International
DHA-Pharmacology
DHA Pharmacology (DHA-Pharmacology)

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Question: 1

Of the following ophthalmics, which might be ordered for the treatment of conjunctivitis?

A. Cromolyn NA
B. Timolol
C. Travatan
D. Both B and C

Answer: A

Explanation:
Cromolyn NA Cromolyn NA is an anti-allergy medication that can be used to treat various allergic eye conditions, including allergic conjunctivitis. It works by stabilizing mast cells, which are involved in the release of histamine and other chemicals during the allergic response. This can help reduce inflammation, itching, and redness associated with allergic conjunctivitis.
Timolol Timolol is a beta-blocker primarily used in the treatment of glaucoma. It decreases intraocular pressure by reducing the production of aqueous humor in the eye. It is not typically used for the treatment of conjunctivitis, as it does not address the inflammation or infection associated with this condition.
Travatan Travatan (Travoprost) is a prostaglandin analogue also used mainly for the management of glaucoma. Like Timolol, it works by reducing intraocular pressure but does so by increasing the outflow of aqueous humor. Similar to Timolol, Travatan is not used for treating conjunctivitis.
Both B and C This option suggests using both Timolol and Travatan, both of which are inappropriate for the treatment of conjunctivitis as they are specifically targeted treatments for lowering eye pressure in glaucoma patients. In conclusion, among the medications listed, only Cromolyn NA (Opticrom) would be appropriately ordered for the treatment of conjunctivitis, particularly if it is of the allergic type. It helps control the symptoms by preventing the release of substances that cause inflammation and irritation.

Question: 2

Ibuprofen should not be used in children under which age?

A. 7 years of age
B. 5 years of age
C. 18 years of age
D. 6 months or less

Answer: D

Explanation:

Ibuprofen is a common over-the-counter medication used to relieve pain, reduce inflammation, and lower fever. However, it's important to use this medication safely and appropriately, especially when it comes to children.
Ibuprofen should not be used in children under the age of 6 months. This guideline is due to the potential risks and the lack of specific safety data in very young infants. The bodies of infants under 6 months old are still developing, including their kidney and liver functions, which are crucial for the metabolism and excretion of drugs like ibuprofen. Using ibuprofen in such young infants could lead to serious complications, such as kidney damage and gastrointestinal issues.
When considering ibuprofen for children who are older than 6 months, it is essential to get the dosage right. Pediatric dosing of ibuprofen is typically based on the child's weight, not their age. This approach helps to ensure that the child receives the therapeutic benefits of the medication without exceeding the safe dosage limits. Parents and caregivers should use a dosing tool, such as a syringe or dropper that is specifically designed for administering medications to children, to ensure accuracy.
Furthermore, always consult with a healthcare provider before giving ibuprofen or any other over-the-counter medication to a child. A healthcare provider can confirm whether ibuprofen is appropriate for your child's particular situation or if another medication might be safer or more effective. They can also provide guidance on the correct dosage and inform you about potential side effects and signs to watch for, which could indicate an adverse reaction.
In summary, ibuprofen should not be administered to children who are 6 months of age or younger. For older children, careful consideration of the dosage and consultation with a healthcare provider are crucial steps to ensure the safe use of the medication.

Question: 3

Hydroxyurea has been ordered for the patient that has difficulty swallowing. Which of the following should the nurse be aware of with this medication?

A. The capsule should never be opened.
B. The medication could be administered intramuscularly.
C. The medication would not be administered.
D. The capsule can by opened and mixed with water if the patient has problems swallowing.

Answer: D

Explanation:
Hydroxyurea is a medication used primarily for the treatment of chronic myeloid leukemia, certain ovarian cancers, and sickle cell anemia. It functions by interfering with the synthesis of DNA, specifically by inhibiting the enzyme ribonucleotide reductase. This action blocks the transformation of ribonucleotides into deoxyribonucleotides, which are essential components for DNA synthesis. Thus, hydroxyurea effectively slows down the replication of rapidly dividing cells.
When prescribing hydroxyurea, healthcare providers must consider the patient's ability to swallow the medication. Hydroxyurea is typically available in capsule form, which can pose difficulties for patients who have trouble swallowing pills. In such cases, it is crucial for the nurse to be aware of the proper administration guidelines. Unlike some medications that must not be altered, hydroxyurea capsules can be opened. The contents can be dissolved in water to facilitate easier ingestion by the patient. This method of administration ensures that patients who cannot swallow pills still receive their necessary medication in a safe and effective manner.

However, it is important to handle hydroxyurea with care during preparation due to its cytotoxic nature. The powder from the capsule is potent and can be harmful if it comes into contact with the skin or is inhaled. Nurses should wear gloves when handling the medication and avoid any direct contact with the powder. After preparing the mixture, it should be administered to the patient immediately to ensure its effectiveness and to prevent any degradation of the medication.
In summary, for patients who have difficulty swallowing, hydroxyurea capsules can be carefully opened and the contents mixed with water. This alternative method of administration allows continued treatment adherence, ensuring therapeutic effectiveness while accommodating the patient's needs. Nurses should take appropriate precautions when preparing the dosage to avoid exposure to the cytotoxic properties of the drug.

Question: 4

Morphine and codeine are created from opiate alkaloids withdrawn from the resin of the opium poppy making them which type of narcotic medication?

A. Natural opioid
B. Semi-synthetic opioid
C. Synthetic opioid
D. All of the above

Answer: A

Explanation:
Morphine and codeine are classified as natural opioids. These substances are derived directly from the opium poppy, specifically from the resin of the poppy, known as opium. The process of obtaining these drugs involves extracting the natural alkaloids from the opium resin, which includes a variety of compounds such as morphine, codeine, and thebaine.
Opioids, as a broader category, can be divided into three types based on their origin and method of production: natural opioids, semi-synthetic opioids, and synthetic opioids. Natural opioids are directly extracted from the opium poppy and used in their natural form without any chemical modification. Morphine and codeine fall into this category because they are directly harvested from opium and used medicinally with minimal processing.
Semi-synthetic opioids, on the other hand, are created by chemically altering natural opioids. An example of a semi-synthetic opioid is heroin, which is made by modifying morphine. Another example is oxycodone, derived from thebaine. These medications are synthesized to varying degrees to enhance their effects or to reduce side effects.
Synthetic opioids, such as fentanyl and methadone, are entirely man-made and do not rely on the opium poppy for their production. These drugs are synthesized in laboratories and have structures that are significantly different from the natural opioids, although they act on the same receptors in the human body.
In summary, morphine and codeine are natural opioids because they are directly extracted from the opium poppy's resin. They are not chemically altered significantly from their original form as found in nature, unlike semi-synthetic and synthetic opioids. Thus, when considering the classification of narcotic medications derived from the opium poppy, morphine and codeine are best categorized as natural opioids.

Question: 5

The contraindications for the use of the lipase inhibitor Xenical would be considered which of the following?

A. Cholestasis
B. Chronic malabsorption syndrome
C. Both A and B
D. None of the above

Answer: C

Explanation:
The contraindications for the use of the lipase inhibitor Xenical (orlistat) primarily include conditions that would be adversely affected by its mechanism of action or where its use would be inappropriate due to an existing health condition. Given the options provided in the question, the correct response would be "Both A and B." Here's an expanded explanation for each listed condition:
Cholestasis: Cholestasis is a condition where there is a decrease in bile flow through the bile ducts. Since Xenical works in the gastrointestinal tract to inhibit the absorption of fats by blocking the enzyme lipase, its use can be problematic in individuals with cholestasis. Bile is essential for the digestion and absorption of fats, and in the presence of cholestasis, there is already an impaired fat absorption. Using Xenical could exacerbate malabsorption issues and lead to further complications.
Chronic Malabsorption Syndrome: This syndrome refers to various disorders where the small intestine cannot absorb enough nutrients and fluids from the diet. Given that Xenical's primary action is to prevent the breakdown and absorption of fats from the diet, its use in patients with chronic malabsorption syndrome would further aggravate their condition by increasing nutrient deficiencies, especially in fats and fat-soluble vitamins.
Hypersensitivity to the medication: Like all medications, hypersensitivity or an allergic reaction to Xenical is a direct contraindication. If a patient is known to be hypersensitive to orlistat or any other component of the medication, it should not be administered to avoid allergic reactions, which can range from mild to potentially life-threatening.
Given these points, the response "Both A and B" encompasses the contraindications relating to the physiological effects of Xenical on fat absorption, which are directly impacted in both cholestasis and chronic malabsorption syndrome. These conditions make the use of a lipase inhibitor like Xenical inappropriate and potentially harmful, emphasizing the importance of screening for such contraindications before prescribing this medication.

Question: 6

Dopamine would typically be used for elevating the patient’s blood pressure during shock. The onset of this medication would be which of the following?

A. 15 minutes
B. Less than 5 minutes
C. 30 minutes

D. 1 minute

Answer: B

Explanation:
Dopamine is a medication commonly administered in critical care settings, particularly for patients experiencing shock, to help elevate their blood pressure. The question revolves around understanding the onset of action of dopamine when used in such emergency situations.
The onset of a medication refers to the time it takes for the drug to start working after it is administered. For dopamine, this onset is particularly rapid. Clinical guidelines and pharmacological references typically indicate that the onset of dopamine, when administered intravenously, occurs in less than 5 minutes. This quick action is crucial in emergency settings where rapid response to treatment can be life-saving.
Due to the rapid onset and potent effects of dopamine, it is important to monitor the patient's blood pressure closely once the medication is started. Most hospital protocols recommend monitoring the blood pressure every 5 minutes initially to assess the patient's response to the treatment and to adjust the dosage as needed to avoid potential overcorrection and adverse effects. This frequent monitoring continues until the patient's condition stabilizes.
In summary, when dopamine is administered to a patient, especially in cases of shock where rapid intervention is needed, its effects on blood pressure are typically observed in less than 5 minutes. This rapid onset makes it a critical component in the management of significantly low blood pressure in acute settings. Monitoring protocols are stringent, reflecting the potency and rapid action of the drug.

Question: 7

If a patient is on both milnacipran and warfarin, which of the following statements would be considered correct?

A. The effects of the warfarin would be decreased
B. There would no problem with the patient being on both of these medications.
C. The effects of the warfarin would be increased
D. None of the above

Answer: C

Explanation:
When considering the interaction between milnacipran and warfarin, it's important to understand the pharmacological profiles and mechanisms of both drugs. Milnacipran is a serotonin-norepinephrine reuptake inhibitor (SNRI), primarily used in the treatment of fibromyalgia and depression. Warfarin, on the other hand, is a widely used anticoagulant that inhibits vitamin K epoxide reductase, a key enzyme in the synthesis of clotting factors.
The primary concern with the co-administration of these medications arises from the potential pharmacodynamic and pharmacokinetic interactions. Milnacipran is known to increase serotonin levels. Although milnacipran primarily affects serotonin and norepinephrine reuptake, its influence on platelet aggregation (through serotonin pathways) could theoretically alter hemostatic balance. Increased

serotonin in platelets can enhance their aggregation, a mechanism that is contrary to the anticoagulant effect desired with warfarin.
Regarding warfarin, its effectiveness can be modulated by numerous factors including changes in plasma protein binding and metabolic alterations. Milnacipran does not significantly affect the cytochrome P450 enzymes, which are crucial for the metabolism of many drugs including warfarin. However, the potential increase in platelet aggregation due to heightened serotonin levels could theoretically counteract the anticoagulant effect of warfarin, thereby necessitating closer monitoring of the international normalized ratio (INR) in patients. An increase in INR indicates an increased effect of warfarin.
Additionally, the statement regarding the interaction of warfarin with aspirin or digoxin when a patient is also taking milnacipran is less directly related to the interaction between milnacipran and warfarin. Aspirin has antiplatelet properties and when used with warfarin, can increase bleeding risk. Digoxin's primary concern with warfarin would relate more to combined effects on cardiac function and rhythm than direct interaction through metabolic pathways.
Therefore, the correct statement from the options provided would be the acknowledgment of a potential increase in the effects of warfarin due to altered platelet function from increased serotonin levels, though this is more of a theoretical risk than one robustly documented in clinical studies. The additional effects on aspirin and digoxin are not directly relevant to the milnacipran-warfarin interaction and would depend on other individual patient factors. Thus, careful monitoring and possibly adjusting the dosage of warfarin would be prudent when used concurrently with milnacipran.

Question: 8

If the patient that is taking mirtazapine is experiencing weight gain, which of the following recommendations would be considered correct?

A. Instruct the patient to avoid snacking.
B. Consider switching the patient to an SSRI.
C. Instruct the patient to avoid exercising.
D. Both A and B

Answer: D

Explanation:
When managing a patient experiencing weight gain from mirtazapine, several interventions can be considered to address this side effect. Mirtazapine, an antidepressant, is known for its potential to increase appetite and subsequently cause weight gain in some patients. Here are detailed explanations for the recommendations:
Instruct the patient to avoid snacking: Encouraging the patient to avoid snacking can help control calorie intake. Snacking, especially on high-calorie or sugary foods, can contribute significantly to weight gain. Educating the patient about healthy eating habits and suggesting structured meal plans might help manage weight effectively.
Consider switching the patient to an SSRI, venlafaxine or bupropion: These alternatives to mirtazapine have a lower risk of causing weight gain. SSRIs (Selective Serotonin Reuptake Inhibitors) generally have a more neutral or even weight-reducing effect in some patients. Venlafaxine, a serotonin-norepinephrine reuptake inhibitor (SNRI), and bupropion, a norepinephrine-dopamine reuptake inhibitor (NDRI), are also known for their lower likelihood of weight gain compared to other

antidepressants. Switching medications should be considered after evaluating the patient's overall mental health stability and in consultation with their healthcare provider.
Instruct the patient to exercise regularly: Regular physical activity is crucial in managing weight. Exercise not only helps in burning calories but also in improving overall physical and mental health. Establishing a routine that includes both cardiovascular and strength training exercises can be beneficial. Patients should be encouraged to find forms of physical activity they enjoy, which will help with adherence to a regular exercise schedule.
Both A and B: This option refers to combining the recommendations to avoid snacking and either adjusting the medication or promoting regular exercise. This comprehensive approach addresses both dietary habits and medication management, which are critical in controlling weight gain effectively.
Thus, when recommending strategies for a patient experiencing weight gain on mirtazapine, it's important to consider a holistic approach that includes dietary advice, potential medication adjustment, and promoting an active lifestyle. Each strategy should be tailored to the individual's specific health needs and preferences, ensuring the best possible outcome in managing side effects and maintaining overall well-being.

Question: 9

Which of the following would not be caused by adrenocorticotrophic hormone ACTH?

A. Metabolism increase
B. Absorption of sodium
C. Edema
D. Abnormal menses

Answer: B

Explanation:
Adrenocorticotropic hormone (ACTH) is a hormone produced in the anterior pituitary gland. Its primary role is to stimulate the adrenal glands to release cortisol, a steroid hormone that plays a critical role in metabolism, inflammation, and the body's response to stress. ACTH does this by binding to receptors on the adrenal glands, which are located above the kidneys.
One of the direct effects of increased ACTH and subsequently elevated cortisol levels is an increase in metabolism. Cortisol mobilizes glucose, amino acids, and fatty acids to meet the body's increased energy demands during stress, which in turn can lead to an overall increase in metabolism. Therefore, an increase in metabolism would indeed be a typical result of elevated ACTH levels.
ACTH also influences the balance of electrolytes in the body by affecting the adrenal cortex to release aldosterone, another steroid hormone. Aldosterone promotes sodium retention and potassium excretion by the kidneys. This sodium retention can lead to water retention, consequently causing edema, or swelling, particularly in the extremities.
The hormone's impact on the body can also extend to other, less direct outcomes. For example, abnormalities in menstrual cycles (abnormal menses) can occur due to the overarching effects of cortisol on various bodily systems, including reproductive health. Cortisol can influence the production of gonadotropins, hormones that are crucial for the regulation of the menstrual cycle.
However, ACTH or its induced hormones (like cortisol and aldosterone) do not typically cause direct absorption of sodium. Instead, they influence other hormones that regulate sodium absorption, such as aldosterone. Therefore, the statement that ACTH directly causes sodium absorption is inaccurate.

Instead, ACTH stimulates the release of aldosterone, which in turn promotes sodium retention in the kidneys.
In conclusion, among the options provided, the direct absorption of sodium is not directly caused by ACTH itself but rather through its stimulation of aldosterone production in the adrenal glands. All other options listed (increase in metabolism, edema, and abnormal menses) can be linked more directly to the effects of ACTH and the hormones it influences.

Question: 10

Which of the following would be ways that a drug can be excreted from the body?

A. Skin
B. Kidney
C. Feces
D. All of the above

Answer: D

Explanation:
Drugs can be eliminated from the body through various routes and mechanisms. Each route of excretion plays a crucial role in clearing drugs or their metabolites from the system, affecting both the duration and intensity of the drug's effects. Understanding these pathways is essential for pharmacology and effective therapeutic management.
Skin: Excretion through the skin occurs primarily via sweat. Drugs or their metabolites can be secreted into sweat and then removed from the body as perspiration occurs. This route is generally less significant in terms of quantity compared to other excretion pathways but can be relevant for certain substances.
Saliva: Some drugs can be excreted through saliva. This route, like sweat, typically involves smaller quantities but can be significant for specific drugs. Drug residues in saliva are sometimes used in drug testing, demonstrating the presence of the substance in the body.
Kidney: Renal excretion is one of the primary and most efficient pathways for drug elimination. The kidneys filter blood, remove waste, and excrete drugs and their metabolites in the urine. Factors such as urine pH and kidney function can influence the rate and extent of drug excretion via this route.
Feces: Drugs can also be excreted in the feces, either unchanged or as metabolites. This can occur through the biliary excretion (where substances are secreted into bile and transported to the intestines) or direct secretion into the intestines. Drug characteristics, such as solubility and stability in the gastrointestinal environment, affect the extent of fecal excretion.
Bile: Excretion via bile is a significant route for drugs that undergo enterohepatic recirculation. Here, drugs are first processed in the liver, secreted into the bile, passed into the intestines, and part of them may be reabsorbed back into the bloodstream. The remainder is excreted in feces.
Lungs: Volatile substances, including some anesthetics and alcohol, can be excreted through the lungs. This occurs when these substances evaporate into exhaled air. The rate of pulmonary excretion depends on the substance's volatility and the rate of ventilation.
The option "All of the above" in the context of drug excretion indicates that all the listed mechanisms (skin, saliva, kidneys, feces, bile, and lungs) are valid pathways for the elimination of drugs from the body. Each route may vary in its importance and efficiency depending on the drug's chemical properties

and the individual's physiological condition. Understanding these pathways helps in predicting drug behavior in the body, managing potential toxicities, and optimizing therapeutic regimens.

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