

Medical Equipment Maintenance Management And Oversight Synthesis Lectures On Biomedical Engineering

WHO and partners have been working towards devising an agenda, an action plan, tools and guidelines to increase access to appropriate medical devices. This document is part of a series of reference documents being developed for use at the country level. The series will include the following subject areas: * policy framework for health technology * medical device regulations * health technology assessment * health technology management * needs assessment of medical devices * medical device procurement * medical equipment donations * medical equipment inventory management * medical equipment maintenance * computerized maintenance management systems * medical device data * medical device nomenclature * medical devices by health-care setting * medical devices by clinical procedures * medical device innovation, research and development. These documents are intended for use by biomedical engineers, health managers, donors, nongovernmental organizations and academic institutions involved in health technology at the district, national, regional or global levels. For organizations with the appropriate resources to implement this tool, CMMS can be very beneficial. It is a highly flexible tool that when properly implemented has the ability to transform the management of medical equipment while also improving the availability and functionality of the technology required to prevent, diagnose and treat illness.

WHO and partners have been working towards devising an agenda, an action plan, tools and guidelines to increase access to appropriate medical devices. This document is part of a series of reference documents being developed for use at the country level. The series will include the following subject areas: . policy framework for health technology . medical device regulations . health technology assessment . health technology management . needs assessment of medical devices . medical device procurement . medical equipment donations * medical equipment inventory management * medical equipment maintenance * computerized maintenance management systems * medical device data * medical device nomenclature * medical devices by health-care setting * medical devices by clinical procedures * medical device innovation, research and development. These documents are intended for use by biomedical engineers, health managers, donors, nongovernmental organizations and academic institutions involved in health technology at the district, national, regional or global levels. Once established, the inventory serves as the foundation for moving forward within the HTM system and ensuring safe and effective medical equipment. The inventory may be used to develop budgets for capital purchases, maintenance and running costs: to build and support an effective clinical engineering department, by allowing for workshop planning, hiring and training of technical support staff, and establishing and maintaining service contracts: to support an effective medical equipment management program, such as planning preventive maintenance activities and tracking work orders; and to plan the stock of spare parts and consumables. The inventory may also be used to support equipment needs assessment within the health-care facility and to record the purchase, receipt, retirement and discarding of equipment. Facility risk analysis and mitigation, and emergency and disaster planning, are also supported by an inventory. In addition to being essential for safe and effective patient care, medical equipment also has significant impact on the income and, thus, vitality of healthcare organizations. For this reason, its maintenance and management requires careful supervision by healthcare administrators, many of whom may not have the technical background to understand all of the relevant factors. This book presents the basic elements of medical equipment maintenance and management required of healthcare leaders responsible for managing or overseeing this function. It will enable these individuals to understand their professional responsibilities, as well as what they should expect from their supervised staff and how to measure and benchmark staff performance against equivalent performance levels at similar organizations. The book opens with a foundational summary of the laws, regulations, codes, and standards that are applicable to the maintenance and management of medical equipment in healthcare organizations. Next, the core functions of the team responsible for maintenance and management are described in sufficient detail for managers and overseers. Then the methods and measures for determining the effectiveness and efficiency of equipment maintenance and management are presented to allow performance management and benchmarking comparisons. The challenges and opportunities of managing healthcare organizations of different sizes, acuity levels, and geographical locations are discussed. Extensive bibliographic sources and material for further study are provided to assist students and healthcare leaders interested in acquiring more detailed knowledge. Table of Contents: Introduction / Regulatory Framework / Core Functions of Medical Equipment Maintenance and Management / CE Department Management / Performance Management / Discussion and Conclusions

Maintenance Management for Medical Equipment

Managing Medical Devices within a Regulatory Framework

Computerized Maintenance Management System

Reliability and Maintenance of Medical Devices

World Congress on Medical Physics and Biomedical Engineering 2018

Thoroughly covers the management of medical instrumentation systems with a strong emphasis placed on safety. Coverage includes data communications within hospitals and mobile emergency units, including ambulances and other medical squads. Contains a wealth of practical, how-to advice including and selecting the best desktop computer for biomedical systems, repair methods for water damaged medical equipment, determining what test equipment tools are needed, choosing the right solid-state replacement components, and many others. Provides a vitally important section on preventative maintenance and proper program design. This handy reference is ideal for the clinical technician.

This book gathers the joint proceedings of the VIII Latin American Conference on Biomedical Engineering (CLAIB 2019) and the XLII National Conference on Biomedical Engineering (CNIB 2019). It reports on the latest findings and technological outcomes in the biomedical engineering field. Topics include: biomedical signal and image processing; biosensors, bioinstrumentation and micro-nanotechnologies; biomaterials and tissue engineering. Advances in biomechanics, biorobotics, neurorehabilitation, medical physics and clinical engineering are also discussed. A special emphasis is given to practice-oriented research and to the implementation of new technologies in clinical settings. The book provides academics and professionals with extensive knowledge on and a timely snapshot of cutting-edge research and developments in the field of biomedical engineering.

Key to expect when Managing Medical Equipment and Healthcare Technology in Your Organization As medical technology in clinical care becomes more complex, clinical professionals and support staff must know how to keep patients safe and equipment working in the clinical environment. Accessible to all healthcare professionals and managers, Medical Equipment Management presents an integrated approach to managing medical equipment in healthcare organizations. The book explains the underlying principles and requirements and raises awareness of what needs to be done and what questions to ask. It also provides practical advice and refers readers to appropriate legislation and guidelines. Starting from the medical equipment lifecycle, the book takes a risk-based approach to improving the way in which medical devices are acquired and managed in a clinical context. Drawing on their extensive managerial and teaching experiences, the authors explain how organizational structures and policies are set up, how funding is allocated, how people and equipment are supported, and what to do when things go wrong.

Maintenance Management Procedures for Medical Equipment

Contracting in medical equipment maintenance services: An empirical investigation

Clinical Engineering Handbook

Electronic Healthcare

Contracting in Medical Equipment Maintenance Services

Background papers 1 to 9 published as technical documents. Available in separate records from WHO/HSS/EHT/DIM/10.1 to WHO/HSS/EHT/DIM/10.9

For decades, reliability engineering techniques have been successfully applied in many industries to improve the performance of equipment maintenance management. Numerous inspection and optimization models are developed and widely used to achieve maintenance excellence, i.e. the balance of performance, risk, resources and cost to reach to an optimal solution. However, the application of all these techniques and models to medical devices is new. Hospitals, due to possessing a large number of difference devices, can benefit significantly if the optimization techniques are used properly in the equipment management processes. Most research in the area of reliability engineering for medical equipment mainly considers the devices in their design or manufacturing stage and suggests some techniques to improve the reliability. To this point, best maintenance strategies for medical equipment in their operating context have not been considered. We aim to address this gap and propose methods to improve current maintenance strategies in the healthcare industry.

This volume presents the contributions of the 6th International Conference on Advancements of Medicine and Health Care through Technology - MedITech 2018, held between 17 - 20 October 2018 in Cluj-Napoca, Romania. The papers of this Proceedings volume present new developments in : - Health Care Technology - Medical Devices, Measurement and Instrumentation - Medical Imaging, Image and Signal Processing - Modeling and Simulation - Molecular Bioengineering - Biomechanics

Operating Guide for Medical Equipment Maintenance

Biomedical Equipment Maintenance and Repair Naval Regional Medical Center, Camp Pendleton, California

Proceedings of CLAIB-CNIB 2019, October 2-5, 2019, Cancún, México

International Conference on Advancements of Medicine and Health Care through Technology; 12th - 15th October 2016, Cluj-Napoca, Romania

Procurement Process Resource Guide

Global competition has caused fundamental changes in the competitive environment of the manufacturing and service industries. Firms should develop strategic objectives that, upon achievement, result in a competitive advantage in the market place. The forces of globalization on one hand and rapidly growing marketing opportunities overseas, especially in emerging economies on the other, have led to the expansion of operations on a global scale. The book aims to cover the main topics characterizing operations management including both strategic issues and practical applications. A global environmental business including both manufacturing and services is analyzed. The book contains original research and application chapters from different perspectives. It is enriched through the analyses of case studies.

It is my great pleasure to introduce this special issue of LNSV comprising the sci- tific publications presented at ehealth 2009: The second Congress on Electronic Healthcare for the 21st Century, which took place in Istanbul, Turkey during September 23–25, 2009. Building on the first ehealth 2008 congress held in London, UK, the key topic of ehealth 2009 was investigating a realistic potential of the Internet in providing e- dence-based healthcare information and education to patients and global users. The proudly defined aim of ehealth 2009 — bringing together the three medical sectors: academia, industry and global healthcare institutions — was met and made the c- gress a truly unique event. The formal and informal discussions among the conference participants led to numerous stimuli for new collaborations. We accepted 26 full and 10 short technical presentations by speakers from all over the world, having received over 80 submissions. In addition to two keynotes, the commercial angle was provided by invited industrial speakers representing a wide range of healthcare IT companies including Corinne Marsolier of Cisco, Glenn Kenneth Bruun (CSAM Health), Luis Falcón (Thymbra) and Johan Muskens (Philips Research Europe), as well as international healthcare organizations such as Med-e-Tel represented by the international coordinator Frederic Lievens.

For decades, reliability engineering techniques have been successfully applied in many industries to improve the performance of equipment maintenance management. Numerous inspection and optimization models are developed and widely used to achieve maintenance excellence, i.e. the balance of performance, risk, resources and cost to reach to an optimal solution. However, the application of all these techniques and models to medical devices is new. Hospitals, due to possessing a large number of difference devices, can benefit significantly if the optimization techniques are used properly in the equipment management processes. Most research in the area of reliability engineering for medical equipment mainly considers the devices in their design or manufacturing stage and suggests some techniques to improve the reliability. To this point, best maintenance strategies for medical equipment in their operating context have not been considered. We aim to address this gap and propose methods to improve current maintenance strategies in the healthcare industry. More specifically, we first identify or propose the criteria which are important to assess the criticality of medical devices, and propose a model for the prioritization of medical equipment for maintenance decisions. The model is a novel application of multi-criteria decision making methodology to prioritize medical devices in a hospital according to their criticality. The devices with high level of criticality should be included in the hospital's maintenance management program. Then, we propose a method to statistically analyze maintenance data for complex medical devices with censoring and missing information. We present a classification of failure types and establish policies for analyzing data at different levels of the device. Moreover, a new method for trend analysis of censored failure data is proposed. A novel feature of this work is that it considers dependent failure histories which are censored by inspection intervals. Trend analysis of this type of data has not been discussed in the literature. Finally, we introduce some assumptions based on the results of the analysis, and develop several new models to find the optimal inspection interval for a system subject to hard and soft failures.

Hard failures are instantaneously revealed and fixed. Soft failures are only rectified at inspections. They do not halt the system, although they reduce its performance or productivity. The models are constructed for two main cases with the assumption of periodic inspections, and periodic and opportunistic inspections, respectively. All numerical examples and case studies presented in the dissertation are adapted from the maintenance data received from a Canadian hospital.

Medical Equipment Maintenance - Programme Overview

6th International Conference on Advancements of Medicine and Health Care through Technology; 17–20 October 2018, Cluj-Napoca, Romania

Package WHO Medical Device Technical Series

Research Priorities for U.S. Manufacturing

June 3-8, 2018, Prague, Czech Republic (Vol.1)

Managing Medical Devices within a Regulatory Framework helps administrators, designers, manufacturers, clinical engineers, and biomedical support staff to navigate worldwide regulation, carefully consider the parameters for medical equipment patient safety, anticipate problems with equipment, and efficiently manage medical device acquisition budgets throughout the total product life cycle. This contributed book contains perspectives from industry professionals and academics providing a comprehensive look at health technology management (HTM) best practices for medical records management, interoperability between and among devices outside of healthcare, and the dynamics of implementation of new devices. Various chapters advise on how to achieve patient confidentiality compliance for medical devices and their software, discuss legal issues surrounding device use in the hospital environment of care, the impact of device failures on patient safety, methods to advance skillsets for HTM professionals, and resources to assess digital technology. The authors bring forth relevant challenges and demonstrate how management can foster increased clinical and non-clinical collaboration to enhance patient outcomes and the bottom line by translating the regulatory impact on operational requirements. Covers compliance with FDA and CE regulations, plus EU directives for service and maintenance of medical devices Provides operational and clinical practice recommendations in regard to regulatory changes for risk management Discusses best practices for equipment procurement and maintenance Provides guidance on dealing with the challenge of medical records management and compliance with patient confidentiality using information from medical devices

Recent growth in the field of biomedical equipment technology has been rapid, producing a proliferation of increasingly complex medical devices. In order to assure continuous, efficient, and accurate utilization of equipment, a comprehensive, well designed maintenance and repair program is mandatory. Many facilities use service contracts to assist indigenous biomedical staffs in maintaining their equipment. This study attempts to determine the optimal method for a cost effective management system to be used in deciding whether individual medical equipment items are to be contracted out for maintenance and repair, or serviced by in house Biomedical Equipment Technicians. The cost effective model was developed specifically for the NRMCM at Camp Pendleton, but nothing would preclude its use at other Navy hospitals. Keywords: Health care facilities, Biomedical equipment maintenance, Preventive management. (sdw/kt).

Clinical Engineering Handbook, Second Edition, covers modern clinical engineering topics, giving experienced professionals the necessary skills and knowledge for this fast-evolving field. Featuring insights from leading international experts, this book presents traditional practices, such as healthcare technology management, medical device service, and technology application. In addition, readers will find valuable information on the newest research and groundbreaking developments in clinical engineering, such as health technology assessment, disaster preparedness, decision support systems, mobile medicine, and prospects and guidelines on the future of clinical engineering. As the biomedical engineering field expands throughout the world, clinical engineers play an increasingly important role as translators between the medical, engineering and business professions. In addition, they influence procedures and policies at research facilities, universities, and in private and government agencies. This book explores their current and continuing reach and its importance. Presents a definitive, comprehensive, and up-to-date resource on clinical engineering Written by worldwide experts with ties to IFMBE, IUPESM, Global CE Advisory Board, IEEE, ACCCE, and more Includes coverage of new topics, such as Health Technology Assessment (HTA), Decision Support Systems (DSS), Mobile Apps, Success Stories in Clinical Engineering, and Human Factors Engineering

Management and Oversight

Medical Devices

MEDITECH 2018

Biomedical Equipment Repairer

Medical and Dental Expenses

Advancements in medical and healthcare technologies pave the way to improving treatments and diagnoses while also streamlining processes to ensure the highest quality care is given to patients. In the last few decades, revolutionary technology has radically progressed the healthcare industry by increasing life expectancy and reducing human error. Advanced Methodologies and Technologies in Medicine and Healthcare provides emerging research on bioinformatics, medical ethics, and clinical science in modern applications and settings. While highlighting the challenges medical practitioners and healthcare professionals face when treating patients and striving to optimize their processes, the book shows how revolutionary technologies and methods are vastly improving how healthcare is implemented globally. This book is an important resource for medical researchers, healthcare administrators, doctors, nurses, biomedical engineers, and students looking for comprehensive research on the advancements in healthcare technologies.

This book (vol. 1) presents the proceedings of the IUPESM World Congress on Biomedical Engineering and Medical Physics, a triennially organized joint meeting of medical physicists, biomedical engineers and adjoining health care professionals. Besides the purely scientific and technological topics, the 2018 Congress will also focus on other aspects of professional involvement in health care, such as education and training, accreditation and certification, health technology assessment and patient safety. The IUPESM meeting is an important forum for medical physicists and biomedical engineers in medicine and healthcare learn and share knowledge, and discuss the latest research outcomes and technological advancements as well as new ideas in both medical physics and biomedical engineering field.

Equipment manufacturers offer different types of maintenance service plans (MSPs) that delineate payment structures between equipment operators and maintenance service providers. These MSPs allocate risks differently and thus induce different kinds of incentives. A fundamental question, therefore, is how such structures impact service performance and the service chain value. We answer empirically this question. Our study is based on a unique panel data covering the sales and service records of over 700 diagnostic medical body scanners. By exploiting the presence of a standard warranty period, we overcome the key challenge of isolating the incentive effects of MSPs on service performance from the confounding effects of adverse selection. We found that moving an operator from a basic pay-per-service plan to a fixed-fee full-protection plan leads to both a reduction in reliability and an increase in service costs. We further show that the increase in cost is driven by both the operator and the service provider. Our results point to the presence of losses in service chain value in the maintenance of medical equipment. This provides the first evidence that a basic pay-per-service plan, where the risk of equipment failure is borne by the operator, can actually improve performance and costs.

The Competitive Edge

Maintenance Management for Medical Equipment (book

Use, Maintenance, and Management

Second International ICST Conference, eHealth 2009, Istanbul, Turkey, September 23-25, 2009, Revised Selected Papers

Medical Equipment Used to Support Operations in Southwest Asia

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WHO and partners have been working towards devising an agenda, an action plan, tools and guidelines to increase access to appropriate medical devices. This document is part of a series of reference documents being developed for use at the country level. The series will include the following subject areas: * policy framework for health technology * medical device regulations * health technology assessment * health technology management * needs assessment of medical devices * medical device procurement * medical equipment donations * medical equipment inventory management * medical equipment maintenance * computerized maintenance management systems * medical device data * medical device nomenclature * medical devices by health-care setting * medical devices by clinical procedures * medical device innovation, research and development. These documents are intended for use by biomedical engineers, health managers, donors, nongovernmental organizations and academic institutions involved in health technology at the district, national, regional or global levels. An effective medical equipment maintenance program consists of adequate planning, management and implementation. Planning considers the financial, physical and human resources required to adequately implement the maintenance activities. Once the program has been defined, financial, personnel and operational aspects are continually examined and managed to ensure the program continues uninterrupted and improves as necessary. Ultimately, proper implementation of the program is key to ensuring optimal equipment functionality.

A practical guide to the maintenance and repair of essential laboratory and hospital equipment. Intended for use in institutions that do not have specially trained technicians or engineers the book responds to the situation frequently seen in developing countries where much of the equipment is imported and adequate information on maintenance and repair is rarely provided by suppliers. With these special needs in mind the manual aims to help staff using specific types of equipment to understand basic principles of construction and operation adopt good working practices avoid common errors perform routine maintenance and spot the early signs of defects or deterioration. Advice on equipment repair concentrates on common causes of problems that can be solved without expertise in engineering. Throughout the manual line drawings illustrate features of construction and design while numerous checklists offer advice on periodic inspection and cleaning good working practices and the essential do's don'ts must's and never's of routine operation and maintenance. Information ranges from the steps to follow when recharging batteries through advice on how to protect microscopes in hot climates to instructions for changing a blown fuse in an ultrasound scanner. Basic safety procedures for protecting staff as well as patients are also described. The most extensive chapter covers the maintenance and repair of basic laboratory equipment moving from autoclaves and incubators to cell counters and systems for water purification. The remaining chapters describe the correct use maintenance and repair of diagnostic equipment anaesthetic and resuscitation equipment operating room equipment and ultrasound and X-ray diagnostic equipment.

Medical Equipment Management.

Operations Management

Managing the Mismatch : an Outcome of the Priority Medical Devices Project

Maintenance and Repair of Laboratory, Diagnostic Imaging, and Hospital Equipment

An Outcomes-Based Method of Keeping Medical Equipment Safe and Reliable

Author Joseph Dyrn has been awarded the Association for the Advancement of Medical Instrumentation (AAMI) Clinical/Biomedical Engineering Achievement Award which recognizes individual excellence and achievement in the clinical engineering and biomedical engineering fields. He has also been awarded the American College of Clinical Engineering 2005 Tom O'Dea Advocacy Award. As the biomedical engineering field expands throughout the world, clinical engineers play an evermore important role as the translator between the worlds of the medical, engineering, and business professionals. They influence procedure and policy at research facilities, universities and private and government agencies including the Food and Drug Administration and the World Health Organization. Clinical Engineers were key players in calming the hysteria over electrical safety in the 1970's and Y2K at the turn of the century and continue to work for medical safety. This title brings together all the important aspects of Clinical Engineering. It provides the reader with prospects for the future of clinical engineering as well as guidelines and standards for best practice around the world. * Clinical Engineers are the safety and quality facilitators in all medical facilities.

Instead of blindly following manufacturers' maintenance recommendations, Clinical Engineering (CE), also known as Health Technology Management (HTM), professionals can use a method similar to Evidence-Based Medicine to keep medical equipment safe and reliable while using judiciously their limited resources. Evidence-Based Maintenance (EBM) analyzes the causes of equipment failures and uses these results to continually improve maintenance. EBM is particularly suited for those who want to take advantage of the Alternate Equipment Management (AEM) program allowed by the Centers for Medicare & Medicaid Services (CMS) because it allows comparison of different maintenance strategies and provides concrete evidence to prove the safety and effectiveness of the AEM program adopted.

To maintain competitiveness in the emerging global economy, U.S. manufacturing must rise to new standards of product quality, responsiveness to customers, and process flexibility. This volume presents a concise and well-organized analysis of new research directions to achieve these goals. Five critical areas receive in-depth analysis of present practices, needed improvement, and research priorities: Advanced engineered materials that offer the prospect of better life-cycle performance and other gains. Equipment reliability and maintenance practices for better returns on capital investment. Rapid product realization techniques to speed delivery to the marketplace. Intelligent manufacturing control for improved reliability and greater precision. Building a workforce with the multidisciplinary skills needed for competitiveness. This sound and accessible analysis will be useful to manufacturing engineers and researchers, business executives, and economic and policy analysts.

Biomedical Equipment

MEDITECH 2016

A Review of the Organisation and Management of Medical Equipment Maintenance Services

An Empirical Investigation

Evidence-Based Maintenance of Medical Equipment

This volume presents the contributions of the fifth International Conference on Advancements of Medicine and Health Care through Technology (Meditech 2016), held in in Cluj-Napoca, Romania. The papers of this Proceedings volume present new developments in - Health Care Technology, - Medical Devices, Measurement and Instrumentation, - Medical Imaging, Image and Signal Processing, - Modeling and Simulation, - Molecular Bioengineering, - Biomechanics.

Introduction to Medical Equipment Inventory Management

Emerging Trend in the Digital Era

Medical Equipment Maintenance

VIII Latin American Conference on Biomedical Engineering and XLII National Conference on Biomedical Engineering

Advanced Methodologies and Technologies in Medicine and Healthcare