

Krokodil: how 'flesh-eating zombie drug' is causing a global crisis

November 6 2018, by Simon Cotton



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

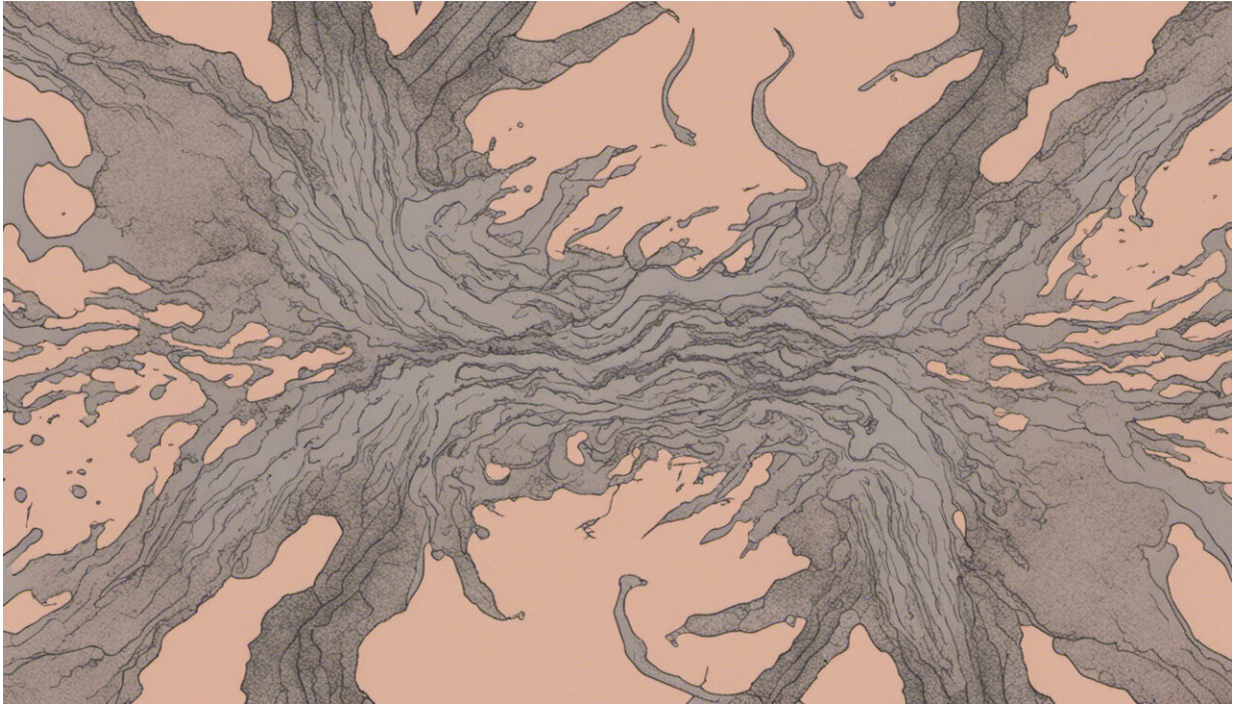
Desomorphine has been [in the news lately](#). Never heard of it? That's quite possible. But you may well have heard its street name: "Krokodil." However you know it, it's a cheap substitute for heroin that has been widely branded a ["flesh-eating zombie drug"](#) – and it's bad news.

There are two reasons for its horrific reputation, one related to desomorphine itself, and the second to the way the street drug is produced.

Desomorphine was actually [first synthesised in 1932](#). As you would guess from its name, it is a "semi-synthetic" relative of morphine, the natural painkiller derived from opium poppies. Compared with morphine, it has one less double bond and one fewer –OH group (morphine has two, desomorphine has one). That's significant because the more –OH groups a molecule has, the better it will dissolve in water. Conversely, the fewer –OH groups a molecule has, the more lipid (fat) soluble it will be – and that makes it more likely to cross the blood-brain barrier.

In keeping with this, desomorphine is [roughly ten times stronger a painkiller than morphine](#) and its effects are felt sooner. It is also eliminated from the body more quickly. Consequently, while a heroin user's euphoria may last four hours or more, a Krokodil "high" lasts for two hours at most. This means that more doses are required to sustain the high and that desomorphine has a greater potential to cause addiction, which can manifest within just days.

Indeed, Desomorphine was originally synthesised to create a painkiller with [fewer side effects than morphine](#). But while it did offer greater analgesic power, it fell into disuse because of its particular tendency to cause dependence.



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The return of Krokodil

Desomorphine was largely forgotten for years – until circumstances conspired to bring it back into prominence. When the Russian government restricted the movement of heroin from Afghanistan into Russia around 2003, there was a sharp increase in the price of heroin on the street. As a consequence, Russian addicts started looking for cheaper substitutes, [including desomorphine](#).

But we are not talking pharmaceutical-grade desomorphine, but rather a version made in kitchen laboratories. The base [ingredient for this version is codeine](#), another natural painkiller found in poppies, with a structure not too different from morphine. [Codeine is readily available](#) – often over the counter – as a milder painkiller than morphine. This is then

mixed with a number of other additives to create "Krokodil".

So how did the name "Krokodil" come about? One theory is that it refers to the scaly green skin it can create around injection sites. Another is that it is a corruption of the name of one of the intermediates in its synthesis, " α -chlorocodide", which is formed when the codeine reacts with the additive, thionyl chloride. Maybe it is a bit of both.

Either way, while Krokodil use [first became prevalent in Russia](#), leading to a lethal epidemic there, it has now spread to [Colombia](#), the US, and Europe, [including the UK](#).

Devastating consequences

Desomorphine is so cheap, partly because of the availability of codeine but also because making it is relatively straightforward; people attempt it at home without the use of a [fully-equipped laboratory](#).

I won't describe the process in detail for obvious reasons. Typically, however, the [codeine](#) is prepared with readily obtained chemicals, including paint thinner, hydrochloric acid, iodine (from "tincture of iodine" antiseptics) and phosphorus (obtained from matchboxes). The process has a lot in common with the so-called "Nagai" method for making methamphetamine. Addicts often do this using their own kitchens and typically don't bother [to purify the resulting substance](#), which [creates more problems](#).

Users inject their impure desomorphine – and if they miss the vein may end up with an abscess and dead flesh. Other health effects include gangrene, phlebitis, bone infection and pneumonia, not to mention brain damage. Needle sharing may be responsible for spreading HIV and hepatitis C. Tragically, addicts often die within [two to three years](#).

Another reason Krokodil can be so destructive is the relatively short period of time the drug spends in the body. In order to prevent the onset of withdrawal symptoms, addicts can end up stuck in a continuous cycle of making and injecting, forsaking food and pretty much everything else in the process.

Krokodil has become a popular drug of abuse because it is cheap and easy to make. Sadly, the downside is much greater, leading to addiction, serious medical complications and death. Just don't go there.

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