N431
Henke's Med Math – Part 1

Chapter 4: Calculation of Oral Medications: Solids and Liquids – Proficiency test 1

1. Order: 20 mEq PO BID

    a. Supply: 30 mEq/15 ml

        i. Answer: 20 mEq / 30 mEq * 15 ml = **10 ml**

2. Order: 150 mg PO TID

    a. Supply: 75 mg/7.5 ml

        i. Answer: 150 mg/ 75 mg * 7.5 ml = **15 ml**

3. Order: 0.125 mg PO daily

    a. Supply: 0.25 mg/10 ml

        i. Answer: 0.125 mg / 0.25 mg * 10 ml = **5 ml**

4. Order: 375 mg PO TID

    a. Supply: 125 mg/5 ml

        i. Answer: 375 mg / 125 mg * 5 ml = **15 ml**

5. Order: 40 mg

    a. Supply: 20 mg/2.5 ml

        i. Answer: 40 mg / 20 mg * 2.5 = **5 ml**

6. Order: 0.5 mg PO daily

    a. Supply: 0.25 mg tablets

        i. Answer: 0.5 mg / 0.25 mg = **2 tablets**

7. Order: 100 mcg (0.1 mg) PO daily

    a. Supply: 0.1 mg capsules

        i. Answer: **1 capsule**

8. Order: 250 mg PO daily

    a. Supply: 100 mg scored tablets

        i. Answer: 250 mg / 100 mg = **2.5 tablets**

9. Order: 0.5 g (500 mg) PO Q6H

    a. Supply: 250 mg tablets

        i. Answer: 500 mg / 250 mg = **2 tablets**

10. Order: 0.3 mg PO daily

    a. Supply: 300 mcg (0.3 mg) scored tablets

        i. Answer: **1 tablet**

Chapter 5: Liquids for Injection – Proficiency test 2

1. Order: 10 mg IV stat

    a. Supply: 15 mg/ml

        i. Answer: 10 mg / 15 mg * 1 ml = 0.7 ml

2. Order: 0.1 g (100 mg) IM Q6H

    a. Supply: 200 mg/3 ml

        i. Answer: 100 mg / 200 mg * 3 ml = 1.5 ml

3. Order: 1000 mcg (1 mg) IM daily

    a. Supply: 5000 mcg (5 mg)/ml

        i. Answer: 1 mg / 5 mg * 1 ml = 0.2 ml

4. Order: 25 mg

    a. Supply: vial labeled 1% = 1:100 = 1g/100 ml

        i. Answer: 25 mg / 1000 mg * 100 ml = 2.5 ml

5. Order: 0.5 mg subcut stat

    a. Supply: 0.4 mg/ml

        i. Answer: 0.5 mg / 0.4 mg * 1 ml = 1.3 ml

6. Order: 10 units NPH & 3 units Humulin subcut AM

    a. Supply: 100 units/ml NPH & 100 units/ml Humulin

        i. Answer: 13 units in syringe (regular insulin drawn first)

7. Order: 1.2 mEq IV stat

    a. Supply: 0.5 mEq/ml

        i. Answer: 1.2 mEq / 0.5 mEq * 1 ml = 2.4 ml

8. Order: 500 mcg (0.5 mg) subcut stat

    a. Supply: ampule labeled 1:1000 (1g/1000 ml)

        i. Answer: 0.5 mg / 1000 mg * 1000 ml = **0.5 ml**

9. Order: ticarcillin disodium 1 g (1000 mg) IM

   a. Supply: vial of powder labeled ticarcillin disodium 1 g

      i. <u>Answer:</u>

         a) 2 ml sterile water or sodium chloride for reconstitution OR 1% lidocaine

         b) 1g/2.6 ml

         c) 1 g / 1 g * 2.6 ml = **2.6 ml**

         d) 2.6 ml

         e) Whole vial will be used for dose – no writing needed

         f) Whole vial will be used for dose – discard after use

10. Order: ampicillin sodium 300 mg IM Q8H

    a. Supply: vial of 500 mg powder

       i. <u>Answer:</u>

          a) 1.8 ml sterile water, USP, or bacteriostatic water

          b) 250 mg/ml

          c) 300 mg / 250 mg * 1 ml = **1.2 ml**

          d) 1.2 ml

          e) 0.8 ml left for use at 250 mg/ml concentration – must be used within 1 hour of reconstitution

          f) No storage needed – must be used within 1 hour of reconstitution

Chapter 6: Calculation of Basic IV Drip Rates – Proficiency test 1

1. Order: 1000 ml D5NS – run at 150 ml/hour IV

   a. Supply: 1000 ml bag D5NS

      i. <u>Answer:</u>

         a) 1000 ml / 150 ml * 1 hour = **6.7 hours** (~6 hours 40 minutes)

         b) Macrodrip: (150 ml/1 hour) * (10 gtt/1 ml) * (1 hr/60 min) = **25 gtt/min**

            Microdrip: (150 ml/1 hour) * (60 gtt/1 ml) * (1 hr/60 min) = **150 gtt/min**

         c) Macrotubing allows for smaller drip rate

2. Order: 100 ml LR 1200-1800 IV

   a. Answer:

      i. Macrodrip: (100 ml/6 hr) * (10 gtt/1 ml) * (1 hr/60 min) = **3 gtt/min**

         Microdrip: (100 ml/6 hr) * (60 gtt/1 ml) * (1 hr/60 min = **17 gtt/min**

      ii. Either tubing size allows for a monitorable drip rate – but microtubing may would better due to small volume

3. Order: 150 ml NS IV over 3 hours

   a. Supply: bag of 250 ml NS (macrotubing 15 gtt/ml; microtubing 60 gtt/ml)

      i. Answer:

         a) Allow 100 ml of runoff to obtain 150 ml NS (or set the pump to deliver just 150 ml)

         b) Macrodrip: (150 ml/3 hr) * (15 gtt/ml) * (1 hr/60 min) = **13 (12.5) gtt/min**

            Microdrip: (150 ml/3 hr) * (60 gtt/ml) * (1 hr/60 min) = **50 gtt/min**

         c) Either size tubing provides a monitorable drip rate

4. Order: 500 ml D5W / 24 hrs

   a. Answer: drip rate = **21 (20.8) ml/hr over 24 hours**

5. Order: doxycycline 100 mg IVPB daily

   a. Supply: 100 mg powder

      i. Answer:

         a) Reconstitute 100 mg powder in 250 ml D5W at 250 ml/hr

         b) (250 ml/1 hr) * (10 gtt/1 ml) * (1 hr/60 min) = **42 gtt/min**

6. Order: aminophylline 500 mg in 250 ml D5W to run 8 hours IV

   a. Supply: vial of medication labeled 1 g (1000 mg) in 10 ml; microdrip tubing

      i. Answer:

         a) 500 mg / 1000 mg * 10 ml = **5 ml medication needed**

         b) 250 ml/8 hrs = **31 ml/hr**

7. Order: primary IV at 125 ml/hr & 1 g Mefoxin in 75 ml D5W Q6H over 1 hour

    a. Answer: 24 hour fluid intake = (125 ml*20 hr) + (75 ml * 4 hr) = **2800 ml**

8. Order: 1000 ml D5 ½ NS at 90 ml/hr with an infusion pump

    a. Answer:

        i. 90 ml/hr

        ii. 1000 ml / 90 ml = **11.1 hrs**

9. Order: 500 ml aminophylline 0.5 g (500 mg) to infuse at 50 ml/hr

    a. Answer: 500 ml = 500 mg = **50 mg/hr**

10. Order: trimethoprim and sulfamethoxazole 5 ml IVPB Q6H

    a. Supply: vial of 5 ml; one 5 ml vial per 75 ml D5W run over 60-90 min

    b. The main IV line is connected to an infusion pump – what do you do?

        i. Answer:

            a) 75 ml D5W (with medication included) needed for infusion. Set pump at 75 ml/hr for appropriate run time.

            b) Set secondary line to run at 75ml/hr with a total infusion volume of 75 ml

11. Order: prepare ¾ strength Isocal

    a. Supply: total volume is 150 ml

        i. Answer: 150 ml Isocal * 0.75 = **112.5 ml isocal + 37.5 ml water**

12. Order: prepare half-strength Vivonex

    a. Supply: total volume is 500 ml

        i. Answer: 500 ml Vivonex * 0.5 = **250 ml Vivonex + 250 ml water**

13. Order: prepare 25% osmolite

    a. Supply: total volume is 400 ml

        i. Answer: 400 ml osmolite * 0.25 = **100 ml osmolite + 300 ml water**

14. Order: Prepare full strength Isocal

    a. Supply: total volume is 500 ml

        i. Answer: 500 ml Isocal + 0 ml water = **500 ml Isocal**

Chapter 7: Special Types of IV Calculation – Self-test 4 #1-2

1. Ht: 6' (72 in); Wt: 165 lb (75 kg); BSA: 1.96 m^2

   a. Order: doxorubicin 39 mg (20 mg/m^2) in D5W 250 ml over 0.5 hour

   b. Answer:

      i. 20 mg * 1.96 = 39.2 mg = **Dose Correct**

      ii. 250 ml/0.5 hr = **500 ml/hr pump setting**

2. Ht: 165 cm; Wt: 70 kg; BSA: 1.77 m^2

   a. Order: CCNU 230 mg PO (130 mg/m^2) once Q6 weeks

   b. Answer:

      i. 130 mg * 1.77 = 230.1 mg = **Dose Correct**

      ii. **2 100 mg tab and 3 10 mg tabs = 230 mg total**