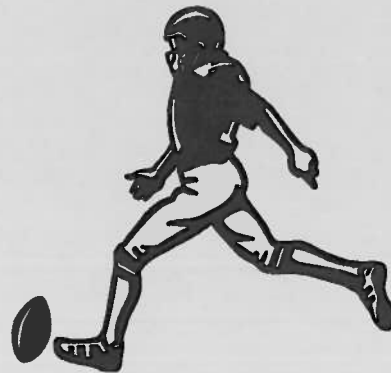
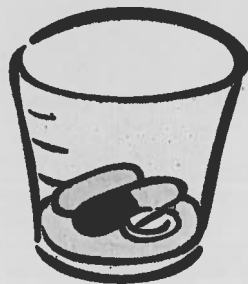


**GRADE 11**

**TOPICS IN SCIENCE**

**DRUGS IN SPORTS  
READINGS**



**DO NOT WRITE IN BOOK**



# Steroids: What are they?

## What Are They?

Ever wondered how those bulky weight lifters got so big? While some may have gotten their muscles through a strict regimen of weight-lifting and diet, others may have gotten that way through the illegal use of steroids.

Steroids are synthetic substances similar to the male sex hormone testosterone. They do have legitimate medical uses. Sometimes doctors prescribe anabolic steroids to help people with certain kinds of anemia and men who don't produce enough testosterone on their own.

Doctors also prescribe a different kind of steroid, called corticosteroids, to reduce swelling. Corticosteroids are not anabolic steroids and do not have the same harmful effects.

But doctors never prescribe anabolic steroids to young, healthy people to help them build muscles. Without a prescription from a doctor, steroids are illegal.

There are many different kinds of steroids. Here's a list of some of the most common anabolic steroids taken today: anadrol, oxandrin, dianabol, winstrol, deca-durabolin, and equipoise. [1],[5]

## What Are the Common Street Names?

Slang words for steroids are hard to find. Most people just say steroids. On the street, steroids may be called roids or juice. [2] The scientific name for this class of drugs is anabolic-androgenic steroids. Anabolic refers to muscle-building. Androgenic refers to increased male characteristics. But even scientists shorten it to anabolic steroids. [3]

## How Are They Used?

Some steroid users pop pills. Others use hypodermic needles to inject steroids directly into muscles. When users take more and more of a drug over and over again, they are called "abusers." Abusers have been known to take doses 10 to 100 times higher than the amount prescribed for medical reasons by a doctor.

Many steroid users take two or more kinds of steroids at once. Called **stacking**, this way of taking steroids is supposed to get users bigger faster. Some abusers **pyramid** their doses in 6-12-week cycles. At the beginning of the cycle, the steroid user starts with low doses and slowly increases to higher doses. In the second half of the cycle, they gradually decrease the amount of steroids. Neither of these methods has been proven to work. [1]

## How Many Teens Use Them?

Most teens are smart and stay away from steroids. As part of a 2002 NIDA-funded study, teens were asked if they ever tried steroids—even once. Only 2.5% of 8th graders ever tried steroids; only 3.5% of 10th graders; and 4% of 12th graders. [4]

## What Are the Common Effects?

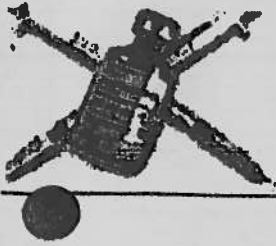
Steroids can make pimples pop up and hair fall out. They can make guys grow breasts and girls grow beards. Steroids can cause livers to grow tumors and hearts to clog up. They can even send users on violent, angry rampages. In other words, steroids throw a body way out of whack.

Steroids do make users bulk up, but the health risks are high. It's true, on steroids biceps bulge; abs ripple; and quads balloon. But that's just on the outside. Steroid users may be very pleased when they flex in the mirror, but they may create problems on the inside. These problems may hurt them the rest of their lives. As a matter of fact steroid use can shorten their lives. [5]

## Steroids Cause Hormone Imbalances

For teens, hormone balance is important. Hormones are involved in the development of a girl's feminine traits and a boy's masculine traits. When someone abuses steroids, gender mix-ups happen.

Using steroids, guys can experience shrunken testicles and reduced sperm count. They can also end up with breasts, a condition called **gynecomastia**.



Using steroids, girls can become more masculine. Their voices deepen. They grow excessive body hair. Their breast size decreases. [1]

### Teens at Risk for Stunted Growth

Teens who abuse steroids before the typical adolescent growth spurt risk staying short and never reaching their full adult height. Why? Because the body is programmed to stop growing after puberty. When hormone levels reach a certain point, the body thinks it's already gone through puberty. So, bones get the message to stop growing way too soon [1]

### Steroid Abuse Can Be Fatal

When steroids get into the body, they go to different organs and muscles. Steroids affect individual cells and makes them create proteins. These proteins spell trouble. [6] The liver, for example, can grow tumors and develop cancer. Steroid abusers may also develop a rare condition called *peliosis hepatis* in which blood-filled cysts crop up on the liver. Both the tumors and cysts can rupture and cause internal bleeding.

Steroids are no friend of the heart, either. Abusing steroids can cause heart attacks and strokes, even in young athletes. Here's how: Steroid use can lead to a condition called atherosclerosis, which causes fat deposits inside arteries to disrupt blood flow. When blood flow to the heart is blocked, a heart attack can occur. If blood flow to the brain is blocked, a stroke can result. [1]

To bulk up the artificial way—using steroids—puts teens at risk for more than liver disease and cardiovascular disease. Steroids can weaken the immune system, which is what helps the body fight against germs and disease. That means that illnesses and diseases have an easy target in a steroid abuser. [5]

By injecting steroids by needle, teens can add HIV and hepatitis B and C to their list of health hazards. Many abusers share non-sterile "works" or drug injection equipment that can spread life-threatening viral infections. [1]

### Steroids Can Cause Extreme Mood Changes

Steroids can also mess with your head. Research shows that high doses of steroids can cause extreme fluctuations in emotions, from euphoria to rage. That's right. Rage can come from how steroids act on your brain. [7]

Your moods and emotions are balanced by the limbic system of your brain. Steroids act on the limbic system and may cause irritability and mild depression. Eventually, steroids can cause mania, delusions, and violent aggression or "roid rage." [5]

### Steroids' Disfiguring Effects

Last, but not least, steroids have disfiguring effects—severe acne, greasy hair, and baldness (in both guys and girls). [1]

The bottom line is: Science proves the serious risks of steroid use.

### References

1. National Institute on Drug Abuse. NIDA Research Report—Steroid Abuse and Addiction (<http://www.drugabuse.gov/ResearchReports/Steroids/AnabolicSteroids.html>). NIH Pub. No. 00—3721. Bethesda, MD: NIDA, NIH, DHHS. Printed 1991. Reprinted 1994, 1996. Revised April, 2000.
2. National Institute on Drug Abuse. Commonly Abused Drugs Chart (<http://www.drugabuse.gov/DrugPages/DrugsOfAbuse.html>). Bethesda, MD: NIDA, NIH, DHHS, 2000.
3. National Institute on Drug Abuse. NIDA InfoFacts: Steroids (Anabolic-Androgenic) (<http://www.drugabuse.gov/Infobox/steroids.html>). Bethesda, MD: NIDA, NIH, DHHS. Retrieved June 2000.

# Another Tour de Pharmaceuticals

## Another Tour de Pharmaceuticals?

1 JULY 1999. One year after a doping scandal struck the Tour de France bike race like a mass crash on a mountain descent, it's déjà vu all over again. In early June, elite cyclist Marco Pantani was ejected -- poised for victory -- from a prestigious Italian race. Instead of glowing on the winner's stand, he spent four hours chatting with cops.

Pantani, the best hill-climber in the business showed signs -- but no proof -- of a banned drug that stimulates the growth of red blood cells. These cells ferry oxygen to the muscles. To an endurance bike racer, red cells are more critical than a hot bike or a rich sponsor. The problem with the drug in question is this: too many blood cells make the blood too thick, leading to deadly clots.



Pantani, humiliated, says he won't start the Tour de France on July 3. The Tour is cycling's toughest -- and most prestigious -- race, a grueling 21-day marathon across more than 2,200 miles of French countryside and Alpine peaks that would make the average cyclist puke -- or hitchhike.

Last year, Pantani won a Tour that most fans want to forget. In 1998, the widespread eagerness to swallow or inject performance-enhancing chemicals caused the removal of seven teams. Rather than traditional sprints across finish lines, television news featured arrests and cars crammed with banned drugs.

Things may not be a whole lot more promising this year. In late May, the French Cycling Federation said half of the 134 pro riders active in France showed in their urine signs of one kind of doping or another. As of this writing, two teams have already been ejected from the 1999 Tour.



However, Johan Bruyneel, coach of United States Postal Service pro cycling team, says this year will be different. "Last year was a really bad year for cycling, bad publicity for the sport and the

~~sponsors. Everybody is aware and everybody wants to play a part to improve the image of cycling and the sponsors,"~~ says the former racer, a Belgian.

"I don't think there's a rider in the peloton [pack] that prefers to take drugs," former Tour de France winner Greg Lemond told Bicyclist Online. "It's simply what [they're] doing to keep up with competition, and if they think everyone's getting away with it, they feel like they need to use it, too. Half of these guys haven't finished high school, have a wife and three kids at home, and if they don't perform, they won't get paid."

In this modern era, sports dopers can pick from the collected wisdom of pharmaceutical science. Among their options are

- EPO, which supposedly increases performance.
- • Testosterone, which increases muscle mass or burns fat.
- • Beta blockers, which slow the heart and help steady the hands of archers and shooters.

In fact, the options are much wider than that. The lists of drugs banned in various sports run into thousands of compounds -- including food supplements as well as prescription drugs commonly used for asthma and other diseases. The banned drugs also include diuretics, used to purge the body of water and dilute telltale signs of drugs in the urine.

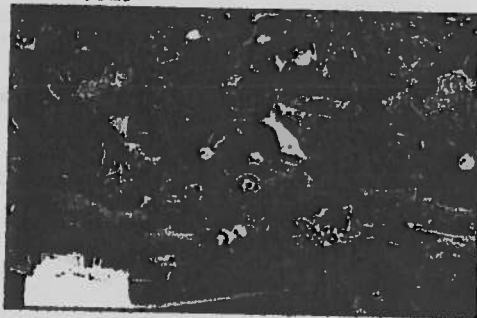
Although doping seems common in pro cycling, the top U.S. team is "adamantly against any kind of performance-enhancing drug," says Margot Myers, spokesperson for the Postal Service team, which will compete again in the Tour. "Every rider's contract says, if they test positive for drugs, there will be immediate dismissal from the team."

Indeed, Bruyneel says that despite the publicity, cycling is a cleaner sport than many. "For the moment, it's one of the cleanest sports in the world... We do urine tests, and we do blood control [testing]. That doesn't happen in any other sport."

**Is it just pro cyclists who rely on doping?**

### **Steroid sales skyrocket**

Cycling may have invented the wheel, so to speak, but not the idea that doping could make you quicker. Athletes in plenty of other sports are similarly caught in pharmacological follies. The all-time home-run king, Mark McGwire, admits to taking a steroid called androstenedione that, while sold as a food supplement and legal in baseball, is banned in many other sports. McGwire certainly hit a homer for the supplements business: The White House office on drug policy says androstenedione sales jumped fivefold after McGwire's unpaid endorsement.



**Sales of a steroid hormone jumped fivefold after the home run king admitted he'd used the stuff**

Swimming seems to be an area of rampant steroid use. Irish swimmer Michelle Smith won three gold medals at Atlanta, but was suspended for four years for tampering with a urine test. Four Chinese swimmers were expelled from the 1998 World Championships for taking diuretics, often used to mask drugs in urine samples.

#### **Why so common?**

Like a hanging in the morning, the public humiliation of bike racers has had a marvelous ability to concentrate the minds of big-time sports organizers. This February, the International Olympic Committee held a widely publicized -- and widely criticized -- meeting in Lausanne, Switzerland, focused on controlling doping by establishing an independent international agency to police sports. The outcome, scoffs Charles Yesalis of Penn State University, was "business as usual" that is unlikely to produce much change. Yesalis, who has studied the use of drugs in sports for 20 years, says the Olympics face a huge problem: "When is the last time -- in public -- they caught a big-name athlete?" Canadian sprinter Ben Johnson was forced to turn in a gold medal 11 years ago. But, demands Yesalis, "What have they done since?" He contends that the International Olympic

~~Committee has been "lying about drugs. There's a lot of good scholarship documenting how widespread they are... Drug use in elite sports has been epidemic at least since the 1960s."~~

Indeed, the Olympic czars seem to have a tempered concern about doping. One of the newest Olympic "sports" is bodybuilding, probably the ultimate steroid-powered pursuit of physical perfection.

**Hypocrisy?**

Everybody loves a winner, someone who can jump further, run faster, or compete longer, and fans' ardor clearly helps explain the popularity of drugs. Sports are more exciting when "larger-than-life people are doing larger-than-life things," Yesalis says. "If you heard the announcer say, 'Ladies and gentlemen, you have just witnessed the 154th-fastest 100 meter dash,' if you saw the NFL [National Football League] and it was a bunch of average-sized guys, would you pay \$200 to go to one of these games? Would NBC or CBS be fighting like crazy for contracts?"

Yesalis says the inaction against drugs also reflects the status of sports as billion-dollar businesses, with high stakes for competitors, advertisers and sponsoring organizations alike: "There are clearly reasons why they don't want this cut -- from a business standpoint."

We dopes at The Why Files want a clear understanding of how works.



### **Another drug war**

The quest for better athletics through chemicals goes back a long time. In 1972, before steroids were banned, 68 percent of Olympic athletes admitted using them. During the 1970s and '80s, East Germany's huge doping program produced legions of highly successful, but oddly mannish female swimmers and track stars. In 1976, the year the Olympics started drug testing, East Germany bagged 11 of 13 women's swimming medals.



After the Berlin Wall fell, some East German sports doctors moved to China. In the 1994 Rome Olympics, Chinese women swimmers accepted 12 gold medals at ceremonies while onlookers protested by waving

syringes. Twenty seven Chinese women have flunked drug tests since 1990, more than the total from all other nations. One way to look at the problem is to gripe about "tainted athletes." On the positive side, the rise of doping is a sign of progress. As medicine identifies the molecular basis for health and disease, it presents athletes with new ways to improve their performance -- some legal, some not.

#### **The tip of the hypodermic?**

Many of the most popular new compounds are identical to natural chemicals made by the body --- making sure detection difficult or impossible. It was one of those undetectable drugs, erythropoetin or EPO, that caused the latest stink in Europe. Biker Marco Pantani, AKA the Pirate, was close to winning the Giro d'Italia, a multi-day race in his native Italy, when he failed a test intended to catch users of EPO.



~~EPO is a genetically engineered version of a natural hormone~~ made by the kidney that stimulates bone marrow to make red blood cells. synthetic EPO is sold as a rescue medicine for treating anemia in end-stage kidney disease, when production of EPO declines.

Because red blood cells carry oxygen to the muscles, and because bikers need a huge amount of oxygen during their arduous sport, raising the number of red blood cells can -- theoretically -- improve performance. Here's a description of the origin of synthetic EPO.



In the past, bike racers tried to increase the number of red blood cells by removing their own blood, storing it, and transfusing it back just before a race. Nowadays, this gory process of "blood doping" has been replaced by genetic engineering. Athletes simply inject EPO, which causes the body to make the cells.

Since EPO is a naturally occurring hormone, testing for it would detect anyone, not very helpful for identifying doped athletes. Unable to measure EPO itself, the mandarins of international cycling at Union Cycliste Internationale (UCI) rely on a surrogate test that measures the density of cells in the blood. Blood, as you'll recall, is composed of cells -- mainly red, but also white -- and serum and other liquids that help the cells flow. A study from the 1980s, before synthetic EPO, showed that bike racers' blood averaged a cellular content of 43 percent, so the UCI decreed that anybody with a level above 50 percent would be disqualified for taking EPO. *It wasn't me, babe*

On June 5, 1999, Pantani, with a cellular content of 52 percent, was ejected from the Giro d'Italia. In a June 11 report in VeloNews, the great cyclist defended his record: "'I am a clean rider,' the 29-year-old Italian told a much-awaited press conference. 'My conscience is clear. I have nothing to do with doping. I am one of the few riders in the world who doesn't have a personal trainer. I don't need doping to win

~~faces, I need hill climbs."~~

Whether Pantani, whose trademark is breaking away from the pack on a hill, is telling the truth or not, it's true that detecting EPO is tricky, since training at high altitude also increases the number of red blood cells.

EPO is not the only genetically engineered compound that could help cyclists and other endurance athletes on the market. Growth hormone, which stimulates the growth of bones and muscle, became so popular that some athletes took to calling the 1996 Atlanta Olympics the "Growth Hormone Games." Like EPO, growth hormone cannot be reliably detected in abusers. Growth hormone can cause carpal tunnel syndrome and swelling in adults who are normally deficient in the hormone; the effects of the hormone on people with normal natural levels are not known.

If EPO and growth hormone are the wave of the future, anabolic steroids are the wave of the present.

### **What happens when kids take steroids?**

#### **Starting young**

Hormones, you'll recall, are chemicals that, in tiny doses, trigger changes in the body. Testosterone, for example, triggers the appearance of secondary sex characteristics in men at puberty. One of these characteristics is the growth of muscles -- a clarion-call to wanna-be athletic dopers.



To anybody who's seen an NFL front line or a pro wrestling match, it's not news that pro athletes are using steroids to

~~build muscles. Although there are definite side effects like acne, kidney and liver problems and reduction of sperm formation, some observers dismiss this use of drugs as a business decision. It may be risky, but then adults are allowed to decide to smoke cigarettes or undertake risky occupations like mining, farming or professional scribbling.~~



~~It's unequivocally wrong to encourage use of performance-enhancing drugs in children.~~

But what about young people who idolize athletes? How will they respond if their heroes take drugs? Various national surveys find between 4 and 12 percent of teen-age boys -- mainly athletes -- taking steroids, says Charles Yesalis of Penn State University. Among teen-age girls, he says, the percentage ranges from 1 to 2 percent -- a figure that doubled during the 1990s.

Even experts who think that adult pro athletes may be justified in endangering their health with chemicals in order to make a living are worried about this trend. "That's my real concern," says Yesalis. "I don't lose sleep over adult athletes, but I don't take the same attitude with children... In my value system, it's **unequivocally wrong**" to encourage use of these drugs in children, he adds.

Performance-enhancing drugs have a "tremendous impact on young people," says Michael Meyers, associate professor of exercise physiology at the University of Houston. "We talk about the health issues with older people. We'll see these problems [like bursitis and arthritis] earlier with young people using them."

**Tearing up knees**

Steroid problems can result when they create imbalances in the body. Normally, the process of athletic training strengthens the entire body in



~~unison, so muscles, ligaments and tendons can all work~~  
together. But because steroids build muscle mass so quickly, the rest of the body cannot adjust quickly enough, Meyers says. "You get a tremendous increase in muscle mass, but the connective tissue does not catch up. The tendons and ligaments are not strong enough," causing such injuries as ligament tears.

Knees are a common victim of overdeveloped muscles, he says. Knee injuries may include a fracture of the femur, the bone connecting the hip to the knee. If the fracture affects the epiphyseal plate, the site where new bone actually grows, the body will grow a bony bridge across the plate, stunting growth in that leg. The other leg will continue growing, causing unequal leg length as the child matures. Although other steroid-induced joint injuries may heal better than this, Meyers says the joints are never "quite the same again."

**Education = salvation?**

If we want kids to avoid performance-enhancing drugs, the solution is to warn them of the dangers, right? Not always, Meyers says. "They tell kids about steroids, and the next thing they ask is, 'How do you use this, how do you administer it, and what dosage?'" In many cases, Meyers says, "the project backfires." Drug education to fight doping, he concludes, amounts to "putting a Band Aid on a bullet wound."

If not education, what else might work? Meyers says it would help if more adult athletes eschewed doping. "I think role modeling is most effective, but you have a lot of role models who are using these things." With pro athletes, he says, "You are dealing with financial security and endorsements," and drugs are common. In professional U.S. athletics, he says, "Anybody is trying to get that edge -- it's a lot more widespread than we take it for."

Other suggestions include testing at random, rather than testing only winners, and testing before competition, when steroids and other training drugs are more likely to be present. Harrison Pope, a psychiatrist at McLean Hospital in Belmont, Mass., who deals with steroid usage, says steroids benefit users because people admire their bodies. "If people could recognize a steroid user, and realize he was simply a product

~~of the drug, and not a health, fit, dedicated athlete, that would help."~~

And how do you recognize a steroid user? "You cannot get bigger than a certain size without steroids," Pope insists.

"Anybody who goes beyond that threshold and says he's not taking steroids is lying."

**What do steroids do to your mind?**

**All In the mind?**

Testosterone -- the male hormone -- has gotten a bad rap lately. Name a social ill related to violence -- war, wife-beating, child abuse -- and it's likely been blamed on testosterone and the many closely related compounds.

Medicine's standard answer to the question of whether steroid doping has psychological effects on athletes has been "no," says psychiatrist Harrison Pope of McLean Hospital in Massachusetts. But he says that's a misconception resulting from the fact that medical experimenters cannot ethically give large doses of steroids.

In the lab, testosterone doses would be limited to 300 milligrams per week. Real athletes, Pope notes, take more than 1,000 milligrams, leading to "a whole different ballgame" where psychological symptoms become "common, and can be very severe."

Pope, who sometimes serves as an expert witness in court, says he's been "involved in a dozen murder cases where someone went on steroids and killed somebody without a history of violence or crime beforehand." In one case, a 16-year-old boy was charged with killing his 14-year-old girlfriend. Pope says, "We have no evidence of any criminal or violent activity before he started taking steroids. At that point, he had a series of run-ins with the police, which culminated in the murder. He was convicted and sent up for life."

As the example shows, wives and girlfriends are often the victims of men who are cranked up on steroids. In a study of 88 athletes who used steroids, Pope found 23 percent of current users reporting "major mood disturbances" including mania and major depression. Steroid users also reported aggressive or violent incidents.

...one user, using his fists and a metal bar, seriously damaged three cars, all

~~with their drivers cowering inside, because he had become annoyed by a~~  
traffic delay. Another was arrested for causing \$1,000 of property damage  
during a fit of anger at a sporting event; another was arrested for assaulting a  
motorist; another rammed his head through a wooden door.... Several users  
reported that they were expelled from their homes by parents, wives, or  
girlfriends because they became intolerably aggressive. (See "Psychiatric  
and Medical Effects..." in the bibliography)

But steroids are not only about hyper-masculinity. In this study, as in many others, I  
reported larger breasts and smaller testicles. Go figure.



# The Awful Truth About Drugs in Sports

From Outside Magazine July 2005

## The Awful Truth About Drugs in Sports

*Cheaters can't be stopped. Testing costs a fortune. It's shockingly easy to beat the system. The drug cops are perpetually playing catch-up. Says who? Drug-testing expert Don Catlin, that's who. He's the doping detective who helped break the BALCO scandal wide open—and the man who's about to launch a radical new campaign to finally solve the problem.*

By **Brian Alexander**

I KEEP WAITING FOR DR. DON CATLIN TO SOUND THRILLED, or at least mildly pleased, about the mushrooming furor over the use of performance-enhancing drugs in sports. Catlin, after all, helped break the now-infamous BALCO doping scandal from this very office, a small, dark, paper-strewn space inside the UCLA Olympic Analytical Laboratory. The lab is one of the world's top facilities for analyzing biological samples from athletes to detect the use of banned substances like anabolic steroids, the blood-oxygen booster erythropoetin (EPO), and scores of other prohibited drugs that aid performance.

But Catlin—a tall, balding, 67-year-old M.D. with a handsomely craggy face—just frowns when I prod him. He sips from an old coffee mug and says the current media blitz reminds him of every other time doping has hit the news: There's a lot of noise, and yet doping persists. He thinks about this a moment and then issues a bleak verdict on the drug-policing system in which he's toiled for the past 25 years.

"People are following this old model—run 'em down, chase 'em, find 'em, assume they are guilty, drag them into testing," he says. "And athletes still get away with stuff, and I maintain you can get away with stuff with everybody looking *right* at you."

This realization has left Catlin profoundly frustrated. A few hours after we first meet, we sit in his lab chatting about doping politics and watching a young woman scan a computer readout from a testing machine. Suddenly, Catlin blurts out, "I don't want to do it anymore. I am 67 years old. I can walk out of this lab, turn the key, chuck it out, and say, 'That's the end. I'm going skiing.' "

Millions of dollars' worth of high-tech gear is whirring all around him. Beyond these



*THE JUICE: Brian Bishop, a technician at the UCLA Olympic Analytical Laboratory, with a rack of urine samples (Jeff Minton)*

walls there's an entire international bureaucracy devoted to catching cheaters. If Catlin is right, and all that won't stop doping, the sports world has an even bigger credibility problem than most of us realize.

And sports definitely has a problem, what with the recent congressional hearings about Major League Baseball's steroid scandal and lingering suspicions that many events—from the Olympics to the Tour de France—are tainted by cheating. In the past two years alone, U.S. anti-doping authorities have uncovered 77 violations. Most recently, homegrown cycling fans suffered a major blow when Tour stalwart Tyler Hamilton was hit with a two-year suspension after allegedly transfusing another person's blood into his body in an effort to boost endurance.

In response, sports and legislative leaders are piling on bigger punishments for doping offenders and demanding ramped-up testing. But Catlin is convinced more of the same won't help, and his voice can't be ignored: He's an insider who knows all about what science can and can't do to stop doping. He ran the drug testing for the 1984 Los Angeles Summer Olympics, the 1996 Atlanta Summer Olympics, and the 2002 Salt Lake Winter Games. These days, his lab conducts tests for the United States Anti-Doping Agency (USADA), the body that oversees drug testing for American athletes in all Olympic sports. He performs testing for the NFL, the NCAA, and minor league baseball. That's a tidal wave of tests, about 35,000 urine (and, occasionally, blood) samples per year, making his the busiest lab of its kind in the world.

Catlin also helps develop new tests, with help from the 40-some researchers and technicians in his lab—including six Ph.D.'s. In 2000 the lab figured out how to differentiate natural testosterone from an artificial drug form made from yams. Just before the Salt Lake Games, Catlin and his team came up with a way to test for darbepoetin, a long-acting form of EPO, a drug that athletes inject to increase endurance. That test was used to bust cross-country-skiing gold medalists Johann Muehlegg, of Spain, and Larissa Lazutina, of Russia.

More recently, Catlin has played a starring role in the BALCO case, the biggest scandal of them all and a strong indicator that, as Catlin has long argued, there are labs out there secretly working to help cheaters outfox the doping police. In a sprawling affair that's still under grand-jury investigation in California, the Bay Area Laboratory Co-Operative, a Burlingame-based company run by a musician-turned-businessman named Victor Conte, allegedly sold potions called "the Clear" and "the Cream." According to illegally leaked grand-jury testimony described in the *San Francisco Chronicle*, these turned out to be steroids used by big-name athletes like baseball's Barry Bonds and Jason Giambi, plus a slew of track-and-field stars. (Giambi has admitted to taking THG; Bonds maintains that he had no idea the substances he was provided by BALCO were steroids.)

BALCO came complete with a B-movie mystery plot. In June 2003, a syringe was mailed by an anonymous source to USADA. (The source turned out to be Trevor Graham, a former coach of track star Marion Jones, who is under investigation by

~~USADA but has not been formally accused of anything.)~~ USADA sent it to Catlin, and his lab deciphered the syringe's contents as a previously undetectable, custom-made steroid that he called THG. Because doping authorities are allowed to hold on to urine samples for up to eight years, Catlin's lab was able to test urine taken from athletes who participated in the U.S. Outdoor Track and Field Championships in June 2003.

When the results came in, four stars of U.S. track and field, among them U.S. shot-put champion Kevin Toth, tested positive. The current world-record holder in the men's 100 meters, Tim Montgomery, reportedly admitted to the BALCO grand jury that he had used THG, too. Montgomery, who denies using any performance enhancers, has since been charged with doping by USADA. At press time, a hearing was scheduled for early June.

At first, Catlin was encouraged by the busts, but now he believes BALCO only proved what he already suspected: Doping has gone big-time, and the current anti-doping regime can't hope to stop it. "The system has failed to deal with the problem," he declares. "And it will fail now."

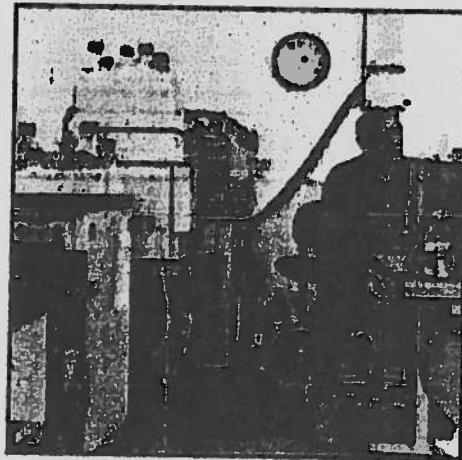
#### The Awful Truth About Drugs in Sports (cont.)

##### THE STATE OF THE ART

Catlin has no intention of giving up, though. Instead, he's decided to mount a campaign to radically change the way sports go about fighting drugs—an idea that he's revealing publicly for the first time in *Outside*. Catlin's vision is to replace the current law-enforcement model—in which all athletes are treated as suspects who are monitored and tested to find evidence of specific drug use—with a reward model, one driven by a new voluntary system that, he hopes, would enable officialdom to actually prove that the athletes who take part in it are clean.

As we'll see, there are serious questions about this scheme's practicality, and Catlin knows that, for his idea to gain traction, sports leaders and drug testing's entrenched power structure will have to accept that the current system is fatally flawed.

That's a tall order, but whatever the outcome, Catlin's pending crusade is a notable attempt to debate and reform what has become a complex, expensive, and inefficient system for detecting performance boosters. A startling figure shows just how costly the current system really is. Last year, USADA charged 38 athletes with doping violations, including some from the BALCO scandal; based on its 2004 expenses for testing, legal costs, research, education, and administration, each violation it discovered cost USADA \$320,404—a huge per-person tab.



*"The system has failed, and it will fail now": Catlin inside his lab. (Jeff Minton)*

The World Anti-Doping Agency (WADA) sits at the top of this pyramid. It was created in the wake of a famous 1998 scandal that dramatically exposed the warts of the old system, in which various sports federations, as well as the Olympics, ran their own anti-doping operations. During that year's Tour de France, French customs officials stopped a car driven by Willy Voet, a masseur for the Festina team, and found a stockpile of EPO. Festina director Bruno Roussel admitted to doping riders, and he, Voet, and a team doctor were charged with drug-law violations and briefly jailed. Festina star Richard Virenque later confessed and was suspended from competition for nine months.

While the scandal threatened to collapse the Tour, it also frightened officials at the International Olympic Committee (IOC). They had long known doping was rampant, but aside from the occasional high-profile enforcement action, like sprinter Ben Johnson's expulsion from the 1988 Seoul Olympics for steroid use, they'd failed to institute a rigorous protocol for catching cheaters.

The following February, then-IOC president Juan Antonio Samaranch convened a meeting at the IOC headquarters, in Lausanne, Switzerland. Two days later, officials emerged with a plan to create WADA as an independent anti-doping agency. WADA's 2005 budget is \$23 million, half of which comes from the IOC. The rest comes from governments around the world.

Not all sports fall under WADA's jurisdiction, of course. Major League Baseball and the National Football League set their own drug policies, and these leagues have to negotiate terms with their players' unions. But the dozens of sports federations that have signed on to WADA—the Union Cycliste Internationale (UCI), for example—must abide by its decisions.

WADA establishes banned methods (such as blood infusion) and the roster of prohibited substances, a list of nearly 200 steroids, stimulants, beta-blockers, diuretics, narcotics, and human hormones that can be dispensed as drugs. All active, elite-level WADA athletes are considered to be part of the "testing pool," and at any time they may be required to provide a urine or blood sample—either during competitions or by surprise while they're traveling, training, or at home.

Based in Montreal, WADA is run by a foundation board and its chairman, Canadian lawyer Richard Pound. It does no testing on its own. Rather, it has accredited a global chain of 33 laboratories like Catlin's to conduct doping tests. National anti-doping agencies, like USADA, are responsible for actually collecting samples, requesting tests from labs, and charging and prosecuting athletes. USADA is financed by American taxpayers, who pay about two-thirds of its \$11 million annual budget, and the United States Olympic Committee, which pays about a third.

As it goes about its business, USADA often performs surprise sampling, with names chosen by an automated draw. So, for example, an American cyclist training in this country might hear a knock on his door from a USADA doping-control officer. In a typical procedure for male athletes, the officer follows the cyclist into a bathroom, then

asks him to raise his shirt and drop his pants so he can get a close look at the athlete's penis. (Cheaters have used bizarre tricks to fake out control officers, including hiding containers of clean urine up their rectums and releasing it through a hidden tube.) The cyclist then urinates into a bottle and divides that sample between two more bottles, labeled A and B. USADA sends these samples to Catlin. The A sample will be tested, the B used to confirm any positive results.

When the same rider shows up for events like the Tour de France, the UCI takes over. It will choose which riders to test—typically the stage winner, the overall leader, and two chosen at random—and what to test for. It then ships the samples to a WADA-approved lab.

Athletes accused of doping can fight the charges by contesting them before a panel of three arbitrators from the Lausanne-based Court of Arbitration for Sport (CAS), the Supreme Court of sports doping. Should a test turn up positive and be confirmed, punishment can range from a warning or suspension to a lifetime ban, depending on the drug, the circumstances, and the athlete's past record.

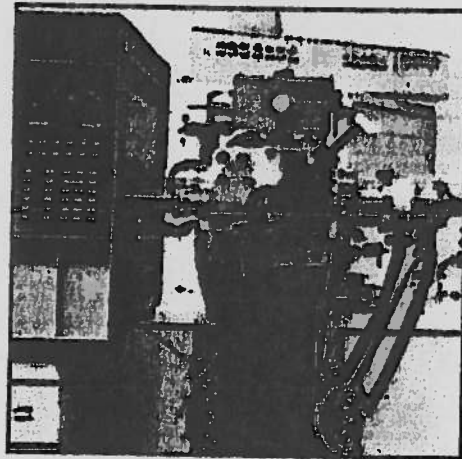
#### The Awful Truth About Drugs in Sports (cont.)

##### INSIDE A DRUG LAB

Catlin's lab is the business end of this system, and his team is exquisitely good at finding drugs on the WADA list. The facility has handled about 300,000 tests over the past 21 years, and it has never produced a false positive. If Catlin says you've doped, you've doped.

Approaching the lab from the outside, you wouldn't know to be impressed. It's housed in a drab off-campus building that looks like a converted Quonset hut, and it sits next door to an auto-repair shop. Just inside the front door, there's a tiny reception foyer where I wait for Caroline Hatton, a forty-something Ph.D. chemist who helped organize the lab and who will escort me through the complete cycle of a drug test. While I wait, a UPS man arrives with a load of boxes. A Huggies carton sits right on top, so mundane as to be incongruously funny—inside are several of that morning's urine samples.

Hatton appears and we walk back to the large, equipment-jammed lab, where we watch technician Yvonne Chambers heft the Huggies carton onto her work table, slice it open, remove several smaller boxes, unseal them, and lift out two bottles marked A and B. They come with a form identifying the sample by gender and sport, with a list of tests to be performed. The sample belongs to a male weight lifter who falls under the



**TOOL OF THE TRADE:** a mass spectrometer, used to identify suspect substances (Jeff Minton)

jurisdiction of USADA. There's no name; he's just a number. During A-stage tests, Catlin's lab never knows the identity of the athlete.

Chambers labels each bottle for tracking purposes. Using a hand pipette, she places some of the A sample in smaller glass tubes, each for use in a separate test. While Chambers works, Hatton explains that the B sample will be stored, to be opened only if the A is positive. For a doping charge to stick, both A and B must be positive. Under the rules, an athlete has the right to observe B-sample testing or send a representative. When this happens, the athlete is first ushered into a waiting room across the hall from Catlin's office and shown the B sample.

Hatton, a small, thin woman, tells me she once met with a male athlete in that room. When she handed him the B sample, she recalls, "he dropped his bottle accidentally on purpose, but it failed to break. After a few seconds of stunned silence from both of us, he picked it up, then smashed it on the floor." Incidents like that explain the taped line on the lab floor around every workstation. Witnesses to B-sample testing are forbidden to cross it.

The lab offers a package of tests for the most commonly abused steroids, like nandrolone and stanozolol. Since the lab's decoding of THG, the standard workup has included it as well. USADA also wants this sample tested for such things as human chorionic gonadotropin, a hormone women generate when pregnant. Dopers sometimes use it to prevent their testicles from shriveling—a side effect of taking steroids.

As the sample moves through various stations, the urine is processed, or "derivatized," so it can be put through a gas-chromatography/mass-spectrometry machine, known as a GC/MS. The steps include several refining and filtering procedures that reduce the sample's volume to a tiny amount of liquid at the bottom of a bullet-shaped vial.

This vial is loaded onto the carousel of a GC/MS, which is about the size of a large microwave oven. The machine heats the sample to between 284 and 356 degrees Fahrenheit, turning it into a gas. The gas is driven through a column, a coiled silica tube a quarter of a millimeter in diameter. As the gas moves through the coil, the various ingredients in urine physically separate like school kids marching single file.

Next, the urine's components enter the mass-spectrometer portion of the machine. This device measures the atomic weight, or mass, as well as the prevalence of various atoms or molecules, and it scans the components one at a time. Since every molecule has a signature molecular weight, the machine can create a personal snapshot of each, depicted as peaks on a computer readout. Years of experimentation have yielded a collection of telltale peaks for drugs of interest and their by-products.

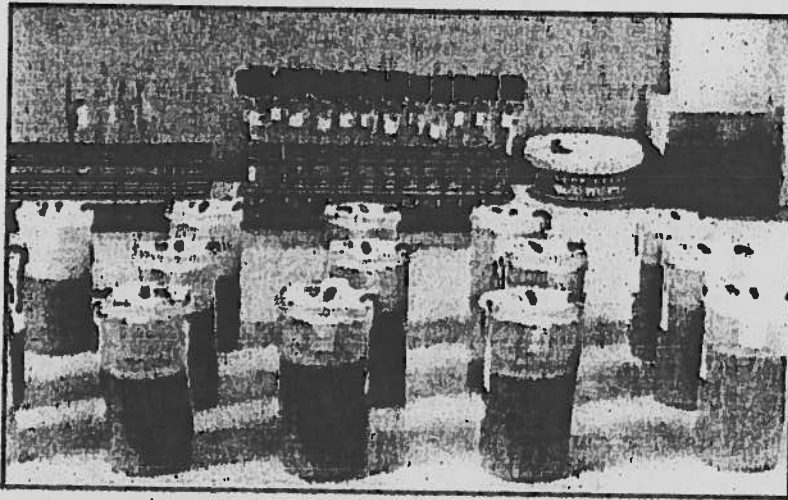
Notably, the procedure I'm watching wouldn't work for THG. By luck or intent, the steroid's designer—whose presumed identity is widely known but who hasn't been publicly named by investigators—created a molecule that disintegrates when heated, so using a GC/MS destroys it, making it undetectable. Instead, the lab has to use a related



technique, liquid chromatography/mass spectrometry, which analyzes the material in a liquid state. Both GC/MS and LC/MS are accurate to within one part per billion.

Seeing Catlin's team at work is impressive, but the experience also raises a question. The people here clearly know how to find drugs. A complex international network has been set up to collect samples from athletes. The whole operation looks like a pretty tight net. So why can't it work?

#### The Awful Truth About Drugs in Sports (cont.)



*(Photograph by Jeff Minton)*

#### **HOW ATHLETES CHEAT**

I pose that question to Hatton, who laughs at the idea that athletes can't beat these tests. "People always say, 'I have always tested clean,' not 'I do not dope,'" she says. "We hear that and giggle." Her reaction confirms what other experts have told me: Dopers evade detection all the time.

Take the case of Tim Montgomery. According to press reports, Montgomery told the BALCO grand jury he used THG.



---

Testing experts seem certain that athletes who cheat often evade detection. "People always say, 'I have always tested clean,' not 'I do not dope,'" says Caroline Hatton. "We hear that and giggle."

---

tuned only to watch for known drugs. Introduce an unknown and the machines can go blind.

Thousands of such combinations are possible, and in a globalized world, these drugs can be made anywhere. In fact, long before BALCO, Catlin argued that clandestine chemists were busily supplying designer steroids to jocks and bodybuilders. Not many people listened. But all they needed to do was scan the Web, where the underground experts talked about exactly what they were doing. As if to further prove Catlin's argument, another designer steroid, dubbed DMT, was discovered at the U.S.-Canada border in December 2003. Like THG, it was found only because of a tip.

As difficult as finding steroids can be, they're a snap compared with the class of drugs based on natural human proteins. The most famous of these is EPO. Because EPO stimulates the body to make more red blood cells, which carry oxygen, athletes who use it get an endurance boost. This makes it especially popular in cycling, cross-country skiing, and distance running.

Another drug based on a natural human protein, human growth hormone (HGH), joined EPO as a doping agent about ten years ago. As its name implies, HGH helps athletes build muscle and bone, adding strength and power. HGH accomplishes this by stimulating the release of yet another protein, insulin growth factor 1 (IGF-1).

These protein drugs are a challenge because they occur naturally in all of us. For more than a decade, testers have been researching ways to tell the difference between natural and artificially introduced proteins. EPO was knocked off first, thanks to a 2000 test developed by scientist Françoise Lasne, of France's National Anti-Doping Laboratory.

The Lasne test is an extremely complex procedure involving a biology lab full of ingredients. It requires nearly three days and dozens of steps, most done by hand. The time factor is one reason why the Tour de France relies more heavily on a simpler hematocrit test, a measure of the volume percentage of red cells in the bloodstream. If a rider's hematocrit exceeds 50, the cyclist will be banned from starting that day.

But he has never tested positive, even though he was tested four times in 2001, three in 2002, and five in 2003. Another example is British cyclist David Millar. Though he never failed a drug test in eight years of riding, he admitted in 2004 that he'd used EPO.

THG itself was invisible to testers until Graham mailed the infamous syringe. Making such a designer steroid isn't even difficult. The UCLA lab reverse-engineered its THG sample and determined that its manufacturer had probably taken an existing steroid and bubbled hydrogen gas through it to slightly alter its structure. The ease of such tinkering matters, because Catlin's machines are

The Lasne test exploits the difference between natural and exogenous ("out of the body") EPO. When drug companies make EPO, the sugar molecules in it are subtly altered from the natural form. The test measures this difference by using a technique called isoelectric focusing, in which an electric charge sends the EPO scooting through a gelatin slab. Exogenous EPO will stop in a slightly different position than natural EPO. The slab is then blotted, and the blotting material is "developed"—not unlike a photograph. This creates an image of small black blobs aligned in rows. If blobs appear in the range where exogenous EPO is known to stop, that means the athlete doped.

Sounds good, but the test can detect exogenous EPO for only three days after the last time an athlete injected it. Unfortunately for the testers, the performance boost can last several weeks, and new red blood cells can survive for about 120 days. So a cyclist could use EPO, stop four days before a test, and still reap benefits.

This brief window also helps defeat surprise sampling. A doping-control officer has to physically find an athlete to collect a sample. Though athletes are supposed to tell anti-doping authorities where they live and where they'll be, Catlin argues that "any good athlete can wriggle out of that and be somewhere the tester isn't. We are chasing the cheaters around." USADA statistics support Catlin: In 2004, the agency recorded 507 missed tests.

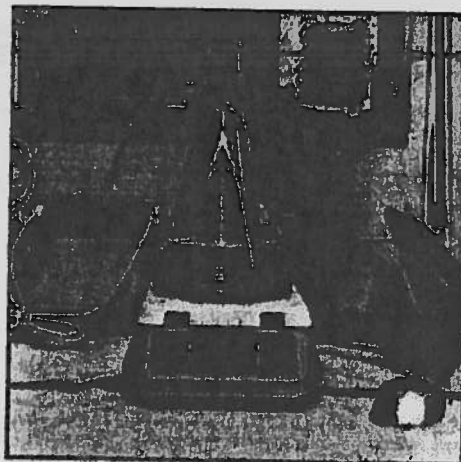
Still, as the case of Tyler Hamilton seems to indicate, some athletes have already decided to shift away from EPO. Hamilton is accused of boosting his red-cell count by transfusing somebody else's blood. Such cheating is detectable because, even if you transfuse blood matched by type—A positive, AB negative, and so on—the blood will have slightly different immune properties from person to person. The test uses a machine called a flow cytometer to sort cells according to these differing properties. But this test has a weakness, too: It can't be used to tell if an athlete has blood-boosted by extracting his own cells during training, storing them, and then injecting them before competitions.

Because there are so many complexities, architects of the anti-doping system may be hurting their cause by trying to keep up with every new technology. For example, in 2003, Kenyan runner Bernard Lagat—later the silver medalist in the 1,500 meters at the 2004 Athens Olympics—was refused entry into the track-and-field world championships after a urine sample from him tested positive for EPO. He denied doping, and his attorney asked German cell biologist Hans Heid to observe his B-sample testing. Lagat's B sample was negative, which didn't surprise Heid. He declared the EPO test "error-prone" and told WADA that "the development of totally new urinary EPO tests should be encouraged and funded."

Heid says WADA authorities told him they knew the test was flawed but were happy to have a test at all. Catlin believes the EPO test was introduced prematurely. WADA clearly saw the need for refinements, too: Last year, four years after the test was first used, WADA issued a refined protocol for performing it.

### CHASING THE FUTURE

WADA's rules demand abundant caution before declaring a test positive, and during my visit to Catlin's lab, I see why. When Allison Evans, who runs many of the EPO tests for Catlin, shows me the results of one test, I think it looks positive. But after applying a statistical analysis, she declares it negative. Catlin says he thinks his lab, owing to caution, exonerates ten guilty EPO users for every one it declares positive. He says he's so fed up with the politics of the test that he's decided not to reapply for a USADA grant that supports the EPO research in his lab.



(Photograph by Jeff Minton)

Heid says the whole idea of routine testing for proteins is worrisome. "Analyzing tiny amounts of samples belonging to the protein field gets really complicated," he says.

"Most of these methods for [proteins] are still in development, in a research state, and not even useful in practical work."

The doping cops are in an impossible situation. They take heat from legislators for not getting ahead of the game. But they're armed with dime-store research budgets, while underground scientists create new avenues for cheaters.

This bodes ill for WADA's ongoing effort to develop a test for HGH and IGF-1. After a decade of research, experts don't even agree on whether or not a validated, usable HGH test exists. WADA says it does. Catlin and other sources say it doesn't.

The test in question may prove useful one day, but Catlin says "there is a big gap between having a test and having a bulletproof test," adding that, as of now, the proposed HGH test results would never withstand a legal appeal.

Even if the test did hold up, it suffers from the same flaw as the EPO test—a short time frame of detectability. The next big challenge will be gene doping—a theoretical procedure that's probably years or decades away, whereby genes would be transferred into muscle or bone marrow—which might be impossible to test for.

The advance of technology places WADA and USADA in an impossible situation. Both take heat from legislators, for failing to get ahead of the cheaters, and from athletes and their lawyers, who say the rules are burdensome and unfair. Yet they're armed with dime-store budgets and asked to defeat doping even while science creates new avenues for it.

Catlin is almost militant in his view that the system is grossly underfinanced. The testing program in his lab runs on about \$2 million per year, supported by fees. (The

~~standard steroid panel I watched cost USADA about \$82.) Catlin can reinvest some of these proceeds back into the lab, but the rest is turned over to UCLA, which owns the facility. If Catlin wants to do research or buy new machines, he's dependent on grants, mainly from USADA or WADA.~~

He estimates the worldwide research budget at somewhere between \$20 million and \$25 million per year, about what Barry Bonds will make this year (\$22 million) and a pittance compared with the billion-dollar TV deals for major sports. The IOC may be a huge multinational business, but WADA still has to beg money from it, and, Pound says, outside agencies that could kick in, like government health institutes and philanthropists, "are far more interested in finding a cure for cancer or diabetes rather than analyzing urine of perfectly healthy athletes."

No wonder Catlin says there's no way to win.  
The Awful Truth About Drugs in Sports (cont.)

### **THE PRAGMATIST**

So why persist? Partly because Catlin, a man who can seem cranky even on a good day, refuses to give in. "I just can't turn in my badge," he tells me. But there's a deeper answer. Beneath a gruff exterior softened by a dry sense of humor, Catlin really believes that sports are a vital part of the human experience, and he wants that experience to be honest.

Other than his two sons, whom he raised alone after his wife died of cancer, this work has been Catlin's greatest passion for 25 years. To him, sports doping is a "grubby, dirty, nasty, filthy business." Catlin's view of his mission is consistent with his character, which combines a serious sense of justice with a dash of Yankee pragmatism.

He was raised a New Englander, graduated from Yale University, and received his medical education at the University of Rochester, graduating in 1965. As a freshly minted doctor specializing in internal medicine, he entered the Army at the height of the Vietnam War and was stationed at Walter Reed Army Medical Center, in Washington, D.C.

One day, Catlin read a newspaper account of a D.C. storefront drug campaigner, a guy who dressed up in old Army fatigues and went around snatching addicts off the streets, hauling them to his "treatment" center, and reforming them. The government was planning to close him down because he had no staff doctor. Catlin went to his headquarters and volunteered.

Meanwhile, in Vietnam, soldiers were dealing with the danger and drudgery by shooting up heroin. Catlin, now considered a drug-addiction expert by the Army, got the nod to head up a treatment program. He fought with generals over their plan to jail addicts, insisting that punishment wouldn't solve the problem. Instead, he focused on getting addicted soldiers out of Vietnam, then treating the addiction.

In 1972, UCLA recruited him to its med-school faculty; he was still teaching when Los Angeles was selected to host the 1984 Olympics. Though a few academic labs, primarily in Europe, had researched sports doping, and the IOC had started using limited doping tests at the 1968 Summer Olympics in Mexico City, there hadn't been much work done in the U.S. Catlin was asked to set up a lab for the L.A. Games, a job he thought would be nothing more than an interesting diversion. He's been at it ever since.

Catlin loves pure athleticism, and he's upset that drugs have made the very fact of greatness a cause for suspicion. He first encountered this reality soon after he started the lab. One day, track coach Pat Connolly stormed into his office. At the time, Connolly was coaching sprinter Evelyn Ashford, who would go on to win four gold medals and a silver in three Olympics. Back then there were whispers that Ashford's success was due to drugs. But Connolly knew Ashford was the best natural athlete she'd ever coached, and there was no way she would allow innuendo to mar her accomplishments. She wanted Catlin to help quash the rumors.

"I went in and said, 'Come out to practice anytime,' " Connolly remembers. "Do not tell us when. Come every day. Whenever. Get samples, test blood, whatever, so we can document. Then, once fingers start to point, we have this record."

Catlin watched Ashford work out and came away in awe. She didn't look like she was on drugs—she was lean, not bulky—and she had a natural grace that convinced him her talents were pure. "Don said, 'Evelyn will never need this. She will not have that problem,' " Connolly recalls. "I did not like his answer."

"She was mad at me," Catlin says. "But she wanted me to test Evelyn and declare her drug-free," and he could not think of any scientific way to give an athlete a formal stamp of approval. He sympathized with Connolly, though. It seemed unfair to be accused just because you were good.

"Though I could not do anything then, the thought was indelibly stamped in my mind," Catlin says. He assumed that, in time, a system would emerge that could exonerate pure athletes like Ashford.

"Something had to give," Catlin says. "It's been 20 years, and nothing gave."

The Awful Truth About Drugs in Sports (cont.)

### A MODEST PROPOSAL

So now, at 67, with his career winding down, Catlin has decided it's time to act. He believes a major upheaval in the anti-doping system is the last best hope for making drugs in sports nothing more than an insignificant irritation. He thinks he's come up with just such an approach, and he's decided to push hard for it in hopes of capitalizing on the recent surge of interest in the issue.

~~He calls his idea the Volunteer Program. It's driven by the concept of using science, testing, and free-will participation to prove that athletes who sign up are clean, based on thorough biological profiles of their bodies. Catlin would use these profiles to create a set of "biomarkers" that show what is and isn't normal for each athlete. Armed with these indicators, he would~~

---

Catlin would try to prove that athletes who take part in his system are clean. Participants would submit to exhaustive biological profiles, for comparison with cutting-edge data on what is and isn't possible in the human body.

---

institute ongoing, voluntary checkups for any athlete who chooses to participate. In return for entering the Volunteer Program, athletes would receive recognition as members. The public, press, sponsors, and governing bodies would be assured that members of the program were not doping.

In this, the idea resembles one floated in the early nineties by Pat Connolly and Charles Yesalis, a Penn State health-policy professor and scathing critic of the current drug-testing system. They suggested creating a Team Clean. But Catlin would bolster the concept by deploying the latest research and technology to make clean a meaningful

word.

First he wants to mount a research project using ordinary weekend athletes, such as college students. A number of biomarkers—blood pressure, cholesterol, total testosterone, hemoglobin, IGF levels, and many others—would be monitored and plotted over time to see how they vary between people and within each person's body. What happens, for example, during a long trip? How does having the flu affect biomarkers? Or doing a workout? The idea is to create a fixed portrait of each athlete so each can serve as his or her own standard.

Then, in a move sure to be controversial, the test subjects would be given safe doses of performance-enhancing drugs for a limited time. Their biomarkers would be monitored to see how the physiological portrait changed.

Using this data, Catlin wants to try the Volunteer Program with one sport, like weight lifting, which has the advantage of a small population that's tested frequently. If it works there, he wants to expand it. Athletes who volunteered would establish a pattern of historical data on their own physiology through frequent biomarker testing. Samples from that testing would be stored and used as reference materials.

For instance, if the monitoring shows a spike in a weight lifter's IGF-1, that probably means he's doping with growth hormone. At that point, Catlin says, a doctor would call the lifter in and say, "Joe, we've been following you for six months and suddenly your IGF is way up. I'm worried. Let's talk."

"You'd approach it as a physician does a patient," Catlin continues. "Is something going on in your life? I am worried you are taking growth hormone, and you know we do not have a bulletproof HGH test, but we do have these blood markers, so I want you in here every week. We are going to track you, and I want to see that go down, and if it doesn't



~~go down, a committee of your peers, other athletes, is going to want to talk to you.' "~~

That's it. No punishment. If Joe doesn't agree, or his levels stay high, he would revert to the old system and take his chances. But he'd also lose the built-in absolution of the Volunteer Program.

Catlin's explanation reveals two critical ingredients of the program. First, he hopes to rejuvenate the role of the sports physician, to make doctors the system's eyes and ears. (Currently, some athletes avoid physicians for fear of being discovered; this endangers their health.) Second, Catlin believes the enforcement of the program's rules must be left to a panel of athletes. His plan makes athletes the judges, not USADA or WADA.

Under the program, there's no need to prove an athlete is shooting up HGH, so you don't need a complicated test for it. Because athletes booted out of the program won't be banned from competing, there will be no subsequent legal battles. Authorities will never again have to worry about unknown steroids floating around the sports netherworld, because Catlin isn't looking for specific causes—drugs—but instead for their effects. Yet another advantage, Catlin argues, is that fewer legal battles and complex drug tests should mean the Volunteer Program will be much cheaper to operate once the initial research is finished. And an athlete like Lance Armstrong—dogged by doping whispers throughout much of his career—would have the opportunity to trumpet a definitively clean bill of health.

Still, some criticisms of the program are obvious. For starters, the plan seems to rely too much on voluntary actions, and you wonder how it would work with a superstar athlete who says, "I'm clean, but I decline to take part."

This is a risk, of course, but imagine a future peloton of cyclists. Some wear a logo showing they're part of the Volunteer Program; some do not. The press, sponsors, and public would surely question any athletes who did not sign up. What are those riders hiding? Why wouldn't they want to be declared clean? Catlin believes social pressure would lead athletes to volunteer. Another area of concern is the reliance on doctors. After all, it was the Festina doctor who supervised the team's EPO use in 1998. But while Catlin hopes to make physicians the front line, their patients will still be checked by independent biomarker testing.

That testing will be rigorous and frequent at first, then will become more sporadic over time. Athletes would have to be available for sampling to the point that Catlin would hand each one a cell phone that he or she would be obliged to answer. Early on, there would still be drug testing, too, to ensure every athlete entering the program wasn't using. Over time, though, the drug testing would diminish in favor of the biomarkers.

"Cheaters just aren't going to join this," Catlin says. "They'd be crazy to."

The Awful Truth About Drugs in Sports (cont.)



## **NOW OR NEVER**

Catlin has a long way to go before this idea becomes more than a dream, but in recent months he's been preparing for his push by sounding out trusted friends among sports administrators. Next, he'll present a formal case to the powers that be—USADA, UCLA, perhaps the USOC, maybe even the federal government through the National Institutes of Health—to seek the necessary research funds.

Meanwhile, the plan has already received a few endorsements. One prominent backer is Thomas Murray, a well-known bioethicist who serves as the chairman of the Ethical Issues Review Panel for WADA. "Don's idea is fascinating," he says. "I would like to see it discussed much more thoroughly as a way to break out of this cops-and-robbers cycle we've been in."

Dr. Robert Wolfe, a human-metabolism expert at the University of Texas Medical Branch in Galveston, says Catlin's plan "could overcome some of these problems with one new drug after another. I think this is a great idea, a fantastic idea, really, and I hope he is successful."

And Evelyn Ashford, who inspired Catlin and now sits on USADA's board, says the plan sounds "great... more logical, like a better way of doing things. I could get behind this, because it is a more positive approach to the problem."

But Catlin will certainly face resistance. Lawyers for some prominent athletes are vocally skeptical. Edward G. Williams, a New York attorney whose clients include accused dopers like Regina Jacobs—who set the 1,500-meter indoor world record in 2003 only to later test positive for THG—says Catlin's idea "sounds hokey." After hearing the basics of the plan, he notes that if an athlete's biomarkers were changed for any reason, not just drugs, he or she might flunk out of the Volunteer Program.

Howard Jacobs (no relation to Regina), a Los Angeles attorney who represents Tim Montgomery and Tyler Hamilton, praises Catlin's objectivity but says the plan sounds too subjective to risk damaging an athlete's reputation for not taking part in it. He wants solid proof of drug use. "It troubles me to have a system where it's OK to say, 'Something looks funny.' You should have to show more than 'Something doesn't seem right, but we do not know what it is.'"

USADA reacts with lukewarm caution; spokespeople for the organization declare their respect for Catlin but issue caveats and polite boilerplate about the need to explore new solutions.

WADA officials pooch-pooch the idea outright, arguing that they're already on the case. "We call what he's talking about the 'longitudinal approach,'" says WADA's chief scientist, Olivier Rabin. "We are well aware of it and have some projects in that direction," he says, referring to WADA's now-defunct Athlete's Passport, which kept track of some biological parameters. But the Athlete's Passport, a voluntary program that had a stop-and-start history at WADA, was mainly a record of drug-test results. Catlin

~~dismisses any comparison.~~

Nobody, not even Catlin, believes his idea is a sure thing. But he feels obliged to fight. If he can't live with the current system, he says, "it is time to pass the baton. But I'm not ready. I need to give the Volunteer Program a go... I gotta get the damn thing off the ground."

For Catlin, and for sports as a whole, time is short.