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Background

One of the main drivers of cost for any institution is the expense associated with surgical or procedural equipment. Given current conditions, a cost-efficient operating room environment could significantly impact operating margins that can help sustain an organization. Evidence has shown significant variability in supply use among surgeons, with data showing that higher supply cost is not necessarily associated with improved outcomes. Therefore, increased expenses in complex environments like operating rooms (ORs) in addition to lack of standardization can lead to significant expenses and product waste.

Some organizations have explored the introduction of cost report cards (forms documenting supply utilization and associated costs) delivered to performing providers, thus allowing timely feedback, potential standardization of procedure cards and ultimately decreased costs.

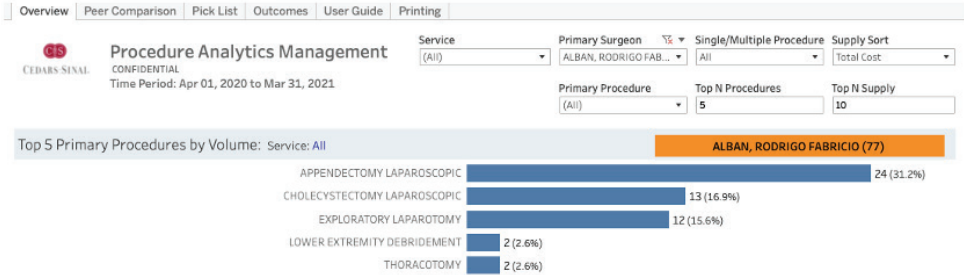
Approach

In order to understand the opportunities for cost savings and improved efficiency in procedure cards, we implemented an electronic health record (EHR) based dashboard to understand the link among logging procedures in the OR and the charge master file provided by the Supply Chain team.

The first step included the development of a dashboard ensuring that two different platforms within Epic communicated with each other effectively and accurately. The Optime platform integrated with our internal EHR and charge cost master was assessed for accuracy with several samples. Once the process was determined, observations with nurses and surgical technologists in the OR were performed to understand how a procedure card was logged onto Epic (Optime) and how implants, instruments and devices utilized were marked as either "open," "open not used" and "available" (not used). Charges were compiled and analyzed for several procedures.

We closely collaborated with our Information Technology (IT) colleagues to develop this data source. We were able to deploy the Procedure Analytics Management dashboard, which has the ability to pull data based on surgeon, most common procedures performed, total cost/case, trends of cost and utilization over time, comparison with other peers for similar procedures, top implants/instruments used in each case and cost related to each of them (see example in Figure 1).

Figure 1



Outcomes

The Procedure Analytics Management dashboard has become a source for assessment and comparison and has given the surgeon the opportunity to customize each procedure card. Emphasis is placed on implants and disposables, as they are linked to higher costs, in order to provide more efficient, standardized and cost-effective care. A comparison chart via formalized letter can be provided to compare each surgeon anonymously (from most expensive to least) and postulate over-time changes.

As a first step, we did a test of change to assess cost-saving opportunities in laparoscopic appendectomies. This was determined by the dashboard initially for all surgeons performing at least five cases/year as shown in Figures 2 & 3.

We noted significant variability among different surgeons in the organization. Surgeon A had significantly higher cost/case for this particular procedure when compared to surgeon Z. In order to standardize practice, a test of change was performed with a smaller group of surgeons with similar practice patterns — e.g., hospital-employed, acute-care surgeons. Similarly, a difference in cost per case was noted from surgeon A to surgeon G (approximately a 35% difference in cost/case).

After communicating these results anonymously and analyzing each surgeon's procedure card, we determined that some disposables/instruments were significantly more expensive than others. Not surprisingly, surgeons were not aware of such differences and immediately were willing to adjust their procedure cards to equivalent and more cost-efficient devices, therefore achieving standardization for this group.

Overall Cost Opportunity as per Dashboard

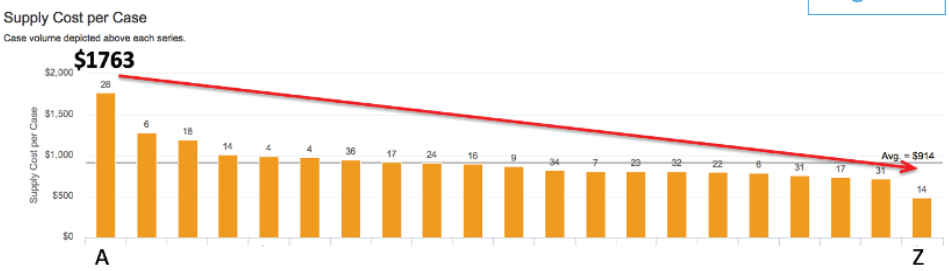
Figure 2

Variance Opportunity

Procedure	Case Volume	Number of Surgeons	Supply Cost per Case	Min - Max Case Cost Range	Variance Opportunity
APPENDECTOMY LAPAROSCOPIC	325	22	$845	$242 - $1,824	$168,303
CHOLECYSTECTOMY LAPAROSCOPIC WITH INTRAOPERATIVE CHOLANGIOGRAM	313	23	$666	$389 - $2,032	$42,536
CHOLECYSTECTOMY LAPAROSCOPIC	152	36	$789	$485 - $2,572	$40,310
EXPLORATORY LAPAROTOMY	43	16	$730	$140 - $1,897	$25,368
INCISIONAL HERNIA REPAIR WITH MESH	26	9	$1,105	$104 - $14,696	$23,140
HEPATIC TUMOR RADIOFREQUENCY ABLATION LAPAROSCOPIC	40	2	$3,608	$2,283 - $7,655	$21,553

Cost Variability per Surgeon

Figure 3



Lessons Learned

Like any other project, close collaboration with others is key. Support from IT and OR management has been instrumental in order to develop this dashboard. Furthermore, while dealing with COVID-19 paused many quality and performance improvement initiatives not only at our institution but worldwide, these difficulties provided future opportunities for further assessment and understanding of the process.

We are currently working on letters to be sent to surgeons including key pieces of information related to findings in the dashboard. The letter would include the top five most common procedures performed by each surgeon, cost/case, trend over time and a list of the most common and most expensive implants/disposables/instruments used, etc.

In addition, each surgeon can see their performance relative to their peers including information on length of stay, readmission and total cost observed.

Next Steps

Our team is working toward achieving the following steps:

- Standardization of procedures carts based on service lines.
- A direct link for surgeons to connect with OR administration to change their carts once they have identified an opportunity for cost reduction.
- Ongoing Supply Chain discussions in order to achieve consolidation of vendors for implants and disposable devices.
- Maintenance of dashboard and data accuracy.