

**NEW JERSEY 2005 HOSPITAL PERFORMANCE REPORT  
TECHNICAL REPORT: METHODOLOGY  
September 2005**

**A. Sources of Hospital Quality Measures**

The **New Jersey 2005 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, as defined in Section C of this technical report. The **2005 Hospital Performance Report** included information on hospital discharges for the period of January 1, 2004 through December 31, 2004. The Department collected all of the JCAHO measures for acute myocardial infarction (AMI or heart attack) and pneumonia but decided, upon the advice of the Department's Quality Improvement Advisory Committee (QIAC), that only the measures chosen for the Hospital Quality Alliance starter set related to AMI and pneumonia should be included in the performance report (see Table 1).

**Table 1: JCAHO Core Performance Measures and Inclusion in Report**

<b>JCAHO Core Performance Measures</b>	<b>Included in Report</b>
<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 for LVSD	Included
Adult smoking cessation advice	Not 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	Not 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	Not Included
Initial antibiotic selection for PN immunocompetant non-ICU patient	Not Included
Blood cultures	Not Included
Adult smoking cessation advice	Not Included
Influenza vaccination	Not Included

All New Jersey general acute care hospitals and one specialized heart hospital were required to submit the information for AMI and pneumonia 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.

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 is in the process of data validation, based on five records per hospital per quarter, to review the accuracy of the data submitted to the federal government for its quality assessment initiatives. The Department plans to use the CMS validation to review the accuracy of the data. At this time, the Department considers the data reported by the hospitals' JCAHO vendors not to be audited, though the best quality data currently available.

## **B. Calculation of Hospital Performance Rates**

### **Calculation of individual rates:**

Each rate was determined following the JCAHO methodology outlined in Section C. 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 measures with 25 or more eligible cases were included in the report.

### **Calculation of overall scores:**

The overall AMI and pneumonia scores for each hospital are summary measures of how well the hospital provided care based on the five AMI measures and the three pneumonia measures, respectively. In deciding to calculate the two 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 and pneumonia were calculated using the following steps:

- We summed the patients who received care (numerator) and patients who were eligible for care (denominator) for the five AMI (or three pneumonia) 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.
- We calculated the overall score as a percentage by dividing the numerator by the denominator.
- We reported the overall scores (as well as individual rates) as whole numbers. When hospitals were presented from high to low overall scores, a more detailed calculation using six decimal places was used.

### **C. Measure Definitions**

The definitions for the eight measures included in this report follow the JCAHO definitions that were in effect for the reporting period (Specifications Manual for National Implementation of Hospital Core Measures (SMNIHCM) versions 1.09 (from January 1, 2004 to June 30, 2004) and 2.02 (from July 1, 2004 to December 31, 2004)).

#### **Acute Myocardial Infarction (Heart Attack)**

- 1. Aspirin at Arrival** – The percentage of AMI patients age 18 or older without contraindications and with documented evidence of receiving an 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 on day of arrival.
    - Patients received in transfer from another 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 and with documented evidence of receiving a prescription for 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.
    - 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 on Arrival** – The percentage of AMI patients 18 years and older without beta blocker contraindications and with documented evidence of receiving 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 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;
  - 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 and with documented evidence of a prescription for 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.
  - 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 for LVSD** – The percentage of AMI patients 18 years and older with left ventricular systolic dysfunction (LVSD) and without angiotensin converting enzyme inhibitor (ACEI) contraindications with documented evidence of a prescription for an ACEI 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 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 ACEI contraindications.
  - **Excluded Populations:**
    - Patients less than 18 years of age.
    - Patients transferred to another acute care 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 therapy.
    - Patients with one or more of the following ACEI contraindications/reasons for not prescribing ACEI documented in the medical record:
      - ACEI allergy;
      - Moderate or severe aortic stenosis;
      - Other reasons documented by a physician, nurse practitioner, or physician assistant for not prescribing ACEI at discharge.

## **Pneumonia**

1. **Oxygenation Assessment** – The percentage of pneumonia patients 18 years<sup>1</sup> and older who receive oxygenation assessment with arterial blood gas (ABG) or pulse oximetry within 24 hours prior to or after hospital arrival.

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<sup>1</sup> The definition from January 1, 2004 to June 30, 2004 had an age restriction of 29 days and older.

- **Numerator:** The number of patients who receive oxygenation assessment with arterial blood gas (ABG) or pulse oximetry within 24 hours of hospital arrival.
  - **Denominator:** All inpatients, including patients transferred from long term care facilities, 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 care access hospital, including another emergency department<sup>2</sup>.
    - 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 less than 18 years<sup>2</sup> of age.
- 2. Pneumococcal Vaccination** – The percentage of pneumonia patients 65 years of age and older screened for and given pneumococcal vaccination status and were administered the vaccine prior to discharge, if indicated.
- **Numerator:** The number of pneumonia patients who were screened for vaccine status and were vaccinated prior to discharge, if indicated.
  - **Denominator:** All pneumonia patients, including patients transferred from a long term care facility, 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 care access hospital, including another emergency department<sup>2</sup>.
    - Patients who left against medical advice.
    - Patients who were discharged to a federal hospital<sup>2</sup>.
    - 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

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<sup>2</sup> Change in definition beginning with SMNIHCM v2.02.

those that have received services to meet their psychological and spiritual needs.

- Patients less than 65 years of age.
- Patient who expired.
- Patients who were discharged to hospice care<sup>3</sup>.
- Patients who were transferred to another short-term general hospital for inpatient care<sup>3</sup>.

**3. Initial Antibiotic Received within 4 Hours of Hospital Arrival – The percentage of pneumonia patients 18 years<sup>4</sup> 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, including patients transferred from long term care facilities, 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 care access hospital, including another emergency department<sup>3</sup>.
  - Patients who have no working diagnosis of pneumonia at the time of admission.
  - Patients who do not receive antibiotics during hospitalization.
  - 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<sup>3</sup>.
  - Patients whose initial antibiotic was administered more than 2160 minutes (36 hours) from the time of arrival.
  - Patients who have received antibiotics within 24 hours prior to hospital arrival<sup>3</sup>.

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<sup>3</sup> Change in definition beginning with SMNIHCM v2.02.

<sup>4</sup> The definition from January 1, 2004 to June 30, 2004 had an age restriction of 29 days and older.

#### **D. Calculation of Top 10% and 50% Scores**

For each quality measure, including the overall score, we identified the hospital score that was at the 50<sup>th</sup> percentile, or median, and the 90<sup>th</sup> percentile, or top 10<sup>th</sup> percentile. For the 2005 report, these statistics included all hospitals, including those with fewer than 25 cases for a measure. In the previous year's report, the statistics were calculated using only hospitals with 25 cases or more for a measure.

Table 2 shows the differences between the two methods of calculation. For AMI, there was little or no change for most measures for the top 50% and top 10% scores with one exception: ACEI for LVSD. Because many hospitals had fewer than 25 cases for this measure, the 2004 top 10% score increased from 93 to 100 using the new methodology, the 2005 top 50% score decreased by 4 points from 89 to 85, and the 2005 top 10% score increased from 97 to 98. Other differences for AMI measures were within one point.

For pneumonia measures, there was a one point difference between the top 50% and top 10% scores for only one measure. This lack of variability was due to no hospitals having fewer than 25 cases for pneumonia measures in 2004 and only one (Deborah Heart and Lung Center) in 2005. (Note: Since Deborah Heart and Lung Center is a specialized hospital, it was excluded from pneumonia reporting in 2004.)

Table 2: Top 50% and Top 10% Statistics for Performance Measures, by Year and Hospital Inclusion Method

Performance Measure	2004 Hospital Performance Report				2005 Hospital Performance Report			
	All Hospitals		Hospitals with 25 or More Cases		All Hospitals		Hospitals with 25 or More Cases	
	Top 50%	Top 10%	Top 50%	Top 10%	Top 50%	Top 10%	Top 50%	Top 10%
<u>Acute Myocardial Infarction (AMI)</u>								
Aspirin at arrival	94	99	94	99	95	99	94	99
Aspirin prescribed at discharge	88	99	88	99	93	100	93	100
Beta blocker at arrival	91	98	91	97	95	99	94	99
Beta blocker prescribed at discharge	89	99	90	99	93	100	93	100
ACEI for LVSD	78	100	78	93	85	100	89	97
Overall score	90	97	90	97	94	98	94	98
<u>Pneumonia</u>								
Oxygenation assessment	99	100	99	100	100	100	100	100
Pneumococcal vaccination	48	74	48	74	70	89	69	89
Initial antibiotic received within 4 hours of arrival	68	83	68	83	77	87	77	87
Overall score	75	84	75	84	84	92	84	92