

Key messages

- Counterfeit hydromorphone tablets are present in BC. Data suggests they are present at a low prevalence, but there is substantial uncertainty about the exact prevalence.
- Counterfeit hydromorphone tablets are potentially harmful to anyone who takes them because they are deliberately made to appear identical to prescription tablets but have unknown ingredients that can be harmful and increase the risk of drug poisoning.
- Across Canada, the ingredients most often identified in counterfeit drug samples are the synthetic opioids protonitazene and isotonitazene. Nitazenes respond to naloxone but are of particular concern because they are not detected by drug checking with fentanyl test strips.

On November 14th, 2023, Interior Health sent out a drug advisory¹ for their region about counterfeit hydromorphone tablets detected in their local illicit drug supply. These tablets contained isotonitazene, a synthetic opioid that is much more potent than hydromorphone. On March 27th, 2024, Vancouver Coastal Health issued a drug advisory about counterfeit hydromorphone tablets in their region containing protonitazene and metonitazene. These counterfeit tablets carried a substantial risk of drug poisoning (i.e., overdose) because of the amount of isonitazene present and because of consumer expectation that the tablets contained hydromorphone.

Counterfeit hydromorphone tablets are public health concern because they are deliberately made to look identical to prescription drugs but are not regulated by Health Canada for safety and quality. A person taking them would not know what ingredients, and how much of those ingredients, are used to make counterfeit hydromorphone tablets.

This bulletin summarizes what we know so far about counterfeit hydromorphone tablets in BC and advice on how a person can minimize their risk experiencing a drug poisoning because of these tablets. It also provides insights on BC and Canada's encounters with other counterfeit drugs, enabling us to draw informed conclusions from previous experience.

Health Canada Drug Analysis Data on Counterfeit Hydromorphone

Counterfeit
(Protonitazene)

Counterfeit
(Metonitazene)

Legitimate
(Hydromorphone)



Photo Source: Vancouver Coastal Health Drug Alert posted on the Toward the Heart Drug Alerts Page. Photo Credit: DAS Lab.

Health Canada's Drug Analysis Service (DAS) analyzes drug samples seized by Canadian law enforcement as well as drug samples submitted by public health agencies.²

Between January 1 and October 31 2023, DAS identified two counterfeit hydromorphone capsules and one counterfeit hydromorphone tablet in samples submitted from BC (Table 1). None were identified from 2018 to 2022. Counterfeit hydromorphone tablets appear to be more frequent in Quebec and New Brunswick than in other provinces and territories.

Health Canada Drug Analysis Data on Counterfeit Hydromorphone

Table 1. Number of Counterfeit Hydromorphone Identifications in Samples Submitted to DAS Laboratories, per Province, from January 1 2018 to October 31 2023 in Canada.

Province/ Territory	2018	2019	2020	2021	2022	2023 (Jan-Oct)
Alberta	0	0	0	0	1	1
British Columbia	0	0	0	0	0	3
Manitoba	0	0	1	0	2	0
New Brunswick	0	0	13	37	68	39
Newfoundland and Labrador	0	0	0	1	0	0
Northwest Territories	0	0	0	0	0	0
Nova Scotia	0	0	6	6	2	1
Nunavut	0	0	0	0	0	0
Ontario	0	11	7	17	13	20
Prince Edward Island	0	0	1	0	3	0
Quebec	0	5	57	104	83	75
Saskatchewan	0	2	0	0	0	0
Yukon	0	0	0	0	0	0
Total Canada	0	18	85	165	172	139

Government of Canada. (2023). Health Canada Drug Analysis Service.

Findings presented here may differ from other data from the Health Canada Drug Analysis Service as these data are presented and analyzed in a different manner. Additional information about the work of the Health Canada Drug Analysis Service can be found here: <https://health-infobase.canada.ca/drug-analysis-service/analyzed-drug-report.html>

Of the three counterfeit hydromorphone capsules and tablet identified in BC in 2023, two capsules had no detectable active ingredient (i.e., they contained no hydromorphone or other ingredients that would have physical effects), and one contained a substance closely related to fentanyl which is commonly used in the production of fentanyl (N-propionyl fluoro norfentanyl).

Across Canada, the ingredients most often identified in counterfeit samples resembling hydromorphone are the synthetic opioids protonitazene and isotonitazene, followed by caffeine and fentanyl (Table 2).

Table 2. Number of Times a Substance was Identified in Counterfeit Samples Resembling Hydromorphone Submitted to DAS, from January 1 2018 to October 31 2023 in Canada.

Substance	Number of Identifications
Protonitazene	328
Isotonitazene	143
Caffeine	28
Fentanyl	27
Metonitazene	18
Venlafaxine	15
4-Anilino-N-phenethylpiperidine	7
Cocaine	6
Methamphetamine	5
Morphine	5

Note: A single sample may contain more than one substance. This table only presents substances that have been detected more than 5 times.

Government of Canada. (2023). Health Canada Drug Analysis Service.

Findings presented here may differ from other data from the Health Canada Drug Analysis Service as these data are presented and analyzed in a different manner. Additional information about the work of the Health Canada Drug Analysis Service can be found here: <https://health-infobase.canada.ca/drug-analysis-service/analyzed-drug-report.html>

DAS notes specific limitations for identifying counterfeit drugs:

- DAS' data is solely based on samples submitted to their laboratories for analysis and may not be completely representative of substances circulating on the market. Given this, DAS data should be used with caution when looking at trends within the unregulated drug supply.
- Analysis methods can't tell the difference between a substance detect found on the surface of the tablet (i.e., a surface contaminant) or if it is an ingredient of the tablet, added either intentionally or unintentionally.
- DAS defines "counterfeit" as a sample that looks like a regulated product but does not contain the expected substance. However, DAS does not specialize in counterfeit drug analysis and cannot conclusively confirm if a product is definitely counterfeit.
- Law enforcement agencies submit samples without giving any information on the seizure, so DAS does not know the circumstances under which a sample was seized nor its expected content.

British Columbia Centre on Substance Use Drug Checking Data on Expected Hydromorphone

British Columbia Centre on Substance Use (BCCSU) collects data from point-of-care drug checking partners offering services at overdose prevention sites, music festivals and other community settings.³ In addition to the DAS data, BCCSU data can provide more information about the substances currently in circulation.

When tested using FTIR method, results come back as either matching the expected drug (if hydromorphone is detected), not matching the expected drug (if an active substance other than hydromorphone is detected), or not applicable (N/A, if no hydromorphone or other active substances are detected).

The number of samples submitted for hydromorphone testing has trended upward in the last five years, particularly since March 2020. To February 2024, BCCSU has observed 718 drug checking requests for hydromorphone tablets, which represents 0.72% of all samples submitted to drug checking services (Table 3).

Table 3. Number of Drug Checking Requests for Hydromorphone Tablets at BCCSU Drug Checking Sites and Total Number of Samples Tested, from June 1, 2018 to February 29, 2024 in BC.

Year	Number of requests for checking hydromorphone	Total number of samples checked	%
2018	3	3115	0.10
2019	2	5030	0.04
2020	42	9849	0.43
2021	164	17092	0.96
2022	186	25335	0.73
2023	232	27829	0.83
2024 (Jan – Feb)	49	5705	0.86
Total	718	99264	0.72

BCCSU. (2024). Drug checking services.

In the first two months of 2024, 12.2% of samples tested that were thought to be hydromorphone, were not found to contain hydromorphone, but instead contained another unexpected active substance (Table 4).

Table 4. Number and Proportion of Hydromorphone Samples Matching Expected Drug Among Substances Submitted to BCCSU Drug Checking Program, from June 1, 2018 to February 29, 2024 in BC.

Year	N/A (%)	No (%)	Yes (%)	Total (%)
2018	1 (33.3%)	2 (66.7%)	0	3 (100%)
2019	0	0	2 (100%)	2 (100%)
2020	24 (57.1%)	1 (2.4%)	17 (40.5%)	42 (100%)
2021	31 (18.9%)	12 (7.3%)	121 (73.8%)	164 (100%)
2022	13 (7%)	9 (4.8%)	164 (88.6%)	186 (100%)
2023	21 (7.7%)	33 (12.1%)	218 (80.2%)	272 (100.0%)
2024	5 (10.2%)	6 (12.2%)	38 (77.6%)	49 (100.0%)
Total	95	63	560	718 (100%)

BCCSU. (2024). Drug checking services.

There are some limitations to point-of-care drug checking:

- Drug checking results are categorized based on the substance expected by the person submitting the sample. However, not all of these tablets expected to be hydromorphone necessarily resembled 8 mg Dilaudid tablets, as some people might not know what they look like and might have been sold or given a tablet that clearly appears different.
- When a substance is identified as matching the expected drug, it may not be possible to determine if it is real or counterfeit (good fakes).
- Because the FTIR technology has a detection limit of about 5%, it might not be able to detect hydromorphone in counterfeit tablets if the concentration in them is below 5% of the whole sample. This could lead to some false negative results.

Table 5. Active Substances Detected in Hydromorphone Samples, Among Substances Submitted to BCCSU Drug Checking Program not Matching Expected Drug, from June 1, 2018 to February 29, 2024 in BC.

Substances Detected by FTIR	
Caffeine	5
Morphine	3
Codeine	2
Ephedrine	2
Protonitazene	2
Benzocaine	1
Cyclobenzaprine	1
Hydrochlorothiazide	1
Acamprosate	1
MDMA	1
N-Propionyl Para-Fluoro Norfentanyl	1
Substances Detected by Test Strip	
Fentanyl	18
Benzodiazepines	3

Substance Drug Checking Data on Expected Hydromorphone

Substance Drug Checking, based on Vancouver Island, tests drugs using a variety of technologies, including fentanyl and benzodiazepine test strips, Raman spectrometry, FTIR spectrometry, and paper spray mass spectrometry.

Substance reports checking 102 expected hydromorphone samples between 2018 and 2023. 78% (80/102) were as expected (meaning that they contained the expected active(s) with no other notable compounds detected). 12% (12/102) did not contain an active component. 9% (9/102) contained an unexpected active, and 3% (3/102) contained an active component in addition to the expected hydromorphone. Within the samples that contained an additional active, two contained fentanyl in addition to hydromorphone and one contained morphine and heroin. Isotonitazene was detected in two expected hydromorphone samples in which no hydromorphone was detected (Table 6).

Table 6. Active Substances Detected in Hydromorphone Samples, Among Substances Submitted to Substance Drug Checking Program not Matching Expected Drug, from 2018 to March 2024 in BC.

Substances Detected	
Isotonitazene	2
Fluorofentanyl	1
Cocaine HCl	1
Metcopramide	1
Acetaminophen	1
Diphenhydramine	1

Literature scan of previous experiences with counterfeit tablets

While counterfeit hydromorphone identification is relatively new in BC, other counterfeit tablets sold and marketed as prescribed opioids (e.g. hydrocodone, oxycodone, Percocet, Vicodin, Norco), stimulants (e.g. Adderall), and benzodiazepines (e.g. alprazolam) are a longstanding and increasing issue in North America and particularly the United States (US) and Mexico.⁴⁻¹⁶

Reports of what counterfeit tablets look like vary considerably. For example, dark green pills sold as oxycodone with CDN pressed on one side and '80' on the other are well documented and known as 'green beans'.¹⁷ Blue tablets sold as oxycodone are known as 'dirty oxys', 'M30s' or 'blues'.^{7, 18} However, counterfeit tablets present in many different colors, forms and with different imprints, making it extremely difficult to identify them.^{9, 17, 19}

In the US, while the DC Department of Forensic Sciences reported no counterfeit tablets as part of their Opioid Surveillance Monitoring Program in 2017, only four years later, in 2021, 62.5% of tested opioid tablets were determined to be counterfeit.²⁰ In September 2021, the United States' Drug Enforcement Administration (DEA) released a Public Safety Alert on the increase in availability and lethality of counterfeit tablets containing fentanyl and methamphetamine.²¹ At that time, the DEA and its law enforcement partners had been seizing counterfeit tablets at increasing rates, and 4 out of every 10 tablets contained a high dose of fentanyl (2 mg or more). This rate increased to 6 out of every 10 tablets in 2022.²²

Moreover, US studies suggest that these counterfeit tablets are increasingly contributing to overdose deaths, particularly since the COVID-19 pandemic.^{13, 23-25} O'Donnell et al. describe recent trends in drug poisoning deaths associated with counterfeit tablets in the US. Findings show that drug poisoning deaths associated with counterfeit tablets more than doubled from July 2019 to December 2021 (from 2.0% to 4.7%), and more than tripled in western states (from 4.7% to 14.7%). This study shows that while counterfeit tablets were originally identified in eastern states, proliferation of counterfeit tablets is expanding to western states.¹³

In 2014, the **Canadian** Community Epidemiology Network of Drug Use (CCENDU) published a Drug Alert on the increasing availability of counterfeit oxycodone tablets containing fentanyl in several Canadian communities and the risk of drug poisoning.¹⁷ CCENDU had received reports of tablets resembling oxycodone appearing in Alberta, BC and Newfoundland. Analysis by DAS found the oxycodone tablets primarily contained fentanyl as the active ingredient (89% of the time), and less frequently alprazolam or ketamine.

In 2021, Tobias et al. published a study on the contents of counterfeit alprazolam (Xanax) tablets in the unregulated drug market **in BC** by examining results from the BCCSU drug checking project.²⁶ Of the 139 samples tested between October 2017 and March 2020 that were expected to be alprazolam, only 33 (23.7%) were identified by FTIR analysis as containing alprazolam. Of these, only 2 (10%) were confirmed by DAS as containing only alprazolam as the active ingredient, and 7 (5%) samples contained fentanyl or fentanyl analogues. Samples were also tested for benzodiazepines using immunoassay strips. Of the 122 alprazolam samples tested, 72.1% were confirmed to contain benzodiazepines. As the authors indicate, these findings show that alprazolam tablets obtained from the unregulated drug market are likely to be counterfeit and unlikely to contain the desired active ingredient.

Many studies point to the recorded limitations of fentanyl and benzodiazepine test strips in identifying contaminants in counterfeit tablets,⁹ and the necessity of more sophisticated drug testing technologies to identify counterfeit tablets (e.g. infrared spectroscopy and mass spectroscopy).^{14, 27}

Emerging evidence suggests that counterfeit tablets may be exposing new segments of the population to fentanyl contaminated products (e.g. people seeking drugs who may be hesitant or prefer not to access ‘street drugs’ and people seeking to circumvent barriers to accessing prescribed medications from a healthcare professional). The proliferation of cryptomarkets and illegitimate ‘online pharmacies’ play a major role in people accessing counterfeit tablets.¹² Research suggests that new users may be accessing tablets from the dark web or their existing networks believing these are trustworthy, diverted prescription medications rather than counterfeit tablets produced by the illegal market.^{6, 23, 24, 28} These users may be opioid naïve, less aware of the risks of counterfeit tablets, and less experienced in drug use and overdose preparedness.

Of concern, several studies found young people to be over-represented in overdose deaths where counterfeit tablets were involved.^{13, 24} The US Centres for Disease Control found that 40.0% of overdose deaths involving counterfeit tablets occurred among persons aged 15 to 24-year-olds and 73.7% occurred among persons aged less than 35 years.¹³ Another study found that while illicit drug use declined between 2019-2020, overdose deaths increased 94% among 14–18-year-olds, in part due to youth purchasing counterfeit tablets.²⁹ The evidence is mixed around whether these young people were new users or not; some suggests an association with documented prescription substance use issues.¹³, and other suggests that the majority had no documented history of opioid use.²⁹ As some studies indicate, young people may be susceptible to social media advertising for cryptomarkets selling counterfeit tablets that youth may be seeking as an alternative to experimenting with ‘street drugs’.^{19, 26, 29}

Key messages on reducing risk

The following key messages may be shared when counterfeit tablets have been detected or to audiences at risk of using counterfeit tablets.

The primary way to avoid counterfeit tablets is to **only use medications prescribed to you** by a licensed professional, dispensed by the prescriber or at a registered pharmacy.

If you are using substances:

- Get your drugs tested. Drug checking locations can be found at www.drugchecking.ca.
 - Nitazenes will not be detected by immunoassay test strips (fentanyl or benzodiazepine).
 - The absence of an expected substance (e.g., hydromorphone) can alert to a counterfeit tablet.
- Inspect your drugs for signs that they might be counterfeit:
 - Are they a different size than normal?
 - Do they have a different shape or colour than they normally do?
 - Do your drugs crumble more easily when you touch it?
 - Remember that counterfeit tablets cannot always be identified based on how they look.
- Use with a buddy or at an overdose prevention site. Use at different times so there is always someone who can respond in an emergency.
- Start low, go slow. Test a small amount first, then go slowly.
- Carry naloxone. Be prepared if a drug poisoning happens. Naloxone is effective for nitazenes, but higher doses might be needed.
- Try to only use one drug at a time. Mixing drugs (including alcohol) increases the risk of experiencing a drug poisoning. If you do mix, use less than you normally would and go slow.
- Be aware of your health and tolerance. Being sick, run down, or having a chronic illness can impact your tolerance and increase your risk of experiencing a drug poisoning. Tolerance can also be lower if you haven't used for a while, or if you are using a substance for the first time.
- Stay aware of public health drug alerts and text alerts. To sign up for text message drug alerts in your region, text JOIN to 253787 (ALERTS). Learn more at towardtheheart.com/alerts.
- If you think you might have a substance use disorder or want medical help to stop using substances, visit helpstartshere.gov.bc.ca or see BC Centre on Substance Use's list of Opioid Agonist Therapy clinics that are accepting new patients.

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