

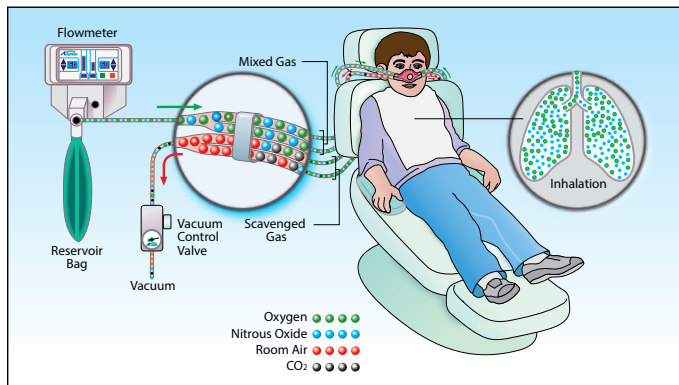


Nitrous Oxide Sedation: Patient Demand vs. Positive Flow

Patients do not breathe in a continuous fashion. There are periods of inhalation, exhalation and rest, each of which account for about a third of the breathing pattern. This means that when the patient inhales, the inhalation rate is about three times higher than the average value seen on the flowmeter.

Patient Demand Systems

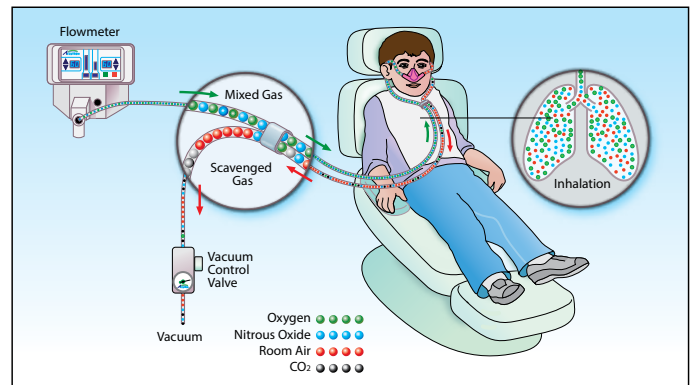
Patient Demand refers to systems that include a constantly flowing flowmeter and a reservoir bag



- Reservoir bags in patient demand systems are designed to match the patient's method of breathing. During the period where there is no inhalation, the bag is filling in preparation for the high volume inhalation.
- When the filling of the bag is matched to the breathing rate of the patient, the patient needs are met with no wasted gas and no inhalation of room air.
- Inhalations at this high rate require large tubing. The smaller tubing used with low-profile nasal masks cannot supply the high flow required during inhalation and therefore cannot use a reservoir bag.

Positive Flow Systems

Positive Flow refers to systems that include a constantly flowing flowmeter but without a reservoir bag



- Without the use of reservoir bags, the inhalation needs of the patient are met through vents or holes in the low-profile mask that allows additional room air to be taken in.
- However, this flow of room air can dilute the concentration of the medical gases in positive flow systems.
- Due to the dilution of nitrous oxide in positive flow systems, raising the nitrous oxide percentage and total flow is often necessary. With maximum nitrous oxide levels limited at 70% on flowmeters and the use of scavenging circuits, delivering increased percentages and flow of nitrous oxide until the clinical effect is achieved is safe for both the patient and clinician. If the flow is higher than the patient needs, the excess will simply be pulled away by the vacuum.

What to Expect When Using a Low-Profile Nasal Masks with a Positive Flow (Bagless) System:

Depending on the lung capacity of the patient, using a positive flow system may translate to diluted nitrous oxide concentrations as compared to a patient demand system, which can be addressed by increasing the nitrous oxide percentage and total flow. Clinicians may also notice increased nitrous oxide usage due to the lack of the reservoir bag but the easier access to the oral cavity and the increased patient comfort due to the design of the corresponding nasal masks make the positive flow systems a unique solution.