PRACTICE CALCULATIONS

**1.**

A client with cardiogenic shock weighs 220 lb. and is receiving dopamine at the rate of 3 mcg/kg/minute. The solution strength available is dopamine 400 mg in 250 ml of D5W. The nurse should set the [infusion pump](http://evolvels.elsevier.com/AngelUploads/) to deliver how many ml/hour? (Enter numeric value only. If rounding is required, round to the nearest tenth.)

First, convert pounds to kg, 220 lb : X = 2.2 lb : 1 kg = 100 kg. Next, calculate the dosage per minute, 3 mcg/kg/min x 100 kg = 300 mcg/min. Convert mcg/min to mcg/hour, 300 mcg/min x 60 min=18,000 mcg/hour. Convert mcg/hr to mg/hour, 18,000 mcg/hr = 18.0 mg/hour. Calculate the rate, 400 mg : 250 ml = 18 mg : X ml 400X = 4500 X = 11.25 = 11.3 ml. So, 18 mg/11.3 ml should be infused at **11.3 ml/hour**

**2.**

A client with [hypertension](http://evolvels.elsevier.com/AngelUploads/) who weighs 72.4 kg is receiving an infusion of nitroprusside (Nipride) 50 mg in D5W 250 ml at 75 ml/hour. How many mcg/kg/minute is the client receiving? (Enter numeric value only. If rounding is required, round to the nearest tenth.)

Calculate the mg/hour infusing, 50 mg : 250 ml = X : 75 ml 250X = 3750 and X = 15 mg/hour. Next, convert mg/hr to mcg/hour, 15 mg/hour = 1 mg / 1000 mcg = 15,000 mcg/hour, then divide by 60 min = 250 mcg/minute. Lastly, 250 mcg/72.4 kg/min = 3.45 = **3.5 mcg/kg/minute**

**3.**

A client who weighs 70 kg is receiving a dopamine solution of 800 mg/500 ml normal saline at 5 ml/hour. How many mcg/kg/minute is the client receiving? (Enter the numeric value only. If rounding is required, round to the nearest tenth.)

To change ml/hour to mcg/kg/minute, use the formula: desired rate (5 ml/hour) / volume available (500 ml) x dose available (800 mg) = 8 mg/hour. Next, convert milligrams/hour to mcg/kg/minute: mg (8) x 1000 / kg (70) / 60 minutes = 1.904 = **1.9 mcg/kg/minute**

**4.**

A client is receiving an IV solution of sodium chloride 0.9% (Normal Saline) 250 ml with amiodarone (Cordarone) 1 gram at 17 ml/hour. How many mg/minute of amiodarone is infusing? (Enter numeric value only. If rounding is required, round to the nearest tenth.)

Convert grams to mg, 1 gram equals 1,000 mg. Using ratio and proportion - 1,000 mg : 250 ml :: X mg : 1ml 250X= 1,000 so X = 4 mg/ml is the solution concentration of amiodarone. The infusion rate (ml/hour) x concentration (mg/ml) divided by 60 minutes/hour 17 ml/hour x 4 mg/ml = 68/60 = 1.13 = **1.1 mg/minute**

 **5.**

A client who weighs 176 pounds is receiving an IV infusion with esmolol hydrochloride (Brevibloc) at 48 ml/hour. The IV solution is labeled with the concentration of Brevibloc 10 mg/ml. How many mcg/kg/minute is the client receiving?

Convert pounds to kg by dividing 176 pounds by 2.2 pounds = 80 kg. Convert the IV concentration from mg to mcg. 1 mg : 1000 mcg :: 10 mg : 10,000 mcg. Infusion rate (48 ml/hour) x concentration (10,000 mcg/ml) divided by 60 minutes/hour x 80 kg = 48 x 10,000 divided by 60 x 80 = 480,000 / 4800 **= 100 mcg/kg/minute**

**6.**

The nurse is preparing the change-of-shift report for a client who has a 265 ml secondary infusion that was started 2 hours ago at a rate of 85 ml/hour via an infusion pump. The nurse should report that how many ml remain to be infused by the hernia nurse

85 ml x 2 hours = 170 ml has infused. 265 ml (total amount to be infused) - 170 ml (amount infused) = **95 ml** remain to be infused

**7.**

A male client receives a prescription for ondansetron hydrochloride (Zofran) 4 mg IV to prevent postoperative nausea after an inguinal hernia repair. The medication is available in 2 mg/ml. How many ml should the nurse administer?

Use ratio and proportion, 4 mg : X ml = 2 mg : 1 ml 2X = 4 X = **2**

**8.**

The nurse is preparing to administer Hepatitis B Vaccine, Recombinant (Energix-B) 5 mcg IM to a school-aged child. The vaccine is labeled, 10 mcg/ml. How many ml should the nurse administer?

Use ratio and proportion, 5 mcg : X ml :: 10 mcg : 1ml 10X = 5 X = **0.5 ml**

**9.**

A client's daily PO prescription for aripiprazole (Ability) is increased from 15 mg to 30 mg. The medication is available in 15 mg tablets, and the client already received one tablet today. How many additional tablets should the nurse administer so the client receives the total newly prescribed dose for the day?

30 mg (total dose) - 15 mg (dose already administered) = 15 mg that still needs to be administered. Using the Desired/Have formula: 15 mg/15 mg = **1 tablet**

**10**.

The nurse is administering a 250 milliliter (ml) intravenous solution to be infused over 2 hours. How many ml/hour should the nurse program the infusion pump?

250 ml : 2 hours = X ml : 1 hour 250 = 2X X = 250 divided by 2 = **125 ml/hr**