Implementation of Policies and Informed Decision Making: Samoa

Summary

This paper outlines the importance of conducting routine preventative maintenance (PM) and how it helps in the implementation of Biomedical Engineering Policies and in making informed decisions to benefit and improve the biomedical service. Progress and achievements thus far include implementing quality assurance measures and tools to improve not only the PM processes but overall performance of the Biomedical team. Also, conducting frequent user trainings to help mitigate equipment faults, maintaining an updated asset registry and documentation as well as improved electrical safety testing. Challenges include the disposal methods of hazardous waste, non-compliant procurement and inefficient asset management system. Lastly, the recommendations highlight the importance of Pacific Island country collaboration in procuring compliant medical equipment and creating a healthcare waste policy specific to medical equipment waste.

1. BACKGROUND

The Biomedical Engineering (BME) Unit at the Samoa Ministry of Health (MOH) is responsible for the lifecycle management of medical equipment located at the two main hospitals and ten district hospitals across Samoa. One of the most important responsibilities of BME is to preform preventative maintenance (PM) servicing of all equipment that are in service at these hospitals. BME follows the Australia and New Zealand **ASNZ3551:2012** standard which outlines the tests and procedures that are required for routine maintenance. PMs are recommended to be done every six months unless specified otherwise by the equipment manufacturer. To comply with this standard, the BME team sets out a monthly plan of visits to the ten district hospitals twice a year and the main hospitals in Upolu and Savaii twice a year. Lastly, the laboratory, dental, imaging unit and specialist clinics are visited annually.

2. PROGRESS AND ACHIEVEMENTS

2.1 Quality Assurance and Performance Improvement Review

The BME team started quality assurance and PIR techniques (Performance Improvement Review) training in 2022, which has allowed the team to review our PM processes over the years and discuss ways to mitigate challenges that we are faced with. Currently, the team is made up of seven biomedical engineers and technicians looking after over 6,000 medical equipment at approximately $60 million SAT. Therefore, it is important to delegate staff to attend PM trips while others can focus on repairs, orders and every day calls. After yearly reviews and BME team audits, the team has come up with a monthly PM schedule, delegated specific PM teams and leaders that are responsible for report writing and communication with the clinical stakeholders at each location. The team is on schedule to reach their PM target this year with proper planning and frequent reviews.

2.3 Continuous User Training

The majority of corrective maintenance and repair works from all hospitals are due to operator error or user negligence. Therefore, the Biomed team, together with nurse managers arrange refresher user trainings during PM visits and ad hoc trainings within the hospital wards. This is especially helpful, as

the clinical staff changes and rotates often, and recruit up to one hundred (100) new nurses a year. BME has also held off-site trainings for nurses and doctors which allows for full participation during trainings. This has shown to be very effective and the team had proposed for funding to hold more off-site trainings this year.

2.2 Updated Asset Registry

Frequent visits to the different hospital sites allow the team to have an up-to-date asset registry each month. This allows the team to stay on top of their repair work, allows forecasting of medical equipment replacement and consumable orders. BME recognizes the importance of frequent asset record updates and having accurate data that is easily accessible.

2.3 Electrical Safety Testing Training

Electrical safety testing is a requirement at every PM as stated in the ASNZ3551 standard. BME is equipped with two electrical safety analysers through SPC donation as well as recently certified staff that underwent proper training in electrical safety. This has allowed the team to confidently preform these electrical safety tests not only at PM trips but after any major repair, also allowing BME to adhere to the standard. The team plans to have all seven members certified in electrical safety testing.

3. CHALLENGES

3.1 Disposal of Hazardous Materials

Medical equipment written off are either due to being beyond economical repair, needing obsolete spare parts as they have surpassed its lifespan or they are removed from the asset registry after not been sited (lost) for over five years. The current process of disposal includes referral to the asset management division of the ministry, where the equipment is then taken to the country dump site or land fill. However, these disposals are potentially toxic with radioactive waste and chemical waste within equipment parts (e.g batteries). This is as area that the BME unit needs improvement and collaboration with the Healthcare Waste and Infection Protection Control divisions of the Ministry as well as with

external counterparts like SPREP (Secretariat of the Pacific Regional Environment Program) and the Ministry of Natural Resources and Environment (MNRE) of Samoa.

3.2 Procurement of Compliant Medical Equipment

As aforementioned, the main cause of equipment failure or faults from the hospitals are due to operator error. However, in a number of cases, this is also due to poor and incompatible design. These equipment are not fit to be used in Samoa's environmental context; for instance, the high humidity, salinity and dust in the air accelerate the deterioration of touchscreens and corrosion and rusting of metal. The water quality in Samoa also creates difficulties in water systems and needing special treatments and filters. Also, the design of some equipment make them prone to damages if users are not extra careful which can be difficult in high stress situations. Therefore, improvements in the procurement of adequate equipment need to be looked into.

3.3 Asset Management System

The current method of asset management within the MOH as well as BME is inefficient. To store and record biomedical assets and recording the history of work done on medical equipment, BME uses two main spreadsheets, the Asset Record and Service Record. It is evident through the BME audits that the time used for data entry as well as the frequent update of the asset record could be improved. The team is working on implementing a new asset management system to help with this.

4. FUTURE DIRECTIONS

1. Healthcare Waste Policy

As aforementioned with the challenges in the disposal of medical equipment, it could be recommended that the Pacific Biomed Network can discuss and share their methods of disposing hazardous medical equipment. This could lead to forming a proper Disposal or Medical Equipment Waste policy that would benefit not only the waste in BME but the country as well.

2. Procurement Plan and Pacific Biomedical Network

The procurement of medical equipment is important for the BME to have a say in. The medical equipment donation policy also needs to be enforced to discern which medical equipment is fit for Samoa. The collaboration between the different Pacific Island countries would add value to this as our environmental conditions and cultures are similar if not exactly the same. BME recommends shared information, knowledge and experience between the PBEN to address this issue and share the benefits.