

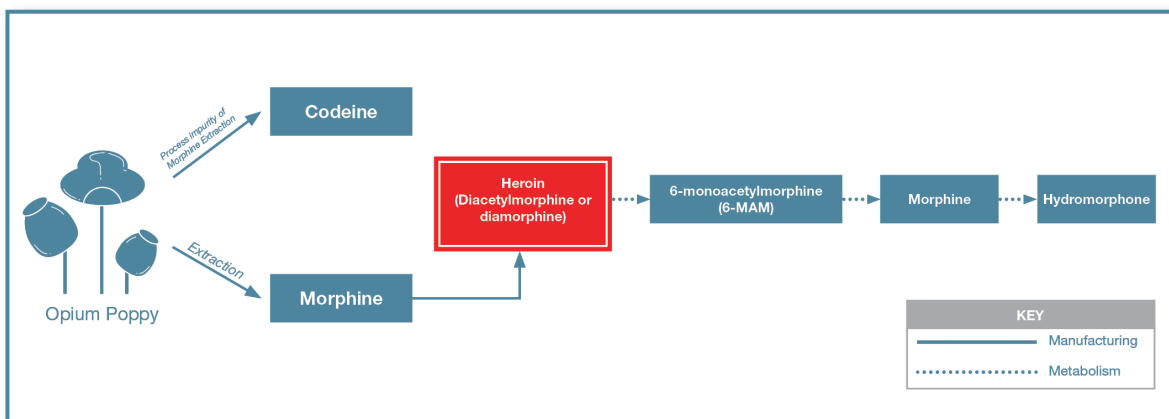
## HEROIN

Heroin is an opioid synthesized from morphine, a naturally occurring opiate from the pod of poppy plants.<sup>1</sup> Heroin was created in an attempt to find a safer and less addictive analgesic than morphine, but was later found to have addictive properties far exceeding morphine. It is typically found as a white or brown powder, or as a black sticky substance commonly called black tar heroin.<sup>2</sup> It can be injected, smoked, or snorted, producing a strong euphoria known as the *rush*, followed by alternating states of sleep and restlessness.<sup>2</sup> Heroin quickly becomes physiologically and physically addictive among users due to the *rush*.

Heroin, also known as diacetylmorphine, is rapidly metabolized to 6-monoacetylmorphine (6-MAM) and then further into morphine.<sup>1</sup> Characteristic test results of recent heroin use include the presence of 6-MAM and morphine at extremely high levels, as well as the possibility of codeine as a process impurity from the production of heroin.<sup>1</sup> A recent study suggests the possibility of a natural, unknown inhibitor of the metabolism of 6-MAM to morphine, making it possible to see only 6-MAM with heroin use.<sup>3</sup> The presence of morphine and potentially codeine and/or hydromorphone without 6-MAM can indicate the end of the elimination phase several days after heroin use.<sup>4</sup>

In an attempt to enhance the effects to the user, heroin can be fortified with other drugs such as cocaine, fentanyl, and fentanyl analogues.<sup>2</sup> The addition of such drugs has contributed to an increase in heroin-related overdoses and deaths.

Precision Diagnostics offers urine and oral fluid tests for 6-MAM, as well as the common metabolites related to heroin use: morphine, codeine, and their respective metabolites as seen in the figure below.<sup>5,6</sup>



Interpretations of 6-MAM and morphine patient reports can be challenging.

**A Precision Diagnostics trained Clinical Support Specialist can assist with further review of your patient's results**

**(800) 635-6901 Option 2**

References:

1. Baselt, Randall C., Disposition of Toxic Drugs and Chemicals in Man, 10th ed. Biomedical Publications, Seal Beach, CA. 2014; 992-995.
2. Drugs of Abuse. A DEA Resource Guide: 2017 Edition. 42. [https://www.dea.gov/pr/multimedia-library/publications/drug\\_of\\_abuse.pdf](https://www.dea.gov/pr/multimedia-library/publications/drug_of_abuse.pdf)
3. Andersson, M., Bjorkhem-Berman, L., Beck, O., (2015). Possible mechanism for inhibition of morphine formation from 6-acetylmorphine after intake of street heroin. Forensic Science International. 252:150-156.
4. White, R. M., Black, M. L., Pain Management Testing Preference, AACCPress, Washington DC. 2007; 13-14.
5. Medical Review Officer Manual for Federal Workplace Drug Testing Programs. Effective October 1, 2010; 57, 80-82. [https://www.samhsa.gov/sites/default/files/workplace/mro-guidance-manual-oct2017\\_2.pdf](https://www.samhsa.gov/sites/default/files/workplace/mro-guidance-manual-oct2017_2.pdf)
6. Knight, J., Puet, B. L., DePriest, A., Heltsley, R., Hild, C., Black, D. L., Robert, T., Caplan, Y., Cone, E. J., (2014). Prevalence of heroine markers in urine for pain management patients. Forensic Science International. 243:76-83.

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Precision Diagnostics, a leader in clinical laboratory testing and medication adherence monitoring, is transforming healthcare through the delivery of comprehensive, insightful clinical data that can help improve patient outcomes and manage costs. Specializing in providing quantitative drug testing, Precision Diagnostics' innovative state-of-the art technology provides insurers, pharmacies, medical practitioners, and patients with new levels of visibility and transparency that allows doctors to better assess patients' medication adherence, ensure patient compliance, and improve outcomes.

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