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A Back-Saving Golf Swing

By Arnold Mann

"The sky, the sky/ Hands up, hands up high/ Finish high, finish reverse C."

That's what golf pros were teaching back in the 1950s and '60s. The classic swing--big and full, finishing in a perfect "reverse C." Unfortunately, that same classic swing can put your average 50-year-old in the hospital. Top tour players like Jack Nicklaus, Lee Trevino, Tom Kite and Fuzzy Zoeller, to name a few, have at one time or another each been sidelined with career-threatening back injuries. Today even younger players like Fred Couples, Peter Jacobsen and Tiger Woods have closeted that backbreaking motion, along with their steel-shafted drivers, in favor of the gentle power of graphite and a more balanced, upright, back-friendly swing.

What makes the golf swing so hard on the back? University of Southern California orthopedic surgeon Robert G. Watkins says it's the repetitive extremes in rotation and compression that go with the sport. "Spine injuries lead the list of injuries on both the senior and regular PGA tours," says Watkins, spine consultant to the Professional Golfers' Association Tour and editor of *The Spine in Sports* (Mosby, 1996). "It's true for amateurs too."

The human spine simply wasn't designed to swing a golf club. A 1996 study showed both professional and amateur golfers generating "peak spinal compression loads" of 6,000 newtons (a measure of gravitational force). That's the equivalent of eight times an individual's standing body weight. These back-crunching levels are "close to the known failure loads associated with lumbar intervertebral joints," concludes Thomas P. Headman, a biomechanical engineer at the University of Southern California.

The same study clocked amateurs generating 85 Nm (newton meters) of torque, compared to 57 Nm generated by professionals with more energy-efficient swings. Normal joints in the spine fail, Watkins notes, at 88 Nm of torque, while degenerated joints, typical of avid or professional golfers, fail at 54 Nm.

The two principal trouble spots are the shock-absorbing disks between the vertebrae and the facet joints, at the back of each vertebrae, that act as brakes to rotation. Each disk is a round ligament, made up of an annulus, which is like a multilayered collagen basket that absorbs rotational stress, and a lighter-density liquid nucleus that absorbs compression. The layers of the annulus are woven for maximum absorption. But it doesn't take much to tear this basket. "You can tear the annulus with no more than 3% of sudden loaded rotation," Watkins says. "If the disk ruptures into the spinal canal, it can injure the sciatic nerves that run down to the legs." Couples once likened the resulting pain to "a hand grenade going off in my back." Facet joints are more prone to arthritic changes and to producing bone spurs that narrow the spinal canal.

So why doesn't the hand grenade go off every time you swing a golf club? Coordinated muscle function. That's what enables John Daly to hit 1,000 practice balls a week with a swing speed exceeding 130 m.p.h. "An uncoordinated swing is much more likely to hurt the spine," Watkins says. "Pros don't generate these peak torques on their spine like the amateur does, because of coordinated muscle function. They can still get in trouble, because they do it 10,000 times. But it's not because they don't have the coordinated muscle strength to protect their backs."

Watkins and other top specialists employ a program of "trunk stabilization" exercises for professional and amateur athletes. The idea is simple: put the spine in a safe, neutral position; then run it through a series of rotational exercises designed to increase overall range of motion and strengthen the supporting muscles of the spine. (A description of these trunk-stabilization exercises can be found at).

Then there's the swing itself. Today's back-friendly swing is more upright, with the hips and shoulders more level throughout the swing, to promote easier rotation. Even the idea of keeping your head down throughout the swing is on the way out, says top teaching pro Darrell Kestner. Superstars David Duval and Annika Sorenstam, he notes, have both taken to letting their head and eyes leave the ground at or even before impact, rather than lagging behind as the body comes out of its turn and releases toward the target. "That's the newest back-friendly swing change," says Kestner, "where the eyes and the head are releasing at impact. So there's very little strain on the neck and back."

Here's a back-friendly swing to get you through the next millennium.

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