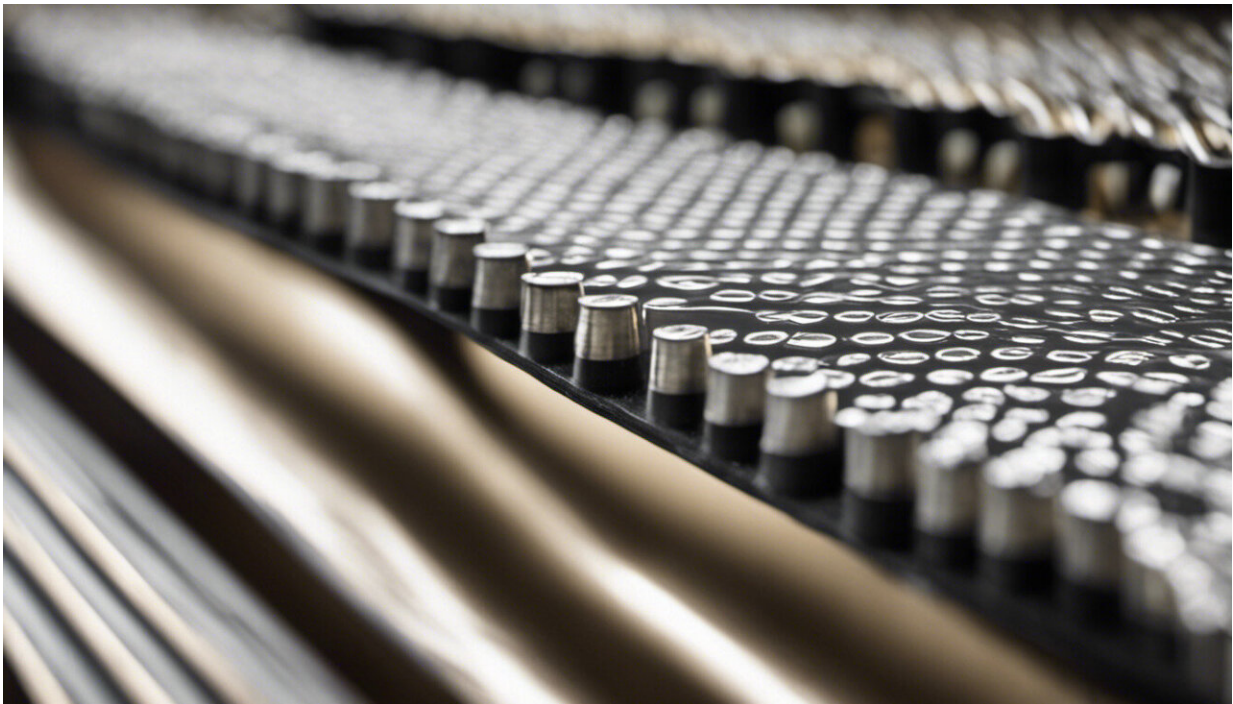


In sport's drug-testing arms race, the cheats are usually a step ahead

June 11 2015, by Tom Bassindale



Credit: AI-generated image ([disclaimer](#))

Yet another big name in sport has been caught up in allegations surrounding a doping scandal. Alberto Salazar, coach to several star athletes including double Olympic gold medallist Mo Farah, [denies](#) claims in a [BBC documentary](#) he broke anti-doping rules with one of his trainees, Galen Rupp. Farah is not accused of any wrongdoing.

Salazar [once said](#) an athlete might "not even consider it cheating if they believe all their top [competitors](#) are doing it". Does this mean many [elite athletes](#) are doping? If so what are they using and how do they evade the tests?

Testing has improved over the past 20 years. Equipment is more sensitive and specific to particular substances. This means testers can find smaller amounts of a substance in each sample and so any drug used will be detectable for longer.

If these new and improved tests worked more efficiently you would expect the percentage of [athletes](#) caught to increase. However, this number remains fairly static at around 2% of all athletes tested. This is very low compared to the estimated 14-39% [who are thought to dope](#), based on questionnaires and some lab testing. This gap tells us many athletes are doping in a way to avoid testing positive for a banned substance.

Cat and mouse

Most new drugs are detectable in urine samples once testers have worked up a method. Pharmaceutical companies and WADA are now sharing information on new drugs in development, meaning labs start to develop tests before the drug is released. But these tests still require considerable time and resource to develop, years in some cases. Validation is not simple, complicated by the body breaking down the drug before it reaches the urine.

As such, a game of cat and mouse can ensue between dopers and testers. CERA, a synthetic form of the hormone known as EPO which is used to increase red blood cell production, was approved for use in kidney disease patients in early 2008. A test was developed by the middle of the year but it was presumed athletes were using the drug before testing

caught up. This was later confirmed when the test was [used without warning](#) in the Tour de France and on samples frozen from earlier in the year.

As well as equipment changes, there have been step changes in the thinking behind tests over the past decade, most recently with the creation of the "[athlete biological passport](#)". This looks for evidence of doping but not necessarily the substances used themselves. For example, it detects increased ability to carry oxygen in the blood that is likely caused by use of EPO or similar drugs. Results are then stored on a database and compared to an individual's profile.

The athlete biological passport has had successes and some cyclists and athletes [have been suspended](#) through its use. But it [has struggled](#) to catch those using microdosing - taking small regular doses of drugs like EPO rather than single large doses.

The knowledge required to avoid testing positive is certainly not beyond medics working with athletes. If they know the time the drug remains in the body they can calculate how long before a competition use must be stopped. They also know the "at risk" period following use when an athlete may get caught.

The best way of not testing positive in this period is not to be tested. Athletes give their whereabouts for one hour of each day in advance. Athletes have been known to give incorrect addresses to avoid testers or to simply hide if they know they are at risk. There is a rule that three missed tests over 18 months constitutes a doping offence. That gives you one or two chances to avoid testing and blame logistics or disorganisation, a risk some athletes are willing to take. It was this rule that led to Olympic and World 400m champion Christine Ohuruogu [serving a one-year suspension](#) though she has always vehemently denied any [wrongdoing](#).

Playing the system

Athletes will also seek to exploit loopholes in the regulation. The increased sensitivity of testing has created a greater likelihood of positive results from contaminated supplements or food. A drug detected in urine from contamination is impossible to differentiate from deliberate use just through testing, creating more scope for athletes to contest the results.

Exactly what drugs should be off-limits to athletes is itself a major topic of debate. The substances in the Salazar [allegations](#) are testosterone, which is banned at all times in sport, and prednisone (used to treat asthma) and the thyroid medication thyroxine, which are just controversial.

[The question](#) is whether substances such as these are required to treat pre-existing medical conditions or are just being used to help athletes recover from intense training sessions, gain energy or lose weight.

There are two types of medicines that fall into the grey area of medical treatments that may not strictly be required. One set are on the World Anti Doping (WADA) [banned list](#) and require medical assessment before they can be used. The second set, which includes prednisone and thyroxine, are neither monitored nor recorded.

There have also been examples of drugs not available to the public being detected in sports samples. And there are even some drugs being used such as [GW1516](#) which was considered unfit for human use.

Who is winning the race? In general the athletes are one step ahead most of the time, but occasionally testers get on top. One thing is for sure: as long as people have incentives to win, it is very unlikely doping will be eradicated.

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