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REGIONAL PRIORITIZATION AND REPLACEMENT OF SURGICAL TABLES

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ABSTRACT

A surgical table audit conducted within the Winnipeg Regional Health Authority (WRHA) revealed one-third of the surgical tables were in need of replacement. Tables within the region requiring replacement were prioritized using a prioritization system developed in-house.

A limited amount of capital was allocated to the initiative with the intention of targeting upwards of twenty-five surgical tables for replacement. The option of purchasing remanufactured tables was researched and analyzed to determine its viability compared to purchasing brand new. Research and analysis took the form of literature reviews, discussion with technicians from various hospital sites, along with a site-visit to a remanufacturing plant specializing in the remanufacturing process of surgical tables. The region concluded that the remanufacturing process was an acceptable and cost-effective option for replacement of the tables.

Next, a regional RFP was developed. The RFP consisted of standard schedules, technical questions on the remanufacturing process along with a modified pricing schedule. The region was interested in obtaining proposals for three different options; (1) restoration of existing in-house tables, (2) purchase of remanufactured tables, and (3) purchase of new tables. The RFP was developed to allow for the region to select each table from option 1, 2 or 3.

Tables were selected according to site-specific needs with efforts focused on maintaining a standardized fleet at each site. A common requirement was the need for higher weight capacity. The strategy, cost effectiveness, and evaluation process used to successfully conduct the regional replacement of surgical tables will be discussed.

INTRODUCTION

In the summer of 2014, surgical tables became a topic of discussion within the Winnipeg Regional Health Authority (WRHA) as they were worn and advancing in age; raising a concern for the Clinical Program. According to ECRI, an average usable life of a surgical table is expected to be approximately 15 years [1]. Approximately 50% of the OR tables currently in use within the region have surpassed the life expectancy stated by ECRI Institute. With the above information in hand, the Clinical Program agreed to prioritize the replacement of the oldest OR tables at each of the seven WRHA facilities. To help explore the feasibility of purchasing remanufactured tables the Clinical Program approached Clinical Engineering for technical assistance.

METHODS AND MATERIALS

For situational analysis a site survey was conducted followed by consultations with stakeholders from each participating facility. The survey consisted of two parts. The first part asked for the manufacturer, model number, serial number, table classification, year of manufacture, and current condition of the table evaluated on a numerical scale. The second part consisted of a series of questions asking about whether site-specific needs are currently being met with the surgical tables at their facility. Additional questions in regards to backup tables, previous experiences with tables and views and thoughts on receiving a remanufactured table were also included.

Following the survey, consultation with stakeholders at each participating site allowed for the documentation of site-specific standards, general workload and the types of surgeries conducted within their facility. Most facilities indicated that they needed more bariatric capabilities. An analysis of the collected data concluded with a prioritization system to rank surgical tables.

During this time, a parallel effort to assess the remanufacturing process was undertaken. Literature reviews were conducted, discussions with repair technicians from various hospital sites and a site-visit to a remanufacturing plant were held. A report on the evaluation of the remanufacturing process was presented to the Clinical Program for their review. Following acceptance of the report, contracting services was engaged to assist in creating a regional request for proposal (RFP) that encompassed all WRHA sites. A summary of the strategic process used to conduct the replacement of surgical tables in the region is shown in Figure 1.

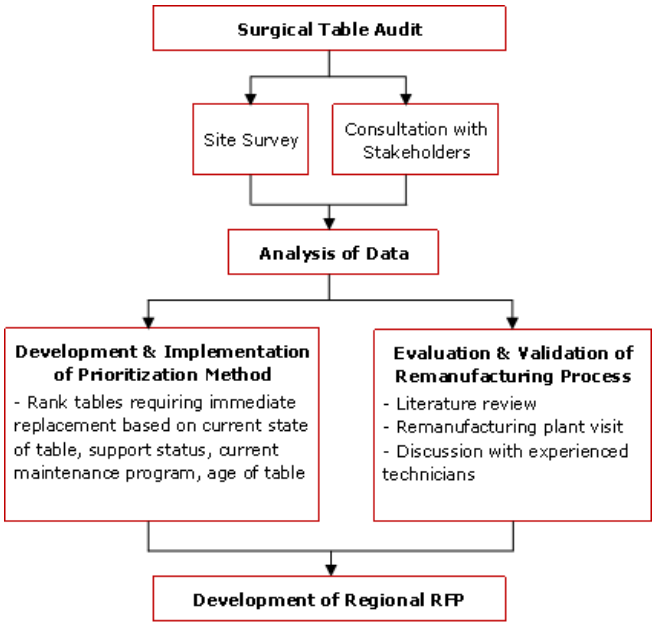

Figure 1: Flow diagram depicting the strategic process to conduct the replacement of surgical tables in the region

Prioritization Method of Rank Surgical Tables

The audit captured all surgical tables from seven participating sites. One-third of the current OR tables within the region were rated as heavy wear and in need of immediate replacement. The prioritization method ranked the twenty five surgical tables most in need of replacement. The tables were prioritized based on four distinct categories; current state of the table, support status, current maintenance program and age of the table.

Evaluating and Validation of the Remanufacturing Process

Multiple sites within Canada and the United States currently have remanufactured tables within their healthcare facilities [2]. Literature reviews and other user reviews were conducted to understand the variation in remanufacturing processes available. Prior to visiting the remanufacturing plant for a presentation and tour of their facility, surgical table operational and service manuals were studied, which allowed for an improved understanding of the components and assemblies present within typical surgical tables. Common electrical and mechanical properties including topics of fracture, corrosions, and cyclic loading based on the nature of the operation of the surgical tables were also discussed with technicians from various hospital sites.

A major distinction between the term 'remanufacturing' and 'refurbished' was stressed through literature search and discussion with the local remanufacturing site. During the remanufacturing process, the surgical table is completely stripped and re-built to satisfy the performance specifications outlined by the original equipment manufacturer unlike the refurbishing process where tables are not completely disassembled and only parts showing wear are replaced.

Under the remanufacturing process, all systems such as hydraulic, electrical and mechanical sub-systems are inspected and tested before re-assembly. In order to continue the rebuild, they must pass inspection. If they do not pass, then they must be replaced. Inspections of assemblies are documented and copies are included with the table at the time of purchase.

The region concluded that the remanufacturing process was an acceptable and cost-effective option for updating tables requiring replacement.

Development of the Regional RFP

The RFP consisted of standard schedules that included warranty and post warranty support, technical training, part listings, infection control, technical questions to define the remanufacturing process along with a pricing schedule.

Using information from the literature search and site visit, technical questions were formulated. Questions developed allowed for the WRHA to understand the vendors overall remanufacturing process, such as whether new, used or a combination of both new and used parts were used during the rebuild. Additional question were included to determine whether the vendor was open to installing new fittings, hoses and circuit boards during the rebuild instead of testing and re-using existing parts.

To ensure clinical requirements for each table could be addressed by this RFP, the contracting department recommended obtaining proposals for three different options; (1) restoration of current tables, (2) purchase of remanufactured tables, and (3) purchase of new tables. The RFP informed vendors of the types of procedures being performed on each table so appropriate remanufactured and new tables could be offered. The RFP responses were graded according to instructions provided within the RFP. A negative scoring system was used, along with documentation indicating the reason for each vendor's subtracted points.

Tables were selected from the vendor offerings in a cost effective manner according to site-specific needs and site standardizations. This ensured consistency in operation and an easier transition to the replacement table for staff members. Bariatric patients have become more prominent in our society as seen in literature as well as in the conducted site survey [3]. Considerations due to the increasing demand for higher weight requirements introduced by the volumes of bariatric patients in today's society were also taken into account.

RESULTS AND FINANCIAL SAVINGS

The purchase of remanufactured tables has proven to be an appealing decision financially. By purchasing or remanufacturing the regions current tables, the WRHA was able to save upwards of 50% on a like for like replacement, averaging between $15,000 to $20,000 in savings per table. If a table was to be upgraded to allow for bariatric or other features such as sliding capabilities, the region saved up to 40% where a trade-in value was included.

Accessories were not included within the cost analysis. The RFP has been developed to allow the sites the freedom to select the accessories throughout the length of the contract when accessories are required. Purchasing brand new tables would have cost the region between $800,000 to $1,000,000 for tables alone. By purchasing remanufactured tables, the region was able to save approximately $300,000 on the replacement of 25 surgical tables. At time of submission, all twenty five tables were either being remanufactured or remanufactured tables were being purchased by trading in the existing table.

DISCUSSION AND CONCLUSIONS

The communication with stakeholders during the entire process has also proven to be a key factor in the success of this replacement process. The benefit of creating a regional RFP was that it enabled the region to have a contract with a selected vendor. It created business for future purchases allowing the region to select accessories for the tables along with further consideration of replacing other surgical tables as required. Another advantage to conducting the replacement as a regional process was it gave the region the freedom to shift tables between sites. Where a table may no longer be suitable at one site, the restored table may be perfectly adequate for another. Financial savings increased as a result of shifting tables between sites.

Another positive to purchasing a remanufactured table was that they came along with a two year's manufacturer warranty, providing longer warranty than a new table would have unless extra warranty packages

were purchased for an increased cost. The remanufacturing process is expected to add at least ten years to the life expectancy of the tables. The tables have been purchased and are in the process of being installed within their respective facilities. Future performance of the purchased tables will be assessed for years to come.

This strategic approach may be useful for other clinical engineering programs who are considering remanufactured medical equipment and looking to validate the remanufacturing process. Although complex, the three bid system allowed the Clinical Program the flexibility to consider multiple options and make the best choice for their patients. This strategic approach can be used as an outline for replacement of other medical equipment with remanufactured equipment for clinical use. It is recommended that a similar process include an audit phase, evaluation of the remanufacturing process, and an in-depth needs assessment prior to developing the RFP.

ACKNOWLEDGMENTS

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REFERENCES

[1] ECRI Institute, *Expected Life of Medical Devices*, 2014 [cited 2014 Jul 24]; Available from: https://members2.ecri.org/Components/BiomedicalbenchMark/Documents/Health%20Care%20System%20Expected%20Life.pdf?pnk=biomedicalbenchmark.

[2] Meditek, *Meditek Remanufactured Surgical Tables*, 2015 [cited 2015 Mar 03]; Available from: http://www.meditek.ca/products-page/remanufacturing/meditek-remanufactured-surgical-tables/.

[3] D. Lautz, W. Jiser, J. Kelly, S. Shikora, S. Partridge, J. Romanelli, R. Cella and J. Ryan, "An update on best practice guidelines for specialized facilities and resources necessary for weight loss surgical programs. - PubMed - NCBI", *Ncbi.nlm.nih.gov*, 2009 [cited 2014 Aug 20]; Available from: http://www.ncbi.nlm.nih.gov/pubmed/19396071.