MIP
Molecular Imaging Products Company
A Division of Summit Anesthesia Support
Anesthesia Technologies

Sniffing a bit too much Isoflurane Got you Down??

Are you sick and tired (no pun intended) of having headaches and/or feeling, well, a bit light headed by the end of a day of anesthetizing your subjects with Isoflurane? Sniffing a bit too much of the "juice?" Ready for a nap by 2:00PM? These symptoms could be a result of watching Jimmy Kimmel--or maybe you are not paying enough attention to your anesthetic procedures? Here are a couple common problem areas for investigators using gas anesthesia:

1. If you are using the "drop" technique (saturating Isoflurane on a gauze sponge in a Bell Jar), and you smell the anesthetic, you are orders of magnitude over the OSHA tolerance of exposure (2ppm in 1 hour). Hey, we're not being judgmental here! Also, you run the risk of overdosing your subjects. Isoflurane has a relatively high vapor pressure (compared to Ether--which used to be the "popular" way to do this technique). Vapor pressure is willingness of a liquid to convert into a gas. At room temperature, it is possible, in a closed environment (like a Bell Jar) to achieve 25 to 30% concentrations of Isoflurane. Plus, when you open the Bell Jar, you cannot help but get "bunches" of Iso in your face! Unless, or course, you are a "gold star" investigator who uses a Chemical Fume Hood for all his Bell Jar techniques. Yikes! If you have not had an anesthetic accident using this technique, you are very skilled--or very lucky! *Danger*, Dr. Will Robinson! Using this technique can be dangerous to your health--and that of your subjects.

2. Hey, folks, those "open" nose cones / face masks don't work like you may think. The anesthetic gases will follow the path of least resistance around the animal's muzzle and into the workplace. If you have a "passive" Waste Gas Management system which requires the gases to flow towards an Activated Charcoal Filter, for example, you need to have a Coaxial Non-Rebreathing System with a face mask / nose cone with a thick, 12 mil latex diaphragm. Coaxial means that there is a Fresh Gas Inlet into the face mask or nose cone, and a Waste Gas outlet to the Waste Anesthetic Gas Management System.

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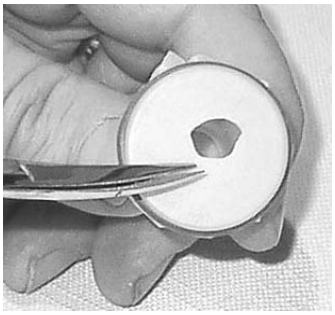
And, the fresh gas inlet needs to be positioned such that it is as close to the animal's breathing apparatus as possible. With this configuration, the fresh gas flows at a relatively high rate in relation to the animal's tidal volume. The fresh gas "flushes" the last exhaled breath (containing CO2) towards the Waste Gas Management System. If the mechanical "dead space" (volume within the face mask / nose cone) is kept at a minimum, and the flow rate is correct, the animal will not rebreath it's exhaled CO2 and will not become acidotic.

The diaphragm is stretched across the face mask / nose cone and held in place by a silicone "O" ring. If the diaphragm is cut properly--in a *circle*--not a "X" or cross, and the hole is of an appropriate size such that the diaphragm fits snugly around the animal's muzzle, then the gases will follow the path of least resistance—to come into the workplace--but flows towards the Waste Gas Management System. Simple. Easy. No more sniffing Iso when working over your subjects.



Surgery glove material does not make a very good diaphragm. It is very wimpy and will not "seal" around the animal's muzzle. It also is so thin that it disintegrates quickly in the presence of oxygen, light, and anesthetic. The 12 mil diaphragm that we recommend is the correct thickness to afford a tight seal.

Bottom line, please take care of your self, be safe, and heed common sense. Your nose will thank you; and your subjects will thrive to be studied another day!

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