

The Next Step

- The Next Step Is To Calculate The Concentration Of The Medication Received From The Pharmacy
 - Divide The Medication By The Fluid
 - 100 mg of ceftriaxone is mixed in 10 mL of Normal Saline
- Compare With The Recommended Concentration
- "Concentrations Of" Directions Take Precedence Over "Must" Directions

$$\frac{100 \text{ mg}}{10 \text{ mL}} = 10 \text{ mg of ceftriaxone in each mL}$$

Practice Problem #1

The IVPB you are to administer contains 350 mg of ceftriaxone mixed in 25 mL of Normal Saline.

The recommended range is 10mg to 40 mg per mL.

Does the dilution fall in the recommended range?

$$350 \text{ mg} \div 25 = 14 \text{ mg/mL} \text{ yes}$$

Practice Problem #2

Medication: Ranitidine 18 mg
Mixed in: 10 mL normal saline

What is the concentration of this medication?

$$18 \text{ mg} \div 10 \text{ mL} = 1.8 \text{ mg/mL}$$

Recommended Range

Recommended Dose Consists Of:

- Age Or Age Range Of Patient
- Dose
 - The Recommended Dose For Adults Is Usually Expressed In A Stated Dose
 - "1 to 2 Gm"
 - The Recommended Dose For Children Is Usually Based On The Child's Weight
 - "50 to 75 mg/kg"
- Frequency of Dose
 - How Often The Dose Can Be Administered

Practice Problem #3

The pediatric dose for piperacillin sodium is 200 mg to 300 mg/kg/24 hours in equally divided doses every 4 to 6 hours. The patient weighs 30 kg.

Which of the following is within the recommended range?

- A. 2,000 mg every 4 hours
- B. 1,200 mg every 4 hours
- C. 1,450 mg every 6 hours
- D. 6,000 mg every 6 hours

$$30 \div 2.2 = 13.63 \quad 200 \times 30 = 6,000 \text{ mg}$$
$$13.63 \times 200 \text{ mg} = 2,727.3 \quad 300 \times 30 = 9,000 \text{ mg}$$
$$13.63 \times 300 \text{ mg} = 4,089$$

A. ~~2,000~~ $\times 6 = 12,000$

B. $1,200 \times 6 = 7,200 \text{ mg}$

C. $1,450 \times 4 = 5,800$

D. $6,000 \times 4 = 24,000$

Practice Problem #4

Calculation based on once a day dose.

Patient: 20 kg, 5-year-old

Prescribed Medication: 1,000 mg of ceftriaxone daily

Medication Reference

Recommended Dose: 50 to 75 mg/kg of body weight in 24 hours as a single dose or in equally divided doses every 12 hours. Do not exceed a total dose of 2 gm in 24 hours.

Is the prescribed medication in the recommended range?

yes

~~20 kg~~ $\times 2.2 =$

$$50 \text{ mg} \times 20 \text{ kg} = 1,000 \text{ mg}$$

$$75 \text{ mg} \times 20 \text{ kg} = 1,500 \text{ mg}$$

$$2 \text{ gm} = 2,000 \text{ mg}$$

yes it is in recommended range.

Practice Problem #5

Calculation based on BID dose.

Patient: 20 kg, 5-year-old

Prescribed Medication: 700 mg of ceftriaxone, BID.

Medication Reference

Recommended Dose: 50 to 75 mg/kg of body weight in 24 hours as a single dose or in equally divided doses every 12 hours. Do not exceed a total dose of 2 gm in 24 hours.

Is the prescribed medication in the recommended range?

$$20 \text{ kg} \times 50 \text{ mg} = 1,000$$

$$20 \text{ kg} \times 75 \text{ mg} = 1,500$$

$$2 \text{ gm} = 2,000 \text{ mg}$$

Yes, it is in recommended range

$$700 \times 2 \text{ (BID)} = 1,400 \text{ mg}$$

Practice Problem #6

Which of the following is a recommended dose for a 30 kg child? The medication is vancomycin (Vancocin).

Medication Reference

Recommended Dose for Pediatric Patient:

40 mg/kg/24 hours equally divided and given every 6, 8, or 12 hours. Do not exceed 2 gm in 24 hours.

A. 200 mg every 6 hours

B. 400 mg every 8 hours

C. 100 mg every 12 hours

~~D. 1,200 mg every 24 hours~~

$$30 \text{ kg} \times 40 \text{ mg} = 1,200 \text{ mg}$$

$$200 \text{ mg} \times 4 = 800 \text{ mg}$$

$$400 \text{ mg} \times 3 = 1,200 \text{ mg}$$

$$100 \text{ mg} \times 2 = 200$$

A Review - Tubing Drop Factor

• Microdrip Infusion Set

– 60 Drops (gtts) = 1 mL

– 60 Minutes = 1 Hour, Therefore

– gtts/minute = mL/hr

• IV Pumps Are Microdrip

• Macro drip Infusion Set Drop Factor Will Vary.
Check The Package!

**VOLUME TO BE INFUSED X TUBING DROP FACTOR =
DROPS/MINUTE
INFUSION TIME IN MINUTES**

For A Microdrip System: Drops/Minute = mL/Hour

Memorize

Practice Problem #7

- What Is The Recommended Rate Of Administration For A 25 mL IVPB To Be Given Over 30 Minutes?
- The IVPB Will Be Administered By IV Pump

$$\frac{25 \text{ mL} \times 60}{30} = 50 \text{ mL/hr}$$

$$25 \text{ mL} \times 60 \text{ gtt/mL} = 1,500 \div 30$$

Practice Problem #8

- Patient:** A 6.5 kg, toddler, with the diagnosis of acute otitis media.

Prescribed Medication: Administer 275 mg amoxicillin (Amoxil) every 12 hours

Medication Reference Recommended Dose: Acute otitis media: 80 to 90 mg/kg/day divided every 12 hours

Concentration of Suspension: Amoxicillin suspension 250mg / 5 ml

The recommended range is ___ mg to ___ mg every 12 hours.

The nurse will administer ___ ml of amoxicillin every 12 hours

$$6.5 \text{ kg} \times 80 = 520 \div 2 = 260 \text{ mg}$$

$$6.5 \text{ kg} \times 90 = 585 \div 2 = 292.5$$

Recommended range is 260mg to 292.50mg

The nurse will administer 55 mL of Amoxicillin every 12 hrs.

$$\frac{D}{H} = V \quad \frac{275}{50} = 5.5 \quad 250 \div 5 = 50$$

$$\frac{275}{50} \times 50 =$$

Practice Problem #9

2. Patient: 15 kg, 3-year-old
 Prescribed Medication: Administer 1.1 grams of ceftriaxone (Rocephin), IV every 12 hours

Medication Reference
 Recommended Dose: 50 to 75 mg/kg of body weight/24 hr as a single dose or in equally divided doses every 12 hours (25 to 27.5 mg/kg every 12 hours). Do not exceed a total dose of 2 gm/24 hours

- The nurse would
 A. administer the medication.
 B. contact the primary care provider regarding a dose below the recommended range.
 C. contact the primary care provider regarding a dose exceeding the recommended range.

$$15 \times 50 = 750 \text{ mg}$$

$$15 \times 75 = 1,125 \text{ mg}$$

$$2 \text{ gm} = 2,000 \text{ mg}$$

$$1.1 \times 2 = 2.2 \text{ g}$$

Practice Problem #10

3. Patient: 16 kg child
 Prescribed Medication: 640 mg meropenem (Merrem), IVB every 8 hours
 Label on IVPB: Meropenem 640 mg in 25 ml normal saline.

Medication Reference
 Recommended Dose: 40 mg/kg every 8 hours
 Dilution/Concentration: 2.5 to 50 mg/ml
 Rate of Administration: Intermittent infusion may be given over 15 to 30 minutes by IV pump

- The prudent nurse will
 A. administer the medication at 50 ml/hr.
 B. administer the medication at 125 ml/hr.
 C. contact the pharmacist regarding the concentration.
 D. contact the primary care provider regarding the ordered dose.

$$25 \text{ ml} \times 2 = 50 \text{ ml/hr}$$

$$60 \div 15 = 4$$

$$25 \text{ ml} \times 4 = 100$$

$$25 \times 2 = 50 \text{ ml/hr}$$

Practice Problem #11

- Prescribed medication: Gentamycin sulfate 10 mg mixed in 50 mL normal saline every 8 hours.

Rate of Administration: Administer each dose over a minimum of 20 minutes or a maximum of 30 minutes.
 The most appropriate rate for the nurse to set the IV pump is how many milliliters per hour?

- A. 50
 B. 75
 C. 100
 D. 160

$$50 \text{ mL} \times 2 = 100 \text{ mL/hr}$$

$$50 \times 60 = \frac{3000}{20} = 150 \text{ mL/hr}$$

$$50 \times 60 = \frac{3000}{30} = 100 \text{ mL/hr}$$