

ENGINEERING A BETTER HEALTH CARE SYSTEM IN LEBANON

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The rise of medical technology during the past years has led to an increase in competition between hospitals in the developing world. However before a hospital determines its rank among competitors and considers itself as its reference group for self reflection, cost and technical analysis of medical equipments and supplies must be well planned and calculated to the best interest of the hospital who's foremost interest is the patient.

The question is how are things done in Lebanon and who is the authority in a hospital in such matters? Managerial decisions are decided by hospital managers. These hospital managers, who often are doctors or in some cases MBA holders, even the bodies who managers consult with such as the purchasing, biomedical maintenance, and quality management departments which in most occasions are non professionals in such circumstances. Consultation might extend to include a specialized doctor such as a radiologist. I give the case of which a CT-scan is to be purchased. Sure a radiologist is expected to give her opinion if an image is of high resolution or not; however as aforementioned, before radiologists or any other specialized doctor is a specialist in determining which CT-scan is best to be purchased by the hospital. This is quite a daunting task when one considers the vast amount of CTs available on the market.

In order to ensure cost effective strategies when it comes to medical equipments and supplies, money is like falling leaves in autumn due to unsystematic purchasing methods. The typical NSSF and MH payments in Lebanon are relentlessly delayed. Even patients have credit notices from the hospital so hospitals find themselves strangled at

the end of the month. What is even more daunting is that employee payments could extend and this would simultaneously result dissatisfaction among the staff, thus productivity pulls downward and health services in a hospital might have critical effects on patients. This is where most hospitals may lose their credibility.

In addition to being cost effective, hospitals are expected to deliver optimum safety precautions in regard to patients, and medical equipment users through providing efficient clinical support that ranges from inspecting, installing, and repairing medical technology.

Clinical Engineers ensure that show is always running behind the scenes. The American College of Clinical Engineering emphasizes both patient care and management by defining a clinical engineer as "a professional who supports and advances patient care by applying engineering and management skills to health care technology. Clinical Engineering Departments are also responsible to purchase, maintain, and repair medical devices and technology.

ROLES OF CLINICAL ENGINEERING DEPARTMENTS: (1)

- **Strategic planning:** As new scientific advances in health care are to be considered for incorporation in the clinical services of a hospital, key elements in the planning process must involve (1) performing an audit of existing technologies, (2) conducting a technology assessment for new and emerging technologies to be acquired, (3) planning for replacement and selection of new technologies, and (4) developing processes to implement equipment acquisition and utilization.

- **Technology management:** Technology management ensures the best interests of the patient, the medical operators, and the hospital. It is to ensure that cost-effective, effective, appropriate, and safe equipment is available at the hospital. The management function includes in-house routine inspection, preventive and corrective maintenance and safety considerations in reducing technology related patient and staff incidents, as well as more advanced man-

agement functions such as benefit analysis, reliability, risk-management techniques, and sustainability.

- **Standards and regulatory activity:** Health care is competitive, thus it will remain to be regulated by accrediting bodies to ensure hospitals deliver effective, safe, and sustainable services. Accrediting bodies affect the hospital explicitly or implicitly. International standards and regulations have to be part of the Quality and risk management of the technology management in a hospital.

- **Educational services:** The Clinical engineering department should provide (1) Prime responsibility for making provisions for training and education associated with technology and instrumentation used in the hospital, (2) Education of clinical engineering staff, (3) Education of health care facility staff (nursing, medical, and paramedical staff), finally the objective is to provide to all medical equipment users with the understanding and knowledge necessary for the proper use of all the equipments.

TESTIMONIES OF CLINICAL ENGINEERING DEPARTMENT'S ACHIEVEMENTS:

Controlling Costs

In many hospitals, clinical engineering has reduced costs significantly while improving equipment management processes. The following brief examples show cost reductions accomplished by clinical engineering departments.

- Minnesota, USA: The clinical engineering department at a 700-bed hospital in Minnesota took over maintenance of all surgical tables within the organization, resulting in a net savings of more than \$60,000, even after funding one additional technician, spare parts, and specialty training. Prior to this undertaking, the facility spent more than \$138,000 on multiple service contracts covering tables sold by various vendors.(2)

- McLaren Health Care in MI: the clinical engineering department saved \$10.7 million over five years by reducing and renegotiating service contracts, hiring specialized labor, and instituting a cost awareness program to urge staff to take better care of equipment.(2)

- Kingdom of Saudi Arabia's National Guard Health Affairs: NGHHA noted the Clinical engineering department reported as achievements that the Clinical Engineering reduces the service without affecting service quality by means of: Decreasing the number of full service contracts, and decreasing the level of spare parts stocks by Initiating Spare Parts on Demands Contracts.(3)

IMPROVING PATIENT OUTCOMES

Clinical engineers have made contributions to patient safety and incident investigation. According to the American College of Clinical Engineering Clinical engineers are essential members of multidisciplinary hospital teams investigating incidents in which a medical device may have contributed to injury or death. The clinical engineering perspective can be instrumental in identifying root causes and solutions. (4)

- Hartford Hospital, CT: The clinical engineering department reduced patient falls by 35% after implementing the recommendations of a multidisciplinary patient safety action group.(5)

- Brigham and Women's Hospital, MA: Clinical engineering designed, planned, and installed all clinical technology in a new facility, maximizing patient safety, clinical workflow, and ease of use.(5)

The world of health care is not what it used to be. Hospitals nowadays find themselves in a race against the accelerating pace in scientific development in order to achieve optimum health care services at most desirable cost efficiency. The utmost way to achieve satisfactory results is through an active and enabled clinical engineering department that is required to play a vital role in hospitals. These roles range from improving patient outcomes, controlling costs, reducing risks, and providing critical training and support to physicians, nurses, and other clinicians.

Hospitals now should decide on the best course to engineer their future in this new world of competition in order to provide the best options for their patients. In the end, that is what health care professionals signed up for.

References

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