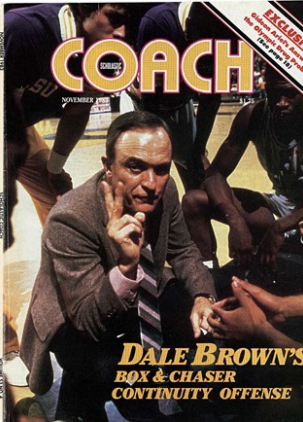




The Pharmaceutical Athlete

What can we do about all the athletes on drugs



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The Pharmaceutical Athlete: An Olympian Dilemma

In this article, Dr. Gideon Ariel, Chairman of Computer Sciences/Biomechanics at the U.S. Olympic Committee, discusses the widespread use of drugs, particularly anabolic steroids, among athletes. He highlights the profound health, political, and ethical implications of this "chemical technology race in sports". Ariel argues that high technology and modern training methods can surpass the pharmaceutical approach to enhancing performance. He also shares his research findings on the psychological effect of steroids on athletes and the potential of training the neuromuscular system to achieve performance gains. Ariel concludes by emphasizing the need for innovation and technology as alternatives to drug use in sports.

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Below find a reprint of the 5 relevant pages of the article "The Pharmaceutical Athlete" in "Scholastic Coach":

EXCLUS!ve
Gideon Ariel's Answer
to the Olympic Drug Problem
(See page 18)

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**THE PHARMACEUTICAL ATHLETE:
An Olympian Dilemma**

What can we do about all the athletes on drugs?

By DR. GIDEON ARIEL / Chairman, Computer Sciences/Biomechanics, U.S. Olympic Committee

THE athletic world went into shock over the drug "scene" at the Pan American Games in Venezuela. The new drug-detecting devices created all kinds of embarrassment for both our athletes and for us as a nation.

We now definitely know: The widespread use of drugs has created a "chemical technology race in sports" with profound health, political, and ethical implications.

As a member of the U.S. Sports Medicine Committee, I am not surprised by these events. The committee has known for years that our athletes have been using steroids to enhance their strength.

At a recent meeting of the council of Sports Medicine, I challenged one of the physicians to reveal exactly how many athletes were on anabolic steroids. His answer was staggering: *Nearly 100% of our weight-event athletes were making extensive use of steroids.*

Role of anabolic steroids...

Questions: With all the technological advances in sport, (1) is drug use really necessary, and (2) can high technology replace them?

I believe that high technology can solve the problem, that modern methods of training can surpass the pharmaceutical approach.

The efficiency of performance depends upon many factors. Since all activities rely ultimately on the voluntary contraction of muscle tissue for driving force, such training is essential for the athlete, particularly for activities in which force is a dominant factor.

Many athletes, in their efforts to improve performance, have been supplementing their training regimens with an endless variety of ergogenic aids and drugs. The anabolic steroids are being used to accelerate the development of muscular force and body weight.

Until recently, the difficulty of detecting them in the urine or blood assured their continued use, despite their illegality. My experience indicates that the top medal winners in most of the recent Olympics have taken one or more anabolic agents.

As early as 1971, Jay Silvester, former world record holder in the discus, was quoted as saying:

There's no question, no question at all, that anabolic steroids have an effect on performance. I don't feel they are ethically defensible, but there doesn't seem to be any way to legislate in or to police the athletes. I've taken the drugs in the past. In fact I was given them in 1964—when I didn't even know what they were—by an Olympic team physician.

Ken Patera, an American competing in the 1970 world weightlifting championships, told the N.Y. Times Magazine (October 17, 1971) that lifters have been using steroids regularly for years.

After winning a gold medal at the Pan American Games, Patera told about an encounter with the Russian champion, Alexeyev, at the Olympics in Munich:

Last year the only difference between me and him was that I couldn't afford his drug bill. Now I can. When I hit Munich next year, I'll weigh in at about 340 pounds. Then we'll see which is better—his steroids or mine.

Despite official censorship, athletes have continued to use anabolic steroids, purportedly to stimulate muscle growth and increase muscular force. Although scientific data on anabolic agents are sparse, there is sufficient clinical evidence that such drugs can stimulate muscle hypertrophy and muscular force.

Remember, much of the evidence is clinical in nature, and research with healthy human subjects is lacking.

Physiological bases for steroids...

In order to understand the problems associated with steroids, it is necessary to study several of the physiological bases for these substances. There are two major systems

for integrating the body's activities: (1) the nervous system, which sends high speed electrophysical signals, such as the action potentials via neurons, and (2) the endocrine system, which sends less rapid chemical messages with hormones via the vascular system.

The hormones modify existing metabolic processes and, therefore, change the rates at which certain vital functions proceed. They do not create new biochemical processes or properties; the hormones are, rather, secreted in response to specific secretory stimuli.

The rate at which they are released is not strictly constant; it varies from low to high according to the nature and intensity of the secretory stimulus.

Minute quantities of hormones are normally present in the blood.

They usually are bound to specific carrier proteins while being transported in the blood. They are believed to be catalytic in effect, since the magnitude of the hormone-mediated response is out of proportion to the amount of hormone required to evoke the response.

Once the hormones have accomplished their missions, their production is diminished or inhibited by the hormones they have produced or by other neuro-hormonal mechanisms. In this way, the endocrine balance is normally maintained.

The steroid hormones are very specific in their structure and physiological actions. The natural anabolic steroids are secreted by the testes and the adrenals. The two main functions of the testes are hormonal and reproductive. Testosterone can be considered the single significant factor responsible for the male hormonal effects caused by the testes.

Psychological effect on elite athletes...

In the early 1970s, the effect of anabolic steroids on elite athletes was of special interest to me, and I conducted several experiments at the U.S. of Massachusetts. These were probably the first investigations conducted with elite athletes, several of whom went on to win Olympic medals.

The first study was on the psychological effect of these ergogenic aids. In the first half of the study, we trained all the athletes with weights. In the second half, we informed the subjects that we were putting them on steroids. We actually fed them placebos—that is, "sugar pills."

The results were interesting—everyone improved more when they thought they were taking steroids! It was obvious that psychological factors influenced their performance.

The study was so intriguing that we instituted another study using a double-blind technique with the drug and the placebo. The oral anabolic steroid and the placebo were identical in appearance and were assigned to the subjects by code—with only the infirmity knowing which was which.

The subjects were divided into two equal groups. Group A received the anabolic steroid the first four weeks and the placebo the last four weeks, while Group B received the placebo and the steroid in the reverse order.

Results: The subjects improved

with their voluntary muscular force both with and without the anabolic steroid, but all showed greater improvement during the drug period (Journal of Applied Physiology, 1972).

The study drew a wave of criticism. Many people refused to acknowledge the findings.

As a member of the Olympic Committee for the past seven years, I (and other individuals) have criticized the Committee's three-monkey approach to this important issue: see no evil, hear no evil, speak no evil. And then came Venezuela...

Nobody could bury his head in the sand anymore. Our best athletes have been asked to drop out or risk disqualification.

At this point, instead of meeting

"As a general rule the most successful man in life is the man who has the best information."

—Benjamin Disraeli

with them and discussing the problem, the USOC blamed the athletes for using anabolic steroids and declared "war" on them.

The Philadelphia connection...

Interestingly enough, a month before the Pan Am Games, a group of scientifically minded people, concerned over the widespread use of drugs in Olympic sports competition and training, held a confidential conference in Philadelphia.

The group included several members and the staff of the Sports Medicine Committee, a distinguished group of consultants (including Olympic athletes and coaches, physiologists and physicians familiar with the drug problem), and representatives from Hahnemann University and the National Institutes of Alcohol and Alcoholism and Drug Abuse.

The participants agreed that many athletes throughout the world were taking steroids regularly, usually in conjunction with other drugs, and that in the power events, such as throwing and weightlifting, practically everyone was a user.

In the Soviet Union, it was reported, drug use was a standard part of the training for many sports. In the U.S., about 300,000 athletes were using steroids to improve their performance.

Another major concern of the conference was that these drugs were also being taken by younger athletes, teenagers and children as young as eight were using steroids and growth hormones.

Trainers and physicians reported that they were receiving an increasing number of parental requests for medications that would improve the performance of their children.

The primary concern of the conference was with anabolic steroids. The UCLA toxicology laboratory has identified more than 85 types closely related to the male hormone testosterone. When originally used by athletes in the early 1960s, the dosage levels were 5 to 10 mg per day. The current practice is 50 to 100 mg daily in track and field and 500 to 1,000 mg daily in the power events.

The preponderance of evidence shows that steroids can improve the performance, often dramatically, of elite athletes who are soundly conditioned and trained.

To escape detection, the athletes cease injections about 40 days before competition and oral dosages 10 to 14 days prior to competition. There is no data on whether steroids are fully eliminated from the body during these intervals.

The negative side effects of steroids, many of which are probably still unknown, are also matters of great concern.

The Philadelphia conference concluded that the use/misuse of drugs by athletes throughout the world was a health problem that still hadn't received full recognition, and that the drug issue was "dynamic," just waiting to explode.

It was a prophetic deduction. The "dynamic" exploded only a few weeks later at the Pan Am Games.

Solution to the Drug Problem...

As one of the first investigators to study elite athletes and anabolic

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"THE PHARMACEUTICAL ATHLETE"

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steroids, we have never stopped looking for a solution to the drug problem. Merely telling the athletes that drugs are "bad" is ineffective. As indicated at the conference, most athletes are willing to sacrifice years from their lives to win the Olympic Gold.

The only effective solution to the drug problem lies in providing suitable alternatives based on our greatest strengths: innovation and technology.

Technology put Americans on the moon, created thousands of inventions, and even gave the Fosbury Flop to the world. It can also provide a technological rather than pharmaceutical "edge" for our athletes.

When an athlete takes anabolic steroids, he or she effects the retention of nitrogen, which leads to the synthesis of protein in the body. Some of the protein is incorporated into the muscular system and builds bigger and stronger muscles.

But stronger muscles alone do not assume optimum performance. The critical factor is speed, and steroids cannot add speed to the muscles, only force.

A recent examination of several elite athletes revealed an interesting point about their speeds. Ben Plucknett, who owns the world record in the discus, Brian Oldfield, the best shot-putter in the world, and Mac Wilkins, the discus gold medalist from Montreal, were tested for bench-press strength at several different velocities.

It was found that at a slow velocity, Plucknett was the strongest.

Plucknett—623 lbs.
Oldfield—275 lbs.
Wilkins—475 lbs.

At an intermediate velocity, Plucknett's strength decreased in comparison with the other lifters:

Plucknett—432 lbs.
Oldfield—274 lbs.
Wilkins—454 lbs.

At a higher speed, Oldfield was found to be the strongest:

Plucknett—235 lbs.
Oldfield—265 lbs.
Wilkins—245 lbs.

Other athletes were tested at the same time under identical conditions. None was able to generate the same level of force even at the lowest speed. The conclusion to be drawn is that our world-record holders have different

capabilities than other athletes for generating power, and it is power, not force, which is the secret to winning. In other words, *generating force at a high speed* is what separates the great athletes from the good ones—and *anabolic steroids cannot contribute to the development of speed*, only to muscular bulk.

Extensive research is currently being conducted (at the Coto Research Center) on the training of elite athletes with a computerized exercise machine. The focus is on determining whether training the neuromuscular system can have a greater effect than drugs on the athlete's performance goal.

Preliminary evidence indicates that significantly effective gains can be obtained from training the nervous system at velocities similar to those generated in the explosive events.

The results suggest an alternative to the steroid approach. Good old Yankee ingenuity can fill the breach. It *must* be used if we expect our athletes to continue to compete at world-class levels.

The two questions that remain are: Can we do enough and do we have the time?

WEIGHT PROGRAM

(Continued from page 71)

have the edge physically and psychologically as a team. Kids can't see the improvement every week. It is a constant fight to motivate them.

Another vital "must" is organization. Make each coach responsible for some aspect of the weight program, whether it is individual awards, testing, attendance, motivation, or just making sure the weight room is picked up. One person cannot do it all.

Prairie is fortunate in having a football staff made up of individuals who are willing to devote themselves during the off-season. As a head coach, I appreciate their efforts. Our program couldn't work otherwise.

One final idea we came across last year was to decorate our weight room with college football posters and schedules. Thanks to all the generous SIDs, we have a weight room with a big-time football atmosphere.

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