



**Topic:** *Post-mortem detection of hydromorphone among persons identified as having an illicit drug toxicity death since the introduction of Risk Mitigation Guidance prescribing: Toxicology supplement*

**Date:** December 2021 **Data Source:** BC Coroners Service

**Key Findings:**

- Among the 2,423 persons who had an illicit drug toxicity death from March 1, 2020 to May 31, 2021, 1.9% (N=45) had hydromorphone without fentanyl or fentanyl analogues detected in post-mortem toxicology.
- In these 45 cases, an average of 7 substances were found in post-mortem toxicology in addition to hydromorphone.
- There were 0 illicit drug toxicity deaths where only hydromorphone was detected.
- In illicit drug toxicity deaths where hydromorphone without fentanyl or fentanyl analogues was detected, concurrent use of hydromorphone with other opioids (e.g. codeine, morphine), mental health medications (e.g. SSRIs), cocaine, methamphetamine, and sedatives was common.

**Background:**

- In September 2021, a Knowledge Update was released that described detection of hydromorphone in post-mortem toxicology among persons who had an illicit drug toxicity death from March 1, 2020 to May 31, 2021.
- In response to inquiries, a supplementary analysis was completed on illicit drug toxicity cases where hydromorphone without fentanyl was detected (N=45) using analyzed updated surveillance data from the BC Coroners Service.
- The number of cases described in this supplement is slightly higher (N=45) than in the original Knowledge Update (N=41) because new toxicology data was received by the BC Coroners Service since September 2021.
- In this updated data extract, hydromorphone without fentanyl or fentanyl analogues was detected in 1.9% (N= 45) of illicit drug toxicity deaths between March 1, 2020 and May 31, 2021.



**Toxicology results for illicit drug toxicity deaths with hydromorphone and without fentanyl or fentanyl analogues**

**Source: BC Coroners Service**

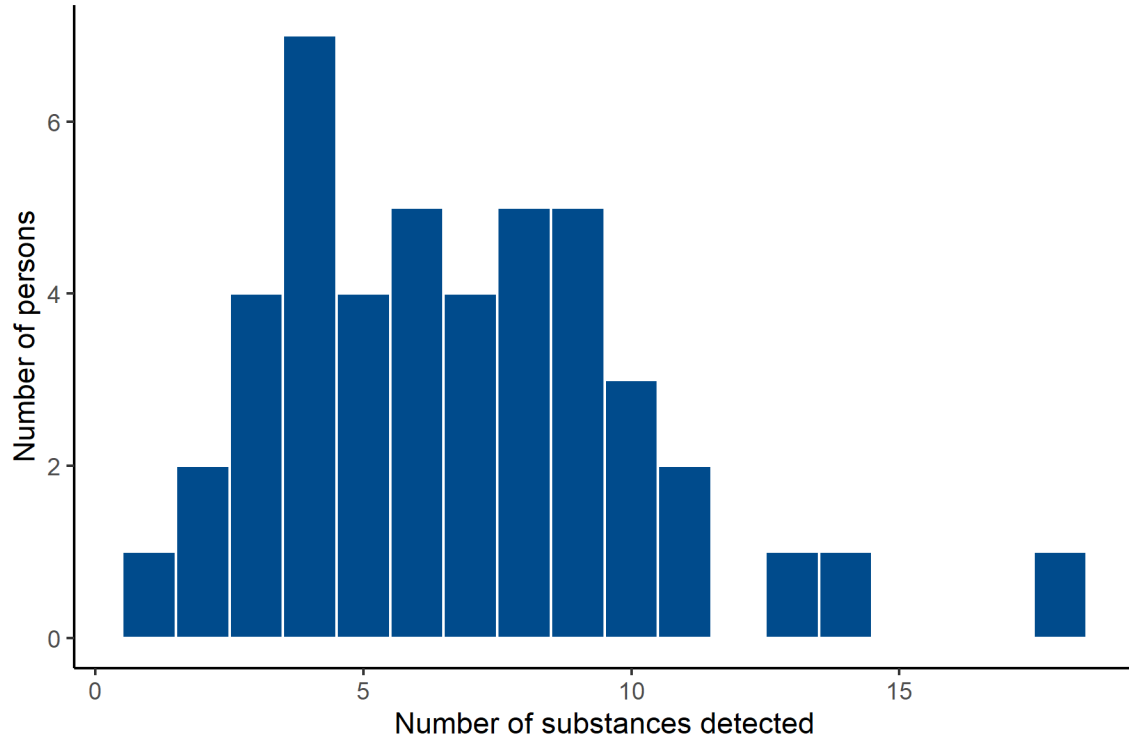
- This knowledge update uses post-mortem toxicology data from illicit drug toxicity deaths in BC. This data has not been linked to PharmaNet meaning that we cannot confirm that the detected substances were prescribed to the decedent, nor whether the hydromorphone detected was prescribed as part of Risk Mitigation Guidance or for some other reason.
- Among the 45 illicit drug toxicity deaths where hydromorphone without fentanyl or its analogues was detected:
  - o There were 0 cases where hydromorphone alone was detected in post-mortem toxicology.
  - o An average of 7 substances were found in addition to hydromorphone (Minimum=1, Maximum=18) (See Figure 1).
  - o Hydromorphone and one additional substance (benzoylecgonine; a major metabolite of cocaine) were detected in one case, and there were two cases where two additional substances were detected in addition to hydromorphone (Case 1: morphine and naloxone, Case 2: morphine and benzoylecgonine).
  - o Opioids (excluding hydromorphone) were detected in 66.7% of cases (See Table 1). Morphine was the most common opioid detected, found in 86.7% of cases where opioids were detected.
  - o Stimulants were found in 64.4% of cases. Cocaine and methamphetamine or other amphetamines were the most commonly detected stimulants.
  - o Other substances were identified in 55.6% of cases. Other substances include antihistamines, naloxone, and non-steroidal anti-inflammatory drugs (NSAIDs).
  - o Mental health-related medications were identified in 57.8% of cases<sup>1</sup>. Selective Serotonin Reuptake Inhibitors (SSRIs) were found in 80.8% of these cases.
  - o Alcohol and Cannabinoids were found in 57.8% of cases. Cannabinoids were found in slightly more cases (n=17) than alcohol (n=12).
  - o Sedatives were identified in 51.1% of cases.

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<sup>1</sup> Some of the mental health medications are also prescribed for insomnia and pain and do not necessarily indicate diagnosis of a mental disorder.



**Figure 1:** Number of substances detected in post-mortem toxicology for illicit drug toxicity death cases where hydromorphone was detected without fentanyl or fentanyl analogues (N=45)





**Table 1:** Substances detected in post-mortem toxicology for illicit drug toxicity death cases where hydromorphone was detected without fentanyl or fentanyl analogues (N=45)

Substance	Substance Category	n
Alcohol	Alcohol/Cannabinoid	12
Cannabinoid	Alcohol/Cannabinoid	17
Antipsychotic	Mental health medications	6
Mood stabilizers	Mental health medications	3
SSRIs	Mental health medications	21
TCA	Mental health medications	7
Benzo/z-drug	Sedatives	17
Gabapentinoid	Sedatives	11
Buprenorphine	Opioids	3
Codeine	Opioids	4
Heroin	Opioids	3
Hydrocodone	Opioids	2
Methadone	Opioids	5
Mitragynine	Opioids	2
Morphine <sup>2</sup>	Opioids	26
Oxycodone	Opioids	2
Oxymorphone	Opioids	2
Antihistamine	Other	8
MDMA	Other	2
Tadalafil	Other	1
Dextromethorphan	Other	1
Dissociatives	Other	2
Muscle relaxants	Other	2
Naloxone	Other	14
NSAIDs	Other	6
Cocaine	Stimulants	20
(Pseudo)ephedrine <sup>3</sup>	Stimulants	2
(Meth)amphetamine <sup>4</sup>	Stimulants	14
Methylphenidate	Stimulants	2

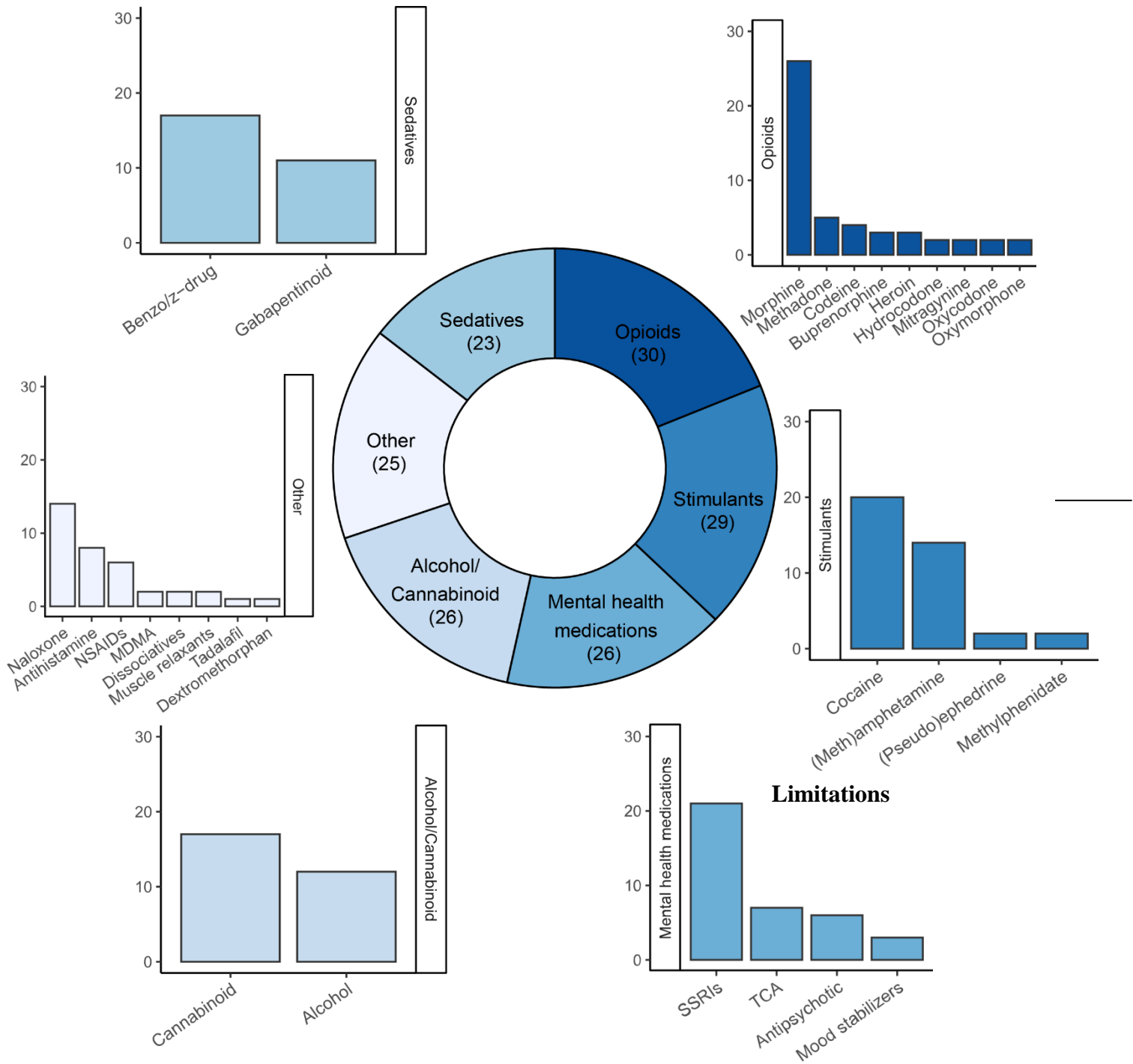
<sup>2</sup> Hydromorphone is a very minor metabolite of morphine. In cases where the morphine to hydromorphone ratio is less than 0.01 (n=8/26) it can be reasonably concluded that the presence of the latter (hydromorphone) was from administration of the former (morphine).

<sup>3</sup> Ephedrine/pseudoephedrine are almost always from impurities in methamphetamine. Both can be used to make methamphetamine.

<sup>4</sup> Refers to either methamphetamine or other amphetamines



**Figure 2:** Substances detected in post-mortem toxicology for illicit drug toxicity death cases where hydromorphone was detected without fentanyl or fentanyl analogues (N=45)





## **Limitations**

- Hydromorphone is also prescribed in BC outside of the context of Risk Mitigation Guidance (RMG) (e.g. pain, palliative care, injectable opioid agonist treatment). Hydromorphone toxicology data cannot be confirmed to reflect hydromorphone that was prescribed as part of RMG and not for other reasons.
- The presented toxicology data from the BC Coroners Service was not linked to PharmaNet. As a result, we cannot confirm whether the substances that were detected in post-mortem toxicology were prescribed to the decedent, nor whether the hydromorphone detected was prescribed as part of RMG.
- BC Coroners Service toxicology data is derived through post-mortem testing of blood, urine or tissue samples. It is possible that the detected hydromorphone originated from heroin or morphine, rather than the consumption of hydromorphone directly, due to similar metabolization of these substances.

## **Interpretation**

- Results suggest that illicit drug toxicity deaths where hydromorphone without fentanyl or its analogues were found had concurrent detection of other opioids (e.g. morphine, codeine), mental health medications (SSRIs), cocaine, methamphetamine, and sedatives.

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