

1. Infiltrated anesthetics: “d” is false but the other statements are true.
Care should be taken to avoid overdose of infiltrated lidocaine because the potential toxic side effects include cardiac (hypotension, arrhythmias) and CNS (excitability, seizures) effects. Bupivocaine can be mixed with lidocaine in the same syringe to achieve rapid anesthesia (from the lidocaine) and prolonged anesthesia (from the bupivocaine). Diphenhydramine can be used when a patient has an unknown allergy to an injected anesthetic. It can also be used when the maximum dose of another medication has been administered and further anesthesia is needed. Injecting sterile normal saline into small lacerations can also achieve some anesthesia in patients with allergic concerns. Adding bicarbonate to lidocaine (creating “buffered lidocaine”) will decrease the acidity and reduce the pain of injection, but it will shorten (not lengthen) the shelf life of the lidocaine. The recommended ratio is 9 ml of the anesthetic is mixed with 1 ml of 1 mEq/ml bicarbonate.
2. Topical Anesthetics: “a” is false but the other statements are true.
TAC is much more expensive than LET because cocaine is much more expensive than lidocaine and personnel costs are greater in handling a controlled substance (cocaine). Bupivanor is another topical anesthetic which is a combination of bupivocaine and norepinephrine.
3. Topical anesthetics: Statement “d” is false.
EMLA is not approved for use in open wounds. It is a preparation applied to intact skin prior to venipuncture, spinal taps, or minor incisions. ELA-Max can be purchased without prescription, but EMLA needs a prescription for purchase. Parents of children who have a port-a-cath and anticipate needing to access the port-a-cath in the ED could put the cream on the site prior to arrival in the ED. Lidocaine iontophoresis is a process of transdermally delivering lidocaine by electric current. Its depth of penetration is 8-10 mm, which is greater than EMLA and ELA-Max. It also has the advantage of shorter time of onset in comparison to EMLA and ELA-Max. The duration of effect of vapocoolant sprays is less than one minute, which limits its use to very brief procedures such as injections. These skin re-energizers have a very rapid onset of effect, achieving their anesthetic effect within seconds. Ethyl chloride has the disadvantage of being highly flammable, but Fluoro-Ethyl and Fluoro-Methane are nonflammable.
4. Regarding ketamine, the following lettered answers are correct: “b”, “d”, and “e” are correct. The other lettered answers are incorrect.
Ketamine is a derivative of phencyclidine (PCP), which produces a trance-like dissociative state. It produces analgesia, sedation, catalepsy, and amnesia. Typically the patient keeps his eyes open and displays nystagmus. Ketamine supports the cardiovascular system by increasing blood pressure, heart rate, and cardiac output. It also is a mild bronchodilator. Muscles of the upper airway and protective airway reflexes are preserved, making it a very safe medication in the emergency department. When administered slowly, it does not cause respiratory depression. Rare cases of laryngospasm have been reported when ketamine is administered too rapidly, but these patients will respond to bag-valve-mask ventilation. It is not known to cause clinically significant aspiration when given to children who have no known contraindications. Ketamine may cause hypersalivation, which can be addressed by

the co-administration of atropine or glycopyrolate. Ketamine can be given IV, IM, rectally, po, or orally but the most commonly used routes are IV and IM in the emergency department. Emergence reactions are unpleasant hallucinations and dreams which seem to be much more common in adults. They can be treated with benzodiazepines. Ketamine increases intracranial pressure and intraocular pressure, making it contraindicated in patients with head injuries, other risks of increased ICP, eye injuries or glaucoma.

5. Propofol: “b” is the only true statement.
Propofol is a pure sedative and has no analgesic properties. It has inherent anti-emetic properties. It decreases intracranial pressure, so may be given to euvolemic patients with head injury. Other important side effects of propofol are that it commonly causes respiratory depression and apnea and may induce hypotension if injected rapidly.
6. Reversal agents: “e” is false.
Rapid administration of large boluses of fentanyl may cause chest wall rigidity and laryngospasm. These effects may only be partially reversed with naloxone resulting in the need for paralysis and intubation. The recommended initial bolus dose of fentanyl is 1-2 micrograms/kg to avoid that serious complication.
7. All of the listed drugs except propofol may be used by the rectal route to induce sedation in children.
8. Methohexital. The correct answer is “b”
It is a short-acting barbiturate (not benzodiazepine), which has no reversal agent. It is commonly used successfully by the rectal route and may also be given intravenously. As a barbiturate, it has potential to cause vasodilatation and depressed myocardial contractility if infused rapidly, so should not be given to patients who have hypovolemia or cardiovascular instability. Methohexital should not be used in patients with temporal lobe epilepsy because the drug can induce seizures in those patients. Another potential side effect is apnea and respiratory depression.
9. False. “DPT” is no longer considered an appropriate regimen for pediatric procedural sedation. It has a delayed onset of effect, significant risk adverse events including hypotension, dystonic reactions and seizures, unpredictable ability to provide analgesia and sedation, and prolonged duration of sedation. In 1995, the American Academy of Pediatrics Committee on Drugs advised that alternative sedatives and analgesics be considered.

References and Recommended Reading:

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