Calculations Review--Extra Problems

1. If 10 capsules contain 1500 mg of amoxicillin, what would be the weight of amoxicillin contained in 75 capsules?
   a) 10,500 mg
   b) 11,250 mg
   c) 13,750 mg
   d) 17,425 mg
   e) 22,500 mg

1. If 10 capsules contain 1500 mg of amoxicillin, what would be the weight of amoxicillin contained in 75 capsules?
   a) 10,500 mg
   b) 11,250 mg
   c) 13,750 mg
   d) 17,425 mg
   e) 22,500 mg

   10 capsules / 1500 mg = 75 capsules / x

2. Your patient has MRSA pneumonia and you recommend targeting a vancomycin trough concentration of 15 mcg/mL. Express this value in terms of mg/dL.
   2. 0.015 mg/dL
   3. 0.15 mg/dL
   4. 1.5 mg/dL
   5. 15 mg/dL
   6. 150 mg/dL

2. Your patient has MRSA pneumonia and you recommend targeting a vancomycin trough concentration of 15 mcg/mL. Express this value in terms of mg/dL.
   a) 0.015 mg/dL
   b) 0.15 mg/dL
   c) 1.5 mg/dL
   d) 15 mg/dL
   e) 150 mg/dL

   15 mcg/mL x 1 mg/1000 mcg x 100 mL/1 dL = 1.5 mg/dL

3. How many days will a 20 mL vial of hydromorphone (4 mg/mL) last if the hospice patient is ordered to receive 2 mg PO q4h ATC?
   a) 3
   b) 4
   c) 5
   d) 6
   e) 7

3. How many days will a 20 mL vial of hydromorphone (4 mg/mL) last if the hospice patient is ordered to receive 2 mg PO q4h ATC?
   a) 3
   b) 4
   c) 5
   d) 6
   e) 7

   20 mL x 4 mg/mL = 80 mg
   Needed: 2 mg x 6 doses/day = 12 mg/day
   80 mg ÷ 12 mg/day = 6.67 days (6 days)

4. How many fluid ounces are contained in 5 quarts?
   a) 0.16 fluid ounces
   b) 1.6 fluid ounces
   c) 16 fluid ounces
   d) 160 fluid ounces
   e) 1600 fluid ounces

1 quart = 2 pints
1 pint = 473 mL
30 mL = 1 fluid ounce

   5 quarts x 946 mL/1 quart = 4730 mL
   1 fl. Oz/30 mL = x / 4730 mL = 157.7 fluid oz

5. If a prescription calls for 5 mg/kg and the patient weights 165 lbs., what is the dose to be delivered for this patient?
   a) 75 mg
   b) 185 mg
   c) 227 mg
   d) 375 mg
   e) 412 mg

1 Kg = 2.2 lbs

   165 lbs / x = 2.2 lbs / 1 kg
   X = 75 kg
   5 mg/kg x 75 kg = 375 mg

6. If a prescription calls for 2 tablespoons per day, how many milliliters are required for a 30-day supply?
   a) 50 mL
   b) 90 mL
   c) 500 mL
   d) 850 mL
   e) 900 mL

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   a) 50 mL
   b) 90 mL
   c) 500 mL
   d) 850 mL
   e) 900 mL

1 tablespoon = 15 mL

1 tblsp / 30 mL = 2 tblsp / x
X = 60 mL
60 mL/day x 30 days = 900 mL

7. An IV solution contains 250 mg of levofloxacin in 50 mL D5W. How many liters of D5W would contain 5 g of levofloxacin?
   a) 0.1
   b) 0.5
   c) 1
   d) 2
   e) 10

CLUE: The answer is in front of you! Set up ratios and see which ones match!

5 gm x 1000 mg / 1 gm x 50 mL / 250 mg x 1 L / 1000 mg

8. If a prescription calls for 5 g of sodium chloride, how many milliliters of a stock solution are needed if every 1000 mL contains 20 g?
   a) 25 mL
   b) 40 mL
   c) 250 mL
   d) 300 mL
   e) 400 mL

20 gm / 1000 mL = 5 gm / x

9. What is the minimum amount of a potent drug that may be weighed on a prescription balance with a sensitivity requirement of 6 mg if at least 95% accuracy is required?
   a) 6 mg
   b) 120 mg
   c) 180 mg
   d) 200 mg
   e) 300 mg

9. What is the minimum amount of a potent drug that may be weighed on a prescription balance with a sensitivity requirement of 6 mg if at least 95% accuracy is required?
   a) 6 mg
   b) 120 mg
   c) 180 mg
   d) 200 mg
   e) 300 mg

   Minimum weighable quantity = sensitivity requirement x 100 / %error
   6 mg x 100 / 5% = 120 mg

10. Calculate the dose of a drug to be administered to a patient if the dosing regimen is listed as 7 mg/kg/day. The patient weighs 140 lb.
   a) 65 mg
   b) 125 mg
   c) 315 mg
   d) 420 mg
   e) 450mg

10. Calculate the dose of a drug to be administered to a patient if the dosing regimen is listed as 7 mg/kg/day. The patient weighs 140 lb.
   a) 65 mg
   b) 125 mg
   c) 315 mg
   d) 420 mg
   e) 450 mg

   1 Kg / 2.2 lb = x / 140 lb
   X= 64 Kg
   7 x 64 = 448 mg

11. What is the ideal body weight for a female patient whose height is 5 ft 8 in?
   a) 53 kg
   b) 64 kg
   c) 68 kg
   d) 121 lb
   e) 150 lb

11. What is the ideal body weight for a female patient whose height is 5 ft 8 in?
   a) 53 kg
   b) 64 kg
   c) 68 kg
   d) 121 lb
   e) 150 lb

   Women – IBW = 45.5 + (2.3 x inches over 5 ft)
   Men – IBW = 50 + (2.3 x inches over 5 ft)
   IBW = 45.5 + (2.3 x 8) = 64 Kg

12. A patient weighing 175 lb is to receive an initial daily IM dosage of procainamide HCl (500 mg/mL vial) of 50 mg/kg based on actual body weight to be given in divided doses every 3 hours. How many milliliters should each injection contain?
   a) 0.49 mL
   b) 0.99 mL
   c) 1.87 mL
   d) 3.98 mL
   e) 8.23 mL

12. A patient weighing 175 lb is to receive an initial daily IM dosage of procainamide HCl (500 mg/mL vial) of 50 mg/kg based on actual body weight to be given in divided doses every 3 hours. How many milliliters should each injection contain?
    a) 0.49 mL
    b) 0.99 mL
    c) 1.87 mL
    d) 3.98 mL
    e) 8.23 mL

    175 lb / x = 2.2 lb / 1 kg
    X = 79.5 kg
    50 mg/kg x 79.5 kg = 3977 mg
    3977 mg / 8 doses per day = 497 mg / dose
    497 mg / x = 500 mg / 1 mL
    X = 0.99 mL

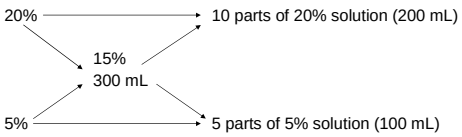
13. What is the creatinine clearance for a 65 year old female patient who weighs 110 lb and has a serum creatinine of 1.3 mg/dL?
    a) 26 mL/min
    b) 34 mL/min
    c) 40 mL/min
    d) 82 mL/min
    e) 100 mL/min

13. What is the creatinine clearance for a 65 year old female patient who weighs 110 lb and has a serum creatinine of 1.3 mg/dL?
    a) 26 mL/min
    b) 34 mL/min
    c) 40 mL/min
    d) 82 mL/min
    e) 100 mL/min

    CrCl = {[(140-65)x50kg] / (72 x 1.3)} x 0.85

14. What volume of a 5% dextrose solution should be mixed with 200 mL of a 20% dextrose solution to prepare 300 mL of a 15% dextrose solution?
    a) 50 mL
    b) 100 mL
    c) 150 mL
    d) 200 mL
    e) 250 mL

14. What volume of a 5% dextrose solution should be mixed with 200 mL of a 20% dextrose solution to prepare 300 mL of a 15% dextrose solution?
    a) 50 mL
    b) 100 mL
    c) 150 mL
    d) 200 mL
    e) 250 mL



15. What is the final concentration obtained by mixing 200 mL of 20% dextrose with 100 mL of 5% dextrose?
    a) 7.5%
    b) 10%
    c) 12.5%
    d) 15%
    e) 17.5%

15. What is the final concentration obtained by mixing 200 mL of 20% dextrose with 100 mL of 5% dextrose?
    a) 7.5%
    b) 10%
    c) 12.5%
    d) 15%
    e) 17.5%

    Two parts: solute and solvent – keep both totals in mind!
    Solvent = 200 mL + 100 mL = 300 mL
    Solute = x / 200 mL = 20 gm / 100 mL; x = 40 gm
    X / 100 mL = 5 gm / 100 mL; x = 5gm
    Solute = 45 gm
    Therefore 45gm / 300 mL = x / 100 mL
    X = 15%

16. You receive a prescription for prednisone 10 mg tablets with the instructions “Take 20 mg po once daily x 3 days, 10 mg po once daily x 3 days, 5 mg po once daily x 3 days”. Calculate the number of tablets to dispense to fulfill this prescription.
    a) 9
    b) 10
    c) 11
    d) 12
    e) 13

16. You receive a prescription for prednisone 10 mg tablets with the instructions “Take 20 mg po once daily x 3 days, 10 mg po once daily x 3 days, 5 mg po once daily x 3 days”. Calculate the number of tablets to dispense to fulfill this prescription.
    a) 9
    b) 10
    c) 11
    d) 12
    e) 13

    Step 1 = 2 tablets x 3 days = 6 tablets
    Step 2 = 1 tablet x 3 days = 3 tablets
    Step 3 = ½ tablet x 3 days = 2 tablets
    Total = 11 tablets

17. How many mL of a 3% solution can be made from 27 g of drug?
    a) 600 mL
    b) 700 mL
    c) 800 mL
    d) 900 mL
    e) 1000 mL

17. How many mL of a 3% solution can be made from 27 g of drug?
    a) 600 mL
    b) 700 mL
    c) 800 mL
    d) 900 mL
    e) 1000 mL

    27 gm / x = 3 gm / 100 mL

18. A nurse calls the pharmacy and asks for help determining how much heparin a patient is receiving. The patient weighs 78 kg and the heparin solution (25,000 units/500 mL D5W) is running at a rate of 22.4 mL/hr. How many units/kg/hr is the patient currently receiving?
    a) 13.2
    b) 14.3
    c) 15.4
    d) 16.7
    e) 17.1

18. A nurse calls the pharmacy and asks for help determining how much heparin a patient is receiving. The patient weighs 78 kg and the heparin solution (25,000 units/500 mL D5W) is running at a rate of 22.4 mL/hr. How many units/kg/hr is the patient currently receiving?
    a) 13.2
    b) 14.3
    c) 15.4
    d) 16.7
    e) 17.1

    25,000 units / 500 mL = 50 units / mL
    50 units / mL x 22.4 mL / hr = 1120 units / hr
    1120 units / 78 kg = 14.3 units/kg/hr

19. An ICU medical order reads "KCl 40 mEq in 1 L NS. Infuse at 0.5 mEq/min." How many minutes will this bottle last on the patient?
    a) 20
    b) 80
    c) 500
    d) 1000
    e) 2000

19. An ICU medical order reads "KCl 40 mEq in 1 L NS. Infuse at 0.5 mEq/min." How many minutes will this bottle last on the patient?
    a) 20
    b) 80
    c) 500
    d) 1000
    e) 2000

    1000 mL / 40 mEq x 0.5 mEq / min = 12.5 ml/min
    1000 mL / 12.5 mL = 80 minutes

20. Using the formula below, how much zinc oxide would be required to make 750 g of the mixture?
    - Zinc oxide 150 g
    - Starch 250 g
    - Petrolatum 550 g
    - Coal tar 50 g

    a) 38 g
    b) 113 g
    c) 188 g
    d) 200 g
    e) 413 g

20. Using the formula below, how much zinc oxide would be required to make 750 g of the mixture?
    - Zinc oxide 150 g
    - Starch 250 g
    - Petrolatum 550 g
    - Coal tar 50 g

    a) 38 g
    b) 113 g
    c) 188 g
    d) 200 g
    e) 413 g

    Total weight = 150 + 250 + 550 + 50 = 1000 gm
    150 gm zinc / 1000 gm total = x / 750 gm total

21. What is the weight of 500 mL of a liquid whose specific gravity is 1.13?
    a) 442 mg
    b) 885 mg
    c) 221 g
    d) 442 g
    e) 565 g

Specific Gravity

- Ratio
  - Weight of substance : Weight of standard substance
  - Weight of 10 mL of sulfuric acid
    Weight of 10 mL of water
    - 18 gm / 10 gm = 1.8

21. What is the weight of 500 mL of a liquid whose specific gravity is 1.13?
    a) 442 mg
    b) 885 mg
    c) 221 g
    d) 442 g
    e) 565 g

    Weight of 500 mL of liquid
    Weight of 500 mL of water
    = X / 500 g = 1.13
    X = 565 g

22. What weight of hydrocortisone should be used to prepare 20 g of an ointment containing hydrocortisone at a concentration of 1:400?
    a) 5 mg
    b) 25 mg
    c) 50 mg
    d) 75 mg
    e) 80 mg

22. What weight of hydrocortisone should be used to prepare 20 g of an ointment containing hydrocortisone at a concentration of 1:400?
    a) 5 mg
    b) 25 mg
    c) 50 mg
    d) 75 mg
    e) 80 mg

    1 / 400 = x / 20 g
    X = 0.05 g = 50 mg

23. Convert 104ºF to centigrade.
    a) 22ºC
    b) 34ºC
    c) 40ºC
    d) 46ºC
    e) 50ºC

23. Convert 104ºF to centigrade.
    a) 22ºC
    b) 34ºC
    c) 40ºC
    d) 46ºC
    e) 50ºC

    C = [(104-32)/9] x 5

24. A patient is to receive an infusion of 2 g of lidocaine in 500 mL D5W at a rate of 2 mg/min. What is the flow rate in milliliters per hour?
    a) 2
    b) 6.5
    c) 15
    d) 30
    e) 150

24. A patient is to receive an infusion of 2 g of lidocaine in 500 mL D5W at a rate of 2 mg/min. What is the flow rate in milliliters per hour?
    a) 2
    b) 6.5
    c) 15
    d) 30
    e) 150

$$\frac{500\ mL}{2\ gm} \times \frac{1\ gm}{1000 mg} \times \frac{2\ mg}{1\ min} \times \frac{60\ min}{1\ hr}$$

25. A prescription calls for tobramycin 0.3% with the directions "1 gtt OU TID". How many mg of tobramycin will be used per day? Assume that the dropper is calibrated to deliver 20 drops per mL.
    a) 9 mg
    b) 0.9 mg
    c) 0.009 mg
    d) 0.0009 mg
    e) 0.00009 mg

25. A prescription calls for tobramycin 0.3% with the directions "1 gtt OU TID". How many mg of tobramycin will be used per day? Assume that the dropper is calibrated to deliver 20 drops per mL.
    a) 9 mg
    b) 0.9 mg
    c) 0.009 mg
    d) 0.0009 mg
    e) 0.00009 mg

1 gtt OU TID = 6 gtt's per day
20 gtt / 1 mL = 6 gtt / x; x = 0.3 mL used per day
0.3 gm / 100 mL = x / 0.3 mL
X = 0.0009 gm = 0.9 mg

26. The infusion rate of theophylline established for an infant is 0.08 mg/kg/h. How many mg of theophylline are needed for a 12-hour infusion bottle if the infant weighs 16 lbs?
    a) 0.58 mg
    b) 7 mg
    c) 14 mg
    d) 30 mg
    e) 150 mg

26. The infusion rate of theophylline established for an infant is 0.08 mg/kg/h. How many mg of theophylline are needed for a 12-hour infusion bottle if the infant weighs 16 lbs?
    a) 0.58 mg
    b) 7 mg
    c) 14 mg
    d) 30 mg
    e) 150 mg

16 lb = 7.3 kg
0.08 x 7.3 = 0.584 mg/hr
0.584 mg x 12 hours = 7 mg

27. There are 5.86 g of potassium chloride (KCl) in a 250 mL infusion bag. How many milliequivalents (mEq) of KCl are present (molecular weight KCl = 74.6)?
    a) 12.7
    b) 20
    c) 78.5
    d) 150
    e) 157

Millequivalents

- The "combining power" of a substance relative to 1mg of hydrogen
- 1 mEq =
  - 1mg hydrogen
  - 20 mg calcium
  - 23 mg sodium
- mEq = $\frac{\text{(mg x valence)}}{\text{atomic, molecular, or formula weight}}$

Stoklosa MJ, Ansel HC. *Pharmaceutical Calculations*. 10th Ed. Media, PA: Williams & Wilkins; 1996.

27. There are 5.86 g of potassium chloride (KCl) in a 250 mL infusion bag. How many milliequivalents (mEq) of KCl are present (molecular weight KCl = 74.6)?
    a) 12.7
    b) 20
    c) 78.5
    d) 150
    e) 157

    Molecular weight of KCl = 74.5
    Equivalent weight of KCl = 74.5
    1 mEq of KCl = 1/1000 x 74.5 gm = 0.0745 gm = 74.5 mg
    5860 mg / 74.5 mg = 78.5 mEq

28. Propylene glycol was purchased at a cost of $24.00 per pound. What is the cost of 100 mL of the liquid (specific gravity = 1.04)?
    a) $2.60
    b) $2.64
    c) $2.75
    d) $5.50
    e) $13.00

28. Propylene glycol was purchased at a cost of $24.00 per pound. What is the cost of 100 mL of the liquid (specific gravity = 1.04)?
    a) $2.60
    b) $2.64
    c) $2.75
    d) $5.50
    e) $13.00

    $\frac{\text{Weight of 100 mL liquid}}{\text{Weight of 100 mL water (100 gm)}} = 1.04$
    Weight of 100 mL liquid = 104 gm

$$104\ \text{gm} \times \frac{2.2\ \text{lb}}{1\ \text{kg}} \times \frac{1\ \text{kg}}{1000\ \text{gm}} \times \frac{\$24.00}{1\ \text{lb}} = \$5.50$$

29. A prescription calls for 1 lb. bacitracin ointment containing 200 Units of bacitracin per gram. How many grams of bacitracin ointment (500 Units/g) must be used to make this ointment?
    a) 182 g
    b) 200 g
    c) 227 g
    d) 362 g
    e) 400 g

29. A prescription calls for 1 lb. bacitracin ointment containing 200 Units of bacitracin per gram. How many grams of bacitracin ointment (500 Units/g) must be used to make this ointment?

a) 182 g
b) 200 g
c) 227 g
d) 362 g
e) 400 g

$$1\text{ lb} \times \frac{1\text{ kg}}{2.2\text{ lb}} \times \frac{1000\text{ gm}}{1\text{ kg}} \times \frac{200\text{ units}}{1\text{ gm}} = 90{,}909\text{ units}$$

90,909 units/x = 500 units / 1 gm
X = 182 gm

30. A total parenteral nutrition order requires 500 mL of D30W. How many mL of D50W should be used if D30W is not available?

a) 125 mL
b) 200 mL
c) 300 mL
d) 375 mL
e) 400 mL

30. A total parenteral nutrition order requires 500 mL of D30W. How many mL of D50W should be used if D30W is not available?

a) 125 mL
b) 200 mL

c) 300 mL

d) 375 mL
e) 400 mL

Need:
X / 500 mL = 30 gm / 100 mL; x = 150 gm
150 gm / x = 50 gm / 100 mL; x = 300 mL

31. How many grams of 1% hydrocortisone cream must be mixed with 0.5% hydrocortisone cream if the pharmacist wishes to prepare 60 g of a 0.8% w/w preparation?

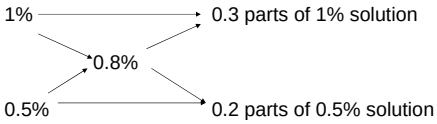
a) 6 g
b) 12 g
c) 24 g
d) 36 g
e) 48 g

31. How many grams of 1% hydrocortisone cream must be mixed with 0.5% hydrocortisone cream if the pharmacist wishes to prepare 60 g of a 0.8% w/w preparation?

a) 6 g
b) 12 g
c) 24 g

d) 36 g

e) 48 g



0.3 parts/ 0.5 parts total = x / 60 gm
X = 36 gm of 1% cream

32. A solution is to be administered by IV infusion at a rate of 55 mL/hr. How many drops/minute should be infused if 1 mL = 20 drops?

a) 15.4
b) 16.5
c) 17.8
d) 18.3
e) 19.1

32. A solution is to be administered by IV infusion at a rate of 55 mL/hr. How many drops/minute should be infused if 1 mL = 20 drops?

a) 15.4
b) 16.5
c) 17.8
d) 18.3
e) 19.1

$$\frac{55\ \text{mL}}{1\ \text{hr}} \times \frac{1\ \text{hr}}{60\ \text{min}} \times \frac{20\ \text{drops}}{1\ \text{mL}} = 18.3\ \text{drops/min}$$

33. How many milligrams of sodium chloride are needed to adjust 30 mL of a 4% cocaine HCl solution to isotonicity. The freezing point depression of a 1% solution of cocaine HCl is 0.09ºC.

a) 62
b) 83
c) 108
d) 120
e) 270

33. How many milligrams of sodium chloride are needed to adjust 30 mL of a 4% cocaine HCl solution to isotonicity. The freezing point depression of a 1% solution of cocaine HCl is 0.09ºC.

a) 62
b) 83
c) 108
d) 120
e) 270

1% / 0.09 = 4% / x; x = 0.36°C
Isotonic solutions have a reduction in freezing points to 0.52°C
0.52°C – 0.36°C = 0.16°C
0.9% NaCl / 0.52°C = x / 0.16°C
X = 0.277% NaCl
X / 30 mL = 0.277 gm / 100 mL
X = 0.083 gm = 83 mg

34. Estimate the milliosmolarity (mOsm/L) for normal saline (Na = 23, Cl = 35.5).

a) 150 mOsm/L
b) 300 mOsm/L
c) 350 mOsm/L
d) 400 mOsm/L
e) 600 mOsm/L

Osmolarity

- Measures osmotic concentration
- Nonelectrolytes (ex: dextrose)
  - 1 mmol = 1 mOsmol
- Electrolytes (ex: NaCl)
  - 1 mmol = 2 mOsmol (Na & Cl)

$$\frac{\text{Wt. of substance (g/L)}}{\text{m.w. (gm)}} \times \text{\# of species} \times 1000 = \text{mOsmol/L}$$

34. Estimate the milliosmolarity (mOsm/L) for normal saline (Na = 23, Cl = 35.5).

a) 150 mOsm/L
b) 300 mOsm/L
c) 350 mOsm/L
d) 400 mOsm/L
e) 600 mOsm/L

$$\frac{9\ \text{gm}}{(23 + 35.5)} \times 2 \times 1000 = \text{mOsmol/L}$$

35. How many mL of isopropyl rubbing alcohol (70% v/v) will be needed to prepare one pint of 50% isopropyl alcohol?
    a) 70
    b) 170
    c) 338
    d) 400
    e) 480

35. How many mL of isopropyl rubbing alcohol (70% v/v) will be needed to prepare one pint of 50% isopropyl alcohol?
    a) 70
    b) 170
    c) 338
    d) 400
    e) 480

    X / 473 mL = 50 gm / 100 mL; X = 236.5 gm
    236.5 gm / x = 70 gm / 100 mL; X = 338 mL

36. What is the percentage strength (w/v) of 50 mg of cefuroxime dissolved in water to make a 500 mL D5W solution?
    a) 0.01%
    b) 0.025%
    c) 0.1%
    d) 0.2%
    e) 2.5%

36. What is the percentage strength (w/v) of 50 mg of cefuroxime dissolved in water to make a 500 mL D5W solution?
    a) 0.01%
    b) 0.025%
    c) 0.1%
    d) 0.2%
    e) 2.5%

    0.05 gm / 500 mL = x / 100 mL
    X = 0.01%

37. What is the percentage strength (w/w) for zinc oxide if 20 grams are mixed with 80 grams of petrolatum?
    a) 25%
    b) 20%
    c) 15%
    d) 30%
    e) 22.5%

37. What is the percentage strength (w/w) for zinc oxide if 20 grams are mixed with 80 grams of petrolatum?
    a) 25%
    b) 20%
    c) 15%
    d) 30%
    e) 22.5%

    20 gm / 100 gm = x / 100 gm
    X = 20%

38. What is the percentage strength of the final solution if 250 mL of 1% lidocaine is diluted in 500 mL?
    a) 0.5%
    b) 1%
    c) 1.5%
    d) 2%
    e) 5%

38. What is the percentage strength of the final solution if 250 mL of 1% lidocaine is diluted in 500 mL?
    a) 0.5%
    b) 1%
    c) 1.5%
    d) 2%
    e) 5%

    X / 250 mL = 1 gm / 100 mL; X = 2.5 gm
    2.5 gm / 500 mL = x / 100 mL; x = 0.5 gm

39. How many milliliters of water are needed to dilute 500 mL of 90% ethanol to a 50% concentration?
    a) 400 mL
    b) 500 mL
    c) 600 mL
    d) 800 mL
    e) 900 mL

39. How many milliliters of water are needed to dilute 500 mL of 90% ethanol to a 50% concentration?
    a) 400 mL
    b) 500 mL
    c) 600 mL
    d) 800 mL
    e) 900 mL

    90 gm / 100 mL = x / 500 mL; X = 450 gm
    450 gm / x mL = 50 gm / 100 mL; X = 900 mL
    900 mL – 500 mL = 400 mL

40. How many mEq of KCl are present in 200 mL of a 5% KCl solution?
    a) 1.34 mEq
    b) 13.4 mEq
    c) 100 mEq
    d) 134.23 mEq
    e) 200 mEq

40. How many mEq of KCl are present in 200 mL of a 5% KCl solution?
    a) 1.34 mEq
    b) 13.4 mEq
    c) 100 mEq
    d) 134.23 mEq
    e) 200 mEq

    5 gm / 100 mL = X / 200 mL; X = 10 gm
    mEq = (10,000 mg x 1) / 74.6 mg = 134 mEq

41. How many mOsm/L of KCl are present in 1000 mL of a 5% solution?
   a) 13.42 mOsm/L
   b) 134.2 mOsm/L
   c) 342 mOsm/L
   d) 1342 mOsm/L
   e) 2345 mOsm/L

41. How many mOsm/L of KCl are present in 1000 mL of a 5% solution?
   a) 13.42 mOsm/L
   b) 134.2 mOsm/L
   c) 342 mOsm/L
   d) 1342 mOsm/L
   e) 2345 mOsm/L

5 gm / 100 mL = X / 1000 mL; X = 50 gm

$$\frac{50 \text{ gm}}{74.6} \times 2 \times 1000 = \text{mOsmol/L}$$

42. How many milligrams of sodium chloride are required to make the following prescription?
- Cocaine HCl 10 mg
- Purified water qs 100 mL
- Sodium chloride qs to make an isotonic solution
   a) 8.98 mg
   b) 9.65 mg
   c) 89.84 mg
   d) 98.65 mg
   e) 898.4 mg

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- Cocaine HCl 10 mg
- Purified water qs 100 mL
- Sodium chloride qs to make an isotonic solution
   a) 8.98 mg
   b) 9.65 mg
   c) 89.84 mg
   d) 98.65 mg
   e) 898.4 mg

Sodium Chloride equivalent of cocaine = 0.16
900 mg of sodium chloride makes 100 mL isotonic
Need to account for sodium equivalents of cocaine
0.16 x 10 mg = 1.6
900 – 1.6 = 898.4 mg

43. A 20% fat emulsion yields 2.1 kcal/mL. How many mL will provide 1200 kilocalories?
   a) 567 mL
   b) 569 mL
   c) 571 mL
   d) 583 mL
   e) 591 mL

43. A 20% fat emulsion yields 2.1 kcal/mL. How many mL will provide 1200 kilocalories?
   a) 567 mL
   b) 569 mL
   c) 571 mL
   d) 583 mL
   e) 591 mL

2.1 kcal / 1 mL = 1200 kcal / X
X = 571 mL

44. If the dose of a drug is 50 mcg, how many doses are contained in 0.035 g?

a) 500 doses
b) 600 doses
c) 700 doses
d) 800 doses
e) 900 doses

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a) 500 doses
b) 600 doses
c) 700 doses
d) 800 doses
e) 900 doses

0.035 gm = 35 mg = 35,000 mcg
35,000 mcg / 50 mcg = 700 doses

45. How many milliliters of a liquid medicine would provide a patient with 2 tablespoonfuls twice a day for 5 days?

a) 300 mL
b) 350 mL
c) 400 mL
d) 450 mL
e) 500 mL

45. How many milliliters of a liquid medicine would provide a patient with 2 tablespoonfuls twice a day for 5 days?

a) 300 mL
b) 350 mL
c) 400 mL
d) 450 mL
e) 500 mL

2 tablespoons BID = 60 mL / day
60 x 5 = 300 mL

46. Calculate the rate for a child (Wt = 22 kg) receiving fentanyl (100mcg/2mL) 3mcg/kg/hr?

a) 1.3 mL/hr
b) 1.7 mL/hr
c) 2.1 mL/hr
d) 2.6 mL/hr
e) 3.0 mL/hr

46. Calculate the rate for a child (Wt = 22 kg) receiving fentanyl (100mcg/2mL) 3mcg/kg/hr?

a) 1.3 mL/hr
b) 1.7 mL/hr
c) 2.1 mL/hr
d) 2.6 mL/hr
e) 3.0 mL/hr

22 kg x 3 mcg/kg/hr = 66 mcg/hr
66 mcg/hr / 50 mcg/mL = 1.3 mL / hr

47. How many milligrams of mercury bichloride are needed to make 200 mL of a 1:500 w/v solution?
    a) 100 mg
    b) 200mg
    c) 300 mg
    d) 400 mg
    e) 500 mg

47. How many milligrams of mercury bichloride are needed to make 200 mL of a 1:500 w/v solution?
    a) 100 mg
    b) 200mg
    c) 300 mg
    d) 400 mg
    e) 500 mg

    1 gm / 500 mL = x / 200 mL
    X = 0.4 gm = 400 mg

48. How many grams of dextrose (molecular weight 180) would be needed to provide 120 mOsm?
    a) 20.7 g
    b) 21.3 g
    c) 21.6 g
    d) 22.3 g
    e) 23.1 g

48. How many grams of dextrose (molecular weight 180) would be needed to provide 120 mOsm?
    a) 20.7 g
    b) 21.3 g
    c) 21.6 g
    d) 22.3 g
    e) 23.1 g

$$\frac{X \text{ gm}}{180} \times 1 \times 1000 = 120 \text{ mOsmol/L}$$

49. How many liters of a 2.5% w/v solution can be prepared using 42.5 g of solute?
    a) 1.42 L
    b) 1.7 L
    c) 1.9 L
    d) 2.1 L
    e) 2.3 L

49. How many liters of a 2.5% w/v solution can be prepared using 42.5 g of solute?
    a) 1.42 L
    b) 1.7 L
    c) 1.9 L
    d) 2.1 L
    e) 2.3 L

    2.5 gm / 100 mL = 42.5 gm / X
    X = 1.7 L

50. The usual dose of sulfamethoxazole/trimethoprim (Bactrim®) is 150 mg TMP/m2/day in divided doses every 12 hours for PCP prophylaxis. What would be the usual dose for SG who is a 2 year old male (Wt = 12 kg, Ht = 34")?
    a) 5 mg
    b) 10 mg
    c) 20 mg
    d) 40 mg
    e) 80 mg

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    a) 5 mg
    b) 10 mg
    c) 20 mg
    d) 40 mg
    e) 80 mg

    34" = 86.36 cm
    BSA = $\sqrt{[(86.36 \times 12)/3600]} = 0.54\ m^2$
    $0.54\ m^2 \times 150 = 81$ mg / day = 40 mg BID

51. A patient is to receive 2000 mL of a solution by intravenous infusion over a period of 24 hours. What rate or infusion (drops/minute) should be utilized if 1 mL = 20 drops?
    a) 26 drops/minute
    b) 28 drops/minute
    c) 30 drops/minute
    d) 32 drops/minute
    e) 40 drops/minute

51. A patient is to receive 2000 mL of a solution by intravenous infusion over a period of 24 hours. What rate or infusion (drops/minute) should be utilized if 1 mL = 20 drops?
    a) 26 drops/minute
    b) 28 drops/minute
    c) 30 drops/minute
    d) 32 drops/minute
    e) 40 drops/minute

$$\frac{2000\ mL}{24\ hrs} \times \frac{1\ hr}{60\ min} \times \frac{20\ drops}{1\ mL} = 28\ drops / min$$

52. A prescription calls for 24 mmol of potassium chloride. How many grams of KCl are required (molecular weight KCl = 74.6)?
    a) 1.73 g
    b) 1.79 g
    c) 1.84 g
    d) 1.93 g
    e) 2.12 g

52. A prescription calls for 24 mmol of potassium chloride. How many grams of KCl are required (molecular weight KCl = 74.6)?
    a) 1.73 g
    b) 1.79 g
    c) 1.84 g
    d) 1.93 g
    e) 2.12 g

    MW KCl = 74.6
    1 mole = 74.6 gm
    1 mmol = 0.0746 gm
    0.0746 gm / 1 mmol = X / 24 mmol
    X = 1.79 gm

53. A TPN formula for 2 L is to contain 25% dextrose. What volume of 70% dextrose injection will supply the needed sugar?

a) 685 mL
b) 700 mL
c) 714 mL
d) 719 mL
e) 725 mL

53. A TPN formula for 2 L is to contain 25% dextrose. What volume of 70% dextrose injection will supply the needed sugar?

a) 685 mL
b) 700 mL
c) 714 mL
d) 719 mL
e) 725 mL

25 gm / 100 mL = X / 2000 mL; X = 500 gm
500 gm / x mL = 70 gm / 100 mL; X = 714 mL

54. A pharmacist combines 140 mL of a 0.9% sodium chloride solution with 250 mL of a 3.4% sodium chloride solution. Calculate the percentage strength of the final mixture.

a) 1.75%
b) 2%
c) 2.25%
d) 2.45%
e) 2.5%

54. A pharmacist combines 140 mL of a 0.9% sodium chloride solution with 250 mL of a 3.4% sodium chloride solution. Calculate the percentage strength of the final mixture.

a) 1.75%
b) 2%
c) 2.25%
d) 2.45%
e) 2.5%

0.9 gm / 100 mL = X / 140 mL; X = 1.26 gm
3.5 gm / 100 mL = X / 250 mL; X = 8.75 gm
8.75 gm + 1.26 gm = 10.01 gm
140 mL + 250 mL = 390 mL
10.01 gm / 390 mL = X / 100 mL
X = 2.5%

55. If city water contains 2.5 ppm of NaF, calculate the number of milliequivalents of fluoride ingested by a person who drinks 1.5 L of water (molecular weight of NaF = 42).

a) 0.073 mEq
b) 0.075 mEq
c) 0.079 mEq
d) 0.089 mEq
e) 0.090 mEq

55. If city water contains 2.5 ppm of NaF, calculate the number of milliequivalents of fluoride ingested by a person who drinks 1.5 L of water (molecular weight of NaF = 42).

a) 0.073 mEq
b) 0.075 mEq
c) 0.079 mEq
d) 0.089 mEq
e) 0.090 mEq

2.5 parts/1,000,000 = X / 100; X = 0.00025%
0.00025 gm / 100 mL = X / 1500 mL; X = 0.00375 gm
1 mEq = 42 mg
1 mEq / 42 mg = X / 3.75 mg; X = 0.089 mEq

GOOD LUCK ON YOUR NAPLEX!