

Continuous Bronchodilator Therapy II

1. The physician has written an order for albuterol 12 mg/hr to be administered for six hours. You have a large volume nebulizer that has an output 30 mL/hr. How medication and diluent (saline) do you need?

$$\text{AMOUNT OF DRUG} = \text{DOSAGE DESIRED} \times \text{DURATION} = \frac{12 \text{ mg}}{\text{hr}} \times 6 \text{ hours} = 72 \text{ mg}$$

$$\text{TOTAL VOLUME} = \text{THERAPY DURATION} \times \text{OUTPUT} = 6 \text{ hr} \times \frac{30 \text{ mL}}{\text{hr}} = 180 \text{ mL}$$

$$\text{DRUG DOSAGE} = \text{DRUG CONCENTRATION vs. AMOUNT OF DRUG} =$$

$$0.5\% = \frac{0.5 \text{ g}}{100 \text{ mL}} = \frac{500 \text{ mg}}{100 \text{ mL}} = \frac{5 \text{ mg}}{\text{mL}}$$

$$\frac{5 \text{ mg}}{\text{mL}} = \frac{72 \text{ mg}}{\chi}$$

$$(5 \text{ mg})(\chi) = (1 \text{ mL})(72 \text{ mg})$$

$$\chi = \frac{72 \text{ mg} \cdot \text{mL}}{5 \text{ mg}} = 14.4 \text{ mL}$$

$$\text{DILUENT VOLUME} = \text{TOTAL VOLUME} - \text{DRUG VOLUME} = 180 \text{ mL} - 14.4 \text{ mL} = 165.6 \text{ mL} = 166 \text{ mL}$$

2. The physician has written an order for terbutaline 8 mg/hr to be administered over the next eight hours. Terbutaline is available as a 0.1 % solution. You have a large volume nebulizer that has an output of 40 mL/hr. How much medication and diluent do you need?

$$\text{AMOUNT OF DRUG} = \text{DOSAGE DESIRED} \times \text{DURATION} = \frac{8 \text{ mg}}{\text{hr}} \times 8 \text{ hours} = 64 \text{ mg}$$

$$\text{TOTAL VOLUME} = \text{THERAPY DURATION} \times \text{OUTPUT} = 8 \text{ hr} \times \frac{40 \text{ mL}}{\text{hr}} = 320 \text{ mL}$$

$$\text{DRUG DOSAGE} = \text{DRUG CONCENTRATION vs. AMOUNT OF DRUG} =$$

$$0.1\% = \frac{0.1 \text{ g}}{100 \text{ mL}} = \frac{100 \text{ mg}}{100 \text{ mL}} = \frac{1 \text{ mg}}{\text{mL}}$$

$$\frac{1 \text{ mg}}{\text{mL}} = \frac{64 \text{ mg}}{\chi}$$

$$(1 \text{ mg})(\chi) = (1 \text{ mL})(64 \text{ mg})$$

$$\chi = \frac{64 \text{ mg} \cdot \text{mL}}{1 \text{ mg}} = 64 \text{ mL}$$

$$\text{DILUENT VOLUME} = \text{TOTAL VOLUME} - \text{DRUG VOLUME} = 320 \text{ mL} - 64 \text{ mL} = 256 \text{ mL}$$

3. The physician has written an order for albuterol 4 mg/hr to be administered for four hours. You have a large volume nebulizer that has an output 30 mL/hr. How medication and diluent (saline) do you need?

$$\text{AMOUNT OF DRUG} = \text{DOSAGE DESIRED} \times \text{DURATION} = \frac{4 \text{ mg}}{\text{hr}} \times 4 \text{ hours} = 16 \text{ mg}$$

$$\text{TOTAL VOLUME} = \text{THERAPY DURATION} \times \text{OUTPUT} = 4 \text{ hr} \times \frac{30 \text{ mL}}{\text{hr}} = 120 \text{ mL}$$

$$\text{DRUG DOSAGE} = \text{DRUG CONCENTRATION vs. AMOUNT OF DRUG} =$$

$$0.5\% = \frac{0.5 \text{ g}}{100 \text{ mL}} = \frac{500 \text{ mg}}{100 \text{ mL}} = \frac{5 \text{ mg}}{\text{mL}}$$

$$\frac{5 \text{ mg}}{\text{mL}} = \frac{16 \text{ mg}}{\chi}$$

$$(5 \text{ mg})(\chi) = (1 \text{ mL})(16 \text{ mg})$$

$$\chi = \frac{16 \text{ mg} \cdot \text{mL}}{5 \text{ mg}} = 3.2 \text{ mL}$$

$$\text{DILUENT VOLUME} = \text{TOTAL VOLUME} - \text{DRUG VOLUME} = 120 \text{ mL} - 3.2 \text{ mL} = 116.8 \text{ mL} = 117 \text{ mL}$$