Canadian Community Epidemiology Network on Drug Use
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Atypical Opioid-Related Overdose Presentations

About the Canadian Community Epidemiology Network on Drug Use

The Canadian Community Epidemiology Network on Drug Use (CCENDU), co-ordinated by the Canadian Centre on Substance Use and Addiction (CCSA), publishes this newsletter regularly to inform people living in Canada about emerging substance use issues and trends, pulling from the best available information sources at the time of publication. To find the archive of past editions of *Substance Use Trends in Canada*, visit our website.

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About Atypical Opioid-Related Overdose Presentations

An opioid overdose occurs when a person is exposed to levels of opioids that exceed their body's tolerance, which can happen even with small doses of potent synthetic opioids and/or with co-occurring substances. An opioid overdose slows or stops breathing and can also cause unconsciousness or blue lips or nails.[1]

Opioid-related overdose presentations have changed as drugs have become more complex and contaminated. Atypical opioid-related overdoses, defined by the presence of different presentations such as muscle rigidity (stiffness), prolonged sedation and others have been reported in Canada with increasing prevalence in some regions.

New substances including xylazine, medetomidine, nonmedical benzodiazepines, etc. in the unregulated opioid supply can contribute to these less common or atypical opioid-related overdose presentations. Awareness, critical thinking and appropriate responses are required to ensure the health and safety of people who use drugs.

Some examples of typical and atypical presentations are listed in the table below (compiled by CCENDU sites, Health Canada and NARCAN).

Table. Common typical vs. atypical opioid-related overdose presentations

Typical	Atypical
Respiratory depression (slow, irregular or absent breathing), with or without gurgling sounds or snoring	Chest wall and jaw rigidity
Blue lips and/or fingernails	Rigidity of limbs and other muscles (stiff posturing)
Unconsciousness	**Profound** bradycardia (slow heart rate)*
Unresponsiveness (when you shake or talk to them)	Dyskinesia (involuntary muscle movement)
Pale and clammy skin	Seizures
Pinpoint pupils	Prolonged sedation (sedated for an extended amount of time, after naloxone is administered and breathing has been restored)

*CCENDU sites reported seeing profound bradycardia early on in overdoses. Typical bradycardia is expected with unaddressed respiratory arrest, but this experience is different.

To better understand this situation, information was gathered via our CCENDU networks and partners in March 2025. This newsletter summarizes their reports by region.

Need to Know

- In any case where an opioid overdose is suspected, naloxone should be administered, whether presentations are typical or atypical. Even if opioids were not involved, naloxone itself will not cause an overdose or other harms.

[1] Opioid overdose - Canada.ca

- Not all opioid overdoses look the same — give naloxone and check for inadequate breathing as a key indicator. Decisions about subsequent doses of naloxone should be based primarily on respiratory status, as multiple doses may be needed. In overdoses with co-occurring substances, naloxone will improve breathing but may not reverse the other signs of the overdose (e.g., sedation, unresponsiveness).
- Atypical opioid-related overdose presentations are being reported more often in some parts of Canada, though the type of presentations and how common they are vary by region.
- Whether atypical presentations are from opioids alone, other co-occurring substances or due to other factors (e.g., dosage, use of prescription medications) is still unknown. Not all atypical presentations are caused by co-occurring substances.
- Some presentations have been reported as atypical but not uncommon, like muscle rigidity (e.g., stiff posturing).
- Most people are aware of the toxicity and unpredictability of the drug supply, however, more information on what atypical presentations look like and why they are occurring is key to reducing harms.
- As with any opioid-related overdose, those with atypical presentations can be distressing for individuals and to anyone providing care. Seek available supports on a regular basis.

Regional Landscape

This section combines reports from both the CCENDU and the National Drug Checking Working Group (NDCWG) sites. For CCENDU, each site collects information from their local partners and networks about substance-related trends and response options.

Atypical presentations are being observed to varying degrees across the country, and some regional differences exist:

- **British Columbia**: Reported a decrease in some atypical presentations like muscle rigidity (stiff posturing) and an increase in others like bradycardia (slow heart rate).
- **Ontario:** Reported significant increases in stiff posturing, jaw rigidity and involuntary movements.
- **Alberta:** Reported an increase in some atypical presentations (e.g., rigidity, unresponsive consciousness), but they are still relatively infrequent compared to typical presentations.
- **Quebec:** Reported both typical and atypical presentations.

- **Manitoba and Newfoundland:** Reported mostly typical presentations.

Figure 1: CCENDU and NDCWG sites that reported on atypical presentations

British Columbia

Muscle rigidity (stiff posturing) has been frequently noted in association with atypical overdose presentations and is common at some sites.

- The site at the BC Centre for Disease Control (sharing data provided by Vancouver Coastal Health) reported that at Insite supervised consumption site in Vancouver, the proportion of overdoses involving muscle rigidity at the facility increased from 21.4% in 2016/17, to a peak of 35.7% in 2022/23 then decreased to 27.1% in 2024.

Bradycardia (slow heart rate) in the context of overdose is increasing in multiple health regions in British Columbia and complicates overdose response.

- Fraser Health Authority reported that they are aware of effects on the cardiovascular system (e.g., low blood pressure, slow heart rate and cardiac arrest) and believe that they might be linked to tranquilizers, like medetomidine.

Presentations with low blood oxygen levels and/or low respiratory rate without complete loss of consciousness have also been reported. At one site these were termed "walking overdoses." Sites also continue to deal with prolonged sedation in the context of overdose.

Other sites also report rare (less than five cases a year) seizure-like presentations, which are of concern because of potential injury to both the individual experiencing the seizure and responders (i.e., flailing limbs). Sites are also dealing with seizures in the context of benzodiazepine withdrawal.

Fraser Health Authority is aware of other atypical opioid-related overdose presentations, which include skin turning blue even when oxygen levels are normal (potentially linked to tranquilizers), seizures, vomiting and flailing.

A recent British Columbia study examining adverse events and their associations with novel adulterants in the unregulated opioid supply also shows an increased prevalence of prolonged sedation and seizure events among people consuming opioids in which benzodiazepines or xylazine were also detected, respectively.

Alberta

The site reported that atypical presentations are increasing in frequency but are still reported to be relatively infrequent compared to typical presentations.

Along with typical overdose presentations such as blue lips indicative of cyanosis (low blood oxygen levels), atypical presentations were described as involving seizure-like activity, muscular rigidity, and/or unresponsive consciousness (where the individual's eyes were wide open, but they were otherwise unresponsive).

Other presentations described by the network were occurrences of extended catatonic states of unresponsiveness in patients who had used opioids (e.g., co-use of fentanyl, methamphetamine and gamma hydroxybutyrate[2] (GHB)). Occurrences of extended catatonia resolved spontaneously in most cases but may require intubation for a short period of time.

There were also reports of involuntary movement and rigidity similar to that seen in Parkinson's disease, though rare.

Manitoba

The site reported that staff, as well as community members who are more likely to be responding to overdoses in their communities, still observe typical presentations (e.g., blue lips, unconsciousness) most often.

A notable trend is that people experiencing an opioid overdose are not always becoming fully alert after receiving naloxone like they used to, though their breathing may return to normal. This is suspected to be related to the presence of benzodiazepines in the local drug supply.

Ontario

Atypical presentations have increased substantially in Ontario in recent months.

The site in northern Ontario reported that they have seen atypical presentations since 2020, but that their prevalence has increased in the past 3–4 months, and they are now seen in most cases.

[2] Gamma hydroxybutyrate is a central nervous system depressant, also known as a club drug.

In February 2025, 80% of opioid-related overdoses included both typical and atypical presentations, whereas 20% included only typical presentations. In March 2025, atypical presentations alone were found more frequently (60%).

The most common atypical presentations reported by the site were stiff posturing, jaw rigidity and involuntary movements. Reports suggest that atypical presentations are related to non-opioid substances and that pre-existing or concurrent cardiac issues may increase the likelihood of an atypical presentation.

Since having access to drug checking results (from 2022), the relationship between the contaminated supply and atypical presentations is being explored. For example, veterinary tranquilizer-associated overdoses (e.g., xylazine) have presented with muscle or jaw rigidity, while benzodiazepine-associated overdoses have presented with involuntary movements and prolonged sedation.

Quebec

Sites in downtown Montreal reported that most overdose presentations remain typical and respond well to naloxone but noted that in some cases, the number of naloxone injections necessary to reverse overdoses is increasing, primarily with nitazenes (non-fentanyl synthetic opioids stronger than fentanyl).

The presence of depressants and tranquilizers in the unregulated drug supply are complicating overdose presentations. The sites describe that bromazolam and xylazine-associated overdoses require regular oxygen, but for medetomidine-associated overdoses, the presentations (i.e., heart rate fluctuating above and below normal), are harder to manage.

Also, with some of the benzodiazepine-associated overdoses (e.g., desalkylgidazepam), people tend to experience less intense but longer lasting sedation, with people remaining partially conscious and mobile.

It is estimated that about 30–40% of opioid-related overdoses include atypical presentations (as described above), with benzodiazepine presence ranging from 20–80% of samples varying by month.

Newfoundland and Labrador

While the site has not reported any specific information on atypical presentations, they may still be occurring. One consistent trend the network is hearing is that some individuals experiencing a perceived opioid overdose are requiring repeat administrations of intramuscular naloxone to achieve reversal.

What Does It Mean?

Atypical overdose presentations can look different. If unsure, always respond by calling 9-1-1 and administering naloxone. If trained or as directed by 9-1-1 call-takers, perform CPR on anyone who does not wake up after being given naloxone.

For First Responders and Emergency Medical Services

In addition to naloxone administration with atypical presentations, response protocols may need to be adjusted according to the presentations.

Some examples of such presentations and adaptive responses (where available) described by the CCENDU sites and their networks are outlined below:

- Dyskinesia: Involuntary or erratic movements can make it hard to recognize an overdose since the presence of movement may make it seem like someone is responsive. If unsure, administer naloxone first.
    - Sudden and unexpected movements can make it difficult to quickly supply oxygen using a tank. Other options such as bag valve masks may be useful to avoid delays in responding but providers need to be adequately trained in these methods as they are not without risk.
- Jaw rigidity: Can make it more difficult to manage the person's airway. Prioritizing open airways through rapid intervention is crucial.
    - The presence of stiffness might make it look like someone is already deceased.
    - Post-overdose observation of individuals for an extended period is helpful for ensuring their airway remains clear and that an adequate breathing rate is maintained.
- Seizures: Can potentially injure both the individual experiencing the seizure and responders due to flailing limbs. Move all objects away from the person to avoid injury and place them in the recovery position following any seizure-like activity.
    - Distinguishing between true seizures and seizure-like events is an advanced skill, making it difficult to develop a protocol for non-regulated professionals. If it is unclear why a person is having a seizure, they need further medical attention and tests.

As much as possible, and with the appropriate consent, document and share observations of atypical presentations and relevant associated information (e.g., the physical appearance of the substance that caused the overdose and any clinical interventions that were helpful).

For Clinicians

- Increasing frequency of polysubstance use and polytoxicity may result in mixed presentations including respiratory depression and seizure-like activity. Nasal naloxone may be preferred in these situations if respiratory depression is present, due to ease of use, however, this may not be available in all regions, in which case injectable naloxone should still be used.

  - Seizures should not be presumed to be related to drug or alcohol withdrawal and may require further investigation.

- Prolonged sedation, even after naloxone, may require longer periods of observation or admission. This is especially critical in mixed overdoses in which life-threatening sedation may return after the effect of naloxone has worn off.
- Increasing frequency of profound bradycardia has been noted. Be aware of this in clinical assessment and response.
- Consult local drug checking data, where available, by reaching out to a known drug checking service provider, subscribing to updates/drug alerts or checking their webpages. Such data can provide insights about which substances individuals may unknowingly be taking.

For People Who Use Drugs

- When opioids are mixed with other sedative drugs, the signs of an overdose may change. Remember that calling emergency medical services, giving naloxone and performing rescue breaths (if someone is not breathing and you know how) are still the most appropriate actions to take.
- Do not use drugs alone. Given that some drug combinations may have unusual or delayed effects, even using drugs in a group setting could be dangerous. Talk with other people about added safety measures that might reduce the likelihood of experiencing harms.

For Policy Makers

- Prioritize campaigns aimed to increase public awareness about how to recognize and respond to an opioid-related overdose and of the safety of naloxone.
- Heightened risk of atypical overdoses increases the need for supervised spaces, drug checking services and easily accessible free naloxone. There is also a need for more training for first responders, clinicians and access to treatment and supports.
- Timely data (e.g., drug checking) and surveillance programs can help determine which substances might be contributing to atypical presentations (and overdose events, in general).

Resources

- Find a Naloxone Kit Near You
- Medetomidine Substance Info Sheet.pdf
- Novel adulterants in unregulated opioids and their associations with adverse events | Canadian Journal of Public Health
- Know How to Recognize an Opioid Overdose

- What is Naloxone

We thank all our partners for their contributions to this newsletter. Your contributions allow us to share valuable insights with subscribers across the country.

Prepared by the CCSA in partnership with the Canadian Community Epidemiology Network on Drug Use

The Canadian Community Epidemiology Network on Drug Use (CCENDU) is a nation-wide network of community level partners who share information about local trends and emerging issues in substance use and exchange knowledge and tools to support more effective data collection.

CCSA was created by Parliament to provide national leadership to address substance use in Canada. A trusted counsel, we provide national guidance to decision makers by harnessing the power of research, curating knowledge and bringing together diverse perspectives. CCSA activities and products are made possible through a financial contribution from Health Canada. The views of CCSA do not necessarily represent the views of the Government of Canada.

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