

Want To Quit Smoking? Biotech Startup Chrono Raises \$48M For Drug-Behavioral Combo

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[Luke Timmerman](#) ,

Biotech hasn't come up with many innovative answers in the past two decades to one of the world's toughest public health problems — smoking. Now a startup in the San Francisco Bay area is raising a bundle of cash to help smokers kick the habit with some carefully calibrated drug delivery and behavioral nudges.

Hayward, Calif.-based Chrono Therapeutics is announcing today it has raised \$47.6 million in a Series B round of venture capital. The investment was led by [Kaiser Permanente](#) Ventures and included capital from an unusually globally diversified set of investors in Switzerland, Malaysia, Japan and the Middle East. The company's previous venture investors from two years ago, Canaan Partners, 5AM Ventures, Fountain Healthcare Partners, GE Ventures, and [Mayo Clinic](#) all ponied up again.

About [40 million adults](#) in the U.S. smoke cigarettes, and the public health and economic scope of the problem is enormous by any measure. Smoking leads to about \$170 billion in direct medical costs each year in the U.S., and another \$156 billion in lost productivity, premature death, and the toll of secondhand smoke, according to 2014 data compiled by the Centers for Disease Control and Prevention. Many smokers want to quit — [an estimated 7 out of 10](#) said so in a 2010 survey — but it's easier said than done. People today can use nicotine patches, chewing gums, prescription drugs such as [Pfizer PFE -0.34%](#)'s varenicline tartrate (Chantix) or [GlaxoSmithKline](#)'s bupropion hydrochloride (Zyban).

Behavioral aids, such as simply calling people on the phone and having a coach remind, encourage, cajole people to stick with their cessation plan can provide a serious boost, sometimes doubling or tripling the quit rate, said Jenny Hapgood, vice president of product management at Chrono Therapeutics.

“It's an absolutely huge health problem and the existing products don't work well. Those are two reasons to be focused on it,” said Chrono's CEO, Alan Levy.

The aspiration at Chrono is to try to combine the modestly successful pharmacological and behavioral approaches into an integrated product that's much more effective. Chrono's technology starts with a transdermal patch to deliver nicotine like with conventional patches, but with a twist. The device is calibrated to deliver peak doses of nicotine right when a smoker is most likely to crave a cigarette — first thing in the morning, and around mealtime, said CEO

Alan Levy. That's supposed to solve one part of the problem with conventional patches, which tend to fade in effectiveness as the dose peters out through the day.⁸

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Then digital technology enters the picture. The Chrono patch has a Bluetooth-enabled sensor that communicates with the smoker's smartphone, and which transmits information back to the company. That information can verify whether the patient is sticking with the cessation plan, and help a coach on the other end determine the next steps to give the patient the best chance at quitting. About eight employees from Chrono, including Hapgood, have come from one of the few successful venture-backed smoking cessation companies of the past decade — Free & Clear,

a Seattle-based company acquired for \$100 million by [Inverness Medical Innovation's Alere health](#) unit in 2009. That company (which [Kaiser Permanente Ventures also invested in](#)) showed it could double or triple smoking cessation rates with its telephone-based coaching service, Hapgood said.

The approach, however, has a couple weaknesses. One is that it's getting harder to reach people by phone in the age of social media and short text messages, Hapgood said. Another is that coaches on the phone can't get true real-time information on whether the user is in fact sticking with the program.

Chrono has some data from the first couple stages of clinical trials that shows its technology can reduce cravings for cigarettes, Levy said. The new round of investment will be used to run more rigorous clinical trials necessary to win regulatory approval for the drug/device combo in the U.S. and Europe. Regulators in the U.S. will want to see whether Chrono can improve quit rates when compared directly to a placebo, Levy said. Regulators in Europe have different requirements — showing a reduction in cravings compared with the standard of care should suffice, he said.

By themselves, strictly nicotine patch-based approaches can lead to about 10% cessation success rates, and behavioral-only approaches can work in isolation for about 10-15% of people, Hapgood said. The hope at Chrono, by combining aspects of each approach, would be to boost quit rates into the 40%, 50% or even 60% range, she said.

Chrono hasn't yet figured out exactly what its product would cost, but it's likely to be a little less than Pfizer's Chantix, a little more than nicotine patches and about the same as nicotine gums, Levy said. The program runs for 10 weeks, with a high dose for the first six weeks which then tapers down to medium and low doses for the rest of the course, he said. While 10 weeks is the time frame the FDA wants to see to confirm smoking cessation rates, the company plans to follow commercial patients for a full six months to confirm long-term cessation, and to gather information about relapse rates that insurers will surely want to see. If everything goes well, the company could be cleared for sale in the U.S. in late 2018 or in 2019, Levy said.

While anything effective against smoking would be a huge achievement for public health, Chrono has other irons in the fire. The drug/device approach could be useful for weaning people off opioid painkiller addiction, and potentially for treating one of the common symptoms of Parkinson's disease, Levy said.

Luke Timmerman is the founder of [Timmerman Report](#) and the author of "[Hood: Trailblazer of the Genomics Age](#)."