



Pro Football Athletic Trainer

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Management of a Cerebral and Spinal Cord Concussion in a Professional Football Player

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Athletic injuries usually do not result in catastrophic and irreversible damage. However, the potential for such an injury, especially when it involves the head or neck, is a major concern for those who care for athletes participating in collision sports. A brain or spinal cord injury can cause permanent paralysis and athletic trainers must be prepared to recognize, evaluate and manage an athlete with this type of injury. The purpose of this article is to present a case study in which a professional football player suffered both a spinal cord and cerebral concussion during competitive play.

Epidemiology

Head and neck injuries tend to be associated with organized sports, specifically football, wrestling or gymnastics. But in reality, these types of injuries are more common in recreational activities such as swimming, diving or playing on a trampoline.¹ Studies show that 10 percent of all sports-related spinal injuries occurred from diving accidents, while only three percent resulted from participating in organized sports.¹

Head and neck injuries associated with football have decreased dramatically at all levels since 1975, even though the number of participants continues to increase.² Although the incidence is decreasing, several recent high-profile cases in the NFL have shown that these types of injuries can still occur.

Cerebral vs. Spinal Cord

Cerebral concussions occur more frequently than spinal cord concussions and may be

more familiar to most athletic trainers.

- **Cerebral concussion:** This is an electrochemical phenomenon triggered by a traumatic or violent blow to the head. Although there is generally no structural damage to the brain, a cerebral concussion results from the disruption in the chemical and electrical activity in the brain. Specifically caused by the release of potassium and other ions into nerve synapses, this interruption is commonly referred to as being “knocked out,” and can result in loss of consciousness, confusion or disorientation.
- **Spinal cord concussion:** Although extremely rare, this is analogous to a cerebral concussion in that a violent impact to the spinal column causes function of the spinal cord to shut down due to the electrochemical imbalances. However, instead of losing consciousness, there is a transient loss of all spinal cord functions with no structural damage to the cord itself.³

Case Study

The injury occurred on November 17, 2002, in the third quarter of an away game against the Tennessee Titans. Pittsburgh Steelers Quarterback Tommy Maddox was running to his left when he was tackled by an opposing player. As he was falling, he received a severe blow to his left shoulder and cervical spine area by a second defensive player. It is believed that this blow caused immediate unconsciousness and loss of sensory and motor function in all four of his extremities.

The collision also caused the quarterback's head to slightly flex forward and rotate



Tommy Maddox is knocked unconscious.

to the right. This resulted in the anterior aspect of his head and helmet being driven into the playing surface.

On-Field Management

As we approached Maddox, he was motionless and lying face down, so we:

1. Immediately focused on stabilizing his head and neck with manual fixation as a cervical spine fracture or spinal cord injury should always be suspected in an unconscious athlete.
2. Performed a primary survey to assess his level of consciousness, checking his airway, respiratory and circulatory systems. He was unconscious and unresponsive, but we could tell that he was breathing as his thorax was rising and falling.
3. Executed a log-roll maneuver to place him in a supine position, allowing for a more thorough assessment of his condition. We continued to stabilize his head and neck with manual in-line stabilization and slight traction. His helmet was left on with the

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News and Notes

New Faces

Brian Magat joins the Cleveland Browns as an assistant athletic trainer. Brian earned his undergraduate degree from the University of Illinois at Chicago and his graduate degree from the University of Nevada-Las Vegas. He worked for the Browns as a training camp intern in 2001 and a season long intern in 2002.



Brian Magat

Jeff Otte becomes the newest member of the Minnesota Vikings medical staff. He joins the organization as an assistant athletic trainer after working as an intern with the team during the 2001 and 2002 seasons. He received his graduate degree from Indiana State University and did his undergraduate work at Gustavus Adolphus College in Minnesota.



Jeff Otte

Reggie Scott was named as an assistant athletic trainer with the Carolina Panthers. Reggie, who graduated from the University of West Virginia, spent 2002 as a year long intern with the Tampa Bay Buccaneers.



Reggie Scott

Award Winners

The following awards were handed out at the 2003 NFL Combine:

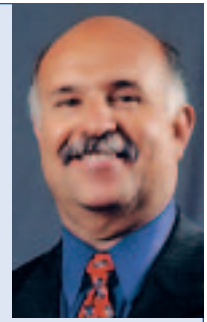
- **The Cain Fain Memorial Award** was presented to Ronnie Barnes, New York Giants' head athletic trainer and former PFATS president. This award is sponsored by the NFL Team Physicians Society and presented to the PFATS member who best reflects the virtues of a certified athletic trainer and the highest level of professionalism.
- **The Jerry Rhea "Hawk" Award** was given to Art Rettig, team physician for the Indianapolis Colts. It is sponsored by PFATS and presented to the NFL team doctor who has made the greatest contributions to both the NFL and the profession of athletic training.

Message From the President

The goal of our organization has always been to provide the best health care for our athletes and the entire NFL community at large. We are also dedicated to finding new ways to meet our members' needs, as evidenced by our recent strategic planning session in Chicago. We evaluated the status of our organization and discussed ways to make our membership even stronger than it is already.

We also worked with our partners at The Gatorade Company to brainstorm ideas for joint projects. I am very pleased to announce that we are creating a

PFATS web site. The first version of *www.PFATS.com* will launch near the beginning of the NFL season in September. While we're still working out the specific content, rest assured it will reflect well on our profession and provide us with efficient and effective ways to stay connected and updated on the issues and practices that impact us. I am very excited about this new endeavor and hope you'll share in my excitement once the site is operational.



Steve Antonopoulos

PFATS Members Meet to Chart Association's Future

Eight PFATS members gathered this past March in Chicago for a two-day meeting to review and revise the organization's mission and long term strategic plan. Current PFATS President Steve Antonopoulos (Denver Broncos) and Immediate Past President Ronnie Barnes (New York Giants) oversaw the meeting, during which the group conducted various exercises to examine the issues, changing dynamics and increasing demands PFATS members face in the NFL today.

"I think it's essential and extremely valuable to take time away from the training room to really examine the state of our association," said Antonopoulos. Knowing where we are will help us articulate where we think we can, and should, go next."

In addition to Antonopoulos and Barnes, other PFATS members in attendance included Brad Brown (Tennessee Titans), James Collins (San Diego Chargers), Troy Maurer (Miami Dolphins), Sam Ramsden (Seattle Seahawks), Bill Tessenorf (Baltimore Ravens) and Ryan Vermillion (Carolina Panthers).



Left to Right: New York Giants' Head Athletic Trainer Ronnie Barnes, PFATS President Steve Antonopoulos and Indianapolis Colts' Team Physician Art Rettig

NFL Athletic Training Staff of the Year

Head Athletic Trainer Jim Maurer and Assistant Athletic Trainers Britt Brown and Greg Gaither of the Dallas Cowboys have been named the 2002 NFL Athletic Training Staff of the Year. They became the 18th staff to be recognized by their peers in receiving this prestigious award.



2002 NFL Athletic Training Staff of the Year
Left to right: Greg Gaither, Jim Maurer and Britt Brown of the Dallas Cowboys

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chinstrap fastened for additional stabilization. Although he was still unconscious, his respirations and pulse were normal. He regained consciousness after several minutes.

4. Had the team physician then perform a secondary survey, assessing his level of consciousness, cranial nerve, motor and sensory functions, and learning as much information about the injury as possible. From the neurological exam, he determined the athlete had motor and sensory loss in all four extremities and the potential for a cervical spine fracture.
5. Placed Maddox on a spine board using a half log-roll maneuver. Once secured to the board, he was lifted onto a stretcher via a six-person lift and positioned feet first into the ambulance to prevent axial loading from deceleration and braking during transport to the hospital. Even though the athlete's respiratory status was normal, we followed our standard operating procedures and removed his face mask with a power screwdriver prior to transport to the hospital.

Diagnostic Testing

Upon arriving at Baptist Hospital in Nashville, clinicians immediately performed:

- An MRI of the brain and spinal cord
- A CT scan of the cervical spine
- X-rays of the cervical spine

Cervical Spine MRI

Three primary reasons for the cervical spine MRI are to:

- Rule out a fracture or dislocation and determine the existence of herniated discs.
- Identify any bruising, contusions, hemorrhaging or swelling to or in the spinal cord.
- Determine the existence of spinal stenosis, as there are significant implications regarding further participation in collision sports if the spinal canal is narrowed, even if there is complete return of function.

The cervical spine MRI study showed no evidence of fractures, dislocations, herniated discs, hemorrhaging, spinal stenosis or any intrinsic abnormalities within the spinal cord.

Cerebral MRI

Doctors ordered an MRI to identify any brain injury. As no abnormalities to the brain or spinal cord could be identified, they determined the athlete's loss of function in all four

extremities following the injury was due to an electrochemical abnormality and not a structural disruption of the cord.

CT Scan and X-Rays

Doctors ordered a CT scan to identify any cervical spine abnormalities that may not have been apparent on the MRI. They also reviewed plain X-Rays. Results from both tests showed no sign of fracture or dislocation.

Diagnosis

As a result of the on-field and clinical testing, Maddox was diagnosed as having suffered both a cerebral and spinal cord concussion. Diagnosis of a cerebral concussion was based on:

- Loss of consciousness for at least two minutes.
- Concurrent retrograde amnesia for approximately 30 minutes.

The spinal cord concussion was identified by:

- The athlete's inability to feel and move his arms and legs for approximately 30 minutes following the injury.
- The fact that the MRIs, CT scans and X-Rays revealed no anatomical, physiological or structural damage to the spinal cord or spinal column.

Follow-Up Care

Maddox was transferred back to Pittsburgh the next day where the Steelers' Team Neurosurgeon Joseph Maroon performed a complete physical and neurological exam and administered the Immediate Post Concussion Assessment and Cognitive Test (ImPACT).⁴ ImPACT is a computer-based testing method used to establish normative values for an athlete's subjective complaints and cognitive functions including reaction time, memory, orientation and processing speed of the brain.

Maddox first took a baseline exam in August 2001. These results were then compared to the findings from his retest the day after the injury. The post-injury test noted mild declines in memory and reaction time but indicated his acute neurocognitive recovery was excellent.

He was re-evaluated two days later and results showed continued improvement with memory and reaction time. Overall, his brain function had returned to a normal state within 48 hours of a significant blow to the head and neck.

Rehab and Return to Play

Our first goal was to make sure Maddox had a full understanding of his injury and the possible risks associated with participating in football. With the help of diagnostic studies and our team neurosurgeon, he was given the information needed to make a decision about returning to professional football. Once he decided to stay in the sport, it became our responsibility to make sure he was mentally and physically ready.

Since his MRI, CT scans and ImPACT test results were normal, we addressed his subjective complaints by emphasizing a gradual progression to full activity based on complete symptomatic relief. To help him recover mentally and physically from the initial trauma and intensive care treatment, we instructed him to rest and perform simple activities of daily living until he felt asymptomatic.

Once asymptomatic at rest, he began a functional progression of exercise consisting of light nonsport-specific aerobic activities (e.g., riding a stationary bike) and a few sport-specific activities (e.g., throwing a football).

We monitored his symptoms using a visual analog scale and additional ImPACT testing. He also increased his mental functioning by participating in off-field activities such as watching film, team meetings and interacting with players and coaches.

The emphasis of his rehabilitation program then moved to position-specific drills. Restrictions on team activities were removed as soon as he felt comfortable. By carefully increasing the time, type (non-contact vs. limited contact vs. full contact) and intensity of sports-related activities, Maddox was able to return to practice. He returned to full competition once he was asymptomatic at rest, with exertion and with contact.

Neurocognitive function and Maddox's report of symptoms were closely monitored during the entire rehabilitation process.

Conclusion

Cervical spine injuries can be devastating for the athlete, the athlete's family and those who care for him. When a neurological injury occurs, it is the responsibility of the sports medicine team to rapidly assess the scene, immobilize the head and neck and prepare the athlete for transport to a trauma center where

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Fueling More than Race Cars

Jeff Zachwieja, PhD

Matt Kenseth, who has won the most races of any NASCAR driver this year, knows something about dehydration and the importance of fueling himself to stay safe while making hundreds of laps around the racetrack. For Kenseth, and the other NASCAR drivers, a day of competition means racing at about 185 miles an hour for up to three hours at a time — and in a car that can heat up to 130°F. Add to that the impact of wearing a full-body fire retardant suit and helmet, and Kenseth easily qualifies for athlete status. Not unlike football players in full uniform during two-a-day workouts, he and the other drivers really need to beat the heat during extreme hot and sweaty circumstances.

Sweating It Out During a Race

Knowing the challenges NASCAR drivers face in managing heat-related issues of safety and performance, scientists from the Gatorade Sports Science Institute (GSSI) set out to help address the problem in 2001. The first step was to collect data on drivers' sweat rates and fluid intake during a NASCAR Winston Cup series race. To our knowledge, this was the first time anyone had studied the hydration needs of the most skilled drivers in stock car racing.

What did we learn?

- Drivers were well hydrated before the race
- Drivers lost one to two quarts of sweat per hour of racing
- Fluid intake did not match sweat loss
- Drivers were almost two percent dehydrated by the end of the race

Most remarkable were the limited opportunities to drink and the manner in which drinking was accomplished. During pit stops (lasting only 13 to 15 seconds), crews passed drink bottles to the drivers. The bottles contained mostly ice and drivers had to maneuver the



The Gatorade In-Car Drinking System

attached straw under their helmets or through their face shields to drink. It was a cumbersome process for such a high-tech sport.

GSSI Helps Drivers Drink

Not surprisingly, the combination of high in-car temperatures and poor accessibility to drinkable fluid led to the observed dehydration. As is the case with other athletes, a dehydrated driver will heat up more quickly, and this can impair both physical and mental performance. Most important for NASCAR drivers, dehydration will:

- Slow reaction time
- Reduce hand-eye coordination
- Impair cognitive functioning

Through research and discussions with drivers, crew chiefs and their teams, we began to understand just how challenging it is to get drivers the fluid they need during a race. We also realized doing so was paramount for the health and safety of the drivers. With this in mind, GSSI scientists and engineers at the Quaker Oats Company Research and Development Center committed to creating an in-car hydration system for NASCAR drivers.

Together, we established that this unique delivery system should:

- Keep fluid cold throughout a race

- Be light weight, the majority which is from the fluid itself
- Deliver fluid easily
- Be hands-free
- Hold enough fluid to last an entire race

Gatorade In-Car Drinking System

After several months of prototype development, driver feedback, fabrication and even crash testing, the Gatorade In-Car Drinking System (G.I.D.S.) was born. The system, which once sealed can be mounted just about anywhere in the car, consists of:

- An insulated, protective pouch made of Kevlar material that resists conductive and radiant heat.
- A flexible reservoir holding up to 100 ounces of fluid that is inserted into the Kevlar pouch along with freezer gel packs to maintain a consistently cold (45°F) fluid temperature.

The fluid reservoir is connected to a battery-operated pump. When a switch activates the pump, it circulates cold fluid through an insulated delivery tube. This tube connects to a small mouthpiece on the inside of the driver's helmet. To drink, the driver simply bites down on the mouthpiece without having to take his or her hands off the steering wheel or gearshift.

Use and Reaction

Two drivers used a G.I.D.S. prototype during the final six races of the 2002 season. Six drivers then used G.I.D.S. during this year's Daytona 500. Because reaction to the system has been so positive by drivers and pit crew members, it's expected that many more drivers will use it during summer races when temperatures and humidity soar.

"Since we first started testing the system with Matt last year, we noticed that he is drinking more fluid during a race," said Todd Millard, crew specialist for Matt Kenseth's No. 17 Roush Racing Team. "G.I.D.S. also helps make Matt's pit stops more productive. Instead of having to hand Matt a sports bottle, we are able to utilize our time in other ways to help him win."

At GSSI, we believe that G.I.D.S. will set the standard by which NASCAR drivers achieve optimal hydration for their sport.

Jeff Zachwieja is a senior scientist at the Gatorade Sports Science Institute.

2003 GSSI Conference: Hot Topics in Sports Nutrition

The 17th annual GSSI conference is scheduled for July 24-25, 2003, at the Downtown Marriott Hotel in Chicago. Whether you're a certified athletic trainer or a student who's interested in sports nutrition, the conference promises to deliver. Researchers and practitioners from around the world will explore the effects of creatine, protein, amino acids, supplements, antioxidants and caffeine on the athlete's system. They'll also address how to curb muscle cramps, improve immune function and enhance recovery. We invite you to be a part of it.

For more information and to register for the conference, go to www.gssiweb.com.

Inter-Association Task Force on Exertional Heat Illnesses Consensus Statement

Douglas Casa, PhD, ATC, FACSM

In February 2003, more than 20 medical experts from 18 professional associations[†] came together in Atlanta to form an inter-association task force on the prevention, recognition and treatment of exertional heat illnesses (EHI). The group's mission was to develop guidelines to increase safety and performance for people engaged in physical activity. Following are excerpts from that statement.

Preventing EHI

Every athletic organization should have a plan for addressing exertional heat illnesses and the key factors to identify the early stages of an exertional heat illness. These include:

- Intrinsic factors such as inadequate heat acclimatization, lower levels of fitness status, dehydration, etc.*
- Extrinsic factors such as prolonged exercise with few breaks, exposure to high temperatures, limited access to fluids, etc.*

It's possible to reduce the risk of exertional heat illnesses through an implemented heat illness education program and by providing appropriate onsite medical staff. This staff should perform preparticipation physical examinations that address fluid intake, weight fluctuations, medication and supplement use and history of cramping or heat illness on all athletes.

Dehydration

When athletes do not replenish fluids, they become dehydrated. Mild dehydration (less than two percent body weight loss) is often unavoidable because athletes cannot always balance fluid intake with fluid losses. Even mild dehydration can hinder performance and thermoregulatory function.

Symptoms may include dry mouth, thirst, irritability, apathy, decreased performance, etc.*

Prevention • Maintaining normal hydration (as indicated by baseline body weight) is the key to avoiding heat illnesses. Athletes should not be allowed to practice if their total body weight loss is greater than two percent of their baseline. They should:

- Begin each exercise session properly hydrated
- Have convenient access to fluids during practice and in addition to prescribed breaks

Treatment • The athlete should first be moved to a cool environment and rehydrated with a sports drink containing carbohydrates and electrolytes (e.g., sodium and potassium). Flavoring may also enhance voluntary rehy-

dration. Replacing lost sodium after exercise is best achieved by consuming food in combination with a rehydration beverage.

Return to Play • Continued participation is acceptable if dehydration is minor and the athlete is symptom free. Periodic checks from on-site medical personnel are recommended.

Heat Exhaustion

Heat exhaustion results from strenuous physical exercise and environmental heat stress. It can be recognized in an athlete who has difficulty continuing intense exercise in heat, mild hyperthermia (usually <104°F/40°C) and a lack of severe CNS dysfunction.

Other possible symptoms include dizziness, dehydration, profuse sweating, headache, cramps, etc.*

Treatment • It's best to remove athletes from activity to a shaded or air-conditioned area and remove excess clothing and equipment. Then:

- Cool athletes until rectal temperature is approximately 101°F (38.3°C) and lay them comfortably with legs propped above heart level
- If not nauseated, vomiting or experiencing any central nervous system (CNS) dysfunction, rehydrate athletes orally. If athletes can't take oral fluids, implement intravenous normal saline
- Monitor heart rate, blood pressure, respiratory rate, core temperature and CNS status
- Transport to an emergency facility if rapid improvement is not noted

Return to Play • Athletes should be symptom free, fully hydrated and cleared by a physician before returning to play.

Exertional Heat Stroke (EHS)

Exertional heat stroke is a severe illness characterized by CNS abnormalities and potential tissue damage resulting from elevated body temperatures.

Recognition • The ability to rapidly and accurately assess core body temperature via rectal thermometer and CNS functioning is critical for evaluating EHS. Most critical are:

- CNS dysfunction (altered consciousness, coma, convulsions, disorientation, irrational behavior, decreased mental acuity, irritability).*
- Hyperthermic (rectal temperature usually >104°F/40°C) immediately post-incident

Other symptoms may include nausea, dizziness, hot and wet or dry skin, increased heart or respiratory rate, etc.*

Treatment • Aggressive and immediate whole-body cooling via cold water immersion is the key to optimizing treatment of EHS and should be initiated within minutes post-incident.

- Immediately immerse athlete in tub of cold water (approximately 35°-58°F/1.67°-14.5°C), onsite if possible. Remove clothing/equipment.
- If immersion is not possible, transport immediately. Alternative cooling strategies should be implemented while waiting for and during transport. These strategies could include spraying the body with cold water, fans, ice bags or ice over as much of the body as possible and/or cold towels (replace towels frequently).
- Monitor airway, breathing, circulation, core temperature and CNS status
- Place an intravenous line using normal saline (if medical staff is available)
- Cease aggressive cooling when core temperature reaches ~101°-102°F (38.3°-38.9°C)
- Transport athlete to medical facility

Return to Play • Physician clearance is necessary before returning to exercise.

*For more information on exertional hyponatremia, heat cramps, exertional heat illness or to read the entire consensus statement, see the June edition of the NATA News or visit www.nata.org.

Douglas Casa is the director of the athletic training education program at the University of Connecticut.

†The Inter-Association Task Force on Exertional Heat Illnesses

American Academy of Pediatrics
American College of Emergency Physicians
American College of Sports Medicine
American Dietetic Association
American Medical Society for Sports Medicine
American Orthopaedic Society for Sports Medicine
American Osteopathic Association of Sports Medicine
American Physiological Society
CDC – Nutrition and Physical Activity
Department of Defense Health Affairs
Gatorade Sports Science Institute
National Association of EMS Physicians
North American Society for Pediatric Exercise Medicine
National Association of Sport and Physical Education/AAHPERD
National Athletic Trainers' Association
National SAFE KIDS Campaign
National Strength and Conditioning Association
U.S. Army Center for Health Promotion and Preventative Medicine

Tips and Techniques From the NFL Sidelines

Geoffrey Kaplan, ATC, Assistant Athletic Trainer, Tennessee Titans

Dave Kendall, ATC, Head Athletic Trainer, Kansas City Chiefs

Jim Maurer, ATC, Head Athletic Trainer, Dallas Cowboys

Jeff Tanaka, ATC, Assistant Athletic Trainer, San Francisco 49ers

Todd Toriscelli, MEd, ATC, Head Athletic Trainer, Tampa Bay Buccaneers

Miles Rush, MS, ATC, CSCS, discussion moderator
Additional editorial assistance for this article was provided by Magie Lacabra, Med, ATC, Skeeter Schuessler, Todd Sperber, MA, ATC and Jason Wulf, ATC, CSCS.

The job of an athletic trainer in the NFL may seem exciting and glamorous, but at its most basic, it is still about taking care of the health and safety of athletes. We sat down with five athletic trainers with more than 60 years of collective NFL experience to learn a little about their jobs and some of the wisdom they've acquired from their careers on the sidelines.

Miles Rush: *What's the most important item you carry in your fanny pack and why?*

Jeff Tanaka: I was going to say I carry a Sharpie pen, but even though we had nothing to do with it, I've already taken enough heat about that!



Left: Jeff Tanaka, San Francisco 49ers' assistant athletic trainer

(All): Laughter

Tanaka: The most important things I carry are personal protective items, such as gloves and a CPR barrier. I also carry a digital tapeless recorder to take notes if anything happens on the field.

Geoffrey Kaplan: In no specific order of importance, I carry a CPR barrier mask, a face mask extractor, a single-dose epinephrine pen and a cell phone. All are important, as you can potentially have a catastrophic event without any one of them.

Dave Kendall: I'm impressed because even after all my years in the league, I carry those same four things, Geoff. I also carry a mirror in case there's a problem with contact lenses. Nasal plugs as well.

Jim Maurer: I actually don't wear a fanny pack at practices, since there are athletic training kits set up at each of our water pumpers and all the equipment I need is near by. However, I do tend to carry tongue forceps, an oral screw, half-inch tape gauze and Band-Aids for that quick repair.

Todd Toriscelli: The one thing I do a little differently is carry a Palm Pilot. There's always something that comes up, maybe the coach and I have a conversation about an event or an injury occurs that I want to document, and I can write it in my Palm Pilot for future reference. It also contains everybody's phone number.

Rush: *Interesting. Can you identify your three favorite pieces of rehabilitation equipment?*

Toriscelli: I frequently use a piece of equipment called the Shuttle, which is basically a horizontal leg press device with bands that can be used for added resistance. I like it because it's very specific based on what angle you want your athlete to work at. You can really isolate parts of the range of motion that are pain-free, which is a big confidence builder.

Tanaka: A couple of our favorite pieces are physio balls and medicine balls. Physio balls are extremely versatile, you can use them to train both the core and the extremities, and medicine balls are great for changing resistance and the athlete's center of gravity.

Kaplan: I agree, Jeff. In fact, I use something called a Bosu, which is basically a physio ball cut in half and mounted on a platform. It's about half the size of a 55 cm physio ball, and I love it because it's low-tech and cheap. You can use it either right-side up or right-side down and it helps build both upper and lower body balance and proprioception. Another piece of equipment I use is my hands. There's huge value in being able to put our hands on our athletes and do different exercises, whether it be stabilization exercises or strengthening exercises. This is something we can't get away from and I think we all enjoy doing.

Maurer: Yes, our hands are indeed critical pieces of equipment. And to that extent, so are our heads in thinking of new exercises for our athletes. Another thing we find very effective is a biofeedback unit, especially with lower body injuries in the first phases of rehab.

Kendall: My three favorites are hands, sports cord and surgical tubing. We are also fortunate to have an aquatic unit, which allows us do a myriad of exercises whether it be nonweight bearing, partial-weight bearing, upper extremity or lower extremity.

Rush: *Moving away from the topic of rehabilitation, what is the strangest injury you've seen while working in the NFL?*



Todd Toriscelli, Tampa Bay Buccaneers' head athletic trainer

Kaplan: I've seen a few. The first was a stroke suffered a few years ago by a rookie offensive lineman. He complained of tingling and numbness on one side of his face and down through his arm during practice, so we held him out of activity to see if it would resolve. It didn't, so we had him evaluated immediately by our team internist and they diagnosed him as having a cerebral vascular accident or stroke. Very unusual for a 22-year-old male.

Rush: *Any idea what caused it?*

Kaplan: Not really. He was African American, had borderline hypertension, high cholesterol and his family history wasn't good. While those are all big risk factors for an older person, he was still very young for having a stroke.

Rush: *So what ended up happening?*

Kaplan: He was put on injured reserve and unfortunately his football career ended. I don't think there was a doctor willing to clear him and no one was willing to take the risk.

Rush: *What was the second injury?*

Kaplan: The second was an axillary vein thrombosis that happened to one of our defensive backs. He came in after practice and one arm was three times bigger than his other arm. Veins just popping up and sticking out, it was really incredible. He went into the hospital and the doctors removed his first rib and anticoagulated him, and he was back on the field six

weeks later. We really aren't sure what caused it, but it was strange to see.

Kendall: One that sticks out for me happened to one of my players while he was rehabbing an ACL reconstruction. This was early in my career, back when this procedure was done with an open incision. During one of our rehab sessions, he started complaining of chest pain. We had our doctors look at him and they diagnosed him with a life-threatening blood clot caused by the surgery. It really caught me off-guard as I had never been exposed to something like that — and it taught me not to take subtle things for granted.

Tanaka: That's very true, Dave. When I was in college and working with a men's basketball team, we had a player get some dental work done and it ended up getting infected while we were on the road. We sent him to the doctor as soon as we could but the infection went systemic. He ended up spiking a fever and being rushed to the hospital. The whole side of his face and neck was swollen and they ended up having to extract the tooth. I hadn't really thought that something that starts out relatively benign, like dental work, could become so serious.

Maurer: We had a wide receiver who took a helmet right to the middle of his gut a few years ago. You knew it was a bad hit, he lost his breath and was on the ground for awhile and even though he never lost consciousness, he was definitely hit hard. After a few minutes, we got him to the sideline, and he said that he was starting to feel better, although he still felt a little sick. Well, about five minutes later he said that he was



Jim Maurer, Dallas Cowboys' head athletic trainer

feeling really bad and he could hardly walk. So, naturally we got him in the ambulance and to the hospital and they started working on him to see what was wrong.

Rush: *What did they come up with?*

Maurer: They performed a variety of tests, but the results all came back negative. He wasn't getting any better, so they decided that they would have to perform surgery to find out what happened. During the surgery, they discovered that the force of the blow had pushed his intestines against his spine, completely severing his jejunum. Our internal medicine physician said he had never seen anything like it before.

Rush: *How did the injury resolve?*

Maurer: He was in the hospital for about two months but he had a full recovery. After he came back to us, we put him through an extensive rehabilitation program and he was actually able to play a little that next year.

Toriscelli: A similar injury happened to one of my players when I was a head athletic trainer in college. The athlete was struck in the abdomen on kickoff but didn't even get the wind knocked out of him. He came off the field on his own and sat on the bench. Even though he said he was fine, I knew he was hurt. He seemed to be coming around but within five minutes his condition started going downhill. He had tremendous groin pain, looked pale and his pulse was very rapid. So we sent him by ambulance to the hospital and it turned out his spleen had been ruptured. Interesting that his groin pain was probably caused by the blood running down into his lower abdomen.

Rush: *Over the past few years, the topics of heat illness and hydration have become widely discussed within the athletic environment. How do you make sure your athletes stay properly hydrated during practices and games?*

Kendall: We do as much as we can to educate our players as soon as possible on the subject. Ten-year veterans and rookies, alike, we don't wait until training camp to preach to these guys about hydration and heat illness. We start talking hydration as soon as they sign with our team.

Toriscelli: I agree that education is critical. We've had scientists from the Gatorade Sports Science Institute (GSSI) come in and present to our team on hydration and nutrition. The GSSI scientists even came to our facility to study some of our athletes who had a history of cramping and other dehydration-related problems. I learned a great deal from the scientists



Center: Geoffrey Kaplan, Tennessee Titans' assistant athletic trainer

about the hydration patterns and sweat rates of some of our problem players, and we were able to address these problems. We also make sure our athletes stay healthy the old-fashioned way, by having them weigh in and weigh out before and after every practice to make sure they are replacing the fluid they lose through sweat.

Tanaka: Educating the coaches is important as well. Making sure they understand how important hydration is and what's going on with our athletes is key. It gets the coaches' attention when we tell them that the guys will perform better when they are well hydrated. We're fortunate because our head coach really is good about working with us and listening to what we have to say. He supports us and gives us the time to meet with the players.

Kaplan: As athletic trainers, we're always preaching to our players to drink fluids, but we're starting to be more specific in terms of what they drink — and prefer they have sports drinks over water. That's because we've had guys drink a lot of water and still cramp up very badly. Some of these guys will grab big one gallon jugs of water and chug them all day. But since they're not replacing the sodium they lose in sweat, they still cramp and wonder why.

Rush: *It's clear you guys play an important role on the field, just by virtue of making these recommendations. That said, would you recommend a career in the NFL to a newly certified athletic trainer who is not sure about where to work?*

Maurer: I truly enjoy being an athletic trainer and I must admit that the nostalgia of being part of the NFL is a lure for me. I love being a part of the Dallas Cowboys, and it's a very good fit for me. Many of our student athletic trainers have told me, "I can't wait to start my career in the NFL because I want to try to get your job," which I think is great because I've exposed them to a career they want to pursue. I also feel good

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A ROUNDTABLE DISCUSSION

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when other students realize that the NFL may not be the best work setting for them.

Tanaka: We get athletic training students all the time who write letters or apply for internships and say, “My goal is to work in the NFL,” and I always want to ask “Why?” What they see on television may look glamorous, but there’s a lot more to the job than Sundays. Ironically, I never had the goal of working in the NFL. I just wanted to be good enough to have a job as an athletic trainer somewhere. I was fortunate enough to get some opportunities in, and exposure to the NFL, and I found that was the direction I wanted my career to go in.

Kaplan: I’d tell new ATCs that if they want to be in the NFL, they can’t be in it just for the Sundays. Game days and working with high level athletes are the best part of the job, but the novelty of working in the NFL wears off quickly if they’re not willing to work the other 350 odd days when there aren’t games. If you’re not in it for the right reasons, you’ll start asking yourself “Why am I spending so much time away from my family, why am I working 85 hours a week and spending 17 hours in the training room and on the sideline each game day for 16 Sundays?” Winning on game days is the goal, but if you’re not disciplined and focused, you’re going to have a hard time being an athletic trainer in the NFL.

Toriscelli: NFL football is the greatest game on the planet played by the greatest athletes in the world, and just to be a part of it is a privilege. It’s easy to say you want to be in the NFL because of what it is to the public eye, but you have to love being an athletic trainer first. I get a lot of satisfaction out of helping people reach their goals, and if that’s not



Right: Dave Kendall, Kansas City Chiefs’ head athletic trainer

important to students, then they’ll ultimately become frustrated and fail.

Kendall: It doesn’t happen very often, but every now and then I’m reminded of why I do this. I’ll be on the sideline on a game day and one of my players, who I’ve done a lot of work with, will nudge me or put his arm around me and say, “You know what? You did a hell of a job and I appreciate what you did for me and thank you.” There’s not any amount of money or glory that can replace that feeling.

Geoffrey Kaplan, who received the 2000 NFL Athletic Training Staff of the Year Award, has spent nine years as an assistant athletic trainer with the Tennessee Titans. Dave Kendall, who is only the second head athletic trainer in Kansas City Chiefs history, has worked as an athletic trainer in the NFL for 29 years. Jim Maurer has earned three Super Bowl rings during his 14 years with the Dallas Cowboys, the last eight as the team’s head athletic trainer. Jeff Tanaka has been an assistant athletic trainer with the San Francisco 49ers for five years. Todd Toriscelli has been the Tampa Bay Buccaneers’ head athletic trainer for seven years and won his first Super Bowl championship in 2002.

Photo of Todd Toriscelli: Tom Wagner/Tampa Bay Buccaneers

Cerebral and Spinal Cord Concussion ...

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further treatment and diagnosis can be achieved. It is essential that the sports medicine team take every caution necessary when evaluating, treating and managing the athlete to prevent further damage.

John Norwig is the head athletic trainer and Ryan Grove and Ariko Iso are assistant athletic trainers with the Pittsburgh Steelers. Joseph Maroon is a team physician for the Steelers.

Photo Credit: Pittsburgh Steelers/Mike Fabus

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