

Virtual Mentor
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Ethical Issues in the Physician-Athlete Relationship

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FROM THE EDITOR

How You Play the Game

“What I know most surely about morality and the duty of man,” Albert Camus declared, “I owe to sport” [1]. The throngs of coaches, trainers, parents, and spectators to American athletics might well cheer him on.

No other leisure activity in our culture can compete: we take sports and athletics to be not only panaceas for the body, but tutors for the soul. Most of us, implicitly or explicitly, believe that healthy participation in athletics enriches our sense of teamwork, self-discipline, and sportsmanship—that, deep down, athletic competition really is all for fun, and there is such a thing as going too far. The old bromide stands: it’s not about whether you win or lose; it’s about how you play the game.

But winning and losing can—and do—dominate our perception of athletic competition. Our success on the practice field could one day spell greater success in the arena. Teenaged quarterbacks fantasize about being drafted into the National Football League (NFL), while college-level gymnasts dream Olympic dreams. This is how mortals gain immortality, A.E. Housman reminds us in his poem, “To an Athlete Dying Young” [2]:

The time you won your town the race
We chaired you through the marketplace;
Man and boy stood cheering by,
And home we brought you shoulder-high.

And if we risk our lives to gain this privileged fame, what of it? In memorializing his athlete’s untimely demise, Housman declares,

Now you will not swell the rout
Of lads that wore their honor out,
Runners whom renown outran
And the name died before the man.

So do many young athletes believe: better to have won glory at the expense of longevity than to watch one’s former glory fade. Winning is everything.

The physician who serves any athlete confronts the fact that, simply put, this is the place where desire for winning performance may meet pathology. While any doctor would wish patients the best in their endeavors, he or she must also consider what constitutes a healthy endeavor. The tension between physical achievement and health

lies at the heart of the physician-athlete relationship and frames the ethical dilemmas this issue of *Virtual Mentor* seeks to illustrate for practitioners.

One way in which athletes' ambitions can create ethical dilemmas is by causing them to take inadvisable risks. Anthony Cortese dissects the culture of bodybuilding, particularly with regards to perceptions of health and beauty in American society.

In their case commentary, David Sohn and Robert Steiner consider a soccer player who asks her physician to clear her to play in a national championship—in spite of the fact that she has a torn anterior cruciate ligament (ACL). Bargaining for the physician's cooperation, the soccer player states that she will assume liability for any complications that might arise. Drs. Sohn and Steiner lay out the ethical principles at stake in the situation: autonomy for the athlete who wishes to play at all costs and the physician's obligation to do no harm.

In their case commentary, Christopher Madden, Aaron Campbell, and Jessica Pierce discuss a situation in which a patient receiving a pre-travel evaluation from a high-end concierge physician requests corticosteroids to improve his acclimatization and, he believes, enhance his performance on a high-altitude climbing adventure. Drs. Madden, Campbell, and Pierce explain the dynamics of patient-physician relationships in concierge medicine and the need for physicians experienced in pre-participation evaluations. Prescribing a substantial "dose of reality," they underline the need for physicians to be forthright in their recommendations to patients who are intending to sacrifice well-being for the sake of unrealistic goals—which may also endanger the health of others on that athlete's team.

When it comes to contact sports like American football, the playing field has grown very complex indeed. Richard Weinmeyer discusses the litigation concerning concussions in the NFL. Many states have passed laws to protect athletes from the adverse effects of multiple concussions, thus complicating the clinician's obligations to young patients. Kevin D. Walter discusses further prevention strategies for concussions among young athletes. In their case commentary, Michael O'Brien and William Meehan share their insight on the dilemma of a doctor whose teenage patient wants to play high school football. His parents have conflicting views on the subject: one believes that sports like football present unacceptable risks to young athletes and one considers that the desirable benefits of sports outweigh those risks. In elucidating the ethical concerns underlying this case, O'Brien and Meehan tease out the challenges the situation entails: should young athletes be allowed to participate in any sport they choose, or should physicians recognize and advise limits based on the youths' histories and how injury-prone they are?

Another arena in which athletes' ambition can lead to ethical questions is that of doping. Gary A. Green explains the use of human growth hormone for performance enhancement and evolving tests for detecting it. John Hoberman considers physician complicity in performance-enhancing drug use in both professional athletics and

“rejuvenation” clinics. Ed Laskowski draws on his experiences as a US Olympic team physician in a podcast interview on the physician-athlete relationship.

Lastly, Andrew Courtwright takes up the meta-issue of how we talk about performance enhancement in his review of Simon M. Outram’s article “Discourses of Performance Enhancement: Can We Separate Performance Enhancement from Performance Enhancing Drug Use?”

We hope the reader finds reading this issue as thought-provoking, stimulating, and entertaining as we found preparing it to be. These topics constitute a major area of concern for many clinicians, both in sports medicine specialties and primary care practice. Performance-enhancing drugs, brutal fitness regimens, and unrealistic expectations of athletic success have become endemic in many parts of America, but these stark realities need not define sport. With the right medical guidance, expertise, and compassion, sports and fitness can remain central to many athletes’ knowledge of “morality and the duty of man.”

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ETHICS CASE

Evaluating the Risks and Benefits of Participation in High-School Football

Commentary by Michael J. O'Brien, MD, and William P. Meehan III, MD

Dr. Gupta is a private practice pediatrician in a small, rural town. As a primary care physician, he is often asked to evaluate children and teenagers for participation in youth sports programs. This means much of his work is dedicated to high school football, one of the mainstays of youth athletics in the region. Dr. Gupta is often happy to serve in this capacity; he has spent much of his career working to prevent child obesity and believes strongly that community sports and fitness are crucial components of healthy lifestyles.

He is asked to evaluate 15-year-old Jesse in preparation for the boy's first season on a junior varsity high school football team. Jesse is accompanied by both of his parents. As Dr. Gupta walks into the examination room, he senses that the atmosphere is tense. After a brief history and pre-participation physical exam, he asks Jesse's mother and father if they have any questions.

Jesse's mother speaks up. "I've read that they've started placing sensors in players' helmets, and they show that a lot of these boys are taking pretty hard hits. They say that concussions are actually more harmful than we knew about back in our day, and that over time all these head injuries could really cause damage to the brain. I'm worried, because Jesse's already had one or two concussions in the past. Should we really let Jesse play football?"

Jesse's father shakes his head and interjects: "Jesse's brothers played high school football, and they got banged up pretty bad, but they're fine. One of them has a scholarship to a good university, and he's still playing football. I played the game myself when I was in school and it taught me a lot of important life skills—skills that served me as a unit leader in the Army and that I still use in running my business. I want Jesse to have the chance to play on a team and learn the value of sportsmanship. More important, I don't want him hanging around after school with these other kids who are doing drugs and getting into trouble."

Dr. Gupta listens carefully to each parent's arguments. He says that he understands Jesse's mother's concerns about the risks of the sport, and he makes a point of acknowledging them. However, he also agrees with Jesse's father that youth sports play an important part in teaching children and teens teamwork, leadership, and healthy lifestyles. He asks the parents to discuss their concerns with each other further, as well as with Jesse, and in the end to decide as a family how they want to

proceed. The parents thank Dr. Gupta for his time, but as they get up to leave the office, he feels they wanted something more from him.

Commentary

In this case, Jesse, a 15-year-old male athlete with a history of one or two prior concussions, wishes to participate in football. Dr. Gupta is asked to perform a pre-participation evaluation. Jesse's mother expresses concerns about her son playing football. Specifically she is worried about the risk of concussions, the cumulative effect of concussions, and the cumulative effect of blows to the head that her son might sustain that do not cause symptoms of concussion (i.e., subconcussive blows). Jesse's father, on the other hand, notes the benefits of participating in football and uses Jesse's brothers as examples of former high school football players who benefited from the experience.

This case illustrates one of the major functions of sports medicine physicians, which is to clear athletes for participation in sports. Although there are benefits to sports participation, there are also risks involved. The risk of injury, especially in collision sports such as American football, directly opposes the benefits to the athlete's health and social well-being. The issue of clearing an athlete for sports participation can be complicated, particularly if the athlete has suffered previous injuries, as Jesse has.

When making a decision to allow or prohibit an athlete from participating in sports, we often turn to central ethical principles to help guide us, such as respect for autonomy, beneficence, nonmaleficence, and justice [1-4]. In the current situation, however, two of these principles are in direct conflict. In order to respect the family's autonomy, Dr. Gupta must allow them to make an informed and free decision regarding the risks they are willing to accept in order to achieve the benefits of participation in football. The principle of beneficence, however, mandates that Dr. Gupta act in the best interest of Jesse's health. This is a classic conflict that arises frequently in the field of sports medicine [5-9].

Jesse's mother rightly notes that there are cumulative effects from concussions [10-13]. Many athletes who sustain one or two concussions in sports will go on to have safe, long, healthy, productive lives [14]. As an athlete sustains additional injuries, however, the risk of suffering long-term problems with cognition, behavior, and somatic symptoms increases. Currently, we are unable to predict the probability of long-term problems for a given number of sport-related concussions. Some athletes who have sustained multiple traumatic injuries to the brain over long careers in boxing, American football, and other sports have pathologic changes in the brain such as the deposition of beta-amyloid and phosphorylated tau [15-24]. This condition has become known as chronic traumatic encephalopathy. Although the evidence consists mostly of case reports and series at this time, and there are no definitive studies that show a direct association between the pathologic changes and the presumed neurobehavioral sequelae [25-27], the preliminary evidence is compelling. Therefore, Jesse's mom is right to view this as a risk. Participation in American football also carries the risk of injuries besides concussions and chronic

traumatic encephalopathy, including catastrophic injuries—those that result in death or permanent neurologic damage—the rates of which are higher in American football than most other team sports [28-38].

Jesse's father, on the other hand, rightly notes the benefits of participation in team sports, focusing on social benefits such as sportsmanship. The health benefits of regular exercise are well known, including reduced rates of all-cause mortality, cardiovascular disease, hypertension, rheumatoid arthritis, fibromyalgia, metabolic syndrome, type 2 diabetes, breast cancer, colon cancer, chronic fatigue syndrome, and depression [39, 40]. He points out that many previous high school football players, including Jesse's brothers, are healthy. He also believes that participation in athletics decreases Jesse's risk of getting into trouble after school. He does not want to deny his son these benefits for fear of risk of injury.

When such conflicts arise in medicine, we often turn to ethical principles to guide us in reaching a decision [1-4]. In this case, as is common in sports medicine [5-9], we have two ethical principles that are in conflict with one another. The principle of respect for autonomy acknowledges a person's right to make choices and to take actions based on personal values and beliefs [41]. This principle is derived, in part, from the philosophical teachings of Immanuel Kant and John Stuart Mill. It is a strong, culturally held belief in America and many other Western cultures. This principle has been emphasized in the code of ethics of the International Federation of Sports Medicine (FIMS), which states, "the team physician must...not refuse an athlete the right to make their [sic] own medical decisions" [42]. In addition, the code of ethics of the American Medical Association (AMA) says that "physicians should assist athletes to make informed decisions about their participation in amateur and professional contact sports which entail risks of bodily injury" [43]. It is important to remember that a decision can only be considered truly autonomous if the family understands the nature of the risks being assumed and is free from coercion or other external influences. If respect for autonomy were the only ethical principle involved in this scenario, then Dr. Gupta would discuss with Jesse and his parents the data regarding the risk of injuries in football and allow the family to decide whether or not they wish to assume the risks involved. Ultimately, Jesse's parents have to decide whether they will give permission for Jesse to play.

There is, however, another fundamental principle of biomedical ethics, the principle of beneficence, which conflicts with the principle of respect for autonomy in this scenario. According to the principle of beneficence, physicians have a moral obligation to act for the benefit of their patients. Some believe they should be paternalistic; that is to say, physicians should make decisions on patients' behalf. Patients or parents may desire or request that physicians take the summary of the existing evidence and give their own informed opinions on what they should do, particularly in cases like this where there is not a clear cut-answer.

There are nearly always external forces acting on athletes, making it difficult for them to make truly autonomous decisions. These external forces may include the

inherent desire to support the team or to avoid disappointing a coach or parent. Opportunities for college admission or scholarships can also exert enormous pressures on an athlete's decision making. The argument can be made that in some instances paternalism is the only real way to safeguard the welfare of athletes.

The tension between these two principles can be seen in the codes of ethics of FIMS and the AMA. In addition to the statements above reinforcing the principle of respect for autonomy, each also emphasizes the principle of beneficence. According to the FIMS manual, a "team physician must...always make the health of the athlete a priority" and "oppose practices that may jeopardize the health of an athlete" [42]. According to the AMA code of ethics, "the professional responsibility of the physician who serves in a medical capacity at an athletic contest or sporting event is to protect the health and safety of the contestants.... The physician's judgment should be governed only by medical considerations" [43] Although this tension has been considered by many authors, there is not universal agreement as to which principle takes priority. Some believe physicians should be paternalistic and safeguard the welfare of athletes, prioritizing beneficence over all other competing principles [44, 45]. Others argue that athletes, if well-informed, should be able to decide for themselves and that physicians must overcome their natural inclination to paternalism, further arguing that autonomous patients have a right to deny a specific treatment for injuries or illness irrespective of the assumed risks [46]. They note that athletes themselves are in fact the ones who know best how decisions will affect their lives. Some argue that patient autonomy always supplants the doctor's opinion.

Ethical principles, however, are not hierarchical, with one taking clear precedent over the other in every situation. Ethical principles need to be considered and balanced in each situation. As these two principles, respect for autonomy and beneficence, frequently conflict when making decisions about allowing athletes to participate in sports, we must balance the value of one against the value of the other. As outlined by Beauchamp and Childress,

as a person's interests in autonomy increase and the benefits for the person decrease, the justification of paternalism is rendered less likely; conversely, as the benefits for a person increase and the person's interests in autonomy decrease the plausibility of an act of paternalism being justified increases. Thus, preventing minor harms or providing minor benefits while deeply disrespecting autonomy has no plausible justification; but preventing major harms or providing major benefit while only trivially disrespecting autonomy has a highly plausible paternalistic justification [47].

The risks of participation in football, particularly the cumulative effects of concussion and chronic traumatic encephalopathy, are not fully clear. Dr. Gupta cannot reliably predict whether or not Jesse will sustain further concussions, whether those concussions will have a significant effect on his future well-being, and whether or not the subconcussive blows he is likely to sustain while participating in high

school football will result in long-term consequences. Thus, it is unclear whether the decreased risk of injury associated with prohibiting Jesse from playing football outweighs the benefits to his health and well-being of allowing him to participate.

Because there is no unusual risk in this case, respect for the family's autonomy outweighs any potential net benefit, if indeed there is one, to prohibiting Jesse from playing. If there were a clear history of unusual risk or vulnerability (for instance, if Jesse had a history of multiple concussions occurring with decreasing force, injuries that were taking longer and longer to recover, or incomplete recovery) then it would be the responsibility of the physician to step in and insist that Jesse be disqualified from contact sports. In this case, that history doesn't exist, so, the decision should be left to Jesse and his family. Essentially, this process is similar to informed consent after a discussion of the best medical information available.

We agree with Dr. Gupta's decision to acknowledge and recognize both the health risks that Jesse's mother is worried about and the benefits that Jesse's father wants his son to obtain. His recommendation, that the family further discuss the risks and benefits, including Jesse in the conversation, and come to a conclusion about whether or not they wish Jesse to participate in sports, is sound.

Dr. Gupta's approach could be augmented, however, by a more complete evaluation of Jesse and a more complete discussion of the available medical literature. He could more thoroughly assess Jesse's readiness for a collision sport and potential risk of injury. For instance, if Jesse were particularly undersized for his sport or proposed position, if he had physical deficits such as subpar core strength, balance, or neck strength, or if he had already demonstrated a propensity for sustaining concussions with relatively low levels of contact that are expected to occur frequently in football, then Jesse, his family, and Dr. Gupta might feel more strongly about finding a sport with less contact. Furthermore, Dr. Gupta could review the relative incidence of concussion in football versus other team sports. He could discuss the studies that have demonstrated the cumulative effects of concussions sustained during sports. He could discuss the limitations of those studies, including the changes in management of sport-related concussions since the time those included in the studies were playing. He could discuss the evidence of chronic traumatic encephalopathy as well as the limitations of that evidence. By discussing the studies and data that are available while simultaneously acknowledging the existence of clinical uncertainty, Dr. Gupta would promote a more autonomous decision-making process, allowing Jesse and his parents to perform a more informed risk-benefit analysis [4, 48].

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William P. Meehan III, MD, is director of The Micheli Center for Sports Injury Prevention, director of research for the Brain Injury Center at Boston Children's Hospital, and an assistant professor of pediatrics at Harvard Medical School. Dr. Meehan serves on the section on emergency medicine for the American Academy of Pediatrics, the advisory board of the Sports Legacy Institute, and the advisory committee for Sports Head Injuries for the Commonwealth of Massachusetts Department of Public Health.

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Related in VM

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ETHICS CASE

A Patient's Request for Steroids to Enhance Participation in Wilderness Sport and Adventure

Commentary by Christopher Madden, MD, Aaron D. Campbell, MD, MHS, and Jessica Pierce, PhD

Dr. Pritchard is an internist for a relatively small number of affluent families in a concierge-style practice. Much of his practice is centered on patients who engage in marathon running, alpine climbing, or endurance cycling. Mr. Jones is a successful entrepreneur who has recently entered the world of adventure sports. He has asked Dr. Pritchard for a pretravel evaluation for a trekking and climbing trip to Nepal.

Dr. Pritchard enters the examination room, and he and Mr. Jones exchange pleasantries. Dr. Pritchard asks Mr. Jones how he has been training for his trek.

“Well, I’ve tried to keep up on a regular training schedule—and I’m in pretty good shape for a guy my age—but I’ve just been too busy at work to get to the level I want to be at. The problem is that the guys I’m going with have been doing this for years. I’m worried I’ll fall behind while I’m getting used to the altitude.”

“Won’t they wait up for you?” Dr. Pritchard asks.

“They will, but I don’t want to slow down the pace,” Mr. Jones says. “We’ve wanted to do this trip for years, and I don’t want anything to hold us back. I was actually wondering if you could help me out in that department.”

“What do you mean?”

“Well, I know some doctors prescribe corticosteroids to help climbers acclimatize faster. It might shave time off the trek, and it would help me summit the peak we’re planning on climbing.”

“I’m not certain that’s a good thing to do. There is risk involved with misuse of these drugs,” Dr. Pritchard says.

“I’m not going to misuse it,” Mr. Jones rebuts. “I’m just trying to keep up with my buddies—we’re all in our 50s. This is just a chance for friends to get together and have fun.”

Commentary

Concierge medical practices typically charge a membership fee to patients in exchange for medical care and other services. It is not uncommon for concierge practices to be the subject of high expectations from consumers. In a purer world, membership fees would not influence the physician-patient relationship, but, in reality, concierge physicians may feel obligated to keep their patients, who are paying their own bills and memberships, content and coming back. This has tremendous potential to affect care decisions. Medical ethicists have long worried about the moral risk of a seller-consumer model to the physician-patient relationship, and in this case the concern seems particularly apt.

Is Mr. Jones paying for medical advice and treatment, or is he paying for a better chance of achieving his goals through what he mistakenly believes will be an effective pharmaceutical shortcut? If he is paying for performance enhancement, it is unethical for this physician to prescribe a treatment plan that he understands relatively little about and that may, in fact, offer no benefits to the patient and impose risk. Does Mr. Pritchard risk losing a high-paying, affluent patient in an already small practice that will affect his bottom line? Perhaps, but it is quite possible that Mr. Jones would appreciate a dose of reality and some high-quality advice; he might revise his plans for the expedition or at least shift his, and his team's, expectations.

The use of medication for the prevention and treatment of life-threatening altitude-related illness is very different, medically and morally, from the use of medication to enhance performance. In the first case, the physician is acting in the role of healer to promote the well-being of others. In the second, the physician is going beyond therapy into something quite different. Whether or not a physician is comfortable entering the realm of performance enhancement is a matter of personal convictions. But if a physician chooses to offer a prescription for performance enhancement that carries with it significant risk to the patient and to others, that physician ought to be very clear with him- or herself and with the patient about this intent.

Clearing up Mr. Jones's Misconceptions

Mr. Jones only recently entered the world of adventure sports, and he is already planning a significant trip to Nepal, presumably to attempt a high-altitude peak. Most successful mountaineers spend years preparing and acquiring skills for long high-altitude treks and summit attempts. Before leaving for a serious expedition, they have a high level of generalized fitness and will have employed specific training and conditioning strategies to prepare for altitude exposure. The commercialization of big summits such as Everest has opened the door for less experienced climbers and mountaineers to attempt more challenging and high-risk summits. The lack of knowhow combined in some cases with unrealistic goals invites cavalier thinking and the desire to take shortcuts. What is missing is experience, preparation, and education, the essential elements that lead to personal health, good decision making, and climber safety on high-altitude peaks.

Patients like Mr. Jones would benefit from counseling about appropriate preparation and about the risks that taking shortcuts poses not only to him but to all members of his climbing team. The fact that Mr. Jones perceives that physical fitness will help him at altitude is evidence of his inexperience. While fitness can certainly affect the climbing ability of an individual from a strength and stamina standpoint, it does not enhance acclimatization or prevent altitude illness. If Mr. Jones is relatively new to high-altitude mountaineering he may not be familiar with how he acclimatizes to altitude, which is highly individualized, impossible to predict, and, for all individuals, taxing above 8,000 feet [1].

Perhaps the most worrisome aspect of this case is Mr. Jones' request for steroids. Acetazolamide is the drug of choice for preventing acute mountain sickness (AMS) and high-altitude cerebral edema (HACE), depending on other risk factors [2]. It is a carbonic anhydrase inhibitor diuretic, and it is the only medication that facilitates acclimatization, but, it is important to point out, it does not enhance performance.

Preparticipation Evaluations and the Need for Experienced Physicians

It is not uncommon for trekking or guide agencies to require clearance or evaluation by medical professionals in an effort to minimize liability, but this is often little more than a legal formality. Additionally, there is lack of standardization regarding preparticipation evaluation (PPE) by physicians for wilderness sports and adventures. Clear guidelines exist for PPEs for more traditional or organized sports, but these do not apply well to events such as mountaineering in Nepal [3]. The lack of PPE guidelines specific to wilderness sports/adventures has the potential to leave clients unprepared for the rigors of mountain climbing and altitude travel and ultimately less safe.

Furthermore, the quality of such pre-adventure medical consultations can vary widely. Those seeking pretrekking, -climbing, or -mountaineering advice may not readily find physicians experienced in these realms. Furthermore, unless physicians are trained in sports medicine, they may not understand the principles of PPEs and therefore not be able to draw upon foundational PPE concepts to adapt them for wilderness sports. Physicians who have little or no experience with mountaineering may underestimate its risks. They may be unfamiliar with the extensive literature on the effects of various drug interventions such as corticosteroids on an athlete at altitude, and they may have only superficial understanding of how underlying health conditions such as obesity, hypertension, coronary artery disease, congenital heart conditions, lung disease, and diabetes interact with the physical demands of high-altitude physiology and the use of pharmaceuticals [4]. They are also unlikely to go over points of travel medicine and pretrip planning with the prospective traveler or adventurer.

The goals of such evaluations are not to disqualify, but to assess person's preparedness and counsel him or her on risk reduction based on individual health and sport-specific risk. If a pre-adventure consultation is not performed thoroughly by a

skilled and knowledgeable physician, in this case with training in altitude medicine and mountaineering, then medical clearance is inadequate.

Recommendations

A clinician experienced in altitude medicine would likely recommend typical preventive acclimatization measures, in addition to sport-specific personal training and conditioning, and might prescribe medication for use in emergencies. Such a clinician would also counsel Mr. Jones about such matters as: proper physical training and conditioning, appropriate trek planning and preparation, realistic goal setting, the need for objective decision making, the distinction between appropriate use of the correct medication to facilitate acclimatization for prevention of illness and performance enhancement, and the need for further evidence-based research before making final recommendations. Another thing to point out is that Mr. Jones' "not wanting anything to hold us back" represents a dangerous mindset on summit attempts like this, where many elements are outside of individual control and objective reasoning is vitally important for safety.

Dr. Pritchard should resolve Mr. Jones' misperception about the use of steroids for acclimatization and performance enhancement. He might also caution Mr. Jones about participating in an expedition with plans for an ascent profile to altitude designed for the most fit individuals in the group rather than the least fit individuals; such plans put the entire team at risk for injury, illness, or need for rescue. Mr. Jones should leave the office not with a prescription in hand and a false sense of security, but with strong advice against ignoring well-established acclimatization principles to achieve a fast ascent.

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1. Regardless of fitness level or an individual's adaptive response to altitude, all individuals exposed to altitudes above 8,000 feet (2,500 meters) experience the deleterious effects of progressive gains in altitude; lower barometric pressure leads to decreased exercise tolerance and potential for altitude illness if attempted too quickly. Moreover, above extremely high altitudes of 24,000 feet (7,500 meters), known to mountaineers as the "death zone," complete acclimatization is essentially improbable, and, while the atmospheric concentration of oxygen remains at 21 percent, its availability is much less than normal. On the summit of Everest at 29,029 feet (8,848 meters) there is only approximately one-third the normal amount of oxygen available for physiologic consumption. Schoene RB. Training for wilderness adventure. In: Auerbach P, ed. *Wilderness Medicine*. 6th ed. Philadelphia, PA: Elsevier; 2012.
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4. Inexperienced physicians might not know that dexamethasone plays an integral role in the treatment of acute mountain sickness (AMS) and high-altitude cerebral edema (HACE) in susceptible individuals, but it is not the first-line medication for prevention and it does not facilitate acclimatization. In rare situations such as when military recruits or search and rescue (SAR) teams need to advance rapidly to high altitudes, dexamethasone can be used in conjunction with acetazolamide for prevention of AMS and HACE. The drug of choice for prevention and treatment of high-altitude pulmonary edema (HAPE) in susceptible individuals is nifedipine, a calcium channel blocker, not dexamethasone, and not acetazolamide. None of these medications, moreover, are recommended for performance enhancement.

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ETHICS CASE

Nonmaleficence in Sports Medicine

Commentary by David H. Sohn, JD, MD, and Robert Steiner, MD

Dr. Robles is a sports medicine specialist in a group practice in a major urban area. While some of her patients compete in professional sports, she also serves many younger athletes. She is an active member of several local professional societies, and she often attends conferences with her colleagues in sports medicine around the country.

Today, she is asked to see 18-year-old Alison, a high school senior and a promising soccer player. Alison has an impressive record as a center forward, and her team is poised to enter a national championship. Alison feels her performance in this competition may also influence the scholarships she hopes to be offered when she enters college in the next academic year.

As Dr. Robles enters the room, she sees that Alison is obviously uncomfortable, holding an ice pack to her knee. After a brief history and physical exam, Dr. Robles concludes that Alison has injured her anterior cruciate ligament (ACL). She says that Alison cannot play a cutting and pivoting sport like soccer with an ACL-deficient knee because it could risk further, irreversible damage to the articular cartilage and menisci.

Alison leans forward. “I understand what you’re saying, but the championships are on the line. I have to play in this game. The school won’t let me play without a doctor’s note.”

Dr. Robles shakes her head and says, “I cannot recommend that you return to play with your knee injury.”

Alison thinks for a moment, and then asks, “Well, what if you write a note to the school saying that, although you don’t recommend that I play, I’m legally an adult now, and I accept the risks you’ve explained to me. Then I can just play with a knee brace—and all of the liability falls on me.”

Dr. Robles is taken aback, but quickly regains composure and reemphasizes her conservative recommendations. Alison repeats her suggestion—that Dr. Robles should write a note explaining that it’s okay for Alison to decide whether to play or not, so long as she assumes liability for playing on the injured knee. Dr. Robles wonders if Alison understands the long-term implications of further damage to her knee.

Commentary

Medical ethics are involved in almost every decision a physician makes. Fortunately, most decisions are simple and motivated by a desire to help the patient. Administer the appropriate antibiotic, or recommend and execute the correct surgical procedure, and there are no conflicts. The problems arise when ethical principles conflict with one another.

The four major ethical principles in Western medical ethics are respect for autonomy, beneficence, nonmaleficence, and justice [1]. Respect for autonomy is respect for a patient as a decision maker; an adult person of sound mind has the right to make decisions about his or her body. Beneficence is the obligation to do good on behalf of the patient. Nonmaleficence is the obligation to avoid harming the patient. And justice is fairness in the distribution of health care resources, as well as respect for the law.

This case demonstrates the tension between the ethical principles of autonomy and nonmaleficence. Autonomy again refers to the principle that an adult person of sound mind has the right to make decisions about the treatment of his or her body. At its core is respect for a patient's dignity and ability to choose the best course of treatment. When beneficence is determined to outweigh respect for autonomy, we call this paternalism—the idea that the more educated and trained physician makes decisions on behalf of the patient to best further that patient's interests.

Alison is a legal adult of sound mind who feels it is in her best interest to play soccer even though she has an ACL tear. She clearly understands that playing with a torn ACL puts her at risk for further injury, as she herself states that she will assume the risks for that potential scenario. For her, playing in a high-profile game could have many benefits, perhaps college scholarships and perhaps even a future in professional sports. In recent years we have seen professional athletes make such decisions, such as when quarterback Philip Rivers played in a National Football League game with a known ACL tear [2]. But Dr. Robles, mindful of nonmaleficence, is hesitant to leave the decision to Alison, because she is concerned that Alison will further damage her knee—suffer harm—and that she, Dr. Robles, will have allowed this to happen. Nonmaleficence trumps respect for autonomy. An extreme example would be a patient requesting the amputation of a healthy leg. Harming the patient is not permissible just because the patient wants it and is of sound mind.

If Alison wishes to play against medical advice, she can take that up with her athletic department. Dr. Robles, however, should not clear her for sport. Furthermore, Alison is asking Dr. Robles, in effect, to deceive in her professional capacity. Society and patients put their trust in physicians because of an expectation that physicians will be, among other things, truthful, and to deceive—even indirectly—would violate this trust. Dr. Robles cannot control what Alison does after she leaves the doctor's office, but her obligation as a physician is to inform Alison of the risks of playing with an ACL-deficient knee and advise Alison against playing.

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THE CODE SAYS

The AMA *Code of Medical Ethics*' Opinion on Treating Athletes

Opinion 3.06 - Sports Medicine

Physicians should assist athletes to make informed decisions about their participation in amateur and professional contact sports which entail risks of bodily injury.

The professional responsibility of the physician who serves in a medical capacity at an athletic contest or sporting event is to protect the health and safety of the contestants. The desire of spectators, promoters of the event, or even the injured athlete that he or she not be removed from the contest should not be controlling. The physician's judgment should be governed only by medical considerations.
Issued June 1983; updated June 1994.

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JOURNAL DISCUSSION

What We Talk about When We Talk about Performance Enhancement

Andrew Courtwright, MD, PhD

Outram SM. Discourses of performance enhancement: can we separate performance enhancement from performance enhancing drug use? *Perform Enhance Health*. 2013;2(3):94-100.

The usefulness of a review article is a function of its comprehensiveness and the clarity of the framework the author uses to organize an extensive academic literature. Simon Outram's article "Discourses of Performance Enhancement: Can We Separate Performance Enhancement from Performance Enhancing Drug Use?" is valuable in both respects [1]. Outram provides a typology of discourses about performance enhancement as a way of summarizing the key literature in this field. He focuses on four topics: (1) the meaning of the term "performance enhancement"; (2) performance enhancement as it relates to health; (3) the regulation of performance-enhancing drugs and technology; and (4) actual social practices regarding performance enhancement. As an orthogonal distinction to these four domains—that is, a distinction that cuts across all four—he differentiates between performance enhancement in sport and in cognition, using examples from one field to illustrate the other.

First, Outram notes that the term "performance enhancement" is often considered synonymous with the term "performance-enhancing drug" but that treating the two as equivalent ignores important insights from broader discourses about performance enhancement. For example, there is a long history of integrating performance-enhancing *technologies* into sport, in contrast to the strong regulatory approach to performance-enhancing *drugs* [2]. These technologies (such as altitude tents or advancements in bicycle alloys or ski design) may carry health risks as significant as those of certain performance-enhancing drugs, but the conversation around their use has centered not on safety but on questions of essentiality and authenticity. Advances in swimsuits—which are not essential to swimming (after all, a person is physically capable of swimming naked)—are seen as taking away the authenticity of a swimmer's performance, whereas advances in ski design are not, given that skis are essential to that sport [3]. Thus, Outram argues, keeping the term "performance enhancement" ecumenical allows us to draw on insights from approaches to performance enhancement beyond performance-enhancing drugs.

Second, Outram focuses on the longstanding discourse about the relationship between performance enhancement and health. He notes the extensive philosophical work that has developed around distinguishing interventions that constitute

treatment, which have the goal of making a person well or healthy, from those that constitute enhancement, which have the goal of making a person better than well [4]. Because this conceptual distinction has been so challenging to maintain, however, Outram correctly emphasizes the more recent debate on what constitutes a healthy athlete as opposed to a healthy person. Rather than thinking of health as the absence of disease, several authors have suggested that, in the athletic context, health should be thought of as the ability to achieve one's reasonable goals [5]. On this definition, it could be argued that some performance-enhancing substances such as androgenic steroids actually promote the health of an athlete, especially if used in a controlled manner. Similarly, this conception of health may impact the way the physician-athlete relationship is conceived, particularly if the physician's aim is to make the athlete—in contrast to the typical patient—healthy for competition [6].

Third, Outram reviews arguments about the regulation of performance-enhancing substances in sport. He notes that current regulations often turn on whether a particular drug is an actual or potential health threat or violates the spirit of sport. With regard to the second question, several authors have argued that, rather than violating the spirit of sport, the use of performance-enhancing drugs is faithful to it [7]. For example, drugs like erythropoietin—a red-blood-cell-stimulating compound—may offer athletes the ability to train harder and recover faster, leading to athletic excellence and achievement. This position, unsurprisingly, is associated with arguments to deregulate performance-enhancing substances. Outram also discusses “third-way” or harm-reduction models of regulation, whereby the permissibility of using a particular substance is contingent on the health state of a particular athlete [8]. Finally, he emphasizes the limits of our knowledge about whether certain regulated substances actually improve performance, although the regulatory implications of this epistemic deficiency are not clear.

Fourth, Outram reviews the distinction between social values and actual social practices regarding performance enhancement. He notes that surveys consistently demonstrate strong public opposition to performance-enhancing drugs in sport and cognition. This reflects, he suggests, a broad commitment to the value of unenhanced achievement. At the same time, however, there has been little change in public support for sporting activities such as Major League Baseball or the Tour de France after revelations of widespread use of performance-enhancing drugs. And there is also widespread use of potentially performance-enhancing supplements in the nonprofessional sports context. Noting these trends, some authors argue that the public tacitly accepts the use of performance enhancement despite expressing censure for it [9]. Over time, they suggest, our lived values may replace our more theoretical opposition to performance enhancement in sport and in cognition.

By way of closing comments: first, although Outram's typology provides a helpful way of organizing the literature on performance enhancement, in practice these conversations are deeply interconnected, and his framework can create artificial divisions. For example, the treatment-enhancement distinction is often thought to map directly onto the permissibility of using a drug or technology and its regulation.

Treatments are permissible; enhancements impermissible and hence regulatable. Similarly, conversations about authenticity lead directly to conversations about regulation, as with policies banning buoyant swimsuits. In general, the answer an author gives in one discourse about performance enhancement often directly impacts his or her position in another discourse, which can be obscured by treating them as separate conversations.

In addition, Outram follows the common practice of treating performance enhancement in sport and in cognition as separate conversations, related only in the way that they rely on similar distinctions or can inform complex cases in each domain. This approach reinforces the perception that performance enhancement in sport is only about physical accomplishments (e.g., stronger, faster, higher) and cognitive enhancements are only for academic accomplishments. Questions about the moral and regulatory status of cognitive enhancement—for example, the use of amphetamine salts among coaches or among athletes mastering playbooks—are just as relevant in sport and should be directly considered in that context as well.

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STATE OF THE ART AND SCIENCE

Drug Testing in Sport: hGH (Human Growth Hormone)

Gary A. Green, MD

While it may be tempting to consider the use of performance-enhancing drugs (PEDs) in sports as a modern phenomenon, the taking of substances to beat the competition has been going on for hundreds if not thousands of years. There is evidence that the Ancient Greeks and Romans gave their athletes special potions to improve their performance [1], and this trend continues to the present day, albeit with more sophisticated methods. One of the unfortunate realities associated with this drive to gain an advantage is that physicians have frequently been complicit, if not essential, in working with athletes to violate both the rules of sport and medical regulations.

Despite the advice of Sir William Osler that the role of the physician is “to educate the masses not to take medicine” [2] too often physicians have been athletes’ source of PEDs. The sophisticated doping programs of the former East German Democratic Republic and the Tour de France would not have been possible without physician assistance [3]. Surveys of National Collegiate Athletic Association athletes report that physicians are among their leading sources for obtaining anabolic steroids [4]. The reasons for this are myriad and include wanting to be associated with sports, monetary gain, naïveté, ignorance, greed, and desire to help the athlete, among others. In addition to sports, PED use has now spread beyond competitive athletes into the general population [5].

Throughout the centuries, athletes have used many different PEDs with varying amounts of success. One of the more recent drugs to gain popularity among both athletes and nonathletes is human growth hormone, hGH. Before 1985, patients with growth-hormone deficiency had to rely on cadaver pituitary extract for their treatment. Supplies were necessarily limited, costs were high, and use posed the danger of fatal viruses such as Creutzfeldt-Jakob disease. Fortunately for these patients, recombinant hGH (rhGH) was developed and has been available in the United States since 1985. This has increased the supply of hGH for GH-deficient patients, but also increased the possibilities for abuse.

hGH Use and Testing

Recombinant hGH is tightly regulated under the US Code 333(e): it is only allowed for very specific conditions such as pediatric and adult GH deficiency, smallness for gestational age, chronic renal failure, HIV-related wasting states, Turner Syndrome, and other rare diseases. It is not allowed to be used off-label for any other conditions or purposes, such as anti-aging interventions or performance enhancement. There are

also very strict regulations for the diagnosis of adult GH deficiency. Despite these regulations, anecdotal stories of athletes abusing hGH have been known since the 1980s.

There has been a constant battle in sports between PED use and attempts to curtail it. Testing for anabolic steroids has improved, and athletes are trying other, less detectable substances. Testing for hGH is yet one more chapter in this story. Recombinant hGH is a 191-amino-acid single-chain polypeptide that is very similar to native hGH, which makes detection a challenge. The initial test developed in the mid-2000s for rhGH detection took advantage of the fact that native hGH is made up of multiple isomers, while rhGH contains only the 22kD isomer. When someone takes rhGH, the natural production of hGH is suppressed and the percentage of the 22kD isomer relative to the other isoforms increases. Although this test is accurate and there have been several confirmed cases of athletes who have admitted the use of hGH, the isoform test has a limited window of detection, usually on the order of one or two days following administration of the hormone.

Does hGH Enhance Athletic Performance?

But is the presence of hGH worth testing for? Thomas Murray, president emeritus of the Hastings Center and one of the most thoughtful scholars in the field of bioethics, said “good ethics begin with good facts” (personal communication, 2005), and that is true regarding the discussion of hGH and sport.

First, no studies have conclusively demonstrated that hGH *alone* improves performance or has positive effects that would theoretically affect exercise. Indeed, the only studies in which hGH was shown to have a positive effect on athletic performance were in anabolic steroid users [6, 7]. There are several possible reasons for this, however, that point to divergent possible underlying factors: the amount of hGH that can be used ethically in experimental studies is limited, and it is possible that athletes use doses far in excess of what could be studied ethically. Secondly, studies may be statistically underpowered to demonstrate small differences that are clinically insignificant but athletically important. For example, the winning time in an Olympic race can be determined by a difference of hundredths of seconds, and proving that a change in speed that tiny is occurring at statistically significant rates would require almost a billion subjects.

But there are other indications that hGH by itself is not effective. I have reviewed hundreds of patient files from physicians and clinics across the United States in my role as a consultant to law enforcement agencies investigating physicians. These physicians and clinics purported to practice in areas such as anti-aging medicine, hormone replacement therapy, and rejuvenation, by prescribing hGH, anabolic steroids, and related compounds—probably prescribing more hGH in a week than most physicians do in a lifetime. Although most of the prescriptions were illegal, these physicians had a very good working knowledge of hGH and anabolic steroids, and I have yet to see that even one patient was given hGH by itself. Every patient who received hGH also received testosterone, synthetic anabolic steroids, or

combinations of the two. None of these physicians was willing to risk cash flow and patients' satisfaction by prescribing hGH alone. Thus it seems unlikely that hGH has undemonstrated effectiveness when used by itself, so testing for it may not be accomplishing the intended goal.

A second, recently validated test, however, measures not the presence of hGH but rather its biologic effects. When rhGH is given to a patient, it has a variety of metabolic effects that produce an increase in several markers. Two of these are insulin-like growth factor I (IGF-1) produced by the liver and the N-terminal propeptide of prolagen type III (P-III-NP) that is produced by bone. The concentrations of these analytes have been studied extensively in a variety of medical conditions and subjected to intensive statistical analysis [7]. By measuring the concentrations of IGF-1 and P-III-NP, the test can discriminate between those who have used rhGH and normal controls. Although this is an indirect test, it has the advantage of being able to detect rhGH use up to two weeks after administration of the hormone and to measure the effect of rhGH and, potentially, other compounds that increase growth factors. This may turn out to be a more efficient method of deterring athletes' use of PEDs than identification of every possible individual substance.

Larger Questions

Some athletes and nonathletes will always seek out physicians willing to provide them with illegal and illegitimate drugs. Given this reality, many have wondered about the utility, expense, and effort involved in curtailing the use of PEDs. Although PEDs like rhGH do pose health risks to athletes [8], sports in general pose many health risks that athletes willingly accept, some far more likely and more significant than those associated with PED use. This raises the question: why bother with antidoping efforts? The answer is complicated and beyond the scope of this article, but it can be summarized thusly: although each sport has its own individual character, one unifying principle is that all sports involve competition that measures a given participant's performance against those of others according to a common set of rules. PED use has the potential to alter a sport so significantly that results are determined by who has the best chemist rather than who is the best athlete. Secondly, if there were no rules restricting PED use, sports would rapidly deteriorate, as in the former East German Democratic Republic. In addition, sports without PED regulations would pose an ethical quandary for athletes. They would be faced with three options: compete at a significant disadvantage, use PEDs in contradiction with their values, or quit the sport. I would argue that all three are unethical or unfair alternatives, as well as unappealing to competitors: the strongest support for antidoping efforts come from the athletes themselves. In my extensive work with competitive athletes, the overwhelming majority have been in favor of antidoping regulations as long as they are accurate, universal, and applied uniformly. When I asked a former Tour de France rider who was involved in the recent PED scandals if he thought the tour should eliminate all antidoping regulations, he replied, "No, that would turn it into a freak show."

Conclusion

It is worth noting that, although the athletes who are caught using PEDs loom large in the public eye, those who compete cleanly and abide by the rules—those we don't hear about—are in the majority. The ultimate purpose of antidoping regulations is not to catch cheating athletes; it is to protect the athletes who want to compete fairly. Although the concept of cheating through the use of PEDs goes back thousands of years, it is also true that valuing honorable competition is at least that old. As the Roman author Epictetus said around 100 AD, “if you seek truth you will not seek victory by dishonorable means, and if you find truth, you will become invincible” [9].

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HEALTH LAW

Concussion-Related Litigation against the National Football League

Richard Weinmeyer, JD, MPhil

Over the last decade, three grisly events have caused the National Football League (NFL) to reexamine its relationship with its players and have ignited intense scrutiny from NFL athletes and the public. In 2006, Andre Waters, a retired defensive back from the Philadelphia Eagles and Arizona Cardinals, committed suicide after struggling with depression for many years [1]. Soon after his death, his family chose to have pieces of his brain analyzed to better understand just what might have triggered his depression and his suicide [1]. Five years later would come a second troubling death when Dave Duerson, a former safety for the Chicago Bears, took his own life [2]. Unlike Waters, whose self-inflicted gunshot wound was to the head, Duerson shot himself in the chest and left an eerie suicide note saying, “Please, see that my brain is given to the NFL’s brain bank” [3]. And, in 2012, perhaps the most famous incident in this string of tragedies would take place; former San Diego Chargers linebacker Junior Seau shot himself to death, again in the chest rather than in the head [4].

Postmortem examinations of the brains of these once-towering giants of the gridiron revealed disturbing evidence that these deaths, along with many other deaths and debilitating injuries of NFL players, were associated with a single condition: chronic traumatic encephalopathy (CTE), a degenerative brain disease similar to Alzheimer disease [5]. CTE is caused by a history of repeated head trauma (including known concussions and asymptomatic subconcussive injuries), and its often-devastating behavioral manifestations include “memory loss, confusion, impaired judgment, impulse control problems, aggression, depression, and, eventually, progressive dementia” [6]. Among professional football players and many in the medical community, the occurrence of CTE is widely considered to be the result of the years of constant head injuries players experience in practice and in play, especially the repeated concussions that coaches, team doctors, and—many argue—the NFL, have shrugged off as “dings” or “bell-ringers” [7].

There are presently 242 concussion-based actions pending in federal and state courts against the NFL. They assert, among many charges, that the league was aware of the neurological effects of repeated head injuries and deliberately concealed this information to the detriment of players and players’ families [8]. This article touches upon the legal claims against the NFL in these lawsuits and just why so many former players argue that the league neglected its responsibilities to protect the health and welfare of the athletes who have made football arguably the most popular pastime in the United States. Professional athletic leagues in America are no stranger to the

courtroom, but the litigation surrounding this current controversy could help to clarify just what athletic associations and leagues owe to the safety and health of their players.

The NFL's Contentious Handling of Head Injuries

The controversy surrounding the NFL and the brain injuries experienced by its players has grown out of contentious debate between the league and the medical community about the long-term repercussions of concussions and other head trauma. The NFL continues to structure its safety rules around medical determinations that many have deemed highly suspect. In 1952, the *New England Journal of Medicine* published a study on recurring sports injuries, including injuries experienced in football, which found that “patients with cerebral concussion that has recurred more than three times or with more than momentary loss of consciousness at any one time should not be exposed to further body-contact trauma” [9]. The NFL responded to this and other evidence of the potential for serious injury by gradually enacting play rules intended to create a safer on-field environment. In 1962, for instance, the NFL passed a rule prohibiting players from grabbing other players by the face mask and, in 1979, a rule forbidding players to “butt, spear or ram an opponent with the crown or top of the helmet” [10]. But it was not until 1996 that this anti-helmet-ramming rule was actually enforced, with many coaches encouraging the technically prohibited plays during the 17-year gap [10].

The NFL's MTBI Committee

As more questions and concerns about head injuries arose in professional football, a commission created by the NFL in 1994 recommended an independent scientific investigation to “foster better understanding of the causes, diagnosis, treatment and prevention of concussion” [11]. This did not happen, however. The NFL formed the Mild Traumatic Brain Injury (MTBI) Committee, made up of NFL team medical personnel and outside medical specialists in biomedical engineering, neurology, and neurosurgery and chaired by Elliot Pellman, a physician for the New York Jets who specialized in rheumatology and had little training in diagnosing and treating head injuries. During Dr. Pellman's tenure, the MTBI Committee published a 13-part study that ultimately denied the possibility of serious head injuries in NFL football [12]. The committee found that a large percentage of players appeared to the team physician to recover fully from concussion within an hour and that postconcussion signs resolve more quickly in NFL players than in nonathletes [13]. As one report noted, “NFL players are a highly conditioned, physically fit population accustomed to playing with pain and highly motivated to return to play as soon as possible” [13]. Furthermore, the MTBI Committee asserted that it found no cases of CTE in NFL players [14].

What makes these conclusions particularly surprising is that, despite the committee's avowal that professional football players were unusually sturdy athletes, the data from their research revealed that blows to the head resulted in equal if not greater brain damage for NFL players than for professional boxers, for whom the connection between head injuries and CTE was well established [12].

Small Changes

In the years following the MTBI Committee's published reports, and amidst a cascade of claims by former players about poor health caused by their involvement in professional football, the NFL made some concessions. In 2006, after the wife of a former NFL player wrote to the NFL commissioner detailing her husband's mental and physical decline and the financial hardships their family had endured, the NFL responded with a plan to financially assist some former players [15]. Under the 2006 NFL Collective Bargaining Agreement, a new provision was added that would provide medical benefits under the league's retirement plan to former players suffering from dementia who had played a certain number of seasons with the league or who were permanently disabled [16]. And, in 2009, the NFL promulgated new concussion standards for when a player could return to fulltime play in an NFL game after experiencing a head injury. While the previous 2007 standards stated that a player could not return to a game following a concussion if his team's medical staff determined that he had lost consciousness, the 2009 standards stated that a player could not return to play or practice on the same day if exhibited any signs or symptoms of a concussion [17]. All the while, the NFL continued to deny any connection between football and degenerative brain diseases [12], and, in response, the players and their families have sought redress in the courts.

Analyzing a Claim of Negligence

Scholars who have reviewed the more than 200 lawsuits filed against the NFL by former players or their families have identified numerous causes of action arising from the NFL's actions or lack thereof [18]. Of those, the most common claim is that of negligence on the part of the NFL towards its players. How this claim could be assessed by a court will be analyzed below using the elements of the legal definition of negligence.

One claim of negligence toward the NFL argues that the league "consistently breached its duty to protect the...well-being of its players by not enacting adequate rules, policies, and regulations that protect the players" [12]. To demonstrate that the NFL was negligent, the plaintiffs will need to demonstrate (1) the existence of a duty on the part of the defendant (the NFL), (2) that the NFL breached that duty, (3) a causal connection between the breach of the duty and the injury to the players, and (4) actual damages, meaning that the players experienced harm as a result of the NFL's action or inactions [19].

Duty

Players bringing a lawsuit must first show that the NFL owed a duty or several duties to its athletes. Employers possess a duty to their employees to ensure reasonably safe working conditions, taking into account the kind of activities entailed in their jobs [20]. What is reasonable depends on the type of work being carried out, so that standards for the NFL and its players will of course be different than, for example, standards for restaurant owners and kitchen staffs.

Players will argue that the NFL had a duty to enact rules to protect players from head injuries. Players will argue that the NFL knew of the risks concussions and other head injuries posed to players that had been part of the medical literature since 1952, with research in this field growing over the last several decades [12]. In addition, the NFL's own research into head injuries, its creation of a fund to help players with dementia, and the changing of its safety and injury standards could be seen as an acknowledgement by the league that there were clear health and safety risks permeating the game [12]. Furthermore, players will claim that the NFL had a duty to warn its employees of any unsafe conditions that came to its attention and that players could not discover through their own efforts within the scope of their employment [21].

Breach

Following the establishment of a duty, players must then show that the NFL breached it. A breach is defined as "failure to conform to the required standard" [19]. Players will argue that the NFL failed to ensure a safe working environment because it did not take the information about risks into consideration when formulating the rules and policies that shape the playing environment.

Causation

Proving causation is likely to be the greatest hurdle for professional football players in court [18]. At first glance, it seems fairly clear that injuries sustained in football have led to NFL players developing CTE. Professional football players receive repeated head injuries during their careers, these injuries cause CTE, and CTE results in debilitating conditions that permanently incapacitate players or ultimately lead to their deaths. However, to succeed in litigation, a player will have to prove that it is more likely than not that it was the physical contact he endured during his NFL career that was the proximate cause of his CTE [18]. This is a difficult claim to assert because, while it is strongly believed that CTE is caused by repetitive brain trauma, there is still no definitive scientific conclusion that CTE is the result of these injuries [22]. Furthermore, CTE can only be diagnosed by autopsy [22], and the diagnoses that have been done up to this time have disproportionately come from the brains of NFL players who have committed suicide, bringing any number of other environmental, social, and behavioral factors into the equation, such as genetics, substance abuse, and other mental health problems [23]. While CTE and head injuries sustained during NFL play seem connected, the causal link may not be strong enough to succeed in court.

Damages

Finally, if a claim for negligence survived examination of the first three elements, a player would have to demonstrate the financial damages he has accumulated as a result of the injuries and illnesses he has endured. Damages are often determined according to a person's lost wages; the costs of past, present, and future medical care; and the pain and suffering the person endures as a result of a trauma [24]. This too may be a hard to demonstrate convincingly. There is considerable uncertainty about an NFL player's income, especially future income, because it is not a

guaranteed amount [25]. Professional football players can certainly make a substantial amount of money during their careers, but the only money they are guaranteed comes in the form of signing bonuses and salaries due while on a team's roster [25]. If a player is cut from a team or can no longer meet the requirements of his employment contract, he is owed nothing more. Moreover, given the unpredictable length of players' careers and possible extra income depending on success he may or may not achieve, such as money received from lucrative endorsements, forecasting future income is almost impossible [18]. Lastly, medical costs may be a challenge to calculate as well, because it may be difficult to separate the amounts tied to a player's head injuries from other medical costs.

Recent Developments in NFL Litigation

While a claim for negligence may be a difficult victory to achieve in court, that did not prevent more than 4,500 former players from filing lawsuits against the NFL since 2011. These cases were consolidated into a class action lawsuit that was filed with a federal court in Pennsylvania in 2012 [26]. However, in August 2013, before the case had been brought into court, the NFL agreed to settle with the players and their families for \$765 million [27]. Under the agreement of the settlement, the settlement would not be regarded as an admission of guilt by the NFL for the injuries and deaths attributed to the rules and policies of the league [27]. The judge presiding over the cause, Anita B. Brody, rejected this settlement in January 2014, stating that she was "primarily concerned that not all retired NFL players who ultimately receive a qualifying diagnosis or their related claimants will be paid" [28] because the NFL and the players' lawyers had not "produced enough evidence to convince her that the \$765 million would cover the potential costs for 18,000 retirees over the 65-year life of the agreement" [29]. For many players, the suggested settlement was welcome news because of their current conditions and the financial toll their injuries have taken [27]. Others, however, were pleased by the judge's decision because many players and their families felt that the amount of money offered by the NFL was insufficient to meet the needs of former and current players, and that the NFL case could potentially serve as a valuable model for other professional sports injury cases in the future [29].

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POLICY FORUM

Addressing Concussion in Youth Sports

Kevin D. Walter, MD

When medical professionals discuss injury prevention in the school-aged population, the focus is usually on motor vehicle safety (seat belt, booster seat, car seat use, and so on), domestic violence (e.g., teen dating violence), and bicycle helmet use. Recently, sports safety has become another focal point for youth injury prevention with the recent enactment of state concussion laws [1]. Unfortunately, research on concussion prevention in sports is still lacking in many places, as is the translation of that research into knowledge and clinical practice for medical professionals. The Institute of Medicine (IOM) Committee on Sports-Related Concussions in Youth, of which I was privileged to be a member, recently published a report, *Sports-Related Concussions in Youth: Improving the Science, Changing the Culture* [2]. In just under two years, the committee was able to complete an exhaustive review of the literature and put together a report documenting the evidence and concepts behind neurological development and concussion diagnosis, management, and prevention. This report discusses youth ranging in age from elementary-school children to young adults, including military personnel and their dependents. Leaders were brought in from various fields to serve on the committee, and expert speakers and public testimony were heard during the deliberations for the report.

So how can we reduce concussions among young athletes? To create injury prevention strategies for sport, one must understand the rules and goals of the sport in question. There should be accurate epidemiologic data on injury frequency and type to enable recognition, management, and prevention of injuries.

Obstacles

One major difficulty in collecting data on which to base injury prevention strategies is the lack of large epidemiologic studies and comprehensive injury surveillance systems for youth sports. There are three commonly cited injury surveillance systems, each of which is limited in a different way. The NCAA Injury Surveillance system provides robust information on injuries that occur in collegiate athletics, but that data does not tell us about high-school athletics or recreational activities. High School RIO (Reporting Injuries Online) has worked with the National Federation of State High School Associations to create an Internet-based injury surveillance system for high-school athletics, which is significant but does not account for recreational activities or private sports. Finally, the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS), which collects information from emergency visits to registered hospitals involving consumer products like a lacrosse helmet or a baseball, may tell us more about

recreational activities than the NCAA or High School RIO, but it is limited by its focus on emergency department visits. This does not inform us about injuries treated by primary care physicians, at home, or by school-based or club-based athletic trainers. Even used together, these surveillance reports do not give a complete picture of sports injuries in young people.

Another barrier to getting accurate data is that athletes underreport their injuries. A 2004 study by McCrea [3] showed that only 47.3 percent of affected athletes reported a concussion. Many of these athletes felt a concussion was not serious enough to warrant reporting and said they did not want to be withheld from competition. Self-reporting of symptoms plagues concussion research in particular because there is no single test that can confirm or exclude the diagnosis of concussion. Concussion incidence may well be underreported, since many athletes will not recognize symptoms as an injury and even deny their existence in order to continue participation. Therefore, I believe that injury rates are higher than what is currently reported in the medical literature.

Even if we formulate recommendations, implementing them across the board can be difficult because not all sports are overseen by central bodies. Participation in extreme sports, which are largely recreational rather than part of school leagues, is significantly increasing, with the number of skateboarders, for example, increasing 178 percent from 1995 to 2005 [5] and up 14 million US participants [4]. A study presented at the 2014 Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS) attempted to quantify the injury risk for participants in the extreme sports of mountain biking, motocross, skateboarding, surfing, snow machining, snow skiing, and snowboarding [4]. This study revealed that skateboarding, snowboarding, and skiing carried the highest incidence of head and neck injury and that concussion was the most common head and neck injury in extreme sports. Enforcing change in unregulated, primarily recreational activities of this kind is much harder than regulation and rule creation for structured, organized leagues like high school or Pop Warner football. This means it is difficult to implement standards in a way that will protect all athletes.

Recommendations

To truly improve injury prevention and reduce concussion incidence, we need to accomplish several things:

1. Establish a national injury surveillance program to determine with accuracy the incidence of sports-related concussion in youth. The IOM believes that a better understanding of the true incidence of concussion will allow researchers to target injury prevention strategies to needed groups and better evaluate their effectiveness [2].
2. Undertake further research to establish objective markers (i.e., biomarkers) for diagnosing concussion to reduce the dependence on self-reporting and to inform evidence-based, age-specific guidelines for concussion management.

As the IOM report points out, the most widely used guidelines, the “Zurich 2” guidelines, are based primarily upon clinical experience rather than evidence [6, 2]. Support for further research into the short-term and long-term outcomes after concussion, such as health-related quality of life, is important.

3. Promote appropriate age-related rules, techniques, and standards of play [2]. The NFHS, state interscholastic high school athletic associations, and many national governing bodies for sport work diligently to evaluate these issues and improve participant safety for organized school sports. But not all private or club sports are affiliated with national governing bodies and most recreational athletes do not participate under the oversight of a governing body, so educating those athletes is difficult but paramount.
4. In order to prevent false claims of protection and concussion reduction, implement stricter oversight of the companies that produce protective equipment. Both the IOM and the AAOS agree on the need for further research and advocacy to improve protective equipment and establish a biomechanical threshold for concussion [2, 4]. There is evidence that helmet use reduces head injury risk in skiing, snowboarding, and bicycling, but the effect on concussion risk is inconclusive, and use in other sports did not impact concussion risk [7]. There is also no evidence that helmet “add-ons” reduce concussion risk [8]. Equipment manufacturers are creating sensors in mouthguards and helmets that light up after certain levels of impact, but since there is no scientifically established biomechanical threshold for concussion, these levels may not be clinically meaningful.
5. Improve medical care at sporting events [4]. Many organized contact sports are played without trained medical personnel on the sideline. The National Athletic Trainers Association (NATA) estimates that only about 40 percent of US high schools had access to a full- or part-time athletic trainer in 2013 [9], and many club and private sports have no athletic trainer affiliation. A single athletic trainer would have a difficult time covering even one high school’s football players alone, given that there are often freshman, sophomore, junior varsity and varsity teams all participating at the same time, not to mention equivalent teams for boys’ or girls’ soccer during the same season. Many club sport tournaments, including higher-risk sports like soccer, lacrosse, and rugby, often have no on-site medical personnel. Improving medical coverage at athletic competitions is critical: it should be the expectation, rather than the exception, that on-site medical coverage is present for all high-risk and contact or collision sports.
6. Improve medical education about concussion. This includes better concussion education for students entering health professions but also improved education for health care professionals after graduation [10, 11]. A study found that only 26.6 percent of general pediatricians were somewhat or very familiar with recently passed concussion legislation and that only 14.6

percent of general pediatricians used concussion consensus guidelines in their practice [12]. An informed primary care clinician can provide crucial anticipatory guidance for safe sport participation, like reminders to wear helmets and use the proper protective equipment.

7. Promote appropriate coding of injuries, such as the use of E codes to document emergency visits. Consistent proper use of E codes, which can fall by the wayside during busy times, will help the NEISS become a more accurate system.
8. Improve awareness of concussion among the public and education on concussion among coaches, officials, and athletes. Coaching education has been shown to positively impact the ability of youth sports coaches to recognize concussion [13]. The NFHS and Centers for Disease Control and Prevention have created free online webinars for coach, athlete, and lay public concussion education. With these online educational tools, access to high-quality information is easy enough that athletic organizations can make educational sessions mandatory for all coaches and officials.

Every state currently has a concussion law that includes promoting awareness of concussion, immediate removal of a player with a suspected concussion, no same-day return to play for those with concussions, and requirement of written medical clearance prior to return to play [14]. The laws are unique to each state and need to be understood by health care professionals, sports organizations and coaches, and athletes and families. Ideally, each state law should protect all young athletes, not just those in school-based athletics, especially since the efforts of the NFHS and each state high school athletic association do not currently affect recreational play environments.

9. Change injury culture in sport: encourage athletes to report their injuries and foster an environment in which athletes who report injuries and take appropriate precautions are not considered weak or “soft” [2].

The health, economic, and education implications of youth concussion in the US are significant. Policymakers at all levels of government and health care professionals are in a position to enact community and national policy changes to improve the safety of our young athletes. These changes will not only help with concussion recognition and management, but also increase safe participation in sport, which improves health outcomes for all [1].

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MEDICINE AND SOCIETY

Muscle as Fashion: Messages from the Bodybuilding Subculture

Anthony Cortese, PhD

We are entering a golden age of drug development. The use of...substances in athletics will grow proportionately.... It will be...critical...both medically and philosophically [1].

You cannot hold a comprehensive discussion about bodybuilding without talking about the use of anabolic steroids and other performance-enhancing drugs [2].

Widespread attention to unleashing the potential of the human body, fitness, competitive sports, and a dynamic and healthy lifestyle has allowed bodybuilding to become more observable and conventional within popular culture in the United States than ever before. Rapid advances in technology and sports medicine have given bodybuilders more options for training and exercise physiology and stronger types of anabolic steroids, human growth hormones, and testosterone. (Think only, for example, of New York Yankee all-star third baseman, Alex Rodriguez, aka A-Rod, who was suspended for the entire 162-game 2014 season for using banned performance-enhancing drugs.) This link to anabolic steroids has contributed to giving bodybuilding a negative image.

The central question this article explores is whether the phenomenon, practice, and sport of bodybuilding is rooted in an aesthetic that American culture misjudges or whether it represents a truly marginal activity (the idea one might get from the online forum entitled “Underground Bodybuilding”). *Misjudgment*, here, cuts both ways: appraising a commodity—in this case, a body image—at a higher value than what it is actually worth (overpricing) or appraising a commodity—again, body image—at a lower value than what it is actually worth. In the long run, is bodybuilding merely a logical extension of a healthy lifestyle and athletic activity or the expression of an unhealthy lifestyle? Bodybuilder contributors to various online fora and their supporters argue that the public remains ignorant—yet still seems to rush to judgment—about performance-enhancing substances and the people who use them [3]. Bodybuilders complain that even their spouses, friends, and family members do not comprehend what motivates them [3].

Beneath this significant conceptual issue lies a practical one of even greater consequence—the ethics of sports medicine and a challenge to professionalism that students, residents, and other physicians are likely to confront in their education and daily practice. Previous research has discussed the unclear role of medicine as a basis for knowledge and expertise among bodybuilding participants, many of whom

systematically disavow medical assertions on the use and dangers of chemical enhancements that dramatically improve physique [4]. Those data on perceptions of the medical profession, risk, and bodybuilders' sources of medical information, suggest medicine is but one among many sources for information on the social construction of self and body in postmodern society.

The human body is physically and also *socially* constructed. Hence, it represents, as Anthony Synnott says, numerous and evolving personified “selves” and very different realities and perceptions of reality [5]. These meanings change across time and culture: the body can be thought of as a *tomb*, *temple*, or perhaps a *corpse* [5]. All agree that the body is physical, but for some (e.g., those with religious or philosophical beliefs) it is also spiritual and mystical. Bodybuilding (and biomedicine, for the most part) view the body as a machine with no absolute and universal meaning. Thus, bodybuilders can construct their physical bodies to fit the meaning that “body” has for them.

In Defense of Bodybuilding

Serious training for competition in bodybuilding requires toughness, dedication, discipline, and the willingness to denounce mediocrity, comfort, and a decadent lifestyle. Those who do not appreciate this dedication may mislabel the bodybuilder, perhaps from envy. It is not rare to hear a condescending attitude expressed toward individuals who exhibit an ultra-strong work ethic and unflinching dedication in the gym and labor intensely as they prepare for contests and competition. Upon close inspection, bodybuilding is much more than flexing muscles on a stage. Advocates note that bodybuilding fosters discipline or mental toughness, maintains good health, boosts self-confidence, and promotes rest and healthy sleep [6]. Confidence is not arrogance; the bodybuilder often leaves pieces of his or her heart in the gym or on the stage.

The Case against Bodybuilding

Arrogant. Conceited. Narcissistic. We commonly hear these adjectives used to describe bodybuilders. To be sure, some bodybuilders—both competitive and noncompetitive—are narcissistic, conceited, proud, arrogant, and even worse—obsessed with posing for and admiring themselves in mirrors and body-image-driven impression management. In short, we might characterize bodybuilders as far too “into themselves.” Although bodybuilders clearly do not have a monopoly on these characteristics, stereotypes often contain a grain of truth.

Bodybuilding can also pose serious health risks. It is erroneously believed that bodybuilding requires large increases of protein consumption. Too much protein—often consumed in the form of supplements—can cause more harm than good, straining organs, especially kidneys [6]. Excessive sweating during workouts can result in dehydration that, in turn, can cause painful cramping. And the lifting of weights can itself be dangerous without a spotter and even with one.

A Small Research Project

What image does the bodybuilding culture itself promote? To examine this question, I searched the Internet for bodybuilding fora. I found six: Bodybuilding [7]; Underground Bodybuilding [8]; EliteFitness [3]; Muscle Talk [9]; Wanna Be Big [10]; and Get Big Bodybuilding [11]. All sites have essentially the same functions, the same structure, and highlight the same general areas: supplements, chemical enhancement (anabolic steroids), blogs, workout programs, specific exercises, photo galleries, competitions, motivational content, and diet and nutrition. Not surprisingly, there is market segmentation by demographics (e.g., teens, over-35, women, personal trainers) and particular niches (e.g., power lifters, professionals, other athletes).

The EliteFitness website homepage has a tab not explicitly addressed by other sites: Sex (“Not getting laid? Click here to change things!”), demonstrating the strong perceived link between physical appearance—especially muscularity—and sexual allure [12]. For this reason, the EliteFitness site and its fora lend an extra dimension to my analysis of the bodybuilding culture while retaining the functions, structure, and specific categories of the other sites. I registered online to gain member status and was put automatically on the EliteFitness mailing list.

EliteFitness sent 44 e-mail advertisements in the next 30 days. Each ad hawked a particular product to enhance bodybuilding. Table 1 lists those product types and shows how often each type was promoted.

Table 1. Frequency of advertisements for product types in EliteFitness mailing list e-mails

<u>Product</u>	<u>Number of ads</u>
Steroid	40
Protein absorbent	1
Tan/sexual functioning	1
Recruitment of new subscribers	1
Fat burner	1
<i>Total</i>	<i>44</i>

The overwhelming majority (40 of 44; 90.9 percent) touted the positive effects of steroids (build muscle, increase strength, burn fat, high sexual or athletic performance) without mention of dangerous side effects.

Forty of the 44 messages contained at least one image. Many contained more than one. Table 2 shows what kind of images was displayed and the frequency of usage.

Table 2. Types of images used in EliteFitness e-mail advertisements and their frequency

<u>Type of image</u>	<u>Frequency of use</u>
Product jar or bottle	16
Single man	12
Single man (before & after)	2
Two men	1
Man and woman	6
Man and two women	7
Single woman	1
No image	4

In the ads with one man and one woman, there is physical contact between models and both men and women ritualistically display the characteristic youth, beauty/attractiveness, flawlessness/perfection, and sexual allure of the provocateur. Not to be outdone, the ads with one man and two women imply sexual activity—in fact, a ménage a trois.

Both men and women wear only bikinis, exposing a great deal of flesh. There is intimate contact between the man and women and even between the women, and all three are in bed together. One ad featuring one woman alone, displays her as a passive and submissive provocateur in high heels, bent over and leaning away from—yet suggestively looking directly at—the viewer. By contrast, ads with a single man, although provocative, are less sexually suggestive than those including women. In the ad depicting two men, one is tying a tourniquet around the arm of another in preparation for a blood test. The same preparation would be used for a steroid injection. The ad is marketing four products: Winstrol and Masteron (anabolic steroids) hGH (human growth hormone), and testosterone. Each is injectable. (Winstrol comes in oral form but with greater toxicity than the injectable form.) Overall, the data display a clear message: inject or swallow various types of these products to increase muscle, sexual allure, and sexual libido.

People lift weights and build their bodies in other ways for a variety of reasons: to build muscle, lose fat, get stronger, become better athletes, and compete at a higher level in their chosen sports. In the 1970s, Arnold Schwarzenegger, bodybuilder and former Mr. Universe, united the physique and power of the bodybuilder with the sexual attraction of the leading man in blockbuster American movies. Since that breakthrough, men have begun to build muscle for a new reason: defining extraordinary muscularity as a measure of masculinity (Cortese A, unpublished data).

Results from the present research indicate bodybuilders are a prime marketing target for readily available and relatively inexpensive anabolic steroids. This leads me to conclude that, as a group, bodybuilders consume these products. Such behavior is considered fringe by those athletes who believe in using only natural means for attaining fitness and muscular development. My sample is relatively small and may

not be generalizable across all bodybuilding sites or other types of bodybuilding groups or subcultures.

Still, the bodybuilding culture is in step with society at large. Its reliance on and promotion of anabolic steroids to achieve extreme and even freakish results is not unlike dependence on cosmetic surgery and dentistry, spray tanning, and the wearing of wigs, toupees, and artificial braids. Our culture, it seems, instills in us an unquenchable thirst for the perfect body.

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OP-ED

Physicians and the Sports Doping Epidemic

John Hoberman, PhD

After 25 years of nonstop doping scandals involving elite athletes such as cyclists and sprinters, the major role physicians have played in these doping cultures has received much less attention than it deserves, and especially in medical circles. Physician involvement in these illicit, and often medically dangerous, practices will seem counterintuitive to those who associate physicians with the task of healing and the injunction to do no harm. The reality, however, is that many doctors have been providing athletes with doping drugs and expertise throughout the modern doping epidemic that dates from the 1960s [1-5]. It was during that decade that anabolic steroids became common in Olympic sports such as weightlifting and track and field. Over the past half-century, the global demand for androgenic doping drugs has grown to serve multiple niche markets that include the elite athlete population along with much greater numbers of police officers, firefighters, military personnel, bodybuilders, and members of other “action-oriented” male subcultures [6, 7].

Doping in Sport

Physicians dope athletes for a variety of reasons that can range from unethical service to the state to the gratifying of their own immature emotional needs. The East German doctors who participated in the doping of thousands of young athletes, including the administration of anabolic steroids to pubescent girls, functioned within a state-sponsored apparatus whose political mission of sportive nationalism trumped medical ethics [8]. State-sponsored doping in West Germany expressed similar nationalist ambitions that could not be fully realized in a democratic society [9]. The gold medals won by East German athletes at the 1976 Montreal Olympic Games persuaded many West German sports physicians that it was time to adopt the use of androgenic drugs as a matter of national policy [2, 10]. At the Congress of German Sports Physicians held in Freiburg in October 1976, the most prominent West German sports physicians minimized the medical dangers of anabolic steroids and recommended that they be administered to athletes under medical supervision [2, 10]. Far from being a German specialty, however, this pro-steroid mindset can be found among sports doctors around the world. The repeated doping scandals involving the Tour de France, to take one example, have clearly demonstrated that there is an international medical doping culture that could properly be called Dopers Without Borders. Some physicians have issued therapeutic use exemption (TUE) certificates to athletes that are unwarranted but allow their use of drugs that are believed to boost athletic performance [11, 12].

One rationalization for physician-managed doping is the “lesser harm” argument [13]: since athletes do not possess the self-discipline or knowledge to limit their intake of doping drugs, it is the physician’s responsibility to exert some control and thereby limit medical harm. What such physicians do not understand is that at least some of these athletes will top off their medically sanctioned doses with drugs they obtain on the black market.

The proponents of legalizing “medically supervised” doping imagine that such arrangements between doctors and athletes are comparable to proper clinical relationships between doctors and patients [13]. In fact, these are doctor-*client* relationships that can subordinate medical judgment and the client’s health to the demands of performance. This mismatch is exacerbated when doctors become infatuated by the celebrity of their “patients.” Some doctors identify so strongly with athletes’ goals or derive so much satisfaction from the athlete’s celebrity status that they willingly abandon medical norms in favor of the ambitions of athlete-clients who are now in charge of their medical “treatment.” In the world of Mixed Martial Arts (MMA), these practitioners are known as “mark doctors”—“fan boy doctors who are willing to write up prescriptions for drugs to fighters in exchange for a celebrity rub” [14].

This type of emotional dependence works in both directions. Just as doctors can succumb to the charismatic appeal of athletes, athletes can revere doctors as if they were infallible gurus. In his memoir *The Secret Race*, the doped former professional cyclist Tyler Hamilton writes that the notorious Italian doping doctor Michele Ferrari “was our trainer, our doctor, our god” [15].

Finally, the doping doctor can engage in the pharmacological manipulation of athletes because he yearns to participate in a transcendent performance [16-19]. Lothar Heinrich, a German sports physician who doped professional cyclists at a sports-medical clinic in Freiburg, stated in 2007: “When you watch sports you are always hoping for a miracle.... You hope to participate in something of historic significance” [16]. In most cases, however, I see the profit motive as far more influential than any interest in producing record performances.

Beyond Sport

The involvement of physicians in the doping of athletes must be understood in the larger context of the promotion of hormonal enhancements for entire populations of prospective “patients.” In an era when testosterone-replacement drugs are being mass-marketed as an elixir of youth—a marketing ploy the editor of *JAMA* was protesting as far back as 1939 [20]—distinguishing between traditional therapy and enhancement procedures is becoming increasingly difficult. Warnings against indiscriminate testosterone supplementation from The Endocrine Society and other medical authorities cannot compete in the media marketplace with drug company television advertising [21]. Doping doctors, who have been operating along this frontier since the 1960s, can be seen as the vanguard of an army of medical practitioners who have left the traditional practice of medicine for the cash-only

business of male hormone replacement therapy. The American Academy of Anti-Aging Medicine (A4M), founded in 1992 by two Belize-educated osteopaths, has been the principal promoter of this trend [22, 23]. Consequently, the pro-steroid lobby of the sports world is now dwarfed by the enormous lobbying operation being waged by “anti-aging” doctors, their (often unregulated) clinics, and the pharmaceutical industry that supplies them with testosterone products [24].

Conclusion

The connection between doping athletes, their physicians, and the expanding world of “anti-aging” medicine is exemplified by the recent controversy involving the professional baseball star Alex Rodriguez and the unregulated clinic in Coral Gables, Florida, that is accused of supplying him with androgenic doping drugs. The 549 anti-aging clinics currently operating in the state of Florida are unregulated to the point that some of them are owned by felons [25]. The athletes they supply constitute a miniscule fraction of their male clientele, many of whom are receiving interventions to produce conspicuous musculature, sexual rejuvenation, or both [24]. This medical commerce is presided over by a dysfunctional state Department of Health that does not effectively regulate a type of medical practice that is carried on in a legal gray zone and in violation of best practices [24]. The entire operation depends on physicians’ offering “hormone consultations” that produce diagnoses of “deficient” testosterone levels (“low T”) that are “restored” by prescription drugs [25].

In summary, the physician-assisted doping of athletes has had two major effects on the modern world. First, it has transformed high-performance sport into a chronically overmedicated subculture the pharmacological practices of which violate the ethical norms of sport. Second, the doping doctors of the sports world have pioneered “entrepreneurial” medical practices that are now available to enormous numbers of people in search of hormonal rejuvenation. The unwillingness of the doping doctors to accept the notion of natural limits to athletic performance is being imitated on a much larger scale by a doctor-enabled hormone enhancement industry that has thus far encountered no significant obstacles to growth.

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Suggested Readings and Resources

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