1. A nurse is providing an oral medication for pain relief to a client. To attain the fastest pain relief, the nurse administers the medication so that it is most rapidly absorbed from the gastrointestinal (GI) tract. Which of the following has the fastest absorption?
   1. tablet
   2. enteric-coated pill
   3. capsule
   4. liquid suspension

ANS: 4
Liquid medications do not need to go through the dissolution phase and may be immediately absorbed. Tablets and capsules must be dissolved. Enteric-coated tablets are designed to be absorbed at a slower rate.

DIF: Cognitive Level: Application
REF: 3
TOP: Nursing Process: Intervention/Implementation
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

2. A client asks why he has to take a medication on an empty stomach. The nurse explains that generally food does which of the following to drug dissolution and absorption?
   1. enhances
   2. increases
   3. decreases
   4. does not have an effect

ANS: 3
Food in the stomach decreases the contact with the digestive lining of the stomach, decreasing the absorptive surface.

DIF: Cognitive Level: Application
REF: 3 | 4
TOP: Nursing Process: Intervention/Teaching
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

3. Absorption is affected by many factors. Drugs that are absorbed readily across the GI membrane are:
   1. lipid-soluble nonionized drugs
   2. water-soluble ionized drugs
   3. non-lipid-soluble nonionized drugs
4. lipid-soluble ionized drugs

**ANS:** 1

The GI membrane is made up of lipids; therefore lipid medications are most easily absorbed across the digestive membrane of the stomach. Medications that are nonionized (neither positive nor negative) also pass through the GI membrane faster than those with a charge.

**DIF:** Cognitive Level: Comprehension  **REF:** 4  **TOP:** Nursing Process: Analysis

**MSC:** CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

4. A client asks why the oral dose of his pain medication is higher than the intravenous dose. The nurse explains that with the oral dose, some of the drug is absorbed from the GI tract and is metabolized by the liver to an inactive drug form. This reduces the amount of active drug and is called (the):
   1. protein binding
   2. passive absorption
   3. hepatic first pass
   4. pinocytosis

**ANS:** 3

Oral medications are partly metabolized in the liver such that less active drug is available. This is called the hepatic first pass.

**DIF:** Cognitive Level: Comprehension  **REF:** 4  **TOP:** Nursing Process: Analysis

**MSC:** CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

5. When providing a medication, if the nurse wanted to select the route that ensures greatest bioavailability, that route is:
   1. orally
   2. intravenously
   3. intramuscularly
   4. subcutaneously

**ANS:** 2

The intravenous (IV) route is immediately available for distribution and action. The other routes require metabolism in order to become active.

**DIF:** Cognitive Level: Comprehension  **REF:** 4  **TOP:** Nursing Process: Analysis

**MSC:** CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

6. A client’s serum protein and albumin levels are below normal values. For a drug that is highly protein-bound, there would be:
1. more free drug in circulation
2. less free drug in circulation
3. more drug bound to protein
4. more drug excreted in the urine

ANS: 1
With less protein available, less drug is attached to protein. Drugs that are not protein-bound are active or free.

DIF: Cognitive Level: Comprehension  REF: 5  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

7. A client is taking a drug that is moderately highly protein-bound. Several days later, the client takes a second drug that is 90% protein-bound. What happens to the first drug that is highly protein-bound?
   1. The first drug remains protein-bound.
   2. The first drug becomes increasingly inactive.
   3. The first drug is released from the protein and becomes more pharmacologically active.
   4. The second drug becomes more active.

ANS: 3
90% protein binding is considered very highly bound. When taken by the client, it would displace the moderately highly protein-bound medication and make the first drug free in the circulation and active.

DIF: Cognitive Level: Comprehension  REF: 5  TOP: Nursing Process: Active
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

8. A nurse is determining if a medication is ordered to be given at the appropriate intervals. This is done by assessing the half-life of the medication. The serum half-life ($t_{1/2}$) of a drug is:
   1. the time required for half of a drug dose to be absorbed
   2. the time required after absorption for half of the drug to be eliminated
   3. the time required for a drug to be effective
   4. the time required for half of the drug dose to be completely distributed

ANS: 2
This is the definition of half-life.

DIF: Cognitive Level: Comprehension  REF: 6  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies
9. A client is to receive a drug that has a half-life of 36 hours. The drug would probably be administered on a dose schedule of:
1. once a week
2. once a day
3. twice a day
4. three times a day

ANS: 2

36 hours is considered a long half-life. It allows for a dosing pattern that is once per day because it takes 36 hours for half of the drug to be eliminated, maintaining therapeutic drug levels.

DIF: Cognitive Level: Analysis  REF: 6  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

10. A client is suffering from end-stage renal disease. Because of this condition, the nurse monitors drug levels to assess for:
1. accumulation
2. subtherapeutic levels
3. drug ineffectiveness
4. poor compliance

ANS: 1

Although some medications are excreted via the skin and feces, the primary route for drug elimination is the renal system. If kidney function is impaired, drugs may reach toxic levels.

DIF: Cognitive Level: Comprehension  REF: 6  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

11. A client’s creatinine clearance level is 105 ml/minute. Based on this information, a nurse would anticipate that the dose of the drug would be:
1. increased
2. decreased
3. the same
4. changed

ANS: 3

This is a normal creatinine clearance level (normal level is 85-135 ml/min); therefore the dose would be unchanged.

DIF: Cognitive Level: Analysis  REF: 7  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies
12. Isoproterenol (Isuprel) is an example of a medication that enhances the beta receptors in the body. Drugs that enhance a response are known as:
   1. antagonists
   2. agonists
   3. depressants
   4. therapeutic effect

   ANS: 2
   This is the definition of an agonist.

DIF: Cognitive Level: Comprehension       REF: 8       TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

13. A nursing role is to teach clients to watch for adverse medication reactions. Adverse effects are:
   1. mild side effects
   2. therapeutic effects
   3. undesired effects
   4. desired effects

   ANS: 3
   This is the definition of adverse effects/reaction.

DIF: Cognitive Level: Comprehension       REF: 11       TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

14. Undesired effects are frequently associated with a client stopping a medication before completion of the full course. Physiologic effects, not related to the desired effect, that can be predicted or associated with the use of the drug are called:
   1. severe adverse reactions
   2. side effects
   3. synergistic effects
   4. toxic effects

   ANS: 2
   This is the definition of side effects.

DIF: Cognitive Level: Comprehension       REF: 10       TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

15. A nurse is learning how to draw peak and trough levels of a medication. The nurse is aware that the trough level is the:
   1. minimum effective concentration of a drug
2. highest plasma concentration of a drug  
3. lowest plasma concentration of a drug  
4. rate of absorption of a drug  

ANS: 3  
This is the definition of trough.

DIF: Cognitive Level: Comprehension  
REF: 9  
TOP: Nursing Process: Analysis  
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

16. For the client receiving frequent daily drug dosing of a drug that has a long duration of action, the effect may be:  
1. drug accumulation and possible drug toxicity  
2. drug excretion  
3. inability to excrete the drug  
4. increased drug half-life  

ANS: 1  
Medications with a long half-life and frequent dosing may build up in the system or accumulate and lead to toxic effects.

DIF: Cognitive Level: Analysis  
REF: 9  
TOP: Nursing Process: Analysis  
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

17. Drug tolerance to a frequently repeated administration of a certain drug is known as:  
1. pharmacogenetics  
2. tachyphylaxis  
3. drug accumulation  
4. drug toxicity  

ANS: 2  
This is the definition of tachyphylaxis.

DIF: Cognitive Level: Comprehension  
REF: 11  
TOP: Nursing Process: Analysis  
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

18. Because of hereditary influence, drug action may vary from a predicted drug response. This is known as:  
1. biotransformation  
2. tachyphylaxis  
3. pharmacogenetics  
4. transcription factors  

ANS: 3
This is the definition of pharmacogenetics.

DIF: Cognitive Level: Comprehension  REF: 11  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

19. The nurse is monitoring a patient prescribed an aminoglycoside antibiotic for toxicity. Which of the following nursing interventions is indicated when administering this medication?
   1. Ensure that the client voids before administration.
   2. Have emergency airway equipment at the bedside.
   3. Monitor blood levels of the medication.
   4. Determine liver function before each dose.

ANS: 3
Aminoglycide antibiotics have a narrow therapeutic index. Because of this, the nurse must monitor blood levels to ensure that drug dose is a therapeutic dose, but not a toxic dose.

MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

20. A nurse is administering a high dose of a medication in order to rapidly achieve a minimum effective concentration. This dose is known as the:
   1. toxic dose
   2. maintenance dose
   3. therapeutic dose
   4. loading dose

ANS: 4
This is the definition of loading dose.

DIF: Cognitive Level: Comprehension  REF: 10  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies

COMPLETION

1. An oral medication passes through several phases and processes in order to achieve a physiological response. Place the following in the order they occur:
   1. elimination
   2. distribution
   3. dissolution
   4. absorption
5. metabolism

ANS: 3, 4, 2, 5, 1
This is the order of the steps from when an oral medication is ingested to eliminated.

DIF: Cognitive Level: Comprehension  REF: 3  TOP: Nursing Process: Analysis
MSC: CONTENT CATEGORY: Physiological Integrity: Pharmacological and Parenteral Therapies