

Latest Version: 6.0

Question: 1

A 22-year-old woman adopted a cat. Shortly thereafter, she developed itchy eyes and persistent rhinorrhea. She was clearly allergic to the pet, but desperately wanted to keep it. She tried taking diphenhydramine, but it had intolerable side effects.

Which of the following is a common effect of this type of medication?

- A. Decreased intraocular pressure
- B. Bradycardia
- C. Xerostomia
- D. Diarrhea
- E. Excessive sweating

Answer: C

Explanation:

Diphenhydramine possesses anticholinergic properties. Xerostomia, or dry mouth, is a common side effect of anti-cholinergic medications, due to anti-muscarinic, parasympatholytic effects. Other adverse reactions may include:

- Mydriasis with blurred vision, photophobia
- Urinary retention
- Constipation
- Anhidrosis
- Hyperthermia
- Tachycardia
- Altered mental status

A commonly referenced mnemonic for anti-cholinergic toxicity is “mad as a hatter, red as a beet, dry as a bone, hot as a hare, blind as a bat” to reflect confusion, flushing, dry mouth, hyperthermia and mydriasis, respectively.

Question: 2

An 18-year-old female is referred to a dermatologist for treatment of severe acne vulgaris. The dermatologist wants to start her on tetracycline.

What test should the patient have prior to starting treatment?

- A. Pregnancy test
- B. Chest X-ray
- C. Complete blood count
- D. Liver function tests
- E. Creatine kinase

Answer: A

Explanation:

Pregnancy test. Tetracyclines are effective in the treatment of severe cases of acne. They are however teratogenic. As such, it is imperative to make sure female patients are not pregnant prior to starting this medication. In many instances patients are started on concurrent birth control to mitigate this risk even further.

A chest x-ray (B) is an important exam to obtain prior to starting drugs which have pulmonary toxicity as a side effect such as amiodarone. A complete blood count (C) would be useful prior to starting a medication that causes anemia, such as immunosuppressive and chemotherapeutic agents. Liver function tests (D) are important to establish as a baseline prior to starting anti-mycobacterial agents. Creatine kinase levels (E) are used to establish as a baseline prior to starting statins.

Question: 3

A 7-year-old boy has been suffering from influenza and had been given a drug by his father to decrease his high fever. A few hours later, his father brought him to the emergency room in a comatose state with a papulovesicular rash all over the body, moderate hepatomegaly, and asterixis. Laboratory studies reveal elevated levels of blood ammonia, AST, ALT, and PT. CT scan findings are suggestive for generalized cerebral edema.

The drug the father gave his son is most likely which of the following drugs?

- A. Aspirin
- B. Acetaminophen
- C. Indomethacin
- D. Mefenamic acid
- E. Diclofenac

Answer: A

Explanation:

A: The syndrome is an acute noninflammatory encephalopathy with hepatic failure. Although the etiology of Reye's syndrome is unknown, the condition typically follows viral illness, particularly upper respiratory tract infection (URTI), influenza, varicella, or gastroenteritis, and is associated with aspirin use during the illness. A dramatic decrease in aspirin use in children has made Reye's syndrome rare. High index of suspicion is critical for diagnosis. Consider Reye's syndrome in any child with vomiting and altered mental status. Pathogenesis is unclear, but it typically involves mitochondrial dysfunction in a viral-infected, sensitized host, usually with exposure to mitochondrial toxins (e.g., salicylates, in >80% of cases). Individuals with low levels of urea cycle enzymes are also at increased risk. Mortality has fallen from 50% to less than 20% as a result of earlier diagnosis, recognition of milder cases, and more aggressive therapy. Signs and symptoms of Reye's syndrome include protracted vomiting, with or without significant dehydration, encephalopathy in afebrile patients with minimal or absent jaundice, and hepatomegaly in 50% of patients. Antiemetics may mask early symptoms. Liver function tests reveal elevation of ammonia levels to as much as 1.5

times normal (up to 1200g/dL) 24-48 hours after the onset of mental status changes; this is the most frequent laboratory abnormality. Transaminases (ALT and AST) increase to 3 times normal. Histologic changes include: hepatocyte cytoplasmic fatty vacuolization, astrocyte edema, loss of neurons, and edema and fatty degeneration in proximal lobules. The American Academy of Pediatrics Committee on Infectious Disease recommends that salicylate not be given to children with chicken pox or influenza B. B: Acetaminophen is incorrect. Acetaminophen acts by prostaglandin synthesis in the CNS, and this explain its antipyretic and analgesic properties, which account for its weak anti-inflammatory activity. Acetaminophen is a suitable substitute for the analgesic and antipyretic effects of aspirin in those patients with gastric complaints and to avoid Reye's syndrome in children. C: Indomethacin is incorrect. Indomethacin is more potent than aspirin as an anti-inflammatory agent (NSAID), but it is inferior to the salicylates at doses tolerated by rheumatoid arthritis patients. D: Mefenamic acid is incorrect. Mefenamic acid has no advantage over the other NSAIDs as anti-inflammatory agents. The side effects of mefenamic acid, such as diarrhea, can be severe and associated with inflammation of the bowel. E: Diclofenac is incorrect. Diclofenac is approved for long-term use in the treatment of rheumatoid arthritis, osteoarthritis, and ankylosing spondylitis.

Question: 4

The rate that an outcome will occur given a particular exposure, compared to the rate of the outcome occurring in the absence of that exposure is definition of which of the following?

- A. Incidence rate
- B. Prevalence rate
- C. Odds ratio
- D. Relative risk
- E. Confidence Interval

Answer: D

Explanation:

RR = rate of an outcome occurring in an exposed group (treatment group/intervention group) divided by the rate of an outcome occurring in an unexposed group (control group) Ex: Relative Risk = Rate of UTI in patients taking drug XYZ / rate of UTI in patients not on drug XYZ

Reference:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2938757/>

Question: 5

JM is a 32-year-old women who comes to your diabetic clinic with complain of several episodes of hypoglycemia. She is on Insulin NPH/regular 70/30, 22 units twice a day with breakfast and dinner. 8 units with lunch.

After discussing with physician you decide to decrease the total daily insulin by 10% and change to insulin glargine once a day and Insulin Lispro three time a day at ratio of 50:50 – 50 % of long and 50 % of short acting insulin.

What is her new insulin regimen? Round down to the nearest 1 unit.

- A. 16 units of insulin glargine once daily, Insulin Lispro 4 units 3 times a day with meals
- B. 15 units of insulin glargine once daily, Insulin Lispro 5 units 3 times a day with meals
- C. 23 units of insulin glargine once daily, Insulin Lispro 7 units 3 times a day with meals
- D. 30 units of insulin glargine once daily, Insulin Lispro 6 units 3 times a day with meals
- E. 18 units of insulin glargine once daily, Insulin Lispro 6 units 3 times a day with meals

Answer: C

Explanation:

$22 \times 2 + 7 = 51$ units of total insulin per day. Decrease by 10% $51 \text{ units} \times 0.9 = 45.9$ units per day round up to 46 units. $46 \text{ units} \times 0.50 = 23$ units, administer 23 units of insulin glargine once daily. $46 \text{ units} \times 0.50 = 23$ units total Insulin Lispro. Round down, divided by three times a day, 7 units 3 times a day with meals.

Question: 6

JK is a 67 years old African American man who presents to your clinic for his blood pressure management. His past medical history includes Peptic ulcer disease and hypertension. His two BP readings are 160/98, 159/96 and HR 85. He says he has been adherent to his medication and lifestyle. He currently takes 12.5mg Chlorthalidone and Prilosec 20mg daily.

Which of the following is the best strategy to manage his blood pressure?

- A. Increase chlorthalidone to 25mg daily
- B. Add Norvasc 2.5 daily
- C. Add Lisinopril 5mg daily
- D. Add hydrochlorothiazide 25mg daily
- E. Add Lisinopril 20mg daily

Answer: B

Explanation:

As the patient is over the age of 60 and he does not have CKD or diabetes, his goal BP should be SBP < 150 mmHg or DBP < 90 mmHg, and he is not currently at this goal with his medication regimen. Options are to maximize the current medication dosage (option A), or to add a second agent. Since calcium channel blockers like Norvasc are recommended as initial treatment options in African Americans, choosing Norvasc over lisinopril would probably be the more effective option.

Reference:

<http://jamanetwork.com/journals/jama/fullarticle/1791497>

Question: 7

Results from a Meta-analysis where they looked at frequency of postoperative arterial fibrillation in patients on Ascorbic acid after cardiac surgery found odds ratio, 0.44 (95% CI, 0.32 to 0.61). How can you interpret this data?

- A. Ascorbic acid increased frequency of postoperative arterial fibrillation after cardiac surgery by 44%
- B. Ascorbic acid decreased frequency of postoperative arterial fibrillation after cardiac surgery by 44%
- C. There was no statistically significant difference in frequency of postoperative arterial fibrillation after cardiac surgery
- D. Ascorbic acid decreased frequency of postoperative arterial fibrillation after cardiac surgery by 56%
- E. None of the above are correct

Answer: D

Explanation:

Odds ratio of 0.44 (44%) means that this group was associated with an event happening 44% of the time, compared to 1 (an event happening 100% of the time if unexposed), therefore $100 - 44 = 56\%$, which is the reduction caused by the exposure. Exposure is the use of ascorbic acid.

Reference:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1112884/>

Question: 8

A patient takes 1gm of Calcium Carbonate salt three times a day. How much elemental calcium, in grams, is he getting in 24hrs? (MW of Ca: 40.078 g/mol, MW of CaCO₃: 100.087 g/mol)

- A. 3 g
- B. 1.8g
- C. 1.2g
- D. 0.8gm
- E. 1.8mg

Answer: C

Explanation:

Calcium makes up 40% of the MW of CaCO₃. $\text{MW Ca} / \text{MW CaCO}_3 = 40.078 / 100.087 \times 100\% = 40\%$. 40% of 1 g CaCO₃ = 0.4 g. Patient is taking 0.4 g of Ca 3 times daily. $0.4 \text{ g Ca} \times 3 = 1.2 \text{ g of Elemental Ca}$.

Question: 9

Number of new cases per population at risk in a given time period is a definition of which of the following?

- A. Incidence rate
- B. Prevalence rate
- C. Mortality rate
- D. Odds ratio
- E. Confidence Interval

Answer: A

Explanation:

Incidence rate = New reported cases / summed person-years of observation (avg population during time interval). Prevalence = Cases in a population in a given time period / total population at that time
Mortality rate

= deaths during specified time interval / population size at risk for death.

Reference:

<https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson3/section2.html>

Question: 10

A CD4 count of 180 cells per cubic meter may be evaluated as which of these?

- A. Very low
- B. Low
- C. High
- D. Severely high

Answer: A

Explanation:

A CD4 count of 180 cells per cubic meter is considered very low – typically an indicator that the patient has an immunocompromised state, such as AIDS. CD4 counts are a measure of healthy T-cell levels. The lower the count, the more susceptible the patient is to opportunistic infections. A normal range is between 500 and 1,500 cells.