

# Knees Beyond The Toes?

Safe or Not?

Fitness Training on the Net

Ian Middleton BSc

<http://www.fitnesstrainingonthenet.co.uk>



## Knees Beyond The Toes?

You bet they are, In all of the pictures above you can clearly see that the knees are forwards of the toes. Why then do we as trainers still persist in instructing athletes to keep their knees behind the toes. It is time to dispel this myth as we are more than likely setting up our athletes for injury as failure to strengthen and develop the knee structure to withstand the repetitive positions that they will be placed under during sports is criminal. If we want to improve the functional training of our athletes then we must let them take their knees past their toes, but only if they have appropriate levels of control to ensure correct levels of balance and posture, to withstand the load of the body, any external loading, gravitational forces and ground reactions.

Also when they were allowed to pass in front of the toes. The results of the study showed that *differences resulted between static knee and hip torques for both types of squat as well as when both squat variations were compared with each other ( $p < 0.05$ )*. For the unrestricted squat, knee torque (N·m; mean  $\pm$  SD) =  $150.1 \pm 50.8$  and hip torque =  $28.2 \pm 65.0$ . For the restricted squat, knee torque =  $117.3 \pm 34.2$  and hip torque =  $302.7 \pm 71.2$ . The results clearly show that the techniques used in squatting have an substantial affect on the resulting torque. When knees are restricted in movement this places much larger levels of torque on the hips and also has the effect of placing the body in an increased lateral lean. This may have the effect of increasing the chances of hip and back problems. The study concluded that *“Practical applications: Although restricting forward movement of the knees may minimize stress on the knees, it is likely that forces are inappropriately transferred to the hips and low-back region. Thus, appropriate joint loading during this exercise may require the knees to move slightly past the toes.*

Fred Hatfield (Dr Squat, 1989) suggests that *“Squatting properly: with upright torso, knees extending over the feet, and to apposition near or below parallel: centralises the majority of the stress in the quadriceps. The hamstrings, glutes, and erector spinae receive some stress too, but not enough to rob the quads of major effect.”* Hatfield has clearly learnt his craft of squatting well (a bit of an understatement as anyone that can squat 1014lbs is clearly a master of their craft.) and realised the correct distribution of torque over the joints that allowed for safe and effective squat training.

Vern Gambetta (2006) tells us to *“Remember the body is a link system, if we restrict movement in one part another part must make up for that movement.”* With this in mind it seems to me that we have forgotten the importance of the feet and ankle in the safe and effective execution the squat. How much of an effect has the amount of foot that is placed upon the ground during squatting. The answer to this problem may well be to have the foot take a position that is equally spread between the heel and toes. McGill (2006) may provide the answer that allows for athletes to achieve correct placement of the foot from the heels to the toes during squatting by performing a gripping motion of the foot. McGill describes this as *“The floor grip is accomplished with the toes and the heels actually gripping the floor inside the shoe. This also widens the base of support and gives the lifter more stability, which ultimately creates the conditions for optimal hip drive and the steerage of load through the linkage. Sometimes we start shoeless foot gripping exercises with the lifter to develop this type of essential foot athleticism. We'd also do this with golfers and strongman competitors who have to grip the ground when pulling/pushing, etc.”*

McGill's above exercise may help us to achieve correct levels of balance and enable the muscles to function synergistically to provide correct movement patterns from the feet, ankles, hips, low back and neck. With the use of the floor grip during squats you will probably achieve improved balance, stability and posture that may help to properly distribute the weight between the shoulders, low back, hips, knees and ankles. The knees will not be able to travel excessively far forwards of the knees if the feet remain fully anchored to the floor. A bigger danger would be if the knees were seen to be internally rotating during the movement, than if the knees moved slightly forwards of the centre of the toes.

## References

ANDREW C. FRY, J. CHADWICK SMITH, and BRIAN K. SCHILLING *Effect of Knee Position on Hip and Knee Torques During the Barbell Squat* The Journal of Strength and Conditioning Research: Vol. 17, No. 4, pp. 629–633.

<http://functionalpathtraining.blogspot.com/2006/08/where-does-knee-go-where-it-has-to.html>

<http://www.t-nation.com/>

Hatfield, Frederick C. *Power A Scientific Approach* Contemporary Books , 1989