

## **APPLICATION FORM**

**Title of Entry:** MIA: Missing Instruments Accountability Instrument Tracking System Implementation

**Division:** Medium Organizations

**Award:** Optimal Operations

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**Date Implemented:** 04/04/2016  
**Date Results Achieved:** 07/08/2016

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## **Executive Summary: “MIA: Missing Instruments Accountability Instrument Tracking System Implementation”**

In an effort to improve clinical quality, patient experience and decreasing costs of care, our facility chose to improve the tracking of surgical and medical instrumentation. The PeriOperative Services Department has implemented an instrument tracking system. This system has impacted Sterile Processing and the Operating Room in various ways. Labor intensive processes have been eliminated. Interdepartmental relationships have improved and have been maintained between staff members in Sterile Processing and the Operating Room. Instrument set traceability has improved. It is much easier to find a set of missing instruments in an urgent or emergent situation. Paper logbooks and inventory sheets have been eliminated which has drastically reduced the amount of double documentation previously performed. In addition, the ability to run accurate productivity reports in preparation for the Food and Drug Administration (FDA) requirements for surgical instrumentation (Class I Medical Devices) effective in 2020 has been met by the tracking system implementation.

The project expectations were to see improvement in our process and outcome measures. Process measures were to show improvement in our length of time spent manually documenting instrument processing procedure. Using the electronic tracking system a 68% reduction in documentation time was realized. Outcome measures were expected to show improvement in our ability to track surgical instrument sets. Implementation of the tracking system resulted in 100% traceability of our surgical instrument sets.

Additional measures tracked throughout this project were: elimination of paper documentation, removal of multiple record storing locations, ability to track all instrument sets, simultaneous access to inventory sheets throughout the department, and productivity improvement related to the new process for set assembly. A satisfaction survey was completed pre and post instrument tracking system implementation by staff members and other sterile processing customers throughout the health system. Added benefits of the tracking system consist of an impressive array of reporting features. Reports include set maintenance and repair, full circle reporting on set usage and reprocessing, case tracking matching surgical instruments to the patients, and staff productivity comparisons on time of day. Staff members have gained a larger knowledge base utilizing the instrument tracking system and decreased orientation times have been noted.

### **Assessment: Describe the needs assessment and process and/or research conducted prior to implementing the initiative and the results of that needs assessment/research, including evidence and baseline data:**

A needs assessment at our facility showed the instrument set assembly process was labor intensive and not standardized. Inventory books, separated by surgical specialty and alphabetized, were maintained in the Sterile Processing Department (SPD). The inventory books listed the names of the sets and the necessary instruments for each specific pan. The inventory book method created the following problems: There was only one inventory sheet per instrument set, which limited the number of personnel able to reassemble identical pans to one. The inventory sheets were frequently lost or misplaced every day and had to be found before personnel could complete their assigned work, causing daily delays. Incomplete inventory sheets yielded incomplete instrument sets which could lead to surgical delays. If there was not time to immediately update the inventory sheet, it was usually not done, causing future problems during set assembly.

The previous instrument assembly process created the following problems: Sets of surgical and medical instruments were sterilized and stored in one of two ways. The instrument sets were placed in rigid containers with lids and filters or they were placed in a wire pan and wrapped with heavy duty material. Rigid pan containers had handwritten tags on each end of the pan to identify instrument sets and the staff member who assembled the set. Wrapped pans had special sterilization tape securing the wrapper shut. The wrapped pan was hand labeled by the staff member completing the process. Pans and lids were sometimes mismatched, with the name on the lid being different than the name on the pan and the set within. These errors lead to incorrect labeling of the set. Handwritten tags could easily fall out of the pan, causing the pan to be unidentifiable. The pan had to be opened to determine which set was within, thus contaminating the contents, rendering them unable to be used before reprocessing. Staff forgot which set they wrapped and mislabeled the pan of instruments. Incorrectly labeled pans lead to surgical delays as a result of opening the wrong instruments.

SPD staff members were completing excessive paper documentation and there was not a way to accurately track productivity. Handwritten logbooks were maintained for each of the seven sterilizers. The logbooks were used to record the items in each load, load stickers, culture data, and cycle parameters. Load stickers were used to identify instruments placed in a specific load of a sterilizer. Load stickers were placed in the logbook, on each pan of instruments, and on individual instruments. This was a very time consuming process.

There was an inability to meet recommendations with instrument traceability to patients. Instruments were not tracked to storage locations, resulting in time wasted searching for misplaced instrumentation. Disposable items used during surgical procedures were stored in SPD. The case carts that were stored in SPD contained the instruments and disposable items that were used during a surgical procedure. Pans of sterilized surgical and medical instruments were stored in the operating room.

The target condition was to reach the following goals: 100% elimination of paper log books and inventory sheets by April 30, 2016. May 2016 would bring 100% correctly labeled pans of instruments. The standardization of the instrument assembly process allowing simultaneous access and instrument set traceability would reach 100% by June 1, 2016. Productivity related to the new process for set assembly would show 25% improvement and a 50% reduction in time spent performing end of month tabulations would occur by July 2016.

**Intervention: Identify the steps taken to initiate your effort(s) including strategies, implementation plan, and the interventions:**

Due to the labor intensive processes of instrument set assembly, possible surgical delays, and lack of instrument set traceability to our patients, the decision was made to purchase an instrument tracking system. The health system needed to purchase and install the full tracking system including hardware and software by March 2016. The sterile processing manager worked closely with the tracking company to upload all surgical instrument inventories into the system. This was also completed in March 2016. A kickoff meeting, staff education and hands-on training began with two on-site trainers from the vendor company in April 2016. The trainers were available to educate Sterile Processing personnel on the use of the instrument tracking system via in-servicing, hands-on and return demonstration, conference calls, and

written materials. During the time the trainers were on site, all instrument sets, storage locations, OR suites, case carts, and reprocessing machines were coded to be recognized within the system. Barcode labels were distributed to all staff members to allow process scanning by personnel. Staff made the transition from paper to electronic documentation during this time, as well, as inventory sheets and sterilizer logbooks were discontinued. By July 2016, we had instituted a daily reporting feature for culture documentation, staff productivity, daily items processed, instrument repair reports, as well as, various other useful reports. In October 2016, barcodes to surgeon preference cards were added in preparation for the initiation of the OR Scheduler module. OR staff members received initial education in April 2016. Customized user guides were developed for point of use reference material and deployed electronically and in hard copy for all users by November 2016. Instrument set tracking was fully implemented by July 2016, along with staff productivity improvements.

**Results: Summarize the success of your initiative and provide evidence of sustained improvements.**

The overall implementation has provided significant achievements for the perioperative services department. We have achieved 100% compliance for instrument traceability, meeting the upcoming FDA regulations effective 2020. Daily, weekly and monthly audits on various processes are now captured electronically and are easier to retrieve. Continuing education on new modules occurs as they become available. Productivity reporting is carried out on set maintenance and repair, surgical instrument statistics, staffing patterns and daily items processed. Each time a surgical instrument is added or removed from a set, an automatic data upload occurs including instrument set graphics and media.

We are currently working to institute the OR Scheduler module. This module is an interface that interacts with our surgical documentation system to provide up-to-date information on the surgery schedule and needed items for scheduled and emergent procedures. We are planning to expand the implementation of specific modules to include three other facilities within our health system. The final goal is a complete tracking system implementation at each of those sites.

Successes of our tracking system implementation include 1<sup>st</sup> Place Chairman's Quality Award for Improving Clinical Quality, a Nursing Poster Presentation at our health system, and International Association of Healthcare Central Sterile and Materiel Management (IAHCSMM) Poster Presentation. The poster will be submitted to Association of PeriOperative Room Nurses (AORN) for 2018 presentations.

**Adaptability: Describe the potential ability to replicate your initiative in other organizations that provide the same service or serve the same type of population. Also, describe how to maintain the initiative and/or its results, any negative outcomes, areas of improvement, or lessons learned.**

There is great potential to replicate the implementation of an instrument tracking system. A health system would need to compare and contrast the available instrument tracking systems on the market, the compatibility of their existing computer systems to interface with the selected tracking system, and the needed computer hardware with all supporting information technology equipment. The health system would need to request a capital investment quote from the tracking system company to properly prepare a budget and allocate appropriate funds. The locations for the new hardware, data drops and power supplies need to be

determined and installed. Software for the new system needs to be uploaded onto all existing and new tracking system computers. Existing surgical instrument inventory would need to be uploaded into the new tracking system and reviewed for revisions and accuracies. On site education will be scheduled with representatives from the tracking system company to train all users on system applications. Upon completion of education a go-live date is scheduled.

Throughout the implementation of the instrument tracking system, we learned how to “let go” of the paper documentation and rely solely on electronic documentation. The education to all of Perioperative Services has been somewhat difficult due to the busy surgical schedules and various shifts of staff members. We have in-serviced staff, identified leaders to continue teaching, and have created step-by-step user guides to help users navigate throughout the system. To maintain the initiatives we have continued to reinforce education through staff meetings, team meetings, emails, and flyers. We celebrated our successful implementation with several staff parties.

A change of this magnitude takes time to complete. We are updating parts of the system daily to ensure that everything is always 100% accurate. Learning all the system has to offer and utilizing the available tools efficiently is an ongoing process. Currently, there are several modules not in use. We want to make sure everyone is comfortable with the current modules and are utilizing them appropriately before adding something new. We have identified changes or additions that need to be built within the system to make certain parts user friendly and have provided feedback to the manufacturer for their future updates.

## References

FDA. (5/6/2015). UDI Basics. Retrieved from

<http://www.fda.gov/MedicalDevicesRegulationandGuidance/UniqueDeviceIdentification/UDI-Basics/default.htm>

FDA. (9/6/2016). Compliance Dates for UDI Requirements. Retrieved from

<http://www.fda.gov/MedicalDevices/DeviceRegulationGuidance/UniqueDeviceIdentification/ComplianceDatesforUDIRequirements/default.htm>

FDA. (9/19/2016). Unique Device Identification – UDI. Retrieved from

<http://www.fda.gov/medicaldevices/deviceregulationandguidance/uniquedeviceidentification/default.htm>

IAHCSMM. (2016). Central Service Technical Manual, 8<sup>th</sup> Ed. Chicago, IL: International Association of Healthcare Central Service Materiel Management.

## Appendix A: Set Traceability throughout Reprocessing Cycle

We have achieved 100% traceability of the 2,477 sets in our current surgical inventory. Shown in the example below is how to locate one type of instrument set (Large Ortho). Prior to tracking system implementation we had no means of doing this.

The screenshot shows a software interface with a top navigation bar containing buttons for 'Container Assembly', 'Peel Pack', 'Load Indicators', 'Load List', 'Loaners', 'Containers', 'Case Carts', 'Products', 'Change Password', 'Back', and 'Menu'. Below the navigation bar is a table listing various instrument sets. The table has columns for 'Status', 'Updated', 'By', 'Location/Elapsed', 'Case Cart Usage', and 'Last Maintenance'. The 'WRMC LARGE ORTHO INSTRUMENTS' row is highlighted in blue, and its details are expanded in a sub-table below it.

Status	Updated	By	Location/Elapsed	Case Cart Usage	Last Maintenance
+ 1 Assembled	12/1/2016 6:46:10 PM	ahart	ORTHO CART 1 SHELF 3	None	5/25 11/23/2016 6:10:00 AM
+ 2 Assembled	12/1/2016 6:44:04 PM	ahart	ORTHO CART 1 SHELF 3	None	15/25 11/1/2016 6:07:00 AM
+ 3 Assembled	12/2/2016 3:41:54 PM	ibraceharvey	Container Assembly	None	39/25
+ 4 Assembled	12/3/2016 8:00:42 AM	ibraceharvey	ORTHO CART 1 SHELF 4	None	38/25
+ 5 Assembled	12/2/2016 9:47:27 AM	navery	ORTHO CART 1 SHELF 3	None	4/25 11/23/2016 6:09:00 AM
+ 6 Assembled	12/3/2016 8:50:28 AM	nroseth	ORTHO CART 1 SHELF 4	None	11/25 11/1/2016 6:07:00 AM
+ 7 Assembled	12/2/2016 8:06:49 PM	csauter	WASHER 1	None	3/25 11/23/2016 6:09:00 AM
+ 8 Assembled	12/2/2016 10:17:24 PM	nowusu	ORTHO CART 1 SHELF 4	None	14/25 11/1/2016 6:07:00 AM

Below the expanded table, there is a list of other instrument sets:

- WRMC LARGE PIN CUTTER (Prevac 270/4/45, 11/23/2016 5:01:12 PM psanner)
- WRMC LOWMAN RETRACTORS (Prevac 270/4/45, 10/11/2016 10:10:17 AM amasters)
- WRMC MAJOR SHOULDER INSTRUMENTS (Prevac 270/4/45, 11/10/2016 10:26:43 AM amasters)
- WRMC MCCONNELL BAR (Prevac 270/15/45, 10/11/2016 10:10:24 AM amasters)
- WRMC MCGLAMRY ELEVATORS (Prevac 270/4/45, 10/11/2016 10:10:30 AM amasters)

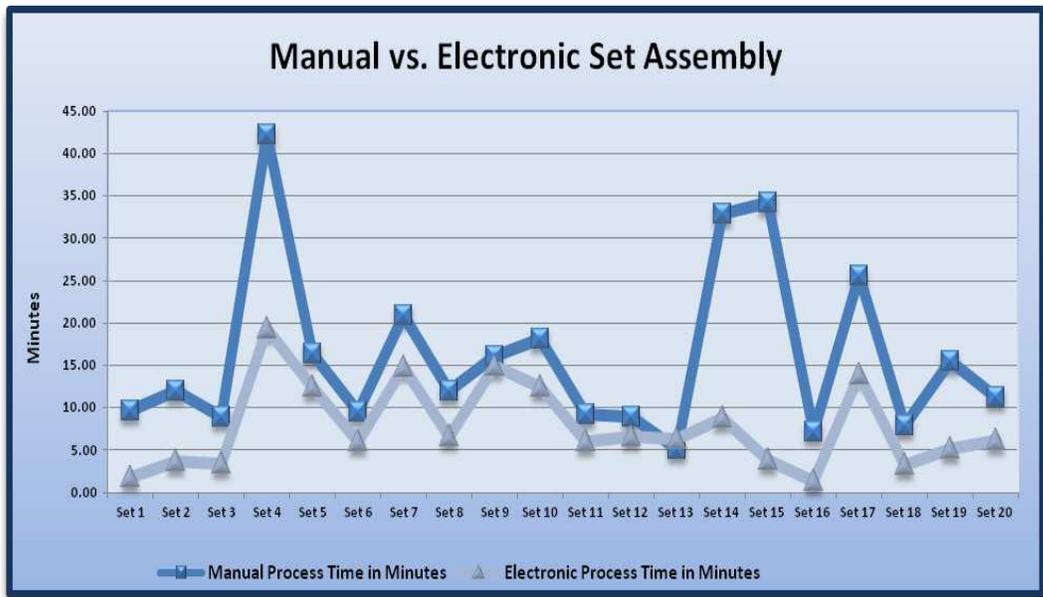
## Appendix B: Set Traceability to Patients

We have achieved 100% traceability of instrument sets to our patients. An instrument set can be tracked throughout perioperative services. Tracking ensures steps were not missed and all cycle parameters were correct. The image below was taken from one of our user guides and outlines the view of how a set is tracked to a patient. Prior to tracking system implementation we had no means of doing this, either.

Case Tracking -- Item Detail									
Case ID	Case Added	Last update	Supplier	Catalog Number	Asset Name	Original Container	Current Container	Location	Mark #
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			Case Cart 22			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC CONNELL SET 1			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC NEURO DISSECTING PAN 3			NEURO CART 5 SHELF 5	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC TM-100 INSTRUMENTS 3			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC TUFFAHA CLOWARD INST 2			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC TUFFAHA EXTRAS 2			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC TUFFAHA LAMI PAN 4			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			WRMC UHT DRILL SET 6			OR #14	
496075	11/2/2016 8:25:54 AM	11/3/2016 7:57:50 AM			CAMERA LIGHT HANDLE	Case Cart 22	Case Cart 22	OR #14	
Subtotal for Case ID: 496075									#Rows: 9
Totals:									#Rows: 9

## Appendix C: Assembly Time Reduction

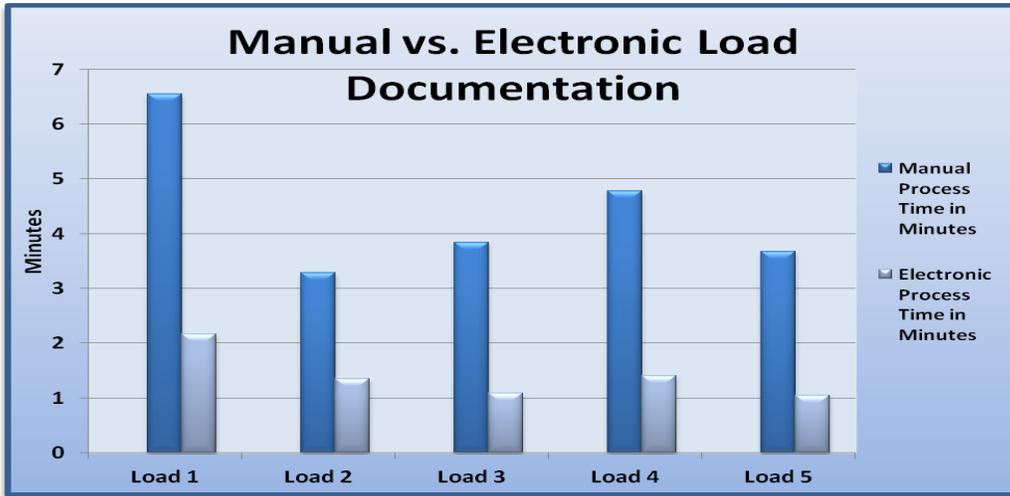
We have achieved a 47% reduction in the time it takes to assemble a set utilizing the tracking system.



In addition, we have reduced our paper costs by \$1,604.82 per year.

### Appendix D: Documentation Time Reduction

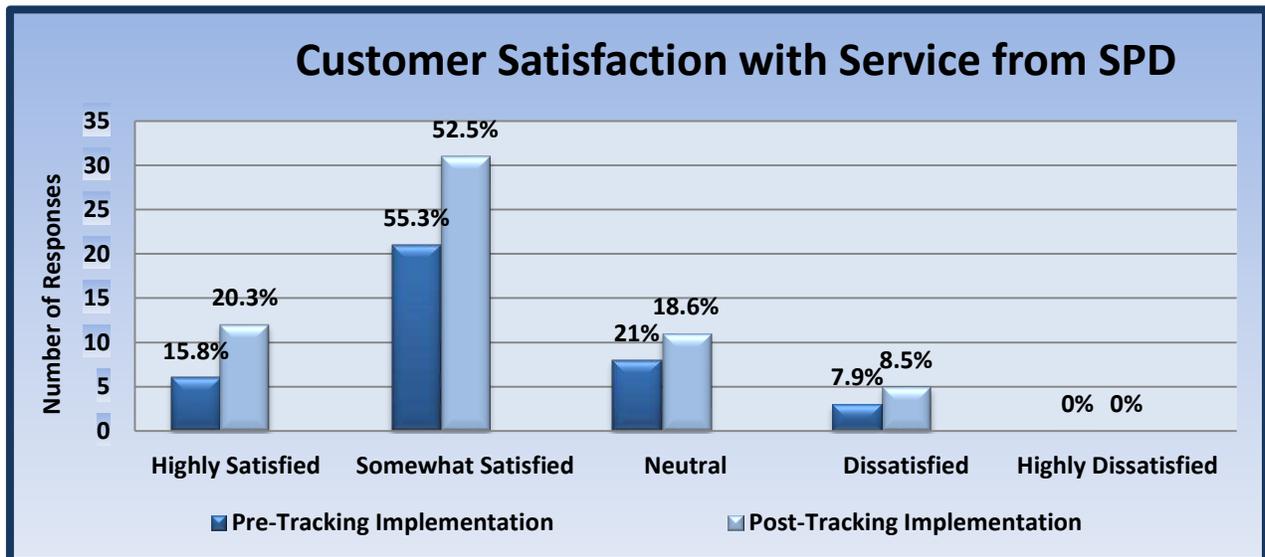
We have achieved a 68% reduction in the time it takes to document a load of instruments utilizing the tracking system.



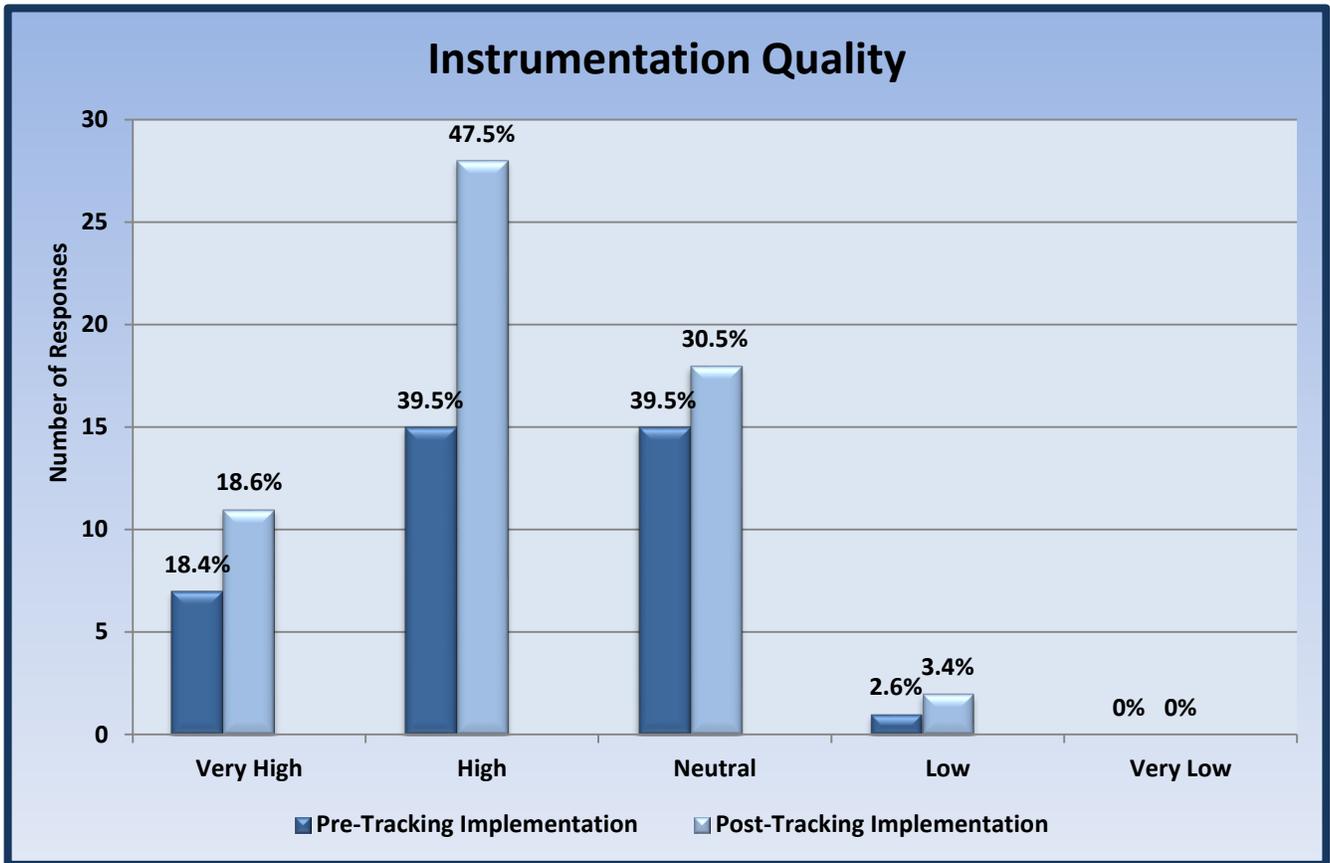
Our total time tabulating productivity measures (monthly volumes) has decreased since our tracking system implementation. Previously, it took an average of 12 hours to complete end of month tabulations. With the new electronic process, it takes an average of 3.5 hours to complete the calculations. This is an average time savings of 71%, exceeding our goal of 50%.

### Appendix E: Customer Satisfaction

Customers of Sterile Processing were requested to fill out a Satisfaction Survey prior to implementing the tracking system and again several months after implementation.



Appendix F: Instrumentation Quality



Appendix G: Reprocessing Expectations

