

## ***Safety In anesthesia machine***

Anesthesia machines have evolved from simple, pneumatic device to sophisticated, computer – based, fully integrated anesthesia systems. A few years ago, a rudimentary background in pneumatics sufficed, but today an understanding of pneumatic, electronics & even computer science is useful. Even though it is more difficult for anesthesiologist to achieve through understanding of modern anesthesia machine, it is essential for the safe practice of anesthesia.

*(Schreiber and Telford, 1998)*

The traditional pneumatic anesthesia machine has evolved into a complex electrical, mechanical & pneumatic multicomponent workstation. An anesthesia workstation integrates most of the components necessary for administration of anesthesia in one unit it consists of the anesthesia machine, vaporizers, ventilator, breathing system, scavenging system & monitors. Added to this may be drug delivery systems, suction equipment system. The anesthesia workstation offers many benefits. Monitoring & control functions as well as alarms can be integrated & data displayed on a single or multiple screens.

*(Olympio, et al., 2003)*

The breathing circuit was by far, the major culprit (39%), causing, (70%) incidence of death or brain damage. A misconnection or disconnection, most frequently leads to hypoventilation or barotraumas. Next, the vaporizer (21%) contributed to an overdose, or to cases of awareness, but gas analysis or cerebral monitoring might have prevented these

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July 14, 20

problems. The ventilator (17%) was not activated correctly, or it delivered an excessive tidal volume (Vt) or inspiratory pressure. High pressure gas supplies (11%) injured patients if connected directly to the patients respiratory system without appropriate decompression. The remainder of the gas machine was infrequently associated with injury (7%). Most importantly, human misuse was three times more common than failure of equipment.

*(Caplan, et al., 1997)*

A checkout procedure is mandatory to determine whether equipment is functioning properly & ready for use. Failure to check equipment properly is a factor in many incidents.

*(Cooper, 1994)*

Properly checking equipment can reduce equipment related morbidity and mortality, improve preventive maintenance and educate the anesthesiologist about the equipment. Many anesthesiologists are unable to identify many faults but with intensive training, performance improves.

*(Arbous and Van kleef, 2005)*

The food and Drug Administration (FDA), working with representatives of the anesthesia community and industry, developed a checkout procedure which was published in 1986. Unfortunately, this list was so complicated for most users & a simplified version was published in 1993. The new version retained or added checks of components that fail more frequently than others and that can injure the patient when they fail

*(Vistica, and Posner, 2003)*

John E. ...

Dr. Alan ...

Many factors should be considered when choosing anesthesia machine, the service, the size and other special features of the machine. All anesthesia machines require periodic servicing by the agent from whom you buy the machine. The machine should be chosen if the service is available, reliable and not time or money consuming. The size of the machine should suit the purpose. Small machines are suitable for small operating rooms and are easy to move. Larger machines offer more equipment but are difficult to move.

*(Goldstein, et al., 1996)*

One machine may be preferred by the anesthesiologist that another. Some like simple machines, others like sophisticated ones. However, important special features include the ability to add more equipment or to use in special environment should be considered. The MRI compatible anesthesia machine should be made of non - ferromagnetic metal and should have aluminum cylinders.

*(Carstensen, 2006)*

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