



INHALATION ANESTHESIA SYSTEMS

HONEST ANSWERS FROM KNOWLEDGEABLE PEOPLE

## **Breathing Circuits**

*Breathing circuits facilitate delivery of fresh gas from the anesthesia machine to the patient, and delivery of waste gas from the patient to the evacuation system. While there are countless styles and types of breathing circuits, they can be divided into two main categories - rebreathing and non-rebreathing.*

### **Rebreathing**

Rebreathing circuits are used with anesthesia machines that have a CO<sub>2</sub> absorber head and/or a ventilator. These circuits consist of a tube from the machine to the patient, which is connected to a Y-piece at the patient, and then another tube extending back to the machine. One-way valves within the machine assure that the gas moves through the tubes in a circular path to the patient and then back to the machine. This type of circuit recycles the unused gas to the anesthesia machine for reuse. The tubes range from less than 2mm ID and only an inch or two in length, to over 2" ID and 60" in length.

### **Non-Rebreathing**

Non-rebreathing circuits also consist of two tubes. One delivers gas from the anesthesia machine to the patient connection. The second, usually a larger tube, channels the waste gases to evacuation. In this type of circuit any gas not utilized is immediately directed toward the evacuation circuit. The waste gas tube should be easily connectable to either a disposable charcoal canister or to an in-house evacuation system. This type of circuit is usually configured with an elbow, a tee or a straight connection to the nosecone/ET tube at the patient end. The fresh gas tube can be located inside or outside the waste gas tube. The internal diameters and overall lengths of the fresh gas and waste gas tubes can vary greatly.



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## Selecting Breathing Circuits

*Key factors to consider when selecting a breathing circuit for your procedure:*

- Is the internal diameter of the fresh gas tube sufficient to deliver an adequate volume of fresh gas to the patient?
- Is the internal diameter of the waste gas tube sufficient enough to not create resistance in the flow of the departing gas? This is a very important factor to consider because gases will follow the path of least resistance. If there is resistance in the evacuation tube, the gases will try to escape elsewhere, such as from around the facemask or other circuit connections.
- Does the nosecone/endotracheal tube connection fit within my procedure boundaries? For example, an elbow may force the patient's head into an unacceptable position for the procedure you are doing, or a tee connection may not fit in your MRI tube.
- Custom breathing circuits can be constructed.