



# Wisconsin Department of Justice

## Morphine, Codeine, and Heroin Monograph

### Morphine, Codeine, and Heroin - General Effects

**Morphine** (MS Contin), **Codeine** (Fioricet, Lortuss, Panadol), and **Heroin** are narcotic analgesics and central nervous system (CNS) depressants.

1. Morphine is used for the relief of moderate to severe pain.
  - a. Morphine has a half-life of 1.3-6.7 hours.
  - b. Morphine can be prescribed on its own or it can be detected as a major active metabolite of codeine or heroin.
2. Codeine is used for the relief of mild to moderate pain and as an antitussive.
  - a. Codeine has a half-life of 1.2-3.9 hours.
  - b. Codeine can be prescribed on its own and metabolizes to morphine. Codeine may also be found in combination with non-narcotic analgesics, antihistamines, and other drugs.
3. Heroin, also known as diacetylmorphine or diamorphine, is a drug of abuse used recreationally.
  - a. Heroin in whole blood rapidly metabolizes to the active metabolite 6-monoacetylmorphine (6-MAM).
  - b. 6-MAM metabolizes further to morphine at a slightly slower rate.
  - c. The detection of 6-MAM is a specific indicator for heroin use or exposure.
  - d. Heroin has a half-life of 2-6 minutes and 6-MAM has a half-life of 6-25 minutes.
    - i. Because of the rapid half-life of heroin, the Wisconsin State Crime Laboratory does not test for heroin, but instead it tests for the metabolite 6-MAM. Presence of 6-MAM is exclusive to heroin use.
4. General effects of narcotic analgesics include but are not limited to: nausea, vomiting, respiratory depression, sedation, and mental clouding/mood swings.
  - a. General impairing effects of narcotic analgesics on driving include, but are not limited to: impaired divided attention, poor coordination, cognitive impairment, delayed reaction time, difficulty following direction, and falling asleep at the wheel.
5. The longer an individual uses a drug, the more they can build up a tolerance to its effects. Tolerance occurs when an individual no longer responds to the drug in the way that they initially responded. When an individual gains tolerance to a drug, a higher dose of the drug is necessary to achieve the same level or response initially achieved. As tolerance is gained, it may reduce some of the possible negative effects of a drug.
6. Drug metabolism (alcohol excluded) exhibits first order kinetics, or the elimination of a constant fraction of drug quantity per unit of time, which means that the amount eliminated is proportional to the drug concentration.
7. The use of more than one drug at a time may enhance the effects the drugs would otherwise have on their own, leading to greater impairment.

#### References

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3. Levine, B., & Vina Spiehler. (2020). Pharmacokinetics and Pharmacodynamics. In B. Levine (Ed.), Principles of Forensic Toxicology (4th ed., pp. 77-93). essay, AACC Press.

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\*\* The interpretive information provided is not exhaustive nor meant to encompass all scenarios where toxicological results are reported. Interpretive information is meant to serve as a general guide for the reader and that for any given case, consultation with a forensic toxicologist is recommended. \*\*

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