

## Scientists find secret of perfect golf swing

Scientists believe they may have finally found the answer to the perfect golf swing.

Scientists claim to have found the secret to the perfect golf swing

By Caroline Gammell

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The key is knowing at exactly what stage of the swing you should exert the maximum force, according to research.

Use too much strength too early or too late and the aspiring golfer will see their handicap stubbornly linger in double figures.

Tiger Woods, who has won 87 tournaments in his 12-year career, is viewed by many commentators as the golfer with the most perfect swing.

Using a complex mathematical equation, Professor Robin Sharp from the Department of Mechanical, Medical and Aerospace Engineering at the University of Surrey, has calculated which parts of the upper body should be used at what stage.

Breaking with conventional thinking, his study suggests that the wrists are not as important as the way a golfer uses their arms.

His research also concludes that height is not as advantageous as previously thought, with short people able to hit a ball almost as far as their taller competitors if they use the right technique.

Prof Sharp studied three professional golfers from the 1968 Ryder Cup - Bernard Hunt, Geoffrey Hunt and Guy Wolstenholme - whose swing action was photographed on a high speed camera.

He focused on three points of rotation on the body - the shoulders relative to the spine, the arms relative to the shoulders and the wrists relative to the arms.

Previous studies have either suggested that maximum power should be used from the start of the backswing, or that a golfer builds up the power throughout the swing, using full force by the time they strike the ball.

This latest study, however, published in the Proceedings of the Royal Society, suggests increasing the power of rotation - known as the torque - to a maximum shortly after starting the swing and maintaining this force until hitting the ball.

Prof Sharp said: "Generating too much arm speed too soon causes an early release, with the club-head reaching its maximum speed before it arrives at the ball.

"The optimal strategy consists of hitting first with the shoulders while holding back with arms and wrists and after some delay, hitting through with the arms.

"At release, the timing of which depends on the combination of shoulder and arm actions employed, the wrists should hit through.

"In the expert swings studied, control of the arms and not the wrists appears to be the priority."

Knowing exactly how long that "delay" should last is the crucial factor.

Prof Sharp said under the model, being tall was not a huge advantage.

"Dimensional reasoning shows that dramatic differences in performance between large and small players should not be expected on the basis of size alone," he said.

"A 21 per cent bigger player can be expected to have just a 10 per cent advantage in club-head speed."