

Fentanyl, fentanyl analogues, and carfentanyl; Frequently Asked Questions.

What are they?

[Fentanyl](#) is a strong synthetic opioid with a rapid onset and short duration of action, used widely in medicine for pain-relief and as a general anaesthetic .

When used via parenteral (subcutaneous, intramuscular or intravenous) routes it is 100 times more potent than morphine. This means 1mg of fentanyl administered by injection has roughly the same effect as 100mg of injected morphine. By way of comparison, an intravenous (IV) dose of pure heroin (diacetylmorphine) is 'only' three times as potent as the same weight of IV morphine.

More than 40 [analogues of fentanyl](#) have been synthesized. Many are used in medicine and veterinary medicine, but some have never been used except in laboratory research. These different analogues of fentanyl are of varying potency, but most are significantly stronger than morphine by weight.

[Carfentanyl](#) (aka carfentanil) is the strongest analogue of fentanyl commercially available. A dose of carfentanyl is 10,000 times more potent than the same quantity of morphine. It's only legitimate use outside of laboratory research is as a general anaesthetic agent for large animals, such as elephants.

How do they work?

Fentanyl and its analogues [work](#) in the same way as traditional opiates and opioids, (such as morphine, heroin, and oxycodone), as an [agonist at the mu \(\$\mu\$ \) opioid receptors](#).

How are they taken?

Fentanyl and its analogues (including carfentanyl) can readily be absorbed through injection, ingestion, inhalation, across mucous membranes, *and* via transdermal (through the skin) routes.

There are a variety of prescription-only medicines containing fentanyl or its analogues, including trans-dermal patches, lollipops and nasal sprays, and ampoules for injecting use. These products are sometimes diverted to the black market. Illicitly-produced fentanyl analogues may be sold online as research chemicals or may be "cut" into black-market heroin to increase its potency.

How big a problem are they in Australia?

In Australia, fentanyl is sometimes extracted from pharmaceutical products (especially transdermal patches) by people who use drugs for purposes of injection, and a small but increasing proportion of opioid overdoses in Australia each year involve [fentanyl diverted from medical use](#) in this way.

Heroin that has been laced with illicitly produced fentanyl is called "China White". Over the last few years [fentanyl-laced heroin](#) and [counterfeit pharmaceutical pills](#) containing [fentanyl analogues](#) have

become a [significant issue](#) in North America and the EU; (for example in [Massachusetts](#) last year 75% of opioid-related fatalities involved illicit fentanyl; in Canada in 2015 the [B.C. Fentanyl Urine Screen Study](#) found nearly 29% of participants tested positive for fentanyl, even though 73% of those participants who tested positive did not report using fentanyl within the previous three days. In recent years authorities in the [EU](#) states have also been detecting samples of heroin that have been laced with fentanyl analogues, and (in the last 12 months) have detected some samples of inert powder laced with fentanyl analogues but sold to the consumer misrepresented as white (salt heroin).

On several occasions in the past 5 years fentanyl analogues and other synthetic opioids have been detected by Australian Customs and Border Protection, and recently an importation of carfentanyl was detected entering [Queensland](#).

To date there has only been one confirmed batch of fentanyl-laced heroin (“China White”) detected in Australia. (See this forensic [case series](#) by Luke Rodda et al). However drugs seized by police represent a very small sample of drugs available in the community, and in most jurisdictions in Australia only a small proportion of drugs seized by police are subjected to serious toxicological examination. It is quite possible that other batches have not been detected.

Australia’s geographic proximity to the primary source of high-quality salt heroin in Myanmar, and our geographic isolation from traditional North American and Latin American sources of black-market fentanyl, appear to have been protective in the past. There is no evidence as yet that this is a serious issue in Australia but the cases identified by [Rodda et al](#) may be the start of an emerging trend.

The black market, like the legitimate market, is increasingly globalising. The emergence of Chinese “grey-market” labs and dark web vendors means anyone can source obscure chemicals, (or even have entirely novel substances synthesised to order), and have them shipped anywhere on the planet. The appeal to major trafficking syndicates of a product like carfentanyl is obvious. It can be sourced more cheaply (per equivalent dose) than heroin; it is roughly 1/3,300th the bulk of a dose-equivalent weight of heroin; and sniffer dogs and Ion-tracking equipment will not detect it. Once imported it could be bulked out with poorer quality heroin (or even an inert powder) to turn an insignificant pinch of dust into thousands of street-deals. To major traffickers, the risk of interdiction or arrest are significantly lower and the potential profit margins are much higher.

The Chinese Government’s [recent announcement](#) that it will ban the production of carfentanyl is welcome news, but [is unlikely to significantly affect](#) the broader black market trend towards novel, highly potent synthetic drugs.

Minimising risk to first-aiders;

In response to a suspected exposure to potent synthetic opioids;

- Triple zero should be called immediately and first-aid administered as per an opioid OD.
- Avoid handling any drug material or paraphernalia at the scene.
- Wear nitrile or latex gloves and use a face-shield if available. As a last resort a simple face shield can be improvised from a piece of plastic bag with a hole in the centre.
- Ongoing ventilation and multiple doses of naloxone may be required.
- If inhalation exposure is suspected ensure the victim has fresh air.
- If ingestion is suspected and the victim is conscious they should be encouraged to flush their mouth, eyes and nose with fresh running water.
- If contact exposure is suspected and the person is conscious, flush the area under running water. However this will probably only help within a very short time of the contact.

Harm Reduction Information for Fentanyl and other potent synthetic opioids.

As mentioned above, pharmaceutical fentanyl is sometimes diverted and used in a non-medical fashion. Drug users might also source fentanyl or other synthetic opioids by ordering online from a Research Chemical vendor, or they might unknowingly be exposed to fentanyl or other potent opioids which have been “cut” into heroin.

1) Diverted pharmaceutical fentanyl products;

When pharmaceutical products are used in a non-medical fashion, the substance, the purity and the dose are usually known to the user. However the most easily sourced pharmaceutical products are not designed for injecting use.

Transdermal patches:

If people are misusing fentanyl patches, it is important that they know how to calculate an appropriate dose. AIVL have an excellent [“not-for-general-distribution”](#) guide to injecting fentanyl extracted from transdermal patches.

Ampoules;

Fentanyl for injection comes in ampoules with the dose in mcg/ml printed on the side. The most common is fentanyl citrate, 50mcg/ml in a 2ml amp.

50mcg = 0.05mg. This is equivalent to 50mg of morphine.

A 2ml amp at 50mcg/ml is as strong as a 100mg IV morphine.

Pharmaceutical fentanyl also presents as sublingual tablets (for breakthrough pain) lollipops (for end-of-life palliative care) and as an intranasal spray (often used in small children, or by paramedics).

