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# PLANNING FOR REPLACEMENT OF GI ENDOSCOPY EQUIPMENT IN A REGIONAL SETTING

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## ABSTRACT

The management of endoscopy equipment is commonly facilitated under a comprehensive equipment/consumable service contract. This is due to the various inventory management challenges, such as developing a cost effective repair and replacement solution for this high value equipment category. A contract provides an effective mean of maintaining and sustaining a functional inventory. However, a contract can also present challenges at the time of renewal/termination due to the value of the owned equipment and inadequate replacement plans. Analysis of the current status, the impact of changing the vendor, and the implications of different replacement options, is necessary. This paper outlines the results of our investigation into the status of endoscopy equipment in preparation for end of contract. The investigation provides an opportunity to identify areas of improvement and develop a reasonable replacement plan. It also provides a learning opportunity for other Clinical Engineering programs.

## BACKGROUND

Selecting GI endoscopy equipment and the vendor best suited to the clinical user needs can be challenging and requires considerable care [1]. The same care and consideration is required when it comes to equipment service. Equipment service can be provided by in-house personnel, the Original Equipment Manufacturer (OEM), a third party such as an Independent Service Organization (ISO) [2] or a combination of in-house personnel and OEM or ISO. Health facilities may prefer to purchase service contracts if they cannot provide a cost effective service through the in-house staff or when they do not want the responsibility for maintenance or they require budget predictability [3]. There are a number of common misperceptions regarding ISO endoscope services, including safety of their work, quality of repair and components used, and quality of their trained staff, that are not necessarily true [4]. A short survey conducted by ECRI on equipment management shows that majority of the facilities prefer contracting with the OEM for servicing their flexible endoscopes [5]. However, long term service contract with OEM is expensive compared with an in-house provided service [2].

Most vendors of GI endoscopy equipment have come up with a variety of comprehensive sale and service packages, such as exchange program or customized financing solutions [1], to attract business from health facilities. While these solutions facilitate the delivery of clinical services, it is necessary to develop an internal mechanism to manage the inventory.

To operate this equipment category, other requirements and their associated costs, which include consumables for endoscopes, Medical Device Reprocessing (MDR) equipment, MDR equipment consumables, proper adaptors and connectors, associated maintenance, and staff training for both endoscopes and MDR equipment should be considered.

Due to some of the changes with in-house service, as outlined above, a few years ago the Winnipeg Regional Health Authority (WRHA) changed to a cost per procedure based contract through a competitive bid process. This contract expires in a couple of years. To prepare for this, the WRHA needed a thorough understanding of current status of GI endoscopy equipment. There was also need to determine the benefit of extending prospective RFP to other clinical areas using similar equipment category. The impact of this initiative on MDR and GI endoscopy Clinical Information System also needed to be understood. Clinical Engineering performed a situation analysis to develop the evidence necessary to guide the decision making process. This paper presents the results of our study and discusses some preliminary data-driven replacement options.

## METHOD

An environmental scan of endoscopes and ancillary equipment within the WRHA facilities was conducted. The scan involved consultation with site equipment managers, vendors/ manufacturers, MDR staff, and third party service companies. A snap shot of current regional GI endoscopy inventory was acquired which indicates ownership status, age, value and distribution over sites. This information was reconciled with inventory in the hospital data bases where possible. Collected information was analyzed through various statistical parameters to delineate different dimensions regarding distribution status and potential replacement plans.

## DATA ANALYSIS

Collected information from environmental scan was analyzed. Areas of impact and areas for possible improvement were identified. Each of these areas will be discussed in details in the following sections.

## AREAS OF IMPACT

### GI Endoscopy Clinical Information System

Exiting Clinical Information System encompasses isolated computer networks in different sites which are in the process of being transformed into a regional integrated version. These systems in general are neutral to the make and model of the endoscopes in use and therefore, this initiative will not affect the current or future Clinical Information System for GI endoscopy.

### Medical Device Reprocessing

Most of the GI Medical Device Reprocessing equipment is less than 10 years old (Table 1). While the average age is low, their annual usage is relatively high. This equipment is currently on a fee for service agreement. The relative distribution of the equipment across the region indicates that most sites have the same number of machines, as shown in Figure 1. In addition, the region uses similar models.

The replacement and upgrade options for this equipment will be influenced, not only by their condition and usage level, but by the vendor of choice for the endoscopes. Switching over to a different GI endoscopy vendor raises compatibility issues, which may require upgrading all existing adaptors and connectors. The cost will vary with the make of the replacement endoscope.

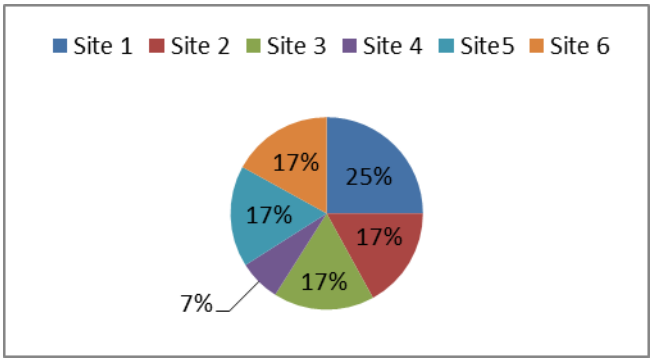


Figure 1: Relative Regional Distribution of MDR Machines

Table 1: Summary of Medical Device Reprocessing Machines Age Status in the Region

| Current Average Age | % Greater than Average Age | % Less than Average Age |
|---|---|---|
| 5.25 Years | 50 | 50 |

Existing Regional GI Inventory

Total value of the GI endoscopy equipment owned at this stage is about 70% of the whole regional GI endoscopy inventory and in two years, this amount may increase. GI endoscopes can be connected to the video processor and light source from the same manufacturer only. In the event of changing the vendor, all GI endoscopy equipment we own will need to be changed. Our analysis found that all endoscopy proprietary equipment (10% of total inventory value) is owned while half of the endoscopes are leased, Table 2. This is one of the key factors to consider in developing the replacement plan. The relative distribution of GI endoscopy equipment across the region indicates that one site has the largest owned equipment inventory (Figure 2).

Due to the complex nature of the existing contract, it is not easy for the sites to recognize if the endoscope or associated proprietary ancillaries are under warranty or not; the same goes for the ownership. Although the vendor has an updated list of this information and they may update financial parties of the program(s) periodically, the complexity of the processes presents challenges for Clinical Engineering, as well, in the management of the inventory. The ancillary equipment, on the other hand, is effectively managed by Clinical Engineering.

Table 2: Summary of Current Regional GI Endoscopy Assets Value

| Asset Value of Endoscopes (%) | | Asset Value of Proprietary Components (%) |
|---|---|---|
| Leased | Owned | Owned |
| 30 | 60 | 10 |

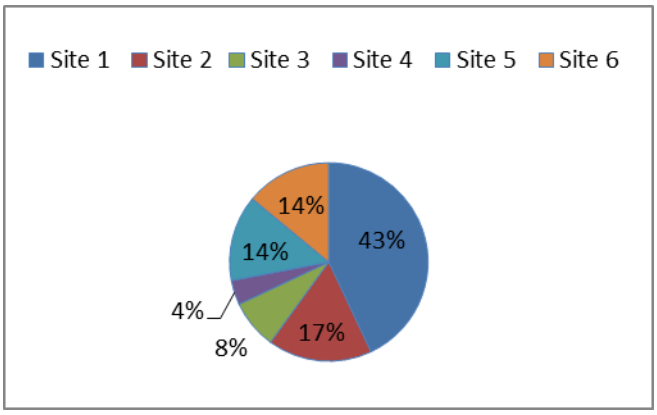


Figure 2: Regional Sites' Owned GI Endoscopy Assets Value (Scopes and Proprietary Equipment)

Other Regional Users of Flexible Endoscopy

Figure 3 delineates existing inventory of the regional non-GI flexible endoscopes. This figure shows that one site has more than 50% of the non-GI endoscopy equipment in the region.

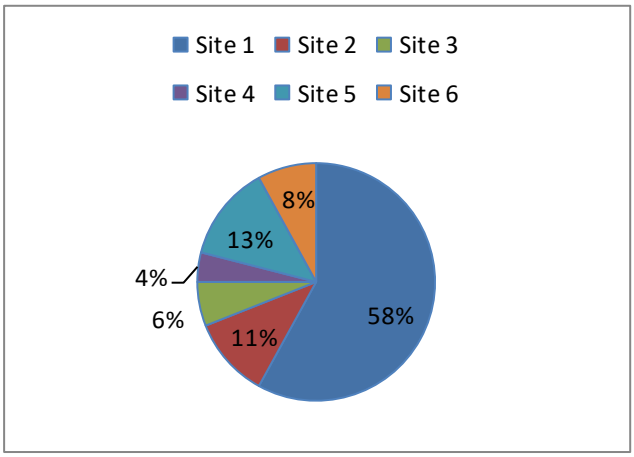


Figure 3: Regional Sites' non-GI Endoscopy Assets Value (Scopes and Proprietary Equipment)

Regional non-GI endoscopy inventory is not standardized. This set of equipment generally is not under any warranty or maintenance program. There are occasions other specialty areas borrow endoscopic equipment from GI endoscopy program. This enhances clinical resilience to equipment failures. Inter-

departmental access to endoscopy equipment also allows service to continue while waiting for the loaners. Regional GI and flexible non-GI endoscopy equipment owned assets are predominantly managed by two major specialties which have approximately 93% of the total inventory (Figure 4). The idea of expanding the scope of the RFP to the non-GI endoscopy areas may be considered.

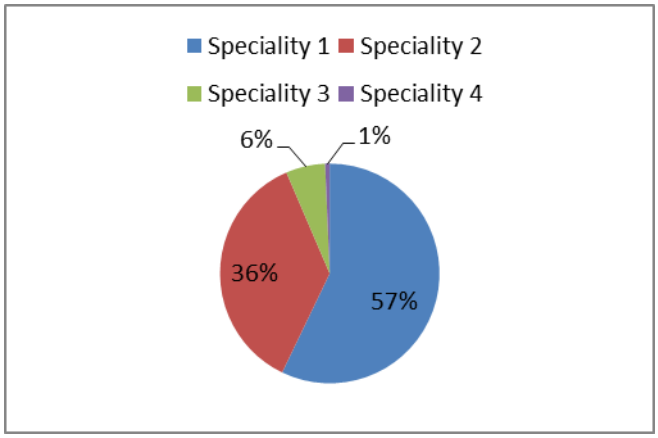


Figure 4: Potential Flexible Endoscopic Assets Contribution for Future Contract Considering Additional Areas

Rigid and Semi-Rigid Endoscopy

Current distribution of rigid and semi-rigid endoscopes across the region is presented in Figure 5. The inventory is concentrated in one specialty area which indicates setting a regional equipment standard for this category is feasible. No regional standard/ contract for this equipment category is in place currently. Rigid and semi-rigid endoscopes are interchangeable between different light sources and image processors using proper adaptors. Therefore, setting a standard for the endoscopes does not warrant replacing ancillary equipment.

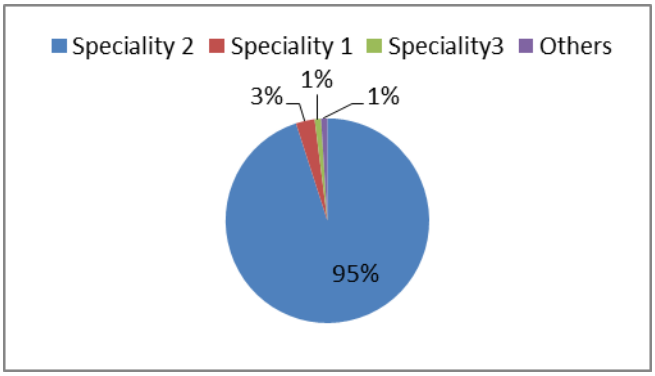


Figure 5: Regional Distribution of Rigid and Semi-Rigid Endoscopes

## REPLACEMENT PLAN

GI endoscopy equipment is generally managed by two specialties among 6 sites. Sites 1, 2, 3 and 6 are managed by one specialty, which constitutes 82% of the owned inventory (Figure 2) and sites 4 and 5 are managed by the other specialty (18%). This suggests the possibility of replacing GI endoscopy equipment by the specialty. This scenario may assist if the available cash value for replacement was limited at the beginning of replacement.

For site distribution, one site owns 43% of the equipment inventory in this category (Figure 2). Considering the fact that the value of owned equipment is 70% (Table 1), it may be difficult to replace the entire inventory in one phase. A multi-year replacement plan (site by site) may be necessary.

Regardless of the replacement plan, MDR equipment upgrade or their replacement should be coordinated with GI endoscopy equipment. Gradual replacement plan may also necessitate maintaining two sets of GI endoscopy contracts simultaneously over the transition phase. Original commitment to the existing vendor needs to be modified accordingly.

## DISCUSSION

The results of the scan provided an important insight into the current endoscopy

equipment status and management practice, as well as the economic, technical, and clinical impact of a possible vendor change.

The Region owns approximately 70% worth of GI endoscopy equipment in the contract. This value of the owned assets has a major economic impact in the event vendor change. Upgrade or replacement of the MDR equipment will also have economic impact.

Technical implications included propriety equipment connections for the flexible endoscopes, which necessitates complete replacement. While the GI endoscopy Clinical Information System is not affected by the replacement plan, upgrading existing MDR equipment or including them in the scopes of this RFP is required.

Clinical implications of the replacement plan include training for clinical GI endoscopy users and MDR staff. Consideration of site-by-site or specialty-by-specialty replacement may also have clinical implications. Therefore, careful consideration of the various dimensions of economic and, technical and clinical factors is necessary. Therefore, further investigation of the appropriate replacement model, taking into account the various factors, is warranted.

## CONCLUSIONS

An environmental scan is an important prerequisite for an evidence-informed replacement plan. This study considered some of the most relevant factors and provided invaluable information for stakeholders to prepare a comprehensive RFP. The study provides a learning opportunity for other CE programs in a similar situation.

## ACKNOWLEDGEMENTS

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