



Can using custom trays reduce instrument repairs?

by Rick Wells, CCSVP

In the game of baseball, you might be surprised to learn that singles and bunts win more games than home runs. While a home run can sometimes win a game, it is important not to overlook the smaller, yet significant steps within budget management, particularly in today's healthcare environment where reimbursement is diminishing and costs are escalating. Yet those who manage budgets often strive for home runs in savings. The truth is, almost twice as many games are won with singles, not home runs.¹ If we can rely on this small gain strategy, we are more likely to be able to reduce our expenses.

Altru Hospital is a community healthcare system with 15 operating rooms in its main hospital, which is located in Grand Forks, ND. The Altru Specialty Center, where the weekly cataract surgeries take place, is located a few miles away from the main hospital and contains four operating rooms and its own Central Sterile (CS) department.

Altru Hospital and SolutionWells teamed up to strategically target eye instruments that frequently get damaged and test the hypothesis that using custom trays will reduce repair expenses. Altru also began looking at custom trays as a way to protect their eye instruments as they prepared to build an off-site eye center that does not have its own CS department. Transporting the eye instruments from the main hospital's sterilization facility to the new eye surgery center created the possibility of more damage to their fleet of instruments.

With the goal of saving money on maintenance costs, let's look at some ideas for hitting more singles in order to try and win the repair-budget game.

Study overview

For this preliminary report, three years of historical instrument repair data was collected to establish a benchmark, which we used to compare to three months of repair data collected after custom trays were introduced to hold existing instruments. For the most accurate outcome, we will continue tracking the data in this study for another nine months so that we have one full year of data using custom trays.

The first study, which will wrap up in late 2017, focuses on the first quarter of a year-long analysis to evaluate the impact that custom trays have on repair for surgical eye instruments and staff efficiency. These year-long findings will be published in 2018.

The second study, to be shared later this year, will evaluate trays designed to eliminate hand-washing of rigid telescopes in favor of following the instructions for use (IFU) for machine washing these expensive and valuable instruments used during minimally invasive surgery (MIS).

The third study looks at compliance, accountability, and how that may affect outcomes for study number two. These findings will be reported in another article in 2018.

This work aims to provide valid information that hospitals could use to develop a strategic plan that would reduce spending by hitting a "single" in a specific specialty. Three questions this study will clarify are:

1. Does it make sense to spend money on custom trays?
2. Do custom trays reduce damage for expensive instruments?
3. Do custom trays have any impact on staff efficiency?

Analyzing the resulting information will provide insight that will help determine if the hypothesis — switching to custom trays lowers repair costs — could become theory.

Specifics

When we designed this analysis, we knew that it would have some problematic variables. For instance, the instruments used in the cataract trays were well-worn prior to the study and we expected breakage during the trial. Regardless of the possibility of damage to older equipment skewing the results, we felt this study important enough to implement. The goal of the study was to test the custom trays while the OR and CS staff continued functioning as usual (i.e., using custom trays was the only change). This study is a real day-to-day look at how moving legacy instruments into custom trays may or may not affect repair strategy.

It's also important to note that in August 2016 nine new additional sets of instru-

ments went into circulation because there were not enough sets previously to supply surgeons for a full day of cataract cases. To start the study and prepare for a move in 2017 to Altru's new facility, new custom trays were introduced December 2, 2016. Since these variables complicated using 2016 as a repair benchmark, it made sense to average data over three years to minimize variables introduced from one year.

When one looks at the cost of a specific fleet of instruments (e.g., Cataract Tray, Neuro Tray, CV Tray, Digital Ureterscope Tray, etc.) it makes sense to protect that investment and try to lengthen its longevity. This may seem difficult, especially when so many people are handling the trays every day, which is why we must first consider the value of what we are using and understand the true cost of keeping it running with precision. These two factors are extremely important when caring for patients and keeping them safe.

Another formula we used to predict and track repair is instrument failure rate (IFR). For example, Altru Hospital's fleet of cataract instruments are worth \$137,292 and the most they spent on annual repair and replacement expenses was \$12,189 in 2015. But on average, Altru was spending \$7,361.12 annually to repair their cataract instruments. The IFR is an easy way to benchmark and explore improvement or a loss for a specific fleet of instruments and provides an additional way to assess, predict and justify how specialty instruments are performing.

Once we established and understood these key points, we made sure that everyone who comes in contact with this equipment was educated and willing to be accountable for its handling — although the goal also was to stop assigning blame for instrument breakage and instead identify the cause and find solutions for avoiding future damage.

Examining the data

The trays used prior to this study had silicone finger-mats in the bottom of the trays with hooks and Sweeney manipulators that may have been contributing to some

of the damage. Also, the silicone finger-mats did not hold the instruments securely, and occasionally they would escape the tray and fall into the ultrasound cleaner during decontamination (see Figure A).

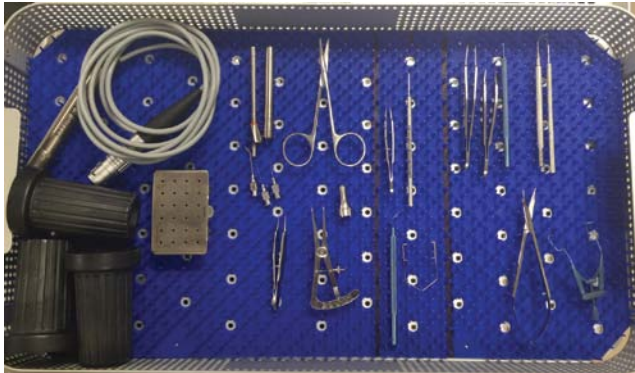


Figure A

The new trays hold the instruments in place 360 degrees and eliminated the need for finger-mats because the silicone holders in the lid mated perfectly with the silicone holders in the bottom of the tray (see Figures B and C). When assembled, the instruments are incapable of moving. These types of trays typically sell for \$1,400 to \$1,500 per tray.

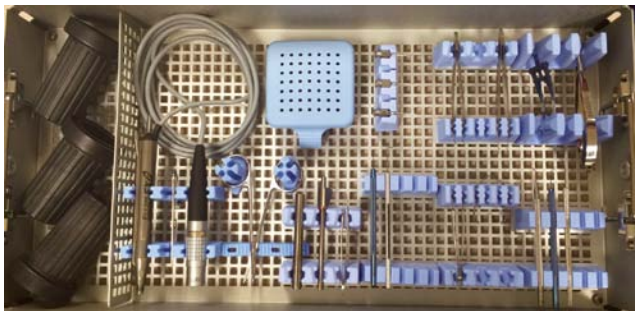


Figure B

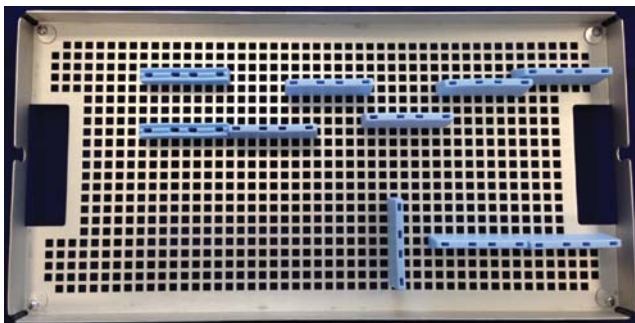


Figure C

Between 2014 and 2016, Altru has been spending an average \$613 per month for repair of their cataract instruments. During the three-month period, the average monthly expense to repair and/or replace inventory dropped to \$417. Altru's instrument failure rate (IFR) also fell from 18 percent to 3 percent. When comparing to early results in 2017, this change is significant. The

remaining nine months of this study will give valuable information to further support or reject the hypothesis that custom trays decrease repair costs.

The first phase of this study shows that using custom trays should reduce repair expenses for Altru Hospital. Averaging the data from 2014 to 2016 blends in the variables that took place in 2016 and gives a more accurate picture of what can happen when one focuses on hitting singles.

If 2017 reflects what the extrapolated numbers suggest, Altru can expect to save 32 percent per year by using custom trays to protect their eye instruments (see Figure D, below).

Efficiency, time savings

The study also seeks to find out if the use of custom trays would have an impact on staff efficiency. Each tray has three zones:

1. Zone A is for keeping instruments used by both of the surgeons.
2. Zone B is for instruments used exclusively by surgeon B.
3. Zone C is for instruments used exclusively by surgeon C.

The old tray used two finger-mats; one was placed underneath the instruments and the second finger mat was placed on top of the instruments to attempt to hold them in place. Prior to the start of the study we timed how long it took one of the CS techs to assemble all the clean instruments in the appropriate zones after they came out of the washer. Using the old tray, it took 8 minutes to assemble compared to 7 minutes it took using the new custom tray. The finger mats retain a significant amount of water after coming out of the washer and must be shaken until reasonably dry. This extra task accounted for the time difference in assembling the trays. (A study by Ofstead, et al shows that a CS Tech costs a hospital \$16.80 per hour or \$0.28 per minute on average.² During our study of 119 cases, the one-minute difference assembling the trays would save the hospital \$33.32 per quarter or \$133.28 per year.)

Conclusion

This preliminary study suggests that implementing custom trays with a designated home that secures each instrument from above and below yields a significant repair expense savings of 32 percent a month. IFR also enabled us to see if repair expenses were reduced during specific timeframes. For instance, in 2015, the eye trays were experiencing an IFR of 18 percent of the value of their fleet (damage per year equals \$12,189 divided by \$68,643, the value of their entire inventory of eye instruments sets). Within three months we saw that figure drop to 3 percent. We will revisit this data at the end of 2017 to see if repair expenses increase or continue falling. **HPN**

References

1. Granillo, L. (2009) http://baseballanalysts.com/archives/2009/08/walking_off.php.
2. Ofstead, C.L., Quick, M. R., Eiland, J.E., and Adams, S.J., (2017).

Rick Wells, CCSVP, President, SolutionWells, specializes in improving the care and handling of surgical instruments through root cause analysis. The company helps CS & OR departments identify and replace insufficient practices with solutions that can help extend the useful life of surgical instruments. Rick can be reached by email at rick@solutionwells.net.

Figure D	2014 -2016 data (three years)			Study data			% of Savings (Yearly 2014-2016 vs. Projected 2017)
	Total	Yearly Average	Monthly Average	Total 3 Months	Monthly Average	Projected Year 2017	
Repair expenses	\$22,083.37	\$7,361.12	\$613.43	\$1,250.49	\$416.83	\$5,007.96	32%

PEOPLE & OPINIONS

Hospital improves costs, efficiencies with custom trays

Part 2: Study completion delivers impressive results

by Rick Wells

Will using custom trays reduce damage to surgical instruments by providing a secure, consistent home for each one? That was the question we aimed to answer in the Altru Hospital cataract instrument study. At the beginning of 2017 we took a three-month snapshot and reported the preliminary results to readers in the June issue of *Healthcare Purchasing News* (Part 1).¹ This next article focuses on the combined data collected from that study.*

Summary

Altru Hospital performs all cataract procedures at its outpatient surgery center located a few miles away from the hospital. Block time for cataract surgery takes place on Tuesday and Wednesday. The twelve-month results for 499 cataract surgeries in 2017 ended up being almost a mirror image of the three-month snapshot *HPN* published in June of 2017. The three-month results showed that using custom trays reduced repairs by 32 percent. The complete study showed a 34 percent reduction over twelve months, which is a substantial savings. That type of savings for many hospitals will finance the purchase of custom trays usually within the first year of use.

Methods

Prior to launching the study, we compiled and analyzed three years of repair data. One year of live repair data was collected and compared to the three years of historic data. Information on damage and repair along with the number of cases was collected weekly during the study. We also conducted a review of water quality, time and temperature recommendations, as well as the IFUs for all cataract instruments.

Study data & results

There were two variables in 2016 that contributed to the drop in repairs for that year:

- Cataract instrument inventory was doubled.
- Custom trays were introduced.

It made sense to average repair expense for 2014, 2015 and 2016 to get a more equitable comparison to the study in 2017. Damage for the cataract instruments at Altru Hospital in 2017 fell to \$4,834 per year from the \$7,361 three-year average, which is a 34 percent reduction in repair. We will examine these two variables in 2016 as they present an opportunity for additional questions.

Discussion

Gathering and analyzing data will always prompt more questions and hopefully help steer the development of new solutions. A noteworthy observation from the historical data collection (three years prior to this study), showed that as procedure volumes fell each year, damage continued to rise.

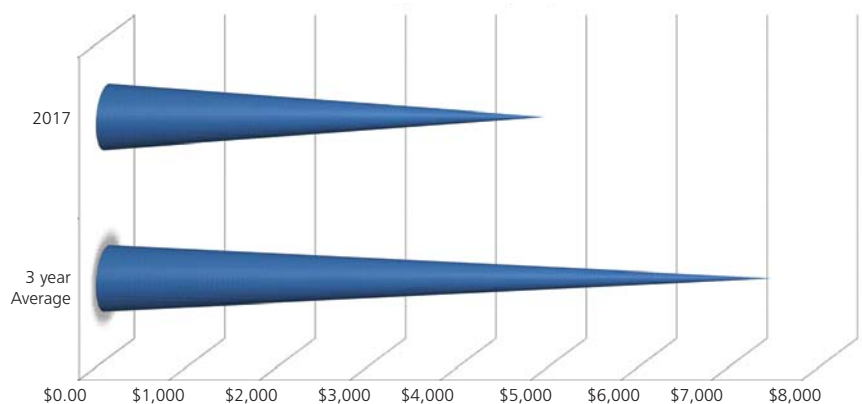
Altru hospital implemented the use of custom trays to help mitigate the escalation of repair expenses. See their previous tray set up in Figure 1, and what they began using in December of 2016 in Figure 2.

When comparing the number of procedures to the amount of damage incurred each year those numbers should mirror one another. If procedures increase, damage should increase and if procedures decline, damage should also decline.

The Altru Study shows that when custom trays are introduced to a repair cost-reduction plan, a 34 percent decrease in expenses can be expected. In 2016 Altru doubled the number of cataract sets and started using custom trays. If we take note of these two factors that occurred with the cataract sets in 2016 and then look at repair in 2015 we see a significant reduction in repair costs. Expenses in 2015 were \$12,181 which fell to \$4,834 in 2017 (61 percent). Again, the Altru study was designed to only look at how using custom trays affected repair expenses, but during the analysis the data suggests that combining additional inventory along with using custom trays also had a positive, synergistic effect.

Beyond savings and compliance

Reducing repair-related costs will always be the biggest advantage of using custom trays and real savings must be demonstrated to justify their purchase. However, they can also do a number of other things beyond savings and compliance. Using custom



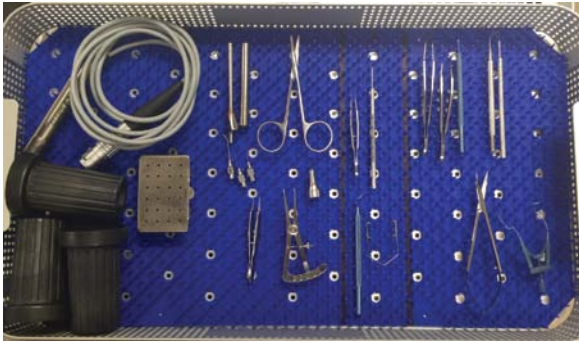


Figure 1

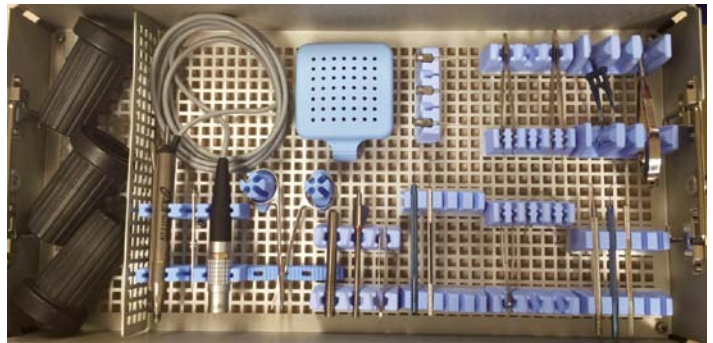


Figure 2

trays can also provide an opportunity to review the necessity of including every instrument in the current tray. For example, an article² published on LinkedIn by pediatric surgeon Peter Nichol, MD, PhD, evaluated how many instruments in his pediatric trays were being routinely used. He found that he was only using 14 percent of those instruments. He suggests breaking the tray up into “as needed” trays to eliminate the need to process so many instruments after each case which would also reduce the number of unnecessary sterilization cycles used.

Added benefits of implementing custom trays:

- culls un-needed instruments from trays;
- divides an overloaded tray into smaller trays;
- saves processing time;
- reduces tray weight and;
- separates instruments used less often to avoid over-sterilization.

The custom tray process also provides an opportunity to examine repair trends for each instrument in the tray. This strategic approach can be used on all current trays, one tray at a time, over a number of years. Facilities should first target trays with the most damage or usage and work down the list. Some may think they don't have time for such a task but with today's healthcare reimbursement environment refocusing on the importance of making sure our house is in order, it would be wise to reconsider.

Conclusion

This study strongly indicates that using custom trays could save hospitals at least 35 percent over the previous year's expenses while providing a quick and simple way to address repair issues within a facility. By paying close attention to the data, healthcare facilities may also discover additional opportunities to address and correct other factors adversely affecting repair-related expenses.

Over the last five to 10 years the focus seemed to be on cutting costs by purchasing items at the lowest price available. In some cases that line-item strategy worked, but not for everyone. In 2017 ten hospitals closed their doors permanently. The need to reduce waste is forcing a refocus on the toughest problem, fixing the broken utilization process within our hospitals.

Call for study participants

Would your healthcare facility like to be a study partner to help expand the research

into custom trays and damage reduction? If interested please contact rick@solutionwells.net to discuss your repair issues and see if a custom tray study could help your hospital while providing solid data for the rest of the hospital industry. **HPN**

References:

1. <https://www.hpnonline.com/can-using-custom-trays-reduce-instrument-repairs/>
2. <https://www.linkedin.com/pulse/occams-razor-simplest-solution-reducing-bio-burden-surgical-nichol/>

** Summit Medical wanted to explore this hypothesis for their InstruSafe trays and sought me out as the principle investigator and objective expert for this study. Summit Medical funded this study as well as donated the Instrasafe trays to Altru Hospital so that other hospitals could benchmark this data.*

Acknowledgements

SolutionWells would like to thank the management at Altru Hospital for allowing us to publish the data from this study and inform industry how repair reduction can affect the bottom line. I would also like to thank the operating room staff, the scheduling desk and central sterilization at Altru Hospital for all of their help in gathering data each week.

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Get surgeons involved

If you're wondering why certain instruments break and are looking to set a goal of decreasing the damage, try increasing surgeon engagement and satisfaction.

When you approach surgeons, it is important to put them at ease. Explain that the sterile processing department is making every effort to ensure every instrument is in prime working condition but you need their advice to make it happen. Show them your repair data and see if they are open to trying different instrument manufacturers. Almost all will consider when approached respectfully.

Once you have the surgeons' approval you can begin approaching the OEMs (original equipment manufacturers). OEMs will loan instruments to your facility and allow you to evaluate them for two weeks, or in some cases, for longer periods of time. A two-week timeframe will allow surgeons enough uses for a thumbs up or thumbs down and also gives you time to see how well or poorly the instruments handle the stress of your SPD processes.

Is the OEM instrument up to the task or should you explore other vendors? How long does it take to process after surgery? Maybe it's not the instrument but the process (e.g., eye tissue is very difficult to remove, so allowing it to sit for hours could be a contributing factor). Investigate the possibilities, keep surgeons informed and solutions will be easier to find.