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Letter

A Hybrid Model of In-house and Outsourcing Maintenance for Medical Devices in Africa

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Dear Editor,

The recent discussion on adopting a hybrid model that combines in-house and outsourced maintenance for medical devices in Africa presents a promising strategy to improve healthcare infrastructure sustainability.

BACKGROUND

Many low- and middle-income countries (LMIC) in Africa cannot afford to procure medical devices every year or every time a device breaks or malfunctions. It is essential for all health care facilities, regardless of their size, to implement a maintenance program for medical equipment. The complexity of the program depends on the size and type of facility, its location, and the resources required.¹

Basic diagnostic, therapeutic, and rehabilitation devices are maintained within the in-house facility. However, maintaining capital and high-tech medical devices is a headache in many African countries. In Africa, maintenance problems as well as many recommended solutions are also complex. Entrusting a new graduate biomedical engineer/ clinical engineer with the responsibility of maintaining high-tech devices without providing proper training, spare parts, toolkits, etc., is a major concern for clinical/biomedical engineers.

Medical device repair and maintenance are extremely important, and the healthcare center has to manage the periodic schedules and updates of the devices. Most maintenance and repair activities are done in response to the operator's request for support. The maintenance and repair service should include a planned preventive maintenance design.²

METHODS

Sampling techniques are used to compare the results of in-house maintenance and outsourcing methods of maintenance. A mathematical tool/model will be developed to identify the method of maintenance that is best suited for a specific device. Currently, there are generally two approaches for managing medical device maintenance: In-house and outsourcing. But there is also a third approach, which is a "hybrid of in-house and outsourcing maintenance".

Capital medical devices and high-tech gadgets require expert maintenance, which is often unaffordable for inhouse workshops in many African countries. It is usually recommended to outsource the maintenance of such highend equipment to suppliers/manufacturers. Sticking to a single approach is not advisable for resource-constrained countries in Africa. Thus, the hybrid approach incorporating both in-house maintenance and outsourcing is found to be very effective.

The key factors of cost, work quality, obtaining expertise, tools, equipment, and technology, risk reduction, response time, and management focus on core health service activity should be considered when deciding on the best approach for a health facility.

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CONCLUSIONS

In general, the health facility can choose which approach is apt depending on the frequency of maintenance, skill, training, and budget availability. Performance evaluation and calibration are the missing links occurring during the in-house maintenance activity. Thus, it is important to outsource high-tech and capital medical devices that offer features of cost-effectiveness, control, and flexibility.

Different medical devices, from simple to complex, different brands, availability/lack of spare parts, availability/lack of training, and workshops will make it very difficult for in-house technicians and engineers to take care of everything in the health facility. Basic medical devices can be maintained by in-house service personnel, but complex devices can be maintained only by outsourcing maintenance to suppliers/companies. Thus, a hybrid in-house outsource maintenance approach is highly recommended in resource-limited countries in Africa. It will avoid debate and confusion as to which approach is better for LMIC, because one approach cannot replace the other.

AUTHOR CONTRIBUTIONS

A.H.A. is the sole author of this work and is responsible for all aspects of the research and writing.

CONFLICTS OF INTEREST

The author declares he has no competing interests.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

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