GHS Quality and Safety Report
March 2011

**All Care Measures**

**Background** – The Center for Medicare and Medicaid Services (CMS) and The Joint Commission (TJC) have developed process of care measures for Acute Myocardial Infarction (AMI), Congestive Heart Failure (CHF), Community Acquired Pneumonia (CAP), and Surgical Care Improvement (SCIP) termed “Core Measures”. The term “All Care Measure” refers to perfect care provided to a patient with a specific disease. It is the percent of patients who received all the needed core measures required for that disease state. The term “Composite” refers to the percent compliance of all possible opportunities (the total number of compliant opportunities for care divided by the total number of opportunities for care). The Composite score will always be higher than the All Care Measure Score. The measures differ slightly between CMS and TJC and are publicly reported on their respective websites (CMS) [www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov) and (TJC) [www.qualitycheck.org](http://www.qualitycheck.org). Reported results lag 3 to 6 months behind due to the complexity and requirements of external reporting.

**GHS Goal** – The FY 2010 GHS goal is an organization wide, rolled up compliance measure for just inpatient All Care Measures. The goal is set at the 75th percentile, which is 91.7%, as provided by Premier through their HQID database of 260 hospitals. We will continue to measure and report outpatient and combined measures, but because the Premier database does not yet have outpatient All Care Measures, we could not include them in our FY 2010 goal.

*In 2011, we chose to estimate probable national improvements and use them to establish our targets. The FY 2011 GHS goal is an organization wide, rolled up compliance measure for just inpatient All Care Measures. Our target is set at 93.00%, which is estimated to be the 75th percentile of the Premier HQID database of 260 hospitals.*

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<th>FY 2010</th>
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<tr>
<td>(1) &lt; 50th percentile</td>
<td>&lt; 88.39% or lower</td>
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<td>(2) 50th to 74th percentile</td>
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<td>(3) 75th to 89th percentile</td>
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**GHS Results** – From December 2009 through November 2010, the GHS All Care Measure compliance rate is 93.3% for inpatient measures, 94.7% for outpatient measures, and 93.5% combined. The inpatient composite compliance rate is 98.2%.

The Acute Myocardial Infarction All Care Measure score for July through September is 98.6%, while the composite compliance rate is 99.6% (745/748). *The composite score in November is 98.5% (267/271).*
The Congestive Heart Failu re All Care Measure score for July through September is 89.1%, while the composite compliance rate is 96.7% (501/518). The composite score in November is 97.7% (167/171).

The Community Acquired Pneumonia All Care Measure score for July through September is 92.1%, while the composite compliance rate is 95.4% (453/475). The composite score in November is 97.0%. The defects are seen with pneumococcal and influenza vaccination.

The Surgical Care All Care Measure score for July through September is 91.9%, while the composite compliance rate is 98.4% (3221/3273). The composite score in November is 98.6% (960/974).

Specific Issues – A meeting was held in March 2011, under the direction of the Vice President for Clinical Effectiveness and Quality, with key physician leaders and administration to review low performance measures, to ensure proper teams are in place, and to develop a plan to address any improvement opportunities along with a process for accountability.

1) Congestive Heart Failure / Discharge Instructions – Noncompliance is largely due to medication reconciliation. The requirement is for the patient to receive a complete list of medications at discharge. The problem lies with discrepancies between the dictated discharge summary medication list and what is handwritten on the discharge orders. Physician education continues to reinforce the requirement to reconcile the discharge medication list that is provided to the patient with the discharge notes. November 2010 results for CHF Discharge Instructions are holding steady for the prior two months at 92.7% compared to a national average of 87%.

2) Community Acquired Pneumonia / Screening for eligibility to receive the Pneumococcal Vaccine – Noncompliance is largely due to the lack of access to records in the ambulatory setting. This vaccine should be given to patients in certain risk groups at least once. Our plan is to continue to educate and also to develop a concurrent variance report that would be sent to nursing leadership for any case that continues to ‘fall out’. Recent data for pneumococcal screening and vaccination has shown a rebound from 79% in October 2010 to 96.2% in November 2010 across the system compared to a national average of 92%. A similar rebound was seen with the Influenza screening and vaccination in November. System-wide compliance rate rose to 94.1% in November 2010. A workgroup that included nurses from the units met and assembled a list of recommendations such as 1) implementing a process at discharge to verify vaccination measures are complete, enforcing vaccination status as part of the handoff communication between the ICU’s and the floor units, begin tracking names of individual nurses who are non-compliant and report to nursing management, develop daily alerts in Soarian Clinicals (completed), and develop a concurrent tool and process for communicating to nursing management any patient where the vaccination status has not been completed.

3) SCIP (Surgical Care Improvement Project) / Perioperative Beta Blocker – Greenville Hospital System’s score has reached a 100% compliance in November 2010 for the second time since tracking this measure in 2007 compared to a national average of 92%. In addition to previous
action steps the Perioperative Beta Blocker has been incorporated as an item on the GHS Surgery Safety Checklist that was implemented across the system in November 2010.

(4) **SCIP (Surgical Care Improvement Project) / Removal of Urinary Catheter within 2 Days of Surgery**

– The single most important intervention to prevent urinary tract infections is to minimize the use of an indwelling catheter. Catheters are often needed for a short period of time after surgery. *System-wide November 2010 results decreased slightly to 92.0% compared to a national average of 92%. GHS implemented a “device out” initiative in August 2010 that prompts for removal of urinary catheters as soon as possible.*

(5) **Outpatient ED Measure / Patients transferred from an ED to an acute care facility with a diagnosis of AMI or Chest Pain** – Prior to being transferred from one of our Emergency Rooms to another acute care facility a patient must receive at least one dose of Aspirin if they have a diagnosis of possible Chest Pain Heart Attack. During August 2010 our compliance rate has been approximately 89.0% compared to a national average of 95%; however, *in November 2010 GHS had one miss (97.1%) for this measure after the implementation of the following three recommendations:* a) intensive individual and group education for Emergency physicians and ED nursing, b) build in IBEX (ED electronic medical record) fields that will generate automatic prompts in an effort to hardwire the process, and c) add a prompt to the medication system in the ED that will prompt nursing to administer aspirin if Nitroglycerin was ordered. The plan is to continue to monitor for sustained performance improvement during upcoming months

### 30 Day, All-Cause Mortality Rates

**Background** – We assess mortality rates through two sources. First, CMS reports 30 day, all-cause mortality rates for patients admitted with AMI, CHF, or pneumonia. Second, we are assessing system, facility, and MS-DRG level 30 day, all-cause mortality throughout GHS compared to the Premier HQID database.

**GHS Goal** – A mortality rate index is calculated that represents a risk-adjusted measure of the observed mortality rate divided by the expected mortality rate. Our goal is to have our mortality index be statistically better than expected.

**GHS Results** – Our system wide 30 day, all-cause mortality rate for Apr 10 – Jun 10 is 1.7% and our mortality rate index is 0.63, which is statistically significantly better than expected. Additionally, CMS recently updated the annual mortality rates for all 3 diseases at all 3 acute care hospitals. Our mortality rates are statistically no different than the national average. Note that as the population becomes smaller around a specific disease, it is very difficult to show statistical significance.
GHS Quality Review of Site-Specific 5-Year Cancer Survival Rates

For Standard 2.11 Annual Review of Patient Outcomes
Presented and discussed at Cancer Care Committee Mtg. November 23, 2010
Completed by: Dawn Blackhurst, DrPH

Study Purpose: To compare site-specific 5-year survival data from the GHS Cancer Registry to the most recent data available from the National Cancer Database (NCDB).

Methods: The study included “analytic” cases diagnosed with cancer in 2003. “Analytic” cancer cases are those who were diagnosed or received their first course of treatment at GHS. GHS survival rates were compared to rates from Teaching/ Research Hospitals within the NCDB (n=244 hospitals). Rates were formally compared for statistical significance using 95% confidence intervals. Estimates of the cumulative proportion of patients surviving at 5 years were calculated using the Kaplan-Meier product-limit method.

Results -Comparison of Overall Survival Rates: Overall “combined-stage” GHS 5-year survival rates were comparable (i.e., not significantly different) to NCDB rates for 10 of the 11 cancer sites [See Figure 1]. For bladder cancer GHS had a significantly higher 5-year survival rate than did NCDB (78.1% vs. 62.2%, respectively); however, GHS had a greater proportion of Stage 0 cases (75% vs. 46%), which would explain the GHS survival advantage. For cervical cancer, GHS also had a noticeably higher survival rate (although not statistically significant); this, again, was due to decreased stage at diagnosis for GHS patients (only 8% of GHS patients were diagnosed at Stage III/IV vs. 27% of NCDB patients).

30 Day, All-Cause Readmission Rates

Background – We assess readmission rates through two sources. First, CMS reports 30 day, all-cause readmission rates for patients admitted with AMI, CHF, or pneumonia. Second, we are assessing system, facility, and MS-DRG level 30 day, all-cause readmission throughout GHS compared to the Premier HQID database. A higher than expected readmission rate can be an indicator of poor quality care in the hospital, premature discharge from the hospital, or problems within the ambulatory care delivery system.

GHS Goal – A readmission rate index is typically calculated that represents a risk-adjusted measure of the observed readmission rate divided by the expected readmission rate. Our goal is to have our readmission index be statistically better than expected.

GHS Results – Through its intrinsic nature healthcare data is dynamic and readmission rate can be one of the most variable measures in healthcare systems due to a variety of factors. Certain processes such as completion of a medical record and coding of the care provided during a hospital stay do not occur until after the patient has been discharged from the hospital. A certain amount of time is allowed to
accurately complete both of these processes. Additionally, for an indicator measuring readmission the process must repeat itself whereby the patient is discharged a second time before the readmission chart can be completed and is available for reporting purposes. Electronic data queries will capture a readmission only after the patient has been discharged a second time. Thus if a patient has a long stay in the hospital during his second admission it could potentially be at least several months before the data query will capture and include that patient’s readmission in the data results. For these reasons and now that several consecutive quarterly readmission reports have been produced a fluctuation in our readmission results is evident as the readmission rate is continually updated and ‘new’ patients are captured in the data reports. From this point forward you will notice possible changes in the results for readmission reports since all data results will be updated for each quarter. Our system wide 30 day, all-cause readmission rate for Apr 10 – Jun 10 was previously at 7.4% and our readmission rate index was 0.7; however, our updated readmission rate is 9.1% with an index of 0.87. Both the original result and the updated result are statistically significantly better than expected.

Additionally, CMS recently updated the annual readmission rates for all 3 diseases at all 3 acute care hospitals. Our readmission rate for AMI and CHF is statistically lower than expected at Greenville Memorial. Our readmission rates for Pneumonia at GMH and for all 3 diseases at Greer and Hillcrest are statistically no different than the national average. Note that as the population becomes smaller around a specific disease, it is very difficult to show statistical significance. Additionally, as reported elsewhere, U.S. News and World Report has identified Greenville Memorial Hospital as having the 5th lowest overall 30 day readmission rate in the country.

**National Patient Safety Goals**

**Background** – The Joint Commission has established a number of National Patient Safety Goals (NPSG), which are process steps that should be implemented to ensure optimal patient safety. TJC is currently reviewing the recommended NPSGs. NPSGs are not publicly reported and they represent a self audit. Consequently, there is no national comparative data.

The currently reported NPSGs include the following:

- NPSG 1 – The use of two identifiers when providing care, treatment, and services.
- NPSG 2 – The reading back of all verbal (telephone) orders and critical test results.
- UP 01 – The use of the Universal Protocol and Time Out prior to surgical procedures.
- NPSG 8 – The completion of medication reconciliation at admission, transfer, and discharge. TJC is conducting additional work to evaluate the medication reconciliation expectations. They have recently re-established this as a NPSG beginning July 2011.
- The presence of documentation of patient education regarding hand hygiene, respiratory precautions, and contact precautions as appropriate.

TJC included two new NPSG indicators in 2010:

- NPSG 1 - Label laboratory specimens at the bedside.
- NPSG 15 – Identify patients at risk for suicide.

**GHS Goal** – Specific organization wide goals for the NPSGs have not been set, but best practice encourages that they should be carried out 100% of the time. Our goal is 90% or higher.

**GHS Results** – Quarterly results are presented in a graph format in the attachments. Compliance has been stable for the NPSGs. Our current overall compliance rate with NPSGs is 95.8%; historically the rates have ranged from 94-96%.

**Specific Issues**

1. **Medication Reconciliation** – This NPSG has proven to be very difficult across the country. In 2009, TJC put a hold on this NPSG and is not currently scoring it at the time of an accreditation survey. Recently, revisions were announced and this goal will once again be surveyed beginning in July 2011. There was a small improvement shown this quarter related to the requirement for the list of home medications to be present on the chart and an indication that the home list was compared to the admission orders for discrepancies. If there was a discrepancy noted, was there evidence of physician notification? A plan is in progress to improve this element of performance under the patient safety goal.

2. **Read back of all verbal (telephone) orders and critical test results** - The expectation is that the staff will write down the order or critical test result and will document that the order or critical test result was read back to and validated with the receiving practitioner. This has been identified as a documentation issue. An e-mail was sent out by the Patient Safety Coordinator to all Directors, Managers and Educators of departments who receive critical results with the specific requirements of the patient safety goal and GHS policy attached. Managers were instructed to review the requirements with all staff and to print and post the requirements for unit staff. The rate for the third quarter of 2010 is now 97.1%.

3. **Safety / Patient Education** – This was removed as a separate NPSG but remains a part of NPSG #7. It involves the need to educate patients and families on specific methods to prevent the transmission of infections, including appropriate hand hygiene and infection control precautions when patients are placed in various isolation modes (respiratory, contact, etc.). The rate remains unchanged and is a result of documentation in the nursing plan of care. Fluctuation of this rate may be anticipated, with a drop in the rate following hand hygiene and flu education by Infection Preventionists. A plan is in progress to improve this element of performance under the patient safety goal.

**AHRQ Patient Safety Culture Survey**

**Background** – Key to Patient Safety is the development of an organization wide culture of safety. This is best measured using the AHRQ Patient Safety Culture Survey tool with standardized results and benchmarks. The results of our survey were previously reported, but opportunities existed in the areas of improving communication and teamwork across units and the creation of a “Just Culture”.

6
**GHS Goal** – For FY 2010, our GHS organization wide goal for the AHRQ Patient Safety Culture was to be in the top quartile using a rolled up measure of the entire survey tool by the fourth quarter of FY 2010. We have approximated the ~82nd percentile as the half way point between the 75th and 90th percentiles. We have kept the same goal for FY 2011.

1. < 50th percentile < 61.00% or lower  
2. 50th to 74th percentile 61.00% to 66.99%  
3. 75th to ~82nd percentile 67.00% to 68.99%  
4. ~82nd to 90th percentile 69.00% to 70.99%  
5. > 90th percentile 71.00% or higher

**GHS Results** – In December 2008, GHS took the survey for the first time. Across GHS, we had a response rate of 55.2% and an overall score of 59.8%. In April 2010, an interim survey was administered. Across GHS, we had a response rate of 30.3% and an overall score of 61.7%, which is a statistically significant improvement.

The final survey for the year was conducted from August 15th though September 5th, 2010. E-mails were sent to participants with a link to take the survey. A total of 5,996 e-mails were sent within GHS and 2,138 were returned for a response rate of 35.7%. The overall composite score showed a statistically significant improvement from baseline to 62.4%. This approximates the 57th percentile nationally. While this is lower than our target of 67%, it represents a 4.3% improvement in score. For comparative purposes, the national mean is 62%, median is 61%, 75th percentile is 67%, and maximum is 85%.

Additionally, the survey asks the respondent to give a patient safety grade to their unit on a 5 point scale. Our baseline “top box” score of “excellent” was 26.3% and improved 15.2% to a current score of 30.3%. This places GHS in the top 75th percentile nationally on this important measure.

There are 12 domains.
- We had a statistically significant improvement in 6 domains, an insignificant increase in 3 domains, and an insignificant drop in 3 domains.
- North Greenville, Greer, and Hillcrest have made significant improvements from baseline and Patewood continues to do extremely well.
- We do well in terms of (1) teamwork within units; (2) the perception of management support for safety; and (3) supervisor and management expectations and actions.
- We continue to have opportunities with (1) the perception of a punitive culture; (2) handoffs and transitions; and (3) teamwork across units.

**Specific Issues**

1. Numerous initiatives are in various stages, working towards continuous improvement in the culture of quality and safety ...
   a. Establishing an organization wide goal in safety culture is critical.
b. Commitment to Excellence is a key driver of a Patient Safety Culture.
c. The Hand Hygiene campaign is a major initiative demonstrating safety.
d. Efforts to improve the electronic reporting of adverse events.
e. Nursing efforts to improve patient falls and pressure ulcer prevention as part of the Nursing Magnet application.
f. Work with Clemson University on:
   i. The development of a human factors based root cause analysis of adverse events and near misses.
   ii. The development of a methodology to assess failure points for high risk medication delivery.
   iii. The implementation of Crew Resource Management methods to improve teamwork in Labor and Delivery.
g. Unit-level Nurse Manager/Medical Director in place across GHS.
h. Recent focus on Safety and Culture in the View (after the April survey) and in Town Halls, (both after the April survey).
i. Nursing presentations about just culture are available and have been provided.
j. Dr. Bob Wachter, one of the nation’s premier experts in patient safety, spent a day at GHS on September 30th. He presented 4 lectures at GMH which were also teleconferenced to the outlying facilities, on safety and spent time specifically with our Vice Chairs of Quality.

(2) Further initiatives being planned ...
   a. Quality Management is developing a toolkit to address specific issues and topics.
   b. A TeamSTEPPS (teamwork and communication) program is being developed and will be available to units soon. The NICU medical leadership has expressed interest in this as soon as it is developed.
   c. We are partnering through PHLIP with Harvard (CRICO/RMF) to categorize our malpractice risk cases and identify any continuing opportunities.
   d. GHS joined University HealthSystem Consortium’s (UHC) Patient Safety Organization (PSO) to submit quality data and analyze it for opportunities for improvement.

**Event Reporting**

**Background** – Critical to the ability to improve quality and prevent adverse events is the need to identify errors and near misses, analyze and understand opportunities for improvement, and implement targeted improvement initiatives. In 2009, GHS implemented an electronic occurrence reporting system. All staff are required to report near misses and adverse events through an on-line system. Reporting tools provide a mechanism to identify, catalogue and analyze health care errors which can then be systematically corrected to improve outcomes and prevent patient injury. Such reporting tools should also be used to report events that are “near misses” or that reveal patient safety concerns. Unfortunately, we know from the literature that in a typical hospital, only 5 to 10% of the errors are reported. If this is true, assessment of errors is being done with 90-95% of the puzzle missing! Without
this additional information, we lack the ability to accurately identify trends and to proactively isolate and solve problems and system issues. GHS tracks reported events by frequency, severity (potential or actual injury to the patient), and type (falls, medication events, anesthesia events, etc.).

**GHS Goal** – The current goal is set at the 75th percentile of Event Reporting compared to comparable size hospitals in the UHC database. Thus, the goal is for the Event Reporting Rate is to be at or above 40.18 reports per 1000 patient days for each of our facilities.

**GHS Results** – Current results are through December, 2010.

**Frequency** - In the past, there has been significant underreporting, particularly of near misses, good catches, and safety concerns. We continue to educate staff and physicians about the importance of reporting and how the information is used to improve patient care. Some progress has been made in increasing reporting of events. The Event Reporting Rate for December 2010 was 18.6 per 1000 patient days, up from 16.47 at the end of 3QTR10; although still lower than 19.2 in 2QTR10. As a system, GHS continues to be below the UHC 75th percentile of 40.18 per 1000 patient days. Patewood, North Greenville and Hillcrest have remained above the 75th percentile in reporting frequency for CY10.

**Severity** – Through December, 2010, the rate of events with moderate to severe injury remained a small percent of the total reports and is in line with prior months.

**Type** – The rate of reporting of patient falls has remained stable. For 4QTR10, a reduction in accidents reported is attributable to emphasis on categorizing falls in the appropriate event category (falls rather than accidents) and to education of staff. A reduction in Laboratory/Pathology events and an increase in clinical process events were again noted this quarter. One equipment event caused a rise in that event category. Departmental education provided lift to reporting in OB/GYN and anesthesia related events.

**Specific Issues** – Appropriate reporting of events continues to be a challenge. GHS converted to a different event reporting system, UHC Patient Safety Net® (PSN) on 12/29/10. Staff training is underway including how to use the system, what to report, and the benefit of reporting. Training is also being conducted for managers regarding use of the system to review and manage event reports for their clinical areas. Physician training is being developed. It is anticipated that the PSN system will improve event reporting capabilities significantly, although there may be a temporary decrease in reporting due to the change in technology. PSN represents a significant improvement in reporting capability over the previous software and allows us to participate in the UHC Patient Safety Organization (PSO).
Infection Prevention

**Background** – GHS has a comprehensive Infection Prevention and Control Program which encompass prevention and control practices, targeted ongoing infection surveillance, and process improvement to minimize infection risk. Targeted healthcare associated infections are also publicly reported in South Carolina and are displayed on the SC DHEC web-site. For 2010 / 2011, top priorities continue to include, hand hygiene, central line associated bloodstream infection (CLABSI), ventilator-associated pneumonia (VAP), surgical site infections (SSI), and multi-drug resistant organisms (MDRO). Physician led, collaborative teams are established to reduce infection risk. This report does not reflect all of the surveillance and work of the Infection prevention program, but focuses on the top priorities. Neither North Greenville Long Term Acute Care Hospital data nor detailed Newborn / Neonatal Intensive Care Unit (NBICU) data are included in this report, but will be added in the future reports as this is developed.

**GHS Goal** – Strive to eliminate infections. Infection rate targets are established annually to promote continuous improvement. The benchmark is typically obtained from the National Healthcare Safety Network (NHSN), a national surveillance program sponsored by the CDC, in which GHS participates. There are no national benchmarks for hand hygiene and multi-drug resistant organisms. Targets were established for these infections based on internal data.

**Hand Hygiene**

**Background** – Hand Hygiene remains the hallmark of infection prevention and was identified as a GHS organization wide goal for FY 2010. Compliance rates around the country typically run around 30% to 70%. There are no national benchmarks, but the literature suggests a critical target of 90% compliance. Dr. Kevin Gilroy leads the hand hygiene improvement team.

**GHS Goal** – Our three year goal is to reach 90% compliance rates for both before and after patient care. Our targets for FY 2010 are set at 70% and have increased to 80% in FY 2011.

1. < 70% or lower  
2. 70% to 79%  
3. 80% to 89%  
4. 90% to 94%  
5. 95% or higher

**GHS Results** – During 2009, Infection Prevention undertook a validation survey involving direct observations of staff and physician hand hygiene compliance that is unknown to the individual being observed. The validation survey confirmed that hand hygiene compliance was lower than previously reported at 53.8%. This number reflects a weighted average for each facility based on the number of discharges. In January 2010, dedicated personnel began monitoring for hand hygiene using a direct observation method strongly suggested by the World Health Organization (WHO). Weighted hand hygiene rates have been steadily increasing and have plateaued at 84-86% compliance during April to
In February 2011, compliance held stable at 89.5%. This is a statistically significant increase over baseline. The data indicates that healthcare providers clean hands most frequently after patient body fluid contact and less frequently before aseptic procedures and before touching the patient. Nursing staff (nurses and technicians) are more likely to clean hands than other healthcare provider groups. We are preparing to transition to an electronic form of monitoring in the near future.

Specific Issues – During 2010, a committee led by Dr. Kevin Gilroy and Dr. Bill Kelly implemented an action plan which includes a marketing campaign, focus group work, and continued monitoring and education. During this year, the focus has been on development of a communications plan in collaboration with media relations and a continued assessment of focus group findings with follow-up as indicated. A significant focus group finding was that front line staff and physicians are not yet comfortable communicating with each other about hand hygiene compliance. The focus groups noted that there is increased attention to the importance of hand hygiene by the organization as evidenced by more hand hygiene dispensers being placed, the CEO discussing the subject in orientation and the slogan campaign. “Germ Warfare – Join the Battle” Is the New Hand Hygiene Slogan: On July 29, GHS announced the winner of the hand hygiene campaign slogan contest: charge nurse Angela McElroy, R.N., 5D Oncology/GMH. The campaign’s purpose is to reduce hospital-acquired infection rates and save lives. A video contest followed which led to the announcement of a winning video during October, 2010. The video was developed by NG LTACH and is available on the GHS intranet for staff to view. Further actions include placement of additional hand hygiene dispensers, revision of the hand hygiene procedure, and the initiation of hand hygiene education revision / planning. A GHS hand hygiene advisory committee with front-line staff representation from the 5 GHS campuses had begun to meet and is focusing on how to communicate with each other about hand hygiene practice. GHS is currently collaborating with Deb International to conduct hand hygiene research and beta test an electronic method for monitoring hand hygiene. An initial research paper has been accepted for publication by the American Journal of Infection Control (AJIC). The research will be in the February 2011 issue of AJIC. Beta testing of the electronic monitoring process has been initiated on the GMH campus during the second quarter and will be spread to other sites during the rest of the year.

Comment on measurement methodology: There are several potential ways to measure hand hygiene compliance. The classic method is to use “secret shoppers” unknown to the healthcare workers. Because these observers cannot necessarily observe care in the patient’s room, they usually are limited to measuring hand hygiene only when the healthcare worker enters and leaves the room. This is the methodology used by Novant when it was able to achieve a 90% compliance rate over 3 years. It also is the methodology we used to identify the baseline of 53.8% compliance in June to September 2009.

A second method is to have the observer introduce themselves to the healthcare worker and follow them into the room. We are currently using this method, but applying it to the World Health Organization’s more stringent criteria around the “5 moments of hand hygiene”. We believe the 5 moments are more scientifically based and important as we have documented the known transmission of infection to patients from bacteria present in their environment in their room. Washing hands only on entry and exit from the room will not prevent these episodes of infection. The down side to this
method is its complexity and the introduction of the Hawthorne Effect, i.e. compliance increases when the healthcare worker knows they are being observed. Thus, the two methods are both valid, but likely will deliver different compliance rates. A critical factor is to measure consistently.

At GHS, we are engaged in a significant research study around hand hygiene compliance. We have identified the Hawthorne Effect, but have also identified that it is not complete. That is, even with this method, we still have a 10% noncompliance rate. Nationally, there is a trend towards the second method of observation, although the 5 moments of hand hygiene are often not rigorously used.

The research being performed here centers around an electronic method to identify the number of times a healthcare worker uses hand gel or soap during a patient encounter. We have developed statistical models to identify the average number of opportunities a healthcare worker should clean their hands based on the WHO 5 moments of hand hygiene during a patient encounter. Thus, the combination of use of hand cleansing agent (numerator) divided by the expected opportunities for hand cleansing (denominator) provides us with an index to measure hand hygiene in real time and across many different units every shift. We are in the process of doing validation studies to see how the various methods correlate mathematically.

The key take away is that none of the methods is capable of determining the actual compliance rate across the organization. Thus, the absolute compliance rate is not as important as the trend towards increased compliance and the consistency and validity of the measurement methodology.

**Surgical Site Infections (SSIs)**

**Background** – We track a number of surgical site infection rates that are publicly reported on the DHEC website. The data in this report is presented in terms of the Standardized Infection Ratio (SIR), which is a statistical ratio of the observed infection rate divided by the expected infection rate. To meet the goal, the confidence intervals of each SIR must cross 1.0. SIRs above 1.0 demonstrate a worse than targeted infection rate, while those below 1.0 are better than targeted.

**GHS Goal** – We have historically set our goals at the NHSN mean, but as this target is reached, we will be increasing our goal to the 75th percentile and then higher as we improve. Additionally the Surgical Infection Prevention Process (SIP) measures goal is to achieve a score greater than 92% (integrated into the All Care Measures).

**GHS Results** – From January 2008 to June 2010, 6 of the 10 surgery types had standardized infection ratios (SIR) less than 1.0 (e.g. observed number of infections was significantly lower than expected); these were colon resection, bariatric surgery, small bowel surgery, gastric surgery, ventral hernia repair and C-section. Three surgery types -- coronary bypass grafting (CABG), abdominal hysterectomy and knee replacement -- had SIRs >1.0, but were not statistically significantly higher than expected. The hip replacement SIR was significantly higher than expected due to a cluster of infections at GMH in Jan. ’10. Investigation of this cluster found no common source of infection; however, process measures were
implemented and infections were reduced. Overall, of the 10 NHSN surgery sites being monitored, there were a total of 67 SSIs; this is significantly lower than our expected number of 107 SSIs.

Surgical Infection Prevention process measures, including appropriate antibiotic prophylaxis, appropriate hair removal, glucose control in CABG patients, and normothermia in colon resection patients, all have compliance rates consistently higher than 92%.

**Specific Issues** – When an increased SSI rate was first noted in CABG patients, an investigation was undertaken, process changes were made, and subsequently the CABG SSI rate stabilized. This team is being led by Dr. Doug Appleby.

In 2009, a cluster of Hip Replacement infections occurred on the Greer campus; investigation revealed an Operating Room ventilation issue. Several orthopedic surgeons have been involved including Dr. Brian Burnikel, Vice Chair of Quality in Orthopedics. MRSA screening of all hip and knee joint patients is being implemented and there is a specific focus on getting Foley catheters out by the second day.

**Central Line-Associated Bloodstream Infections (CLABSI)**

**Background** – Historically, CLABSI rates at GMH have been significantly higher than the NHSN mean on many units. This past year, the CLABSI Elimination team was reformed under the leadership of Dr. Bill Curran. The focus was initially on the Medical – Surgical ICU through the implementation of a variety of interventions. The intent is to extend the improvements to other units across the system. We have partnered with the South Carolina Hospital Association in the Stop BSI initiative working with Dr. Peter Pronovost at Johns Hopkins, a national expert in CLABSI prevention.

**GHS Goal** – We have historically set our goals at the NHSN mean, but as this target is reached, we will be increasing our goal to the 75th percentile and then higher as we improve. Ultimately, the goal is to eliminate all CLABSI infections. The NHSN mean for the Adult ICU is 2.1 / 1000 central line days, for the Adult Non-ICU is 1.8 / 1000 central line days, and for the Pediatric ICU is 2.9 / 1000 central line days.

**GHS Results** – The data in this report is presented in quarterly CLABSI rates for GHS wide adult care areas. The collaborative efforts of the ICU and Non-ICU CLABSI Elimination teams have led to a continued reduction in the Adult CLABSI rate. Actions taken include a major education effort and timely communication about CLABSIs to nursing unit leadership (so that defect analysis can be performed for each CLABSI).

Data are presented through September 2010.

- Greer Memorial, Hillcrest Memorial and Patewood Memorial had CLABSI rates of 0 for both ICU and non-ICU.
- The GHS adult CLABSI rate increased slightly the 3rd quarter of 2010 as reflected by a rate of 1.99/1000 central lines days compared to the previous quarter when the rate was 1.77/1000
central line days during the 2nd quarter of 2010. Several GMH ICU units have gone many months without a CLABSI.

- For January – June 2010, an estimated 53 CLABSIs has been prevented, between 5 to 10 lives have been saved and approximately 2 million dollars in cost savings have been experienced.

**Ventilator-Associated Pneumonia (VAP)**

**Background** – Significant effort has been underway to eliminate ventilator associated pneumonias. The VAP Process Improvement Team led by Dr. Armin Meyer, modified the oral hygiene procedure to include the use of CHG. The expanded use of the CASS tube (continuous aspiration of subglottic secretions), head of bed elevation focus and extensive education has led to significant VAP rate improvement. The data presented is in terms of actual infections per 1000 ventilator days.

**GHS Goal** – The NHSN mean for the Adult ICU is 3.8 / 1000 ventilator days and the Pediatric ICU the goal is 1.8/ 1000 ventilator days.

**GHS Results** – Data are presented through September 2010.

- Greer Memorial, Hillcrest Memorial and Patewood Memorial zero VAP.
- The ICU VAP rate for GMH ICUs was 2.77 for 2009 and Jan-September 2010 has been reduced to 1.22; this is below the mean target of 3.8 and approaching the top 25th percentile of 0.9. The MSICU and NTICU have each had 3 VAPS since January, and both the CV-ICU and CCU have had zero since January.
- The 2009 Pediatric ICU VAP rate was 1.2 (only 1 infection in 825 ventilator days) and thus far in 2010 (Jan-August there have zero VAPS (target 1.8).

**Multi-Drug Resistant Organisms**

**Background** – Multi-drug resistant organisms are bacteria that have mutated over time to become resistant to most antibiotics. They primarily include Methicillin Resistant Staphylococcus Aureus (MRSA), Vancomycin Resistant Enterococcus (VRE), and Clostridium Difficile. Individuals can be colonized with the bacteria, meaning that the bacteria are present, but not causing an infection. The bacteria can also cause very serious, life-threatening infections. We are seeing more individuals come into the hospital already colonized with the bacteria. Generally, it is very difficult to get rid of this colonization. No national benchmarks for incidence of new infections are available.

Throughout 2009, we have been implementing MRSA PCR (polymerase chain reaction) testing, which allows us to rapidly determine patients who are colonized with the bacteria. All patients admitted to GMH and NGH are being PCR tested as of November 1, 2009. This screening facilitates the placement of patients with MRSA colonization into contact precautions to prevent transmission to other patients. Patients with a history of MRSA whose PCR screening was negative are taken out of precautions.
**GHS Goal** – Goals have been established based on GHS historical data. We are collecting MRSA baseline data as previously, both colonization and infections were combined. The goal set for Clostridium Difficile is <0.7 infections / 1000 patient days.

**GHS Results** – Data are presented through November 2010.

- Approximately 13% of patients admitted to GMH were found to be MRSA PCR positive.
- Trends for both MRSA colonization and infection are going down, but show some variability.
- The Clostridium Difficile rate for January- September 2010 was 0.49/1000 patient days which is lower than the 2009 rate of 0.66 / 1000 patient days.