For clinical areas that are not included in national databases, explain how benchmarks and nursing-sensitive measures are selected, implemented, and evaluated by nurses at the organizational, departmental, and unit levels to improve patient outcomes.

As the science of nursing-sensitive indicators and the availability of national databases evolve, so do the decisions about measurement selection and benchmarking. Nursing leaders at the organizational, departmental and unit level are involved in and critical to these decisions. The approaches taken at Massachusetts General Hospital (MGH) include the utilization of state databases, benchmarking within our hospital system (i.e. Partners HealthCare Hospitals) and measuring against internal targets. The examples provided demonstrate ongoing decisions about nursing-sensitive measures that include nurses at various levels of the organization.

MGH submits data to the Commonwealth of Massachusetts Department of Mental Health pertaining to treatment of psychiatric inpatients, specific to the use of restraints and seclusion. This submission is required for all hospitals in the state with licensed psychiatric beds. Data are submitted for:
- Number of admissions and hours of service
- Episodes of restraint/seclusion
- Episode hours
- Long duration episodes

The monthly reports summarize the data for Total Hours per Episode, Total Episodes per 1000 Patient Days, Total Hours per Patient Days, and Number of Individuals Restrained/Secluded per 1000 Patient Days. Hospitals receive reports that present each hospital’s performance as compared to the benchmark or mean for all psychiatric facilities in the state. MGH has consistently demonstrated favorable comparative performance.

In 2004, the National Database of Nursing Quality Indicators (NDNQI) began to offer indicators for psychiatric units. The Nursing Director and Clinical Nurse Specialist for the psychiatry unit reviewed the indicators and data collection guidelines. Due to MGH’s state reporting requirements, they recommended that MGH not participate in the NDNQI indicator submission, a decision supported by the Nursing Executive Operations Committee.

However, in 2007, the psychiatry unit began participating in a JCAHO sponsored voluntary pilot that includes data for restraint and seclusion (attachment 7.6.a). The purpose of the pilot is to assist in refining the tools and systems for data collection and eventually required data submission to JCAHO. The medical and nursing leaders of the psychiatry unit collaborated on this decision to
participate, which was made in part on the ability to impact the final measure set. The results, solutions and challenges realized during the pilot will be shared at the end of the project. Once the measures are adopted by JCAHO, there will be systems to provide feedback to the participating units. Moreover results will offer a national benchmark to help ensure quality care.

The Massachusetts Hospital Association and the Massachusetts Organization of Nurse Executives (MHA/MONE) sponsor a voluntary survey of nursing for all hospitals in the state. Several years ago, the Chief Nurse and Nursing Executive Operations decided that MGH would participate. Data is now submitted yearly in January. The data requested is extensive and includes:

- Filled and vacant positions (RN, LPN, PCA)
- RN turnover (experienced and new graduate)
- Reasons for departure
- Severity of nursing shortage by unit type and shift
- Strategies used for retention and recruitment
- Outreach programs and management practices
- Nursing sensitive quality measures in place
- Systems used to quantify nursing care needs

Reports are distributed in the fall of each year containing the state-wide findings, which allow for comparison of MGH data for RN vacancy and turnover. This benchmark is particularly valuable because the state and regional rates for these two indicators have consistently been lower than national rates, making the state benchmark more applicable in evaluating for quality performance. The benchmark data is also more timely than the national rates published by the ANA. The new MGH quality dashboard will include RN vacancy and turnover and will use the state MHA/MONE survey means as benchmarks.

MGH participates in NDNQI for submission of nursing hours per patient day for 30 inpatient units, but not for psychiatry, pediatrics or obstetrics. Since 2006, MGH has been providing data for 35 inpatient units, including psychiatry and pediatric units, and the emergency department to the state for the Patients First Initiative. This data provides for comparisons with similar types of units throughout the state. The decision for MGH to participate involved the hospital’s CEO/President and Chief Nurse committing to participate to the overall program and goals. Nursing executive leadership then encouraged MGH participation in pilots that established the model for public posting of unit staffing plans and selected outcome measurements. Nursing
leaders from the PCS Office of Quality and Safety, Patient Care Services Financial Management Systems, and Patient Care Services Information Systems played key roles in these pilots, impacting the decisions around final data submission. As the project evolved, all acute-care hospitals in the state pledged participation, which has resulted in a large and public database.

As described previously, use of the QuadraMed® AcuityPlus™ Productivity, Benchmarking and Outcomes System provides a measure of Hours Per Workload Index (HPWI), an indicator that includes a measure of staffing in a ratio with census and acuity (OOD 15). Each year data is submitted for actual annual staffing utilization to QuadraMed® and MGH receives a summary report of performance in comparison to other participating hospitals (attachment 7.6.b). Although there are a limited number of comparatively sized hospitals in the sample, it does provide valuable information regarding our patient needs (high census and high acuity) and productivity (comparative HPWI).

Due to a lack of models, databases and benchmarks for atypical units, PCS is focused on developing workload/productivity measures for these procedural or nontraditional areas for internal use. In developing these internal measurements, both a measures of volume, such as procedure count (e.g. surgical cases in the operating room), and intensity of direct care resources required for care (e.g. number of Staff Nurses and Surgical Technicians for a specified number of case minutes) are included. These two concepts are combined to create a relative value unit (RVU) or measurement to represent care needs. In this model, workload increases and decreases in response to either volume or intensity of staffing needs.

Workload/productivity targets for internally developed systems are determined primarily on the budgeted number procedures and the associated direct care staff hours. Monitoring these parameters by month provides an internal trend that can help to justify the need for additional resources. Associate Chief Nurses and unit Nursing Directors are always involved in the development process to ensure an accurate account of staff and workload parameters. An April 2007 report for Dialysis Nursing is included as an example in attachment 7.6.c. To date, workload/productivity measures have been developed for the Main Operating Room, the Pre Admission Testing Area, Dialysis, Endoscopy, Intravenous Therapy, and the Health Professions (e.g. Occupational Therapy, Physical Therapy, Respiratory Therapy). A model for the outpatient infusion unit is currently in development.

MGH has monitored inpatient length of stay (LOS) by service for many years. This is based on a patient’s entire stay in the hospital. In 2004, the Department of Nursing began to monitor
unit-based LOS because of its focus on capacity management and requests from nursing leaders to have data regarding patient turnover. In addition, other non-inpatient areas, such as the Emergency Department, the Pre-Admission Testing Area (PATA), the Post Anesthesia Care Units (PACU), also measure LOS as an indicator linked to capacity management and throughput. Each area’s Nursing Director participated in the decision to monitor this indicator, and in some areas like PATA, ensure that the data is actually collected to support ongoing reporting. These LOS metrics do not have external benchmarks, but are felt to be valuable for internal trending. A graph of PACU LOS that was used as part of the FY 2008 budget justification process is provided as attachment 7.6.d. This data played a significant role in obtaining additional full time equivalents (FTEs) for FY 2008, when the predicted number of budgeted surgical cases reflected no growth. Because LOS had increased in the PACU, additional staff was requested to assist in increasing throughput. Even in the absence of external benchmarks, a trend of increasing LOS in most areas is seen as unfavorable and therefore an important indicator to measure to ensure adequate organizational capacity.

At times we have developed indicators and goals for performance without the benefit of an external comparison, only to adjust the goals once a more meaningful target becomes available. Hand hygiene is an example of this process. Hand hygiene is considered the single most important measure for preventing nosocomial infections. The purpose of hand hygiene for routine patient care is to reduce microbial contamination acquired by recent contact with patients or environmental surfaces. Hand hygiene includes both disinfection with an alcohol-based, waterless hand rub and hand washing with soap and water followed by alcohol-based hand rub.

Hand hygiene improvement efforts began at MGH in 2000 with the introduction of a waterless alcohol-based hand hygiene product and the concurrent creation of a multidisciplinary Hand Hygiene Task Force. The task force initiated periodic surveillance of compliance to good hand hygiene practice on a random sample of patient care units, and educated staff regarding the use of the waterless product. A poster campaign aimed at raising staff awareness was also initiated.

Expanded surveillance began in January of 2003. Surveillance expanded to weekly observations with varied times, including off-shifts and weekends. Hand hygiene both for before and after patient contact is assessed. Overall compliance rates are reported quarterly to the Infection Control Committee and Nursing Quality Assurance group. In addition, individual unit-based reports are given to Nursing Directors by their unit-based Infection Control Nurses. Unit-based reports allow unit staff to compare their results over time and to compare themselves to the overall hospital rate and to the overall rate of a “cluster” of similar units into which they are grouped.
Initial targets, developed by the Infection Control Unit, were conservative and based on a desire for modest improvements (i.e. 50% before patient contact; 80% after patient contact). Compliance rates increased and in 2005 the performance targets were revised to include a more aggressive “before contact” goal (i.e. 80% before patient contact; 80% after patient contact). When the JCAHO called for a compliance rate of 90% before patient contact and 90% after patient contact, the MGH performance targets were again revised.

Staff Nurses involved in direct care activities are becoming more involved in decisions about measuring performance and comparing quality outcomes. The MGH 2003 Magnet application included the example of the Staff Nurse Sheath Removal Team on Ellison 11, the cardiac access unit, and the quality improvement study designed to analyze the timeliness and any potential complications associated with the RN sheath removers. The results of the study showed that trained Staff Nurses were able to perform the sheath removal procedure on an average of 25 minutes sooner than advanced practice clinicians, and with no differences in complication rates.

Qualified Staff Nurses on designated cardiac units continue to remove arterial and venous sheaths placed in the Cardiac Catheterization Laboratory for diagnostic and/or interventional procedures. The team also continues to improve practice by reviewing quality data annually. One month a year, the team collects data on complication rates for all the procedures performed within that month. Data obtained are compared to published findings to examine their internal trends or to identify practice variations and potential opportunities for improvements.

The Staff Nurse members of the Sheath Removal Team recently became concerned about the increased use of devices (e.g. Angioseal or Starclose) for arteriotomy closures. The traditional method involves the clinician waiting for the patient’s bleeding times to come into a predetermined range prior to manually pulling the sheath and applying direct pressure on the site for up to ten minutes. Reportedly, the new devices were supposed to reduce the patient’s length of stay, the amount of time on bed rest and risks for complications.

Based on their practice, Staff Nurses removing sheaths on patients did not feel they were seeing the benefits of the new and more expensive devices. In March 2007, the team decided to study the patient outcomes for those patients for which closure devices were used and compare them to patients having sheaths removed using the manual method. Results of the study showed:

- Complications rates were the same for both groups
- Patients on whom devices were used had a slightly higher risk for minor re-bleed
- Length of time on bedrest was the same for both groups
• Cost was higher for the patients using the closure devices

The data was shared with the Physicians from the Cardiac Catheterization Laboratory (attachment 7.6.e). Overall use of the device has decreased and the interdisciplinary team is now developing criteria to determine which patients would benefit most from these newer devices.
JCAHO National Hospital Quality Measures: Hospital-Based Inpatient Psychiatric Services Pilot

Background

After several years of planning, in 1997 JCAHO introduced ORYX. The purpose was to incorporate outcomes and other performance measures into the accreditation process “for supporting quality improvement efforts in Joint Commission accredited organizations and for increasing the value of accreditation.” The rationale was that the use of standardized, evidenced based measures across systems could facilitate easier comparison of data across organizations. The end goal is for “patient decision-making to be based on data.”

Early Implementation of Core and non-core Measures

Early on, the options for measurement were flexible and allowed hospitals to use a wide variety of systems and tools. Eventually, core measures (standardized and evidence-based) were identified to meet ORYX goals and facilitate “organizational process improvement.” Initial measures, which pertained mainly to medical conditions, such as AMI, CHF and Pneumonia, were identified and implemented in 2002. In 2004, hospitals with a certain census level were required to choose and report data on 3 identified core measures, or (if patient population did not support this), some combination of core and non-core measures. At this time, behavioral healthcare entities (among others) were encouraged to use and report on non-core measures, as there were no core measures for behavioral health. JCAHO indicated that core measures for behavioral health would take time to identify, due to a historical lack of consensus in the industry around appropriate measures.

Hospital-Based Inpatient Psychiatric Services: 2007 Test Phase

In 2007 JCAHO will welcome participants from JCAHO accredited psychiatric hospitals (and on a case by case basis, general medical/surgical hospitals that provide inpatient services in a distinct psychiatric unit), to test an initial set of (5) measures for the inpatient, psychiatric setting. The measures listed below were established through a collaboration of JCAHO, the National Association of Psychiatric Health Systems (NAPHS), the National Association of State Mental Health Program Directors (NASMHPD) and the NASMHPD Research Institute, Inc. (NRI), with input provided by the APA and other interested organizations.

- Assessment of violence risk, substance use disorder, trauma and patient strengths completed
- Hours of restraint use
- Hours of seclusion use
- Patients discharged on multiple antipsychotic medications
- Discharge assessment

This pilot will be used to develop a “finalized set of measures” to be implemented broadly in the fall of 2008, as a required part of the accreditation process.
Implementation of Inpatient Psychiatric Services Test Set

JCAHO Expectations and “Promises” for Pilot Project

- Only the psychiatric hospitals may substitute this data for other ORYX reporting data “requirements”. General Medical/surgical hospitals must still submit current, required ORYX data
- Data gathered in the test program will not be made public
- Data gathered in the test program will not be used in the hospital survey process
- Results will be included in ORYX Performance Measurement Reports for internal hospital use only
- 20 sites will be randomly chosen for on-site visits to evaluate processes and systems
- 30-50 hospitals will be selected anonymously to evaluate the integrity of data on a monthly basis
- No investigations or punitive action will result from this pilot
- **Deadline for Notifying JCAHO of Intention to Participate**
  - Preferred: November 30, 2006

Data Submission and Vendor Reporting

- Sites will provide data for a one-year time period, running from January 1, 2007 to December 31, 2007
  - Patient data will be eligible for inclusion at the time of discharge
  - Patients with an exclusive diagnosis for chemical dependency will be excluded from the data
- Data should be submitted to vendors on a quarterly basis, unless a site is chosen as one of the 30-50 hospitals referenced in the section above
- Vendors are still in the process of completing the data collection tools, which should be available shortly.
  - Education on using the tools will be provided
  - Sites may choose to use their current vendors (provided they are JCAHO approved for the pilot) for ORYX reports or choose an alternative option
    - McLean is a vendor for the inpatient psychiatric pilot program
- Vendors will provide quarterly reports similar to those provided with established ORYX measures for other clinical areas.

Test Measure Specifics

1. Assessment of Violence Risk, Substance Use Disorder, Trauma and Patient Strengths Reporting

   **Data Gathering**
   - Quarterly or monthly sampling by age group* (see Appendix below)
   - Sites should report on evidence of assessment of areas referenced above
     - Should include documentation of follow-up questions if a response is positive
     - Documentation can be captured on a number of assessments, including the nursing assessment
     - Assessments and documentation should be completed within 72 hours of admission. Compliance with 72-hour time frame should be reported with the other data elements for this area.
2&3. Restraint and Seclusion Reporting
   • Data Gathering
     o Ratio: Minutes of seclusion/restraint/total inpatient days for all patients
       ▪ Calculations will be performed by vendor.

4. Patients Discharged on Multiple Antipsychotic Medications Reporting
   • Data Gathering
     o JCAHO is currently refiguring the denominator for this metric
       ▪ Sampling is the planned method for data collection *(see Appendix below)*
     o “Multiple” means greater than 1
       ▪ Exceptions include:
         • Cases in which 3 individual medication treatment attempts have failed
         • Cases in which a patient is being transitioned from one antipsychotic medication to another one.

5. Patient Discharge Assessment Reporting
   • Data Gathering
     o Quarterly or monthly sampling by age group * (see Appendix below)
     o JCAHO is looking to see documentation that necessary information in passed onto the next provider of care, following discharge
       ▪ Information can be sent via paper or electronic communication
       ▪ The following information should be included in the communication:
         • Confirmation of appointment with next provider or organization (depending on triage process)
         • Why the patient was admitted
         • Level of care recommendation
         • Medications and doses and rationale for any modifications
         • Final diagnosis.
**Appendix**

*Table 1: Quarterly Sample Size*

<table>
<thead>
<tr>
<th>Average Quarterly Population Size “N”</th>
<th>Minimum Required Sample Size “n”</th>
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<tbody>
<tr>
<td>≥ 800</td>
<td>160</td>
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<tr>
<td>200-799</td>
<td>20% of population size</td>
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<tr>
<td>40-199</td>
<td>40</td>
</tr>
<tr>
<td>&lt;40</td>
<td>100% of population required</td>
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</table>

*Table 2: Monthly Sample Size*

<table>
<thead>
<tr>
<th>Average Monthly Population Size “N”</th>
<th>Minimum Required Sample Size “n”</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 260</td>
<td>52</td>
</tr>
<tr>
<td>62-259</td>
<td>20% of population size</td>
</tr>
<tr>
<td>13-64</td>
<td>13</td>
</tr>
<tr>
<td>&lt;13</td>
<td>100% of population required</td>
</tr>
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Comparison of Hospitals - 500+ Bedsize Teaching Hospitals
2005 QuadraMed Data (Adult Med/Surg Units)

<table>
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<tr>
<th>Metric</th>
<th>Year</th>
<th>Rank</th>
<th>Value</th>
<th>Average</th>
<th>Change</th>
<th>% Change</th>
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<tbody>
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<td>Census</td>
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<td>424.0</td>
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<tr>
<td></td>
<td>2004</td>
<td>4</td>
<td>438.0</td>
<td>235.3</td>
<td>14.0</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>3</td>
<td>438.7</td>
<td>231.2</td>
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<td>Acuity</td>
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<tr>
<td></td>
<td>2004</td>
<td>1</td>
<td>1.66</td>
<td>1.39</td>
<td>0.05</td>
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<tr>
<td></td>
<td>2005</td>
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<td>1.74</td>
<td>1.39</td>
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<td>Workload</td>
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<tr>
<td></td>
<td>2004</td>
<td>1</td>
<td>728.5</td>
<td>327.2</td>
<td>47.2</td>
<td>6.9%</td>
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<tr>
<td></td>
<td>2005</td>
<td>1</td>
<td>763.1</td>
<td>322.1</td>
<td>34.6</td>
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<tr>
<td>HPWI</td>
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<td></td>
<td>2004</td>
<td>21</td>
<td>5.08</td>
<td>5.69</td>
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<tr>
<td></td>
<td>2005</td>
<td>19</td>
<td>5.25</td>
<td>5.62</td>
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<tr>
<td>% RN</td>
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<td>3</td>
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<td>72%</td>
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<tr>
<td></td>
<td>2004</td>
<td>6</td>
<td>77%</td>
<td>69%</td>
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<td>-6.3%</td>
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<tr>
<td></td>
<td>2005</td>
<td>7</td>
<td>75%</td>
<td>71%</td>
<td>(1.6)</td>
<td>-2.1%</td>
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MGH Year-to-Year Comparison

- Census: 2003 - 2005
- Acuity: 2003 - 2005
- Workload: 2003 - 2005
- HPWI: 2003 - 2005
- % RN: 2003 - 2005
## FY07 Workload - Productivity Report

### YTD Performance

<table>
<thead>
<tr>
<th>Category</th>
<th>Mgmt.</th>
<th>Other RN</th>
<th>Support</th>
<th>RN</th>
<th>Non-RN</th>
<th>Total</th>
<th>Direct Care</th>
<th>Direct Care</th>
<th>Other Avg. Hours</th>
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<tbody>
<tr>
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<td>3.0</td>
<td>0.6</td>
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<td>12.7</td>
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<td>22.1</td>
<td>16.9</td>
<td>1.9</td>
<td>13.0%</td>
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<tr>
<td>Variance</td>
<td></td>
<td>0.0</td>
<td>0.6</td>
<td>(2.1)</td>
<td>1.0</td>
<td>(0.4)</td>
<td>(1.1)</td>
<td>(1.1)</td>
<td>7.4%</td>
</tr>
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### YTD: April 07

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<th>Category</th>
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<th>Non-RN</th>
<th>Total</th>
<th>Direct Care</th>
<th>Direct Care</th>
<th>Other Avg. Hours</th>
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<tbody>
<tr>
<td>Actual</td>
<td>1.0</td>
<td>3.0</td>
<td>0.6</td>
<td>14.8</td>
<td>3.2</td>
<td>22.5</td>
<td>18.0</td>
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<td>20.4%</td>
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<tr>
<td>Budget</td>
<td>1.0</td>
<td>3.0</td>
<td>1.2</td>
<td>12.7</td>
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<td>22.1</td>
<td>16.9</td>
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<td>13.0%</td>
</tr>
<tr>
<td>Variance</td>
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<td>0.0</td>
<td>0.6</td>
<td>(2.1)</td>
<td>1.0</td>
<td>(0.4)</td>
<td>(1.1)</td>
<td>(1.1)</td>
<td>7.4%</td>
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### Current Month Performance

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<th>Category</th>
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<th>RN</th>
<th>Non-RN</th>
<th>Total</th>
<th>Direct Care</th>
<th>Direct Care</th>
<th>Other Avg. Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>1.0</td>
<td>3.0</td>
<td>1.8</td>
<td>13.6</td>
<td>2.3</td>
<td>21.7</td>
<td>15.9</td>
<td>1.9</td>
<td>13.9%</td>
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<tr>
<td>Budget</td>
<td>1.0</td>
<td>3.0</td>
<td>1.2</td>
<td>12.7</td>
<td>4.2</td>
<td>22.1</td>
<td>16.9</td>
<td>1.9</td>
<td>13.0%</td>
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<tr>
<td>Variance</td>
<td></td>
<td>0.0</td>
<td>1.9</td>
<td>0.4</td>
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### Monthly Actuals

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<tr>
<th>Month</th>
<th>Mgmt.</th>
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<th>Support</th>
<th>RN</th>
<th>Non-RN</th>
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<th>Direct Care</th>
<th>Direct Care</th>
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</tr>
</thead>
<tbody>
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<td>12.2</td>
<td>3.3</td>
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</tr>
<tr>
<td>Jun-06</td>
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<td>3.0</td>
<td>1.2</td>
<td>13.3</td>
<td>3.2</td>
<td>20.8</td>
<td>16.5</td>
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<td>18.5%</td>
</tr>
<tr>
<td>Jul-06</td>
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<td>3.0</td>
<td>1.4</td>
<td>13.3</td>
<td>3.1</td>
<td>20.8</td>
<td>16.5</td>
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<td>14.5%</td>
</tr>
<tr>
<td>Aug-06</td>
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<td>3.0</td>
<td>1.6</td>
<td>12.4</td>
<td>3.4</td>
<td>20.4</td>
<td>15.8</td>
<td>2.8</td>
<td>21.5%</td>
</tr>
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<td>3.0</td>
<td>1.2</td>
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<td>14.8</td>
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<td>18.0</td>
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<tr>
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<td>3.0</td>
<td>0.7</td>
<td>13.3</td>
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<td>16.5</td>
<td>1.7</td>
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<tr>
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<td>2.7</td>
<td>1.0</td>
<td>14.1</td>
<td>3.1</td>
<td>21.8</td>
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<tr>
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<td>1.3</td>
<td>14.5</td>
<td>3.1</td>
<td>22.9</td>
<td>17.6</td>
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</tr>
<tr>
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<td>1.8</td>
<td>13.9</td>
<td>3.0</td>
<td>22.6</td>
<td>16.9</td>
<td>1.7</td>
<td>11.1%</td>
</tr>
<tr>
<td>Mar-07</td>
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<td>3.0</td>
<td>1.8</td>
<td>13.9</td>
<td>2.8</td>
<td>22.5</td>
<td>16.7</td>
<td>1.9</td>
<td>13.0%</td>
</tr>
<tr>
<td>Apr-07</td>
<td>1.0</td>
<td>3.0</td>
<td>1.8</td>
<td>13.6</td>
<td>2.3</td>
<td>21.7</td>
<td>15.9</td>
<td>1.8</td>
<td>13.9%</td>
</tr>
</tbody>
</table>

### Average Hours per RVU

<table>
<thead>
<tr>
<th>Month</th>
<th>Actual</th>
<th>Budget</th>
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<tbody>
<tr>
<td>May-06</td>
<td>1.00</td>
<td>1.10</td>
</tr>
<tr>
<td>Jun-06</td>
<td>1.10</td>
<td>1.20</td>
</tr>
<tr>
<td>Jul-06</td>
<td>1.20</td>
<td>1.30</td>
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<tr>
<td>Aug-06</td>
<td>1.30</td>
<td>1.40</td>
</tr>
<tr>
<td>Sep-06</td>
<td>1.40</td>
<td>1.50</td>
</tr>
<tr>
<td>Oct-06</td>
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<td></td>
</tr>
<tr>
<td>Nov-06</td>
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<td></td>
</tr>
<tr>
<td>Dec-06</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Jan-07</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Feb-07</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Mar-07</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Apr-07</td>
<td>1.00</td>
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</tr>
</tbody>
</table>
PACU Length of Stay

- FY'05 Q3
- FY'05 Q4
- FY'06 Q1
- FY'06 Q2
- FY'06 Q3
- FY'06 Q4
- FY'07 Q1
- FY'07 Q2

Minutes

165.0
170.0
175.0
180.0
185.0
190.0

138
Closure Device Data

March 2007
Ellison 11
Cardiac Interventional Unit

Purpose of Data Collection

• 1st step to look at nursing practice in care of the patient s/p closure device
• Goal is to maximize patient comfort & safety
• Compare to Manual Pull data
  – Time commitment of sheath team
  – Complication rate
• Prove/Disprove the perception that there are more complications with closure devices and that the benefit of less bedrest is/is not a reality

Demographics

• Consecutive sample
• 67 total closed in 20 days (ave 3/day)
• Male 46, Female 21
• Mean age 63 years
• Average BMI: 29, Range: 18.9-59.2
### Medications

- 22 Patients received Plavix
  - Plavix 600mg: 11 (1 diagnostic)
  - Plavix 300mg: 3
  - Plavix 75mg: 8
- 2b3a: 14 (22%)
- Argatroban: 0
- Angiomax: 1

### Procedure

- Diagnostic Cath 33
- Intervention 26
- Septal closure 7
- IVC filter 1

### Device used

- Angioseal 62
- Starclose 5 (4 KR, 1 JG)
Complication Definitions

- **Hematoma**: Accumulation of blood around the sheath site that appears \( \geq \) size of hockey puck pre or post sheath removal.
  - **Early** = less than 2 hours post-SP
  - **Late** is hematoma after 2 hours. ALSO CONSIDERED A MAJOR REBLEED
- **Minor Re-bleed**: requiring compression by Sheath puller of less than 5 minutes. (Considered capillary or superficial)
- **Major Re-bleed**: requiring more than 5 minutes additional compression, or another person. (Considered arterial.)

Closure device data

<table>
<thead>
<tr>
<th>Complications</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematoma pre:</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Hematoma early:</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Hematoma late:</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Minor bleed:</td>
<td>13</td>
<td>21%</td>
</tr>
<tr>
<td>- epi/lido</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Major bleed:</td>
<td>1</td>
<td>1.5%</td>
</tr>
<tr>
<td>Multiple sticks:</td>
<td>1</td>
<td>1.5%</td>
</tr>
<tr>
<td>Femostop:</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Missing data:</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Complications (% of total sample)

![Graph showing complication rates](chart.png)
• Hematoma Early n=4
  – 2 Starclose
  – 2 Angioseal
• Hematoma Late n=3
  – 3 Angioseal
• Major Bleed n=1
  – Peripheral Int.
  – Starclose
• Minor Bleed n=13
  – Only 3 with 2b3a

Bedrest….

• Average 5.6 hrs
• Range 1-12 hrs (if overnight, said 12 hrs.)
• OOB “on time”: 2-3 hours: 18 (29%)
  – OOB <2 hours: 1 (2%)
  – OOB < 4hrs: 22 (35%)
  – OOB > or = 4 hrs: 39 (63%)
• Missing data n=5

Why was bedrest prolonged?

• Venous Sheath: 14 (36%)
• Ooze/hema/bleed: 14 (36%)
• Awaiting PSA repair: 1 (3%)
• Unknown: 10 (26%)
  – ? Order “may ambulate 4 hours after sheath removal=<7F and not on 2b3a”
  – Some without order
  – ? If on 2b3a may affect decision to get OOB
PTT and Venous Sheaths

- 16 venous sheaths pulled by sheath team (24% of total)
- Size: 6-9 fr
- >1 PTT: 4/16 (25%)
  - 3 drawn a little early per guideline
  - 2 patients recvd 12,000u & 11,000u Heparin respectively

Follow up

- Discharged same or next day: 39 (64%)
  - missing data=6
  - No delays for groin reasons
- No ultrasounds needed