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Test Prep NAPLEX

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QUESTION NO: 1

A 23-year-old female presents to your clinic complaining of intermittent throbbing headaches that usually last for several hours and are made worse by the presence of light. She endorses occasional nausea without vomiting during the most severe episodes. Physical examination is unrevealing, and she has no significant past medical history.

Which of the following treatments is considered an abortive therapy for this patient's underlying condition?

A. Sumatriptan

Migraine headaches typically affect females more often than males, and patients most frequently present in their early 20s. Classic symptoms of migraine include throbbing headaches lasting between 2–24 hours in duration, with triggers such as red wine, fasting, stress, and menses. Primary prevention is aimed at the identification and avoidance of triggers. Over the counter NSAIDS can be used if symptoms persist. Failing this, PRN abortive therapy is indicated, including the triptans (e.g. – sumatriptan) and metoclopramide. Choice B – Gabapentin is an anticonvulsant that is considered to be a second-line, prophylactic treatment for recurrent migraine headaches. Its utility is limited by its lengthy side effect profile. Choice C – Amitriptyline, a tricyclic antidepressant, can also be utilized for migraine prophylaxis. However, it will not abort a migraine currently in progress, and extensive side effects limit its use. Choices D + E – Propranolol and diltiazam are beta-blockers and calcium channel blockers, respectively. As with the anticonvulsants and tricyclic antidepressants, these are considered migraine prophylaxis and will not interrupt a migraine once it has begun.

B. Gabapentin**C. Amitriptyline****D. Propranolol****E. Diltiazam****ANSWER: A****Explanation:**

Correct:

A. Migraine headaches typically affect females more often than males, and patients most frequently present in their early 20s. Classic symptoms of migraine include throbbing headaches lasting between 2–24 hours in duration, with triggers such as red wine, fasting, stress, and menses. Primary prevention is aimed at the identification and avoidance of triggers. Over the counter NSAIDS can be used if symptoms persist. Failing this, PRN abortive therapy is indicated, including the triptans (e.g. – sumatriptan) and metoclopramide. Choice B – Gabapentin is an anticonvulsant that is considered to be a second-line, prophylactic treatment for recurrent migraine headaches. Its utility is limited by its lengthy side effect profile. Choice C – Amitriptyline, a tricyclic antidepressant, can also be utilized for migraine prophylaxis. However, it will not abort a migraine currently in progress, and extensive side effects limit its use. Choices D + E – Propranolol and diltiazam are beta-blockers and calcium channel blockers, respectively. As with the anticonvulsants and tricyclic antidepressants, these are considered migraine prophylaxis and will not interrupt a migraine once it has begun.

QUESTION NO: 2

Octreotide 50mcg/hr is ordered for a patient with esophageal varices, nurses prepared by mixing 1ml of concentration 0.5mg/ml of octreotide in 50mls NS. What rate should the bag be infused?

- A. 50ml/hr
- B. 5ml/hr
- C. 5ml/min
- D. 0.5ml/min
- E. 7ml/hr

ANSWER: B

Explanation:

The concentration is the first thing to calculate, using 1 mL of octreotide solution containing a concentration of 0.5mg/mL is really using 0.5mg of octreotide. If this is placed in 50 mL NS then it is

0.5mg/50mL which is 0.01mg/mL or 10 mcg/mL. If the patient needs 50 mcg of octreotide per hour then the patient will need 5, 10 mcg/mL doses or 5 mLs. So the rate for this patient would be 5 mL/hr.

QUESTION NO: 3

How many kcal per gram does IV dextrose provide?

- A. 0.9 kcal/g
- B. 1.2 kcal/g
- C. 1.5 kcal/g
- D. 3.4 kcal/g

ANSWER: D

Explanation:

IV dextrose provides 3.4 kcal/g.

QUESTION NO: 4

A 72-year-old woman suffers from a major depressive episode. She has a history of coronary artery disease, atrial fibrillation on anticoagulation therapy, sick sinus syndrome, glaucoma, and chronic obstructive pulmonary disease.

Which of the following medications is most appropriate for the treatment of her depression?

- A. Amitriptyline

- B. Nortriptyline
- C. Doxepin
- D. Fluvoxamine
- E. Escitalopram

ANSWER: E

Explanation:

In older adults, selection of antidepressant medication should be done with various considerations in mind, most notably side effects and risk of drug-drug interactions. The tricyclic antidepressants (TCAs), as discussed on question 50, have various side effects including cardiac conduction abnormalities and drug-drug interactions that make them undesirable for the treatment of depression in older adults. A selective serotonin reuptake inhibitor is more favorable than a TCA in this patient. Fluvoxamine has a high risk for drug-drug interactions, whereas escitalopram does not. Fluvoxamine also has high protein binding, and can therefore interact with anticoagulant medications, such as warfarin. Therefore, of the medications listed, escitalopram is the most appropriate in this patient. In older adults, psychotropic medications should be started at a low dose and titrated up slowly to the lowest effective dose.

QUESTION NO: 5

JM is a 32-year-old woman who comes to your diabetic clinic with a complaint 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 your physician you decide to decrease the total daily insulin by 10% and change to insulin glargine once a day and Insulin Lispro three times a day at a 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:

$22 \times 2 + 8 = 52$ units of total insulin per day. Decrease by 10% $52 \text{ units} \times 0.9 = 46.8$ units per day round up to 47 units. $47 \text{ units} \times 0.50 = 23.5$ units, administer 23 units of insulin glargine once daily. $47 \text{ units} \times 0.50 = 23.5$ units total Insulin Lispro. Round down, divided by three times a day, 7 units 3 times a day with meals.

QUESTION NO: 6

A patient with multibacillary leprosy is on dapsone, clofazimine, and rifampin. Which of the following is true regarding the mechanism of action of the medications listed?

- A. Dapsone is bacteriostatic because of its inhibitory effects on dihydrofolate reductase
- B. Dapsone is bacteriostatic because of its inhibitory effects on myeloperoxidase
- C. Clofazimine is bactericidal by directly inhibiting bacterial DNA polymerase
- D. Rifampin is bacteriostatic by inhibiting RNA synthesis by blocking DNA-dependent RNA polymerase
- E. Rifampin is bactericidal by inhibiting RNA synthesis by blocking DNA-dependent RNA polymerase

ANSWER: E

Explanation:

A, B – false – dapsone inhibits bacterial synthesis of dihydrofolic acid, via competition with para-aminobenzoate for the active site of dihydropteroate synthetase. Dapsone is both bacteriostatic and weakly bactericidal against *M. leprae*. Neither of the listed mechanisms are the cause of these effects. C – False – A substance with both anti-leprosy and anti-inflammatory activity, clofazimine is weakly bactericidal against *M. leprae* by binding to the guanine bases of bacterial DNA, not DNA polymerase directly. D – False – See below. E – True – Rifampin is bactericidal by inhibiting RNA synthesis by blocking DNA-dependent RNA polymerase.

QUESTION NO: 7

Which of the following antidiabetic medication works by inhibiting carbohydrate breakdown?

- A. Acarbose
- B. Metformin
- C. Dapagliflozin
- D. Pioglitazone
- E. Sitagliptin

ANSWER: A

Explanation:

Acarbose is an alpha glucosidase inhibitor that inhibits carbohydrate breakdown. Metformin is a biguanide that decreases hepatic glucose production. Dapagliflozin is a SGLT2 inhibitor to decrease glucose reabsorption in the kidney. Pioglitazone is a TZD that increases insulin sensitivity. Sitagliptin is a DPP-4 inhibitor that works on incretins/increase insulin secretion/decrease glucagon secretion.

QUESTION NO: 8

What is the amount of potassium permanganate in 300mL of a 1 in 25 solution?

- A. 1 gram
- B. 8 grams
- C. 12 grams
- D. 14 grams

ANSWER: C

Explanation:

- We have 1g of potassium permanganate in 25mL
- We have 300mL of solution
- For every 25mL of that 300mL, we have 1g of $Kmno_4$
- 300mL must have 12g of potassium permanganate (300ml/25mL)

QUESTION NO: 9

Which of the following represents the major route of metabolism for acetaminophen?

- A. Glucuronidation
- B. Sulfation
- C. Cytochrome P-450 oxidation
- D. Direct renal excretion

The major route is glucuronidation catalyzed by UDP-glucuronyl transferase in the liver. Sulfation is the next most common route and is the target mechanism for NAC therapy. Oxidation by cytochrome P-450 results in the formation of N-acetyl-p-benzoquinone imine, which is responsible for the hepatic necrosis caused by acetaminophen overdose. Direct renal excretion represents approximately 5% of the metabolism of acetaminophen. Plasma metabolism of acetaminophen does not generally occur.

- E. Plasma breakdown

ANSWER: A

Explanation:

Acetaminophen is metabolized by choices A through

D. The major route is glucuronidation catalyzed by UDP-glucuronyl transferase in the liver. Sulfation is the next most common route and is the target mechanism for NAC therapy. Oxidation by cytochrome P-450 results in the formation of N-acetyl-p-benzoquinone imine, which is responsible for the hepatic necrosis caused by acetaminophen overdose. Direct renal excretion represents approximately 5% of the metabolism of acetaminophen. Plasma metabolism of acetaminophen does not generally occur.

QUESTION NO: 10

Select the class of Anti-diabetic medication that works in the specified organ to prevent hyperglycemia. Select all that applies.
Fat Tissue (H)

- A. Sulfonylureas
- B. Alpha- Glucosidase Inhibitors
- C. DPP4 Inhibitors
- D. Glucagon-like peptide-1 receptor agonists
- E. Thiazolidinediones
- F. Biguanide
- G. SGLT2 inhibitors

ANSWER: E**Explanation:**

Thiazolidinediones Sulfonylureas work in beta cells in the pancreas that are still functioning to enhance insulin secretion. Alpha-Glucosidase Inhibitors stop α -glucosidase enzymes in the small intestine and delay digestion and absorption of starch and disaccharides which lowers the levels of glucose after meals. DPP4 blocks the degradation of GLP-1, GIP, and a variety of other peptides, including brain natriuretic peptide. Glucagon-like peptide-1 receptor agonists work in various organs of the body. Glucagon-like peptide-1 receptor agonists enhance glucose homeostasis through: (i) stimulation of insulin secretion; (ii) inhibition of glucagon secretion; (iii) direct and indirect suppression of endogenous glucose production; (iv) suppression of appetite; (v) enhanced insulin sensitivity secondary to weight loss; (vi) delayed gastric emptying, resulting in decreased postprandial hyperglycaemia. Thiazolidinediones are the only true insulin-sensitising agents, exerting their effects in skeletal and cardiac muscle, liver, and adipose tissue. It ameliorates insulin resistance, decreases visceral fat. Biguanides work in liver, muscle, adipose tissue via activation of AMP-activated protein kinase (AMPK) reduce hepatic glucose production. SGLT2 inhibitors work in the kidneys to inhibit sodium-glucose transport proteins to reabsorb glucose into the blood from muscle cells; overall this helps to improve insulin release from the beta cells of the pancreas.

Reference:

<https://doi.org/10.1093/eurheartj/ehv239>