CLINICAL ENGINEERING/HTM IN CANADA

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ABSTRACT

The role of Clinical Engineering, Biomedical Engineering Technologists or Health Technology Managers continues to evolve in Canada. The traditional roles in the field continue to be prevalent, however, there is a move towards more value added roles in health care that have resulted in more cost efficient management of medical technology. CE/HTM personnel are more closely involved in the Capital planning for the whole hospital with a more holistic view (hospital wide) rather than a departmental view. Five year capital plans are being developed to assess the capital investment the institutions need to make to replace technology in a more effective manner. CE/HTM personnel have developed closer collaborations with procurement and legal departments to ensure the prompt acquisition of technology, best value for money while at the same time with the right protections for the institutions. Cost reductions in health care funding have prompted the development of Provincial Health Boards. These boards are streamlining processes in the hospitals that have created provincial CE/HTM services in at least five provinces in Canada. The paper will provide an overview of the new roles CE/HTM personnel are playing in the health care area. Improved collaborations with IT/IS are also described. From the educational point of view, Canadian Colleges and Universities continue to see CE/HTM as a field in demand which has prompted the opening of a new college program and a brand new Bachelor degree in Health Care Technology Management.

INTRODUCTION

The role of Clinical Engineers or Health Technology Managers continues to evolve over the past few years. While the traditional roles of the repair and maintenance of the electro-medical equipment continues to be a strong activity, there are other roles that are becoming more prevalent. In a Health Care environment where government provides most of the funding for the hospital, there have been continuous budget reductions that require better Capital Planning and forecasting. CE/HTM are playing a major role in leading the Capital Planning for their institutions. Hospitals are adopting more coordinated efforts in acquiring technologies that best meet the Institution’s goals and objectives. Another aspect of the Capital Planning process is the development of Tendering documents. Provincial governments have instituted more stringent rules for capital acquisitions for procurements that are over a $100,000. CE/HTM professionals are working very close with Procurement specialists to write Requests for Proposals. Once the responses are evaluated a company is selected, CE/HTM personnel contribute to the development of the contract documents that will see the ultimate acquisition of the technology. Part of the contract is the review of the Service Level Agreement (SLA) that the institution expects once the technology is installed and operational.

REGIONALIZATION

The need to provide the best health care while at the same time reduce costs, has prompted the Provinces in Canada to Centralize services. The Ministries of health across the various Provinces in Canada have been creating large provincial health boards to control and distribute the health care funding. This regionalization of health boards has created the need to regionalize Clinical Engineering/HTM departments. The CE/HTM departments in the various hospitals have been merged into large Provincial CE/HTM departments. Five out of the ten Canadian Provinces, have created Provincial CE/HTM departments. While no CE/HTM personnel has lost their job, there has been the need to re-organize the departments as there is only the need for one Director of the service.

Provinces where they have not established large Provincial Health Boards, there has been some merging of hospital boards to better control costs. In Ontario for example, the Ministry of Health has established 14 Local Health Integration Network (LHIN). Each LHIN has control of the funding for Hospitals, Community Health Centres, Long-term Care Homes, Mental health and addiction agencies, Community support service agencies; and Community Care Access Centres. The LHIN has then established the need to merge some hospitals, with the concomitant merge of the CE/HTM departments. The merge of the CE/HTM departments has been positive as some smaller hospitals have benefited from having the service from a larger CE/HTM department. In addition, the merge of the CE/HTM departments has benefited the CE/HTM personnel as there is a “larger” pool of resources within the department
that has allowed them to take on more services and expand their knowledge and areas of control.

The merging of CE/HTM department whether through a provincial department or a local department has also created the need to have a consistent Computerized Maintenance Management System (CMMS) for the department. There has been a move to standardize their CMMS which has also assisted in standardizing technologists’ data entry for better analysis of equipment failures. CE/HTM Departments have also been reviewing PM completion rates on equipment and determining whether changes are needed in the PM program to be more cost efficient while at the same time ensure equipment safety.

PATIENT SAFETY

Canadian Health Care Institutions are more aware of the need to increase their vigilance to reduce patient harm while at the hospital. There has been an increase awareness on the role that CE/HTM personnel plays in ensuring patient safety. Hospitals are developing more stringent protocols for following incidents where Medical devices are suspected to be involved. CE/HTM personnel have been very active in conducting investigations when equipment is suspected to be involved.

IT COLLABORATION

Through Regionalization of Health Care or merging of hospitals, as it is in the case in Ontario, CE/HTM reporting structure has also been changing in the past few years. It is now more common to see the CE/HTM department report to the Chief Information Officer (CIO) who in turn reports directly to an Executive VP or the President. The move to the CIO’s portfolio has been seen as a beneficial move, as it promotes closer collaboration with IT departments. With medical equipment using IT technology more readily, it is becoming imperative that CE/HTM personnel work more closely with IT colleagues. It is not uncommon for a medical device to have a computer to manage the acquisition and storage of information. The medical equipment is subsequently networked so that the information could be transferred to an Electronic Health Record (HER). Some CE/HTM departments have opted for hiring a person with more IT/IS knowledge to be the bridge/representative between CE/HTM and the IT/IS department.

The recent developments in Ransomware, has also prompted CE/HTM personnel to work closely with IT/IS Cybersecurity people. The urgent need to ensure that Medical Systems were not vulnerable to the Ransomware encouraged both groups to work together in implementing Windows patches to Medical Systems.

MES IN CANADA

Managed Equipment Services is a service that large corporations are offering to Health Care institutions to assist them in the management of the medical technology in a holistic manner. For a given annual fee, MES service providers offer Health Care facilities the opportunity to have a complete Capital Planning service. Hospitals will have to enter into a long term contract, ten (10) to fifteen (15) years where the MES provider will provide the following services: capital planning, capital replacement, installation, and commissioning, user and technical training, equipment maintenance and repair and asset management. The MES contracts have well delineated Service Level Agreements and they require monthly/semiannual monitoring.

Two or three Ontario Hospitals have signed MES services with some of the major vendors. The hospital has a list of services that can be acquired from the MES provider. The three contracts include Diagnostic Imaging equipment, monitoring equipment along with their service and support. The MES contract includes intermediate and total upgrade of the technology during the contract period. From the service point of view, some of the MES providers are working together with the hospital CE/HTM department and both units have establish close collaboration. It is still too early to know whether this collaboration will prove beneficial for either side.

CE/HTM EDUCATION

CE/HTM education in Canada has continued to be a healthy market for educational Institutions. Enrollment for the Biomedical Engineering Technologist program continues to be at a steady rate. Some of the programs offer a five to six week internship and all students seem to get a placement in Health Care institutions. Some of the College programs also offer Co-Op option, however, this option might not place all their students in a Health Care facility or industry.

In Ontario there has been an increase of one more college that offers a new biomedical engineering technologist program. The program is in its second or third year of existence and seems to get good student enrollment.

From the University level, there are fourteen universities that offer an undergraduate program in Biomedical Engineering. Most of them have been reviewed by the Canadian Engineering Accreditation Board and have received accreditation of their program. It is interesting to note that the biomedical engineering program has a large percentage of female representation in the engineering school, which is a positive move.

A new Honours Bachelor of Health Care Technology Management is going to be offered at one of the local Ontario Colleges this year. “The proposed four-year Health Care Technology Management degree will have all the qualities of
a traditional university honours degree but place greater emphasis on the practical application of theory. The proposed degree in Health Care Technology Management will prepare graduates to work in the healthcare industry and be responsible for planning and managing medical equipment and related technology aspects, including product assessment, vendor management, risk management, resource optimization and project management. In addition, the graduates will also be able to supervise the activities of other health care professionals, such as medical device equipment specialists, and liaise with clinicians on safe, effective and optimal equipment planning and use.”

It is going to be interesting to see the response from prospective students and the type of HTM person who graduates from the program.

As can be seen, from the educational point of view, it seems that Colleges and Universities feel that the Biomedical Engineering, CE/HTM field are great sources of students and future graduates.

**CE/HTM CERTIFICATION AND PEER REVIEW OF CE DEPARTMENTS**

The Canadian Medical and Biological Engineering Society (CMBES), has developed the Clinical Engineering Standards of Practice. Through the CMBES a committee has been actively promoting the need to have CE/HTM departments peer reviewed. The review will not only help hospitals and their departments to identify areas of improvement, but also will help them in providing documentation during the required Hospital Accreditation through Accreditation Canada. Three to four CE/HTM departments have been Peer Reviewed over the past three years. Two of them are Provincial CE/HTM departments. The other two are one is a large community hospital and the other one is a teaching hospital. The CMBES continues to promote the peer review process as it demonstrates to health care providers that CE/HTM meets a minimum level of performance as indicated by best practices dictated through the Peer Review document.

CE/BME/HTM certification is another area that is being actively promoted in Canada. Registration of Technologists or Engineers is being seen as a requirement for many of the CE/BME/HTM practitioners. Working in a highly regulated environment, it is imperative that CE/BME/HTM personnel be certified. Certification demonstrates to health care colleagues that those registered practitioners meet minimum requirements in the field. This year alone, there were four Canadian CE personnel who wrote and successfully passed the certification exam.

Certification is an area where there is a lot more work to be done in Canada. At the present time, hospitals do not recognize the certification as a requirement for employment. Similarly, hospitals do not provide a difference in salary compensation that could encourage more people to become certified.

**CONCLUSIONS**

Clinical Engineering/ Health Technology Management continues to be very active in Canada. The need to reduce health care costs has caused Ministries of Health to merge hospitals and create larger health boards. This larger health boards have tried to streamline the management of technology by creating provincial or larger CE/HTM departments. These larger CE/HTM departments have continued to provide high quality services. There is a larger role that CE/HTM departments are playing to ensure that the Health Boards/hospitals better manage their technology. Three Institutions in Canada have established long term contracts with MES providers. This is a new form of managing Health Care technology and it is still too early to tell if it will prove beneficial in the Canadian market. CE/HTM departments are working closer with IT professionals to ensure safe deployment of Medical technology in the IT infrastructure. From the educational point of view, Colleges continue to have good enrollment and two new programs have been established, one at the college level and one at the Bachelors level.

**REFERENCES**
