Drip Calculations

1. Dopamine mcg/kg/min
2. Dobutamine mcg/kg/min
3. Lidocaine mg/min
4. Pronestyl mg/min
5. Neosynephrine mcg/min
6. Cardizem mg/hr
7. Cardene(25mg/D5W240cc) mg/hr
8. Amiodorone mg/min
9. Levophed mcg/min
10. Nitroglycerine mg/min

DOPAMINE

Standard Concentration = 400mg in D5W 250 cc

1mg=1000 mcg

400,000 mcg in D5W 250 cc

1cc = 1600 mcg

1 cc =1600 mcg = 26.6 (mcg/min)
60

Dopamine = 400,000 mg/D5W 250

If 1cc=26.6 (t.f)2cc =26.6 x2 (mcg/min)

Formula: (RS x Volume x Wgt x 60) = (Answer is in cc)
(Amt of Drug in mcg)

Example: 5mcg/kg/min Dopamine to an 80 kg patient.

$$\frac{5 \times 250 \times 80 \times 60}{400 \times 1000} = 15cc$$

Example: 15cc of Dopamine to an 8o kg patient.
How many mcg/kg/min this patient will receive?

$$\frac{15 \times 26.6}{80} = 5 \text{ mcg/kg/min.}$$

DOBUTREX

STANDARD = 500 mg/D5W 250cc

1cc=2000 mcg

$$\frac{2000 \text{ mcg/min}}{60}$$

1cc= 33.3mcg/min

Please note than in every cc=33.3 mcg (Dobutrex)

Use Formula $\frac{\text{RS x V x Wgt x 60}}{500{,}000}$

Physicians Orders: Give 10mcg/kg/min

$$\frac{\text{10x 250x 70x 60}}{500{,}000}$$

= 21cc

How many mcgs/kg/min in 21cc ?

21x33.3 (divide by weight)

70 = 10 mcg/kg/min

LIDOCAINE

Lidocaine 2gm/D5W 250cc or 1gm /D5W 250cc

1cc = 8mg

1cc =8/60(mg/min) =0.13 (7.5x0.13) =1mg/min

$$\frac{RS \times V \times 60 \text{ (mg/min)}}{2 \text{ Gm}}$$

$$= \frac{2\text{mg} \times 250 \times 60}{2{,}000 \text{ (mg)}} = 15$$

$$= \frac{1\text{mg} \times 250 \times 60}{2{,}000\text{(mg)}} = 7.5$$

1mg/min = 7.5cc	or 1mg/min =15cc
2mg/min = 15cc	2mg/min =30cc
3mg/min = 23cc	3mg/min =45cc
4mg/min = 30cc	4mg/min =60cc

PRONESTYL

Concentration and Administration is exactly the same as Lidocaine.

Calculations :: Same as Lidocaine

2Gm /D5W 250 or 1Gm/D5W 250cc

1mg/min = 7.5cc	or 1mg/min =15cc
2mg/min = 15cc	2mg/min =30cc
3mg/min = 23cc	3mg/min =45cc
4mg/min = 30cc	4mg/min =60cc

EPINEPHRINE

5mg/ D5W 250 cc

Concentration :: 5mg/D5W 250cc

Then 5000 mcg in 250 cc

1cc = 20mcg

1cc = 20/60 = 0.33mcg/min

Example: **Infuse 10mcg/min**

- **Give 10mcg/min of Epinepherine**

$$\frac{10 \times 250 \times 60}{5000\ \text{mcg}} = 30\text{cc}$$

If you want to find out how many mcgs/min patient is receiving, when you know the volume.

30cc x 0.33 mcgs =9.9mcgs ~10mcgs/min

LEVOPHED

Same principle as Epinephrine for concentration and calculations

8mg in D5W 250 cc

See epinephrine example

NEOSYNEPHERINE

20mg/D5W 250 cc

2,000 mg/D5W 250 cc

Therefore 1cc = 80 (mcg)

$$1cc = \frac{80}{60} = 1.3 \text{ (mcg/min)}$$

If you are giving 10mcg/min, use the formula to calculate

If you know the volume and need to know how many mcg::
Volume X 1.3 =mcg/min

CARDIZEM

125mg/D5W100cc

125 mg of Cardizem =Volume of 25 cc
100 plus 25 =125

Therefore the concentration now becomes
125mg :125cc (1:1) concentration)

4mg =4 cc/hr
5mg =5 cc/hr
6mg = 5cc/hr

CARDENE

- Cardene = 25mg/D5W 240cc
- 1mg = 9.6ml
- 0.1mg per ml
- Therefore 5mg=50cc

Amiodorone

- Bolus Dose = 300 mg in 100cc D5W over 20-30mins in Cardiac Arrest
- Bolus Dose = 150 mg in 100 cc D3W over 20-30 mins for arrhythmia therapy.

AMIODARONE

Concentration is 450 mg/ D5w 250 cc

Dose is 1mg/min for first 6 hours, followed by 0.5 mg/min for next 18 hours.

$$\frac{RS \times V \times 60}{\text{Amount of Drug}}$$

Follow formula: 1mg/min =33.3 cc.

0.5mg/min = 17cc

Calculation of Drip Rate

Example:

Order: Flagyl 500mg/100 ml normal saline IV BID
(administered over 1 hour)

Drop factor: 15 gtt/ml

Calculate drip rate: ? gtt/min

Answer:

$$\frac{100\ \text{ml}}{60\ \text{min}} \times \frac{?}{60\ \text{min}} = \frac{100\ \text{ml}}{\text{hr}}$$

$$\frac{100\ \text{ml/hr} \times 15\ \text{gtt/ml}}{60\ \text{minutes}} = 25\ \text{gtt/min}$$

Calculating mcg/kg/min

$$\frac{\text{dose X kg X 60 min}}{\text{solution concentration}} = \text{cc/hr}$$

$$\frac{\text{5 mcg/min X 75 kg X 60 min}}{\text{1600 mcg/cc}} = \text{18.75 cc/hr}$$

Using a 60 gtt set:

- **18.75 cc/hr = 18.75 gtts/min**

Calculating mg/min

$$\frac{\text{dose X gtt factor}}{\text{Solution Concentration}} = \text{gtts/min}$$

$$\frac{\text{2 mg X 60 gtt/mL}}{\text{4 mg}} = \text{30 gtts/min}$$

Using a 60 gtt set:

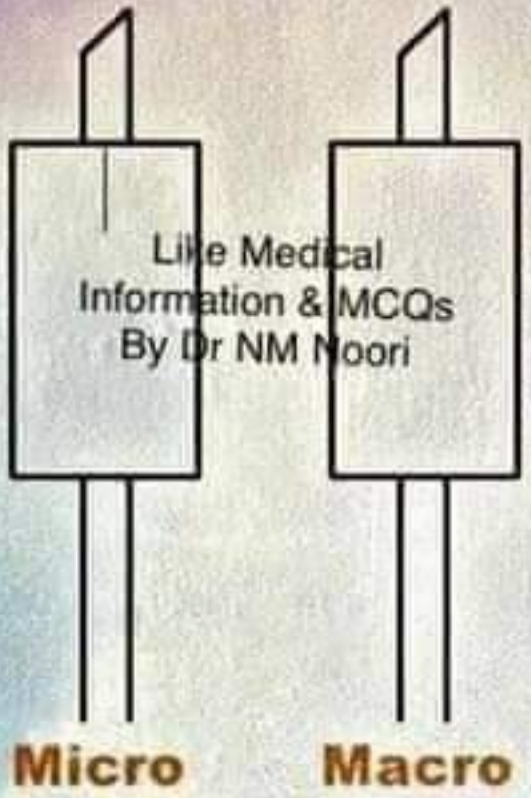
- **30 gtt/min = 30 cc/hr**

Fluid Volume Over Time

$$\frac{\text{Volume X Drip Factor}}{\text{Time in Minutes}} = \text{gtts/min}$$

$$\frac{\text{500 cc X 10 gtt/mL}}{\text{60 minutes}} = \text{83.3 gtts/min}$$

Micro & Macro Drip Sets



60 gtt/mL set

- **60 gtt/min = 1 cc**

10 gtt/mL set

- **10 gtts/min = 1cc**

15 gtt/mL set

- **15 gtts/min = 1 cc**

Drip Chambers

- IV Sets with a small needle in the chamber
  - Microdrip
  - 1 mL = 60 gtts (60 gtts in drip chamber = 1 mL)
- IV Sets without a small needle
  - Macrodrip
  - Baxter tubing macrodrip / 1 mL = 10 gtts(10 gtts in drip chamber = 1 mL)
  - Other companies tubing may be 15 gtt/mL or 20 gtts/mL

Calculating Basic IV Drip Rates

- IV Drip Rate
  - No Pump = rate will be gtt/min- also known as Gravity Drip

- Formula for gtt/min: $\frac{\text{mL/hr X drop factor}}{\text{60 (minutes)}} = \text{gtt/min}$

HLTH 1210/LPN-C
IV Calculation Practice Problems II

Manual IV Flow Rate Formula:

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$$\frac{\text{volume of infusion (in mL) x drop factor}}{\text{time of infusion (in minutes)}} = \text{Flow rate (in gtt/min)}$$

Electronic IV Flow Rate Formula:

$$\frac{\text{total milliliters (mL)}}{\text{total hours (h)}} = \text{Flow rate (in mL/h)}$$

$$\frac{D \text{ (desired)}}{H \text{ (have)}} \times Q \text{ (quantity)} = X \text{ (amount)}$$

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$$\frac{\text{Amount to give (mL)}}{\text{Time (hours)}}$$

$$\frac{\text{Amount to give (mL)} \times \text{Drip factor (gtt/mL)}}{\text{Time (hours)} \times 60 \text{ min}}$$

$$\frac{D \text{ (desired)}}{H \text{ (have)}} \times Q \text{ (quantity)} = X \text{ (amount)}$$

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$$\frac{\text{Amount to give (mL)}}{\text{Time (hours)}}$$

$$\frac{\text{Amount to give (mL)} \times \text{Drip factor (gtt/mL)}}{\text{Time (hours)} \times 60 \text{ min}}$$

EXAMPLE

- To calculate the drip rate of an i.v that is to infuse 1000ml in 8 hours using the tubing that has drop factor of 10 : $\frac{1000 \times 10}{8hrs \times 60}$
  - $= \frac{10000}{480}$
  - Which gives us 21 drops per minute.