Low pressure anaesthesia machine

Country of origin | United Kingdom

Health problem addressed

More than 2 billion people lack access to adequate emergency surgical services and receive just 4% of 234 million surgical procedures performed each year. A major deficiency is the lack of appropriate anaesthesia equipment which can operate despite power outages and shortages of compressed oxygen, both of which are required for conventional machines.

Product description

This device allows oxygen from multiple sources, includes an integrated concentrator, pipeline, and cylinder, and can also draw in room air if no other source of oxygen is available. It can work without power during long outages without any reconfiguration during surgery. It is designed for adult, pediatric and neonatal patients. All disposables are generic.

Developer's claims of products benefits

Conventional anaesthesia machines require compressed oxygen to create the anaesthetic gas mixture. Most machines also need electrical power to operate. Without compressed gas or power there is no general anesthesia other than the use of ketamine. This device, however, works at ambient pressure and can adapt to loss of compressed gas or electric power. If power is available, the device creates its own oxygen supply and acts like a conventional machine (though saving money on compressed gas.) If no power or compressed gas is available, it automatically draws in room air and continues to safely deliver anaesthetic gas. Battery operated patient monitoring provides safe delivery under any circumstances.

Suitability for low-resource settings

Many low-resource hospitals experience power outages and stock outs of compressed gas. This device works at ambient pressure and can adapt to loss of compressed gas or electric power.

Operating steps

When the device is operated, the oxygen flow rate automatically matches the patient minute volume demand. If required, room air is introduced. To deliver the anaesthetic agent, ambient pressures are sufficient and compressed medical gas is not required. When required, patient ventilation is performed with bellows.

Regulatory status

The machine is CE marked and is produced in an ISO certified factory.

Future work and challenges

The organization providing the device operates as a non-profit and sells the device to non-profit and government hospitals at a discounted price that covers manufacturing cost and delivery. It is distributed through NGOs, government tenders, sales to donor organizations and direct sales and donations to hospitals. The challenges include cost-effective distribution in low income countries, cost of training users ranging from anesthesia assistants to consultant anaesthetists, and provision of service to remote locations. The focus is on training users and local technicians and providing backup support when necessary.

Use and maintenance

User: Physician, anaesthesia clinical office, nurse anaesthetist

Training: Training provided by local or international medical doctor anaesthetists and biomedical technicians

Maintenance: Daily checklist for user with occasional replacement of the oxygen sensor and air filter

Environment of use

Settings: Rural, urban settings, primary (health post, health center), secondary (general hospital), tertiary (specialized hospital)

Requirements: Intermittent access to electrical power to charge battery. Stable power connection to use optional oxygen concentrator

Product specifications

Dimensions (mm): 1460 x 530 x 690

Weight (kg): 130

Consumables: 80 USD/year including 60 USD for oxygen fuel cell replacement every 12 to 18 months and 20 USD for primary air filter replacement every year.

Life time: 15 years

Shelf life: 15 years

Retail Price (USD): 15,000

List price (USD): 15,000

Other features: Software use, mobile, capital equipment

Year of commercialization: 2010

Currently sold in: Ghana, Haiti, Jordan, Kenya, Malawi, Nepal, Nigeria, Rwanda, Sierra Leone, Somaliland, South Africa, Tanzania, Uganda, United Kingdom, Zambia

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