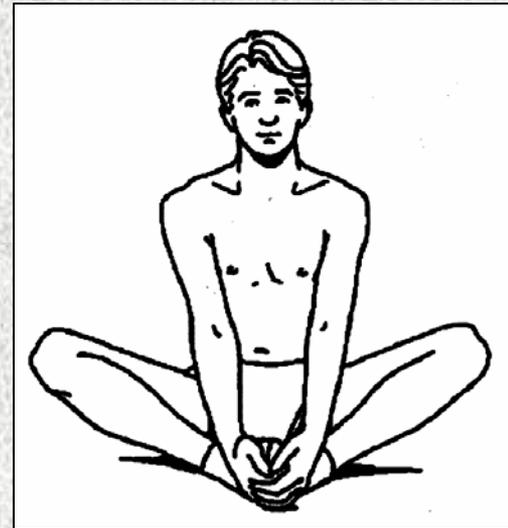
- Stretch slowly in smooth flowing motions – don't push beyond comfort and never bounce a stretch
- Perform stretches that are targeted to the muscle group- go after the muscles that you've been using
- Hold a large body stretch at least 30 seconds for it to have an optimal effect
- Build stretching into your regular exercise schedule- a few minutes after a warm up and 5 to 10 minutes after a sports game or rigorous workout

# Post Exercise Stretches



## Standing Back Bend

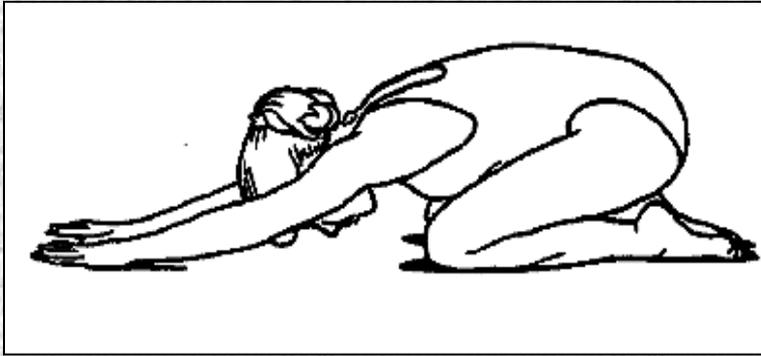
- Arch backward to deepen hollow of low back
- Hold 5 seconds/repeat 5 times



## Hip and Knee Stretch

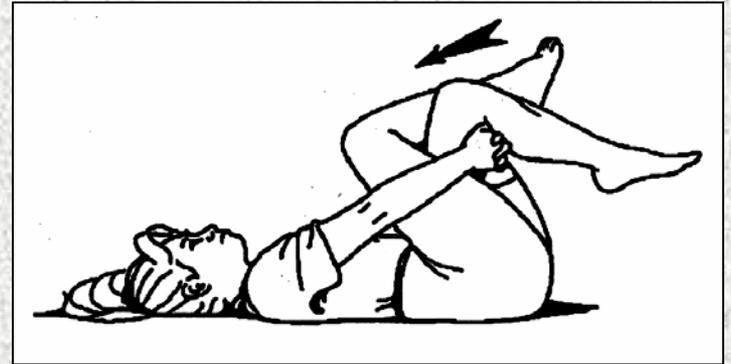
- Sit on floor with knees apart and heels together
- Pull feet toward body until a stretch is felt in inner thighs
- Hold 5 seconds and repeat a few times

# Post Exercise Stretches



## Mid Back Stretch

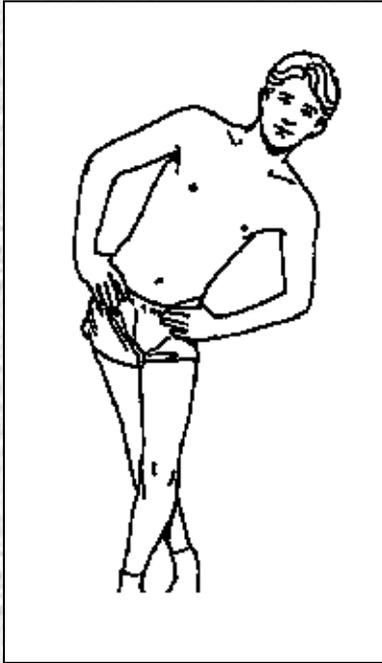
- Kneel down and lower chest to floor, reaching your arms forward as far as you can
- Hold 5 seconds and repeat 5 times



## Hip and Knee Stretch

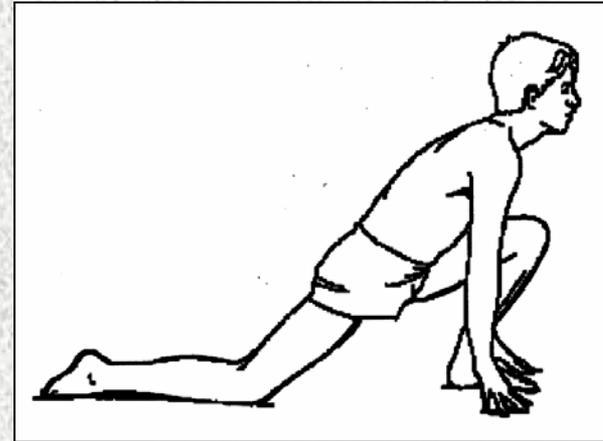
- Lie on your back, elevate knees and cross right leg over the left
- Gently pull left knee toward your chest until a comfortable stretch is felt in the buttock and hip area
- Hold until count of 10 and repeat on opposite side

# Post Exercise Stretches



## Hip and Knee Stretch

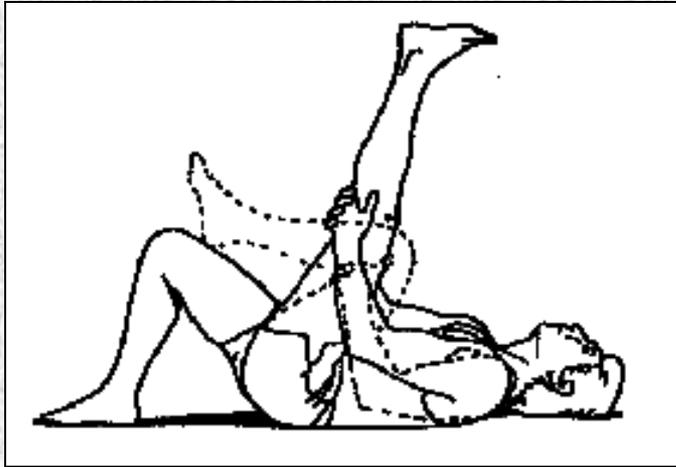
- Cross left leg over right then lean to the left until a gentle stretch is felt on the outside of the hip
- Hold 10 seconds and repeat on the opposite side



## Hip and Knee Stretch

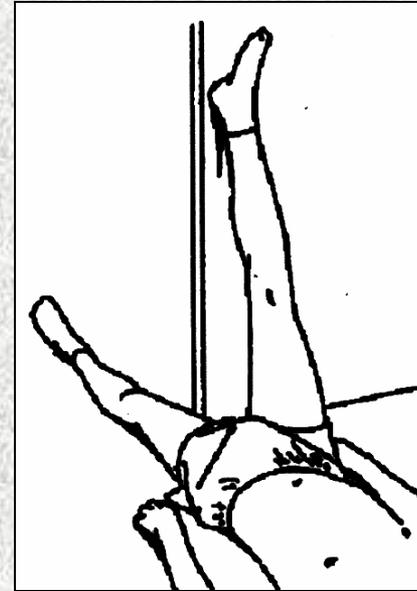
- Kneel down and place left leg forward
- Slowly push pelvis downward while arching your back until a gentle stretch is felt on the front of hip
- Hold 5 seconds and repeat on opposite side

# Post Exercise Stretches



## Hamstring Stretch

- Elevate left knee and clasp with your hands
- Starting with knee bent, attempt to straighten knee until a gentle stretch is felt at the back of thigh
- Hold 5 seconds and repeat with opposite leg



## Hamstring Wall Stretch

- Lie on floor and elevate right leg on wall with left leg through doorway
- Scoot buttocks toward wall until a gentle stretch is felt in back of thigh
- As leg relaxes, scoot closer to wall
- Hold 5 seconds and repeat on opposite side

# Post Exercise Stretches



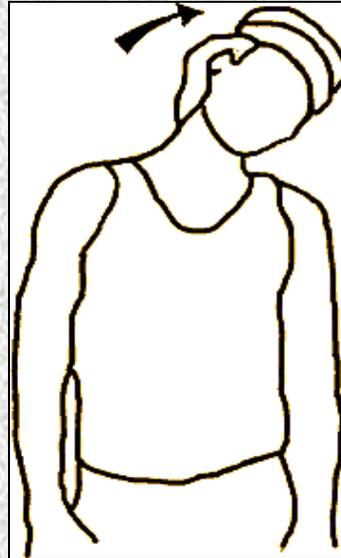
## Ankle and Foot Stretch

- Stand with ball of your left foot on stair
- Reach for bottom of step with heel until a gentle stretch is felt through the arch of your foot
- Hold for 5 seconds and repeat with opposite foot

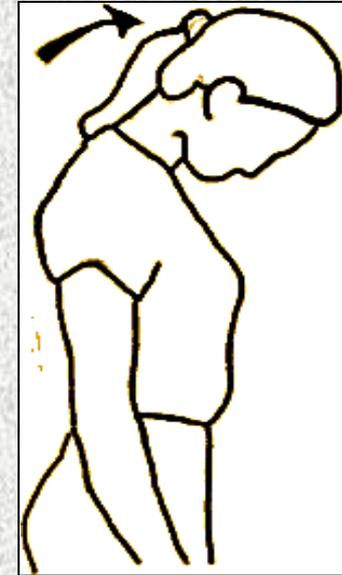
# Stretching the head and neck



1. Turn your head to one side, then the other
2. Hold for 5 seconds, each side
3. Repeat 3 times



1. Tilt head sideways, first one side then the other
2. Hold 5 seconds
3. Repeat 3 times

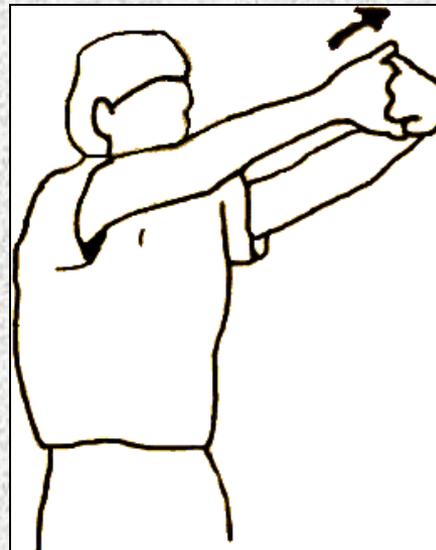


1. Gently tilt head forward to stretch back of neck
2. Hold 5 seconds
3. Repeat 3 times

# Stretching the shoulders & upper back



1. With left hand pull right elbow across chest toward left shoulder
2. Hold 15 seconds and repeat on other side



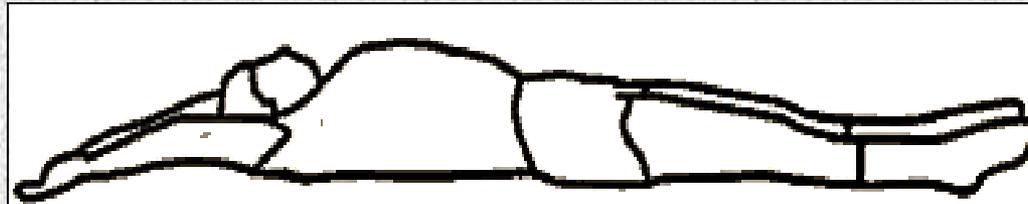
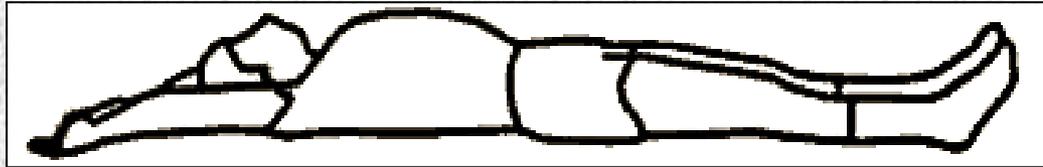
1. Interlace fingers and turn palms out
2. Extend arms forward and raise to top of head
3. Hold 15 seconds, relax and repeat a few times

# Stretching the hips, thighs and hamstrings

1. Sit on floor with right leg straight out in front
2. Bend left leg and cross your foot over outside of right knee
3. Pull left knee across body toward right shoulder
4. Hold for 15 seconds and breath easily then repeat on other side



# Stretching the shoulders, arms, hands, feet and ankles ...*for all sports and exercises*



1. Lie on floor, extend arms overhead, keeping legs straight
2. Stretch arms and feet in opposite directions
3. Hold for 5 seconds, relax and repeat 5 times

# Where to find more information

Resources- articles and guidelines on sports, exercise and injury prevention

[www.uc.edu](http://www.uc.edu)- exercise and mental health articles

[www.spine-dr.com](http://www.spine-dr.com) - running, racquet sports and golf tips

[www.healthywomen.org](http://www.healthywomen.org)- exercise guidelines

[www.emedicinehealth.com](http://www.emedicinehealth.com)- walking for fitness

[www.claytonparkchiro.ca/tips](http://www.claytonparkchiro.ca/tips)- health and exercise tips

[www.holistic-online.com](http://www.holistic-online.com)- exercise and health articles

[www.successfulfitness.com](http://www.successfulfitness.com)- fitness articles

[www.coolrunning.com](http://www.coolrunning.com)- running and jogging articles

[www.cdc.gov/php/dnpa/physical](http://www.cdc.gov/php/dnpa/physical)- guidelines for physical activity

[www.diabetes.org.uk/physical](http://www.diabetes.org.uk/physical)- stretching guidelines

[www.working-well.org](http://www.working-well.org) – racquet sports and golf injury prevention

[www.uihealthcare.com/topics/sportsmedicine](http://www.uihealthcare.com/topics/sportsmedicine)- running/cycling injury prevention

[www.sports-doc.com](http://www.sports-doc.com) – golfing tips and warm-up exercises

[www.uscsportsmed.com](http://www.uscsportsmed.com)- newsletter on sports injury prevention

[www.sportsmedicine.about.com](http://www.sportsmedicine.about.com)- sports injury prevention

[www.womensheartfoundation.org](http://www.womensheartfoundation.org)- stretching and warm-up exercises

[www.golflink.com](http://www.golflink.com) – Feel good golf articles on posture and techniques

