Health problem addressed

Most surgical procedures require suctioning to remove blood, gas, tissue, or other foreign materials and irrigating fluids that accumulate in the operative field and obstruct the surgeon's view. Portable or mobile aspirators can be used if there is no central vacuum system or if suctioning is required in areas that do not have vacuum inlets.

Product description

Surgical aspirators consist of a line-powered vacuum pump, a vacuum regulator and gauge, a collection canister, and an optional bacterial filter. Plastic tubing connects these components, completing an open-ended system that continuously draws tissue debris and fluid from the surgical field to the collection canister. The gauge allows the user to set a safe limit for suctioning, to assess the performance of the vacuum pump, and to detect leaks or blockages. Units are either portable or mounted on a stand or cart for mobility.

Principles of operation

Various pump configurations include rotary-vane, diaphragm, and piston. Each mechanism alternately increases and decreases the vacuum and/or chamber volume, creating suction. Air is drawn from the external tubing into the chamber, drawing aspirate into a collection canister. Most surgical aspirators have an overflow-protection assembly that prevents fluid from overflowing into the pump and valves.

Operating steps

Operator powers on unit and selects appropriate suction level and inserts suction tip into patient cavity. Collection canisters should be monitored and emptied if they come close to capacity.

Reported problems

Suction regulators must be accurate; suction levels that are too high can cause tissue damage. Some models operate at high noise levels that can eclipse the volume of alarms for other devices. A pump containing aspirated fluid can be a source of contamination. Changing or cleaning the suction tip during surgeries or other use can help reduce infection risk. Operators should follow universal precautions, including wearing gloves, face shields or masks, and gowns.

Use and maintenance

User(s): Surgeons, assisting surgeons, nurses, respiratory therapists, other medical staff
Maintenance: Biomedical or clinical engineer
Training: Initial training by manufacturer and manuals

Environment of use

Settings of use: OR, patient bedside, home, long-term care, ER
Requirements: Line power, biohazard disposal

Product specifications

Approx. dimensions (mm): 300 x 400 x 800
Approx. weight (kg): 5-25
Consumables: Tubing, collection canisters, liners, batteries
Price range (USD): 160 - 5,000
Typical product life time (years): 8-10
Shelf life (consumables): Rubber tubing: 10 yrs

Types and variations

Portable (sometimes considered a separate category of emergency aspirators) or on a cart; disposable or reusable canisters; waterproof designs. The three types of pumps used in surgical aspirators are rotary vane, diaphragm, and cylinder piston.

Other common names:
Suction unit, suction pump, evacuator, vacuum pump