**Organization:** Howard County General Hospital

**Solution Title:** Reducing the Frequency of Immediate-Use Sterilization

**Program/Project Description, including Goals:** What was the problem to be solved? How was it identified? What baseline data existed? What were the goals—how would you know if you were successful?

A consistent theme from all levels of surgical services staff including sterile processing was that there were not enough instruments and that the sets were being put up without a critical instrument. This was leading to case delays, staff and surgeon dis-satisfaction and potential patient safety issues due to "settling" for immediate-use sterilization when full processing could have been achieved with better planning and coordination. Additionally, preventing hospital acquired infections has been the focus of The Joint Commission and the Centers for Medicare & Medicaid Services with surveyors tracing instrument processing procedures including the frequency of immediate-use sterilization (AKA “Flashing”). At times, the pressure to move cases along may push staff to perform immediate-use sterilization when full sterilization processing could be performed. Staff may feel “rushed” and make errors when performing immediate-use sterilization; potentially causing a negative effect on patient safety. Further, having the appropriate instrumentation available helps reduce staff stress, distraction, and tension thereby improving patient safety. The available data was reviewed and indicated there was much room for improvement in immediate-use sterilization frequency. These perceptions were validated by the employee engagement results related to "I have the necessary tools and equipment to complete my work".

**Baseline data** included review of Immediate-Use- Sterilization episodes and Gallup Employee Engagement Scores. Beginning January 2012, immediate-use-sterilization episodes were translated into rates in order to ensure that volume decreases were not giving a false sense of improvement.

**The goals of the team were:**

1. Perform instrument inventory including single instruments and sets for both the Inpatient (HCGH Main OR) and the Outpatient (TCAS OR) operating rooms.
2. Evaluate contents of instrument sets to determine possible instrument reallocation and identify one of a kind and critical instruments.
3. Improve immediate-use-sterilization data due to inadequate instrument sets.
4. Make recommendations for purchase of additional instruments based on analysis.
5. Create vendor policies that required loaner trays to be brought into the hospital for processing far enough in advance to allow for full processing well ahead of case start time.
Success would be evaluated through immediate sterilization data, employee engagement scores and staff and surgeon feedback related to having instrumentation available for on time case starts.

**Process: What methodology or process was used to develop the Solution?**

Cleaning, disinfection and sterilization of surgical instruments is a complex process and there was no objective method in place for evaluating whether the current instrument inventory was adequate for the volume of cases being performed at the hospital. An Instrument Performance Improvement team was formed in December of 2011 including key direct care staff from the ambulatory surgery center, the main operating room, sterile processing, informatics, outcomes management, and surgical services leadership. The team looked at the reasons for immediate-use-sterilization and reviewed employee engagement scores related to having the tools and equipment needed. Key surgeons were also included to understand their frustration related to not having the appropriate instrumentation ready for cases without delays (See High Level Time-Line). The team found that there were a multitude of reasons causing the high levels of immediate-use sterilization and set about to solve each of these facets one by one over the past two years.

### High Level Time Line

The team performed a Gap Analysis and utilized the Plan-Do-Check-Act (PDCA) methodology. There were 5 priority focus areas including instrument set inventory, accuracy of count sheets, addition or deletion of instruments, identification of critical instruments, creation or modification of the instrument tracking system and ordering any missing or required instrumentation. A steering committee was formed with five subgroups focused on specific aspects of the project as follows:

- **Instrumentation Processing**
  - Lead: Samatha Oates
  - Instrument intake & output
  - Inventory assessment
  - Backup inventory
  - Count sheet accuracy

- **HUB Management**
  - Lead: Kerry Bode
  - Peel pack management
  - Ownership (ordering, stocking, maintenance)

- **Preference Card Accuracy**
  - Lead: Kathy Herman
  - Key information identification
  - Case cart process
  - Proactive assessment
  - Annual review

- **Business Planning**
  - Lead: Sharon Rossi
  - Instrumentation procurement planning
  - Scheduling
  - Flash sterilization form redesign and recommendation

- **Quality Control**
  - Lead: Sharon Rossi
  - Metrics
  - Quality Control
  - Reporting tools
Solution: What solution was developed? How was it implemented?
The solution was multi-faceted. The team fixed the issues on the front end - ensuring the preference cards (all 6,000 of them) were updated and revised as needed. This is where the pick sheet (an itemized list of everything the surgeon will need for the case including instrumentation) begins and often the source of not having the correct tray ready for the case. There needed to be a proper link to surgical scheduling to ensure that the scheduling coordinators were posting the case correctly, thus ensuring the correct pick list was printing. The team developed a process for establishing instrument inventory. Each tray was opened, audited and decisions made on standardized contents and identification of critical instruments moving forward. Once the inventory was established, we compared what we had on hand to the volume of cases and the volume of cases expected based on volume growth goals. It was identified that the immediate-use-sterilization log did not give enough information related to reasons why “flashing” occurred so that sheet was revised to focus our efforts on specific causes. In 2013, we prepared for the implementation of a new perioperative electronic medical record. All processes put in place were reviewed to ensure that they would work in the new electronic record. This has been a multi-year effort, but we are very proud with the progress and the sustained outcomes achieved.

Measurable Outcomes: What are the results of implementing the Solution? Provide qualitative and/or quantitative results to data.
The efforts of this performance improvement team led to significant reduction in immediate-use episodes and standardization of logs including reasons for “flashing” to allow for tracking and trending. This project also led to standardized processes in both the outpatient and inpatient settings and a centralized process for conducting daily QI monitoring for immediate-use sterilizers. There was also improved teamwork between sterile processing and the operating rooms and improved employee engagement scores.

The control charts for both the inpatient and outpatient areas show a significant reduction in immediate-use sterilization from 2011 to YTD 2013. The graphs below include color-coded bars to match the team objectives as seen in the high level time line.
The report card below illustrates the conversion from immediate-use sterilization episodes to immediate-use sterilization rates. The stretch goals are set at less than 0.03 for the outpatient area and set at less than 0.035 for the inpatient area. The green color coded boxes indicate goals have been met and show significant improvement in 2013.
The spreadsheet below contains the detail on the data monitored and analyzed on a monthly basis and was used to develop the Pareto charts which follow.

### TCAS

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### MAIN OR

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**NOTE:** There is no set AORN Standard; therefore, the P.I. Team set a stretch target based on where we started. The target is evaluated periodically. Main OR cases are more complex requiring multiple trays, therefore target set higher.
The Pareto charts below highlight reasons for immediate-use sterilization in the Main OR (inpatient) for 2012 and for YTD 2013 and assisted the team in its focus on the events. The “single items/miscellaneous” category decreased from 122 episodes in 2012 to 0 episodes in
YTD 2013 through the reallocation of instruments from existing sets and purchase of additional instruments. The “inadequate sets” category decreased from 38 episodes in 2012 to 25 episodes in YTD 2013 and the “vendor items not received in time to process” category decreased from 29 episodes in 2012 to 15 episodes in YTD 2013. This data continues to be reviewed, analyzed, and monitored and the team focus is shifted as ongoing progress is made with reduction and/or elimination of specific categories.
The Pareto charts below show reasons for immediate-use sterilization in the TCAS (The Center for Ambulatory Surgery) OR (outpatient) for 2012 and for YTD 2013 and assisted the team in its focus on the events. The “inadequate sets” category decreased from 98 episodes in 2012 to 38 episodes in YTD 2013 through the reallocation of instruments from existing sets and purchase of additional instruments. The “specialty items for repeat cases” category decreased from 27 episodes in 2012 to 3 episodes in YTD 2013 and the “tear in wrapper/drape” category decreased from 19 episodes to 13 episodes. This data continues to be reviewed, analyzed, and monitored and the team focus is shifted as ongoing progress is made with reduction and/or elimination of specific categories.
The Gallup Employee Engagement mean score related to the survey question on materials and equipment improved from 3.67 in 2011 to 3.79 in 2012 to 3.88 in 2013. The mean score was statistically significant comparing 3.67 in 2011 to 3.88 in 2013.

Gallup Employee Engagement Q02: I have the materials and equipment I need to do my work right.

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<th>YEAR</th>
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Sustainability: What measures are being taken to ensure that results can be sustained and spread?

The instrument improvement performance improvement team still meets on a regular basis, but the focus is now shifting from solving problems to evaluating preventable versus non-preventable immediate-use sterilization episodes. Immediate-use-sterilization episodes were translated into rates in order to ensure that volume decreases were not giving a false sense of improvement. The team continues to examine immediate-use-sterilization episodes, conducts periodic departmental staff surveys to evaluate progress, and annually reviews Gallup employee engagement scores. In addition, the team reviews data related to preference card updates, pick sheet accuracy, and is in the process of identifying other data to ensure sustained improvement. The team reports on a monthly basis to the Perioperative performance improvement committee.
The improvement has been sustained in both the inpatient and outpatient surgery centers. This project was presented as a poster at the 9th Annual Maryland Patient Safety Conference in 2013, but the outcomes (although impressive) were early in the project and now demonstrate sustainability in outcome data. Additionally, the results of this P.I. effort were presented at the 4th Annual Johns Hopkins Medicine Patient Safety Summit in 2013 to share best practices across the health system and advance the culture of patient safety. We are proud of the continued and sustained progress that has been made in 2013.

Role of Collaboration and Leadership: What role did teamwork and collaboration play in the Solution? What partners and participants were involved? Was the organization’s leadership engaged and did they share the vision for success? How was leadership support demonstrated?

Leadership support has been central to this team’s success. The senior director of surgical services led this team and has acted as a mentor to subgroup champions. Her commitment and drive led the collaborative team to success. In addition, the HCGH executive management team was extremely supportive of this team’s efforts as evidenced by their approval to purchase additional instrumentation and a software program for instrument tracking based on the team’s recommendations. The chief of surgery functioned as the team’s physician partner willingly giving time and advice throughout the process and was the 2013 recipient of the Howard County General Hospital’s Physician Champion Award. This project was awarded the 2013 HCGH Tim Kelly Award for Quality and Excellence which celebrates staff-driven projects that demonstrate efforts to improve quality of care, patient safety, and performance improvement. This process improvement project was also chosen by executive leadership to be highlighted during the 2013 Joint Commission survey with accolades received by the surveyors. Most importantly the project is a true example of interdisciplinary collaboration – achieving results by empowering those closest to the work to use their individual talents in order to achieve a synergistic whole.

Innovation: What makes this Solution innovative? What are the unique attributes?
This solution is innovative and unique because rather than just purchasing more instruments or educating staff to limit immediate-use sterilization, an evaluation of the process was completed. Process improvement tools, data management, and a multidisciplinary team approach were utilized. Solutions were developed and implemented and have been sustainable.

Related Tools and Resources: Gap Analysis, Plan-Do-Check-Act (PDCA) methodology, Gallup Employee Engagement Survey Tool, Control Charts, Pareto Charts

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