

Self-Study and Learning Objectives for Opioid Analgesics and Related Drugs

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Note: This is meant to be a guide. It is not “all inclusive;” exam questions you may see won’t necessarily come right off what follows, but it’ll be pretty darned close..

1. Be able to describe what is meant by the three main classes of drugs discussed in your notes – pure opioid agonists, mixed-agonists/antagonists, and pure opioid antagonists – and correctly place the prototypes for each into their proper classes.
2. Recognize mu and kappa receptors as two of the main subclasses of opioid receptors, and correctly state whether drugs in each of the above main classes act as agonists or antagonists on them.
3. Be able to state the main effects of morphine (the prototype of the “pure opioid agonists,” and of the “strong” opioids) on:
 - Pain, and the perception of it
 - Level of consciousness
 - Euphoric or dysphoric effects
 - Central control of ventilation, and responses to rises of PCO₂ that may occur when ventilation is depressed
 - The brain’s “vomiting center” (chemoreceptor trigger zone; CTZ)
 - Peripheral vasculature (as affects blood pressure)
 - Gut and bladder musculature (including the biliary tract)
 - Pupil(s) of the eye(s) — miosis
4. State the main/ most likely cause of death when a pure opioid agonist is taken in overdose, and what measures (pharmacologic or other) can be used to prevent death, if used in time.
5. State how, as tolerance to the effects of an opioid (say, to analgesia or ventilatory depression) develop, average effective and average lethal doses (and the therapeutic index) change.
6. State which of the effects listed in 3, above, do NOT exhibit the phenomenon of tolerance as opioid use continues.
7. State/summarize the general pros and cons, benefits or limitations, of managing pain (assume it will continue for “a while” and require management with a “strong opioid agonist”) with (a) PRN dosing; (b) fixed-interval dosing; and (c) continuous drug infusion/patient-controlled analgesia.
8. Assume a patient has been receiving an opioid agonist such as morphine for pain, the patient still requires opioid analgesia, and a physician orders a switch to a drug such as pentazocine. State the most likely consequences of administering the pentazocine.

9. Describe the characteristics of morphine's oral bioavailability and how that relates to proper or improper use of this drug by that route.
10. Be sure you understand the effects of morphine (or other strong opioid analgesics) on cerebral blood flow (as ventilation is depressed), and the resulting effects on intracranial pressure (ICP). Be sure you understand the "linkage" between the expected effects of morphine on ICP, and how that impacts the proper (or improper) use of morphine on a patient with a closed-head injury (or some large pathologic intracranial mass, such as a brain tumor).
11. Assume a person has been abusing a pure opioid agonist, and have developed significant tolerance to the drug's ability to cause euphoria. Now assume they have taken a massive overdose of an opioid, and are at risk of imminent death. What are the likely outcomes of administering an opioid antagonist in an attempt to prevent their death?
12. What properties or other characteristics distinguish morphine from fentanyl? What is likely to happen if one (any of these) were substituted for another on a milligram-for-milligram basis, and then given parenterally to a patient. (For example, giving 10 mg of fentanyl instead of 10 mg morphine.)
13. Comment on the main pros and cons, benefits or risks, from using meperidine for short-term pain control; long-term pain control; administration to patients with gall bladder/ biliary tract disease; and how the toxicity profile of meperidine differs importantly from that of morphine. Be sure to understand the potentially grave consequences of giving meperidine to a patient receiving an MAO inhibitor, and the signs and symptoms likely to occur if this drug-drug interaction is not prevented.
14. Recognize naloxone as the specific antagonist ("pure opioid antagonist") for the effects of opioids. Be able to state what naloxone does or does not do in terms of administration to patients who have gotten an overdose on CNS depressants that are not opioids. (Also see 11, above.)
15. State the main precautions, risks, or other considerations that you must remember when administering naloxone to reverse ventilatory depression in (a) patients who are also likely to need pain control; and (b) a patient who is physically-dependent on opioids that he/she has been abusing.
16. A patient with a terminal disease requires continuous pain control with a strong opioid analgesic, but a family member is concerned that the patient will become dependent and "addicted" on these medications. State your concerns, and how you might respond to the family member.
17. What is so "special" about oxycodone extended-release tablets (OXYCONTIN) that seems to make them so attractive to many people who want to use opioids. After all, the product is designed so that when it's swallowed, as directed, the drug is absorbed very slowly into the bloodstream.

18. What is the active metabolite of heroin, and what distinguishes that drug from other opioids, such as those used therapeutically, that makes it such a popular drug of abuse?
19. Why is heroin classified by the federal government (the Drug Enforcement Agency) as a “Schedule I” drug? What does that classification mean? In general what is the main factor involved in assigning any drug to one of the main “narcotics schedules?”