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**Functional Check of the Breathing Circuit**

A properly functioning breathing circuit is imperative for the care of patients receiving general anesthesia. On occasion, disposable breathing circuits may have manufacturing defects, scavenging system connections may be faulty, and other system components including human errors may impair the proper function of the breathing circuit. The best approach to uncovering these hidden hazardous issues is to perform a functional test of the breathing circuit prior to applying it to the patient.

**Recommended procedure to be performed prior to each use of the breathing circuit**

1. Connect the breathing circuit and all components that will be used for the case (e.g., elbow with CO<sub>2</sub> sampling line, circuit filters, flexible extension tubing, HME).
2. Remove the breathing bag from the bag arm and place it on the connector that will plug into the mask or connect to the endotracheal tube.
3. Turn the ventilator on and set the mode to Volume Controlled Ventilation and set the ventilator to the rate, tidal volume, and I:E that you might use for the next patient.
4. Depress the oxygen flush button until the bellows reach their maximum height.
5. Observe the breathing bag for normal operation (inhalation and exhalation of test lung) for at least eight respiratory cycles.
6. Observe the exhaled tidal volume—it should be close to the set tidal volume after eight cycles.
7. Observe the breathing circuit pressure—make sure that it is normal.
8. Observe the top of the bellows and determine if it always rises to the same location, or if there is a leak and the top of the bellows (height) is decreasing (may need to compensate for CO<sub>2</sub> sampling flow rate).

*The APSF Committee on Technology believes that a functional test of the breathing circuit is important to perform before the circuit is applied to any patient. Numerous reports each year of defective plastic components in disposable breathing circuits, foreign materials restricting or obstructing gas flow, and misconnections have resulted in the inability to ventilate the patient during induction of anesthesia, a problem that cannot be detected by performing a simple leak check.*

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*APSF Newsletter*  
Guide for Authors

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