

Anesthesia Machine Alarms and Safety Mechanisms

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The equipment anesthesiologists use to care for patients has been carefully engineered for safety. A critically important task of the anesthesiologist is to insure the patient receives ample oxygen during surgery. Anesthesia machines have special fittings where the medical gases, like oxygen, nitrous oxide and air, connect to them. Let's look at the safeguards built into the system.

Outside the hospital is a large oxygen tank that is filled from a truck from a medical gas company. It has special pipe fittings so that only oxygen piping can be connected to the oxygen storage tank. The medical gas line going into the hospital from the storage tank has an oxygen sensor, or monitor, to help insure that pure oxygen is flowing to patient care areas. In the operating room, the anesthesia machines are attached to the hospital oxygen system using hoses that have very specific, pin-indexed fittings that only fit oxygen to oxygen, for example. The hoses are also color-coded to enhance safety. Within the anesthesia machine, there is another oxygen sensor that continuously monitors the gas the patient is breathing so there is always adequate oxygen. These monitors are calibrated and checked repeatedly by the anesthesiologist to insure they are functioning well and measuring accurately.

In addition, the anesthesia machine has a mechanical interlock that insures that the gas mixture going to the patient always has plenty of oxygen. If someone were to accidentally set the wrong gas mixture, the machine will not allow the oxygen level to fall below a set concentration, usually about 30%.

Many times patients undergo mechanical ventilation to help with their breathing during surgery. The machine continuously measures the amount and concentration of gases going in and out of the patient. If the breathing system were to become accidentally disconnected, the machine will alarm until the problem is fixed. In addition, the amount of oxygen within the patient is continuously measured, as is the carbon dioxide being breathed out by the patient. The combination of redundant safety mechanism and skilled, dedicated providers has helped anesthesia become one of the safest areas in medicine.