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Somatropin

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[Into the Light]

FROM BUILDING BIGGER MUSCLES TO HALTING SIGNS OF AGING, HUMAN GROWTH HORMONE HAS ALL THE MARKINGS OF A MEDICAL CURE-ALL. BUT IS THIS CONTROVERSIAL WONDER DRUG WORTHY OF THE HYPE? BY **SHAUN ASSAEL** ILLUSTRATION BY **RAJEEV DOSHI**, **MEDI-MATION**

It's hard to escape the come-ons or resist the promises: Live longer! Feel better! All it takes is a little bit of human growth hormone. Curious? Sure you are. Tempted? Millions are. And bargains seem to abound: Lowest price anywhere! Direct from the pharmacy! A little pinprick, hey, you summon the fountain of youth! ¶ Even a casual read of the sports pages will convince you HGH is a miracle drug that helps pro athletes recover from injuries at record rates. If you believe New York Yankees pitcher Andy Pettitte, who chose to be forthcoming about his use of HGH after his name appeared in the infamous Mitchell Report outlining the use of performance-enhancing drugs in baseball, just two doses—two!—helped him get back on the mound after elbow surgery six years ago. ESPN baseball analyst and former Major Leaguer Fernando Vina said he used HGH in 2003 to try and recover from injuries.



Faces of the controversy clockwise from left: 50 Cent; MLB commissioner Bud Selig and MLBPA executive director Donald Fehr; Andy Pettitte, Sen. Charles Schumer (D-N.Y.); Dr. Lei Jin.

In January, actor Sylvester Stallone, a year after being busted in Australia with 48 vials, bragged of using HGH to get jacked for his new film, *Rambo*. A few weeks earlier, a report alleged that Mary J. Blige, 50 Cent, and other music artists got doses from a Florida antiaging clinic, seduced perhaps by promises that the drug can help remove wrinkles, improve vision, and tone the body.

Truth is, it's hard to prove all those wondrous benefits. For every true believer who touts HGH as a fountain of youth, there's a skeptic who calls it the biggest medical fraud since crystals.

What's indisputable is that growth hormone is a growth industry. According to the World Anti-Doping Agency, the global sales of HGH have risen fivefold in the last decade, to \$2 billion. Americans consume a quarter of the total. That's a major investment in looking younger. It's also one of the biggest medical gambles that we've ever taken with our bodies.

For those of you who skipped Biology 101, here's a refresher: Human growth hormone is a string of 191 amino acids made by our pituitary gland. After it migrates down to the liver, it converts into a substance called insulin growth factor (IGF-1), which is kind of like Miracle-Gro for the metabolism. It stimulates skeletal muscle, cartilage, and tendons. As kids, we gush HGH so that we can grow. But as we age (sigh!) our supply ebbs. Back in the crazy days of *Pumping Iron*, bodybuilders used to shoot up experimental HGH extracted from human cadavers. In the late 1980s, a group of California scientists found they could make it in a lab by genetically

isolating the part of human DNA that spurs its production. They put the DNA in a bacterial culture to spurt growth. Then, after the full chain formed, they isolated it from its host and purified it, ending up with a pure powder called Somatropin. In its final form, it gets mixed with sterile solution and injected. Hello, HGH.

The Food & Drug Administration developed a narrow range of approved uses for the drug. Only people who were wasting away from AIDS or were diagnosed with "acute growth hormone deficiency" were qualified to get prescriptions. But America is the land of the loophole. And by the late 1990s, antiaging doctors started redefining what "acute growth hormone deficiency" might mean to a generation of active guys who were refusing to be slowed down by nature's aches and pains. Most adult men have an IGF-1 range between 120 and 350 nanograms/milliliter. By defining "acute deficiency" at below 200, clinic owners started to treat weekend warriors looking to keep their long-range jump shot or add 20 pounds to their dumbbell curls.

Such vanity isn't cheap. A recommended daily dosage of two international units costs about \$34. Since insurance companies won't pick up the tab, it's on you, baby—straight out of the patient's pocket. No wonder doctors love it and have formed a powerful lobby to advance its use. The American Academy of Anti-Aging Medicine boasts 15,725 doctors worldwide and claims to have created "an environment of academic and clinical freedom to... [fight] aging as a disease." In a recent speech to business leaders,

the group's chairman, Robert Goldman, Ph.D., M.D., predicted that "life spans of up to, and over, 120 years are possible for people alive today." All of which sounds very highbrow until you realize that some of those "wellness" doctors aren't doing very well with the law. In an ongoing probe of online pharmacies, prosecutors from the Albany (N.Y.) District Attorney's office have convicted three doctors for writing prescriptions over the Internet without ever actually seeing patients, often for as little as \$20 each. A Florida obstetrician with a side job as a correspondent for Fox News admitted to writing \$1.3 million worth of scrips. Is that what the A4M means by clinical freedom?

To be fair, it's more than just fast-buck operators who are promoting HGH. Reputable surgeons rave about its recuperative powers. Richard Delamarter, M.D., a partner in the Spine Institute of Santa Monica, says anecdotal evidence suggests that men in their 50s and 60s who take HGH as part of an antiaging regimen heal faster than ones who don't. "There are estimates in the surgical community that it can improve healing from 20 to 50 percent," he says. And yet, in the face of all this seemingly good news, there is ample reason to take a step back and ask a fundamental question: Do we really know what we're getting ourselves into?

Pro sports is in love with HGH because there's no urine test for it, and unions are not willing to accept a blood test—at least not yet. In an appearance before Congress on Jan. 15, baseball's union chief, Don Fehr, promised to consider any test that is "scientifically accurate" and "commercially viable." But who knows what that means?

The World Anti-Doping Agency promises to unveil just such an accurate test at the Beijing Olympics this summer. But it's still a blood test. The tide against such tests, however, may be turning.

"I'd like to see every [baseball] player take a blood test and have the samples frozen." —Jeff Kent

In the hysteria that followed the release of the Mitchell Report, Los Angeles Dodgers second baseman Jeff Kent told the *Los Angeles Times*: "I'd like to see every player take a blood test and have the samples frozen. Not everyone in the game is using HGH, but I would bet it still is being abused." Bold, to say the least.

Yet despite all the hype, the jury is still out about whether HGH really helps athletic performance. In a study published last September in *The Endocrine Review*, researchers from England and Ireland conceded that HGH use seems to reduce protein loss and increase lean body mass. But they found a startling "lack of evidence that these metabolic effects translate into improved performance" among elite athletes. The only gainers were elderly subjects, and even then the HGH had to be combined with testosterone to work. That study echoed a June 2007 report by the respected Garvan

Institute in Sydney, Australia, which posited that most of the benefits felt by HGH users are all in the mind. In that study, half of the participants were given placebos but when questioned later said that they believed they were taking the real deal. As one of the researchers noted, the reactions showed more about "the power of wishful thinking" than the power of HGH.

Alan Rogol, Ph.D., M.D., a pediatrics professor at the University of Virginia who's been working with the drug since 1965, thinks it is impossible that anyone who takes an IU or two a day can see any real effects. "It's all just cosmetic endocrinology," says Rogol. "At those doses, it just doesn't work for antiaging."

On a recent trip to China, I interviewed an American-trained chemist who does some work with GeneScience, one of the world's largest makers of HGH. Its brand, Jintropin, is wildly popular because it costs a fraction of what Eli Lilly or Serono Labs charges. Why, the chemist wondered, does the United States refuse to approve Chinese-made HGH for sale? Wouldn't that drive the cost down, offering savings to all the people who want the drug so badly?

The answer, obviously, is yes. But the FDA doesn't want America to be flooded with low-cost HGH. Of course, that hasn't prevented people from buying all the bargain-priced Jintropin they can find. Stallone had it in his suitcase when he was stopped in Sydney. The Web is full of sites offering it for sale.

The Drug Enforcement Administration is so alarmed by the amount of Jintropin reaching the U.S. that it indicted Dr. Lei Jin, CEO of GeneScience, on charges of conspiring to flood our market in violation of federal drug laws. The case is pending. It's a good idea to be cautious about anything advertised as Jintropin on the Web right now. GeneScience has stopped shipping to U.S. and notes on its Web site that "any unauthorized Jintropin appeared [sic] in USA should be considered as fake."

But America's appetite for performance-enhancing miracles has never been stronger. In an effort to quench it, at least somewhat, Sen. Charles Schumer (D-N.Y.) recently sponsored a bill to classify HGH as a "Schedule III" controlled substance, which means that you could be hit with up to a three-year prison term if you're caught using it without a valid prescription. In this antisteroid climate, the bill has a pretty good shot of passing. But don't expect legions of middle-aged weekend warriors to start getting fitted for prison jumpsuits. And, anyway, why bother going the illegal route when it's so easy to get HGH from a licensed doctor?

The real question is: Is this a medical revolution or a medical con job? All available evidence suggests that HGH helps with recovery from injury. But the other stuff—the better eyesight, smoother skin, heightened energy—may be too good to be true. We've had 40 years of experience with anabolic steroids, and still, growth is going through growing pains.

Team MF: Shaun Assael is an investigative writer with *ESPN: The Magazine* and the author of *Steroid Nation*. His previous book, *Sex, Lies, and Headlocks*, was a *New York Times* best seller.