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Cheating in Sports: What Should Exercise Physiologists Think?

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“There comes a time when it is necessary to question, to argue, to challenge.”
– Shirley M. Steele and Veram M. Harmon [1]

Since the time of the first rock-throwing contest, each generation of competitors who would do whatever is necessary to win has tried just about every conceivable trick in the book. The name of the book is performance-enhancers! The use of enhancers, including drugs, is by no means new. Drugs, supplements, and probably a host of not so obvious ingredients are so common among athletes, coaches, and trainers that no one seems to care that cheating is wrong or, at the very least, a questionable practice. Doing whatever is necessary to win is [the] game today. Remember, it isn't the way you plan the game, it is whether you win or not. Fraud in dietary supplements is a good example of playing the game to win. Bribery and price fixing in business are other examples of thinking that has gone wrong. Such questionable practices run counter to the values of ethical thinking [2]. They should be questioned and challenged. This article takes a strong, intuitive approach to athletics. The use of drugs and/or supplements to give an advantage to a competitor is a dilemma that exercise physiologists need to face.

“At what point do these supplements cross the line and too closely resemble or mimic a banned substance?” -- Alberto Salazar

The laws of common sense are not that complex. Clearly, athletics is no longer about character, doing your best, or learning from your experiences. It has gone to the dogs. Athletes of all ages are using drugs and supplements. Many coaches support the use. They demand bigger, stronger, and faster performances from their athletes. After all, competition and winning are everything. This kind of thinking is so common that many exercise physiologists seem to believe that exercise physiology is all about running faster, jumping higher, and getting bigger muscles. That is, if you do not have something to say about winning or how to win, then you have nothing to say. This thinking is deeply entrenched in the sports medicine/exercise physiology behavior. As researchers, the academic exercise physiologists seemed to believe their role is to provide the magic factors to win. If you think about it, the idea itself is consistent with a difficult and unclear understanding of exercise physiology. The goal of exercise physiology is not to

win in athletics. It is much more about the attitude and disposition of professional thinkers driven by professionalism.

The ASEP leadership believes that exercise physiologists are healthcare professionals [3]. One reason for the difference in behaviors and events reflected in sports medicine and exercise physiology is the ASEP's vision of professional development of exercise physiology. The ASEP leadership understands that existence of exercise physiology per se cannot be justified from the perspective of acute and chronic adaptations to exercise. In the same way, they know that fitness companies cannot rule or control exercise physiology. This is especially interesting in light of those who are invested deeply in the business efforts of many sport supplement companies. They understand that it is wrong that the companies must shape exercise physiology for financial reasons. But, profit maximization, laboratory maximization, and status maximization are not the [keys] to professional development of exercise physiology. There is too much potential for deception and fraud when the money from these companies is allowed to shape the thinking of exercise physiology.

“Ultimately, it is not we who define thinking, it is thinking that defines us.”
– Carey, Foltz, and Allan

Strange as it might be, some exercise physiologists do not see the dangers in cheating. They do not see the problem with using drugs and supplements to enhance performance. In short, they do not understand how athletes are being misled. At some level, it should be obvious that the obsession to build larger muscles with steroids or other forms of deception is wrong. Drugs and sports supplements do not set a good example for young people. It is a problem of immense significance. The erosion of a moral code that speaks to professionalism seems to be meaningless. Rules fail to mean anything when it comes to making money. Think about it. If you can cheat your friend out of his earnings, it is okay – just don't get caught. This kind of failed logic leaves a lot to be desired. Athletics, drugs, and supplements are part of a failed logic [4]. Unfortunately, hardly anyone seems to care. Athletes do not seem to care. Coaches do not appear to care. Have you heard of athletes and coaches arguing over the ethics of sports supplements? No, winning is believed to be everything! It seems that many sports nutritionists do not care either. Or, is it they are learning about themselves and need time to develop their own mind, thought, and language?

Whatever the language or learning curve, the percentage of young athletes using drugs and supplements is increasing. And, this influence of advertising and peer pressure to win at all cost is not really new thinking. The sale of performance-enhancing supplements and/or drugs to athletes is clear and convincing proof that advertising is the first aggressive medium to accessing the mind. It is also fraught with potential ethical issues. Why? Because no one cares that in “...the world of athletics the use of dietary supplements is widespread and there exists a fine line between what is considered a legal supplement and what is a decidedly illegal steroid” [5]. This raises the very important questions: “What are the consensually accepted standards of behavior for sports nutritionists?” “Do sport nutritionists need a code of ethics to guide their work?” Having

the doctorate degree is for certain only part of being educated. Thinking and acting with what is understood as professional are important to being professional (i.e., professional development requires a sense of the complexity of professional thinking).

Mistakes are common without professional thinking and a code of conduct. As an example, think about the following comment: “It has to be said that neither supplements nor steroids can make an athlete great by themselves. Any supplement used without a workout routine will produce no results. This is similar to the stance the American College of Sports Medicine took, until 1985. They held that steroids were nothing more than a placebo. Athletes on steroids just worked harder and longer, and this extra work, not the steroids, was causing the incredible muscle growth and strength increase. They were wrong about steroids, but right that hard work, in the weight room or elsewhere, is an unavoidable part of achieving better performance.” [5]

Cheating is not relative. Cheating is personal and professional misconduct. Illegally distributing or using steroids and other performance-enhancing drugs by athletes is illegal and morally questionable. Sports ought to be about mental and physical hard work and the development of athletic skills. It is in the best interest of everyone to preserve the integrity of athletics. Exercise physiologists ought to argue for clean sports, not the use of drugs or questionable practices linked to performance-enhancing substances. Not allowing for thinking that compromises our professional goals and objectives is important, too. Avoiding conflicts between personal self-interest and professional judgment is smart and proper. This will make it easier for exercise physiologists to champion their initiatives for professional development. There is no quick fix to professionalism. It takes work and dedication to become part of the healthcare industry. The sound of silence from within exercise physiology with an interest in sports nutrition is not professional or new. In one sense, it is too easy and only agrees with our past thinking. And yet, perhaps, this is what defines professionals from nonprofessionals (i.e., avoiding a preoccupation with personal goals for professional standards).

Since conflicts of interest are common in all areas of academia [6], it is fundamentally imperative that the appearance of compromising one’s professional judgment is properly understood. Conversely, what is uncommon is the silence among exercise physiologists about the appearance of conflict of commitment to supplement companies and the unprecedented growth in commercially available products for athletes. Increasingly, too many exercise physiologists are trapped by the silence and the research money and/or equipment from supplement companies with few restrictions except to publish research that [seems to] support specific products. This kind of expectation about research provokes immediate and resounding negative responses from professionals across the research community. Sports nutritionists, in particular, should acknowledge the conflict of interest in their work. They should debate the conflict, set ethical boundaries for their work, and abide by a common professional agenda to do what is right for the right reason. Understandably, this view may not be popular among exercise physiologists with an interest in sports nutrition.

Central to this concern is the question of oversight and accountability in the use of supplement monies that fund research and development of exercise physiology laboratories. Researchers must ensure the integrity of their professional work. Discussions about the benefits of performance-enhancing drugs and/or supplements without thoughtful reflections about ethical issues and concerns are not professional. Conducting research or providing services for a fitness company in which the research has a strong philosophic and/or financial interest is a conflict of interest. Similarly, acting as a nutrition consultant, the receipt of consulting fees or honoraria (such as for a presentation at a national meeting), receipt of laboratory equipment from a company to perform research; all are potential conflicts of interest. This is particularly true when exercise physiologists are pressured to support a company's products. Those who disagree should not try and suggest that the employee, exercise physiologist or otherwise, who works for a fitness company is not doing everything possible to push the products.

In order to understand the obsession of cheating in athletics, exercise physiologists also must ask themselves: "What is the purpose of sports nutrition research?" If it is to help the athlete recover faster from exercise training, or to ensure that the muscles have enough energy substrate (as in carbohydrates) for a long endurance run, then good nutrition is a logical study and application to athletics. If the purpose of sports nutrition is to run faster, jump higher, or lift more weights by ingesting drugs and supplements, then why would anyone value the course, those who teach it, and those who sell the products? Of course there is value in understanding good nutrition for many different reasons. Not all sports nutrition teachers are selling nutrition products either. Many do understand where to draw the line in teaching and acting on behalf of a company. Their value placed on sports nutrition is different than the personal beliefs and attitudes of those who are required to generalize the research.

"Given a thimbleful of facts, we rush to make generalizations as large as a tub." -- Gordon Allport

Understandably, everyone has the right to decide what is good research, what are important facts, and whether the conclusions are sound. We cannot deny however that some personal values are always going to conflict with most professional values. Frustrating as it may be, this reality helps to place some of the historical efforts in sports nutrition in context (i.e., "Was it meant to be the academic vehicle to support fitness supplements?"). Certainly, teachers have opinions about whether a particular product may boost athletic skills. But, in all honesty, if the teacher abides by professional rules of conduct, the teacher's opinion will not take control of the class. The teacher understands that he or she is held accountable to a professional level of conduct that promotes health and athletics. Here, it must be noted that this is a distinct difference in how many exercise physiologists are beginning to view sports nutrition and that credibility is a fundamentally important consideration that is probably overlooked too often.

If society values athletics for all the obvious reasons aside from the "winning at all costs" mentality, if society values professional values and share in the willingness to make those values known to others, and if society helps athletes understand that life and sports are

defined by the choices we make, then, very likely our young children, high school and college-aged athletes will have the courage not to be influenced by misguided individuals. Moreover, it is the responsibility of the profession of exercise physiology to influence the values held by its members. The world must know that the use of drugs and sports supplements is wrong, and that exercise physiologists do not support those with the disposition that drugs and supplements are good for athletics or its participants. A specific mode of conduct is valued in a professional organization. Once the conduct becomes part of the organization's thinking, then it also defines what its members think and how they perform their work.

Do we value cheating or other forms of gaining an unfair advantage? We shouldn't. Taking an unfair advantage of an opponent is not [i.e., should not be] considered to be the right thing in athletics. Winning comes at a price that has value if and only if the winner did not cheat. Stealing, cheating, and other decision-making processes in order to win at all cost is the easy road to success. No one likes cheaters. Frankly, most people probably do not like cheats or those obsessed with winning at all costs. However, it appears that the emerging value system within sports nutrition, athletics, and society reflects something different. Today, cheating is accepted as long as you do not get caught. Clearly, right and wrong is blurred among athletes, coaches, sports nutritionists/exercise physiologists, and fans of different athletic events. For instance, you can hear: "Since everyone is using drugs and supplements, it is the standard within sports." This is a scary way to think. Once a value is internalized, it becomes the norm. Do we really want all athletes, regardless of age, using drugs and supplements?

Similarly, do we really want exercise physiologists making it easier to cheat? No, of course not. It is wrong. This is why there must be an increased awareness of the need to decide what exercise physiologists should think about the practice of exercise physiology. The very notion that all exercise physiologists should condone the thinking of sports nutritionists who embrace supplementation is misguided, particularly if the purpose of sports nutrition distracts from the ethical healthcare responsibilities of exercise physiologists. What is certain is simply this: The decision making in this regard cannot be left solely to exercise physiologists with an interest in sports nutrition or anyone who calls him- or herself a sports nutritionist regardless of academic background. There are important questions of purpose and values that cannot be overlooked. The professional development of exercise physiology entails a high-level commitment to the ethical competence of the individual. In this regard, Churchill argued the following:

"...for a profession in which the sense of professionalism – the motivating pride in one's work and sense of worth and value derived from work – is grounded in the sense of the right, the good, and the just, which is broader than the profession itself. It is to that larger supra-professional meaning of care that the helping professions are answerable." [7] Implicit in Churchill's statement is that "right, good, and just" should be the very foundation of a professional conscience. Personally, this means that exercise physiologists are responsible for the right and just (i.e., ethical) behavior to guide their commitment to athletes, regardless of whether both hold the same values. The exercise physiologist should not judge the athlete (i.e., have nothing to do with the athlete) who

uses drugs and/or supplements, but neither should he/she support the use. This freedom to question, even when it is common knowledge that cheating is part of the sports game, is similar to other considerations in life. There is much to nurture, to think about, and to plan for when it comes to athletics and ethical issues. It is not uncommon to have found ourselves less than prepared for these ethical considerations. However, in order to resolve the ethical situations faced in the practice of exercise physiology, nothing is more certain than our obligation to question, to argue, and to challenge in the fullest context possible the assumed freedom to pursue performance-enhancing drugs and/or supplements.

Athletes, coaches, strength and conditioning specialists, fitness professionals, athletic trainers, exercise physiologists, or anyone (such as a medical doctor, a physical therapist or a nurse) who encourages cheating in sports devalues everything good about competition. It is wrong and exercise physiologists have the obligation to speak out. Why allow athletic records to become worthless? Why encourage athletes to continue the use of anabolic steroids, human growth hormone, erythropoietin (EPO), beta-blockers, stimulants, and diuretics to mention a few [8]. Exercise physiologists must challenge the use of these substances and other performance-enhancing supplements. Everybody seems to want shortcuts. Some think it is all about greed for the rewards, financial and otherwise. Every athlete knows that no one concerns him- or herself with who finished second [9]. And, yet we must argue that this kind of thinking is seriously problematic. Why not coach athletes to believe that their physical performance is more a question of mind over matter than the ingestion of performance-enhancers?

Josephson [10] states that, “The essential elements of character-building and ethics in sports are embodied in the concept of sportsmanship and six core principles: trustworthiness, respect, responsibility, fairness, caring, and good citizenship.” Shouldn’t these essential elements of character building and ethics also serve to guide researchers, professors, and others who have any contact at all with athletes of all ages? The concept that exercise physiologists must be ethically responsible cannot be overlooked. It is wrong to research performance-enhancing drugs and/or supplements to determine if they work and not expect athletes to use them. Athletes are affected by what their professors and coaches say and write on this subject. The emphasis placed on finding drugs and/or sports supplements to gain an advantage on other competitors ought to be criticized. This is the dark side of exercise physiology. Hence, there is no doubt that exercise physiologists ought to make decisions about any and all questionable practices that are not contributing to the professional development of exercise physiology.

“...the most prevalent form of cowardice in our day hides behind the statement ‘I did not want to become involved.’” – Rollo May [11]

After decades of not getting involved in exercise physiology on behalf of its students, there is a huge mess to clean up. The gatekeepers’ unchanged thinking about what is exercise physiology and what is sports nutrition has set the stage for a “false start”. Had exercise physiologists with an interest in professional development and sports nutrition given full attention to a code of conduct, the influence in the personal and professional

lives of athletes (and clients and patients as well) would be much more positive. This is not the case today. The encouraged obedience to the sports medicine myth and the ergogenic aid way of thinking is a problem. It can be changed, however. The question is whether exercise physiologists are willing to examine their attitude towards professional development and sport supplements. Some may say this is stupid thinking or naïve. In actuality, it is not stupid or naïve for one very important reason. The search for the exercise specialist or the competitive edge in sports in the form of a rationalized, scientific justification no longer makes sense. Simply because exercise physiologists have helped to popularize the use of laboratory equipment to understand applied physiology and performance-enhancing aids does not mean that it is a scientific ritual that is right. Do not be drawn into the idea that it is okay to advertise hundreds of sport supplements to enhance athletic performance. The first step in changing the sports nutritionists' unquestioned thinking is to recognize the irresponsibility of encouraging performance-enhancers. The second step is to not be controlled by short-range research needs and do something that is positive, reasonable, and logical on behalf of athletes worldwide. The language of professionalism must prevail within our practice of exercise physiology.

“It is the quest for an ‘edge’ however that poses an ethical dilemma, one that challenges both athlete and scientific researcher alike.” – Elizabeth A. Applegate and Louis E. Grivetti [12]

In a nutshell, to be a professional, exercise physiologists cannot be driven by greed. The enormous money the nutrition and fitness companies have to spend on aggressive advertising, consultation fees, and laboratory equipment cannot be allowed to drive a profession. There are simply too many ethical dilemmas and unanswered questions. In particular, the alleged results are subject to little or no scientific scrutiny with the potential to cause serious bodily reactions among supplement users [13]. It is therefore important to the future of sports and exercise physiology that anyone with any influence at all on the use of performance-enhancing substances should take the time to reconsider his or her work as possibly inadvertently encouraging behavior that is viewed by some individuals in society as questionable [14]. All professionals with any belief at all in the value of sports in the development of character and ethical thinking should be on the lookout for unscrupulous individuals who are interested in tweaking scientific findings for their own personal, professional, or financial advantage.

It is clear to many people in society that the use of performance-enhancing substances is epidemic [15], and it is only going to get worse (i.e., genetic engineering) if controls are not put into place [16]. The athletes are not going to stop using drugs and supplements until the coaches and trainers say “no to the substances”. Exercise physiologists and, in particular, sports nutritionists have got to reconsider their thinking that research itself justifies their actions. Some believe that it is a completely failed logic driven by profitability and personal popularity. Most Americans standing on the outside of academics understand this point even if they are not willing to stop watching athletes who are users. The fact is there has been (and always will be) someone bulking up, losing weight, and competing in sports to win. Americans are part of this out-of-control

experiment played out by big business with untested and unregulated substances. Little is known about the long-term safety of the performance-enhancers and strangely no one seems to care, particularly when research results are disappointing for a company and yet published anyway with a little re-working.

This ever-increasing use of supplements and drugs by athletes and by weekend warriors, young athletes, and people who want to run faster, jump higher, or get stronger can no longer be overlooked or considered as an unquestioned part of athletics. Also, owners of retail stores, trainers, and anyone who markets sports supplements must be held accountable for their unwelcome influence on sports and society. Supplements are not harmless. Supplement contamination is real. Many long-term side effects are yet to be determined. The price tag is high. Cheating is a problem. Ethical thinking cannot be pushed aside. As healthcare professionals, exercise physiologists cannot be part of this problem in this country. So-called sports nutritionists (especially those with a next-to-nothing certification) cannot be allowed to “do their thing” at the expense of young athletes. If they are unwilling to address the ethics of the problem, it is appropriate to hold them accountable for the athletes’ state of mind and physical well being. This is especially the case when it comes to exercise physiologists who refer to themselves as sports nutritionists with direct business arrangements with sport and dietary supplement companies.

“Understand that...most of the so-called ‘sports nutrition professionals’ have financial ties to supplement manufactures.” -- Scientists from the Sports Nutrition Working Group of the International Olympic Committee Medical Commission [17, p. 3]

Exercise, even athletics, holds great promise for all individuals. To position athletics above the ethics of common sense or, in a nutshell, what is right versus what is wrong, is crooked thinking. Athletes must be held accountable to their performances, how they got to where they are, and how they influence others just as businessmen and women are held accountable in their chosen fields of work. Sports supplements are as wrong as gene therapy, regardless of the researchers or athletes who endorse either. Athletics is about more than winning. Human life is about living and being successful, too. Competition is about a level playing field, but nothing is really level in life. Being human is to accept diversity in all things including athletics. Enabling athletes to win through using drugs or supplements is not smart thinking. But, using medical advances and technology to help ensure life is smart thinking. The potential for harm is little to none with gene therapy for the prevention and treatment of diseases. The abuse of any agent other than sound, ethically smart thinking is obvious if used in sports programs to win. Life is more than winning, however important and understandably rewarding.

The truth is plain and simple. The use of a particular supplement or genetically engineered substance of any kind (like, erythropoietin [18]) to enhance athletic performance is unethical and unsafe. The manipulation of the human body, other than by training, good nutrition, and proper psychological preparedness, has serious ethical implications. Aside from the fact that many, if not most, of the sport supplements are a

complete waste of time and money, the prospects are not good that athletes are going to discontinue using them without ethical guidance by their coaches, trainers, and others who influence how athletes think and train. This, it seems, is the problem. There are at least two bodies of literature that claim some expert opinion on athletics and supplements. These comprise the “exercise physiologists with a personal interest or even academic training in sports nutrition” and “coaches with an interest or even a passion in winning at all costs” (i.e., more specifically, “sport supplement advocates” and “coaches”). Members of both groups are not likely to travel the same road or have exactly the same interest, yet both groups tend to speak the same language.

The ethical quandary is which group is in control. The answer is that neither group is operating from a straightforward ethical view. Both have failed, and both are part of the problem. In plain English, it is not acceptable to sacrifice wellness in life for excellence in sports. Athletes, coaches, trainers, exercise physiologists, and others who cannot understand this point have failed to recognize the death-lesson of cyclist Tommy Simpson. His drug-induced athletics is remembered in the 1967 Tour de France race during which he collapsed and later died [19]. Athletics ought to enhance the well being of society, but to do so requires ethical thinking and fair play. The well being of athletes cannot be nurtured by encouraging or allowing athletes the opportunity to engineer their performance through supplements, drugs, or even genetic doping. It just does not make sense even in face of recognized advances in technology and all the wonderful things that have come from it. All athletes have access to the influence of technology (shoes, clothing, sound nutrition principles, equipment, etc) and, yet the technological advances are not enough to predict the winner or to cause predictable harm. This may not be true with specific drug and/or supplement enhancement or genetic modification.

Finally, regard to genetic modification, it is entirely unacceptable to imagine that some forms of genetic technology are likely to be okay while other forms will not be (i.e., the athlete vs. patient model of thinking). This only sets up yet another parallel in troubled thinking. That is, it is presently appropriate (according to some professionals and officials) to use certain supplements and/or drugs while it is inappropriate to use others. This kind of thinking is dangerous. It makes no sense. Most athletes understand that it really tells them which drugs and/or supplements can be consumed. They know that now is the time to get serious with athletics before society becomes convinced that it is acceptable to cheat, regardless of how it is done. And, yet consider the thinking of Miah [20] who argues that genetically modifying athletes might “...actually be good for sport...” He even argues that with “...the ingestion of minute amounts of banned substance...[it] seems excessive (and harmful) to demonize a person...in sport.” This, it seems to me, is both illogical and fanciful thinking. No one said that participation in sports would be easy. No one said life would be easy. Both are a huge challenge, but (by comparison) to think it is okay for the CEO to cheat the stockholders is unacceptable. Athletes who ingest banned substances are cheats, too. Also, if a person finds him- or herself genetically modified to run faster, do not expect society to conclude that it is not cheating. It is cheating, and it devalues the athletes and the sports.

“The ethical dilemma then, is deciding upon whether medical technologies should be used for non-medical purposes, such as performance enhancement in sport.” -- A. Miah [21, p. 11]

Dilemma or a decision is the question! The final rights issue lies in the hands of society or the athlete, which one? What seems clear is that exercise physiologists are not prepared to understand much less avoid the inevitable restructuring of athletic competition. The supplement revolution, whether its protein, creatine monohydrate, or one of a dozen different substances published in dozens of sources, has failed to attract the attention of mainstream exercise physiologists. The significance of failing to understand the importance of ethical thinking continues to allow, if not support, the use of supplements to foster something other than natural. If this sounds too simplistic, so be it. The issues and also the sub-issues that arise from the notion that it is the athlete's right to cheat in sports competition are arguments more on behalf of athletics than the athlete. There remains the problem and ethical dilemma. Is it all about athletics and winning or is it about the athletes? Contrary to what seems to be the popular thinking, athletics exist for athletes. The danger with thinking the converse is that athletes are subservient to athletics and, therefore, the implications of this alone are problematic for human beings of all ages.

Athletes should not get special treatment in school. Athletic programs should get a reasonable share of the money, but so too should the academic side of the house. Coaches should be paid as professors are paid, no more or no less. Both stadiums and classrooms require equal attention to quality and standards for students and athletes. No junior high program, high school athletics, or college campus should be purchased by big money from companies playing hardball. Athletes should attend college for an education; landing a position on a professional team and winning are important but not the primary objective. No research laboratory should ever be funded by nutritional supplement companies without understanding the danger. Let's face it. Steroids work. Athletics is a purchased product in many settings. Athletes are encouraged by their coaches, trainers, and colleagues to use supplements like 1-Testosterone, Methyl 1-Test, ErgoPharm 6-Oxo, and other legal and illegal performance-enhancing drugs. The endorsement opportunities appear to outweigh the risks, right? Cheaters should to be caught and sent home. They should not be allowed to play with non-cheaters. As healthcare professionals, exercise physiologists should be the first to understand and teach the ethics of athletics.

References

1. Steele, S.M. and Harmon, V.M. (1979). *Values Clarification in Nursing*. New York, NY: Appleton-Century-Crofts. p. 20.
2. Boone, T. (2003). Ethical Thinking: What Is It and Why Does It Matter? *Professionalization of Exercise Physiology* *online*. 6:6:June [Online]. <http://www.css.edu/users/tboone2/asep/EthicalThinkingANDexercisephysiology.html>
3. *American Society of Exercise Physiologists*. (2004). Definition of Exercise Physiology. [Online]. <http://www.asep.org/>

4. Boone, T. (2004). The Misperception of Good Intentions. *Professionalization of Exercise Physiologyonline*. 7:4:April [Online].
<http://www.css.edu/users/tboone2/asep/Misperceptions.html>
5. Burdick, J. (2004). Sports and Drugs (and rock and roll?). *Philosophy Now: A Magazine of Ideas*. [Online]. <http://www.philosophynow.org/issue41/41burdick.htm>
6. Goldrick, B.A., Larson, E., and Lyons, D. (1995). Conflict of Interest in Academia. *Image: Journal of Nursing Scholarship*. 27:1:65-69.
7. Churchill, L. (1977). Ethical Issues of a Profession in Transition. *American Journal of Nursing*. 77:873.
8. Australian Academy of Science. (2004). Who will win the drugs race? [Online].
<http://www.science.org.au/nova/055/055key.htm>
9. Barr, R. (2002). Cheating in Sports, Our National Pastime. *Sports Byline USA Insight*. [Online]. <http://www.sportsbyline.com/roncomm/roncom47.htm>
10. Josephson, M. (2001). *A Training Program for Coaches on Ethics, Sportsmanship, and Character-Building in Sports. Pursuing Victory With Honor*. [Online].
<http://www.charactercounts.org/sports/Olympic/olympic-report-intro.htm>
11. May, R. (1975). *The Courage to Create*. New York, NY: W.W. Norton and Company, Inc., p. 17.
12. Applegate, E.A. and Grivetti, L.E. (1997). Search for the Competitive Edge: A History of Dietary Fads and Supplements. *The Journal of Nutrition*. 127:5:869S-873S, p. 7.
13. Armsey, T.D. and Green, G.A. (1997). Nutrition Supplements: Science vs Hype. *The Physician and Sportsmedicine*. 25:6:1-9. [Online].
<http://www.physsportsmed.com/issues/1997/06jun/armsey.htm>.
14. Bahrke, M.S. and Yesalis, C.E. (2002). The Future of Performance-Enhancing Substances in Sport. *The Physician and Sportsmedicine*. 30:11:1-4. [Online].
http://www.physsportsmed.com/issues/2002/11_02/guested.htm
15. *National Center on Addiction and Substance Abuse*. (2000). *Winning at All Cost: Doping in Olympic Sports*. National Center on Addiction and Substance Abuse at Columbia University. New York:NY, p. 2.
16. Adam, D. (2001). Gene Therapy May be Up to Speed for Cheats at 2008 Olympics. *Nature*. 414:6864:569-570.
17. *International Olympic Committee Medical Commission*. (2003). Many Dietary Supplements are Contaminated with Steroid-Like Chemicals that Cause a 'Positive' Doping Test and that Are Not Known to be Safe. Sports Nutrition Working Group. [Online]. http://www.edb.utexas.edu/ssn/SN_Papers/IOC%20alert-Supplement.pdf
18. Longman, J. (2001). Pushing the Limits: Getting the Athletic Edge May Mean Altering Genes. *The New York Times*. [Online].
<http://www.nytimes.com/2001/05/11/sports/11GENE.html>
19. Houlihan, B. (1999). *Dying to Win: Doping in Sport and the Development of Anti-Doping Policy*. Council of Europe Publishing.
20. Miah, A. (2002). Bioethics, Sport and The Genetically Enhanced Athlete. *Journal For Medical Ethics and Bioethics*. 9:3-4: p. 2, p. 4.
21. Miah, A. (2002). Genetics, Privacy, and Athletes' Rights. *Sports Law Bulletin*. 4:5:10-12.

Do you think professional sports cheating scandals are part of the game? Are they simply inevitable? Or do they taint sports forever? Vote up the scandals you think were the most destructive to the sports world at large, and leave your opinion on professional cheating in the comments section below.

1. Rosie Ruiz Wins the Boston Marathon by Taking the Subway. Exercise physiologists apply their knowledge with a therapeutic approach aiming to improve quality of life, disease management or treatment outcomes across all populations. This skill set allows them to work in a variety of settings including hospitals, medical centres, community care organisations, occupational rehabilitation, sports teams and community fitness centres. Exercise physiologists work with any people who may be affected by a number of conditions including heart disease, stroke, neurological conditions, COPD, diabetes, chronic pain, mental health conditions, post-operative rehab While many people like to believe that cheaters are dealt with equally from the gridiron to the baseball diamond, the public's tolerance for cheating in sports varies widely. [As an aside, a study in 2006 found nearly 20 percent of Americans think cheating on taxes is morally acceptable, and 10 percent say so about cheating on their spouse.] Sometimes the cheating incident is only briefly noted, such as in 2003 when baseball slugger Sammy Sosa was caught using a corked bat. He claimed it was an innocent mistake and was suspended for seven games, but otherwise the incident has been mostly