

NEW JERSEY 2006 HOSPITAL PERFORMANCE REPORT

TECHNICAL REPORT: METHODOLOGY

**New Jersey Department of Health and Senior Services
Health Care Quality Assessment
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A. Sources of Hospital Quality Measures and Data

The **New Jersey 2006 Hospital Performance Report** used data based on the measures developed by the Centers for Medicare and Medicaid Services (CMS) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) for reporting on hospital quality. The New Jersey Department of Health and Senior Services (Department) followed the specifications developed by the JCAHO and the CMS, as defined in Section D of this technical report. The **New Jersey 2006 Hospital Performance Report** included information on hospital discharges for the period of January 1, 2005 through December 31, 2005.

The report contains four major changes from previous years. First, in addition to acute myocardial infarction (AMI or heart attack) and pneumonia measures, the Department has added information on congestive heart failure (CHF). Second, the number of published AMI measures has increased from five to seven, and the number of published pneumonia measures has increased from three to six. Third, the report presents the overall scores for each condition at the beginning of the report. This methodology allows consumers and professionals the opportunity to examine performance across measures within a hospital quickly. Finally, hospital reporting has been validated, as discussed in Section C, below.

The report and its methodology have been developed with the guidance of the Department's Quality Improvement Advisory Committee (QIAC). Table 1 lists the measures collected by the Department and an indication as to its inclusion in the report.

Table 1: JCAHO Core Performance Measures and Inclusion in Report

JCAHO Core Performance Measures	Included in Report
<u>Acute Myocardial Infarction (AMI)</u>	
Aspirin at arrival	Included
Aspirin prescribed at discharge	Included
Beta blocker at arrival	Included
Beta blocker prescribed at discharge	Included
ACEI/ARB for LVSD	Included
Smoking cessation advice	Included
Inpatient mortality	Not Included
Time to thrombolysis	Not Included
Thrombolytic agent received within 30 minutes of hospital arrival	Not Included
Time to PCI	Not Included
PCI received within 120 minutes of hospital arrival	Included
<u>Pneumonia</u>	
Oxygenation assessment	Included
Pneumococcal vaccination	Included
Antibiotic timing	Not Included
Initial antibiotic received within 8 hours of arrival	Not Included
Initial antibiotic received within 4 hours of arrival	Included
Initial antibiotic selection for PN immunocompetant ICU patient *	Included
Initial antibiotic selection for PN immunocompetant non-ICU patient *	Included
Blood cultures before antibiotic	Included
Blood cultures within 24 hours **	Not Included
Smoking cessation advice	Included
Influenza vaccination	Not Included
<u>Congestive Heart Failure</u>	
LVF assessment	Included
ACEI/ARB for LVSD	Included
Discharge instructions	Included
Smoking cessation advice	Included

* Because of small sample sizes for ICU patients, these two measures were combined into one measure following the CMS methodology.

** Measure collected beginning with third quarter 2005 discharges.

All New Jersey general acute care hospitals and one specialized heart hospital were required to submit the information for AMI, pneumonia and CHF measures to the Department through their JCAHO vendors on a quarterly basis. Hospitals collected the basic information for each record by abstracting data from patient medical records and administrative databases. The data were transmitted to JCAHO vendors, who processed the data according to algorithms established by the JCAHO to produce scores for each measure. JCAHO vendors then transmitted both the individual patient files and the hospital level information to the Department. The Department summarized the quarterly data and provided a summary report to each hospital for review. The Department also provided each hospital with a summary report for the full twelve months for review.

B. Calculation of Hospital Performance Rates

Calculation of individual rates:

Each rate was determined following the JCAHO methodology outlined in Section D. The rate for each measure was the proportion of times that the hospital provided the appropriate care. Each measure included only those patients who were eligible for that treatment or test. For example, patients with contraindications for aspirin were excluded in the aspirin at arrival and aspirin prescribed at discharge measures. Only hospital rates based on 25 or more eligible cases were published in the report.

Calculation of overall scores:

The overall AMI, pneumonia, and CHF scores for each hospital are summary measures of how well the hospital provided care based on the seven AMI measures, the six pneumonia measures, and the four CHF measures, respectively. In deciding to calculate the summary measures, the Department followed the general approach to reporting hospital performance developed by Rhode Island and Kansas. This method was also used for CMS's Premier Hospital Quality Demonstration Project. It has the advantage of evaluating a hospital by the number of opportunities it had to provide quality care for a specific condition. The overall scores for AMI, pneumonia, and CHF were calculated using the following steps:

- The numerator was the sum of patients who received care and the denominator was the sum of patients who were eligible for care for the condition measures. The results for all measures were included for each hospital, even for hospitals with fewer than 25 cases for a specific measure. As a result, the overall score reflected more data than were publicly reported for the individual scores for low volume hospitals.
- The overall score was calculated as a percentage by dividing the numerator by the denominator.
- Overall scores (as well as individual rates) were reported as whole numbers. When hospitals were presented from high to low overall scores, a more detailed calculation using six decimal places was used.
- Because of the additional measures, the summary scores for AMI and pneumonia are not comparable to previous years. To compare the current year with past year reporting, trend data include AMI and pneumonia summary scores that were based on measures included only in prior reports in addition to the 2006 summary scores.

C. Data Validation

Hospitals have internal processes to check the accuracy of their data collection. The JCAHO has reviewed the accuracy of the vendors' systems for processing the data and calculating the rates as well as conducted a limited study of the accuracy of the abstraction process in a small sample of hospitals.

The CMS reviews the accuracy of the data submitted by hospitals to the federal government for its quality assessment initiatives. Their data validation process examines the abstracted elements of five records per hospital per quarter selected at random from the cases submitted to the CMS for AMI, pneumonia, CHF and surgical infection prevention (SIP)¹ conditions. With assistance from the Healthcare Quality Strategies, Inc. (formerly PRONJ, the Healthcare Quality Improvement Organization of New Jersey), the Department adapted this process to assess the data it received. Validation reports from the first two quarters of 2005 were examined to determine the validity of the data submitted by New Jersey hospitals. The department followed the CMS methodology in calculating 95% confidence intervals for this period, first with all cases and conditions (including SIP) and then, if a hospital failed to meet a certain threshold, another confidence interval was calculated based on a reduced set of measures referred to as starter set measures². The confidence interval had to include or exceed a threshold of 80%, meaning that a hospital was likely to be correct in its reporting of data elements at least 80% of the time. All New Jersey hospitals met this criterion except Southern Ocean County Hospital, which failed to submit data for the first quarter of 2005, so their data were incomplete.

D. Measure Definitions

The definitions for the measures included in this report follow the JCAHO/CMS definitions that were in effect for the reporting period (Specification Manual for National Hospital Quality Measures (SMNHQM) versions 1.01 to 1.03³.

Acute Myocardial Infarction (Heart Attack)

1. **Aspirin at Arrival** – The percentage of AMI patients age 18 or older without contraindications who received aspirin within 24 hours before or after hospital arrival.
 - **Numerator:** The number of AMI patients who received aspirin within 24 hours before or after hospital arrival.
 - **Denominator:** All AMI patients, defined as discharges with an ICD-9 CM Principal Diagnosis Code for AMI, without aspirin contraindications.
 - **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital on day of arrival.

¹ More information on the CMS validation process is available at www.qualitynet.org

² These measures (AMI – aspirin at arrival, aspirin at discharge, beta blocker at arrival, beta blocker at discharge, ACEI/ARB at discharge; Pneumonia – oxygenation assessment, pneumococcal vaccination, antibiotics within 4 hours; CHF – LVF assessment, ACEI/ARB at discharge) represent the original set of measures that hospitals were required to submit to the CMS.

³ Specification manuals can be found at both www.jcaho.org and www.qualitynet.org

- Patients received in transfer from another acute care hospital, including another emergency department.
- Patients discharged on day of arrival.
- Patients who expired on day of arrival.
- Patients who left against medical advice on day of arrival.
- Patients with one or more of the following aspirin contraindications/reasons for not prescribing aspirin documented in the medical record:
 - Active bleeding on arrival or within 24 hours after arrival;
 - Aspirin allergy;
 - Warfarin/Coumadin as pre-arrival medication; or
 - Other reasons documented by physician, nurse practitioner, or physician assistant for not giving aspirin within 24 hours before or after hospital arrival.

2. **Aspirin Prescribed at Discharge** – The percentage of AMI patients 18 years and older without aspirin contraindications who are prescribed aspirin at hospital discharge.
 - **Numerator:** The number of AMI patients who are prescribed aspirin at hospital discharge.
 - **Denominator:** All AMI patients, defined as discharges with an ICD-9 CM Principal Diagnosis Code for AMI, without aspirin contraindications.
 - **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.
 - Patients with one or more of the following aspirin contraindications/reasons for not prescribing aspirin documented in the medical record:
 - Aspirin allergy;
 - Active bleeding on arrival or during hospital stay;
 - Warfarin/Coumadin prescribed at discharge; or
 - Other reasons documented by physician, nurse practitioner, or physician assistant for not prescribing aspirin at discharge.

3. **Beta Blocker at Arrival** – The percentage of AMI patients 18 years and older without beta blocker contraindications who received a beta blocker within 24 hours after hospital arrival.
 - **Numerator:** The number of AMI patients who received a beta blocker within 24 hours after hospital arrival.

- **Denominator:** All AMI patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for AMI, without beta blocker contraindications.
- **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital on day of arrival.
 - Patients received in transfer from another acute care hospital on day of arrival, including another emergency department.
 - Patients discharged on day of arrival.
 - Patients who expired on day of arrival.
 - Patients who left against medical advice on day of arrival.
 - Patients with one or more of the following beta blocker contraindications/reasons for not prescribing a beta blocker documented in the medical record:
 - Beta blocker allergy;
 - Bradycardia (heart rate less than 60 bpm) on arrival or within 24 hours after arrival while not on a beta blocker;
 - Heart failure on arrival or within 24 hours after arrival;
 - Second or third degree heart block on ECG on arrival or within 24 hours after arrival and does not have a pacemaker;
 - Shock on arrival or within 24 hours after arrival;
 - Systolic blood pressure less than 90 mm Hg on arrival or within 24 hours after arrival while not on a beta blocker;
 - Other reasons documented by a physician, nurse practitioner, or physician assistant for not giving a beta blocker within 24 hours after hospital arrival.

4. Beta Blocker Prescribed at Discharge – The percentage of AMI patients 18 years and older without beta blocker contraindications who are prescribed a beta blocker at hospital discharge.

- **Numerator:** The number of AMI patients who are prescribed a beta blocker at hospital discharge.
- **Denominator:** All AMI patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for AMI, without beta blocker contraindications.
- **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.

- Patients with one or more of the following beta blocker contraindications/reasons for not prescribing a beta blocker documented in the medical record:
 - Beta blocker allergy;
 - Bradycardia (heart rate less than 60 bpm) on day of discharge or day prior to discharge while not on a beta blocker;
 - Second or third degree heart block on ECG on arrival or during hospital stay and does not have a pacemaker;
 - Systolic blood pressure less than 90 mm Hg on day of discharge or day prior to discharge while not on a beta blocker; or
 - Other reasons documented by a physician, nurse practitioner, or physician assistant for not prescribing a beta blocker at discharge.
5. **ACEI/ARB for LVSD⁴**– The percentage of AMI patients 18 years and older with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications with documented evidence of a prescription for an ACEI or ARB at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular function (LVF) consistent with moderate or severe systolic dysfunction.
- **Numerator:** The number of AMI patients who are prescribed an ACEI or ARB at hospital discharge.
 - **Denominator:** All AMI patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for AMI, and either chart documentation of a LVEF less than 40% or a narrative description of LVF consistent with moderate or severe systolic dysfunction, without both ACEI and ARB contraindications.
 - **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.
 - Patients with chart documentation of participation in a clinical trial testing alternatives to ACEIs as first-line heart failure therapy⁵.
 - Patients with BOTH a potential contraindications/reason for not prescribing an ACEI at discharge AND a potential

⁴ The definition in previous years only included ACEI. ARB was introduced for January 1, 2005 discharges.

⁵ This item eliminated from the definition beginning with July 1, 2005 discharges.

contraindications/reason for not prescribing an ARB at discharge, as evidence by one or more of the following:

- ACEI allergy AND ARB allergy;
- Moderate or severe aortic stenosis;
- Physician, nurse practitioner, or physician assistant documentation of BOTH a reason for not prescribing an ACEI at discharge AND a reason for not prescribing an ARB at discharge.
- Reason documented by physician, nurse practitioner, or physician assistant for not prescribing an ARB at discharge AND an ACEI allergy.
- Reason documented by physician, nurse practitioner, or physician assistant for not prescribing an ACEI at discharge AND an ARB allergy.

6. Smoking Cessation Advice – The percentage of AMI patients 18 years and older with a history of smoking cigarettes who are given smoking cessation advice or counseling during the hospital stay. For purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival.

- **Numerator:** The number of AMI patients who were cigarette smokers who received smoking cessation advice or counseling during the hospital stay.
- **Denominator:** All AMI patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for AMI, with a history of smoking cigarettes anytime during the year prior to hospital arrival.
- **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.

7. PCI within 120 Minutes of Arrival – The percentage of AMI patients 18 years and older receiving percutaneous coronary intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 120 minutes or less.

- **Numerator:** The number of AMI patients whose time from hospital arrival to PCI is 120 minutes or less.
- **Denominator:** All AMI patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for AMI, with ST segment elevation or left bundle branch block on electrocardiogram who received PCI within 24 hours after hospital arrival.
- **Excluded Populations:**
 - Patients less than 18 years of age.

- Patients received in transfer from another acute care hospital, including another emergency department.
- Patients administered thrombolytic agents.

Pneumonia

1. **Oxygenation Assessment** – The percentage of pneumonia patients 18 years and older who had an assessment of arterial oxygenation by arterial blood gas (ABG) or pulse oximetry within 24 hours prior to or after hospital arrival.
 - **Numerator:** The number of patients whose arterial oxygenation was assessed by ABG or pulse oximetry within 24 hours prior to or after hospital arrival.
 - **Denominator:** All inpatients 18 years and older with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia
 - **Excluded Populations:**
 - Patients received in transfer from another acute care or critical access hospital, including another emergency department.
 - Patients who had no working diagnosis of pneumonia at the time of admission.
 - Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
 - Patients less than 18 years of age.
2. **Pneumococcal Vaccination** – The percentage of pneumonia patients 65 years of age and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated.
 - **Numerator:** The number of pneumonia patients 65 years of age and older who were screened for pneumococcal vaccine status and were vaccinated prior to discharge, if indicated.
 - **Denominator:** All pneumonia patients 65 years of age and older with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia.

- **Excluded Populations:**
 - Patients received in transfer from another acute care or critical access hospital, including another emergency department.
 - Patients who had no working diagnosis of pneumonia at the time of admission.
 - Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
 - Patient who expired in the hospital.
 - Patients who left against medical advice.
 - Patients who were discharged to hospice care.
 - Patients who were transferred to another short-term general hospital for inpatient care.
 - Patients who were discharged to a federal hospital.
 - Patients less than 65 years of age.

- 3. Initial Antibiotic Received Within 4 Hours of Hospital Arrival** – The percentage of pneumonia patients 18 years and older who received their first dose of antibiotics within four hours of arrival at the hospital.
- **Numerator:** The number of pneumonia inpatients whose initial antibiotic dose is administered within four hours of hospital arrival.
 - **Denominator:** All pneumonia inpatients 18 years of age and older with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia.
 - **Excluded Populations:**
 - Patients received in transfer from another acute care or critical access hospital, including another emergency department.
 - Patients who had no working diagnosis of pneumonia at the time of admission.
 - Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
 - Patients who do not receive antibiotics during hospitalization or within 36 hours (2160 minutes) from the time of hospital arrival.
 - Patients who have received antibiotics within 24 hours prior to hospital arrival.
 - Patients less than 18 years of age.

- Patients involved in protocols or clinical trials⁶.

- 4. Blood Cultures Performed Before First Antibiotic Received in Hospital** – The percentage of pneumonia patients 18 years and older whose initial hospital blood culture specimen was collected prior to first hospital dose of antibiotics.
- **Numerator:** The number of pneumonia inpatients whose blood culture was performed prior to the administration of the first hospital dose of antibiotics.
 - **Denominator:** All pneumonia inpatients 18 years and older with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia.
 - **Excluded Populations:**
 - Patients received in transfer from another acute care or critical access hospital, including another emergency department.
 - Patients who had no working diagnosis of pneumonia at the time of admission.
 - Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
 - Patients less than 18 years of age.
 - Patients who do not receive antibiotics or a blood culture.
- 5. Smoking Cessation Advice** – The percentage of pneumonia patients 18 years and older with a history of smoking cigarettes who are given smoking cessation advice or counseling during the hospital stay. For purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival.
- **Numerator:** The number of pneumonia patients who received smoking cessation advice or counseling during the hospital stay.
 - **Denominator:** All pneumonia inpatients 18 years and older with a history of smoking cigarettes anytime prior to hospital arrival with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia.
 - **Excluded Populations:**
 - Patients received in transfer from another hospital’s emergency department.

⁶ Item added beginning with July 1, 2005 discharges.

- Patients who had no working diagnosis of pneumonia at the time of admission.
- Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
- Patients who expired in the hospital.
- Patients who left against medical advice.
- Patients discharged to hospice.
- Patients transferred to a federal hospital.
- Patients transferred to another short-term general hospital for inpatient care.
- Patients less than 18 years of age.

- 6. Initial Antibiotic Selection for Community-Acquired Pneumonia in Immunocompetent Patients** – The percentage of immunocompetent pneumonia patients 18 years and older who receive an initial antibiotic regimen during the first 24 hours that is consistent with current guidelines.
- **Numerator:** The number of pneumonia inpatients who received antibiotics consistent with current guidelines during the first 24 hours of their hospitalization.
 - **Denominator:** All pneumonia inpatients 18 years of age and older with an:
 - ICD-9-CM Principal Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of septicemia and ICD-9-CM Other Diagnosis Code of pneumonia; or
 - ICD-9-CM Principal Diagnosis Code of respiratory failure and ICD-9-CM Other Diagnosis Code of pneumonia.
 - **Excluded Populations:**
 - Patients received in transfer from another acute care or critical access hospital, including another emergency department.
 - Patients who have no working diagnosis of pneumonia at the time of admission.
 - Patients receiving Comfort Measures Only, commonly referred to as “palliative care” in the medical community and “comfort care” by the general public. Patients in this category include those that have received services to meet their psychological and spiritual needs.
 - Patients who do not receive antibiotics during hospitalization or within 36 hours (2160 minutes) from the time of hospital arrival.
 - Patients who are Compromised (i.e., the patient has a clinical condition that could cause an impaired immune system or put the patient at higher risk for infection OR had a prior hospitalization within the past 14 days).

- Patients involved in protocols or clinical trials⁷.
- Patients with Healthcare Associated Pneumonia (i.e., patient had a risk for healthcare associated pneumonia prior to hospital admission as determined by the presence of at least one of the following: hospitalization for two days within the last 90 days; residence in nursing home or extended care facility for any amount of time within the last 90 days; chronic dialysis within the last 30 days; home wound care within the last 30 days)⁸.

Congestive Heart Failure

1. **LVF Assessment** – The percentage of congestive heart failure patients 18 years and older discharged home with documentation in the hospital record that left ventricular function (LVF) was assessed before arrival, during hospitalization, or is planned for after discharge.
 - **Numerator:** The number of congestive heart failure patients with documentation that LVF was assessed before arrival, during hospitalization, or is planned for after discharge.
 - **Denominator:** All inpatients with an ICD-9-CM Principal Diagnosis Code of heart failure.
 - **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.
 - Patients with reasons documented by a physician, nurse practitioner, or physician assistant for no LVF assessment.

2. **ACEI/ARB for LVSD**– The percentage of congestive heart failure patients 18 years and older with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular function (LVF) consistent with moderate or severe systolic dysfunction.
 - **Numerator:** The number of CHF patients who are prescribed an ACEI or ARB at hospital discharge.
 - **Denominator:** All inpatients with documentation of a LVEF less than 40% or a narrative description of LVF consistent with moderate or severe systolic dysfunction and an ICD-9-CM Principal Diagnosis Code of heart failure.

⁷ Item added beginning with July 1, 2005 discharges.

⁸ Item added beginning with October 1, 2005 discharges.

- **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.
 - Patients with chart documentation of participation in a clinical trial testing alternatives to ACEIs as first-line heart failure therapy⁹.
 - Patients with BOTH a potential contraindications/reason for not prescribing an ACEI at discharge AND a potential contraindications/reason for not prescribing an ARB at discharge, as evidence by one or more of the following:
 - ACEI allergy AND ARB allergy;
 - Moderate or severe aortic stenosis;
 - Physician, nurse practitioner, or physician assistant documentation of BOTH a reason for not prescribing an ACEI at discharge AND a reason for not prescribing an ARB at discharge.
 - Reason documented by physician, nurse practitioner, or physician assistant for not prescribing an ARB at discharge AND an ACEI allergy.
 - Reason documented by physician, nurse practitioner, or physician assistant for not prescribing an ACEI at discharge AND an ARB allergy.

3. Discharge Instructions – The percentage of congestive heart failure patients 18 years and older discharged home with written instructions or educational material to patient or caregiver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

- **Numerator:** The number of congestive heart failure patients with documentation that they or their caregivers were given written discharge instructions or other educational material addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.
- **Denominator:** All inpatients who were discharged to home, home care, or home IV therapy¹⁰ with an ICD-9-CM Principal Diagnosis Code of heart failure.
- **Excluded Populations:**
 - Patients less than 18 years of age.

⁹ Item added beginning with July 1, 2005 discharges.

¹⁰ Home IV therapy excluded in definition beginning with October 1, 2005 discharges.

4. **Smoking Cessation Advice** – The percentage of congestive heart failure patients 18 years and older with a history of smoking cigarettes who are given smoking cessation advice or counseling during the hospital stay. For purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival.
- **Numerator:** The number of CHF patients who receive smoking cessation advice or counseling during the hospital stay.
 - **Denominator:** All CHF patients, defined as discharges with an ICD-9-CM Principal Diagnosis Code for CHF, with a history of smoking cigarettes anytime during the year prior to hospital arrival.
 - **Excluded Populations:**
 - Patients less than 18 years of age.
 - Patients transferred to another acute care hospital or federal hospital.
 - Patients who expired.
 - Patients who left against medical advice.
 - Patients discharged to hospice.

E. Calculation of Top 10% and 50% Scores

For each quality measure, including the overall score, we identified the hospital score that was at the 50th percentile, or median, and the 90th percentile, or top 10th percentile. These statistics included all hospitals, including those with fewer than 25 cases for a measure and whose data were not publicly reported. Scores for Irvington General Hospital, which closed during 2005, were not included in these calculations.