

MADE OF STEEL

Before the summer season was in full swing, Atlanta Braves pitcher John Smoltz suffered debilitating, season-ending shoulder pain that required surgery. The 41-year-old player claimed he wasn't ready to retire, but, like all ballplayers, he knows this could be the end. He's not alone. Many greats have been struck down in their primes, leaving fans to wince and sending coaches scrambling to fill their shoes. The most notorious sports injury was the broken tibia and fibula quarterback Joe Theismann suffered during a live Monday Night Football game in 1985. Theismann never took another snap.

[BY LISSA POIROT]

But in this day of modern medicine, new advancements are keeping players in the game. Consider Pedro Martinez, pitcher for the New York Mets, who left the game for nine months after rotator cuff surgery: The outlook wasn't good, but the 36-year-old surprised the sporting world by returning better than ever, landing his 3,000th career strikeout in his first game back on the mound. Today, once career-ending injuries are a thing of the past. Whether players are men of steel or made of steel, the advancements only continue.

Ch-Ch-Changes
As a specialty and serious field of study, sports medicine didn't emerge until the 1950s. Prior to that, an

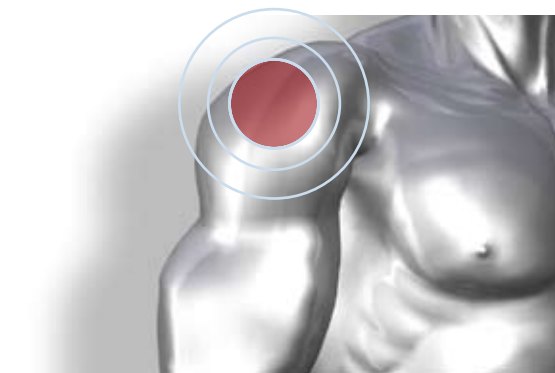
ace bandage and an ice pack was about as sophisticated as sports medicine got. But the last 30 years have changed everything. During the 1970s, the American Orthopedic Society of Sports Medicine was established, growing to some 12,000 members today and taking sports medicine to a whole new level.

The biggest change was the introduction of the arthroscope. Invented in Japan in the 1960s, the scope was thin, flexible and fiberoptic, allowing surgeons to make small incisions to carry out diagnostic and treatment procedures within a load-bearing joint, like a knee, where career-ending sports injuries most often occur.

"Arthroscopic surgery is less invasive and done more anatomically because we're doing things through a microscope and can see right where we're putting the parts and making sure we put things back right where they need to go," said Scott Gillogly, orthopedic surgeon with Atlanta Sports Medicine & Orthopedic Center, and head team physician and orthopedic surgeon for the Atlanta Falcons and Atlanta Thrashers. "It's very true in the shoulder, where in order to get to the shoulder you have to go in and move the deltoid, the pectorals and the biceps out of the way, then take off a muscle called the subscapularis. You take all these normal tissues off just to get where you're going and then do the repair and put those tissues back. Imagine now that you don't have to violate those muscles at all. That automat-



John Smoltz suffered a severe shoulder injury



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ically puts you ahead of the game. There is less pain, less inhibition to motion and just more functional rehabilitation."

As sports became big business, sports medicine, the care of muscles, bones and joints, became a bigger business, with physicians working to keep athletes in motion during their careers, and for the years that followed.

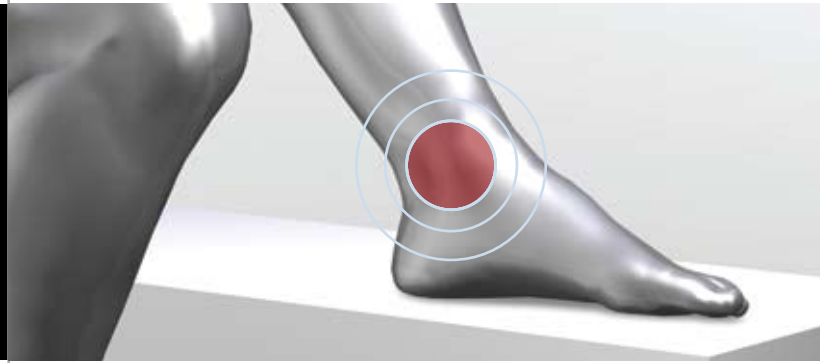
"Sports medicine now isn't just orthopedic, but everything we do is a team effort reaching into just about every bit of medicine you can think of," said James Andrews, orthopedic surgeon at Andrews Sports Medicine & Orthopedic Center in Birmingham, Ala. "Teams have sports doctors, athletic trainers, physical therapists, strengthening and conditioning specialists, medical specialists, nutritionists, psychologists and on and on and on. It's a team effort to take care of athletes at every level."

Physical rehabilitation became a big part of the medical process as well, helping to return function to players following surgery. What was once a slow, deliberate process, now falls into what is known as "Rapid

Rehab," where athletes are encouraged to strengthen muscles around ligaments and joints as quickly as they can. "A lot of times we'll say that rehabilitation is more important than the surgery itself," claimed Andrews.

Added Gillogly, "What you do need to do, once you get that initial settling down of the injury, is to re-strengthen all the muscles that control the joints. That's what allows you to return to function. It's what most often people should do and most often what is lacking, which is why injuries can become worse."

To assist with strength training following surgery, new modalities are in place, including ultrasound and electrical stimulation for pain control and to keep muscles active. There is also new equipment that manipulates the body for those times when movement is too painful or difficult. "We put tabs on the muscles to shock them and keep them from shrinking down, which also gets athletes used to the feeling and allows them to do it faster on their own. We're getting more aggressive in terms of therapy," said David Hill, orthopaedic surgeon at Resurgens Orthopaedics in Johns Creek and Cumming, Ga.



The Terrible Triad

Injuries are a part of the game: A sprain here, a broken bone there. But beyond a catastrophic injury of the spine, neck or head, nothing is as frightening to an athlete than the three most common — and hard to recuperate from — injuries: knee, ankle and shoulder. However, advances in sports medicine are returning players to the game, and regardless of whether athletes sit on the bench for a few weeks or the entire season, careers can continue, many times to pre-surgery performance levels.

Knees Any athlete can see the telltale vertical scar across a knee and know that the wearer suffered an ACL, or anterior cruciate ligament. The medial collateral ligament (MCL) and posterior cruciate (PCL), as well as cartilage may also be affected after what is typically a collision injury. Then again, Tiger Woods' time on the greens hasn't kept him from buckling over in pain due to an old ACL injury and torn meniscus. Unfortunately for most, this knee injury has put out the spark on many sporting careers, especially when suffered in high school or college, as, even when repaired with surgery, the weakened knee was easily injured again.

"If you look back 20 to 30 years, the chances of a guy having surgery and getting back and doing high-level performance was really quite low," said Gillogly. "Today, as high as 20 percent of kids in the NFL draft have had injuries to at least one ACL and yet they are still being considered for the draft. They have played through it and come back after full reconstruction and can return as much as 80 to 90 percent after an ACL when it used to be that was 20 to 30 percent 30 years ago."

Consider Jamal Lewis, who suffered a torn ACL and sprained MCL during his rookie year with the Baltimore Ravens: Following surgery, he was on the bench for the season, but not only did Lewis heal, he returned to break records and join Eric Dickerson, Terrell Davis, Barry Sanders and O.J. Simpson as the only running backs in NFL history to rush for more than 2,000 yards in a single season.



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The reason? Less invasive surgical procedures and more aggressive rehabilitation methods. "Initially, the reaction was that after having this major surgery you had to be careful to avoid hurting it again, and yet we found the more we accelerated the rehabilitation and let the patients do the things their bodies normally did — range of motion, strengthening exercises, fitness, early functional activities — the faster they got better," said Gillogly.

Ankles Nearly every athlete has experienced an ankle sprain — one pivot, one missed footing, one wrong step, and the ankle twists, pain ensues and ice relieves the pressure. But a high ankle sprain is different. While a typical sprain tears the ligament from the small bone on the outside of the ankle to the talus bone, walking may be stiff but still possible. High ankle sprains are tears of the ligaments between the fibula and the tibia and the ligaments holding those bones together called the syndesmosis, often occurring in basketball and soccer, where athletes are constantly pivoting. In this case, the foot and the ankle are no longer stable. If not repaired properly, or given enough time to heal, ankle problems will continue and sprains will be more commonplace.



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"When disrupted, the bones separate and it tends to be a chronic, nagging problem. It could take from 6 weeks to 6 months to come back from this, so we're trying to be more aggressive in fixing it and putting the bones back together," said Gillogly.

The original treatment for this type of injury 20 to 30 years ago was to simply cast the leg and allow the ligament to heal itself. However, by restricting movement, muscles and ligaments would become stiff, making it more difficult for a player to return to the game. Today, surgeons are trying new variations of casting, including inserting screws across the two bones to hold them together, while allowing the injury to heal more reliably.

One quick recovery occurred in 2004 when Terrell Owens, a wide receiver then playing for the Philadelphia Eagles, suffered a high-ankle sprain in December. En route to the Superbowl, Owens refused to sit on the sidelines, elected for the new procedures, and was back on the field for the big game, where he saw nine receptions and 122 yards. Four seasons later, he continues to play well as a receiver for the Dallas Cowboys.

Added Gillogly, "This treatment allows the athletes to condition on it again and return to play much more quickly, like in a matter of one to two weeks. We've

found it's actually healthier for the player. Because the fixation is so strong and they can play on it while they are rehabilitating, they can return to a high-level of function, oftentimes normal function."

Shoulders Smoltz's recent surgery is not his first, and many athletes needing to throw overhead, pitchers in particular, often experience overuse injuries to the shoulder that lead to early retirement. "If you throw a ball 90 miles per hour the fastest it's going is the millisecond it leaves the hand. That means your arm is going 90 mph when it's letting go. Muscles, the rotator cuff in particular, violently contract to keep the arm from going to home plate with the ball. When the rotator cuff gets overused, it can't control these forces and something gets hurt, then the muscles become a little weaker, which leads to increased stress on some other structure and everything begins an initial downward spiral," said Gillogly.

Again, thank arthroscopic, said Hill, who specializes in shoulder repair. "Our technology in the past 10 years has come around a lot. We used to have to do the surgery through a pretty big incision and now we're doing it through the camera. We used to have to make a big trough in the bone in order to sew down the rota-



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tor cuff, now we're using anchors that we put into the bone. In the past few years we've even gone from metal anchors to bio-absorbable anchors the body is able to absorb so if you have to come back later you don't have any metal in there to cause problems. We used to sew down in a very simple fashion and hope it heals, now we've got a technique called a double row that has a media row of anchors and reinforce that with a lateral row of anchors and that increases the surface area for the tendon to heal. Even now a bad rotator cuff injury in a pitcher is career stalling but we're just now turning corners so that is not career ending," he said.

Martinez is one example Hill uses to describe how well the procedure can go, although Gillogly admits rotator cuff injuries remain the toughest to repair, with rehabilitation following surgery taking 9 months to a year. Doctors find that it's not the operation that is tricky, but the restoration of balance between all the parts of the body required to throw a fast pitch.

"The reason the guy was a good pitcher in the first place was because his shoulder was loose, so if you tighten it, how much do you tighten it, 5 percent or 35 percent? If it's too tight or it scars afterwards, it alters the mechanics and it's very hard to get back to high-level performance. So even though the results have improved because of rehabilitation and because of arthroscopic techniques, it's still not perfect in baseball," admitted Gillogly.



The Future of Medicine

While returning athletes to peak form is the goal in sports medicine, concern remains for pushing players too hard and turning to unethical treatments. When Curt Schilling suffered a tendon injury to his ankle during the 2004 World Series, it's understandable that he would want to find a way to play, no matter the cost.

"To get him out there, doctors numbed his ankle and basically tied his tendons together through basic surgery and after every game they'd take the sutures out. He'd pay the price in pain until he could get through the World Series," said Hill, who worries too many kids will witness these feats and strive to be like their heroes.

"Big-time sports is basically big business and money is what makes things happen. These players are very often treated to get them back out there in some shape or form and they aren't treated with anything in mind except to get them back out there. To a larger degree, a lot of professional athletes do pay the price for that later, but the compensation they receive is so high that they decide it's worth it. Kids in school are pushing themselves and subjecting themselves to these injuries in hopes of getting to the pros, and many of them never will," he said.

Andrews worries about the younger kids, especially in baseball, which is why he is an advocate for low-count pitches and the banning of curve ball pitches, and studies performance in his practice's throwing lab. "There has been such an escalation of injuries in youth baseball — a 5-fold increase in shoulder and elbow injuries since the year 2000," he said. "If a young kid playing youth baseball pitches while he's fatigued, there's a 36-percent increase in receiving an injury to his shoulder or elbow. We need to protect the interest of the athletes and make sure they are healthy."

Prevention is being advocated in sports medicine, with doctors pushing for better sports protection. From Big League changes, including banning plays like those that damaged Owen's ankle, to Little League rules like pitch counts, it is the industry's hope that surgeries won't be as necessary as they are.

Still, the future of sports medicine continues to

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shine with physicians anticipating breakthroughs to come from robotic surgery, less complex and diagnostic procedures, and new technology and treatments. Some newer treatments like anti-inflammatory injections and human-growth hormone treatments to help the body heal itself more quickly are currently in use, although, according to Hill, they a precursor to steroids and “a gray area.” On the horizon, gene therapy, tissue engineering and stem cell research may create stronger ligaments or more elastic tissues. Even donated ligaments and tissues from cadavers are finding its way into sports medicine.

“There is an ‘ick’ factor, but the huge advantage is

being able to not sacrifice something in your knee or body, which is especially important for athletes who run backwards like basketball players and cornerbacks. If you remove tissue from their hamstrings, where we most often borrow tissue to repair an ACL, we worry they’ll lose speed running backwards.”

With education and research remaining the core ingredient in sports medicine, athletes can expect to be playing longer than ever. The future of sports medicine is really exciting, exclaimed Andrews, and anyone with an interest in sports should remain on the edge of their seats. **SU**