



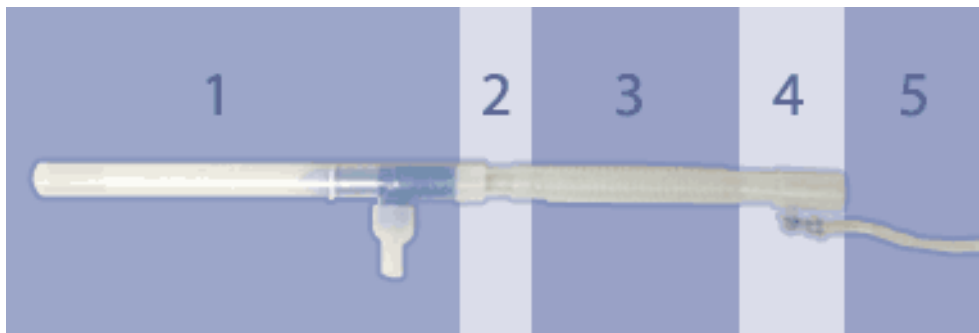
## Oxygen Therapy During RTube™ Sampling

### Purpose

To provide the same or higher concentration of oxygen to the patient during breath condensate sampling.

### Equipment List

1. RTube
2. 15 mm I.D./22 mm O.D. multi adaptor
3. 6 inches of corrugated tubing
4. 22 mm I.D./22 mm O.D. oxygen attachment adapter
5. 6 ft. of star lumen oxygen tubing
6. Oxygen flow meter 0-15 l/min
7. Oxygen source



### Procedure

1. In order to provide the same FIO<sub>2</sub> or higher you will need to determine the patient's approximate minute ventilation and current FIO<sub>2</sub>. Most patients' spontaneous tidal volumes are 5-7 cc/kg of ideal body weight
2. Add the 6 inch reservoir to the RTube by using the 15 mm I.D./ 22 mm O.D. multi adaptor and the oxygen attachment adapter.
3. Place patient on pulse oximeter.
4. Use the below FIO<sub>2</sub> estimation equation to determine the approximate oxygen flow required to meet the patient's FIO<sub>2</sub> demand.

$$FIO_2 \text{ (estimated)} = \frac{O_2 + .21 (V \text{ insp.} - O_2)}{(V \text{ insp.})}$$

O<sub>2</sub> represents the flow in liter per minute of 100% oxygen provided to the RTube. The V insp. is the patient's average inspiratory flow rate, simply multiply the patient's minute ventilation by the sum of the I:E ratio parts (I:E ratio being observed or estimated). As an example:

VT = 200 ml

Respiratory rate = 16

Min. ventilation = 3.2 liters/min

Observed I:E ratio = 1:2

Sum of I:E parts = 3

Est. average insp. flow = 9.6 liters/min

Now assume that we are going to add 2 L/min to the RTube with the above ventilator parameter.

$$FIO_2 = \frac{2 + .21 (9.6 - 2)}{9.6}$$

Estimated FIO<sub>2</sub> is .37

5. Connect the modified RTube to the oxygen flowmeter and titrate to the appropriate liter flow for estimated FIO<sub>2</sub> delivery.
6. Remove patient oxygen source and have them breath through the modified RTube normally.
7. Monitor SPO<sub>2</sub> and adjust oxygen flow to keep within acceptable range throughout sampling.

## References

1. Egan's Fundamentals of Respiratory Care. Scanlan, C; Spearman, C; Sheldon, R; Fifth Edition 1990

Date Written: 4/7/2004