

# **EXERCISE WITHOUT INJURY**

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By  
Graeme Insull

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## **EXERCISE WITHOUT INJURY**

### **INTRODUCTION**

We have all admired the speed, power and grace that good Taekwon-doists are able to exhibit. Some of the most important elements of fitness that these people possess are strength and flexibility. Whether we want to be counted amongst the elite, or merely be able to move successfully through the grades, we require a degree of suppleness to perform various techniques competently.

Everyone has a certain natural degree of strength and flexibility, there are, however, large variations between individuals. Generally, children are more flexible than adults and women are more flexible than men, but men have greater strength. Suppleness reduces as we age, however, the process can be slowed and even reversed by incorporating a series of stretches in our daily routine. The key is to stretch regularly and frequently - once or twice a week at training will not suffice if the maximum benefit is to be realised. A daily regime need not be onerous and can be undertaken while watching TV, listening to music or reading a book.

Flexible muscles respond freely and allow extreme movement of the limbs, lessening the incidence of injury to muscle and connective tissue. Regular and correct stretching also promotes more efficient blood circulation, reduces muscle tension and improves the ability to relax.

On a cautionary note, a number of exercises have been proven to cause a variety of physiological problems, both immediately and in the future. All who give instruction have a 'duty of care' whereby the students safety should be a priority.

Martial arts, along with many other sports have specific techniques and training methods to achieve desired results. Martial arts have, though, been slow to adopt scientific research to modify or eliminate so called contra-indicated movements. This resistance to change may, in part, be due to tradition, the handing down of methods from year to year, generation to generation. Taekwon-do is a relatively new art, and prides itself on applying scientific principles to its various techniques. It should, therefore, have no difficulty in applying scientific research to the exercises it performs and making changes where indicated.

### **THE METHOD**

All stretching and related static exercises should be preceded by a warm-up consisting of light movements such as walking, light jogging, star jumps, arm rotations etc. The idea is to improve blood supply to the muscles, increase tissue temperature and

prepare the body for the activities to come thereby reducing the chance of injury. All muscle groups should be included in the warm up whether or not they are to be the subject of the sessions stretching.

Stretches can be considered as a two part exercise comprising firstly the 'easy' stretch followed by the 'developmental' stretch.

Extend the limb to the 'easy' stretch position, that is, until mild tension can be felt and hold for 20 - 30 seconds. Relax as the stretch is held and the tension will ebb away. This first phase reduces tightness in the target muscles and tissues and is preparatory to the next phase.

For the second phase, or 'developmental' stretch, extend the limb further until some mild discomfort is felt and hold the stretch for 10 - 30 seconds. Once again, relax as the stretch is held and the tension will ease off. This second stage may be repeated extending the limb further each time.

A variation of the static stretch is PNF stretching (proprioceptive neuromuscular facilitation) The idea here is to contract the target muscles then follow up with a gentle static stretch on the basis that there is greater potential for relaxation and stretch after a contraction. This is also effective in increasing muscle strength.

PNF stretching is performed as three or four sets of contractions of about 6 seconds duration followed by 10 seconds of static stretching with about 20 seconds rest before any repeat.

A partner can be used to assist with PNF stretching. This allows the stretching person to relax while the partner applies the pressure.

Partner assisted stretching requires good communication by both parties and awareness by the non-stretching partner to ensure limbs are not over stressed resulting in injury.

It should be noted that when muscles and tendons are asked to extend beyond their norms, there will be some tension and discomfort, this is inevitable, however, pain is an indication that too much is being attempted too soon and is to be avoided.

Do not over extend or bounce, this over stresses the muscles can cause strains and tears or may initiate a counter productive reflex known as 'stretch reflex'. When muscle fibres are pulled too far, the stress is detected by the brain which sends a message to the muscle to contract, exactly the opposite to what the stretch is trying to achieve.

Maintain normal breathing throughout the exercise, impaired breathing suggests a lack of relaxation and the exercise should be eased off.

Any exercise performed at high speed with a lack of control can create instability around a joint and musculo-skeletal problems may develop. Work at a controlled pace with good technique.

## UNSAFE EXERCISES

Much has been written on appropriate stretching and strength exercises for martial arts and it is not my intention to repeat them here. The reader is referred to various books and magazines and to their instructor.

What follows are some exercises which can give rise to medical problems and the reader is cautioned about their use. Modifications or alternative exercises are offered.

### STANDING TOE TOUCH

Purpose: to stretch the calf muscles.

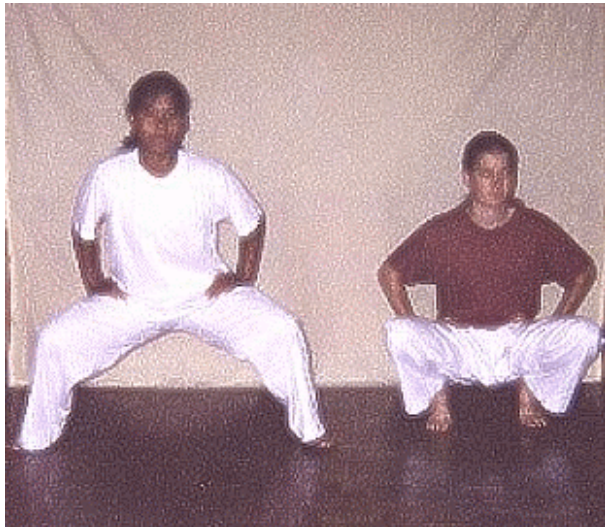


Problem: This technique is usually performed with a curved back, this places a lot of pressure on the lower spine with very painful consequences. The muscles must contract to support the body at the same time as they are being stretched to a bent over position.

Solution: Bend the knees, walk forward on the hands, straighten the knees keeping the heels firmly on the floor. Maintain a straight back, bending at the hips.

Bend-overs where the hands grasp the ankles and pull the upper body down in order to stretch the lower back can cause similar back problems as can bending the upper body through 90 degrees and using the arms in a swimming action.

## REPETITIVE DEEP SQUATS



**Purpose:** To stretch the Achilles Tendon and /or to strengthen the thighs.

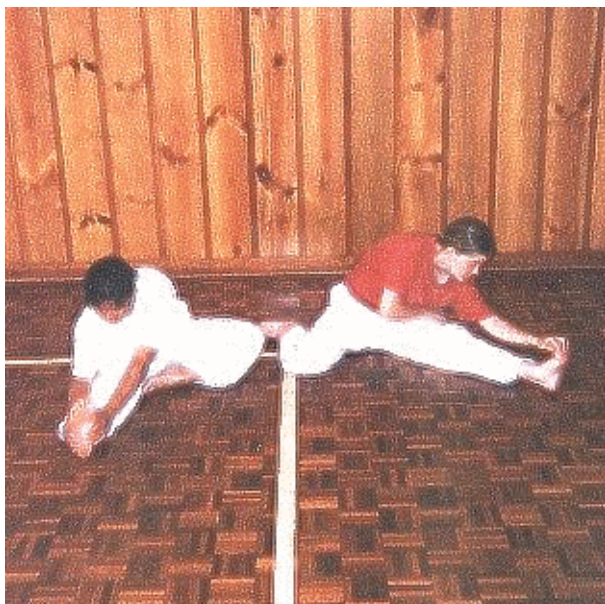
**Problem:** Placing full body weight on over bent knees can cause serious joint problems with ligaments and cushioning cartilage

**Solution:** Perform half squats i.e. bend legs until thighs are parallel to

the floor

Bunny Hops and Duck Walks stress the knees in a similar manner to deep squats and can be as damaging.

## HURDLERS STRETCH



**Purpose:** To stretch the ham string.

**Problem:** This can place considerable lateral pressure on the bent knee damaging inner structures of the joint.

**Solution:** Place the sole of the foot against the inner thigh of the leg being stretched, bend from the hips

## NECK ROTATIONS



Purpose: To stretch the neck muscles.

Problem: Circular motions of the head compress the small joints at the top of the spine pinching nerves.

Solution: Turn the head from side to side. Lower head from front to back, and side to side in a linear fashion. Perform slowly.

## BACK HYPEREXTENSION



Purpose: To strengthen and flex and the back..

Problem: Raising both arms and legs at the same time stresses the lower back.

Solution: Work arms then legs independently or work arm and opposite leg.



## SIT UPS



Purpose: To strengthen the abdominal muscles.

Problem: Hands clasped behind the head used to pull head and upper body up and in so doing stress the neck.

Solution: Place hands along side of ears but not in contact with the head.

Alternatively, cradle head in arms where hands are placed behind the head on opposite shoulders i.e. not holding the head

## JACK-KNIFE SIT UPS



Purpose: To strengthen the abdominal muscles.

Problem: Sudden, jerky motion over stresses the lower back..

Solution: Perform bent leg sit-ups or crunches.

Straight leg sit ups can also over stress the back, but may be acceptable for the fit if performed in a controlled manner - not fast.

## DOUBLE STRAIGHT LEG RAISE



Purpose: To strengthen the abdominal muscles.

Problem: Stresses the lower back, because the hip flexor is worked in a shortened range when there is not sufficient strength in the abdominals.

Solution: Do leg cycling. Work in range where you can maintain a flat back - 45 to 90 degrees. Brace abdominals with the hands if necessary to keep the lower back flat and in contact with the floor.

## PUSH-UPS ON BACK OF HANDS



Purpose: To strengthen the triceps and serratus anterior (muscles in front of shoulder blades)

Problem: Back of hands not designed for load bearing, there are various small bones and ligaments which are easily damaged when used in this manner.

Solution: Conventional push-ups on hands or knuckles will strengthen the target muscles. Hand movements while holding weights will strengthen the wrist.



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Elaine Black, Physiotherapist

Amanda Insull, 1<sup>st</sup> Dan

Thu Thack, 2<sup>nd</sup> Gup