Continuous Bronchodilator Therapy

1. The physician has written an order for Albuterol 10 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?
   YOU WILL NEED TO KNOW THAT albuterol IS A 0.5% SOLUTION, MEANING IT HAS 5 mg/mL.

   $$\textbf{AMOUNT OF DRUG} = \textbf{DOSAGE DESIRED} \times \textbf{DURATION} = \frac{\textbf{10}\textbf{mg}}{\textbf{hr}} \times \textbf{6 hours} = \textbf{60 mg}$$

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

   $$\textbf{DRUG DOSAGE} = \textbf{DRUG CONCENTRATION vs. AMOUNTOFDRUG} =$$

   $$\frac{\textbf{5mg}}{\textbf{mL}} = \frac{\textbf{60 mg}}{\chi}$$

   $$(\textbf{5mg})(\chi) = (\textbf{1mL})(\textbf{60}\textbf{mg})$$

   $$\chi = \frac{\textbf{60}\textbf{mg} \bullet \textbf{mL}}{\textbf{5mg}} = \textbf{12 mL}$$

   $$\textbf{DILUENT VOLUME} = \textbf{TOTAL VOLUME - DRUG VOLUME} = \textbf{180 mL - 12 mL} = \textbf{168 mL}$$

2. The physician has written an order for Terbutaline 5 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 30 mL/hr. How much medication and diluent do you need?

$$AMOUNT\ OF\ DRUG = DOSAGE\ DESIRED \times DURATION = \frac{5mg}{hr} \times 8\ hours = 40\ mg$$

$$TOTAL\ VOLUME = THERAPY\ DURATION \times OUTPUT = 8\ hr \times \frac{30mL}{hr} = 240\ mL$$

$$DRUG\ DOSAGE = DRUG\ CONCENTRATION\ vs.\ AMOUNT\ OF\ DRUG =$$

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

$$\frac{1mg}{mL} = \frac{40\ mg}{\chi}$$

$$(1mg)(\chi) = (1mL)(40mg)$$

$$\chi = \frac{40mg \bullet mL}{1mg} = 40\ mL$$

$$DILUENT\ VOLUME = TOTAL\ VOLUME - DRUG\ VOLUME = 240\ mL - 40\ mL = 200\ mL$$

3. The physician has written an order for Albuterol 8 mg/hr to be administered for eight hours. You have a large volume nebulizer that has an output 40 mL/hr. How medication and diluent (saline) do you need?

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

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

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

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

$$\frac{5mg}{mL} = \frac{64 \text{ } mg}{\chi}$$

$$(5mg)(\chi) = (1mL)(64mg)$$

$$\chi = \frac{64mg \bullet mL}{5mg} = 12.8 \text{ } mL$$

$$\textit{DILUENT VOLUME} = \textit{TOTAL VOLUME - DRUG VOLUME} = 320 \text{ } mL - 12.8 \text{ } mL = 307.2 \text{ } mL = 307 \text{ } mL$$