ANBLPN | AIAANB
Association of New Brunswick Licensed Practical Nurses
L'Association des Infirmier(ère)s Auxiliaires Autorisé(e)s du Nouveau-Brunswick

Administration of Medications: A Self-Assessment Guide for Licensed Practical Nurses in New Brunswick

ANSWER KEYS

CASE SCENARIO

PART 1

1. Mr. Wells has heart failure, a condition in which the heart action and rhythm have been affected (due to previous injury or prolonged cardiac stress), resulting in ineffective heart contractions and possible abnormal heart rhythms. Digoxin has three primary actions; it increases the force of contraction, regulates rhythm as well as slowing the heart rate, allowing the heart to fill and empty more completely.

2. Determine apical heart rate for one full minute for withholding the medication if the rate is less than 60 beats per minute or the rate as defined by organizational policy/practice. The physician should be notified if Mr. Wells exhibits alterations in his rate, rhythm, and quality of pulse. (In the long term care setting a radial pulse may be acceptable) (Clayton et al 2010)

3. 0.5 tabs

4. A trans-dermal patch applied to the client's skin and the medication is time released for absorption while in contact with the client's skin.
    a. Nitroglycerine will dilate the coronary arteries allowing more oxygen to be delivered by the blood to the myocardial cells.
    b. Removing Nitro-Dur after 12 hours reduces the development of tolerance to the medication that would ultimately require higher doses.

5. 1. Apply to any hairless (non-distal) site and ensure contact with skin by pressing firmly
    2. Rotate sites to avoid skin irritation
    3. Replace if the patch becomes loose/curls up
    4. Remove as directed

6. MDI is a metered dose inhaler and refers to the method of delivery. MDI releases a set amount of medication with each compression of the inhaler canister.

7. Mr. Wells has chronic obstructive pulmonary disease, causing bronchoconstriction which results in decreased exchange of gases at the alveolar level. It is also associated with an inflammatory response that further decreases the diameter of the bronchi compounding the respiratory problems. Albuterol is a bronchodilator that relaxes smooth muscle of the bronchi thereby enhancing the flow of air in and out of the lungs. Fluticasone is a topical corticosteroid whose anti-inflammatory properties reduce swelling and mucus production further increasing bronchial diameter and promoting ease of alveolar gas exchange.

Inhaled forms of the medication act locally, resulting in fewer side effects than systemically absorbed forms.

8. Albuterol is administered first to relax smooth muscle of the bronchi and open the airways to permit optimal distribution and absorption of fluticasone.

9. Prednisone is a systemic corticosteroid that reduces the inflammatory process in the bronchi easing Mr. Wells' respiratory effort.

10. Cushingoid syndrome – moon face, fat redistribution, buffalo hump, osteoporosis, hypertension, hypokalemia, hyperglycemia, gastric ulcer, edema, immunosuppression, parchment paper like skin, cataracts etc…

PART 2
Mr. Wells' physician has ordered a diagnostic test, which requires him to fast

1. Contact the physician to receive direction as to whether the medications can be administered with a small quantity of water, deferred, or whether a parenteral form might be necessary.

2. Prednisone causes suppression of the body's normal secretion of corticosteroids and the client is at risk for Addisonian crisis (shock) with sudden withdrawal of the corticosteroids.

3. Prednisone may cause bone loss predisposing the client to an increased risk of fracture caused by secondary osteoporosis. Alendronate will aid in the prevention of bone loss and reduce Mr. Wells' risk of fracture.

4. Several factors predispose Mr. Wells to constipation. These may include decreased bowel motility due to various health problems such as diabetes, potential insufficient fluid intake, decreased activity resulting in reduced peristaltic activity and side effects of medications, in particular acetaminophen with codeine.

5. Level II protocol is to be followed. Administer docusate 100 mg at 0800 and 1700. At 2200 administer sennosides 12mg 2 tablets. Cascara 5-10mL can be given instead of sennosides if Mr. Wells prefers.

6. Tylenol #3

7. It lowers blood glucose by:
    1. stimulating pancreatic release of insulin
    2. increasing the sensitivity to insulin at receptor sites
    3. reducing hepatic glucose formation

8. a. 10 mg = 2 tablets per dose
    b. 20 mg per day / 5 mg tablets = 4 tablets per day.

9. Hypoglycemia

PART 3
Mr. Wells' blood glucose level is progressively rising. His physician orders Humulin 70/30 insulin, 10 units subcut qam.

1. Noncompliance to prescribed diet
   Side effects of medications such as prednisone
   Decreased exercise
   Presence of stress and/or an infection

2. Humulin insulin is a genetically engineered (biosynthetic) hormone replacement for insulin normally secreted by the beta cells of the pancreas. The Humulin insulin 70/30 is a premixed combination of 70% intermediate insulin and 30% short acting insulin.

   a. The onset, peak and duration for each of the two types differ and vary with individuals and manufacturer. Approximate onset, peak and duration for the short acting insulin is ½ hr, 2-4 hrs, 5-10 hrs respectively and the intermediate acting insulin ranges from 1-4 hours, 6-8 hours and 12-24 hours respectively. The newer synthetic insulin generally has a shorter duration than the former animal sourced insulin and further varies with individuals based on metabolic rate and absorption.
   b. Ensure sufficient food intake and exercise corresponds to the onset, peak and duration of the various insulin and monitor blood glucose levels

3. Administer 175 ml (¾ cup) of orange juice. Recheck the blood glucose in 15 minutes. If blood glucose is not normal, administer a second glass of orange juice. Recheck blood glucose. If a meal is more than 1 hour away provide crackers (6) and cheese/peanut butter.

PART 4
Mr. Wells has increasing edema in his lower limbs. The physician orders furosemide 20mg po daily. He has been receiving the medication for two weeks and there is little improvement. The order is changed to furosemide 40mg po daily.

1. Increased urinary output
   Decreased edema upon visual inspection and palpation
   Weight loss
   Decreased blood pressure
   Improved respiratory function

2. Possible hypokalemia from the furosemide and prednisone (especially in the absence of any potassium replacement therapy). The hypokalemia can cause muscle weakness

and potentiate the effect of digoxin that could lead to toxicity. Nausea and visual disturbances are consistent with digitalis (digoxin) toxicity.

3.
    a. This is likely oral thrush
    a. It is a side effect of fluticasone.
    b. Having Mr. Wells rinse his mouth with water after administration of the inhaler will decrease the risk.

4. Low dose ASA has antiplatelet properties and is prescribed to reduce the formation of clots for which Mr. Wells is at added risk because of his multiple health problems.

Metric Conversion Practice Answer Key

1. 1760 mg
2. 0.0084 kg
3. 86000 gm
4. 0.001367 kg
5. 270 ml
6. 0.036 L
7. 0.0007641 gm
8. 790 mg

Dosage Calculation Answer Key

1.. a) ½ tab
b) ½ tab
c) 0.6mL
d) 0.25mL
e) 20mL
2. 8mL
3. 2.5 tabs
4. 1.5mL (1mL meperidine &0.5mL dimenhydrinate)
5. 20mL
6. 20mL
7. 0.7mL
8. 0.4mL
9. 1.5mL
10. 0.25mL
11. 2.5mL
12. 2.6mL
13. 2.2mL
14. 1.25mL
15. 0.8mL

IV Med Drip Rate Calculations

16. 33 drops/min
17. 17 drops/min
18. 200mL/hr
19. 50mL/hr

Transcription Answer Key

1. **Furosemide 20mg po od odd days.**
   It is possible that the intent was to administer the medication on alternate days. Since 31 and 1 are both odd; if given as ordered, the client will receive the medication 2 days in a row rather than every other day. **CLARIFY**

2. **Tobramycin 2 gtts tid a.s. for left eye drainage**.
   The order is incomplete in that it fails to indicate the dosage of tobramycin and number of days of administration prior to reassessment. Medications should be assessed for effectiveness within a set period of time (for example with antibiotics usually about 10 days). The order states to administer to left ear (a.s) yet the reason stated is for eye drainage. **CLARIFY**

3. **Digoxin .25 mg od**.
   Leading zeros (0) should be used for numbers less than 1 to avoid a misinterpretation in dose strength. (i.e. 0.25 mg NOT 25 mg) If there is no institutional standard outlining under what conditions the drug is to be withheld (apical pulse less than 55), a conditional statement or additional assessment parameters are generally required for digoxin.

4. **Nitro-Dur 0.4 mg/hr od**.
   The order is incomplete in that it fails to indicate whether the transdermal patch is to be removed after a set number of hours or left in place for the entire 24 hours. **CLARIFY**

5. **Nitro Spray 0.4mg for angina prn**
   The order is incomplete in that it fails to indicate the number of metered dose sprays and the maximum number of permissible sprays per dose to achieve effectiveness. (i.e. If chest pain is not relieved with a maximum of 3 doses of 1-2 sprays per dose within 15 minutes contact prescriber. Each 2-spray dose should have a minimum 5-minute interval between each administration.) **CLARIFY**

6. **Iron supps daily**
   The order is incomplete in that it fails to indicate the type iron i.e. ferrous gluconate, ferrous sulfate, strength, number of doses per day, route and general directions to be taken with meals, orange juice. "*Supps"* could be misinterpreted as suppositories rather than supplement. **CLARIFY**

7. **Ativan 2.0 mg po for anxiety**
   A trailing zero after a decimal point should be avoided because overlooking the decimal point could result in a tenfold error in administration (i.e. 20 mg instead of 2 mg.) The order is incomplete in that it fails to note the frequency of administration. (i.e. PRN or regularly scheduled) **CLARIFY**

8. **Prednisone ½ tab daily**
   The order is incomplete in that it fails to indicate the dosage strength. Medications frequently come in a variety of strengths. Prednisone, for instance is available in multiple strengths tablets, ranging from 1mg and 50mg strengths. **CLARIFY**

9. **AZT 100 mg po od**
   Abbreviations are to be avoided to prevent possible drug confusion. In this case AZT may refer to azathioprine, zidovudine, or aztreonam. Writing the generic and trade name prevents the risk of misinterpretation. **CLARIFY**