

Innovating beyond technology: building a technical support model to sustain the Universal Anaesthesia Machine

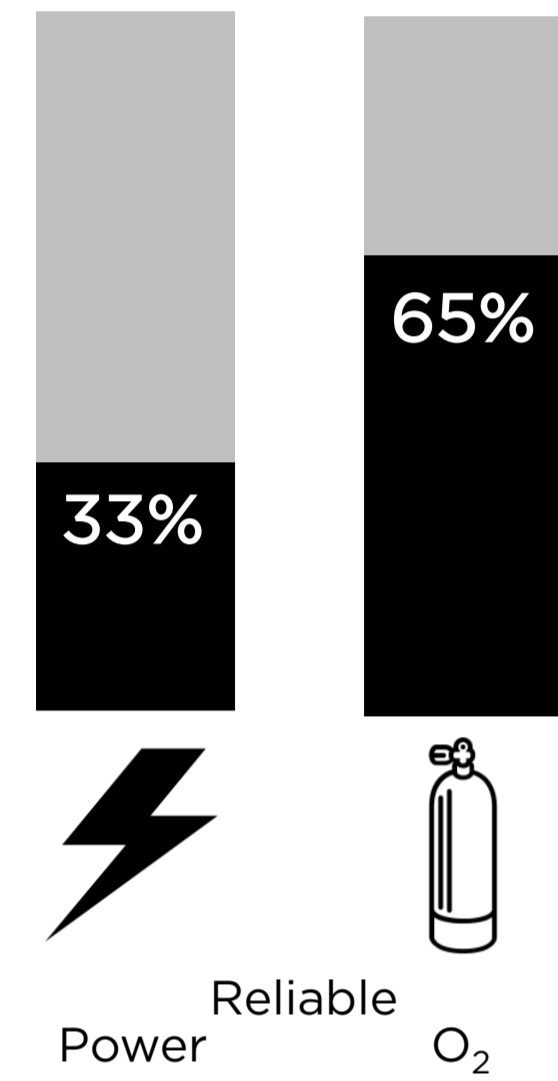
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Condition of anaesthesia equipment

Problems

Hospital infrastructure



Medical equipment status quo

-80% of medical devices in LMICs are donated or second-hand

Manufacturers and donors provide little to no after-sales support like spare parts, maintenance & technical repairs

1/2 to 3/4 of all medical equipment in LMICs is inoperable

Solutions

The Universal Anaesthesia Machine (UAM) - designed for challenging environments



- Multiple sources of oxygen: Built-in oxygen concentrator & external oxygen connections
- Automatic conversion to draw over anesthesia when electricity or oxygen goes out
- Backup manual ventilation
- Battery-powered monitors

A framework for effective technical support



Methods for building a framework for effective service support



Adopting a service philosophy

- Service is one of Gradian's essential tools in pursuing its mission of improving the safety and availability of surgical care around the world.
- We conceive of service as a way to ensure that the equipment we distribute is in the hands of those who know how to use it *safely*, and is fully functional and utilized for as much time as possible.
- We seek to dispel the conception that medical devices in remote locations are unserviceable by responding within twenty four hours of a service issue, visiting all of our equipment customers at least twice a year, training technicians at every level and standing by our parts warranty for at least 2 years.
- Ownership and empowerment for safely operating and servicing medical equipment belongs to local institutions and individuals.



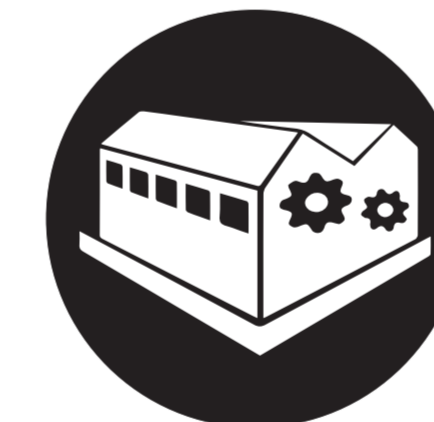
Providing timely and reliable service to UAM users

- Like all medical equipment, the UAM can break down over time, so we strive to offset future expenses through a warranty that comes with all UAM purchases and accounts for after-sales service and support needs. The extendable 2-year warranty is executed through two primary channels of support infrastructure: local partnerships and ongoing customer service.
- For any market entered, Gradian cultivates a strong in-country support team through partnerships with local distributors and their biomedical equipment technicians (BMETs). We thoroughly vet and select partners based on their ability and commitment to provide fast, accurate and comprehensive support to UAM users.
- Gradian's in-country distributors are typically independent entrepreneurs or small businesses, so the technical skills they gain during our training combined with the service support we provide helps them grow their business while fulfilling an important need for us.
- Gradian handles support requests through its distributors, its Biomedical Engineering Manager and its Customer Experience Manager during and after the warranty period. Using a combination of email, phone and SMS messaging services, our team remains in close contact with our technicians and focal points at each hospital to monitor the state of the UAM, report repair requests, organize preventive maintenance visits and assist with other challenges.



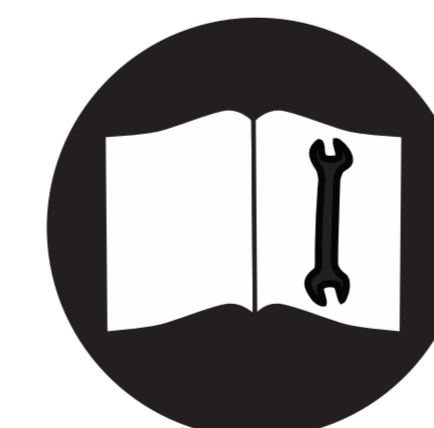
Training BMETs

- During every UAM installation we offer a complementary two-day, on-site technical training for hospital BMETs, or their equivalent, led by our team of regionally based Gradian-certified BMETs. The trainers demonstrate how the machine is assembled, how to manage common repairs and how to conduct preventive maintenance checks using basic tools provided with the UAM. These trainings not only help build a dependable team of technicians for the UAM, but cultivate skills that they can use in their technical careers. The hospital BMETs are usually very appreciative and surprised that this kind of attention and support is being given to them by a manufacturer, allowing them to take center stage in the presence of the hospital's administrators, who often do not fully recognize their contribution.
- The training for Gradian-certified BMETs, which is aimed at our distributor BMETs and independently contracted service providers, takes place over 4 days and the participants fully disassemble and reassemble the UAM and the ventilator down to their bare components and troubleshoot intricate problems. They leave this training prepared to perform all corrective maintenance procedures, perform preventive maintenance, install UAMs and train hospital BMETs during installation.
- To date Gradian has trained over 150 BMETs including hospital staff as well as Gradian-certified BMETs.



Establishing spare parts depots

- Parts depots eliminate the typical delays, complications and costs associated with shipping, customs clearance and regulatory bureaucracies.
- To date Gradian has established, and is currently establishing, spare parts depots in Haiti, Tanzania, Ethiopia, Malawi, Uganda, the Democratic Republic of Congo and Sierra Leone.



Producing training materials and technical resources

- User guides, maintenance manuals, service notes, service videos, diagrams, spare parts lists, software updates and other resources are easily available on the Gradian website to download, and hard-copies can be also be requested free of charge.
- These materials are currently available in both English and French and materials in other languages will be added as we expand into new markets.

Results

Gradian Health Systems has developed an effective support model centered around providing reliable service and empowering in-country BMETs to sustain medical equipment for LMICs. As of the end of May 2016, this model has enabled us to install more than 183 UAMs, conduct more than 110 preventive maintenance visits and complete more than 90 service requests in 25 countries.

The second phase of our service metrics plan will enable us to further quantify and improve our service performance by collecting and tracking indicators such as mean time between failures, downtime, service response time and overall customer satisfaction.

Conclusions

After nearly 5 years of operation, Gradian has learned a number of crucial lessons about the human resources and expertise needed to maintain medical equipment in LMICs. But perhaps the most salient insight is one that the medical equipment field has been grappling with for years: the downside of donating or selling devices without an eye toward the future. And from our perspective, that future quite literally lies in the hands of biomedical equipment technicians.

By focusing heavily on service Gradian has helped enable more than 100,000 surgeries in 24 countries and has helped dispel the notion that medical devices in remote locations are unserviceable, and the company is on track to expand its model to many more hospitals throughout the world.

As the global surgery field aspires to close the unacceptable gap in access to safe surgical and anesthesia care, equipment maintenance and support needs to be given the attention it deserves. For medical device manufacturers, this means ensuring after-sales support complete with linkages to BMETs trained on the equipment and local spare parts to enable repairs.

For governments, this means devoting more resources to those charged with keeping a country's healthcare infrastructure functional. For hospitals, this means regarding its technical staff as a critical part of the team - because providers can't deliver care without those who make healthcare delivery possible. And finally, for the global surgery community, this means acknowledging the role of BMETs in enabling lifesaving interventions.



References

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Further information

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