CPAP System for Use with Intraoperative Conscious Sedation

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With increasing frequency, patients with diagnosed and (more commonly) undiagnosed Obstructive Sleep Apnea (OSA) are presenting to the operating room, the endoscopy suite, or elsewhere for procedures done under conscious sedation or light general anesthesia. Often drugs such as midazolam, meperidine, fentanyl and propofol are used to provide the sedation needed to make such procedures tolerable to the patient. However, an unfortunate result of this process has been a large number of OSA patients who have developed airway obstruction during such procedures. Similar problems exist following extubation after general anesthesia cases in these patients. Recognizing the importance of this issue, the American Society of Anesthesiologists (ASA) has developed a policy paper dealing with the perioperative care of OSA patients [1-3].

While the use of CPAP devices is generally highly effective in OSA patients at home, they are rarely used for hospital and clinic procedures involving conscious sedation or general anesthesia. There are two reasons for this: (1) lack of familiarity of CPAP equipment by many anesthesiologists and endoscopists, and (2) the fact that most CPAP machines do not allow for the administration of oxygen-enriched air.

The present invention description broadly describes a plurality of means to allow a variety of CPAP mask designs to be connected to an anesthesia machine so as to allow CPAP to be administered during procedures done under conscious sedation or general anesthesia with the patient breathing spontaneously. The use of a CPAP machine is not needed, and high levels of oxygen can be administered. (A separate series of designs I have developed but not described here allows oxygen-enriched air to be administered to a CPAP mask without the use of either an anesthesia machine or a CPAP machine, for use in clinical environments such as a recovery room.)

The description of system for use with an anesthesia machine is summarized as follows. The inspiratory and expiratory ports of the anesthesia machine are connected via low-resistance tubing (possibly coaxial in design) to a Y-piece or similar adapter attached to the CPAP mask connector. An optional capnographic sampling port at the Y-piece or elsewhere in the breathing circuit allows for CO2 monitoring. In one design variation the APL valve of the anesthesia machine is adjusted so as to obtain the desired CPAP level, as gauged using the anesthesia machine airway pressure monitoring subsystem.

In another variation the APL valve is set to the closed position, and the desired CPAP level is selected using an adjustable PEEP valve connected to the patient breathing circuit (for instance at the expiratory port of the anesthesia machine).

This summarizes two means by which a CPAP mask can be connected to an anesthesia machine for use with conscious sedation or other anesthetic procedures.

REFERENCES

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