



Medical Equipment Maintenance: Why is Prevention better than cure

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Received: 14th January, 2023; Revised: 08th February, 2023; Accepted: 16th March, 2023; Available Online: 01st April, 2023

A wide range of medical equipment are used within medical institutions for prevention, monitoring, diagnosis and treatment, therefore, forming an integral part of the healthcare pathway. For healthcare providers, the proper functioning of these medical devices is of huge importance because of their role in delivering quality services to patients and considering the associated repair costs. Today, budget restrictions within numerous private and public healthcare facilities present a severe issue of patients being treated on ageing equipment, which are often also defective. This defeats the healthcare system's primary purpose in offering patients quality care. It also risks the operational efficiency and reputation of such medical facilities. These are the exact reasons that emphasize on the importance of medical equipment routine maintenance. Preventive maintenance in simpler terms refers to scheduled replacements and checkups of a medical device.

There is a range of preventive maintenance methodologies in the healthcare system which can be categorized into predetermined, condition monitoring and predictive maintenance. Predetermined maintenance comprises inspections based on a medical device's time/usage intervals. The manufacturer recommendation is what usually governs the frequency of predetermined planned maintenance tasks. This type of maintenance based on schedules is the simplest preventive maintenance to implement. However, is often susceptible to inefficiencies. Condition monitoring serves its purpose by acting on the inefficiencies presented by the predetermined preventive maintenance technique. Predetermined PM may result in certain tasks of relevance not being carried out frequently enough. For instance, parts

might end up wearing out before the schedule determines their replacement date. Condition monitoring, carried out by either regular inspections or through a centralized data system fed by the sensors, presents data that empowers biomedical engineers to carry out maintenance tasks based on the early signs of wear and tear by different components and accordingly replace those parts. Predictive maintenance incorporates a predictive element into the process and builds on condition monitoring. Component conditions can be measured over time using specialised software and this data can be used to predict the time at which it will wear out. For instance, determination of when bearings in rotating hospital equipment will need a replacement can be made by collecting its vibration data. PdM, however, has its own downside, often associated with the cost involved in the process.

Preventing operational failures in medical equipment is where lies the true essence of preventive maintenance. It is of paramount importance in healthcare settings where doctors, nurses and patients rely on this equipment on a daily basis. It is the exact opposite of corrective maintenance, in which maintenance work is carried out after the occurrence of failure instead of before. As a consequence, preventive maintenance benefits the healthcare sector in numerous ways, including its contribution towards efficient operations, reduced liability, and ensuring the medical equipment in use are reliable, confirming patient wellbeing. For the healthcare system to be providing efficient services to its patients it is, therefore, important to realise that prevention is definitely better than cure, and that proactive, instead of reactive, management of medical devices deliver the best results.