Asset Management System for Improvising the Efficiency of Biomedical Engineering Department in Hospital
Vipin Jain*, Rohin Garg**

Abstract

Background: The asset management plans should be such that it provides the management a greater degree of efficiency in the use of medical equipment. The plan should be such that equipment procurement program should be kept as a priority, and should be regularly updated. Also addressing the most serious and urgent needs of hospitals without delay.

Material and methods: A survey was conducted in our own teaching hospital (Teerthanker Mahaveer Medical College, Hospital & Research Centre, Moradabad, Uttar Pradesh, India) which is a tertiary care Centre with 900 functional beds, in the urban area of the state. The survey was conducted for one complete year.

Results: It was interesting to note that the results of health care equipment maintenance resulted in problem to 33 participants out of 45 respondents. Therefore around 74% of the respondents had major to minor issues pertaining to management of health care equipment. About 18 reviewed as equipment maintenance was a major problem; 12 indicated that there was a significant problem and 3 reviewed it as a minor problem. Therefore for rest 12 respondents health care equipment posed no problem whatsoever.

Conclusion: The study conducted in our teaching hospital for the management of the expensive and sophisticated equipment, for the training medical professionals and clinical engineers has shown that maintenance and repair service had two basic functions in a big hospital like ours.

Keywords: Asset Management System, Biomedical Engineering, Efficiency, Medical Equipment.
Materials And Methods

A survey was conducted in our own teaching hospital (Teerthanker Mahaveer Medical College, Hospital & Research Centre, Moradabad, Uttar Pradesh, India) which is tertiary care Centre with 900 functional beds, in the urban area of the state. The survey was conducted for one complete year. The participation was mandatory for each participant. The sole purpose of this survey for equipment maintenance technicians was basically to investigate and evaluate the factors responsible for health care equipment maintenance problems in a public health set like ours. All the replies are first-hand and without any alteration from the clinical engineering technicians. There were 40 clinical technicians, 2 equipment maintenance managers and 3 clinical engineers involved in the study survey so conducted. (Table1)

The response of the participants was as documented both manually and later accessed electronically. Considering responsibility for the physical condition, adequate usage, function ability and budgetary performance of the equipment was designated to the biomedical or engineering departments respectively. The hospitals was not able to provide a regular equipment management reports which included details like cost, age, utilisation levels, physical condition, maintenance backlogs spare part utilisation and replacement requirements. Whatever data so collected was again analysed and documented.

Results

It was interesting to note that the results of health care equipment maintenance resulted in problem to 33 participants out of 45 respondents. Therefore around 74% of the respondents had major to minor issues pertaining to management of health care equipment. About 18 reviewed as equipment maintenance was a major problem; 12 indicated that there was a significant problem and 3 reviewed it as a minor problem. Therefore for rest 12 respondents health care equipment posed no problem what so ever. Equipment maintenance technicians were asked to rate various equipment groups according to their frequency of use and need for maintenance. From the 45 respondents all agreed upon the fact that the diagnostic equipment are most frequently used and need more maintenance than any other equipment. Second were the monitoring equipment, whereas therapeutic equipment and laboratory equipment were ranked third and fourth respectively, with the number of problems faced. The diagnostic instruments included the ECG, EEG, x-ray units etc. (Graph 1)
Discussion

All the respondents agreed upon the fact that the training of equipment users and operators reduces equipment efficiency in terms of time bound results. The basic problem is the lack of training and specialised personnel to conduct continuous and periodic training programs to help personnel to maintain the equipment. The respondents also noted that primarily nurses were the majority users of health care equipment and majority of them were inadequately trained in equipment operation. In spite of continuous interdepartmental shuffling of nurses there was no adequate regular training program for them in new departments. The survey showed that the involvement of the clinical engineering staff for equipment selection and procurement was limited to the writing of technical specifications only. The maintenance specialists felt the same as, there was a lag in the instrument required for the institution to the procurement of the instrument. Thus, suggesting a need for equipment selection and procurement protocol. Inadequately procured equipment are normally the source of maintenance problems and often rendering the equipment as non-functional and waste of money. However, to maintain services the institute lacks proper technical infrastructure and budget too. Few respondents provided negative response to such donations as they were of an inferior quality.8,9 A frequent point mentioned from the participants was that maintenance contracts were negotiated by the administration or financial departments lacking the technical know-how to assess long term results and technical implications in future. The opinion was that the tender boards always focused too much on purchase price. Whereas, the cost of ownership which surpasses all direct and indirect expenses related to the item of health care equipment over its economic life. With the changing trends worldwide and an option was worth considering that the advantages such as low initial capital investment and readily available services. The data so collected from this study based survey clearly suggested that the health care equipment are the necessary component of any quality oriented health care system. On their own the equipment are not functioning in full capacity due to lack of technical knowledge and a comprehensive financial support, which includes the funding to train both maintenance staff and equipment operators and engineers. It becomes hard to imagine that a modern health care system lacking the technical know-how to provide precise diagnosis and treatment for life threatening diseases. Also, there remains a danger of overuse and under-use of such equipment due to lack of technical and management expertise. Also, the economic penalties are soaring high. The need of practical recognition of technological expertise is required for a healthy environmental and social needs. Also, it is observed that inadequate training of nurses, especially working in the intensive care units had the benefit of learning the complex use of machines.10 For example computing data and providing information to private services providers.11 This fact corresponds to the study conducted by the World Bank.12

Conclusion

The study conducted in our teaching hospital for the management of the expensive and sophisticated equipment, for the training of medical professionals and clinical engineers has shown that maintenance and repair service had two basic functions in a big hospital like ours. Primarily it is to retain technical operability and the secondly to give reliable information which is important for management of the equipment which is essential for the selection and procurement of the equipment. Both capacities were found to be in a developing stage in our institute.

References