# Performance Measure Definition

## Emergency Department Length of Stay for Admitted Patients

### Name and Definition

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Emergency Department Length of Stay for Admitted Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Name</td>
<td>Emergency Department Length of Stay for Admitted Patients</td>
</tr>
</tbody>
</table>

**Definition**

The Emergency Department (ED) length of stay (LOS) for admitted patients is the total time from the first documented time after arrival at emergency (the earlier of triage or registration) to the time the patient who is being admitted to hospital as an Inpatient leaves the ED.

This metric does not apply to Urgent Care facilities as these facilities do not have inpatient spaces.

### Domain

Health Services Delivery

### Dimension

<table>
<thead>
<tr>
<th>Acceptability</th>
<th>Efficiency</th>
<th>Appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Accessibility</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### Category of Measure

Strategic

### Type of Measure

Output Measure

### Other Comments / Notes

N/A

## Context

### Business Context


### Rationale

Patients treated in an Emergency Department (ED) should be assessed and treated in a timely fashion. The length of stay in Emergency Department (ED LOS) is used to assess the timeliness of care delivery.

Patients who are treated and then discharged from ED will typically have a distinctly shorter stay than patients subsequently admitted to hospital due to higher complexity, admission processes and other factors. Other discharge categories are also separated due to dissimilar ED LOS including left without being seen, left against medical advice, or death.

Alberta Health Services is taking action to reduce wait times throughout the health system. This performance measure is used to track progress toward reducing wait times for emergency department services and achieving wait time targets.

### Notes for Interpretation

Variation in complexity of patients, site capacity and access to other primary care options (urgent care centres, family physicians, walk-in clinics) in a community vary and can contribute to significant variation in demand for ED services and variation in performance measured.

The triage date and time or registration date and time captured may be between 1 to 30 minutes after a patient walks in the door. The start time used in LOS calculation is the first documented time; the earlier of triage date/time or registration date/time. Some facilities use a ticketing system that patients pull on arrival; this is not used as the start time.

The same methodology is applied at all sites in calculating the ED LOS.

This indicator captures the entire time spent in the ED for admitted patients. This time reflects care provided by the ED, including diagnostic and treatment, and waiting in ED for an inpatient treatment (for example operating theatre readiness) or space (unit bed). Therefore, metric performance is not singularly attributable to one area.

### Organizational Strategy

Develop and implement initiatives for hospital-wide improvement of patient flow including decreasing length of stay.
Performance Measure Definition

Increase availability of community-based service options by working with primary care, Emergency Medical Services (EMS) and Health Link. Focus on availability of physician clinics and urgent care centres providing care for less serious emergencies.

Benchmark Comparisons

National Average ED LOS is 9.8 hours for admitted patients (2012-13 based on data from British Columbia, Alberta, Saskatchewan, Manitoba and Ontario only)

Cited References

2013 Position Statement: Emergency department overcrowding and access block, from the Canadian Association of Emergency Physicians:

Technical Specifications

**Metric**
1. Median LOS (in hours) for patients treated in ED and admitted to inpatient. (Strategic Measure); 2. 90th Percentile LOS (in hours) for patients treated in ED and admitted to inpatient; 3. Percent of patients treated in ED and admitted to inpatient within 8 hours; 4. Total ED LOS (in minutes)

**Preferred Display Format**
1. 99.9; 2. 99.9; 3. 99%; 4. 9,999

**Numerator**
1. Median length of stay between Start Time and End Time. Median value is calculated in minutes then converted to hours.
2. 90th percentile length of stay between Start Time and End. 90th percentile value is calculated in minutes then converted to hours.
3. Count of all records with a length of stay less than or equal to 8 hours (480 minutes).
4. Length of stay in minutes between Start Time and End Time

**Inclusion Criteria for Numerator**
Include Emergency visits for admitted patients.

Emergency Visits:
National Ambulatory Care Reporting System (NACRS):
Abstract_Type = E
Includes visits with MIS Primary (MISPRIME) codes of
• 713100000 – Emergency
• 713102000 – General Emergency
• 713104000 – Observation
• 713106000 – Trauma
AND
• Scheduled ED Visit (SCHEDULED_ED) = N or blank

Alberta Ambulatory Care Reporting System (AACRS):
Abstract_Type = E
Includes visits with MIS Primary (MISPRIME) codes of
• 71310 – Emergency
• 7131020 – General Emergency
• 7131025 – Hospital Urgent Care Centre
• 7131040 – Interim Emergency Assessment
• 7131060 – Trauma Emergency

Include admitted patients only based on disposition code as per Appendix 1

Disposition 06 – Admitted into reporting facility as an inpatient to critical care unit or operating room directly from an ambulatory care visit functional center
Disposition 07 – Admitted into reporting facility as an inpatient to another unit of the reporting facility directly from the ambulatory care visit functional center.

**Exclusion Criteria for Numerator**
Exclude patients where the calculated time is negative.

Exclude patients where the calculated time is greater than 7 days (168 hours).

Exclude patients where ED records does not link to an inpatient record as the admit time cannot be determined. Relevant for cases up to March 31st, 2010 only.

Exclude patients where a many to one link is established between an inpatient record and an ED record or vice versa. Relevant for cases up to March 31st, 2010 only.

**Data Source(s) for Numerator**
Data sources vary by facility. Transactional Emergency Department Information Systems are used for the Calgary and Edmonton urban sites. These systems are Emergency Department Information System (EDIS) in Edmonton and Sunrise Emergency Care (SEC) in Calgary with historical data from Regional Emergency Department Information System (REDIS). For all other facilities, Health Records abstracted data are used.
Data is collected by Coding Specialists in Health Information Management utilizing coding and abstracting software, and by Service Event/Service Log applications for both ED and Inpatient Records. Monthly data extracts which are provided to Data Integration, Measurement and Reporting (DIMR) from each facility are processed and loaded into an AHS database. For visits prior to March 31st, 2010 data is collected using the AACRS. For visits after April 1st, 2010 data is collected using the NACRS.

Data is collected using the National Ambulatory Care Reporting System (NACRS) and the Discharge Abstract Database (DAD) for inpatient data.

### Performance Measure Definition

<table>
<thead>
<tr>
<th>Refresh Rate for Numerator</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Steward for Numerator</td>
<td>Health Information Management HIM</td>
</tr>
</tbody>
</table>

#### Denominator

1. No denominator for median.
2. No denominator for 90th percentile.
3. Count of all valid records for percent calculation.
4. No denominator for number of minutes.

#### Inclusion Criteria for Denominator

Same as numerator.

#### Exclusion Criteria for Denominator

Same as numerator.

#### Data Source(s) for Denominator

Same as numerator.

#### Refresh Rate for Denominator

Same as numerator.

#### Data Steward for Denominator

Same as numerator.

### Technical Notes

**Data Sources:**

- National Ambulatory Care Reporting System format (NACRS) for sites outside of Calgary and Edmonton urban centres. April 1, 2010 forward.
- Alberta Ambulatory Care Reporting System (AACRS) for sites outside of Calgary and Edmonton urban centers. Prior to March 31, 2010 when AACRS was replaced by NACRS.
- Transactional Emergency Department Information Systems are used for the Calgary and Edmonton urban sites. These systems are Emergency Department Information System (EDIS) in Edmonton and Sunrise Emergency Care (SEC) in Calgary with historical data from Regional Emergency Department Information System (REDIS).

**Data Linking for End Time determination:**

For AACRS sourced data the End Time timestamp is not available in this data set and is determined by linking to the DAD recorded (inpatient visit) to determine when the patient left ED as recorded in fields ERDEPTDATE and ERDEPTTIME. Linking is based on matching sex, PHN or ASN, and a comparison of the ED disposition date and the IP ED departure date.

**Timestamp Definitions:**

- **Start Time** is the earliest document time on the ED record. This will be the earliest of either the ED Triage Time or ED Registration Time sometimes referred to as Visit Time.

- **End Time** is the time when the patient has left the ED to enter the acute facility as an inpatient. This time may be after conclusion of the ED visit in that it will include Emergency Department Inpatient (EDIP) time. This is recorded as the Left ED in the NACRS record and determined by linking in the AACRS dataset (see note above). Transactional systems are handled specific to that system.

**Institution Issues:**

Data for the Stollery Children’s Hospital are included within the University of Alberta Hospital. Any patient less than 16 years of age (AGE_ADMIT field) at the time of the visit to the University of Alberta Hospital (INST 88044) is recoded to be a patient of the Stollery Children’s Hospital (INST 88153).
## Performance Measure Definition

### Calculation

<table>
<thead>
<tr>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS calculated as minutes between Start Time and End Time</td>
</tr>
<tr>
<td>1. Median ED LOS value calculated in minutes divided by 60 to convert to hours.</td>
</tr>
<tr>
<td>2. 90th Percentile ED LOS value calculated in minutes divided by 60 to convert to hours.</td>
</tr>
<tr>
<td>3. Percent of patients treated in ED and admitted as inpatient where ED LOS is 8 hours or less is calculated by dividing the number of valid records with an ED LOS of less than or equal to 8 hours (480 minutes) by the total number of valid records multiplied by 100.</td>
</tr>
<tr>
<td>4. Total ED LOS (in minutes) sum of all ED LOS times.</td>
</tr>
</tbody>
</table>

### Relationship to Other Indicators

<table>
<thead>
<tr>
<th>Level of Reporting</th>
<th>National</th>
<th>No</th>
<th>Provincial</th>
<th>Yes</th>
<th>Zone</th>
<th>Yes</th>
<th>Site</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting Notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Frequency of Reporting</td>
<td></td>
<td>Yes</td>
<td>Quarterly</td>
<td>Yes</td>
<td>Monthly</td>
<td>Yes</td>
<td>Other</td>
<td>No</td>
</tr>
<tr>
<td>Other Reporting Frequency</td>
<td></td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Limitations

NACRS (and historically AACRS) Data for Emergency visits is collected by Coding Specialists in Health Information Management utilizing coding and abstracting software. Month end reconciliation ensures data has been collected on all ED visits. The ED discharge time is used to assist in matching to the Inpatient record. This time is sometimes recorded as 2359 when unknown or 2359 was collected as a default time to March 31, 2010 under Alberta Ambulatory Care Reporting System (AACRS) and 9999 as of April 1, 2010 under National Ambulatory Care Reporting System (NACRS). Frequency of 9999 values recorded should therefore be monitored to ensure representative sample cases for reliable ED LOS calculations and performance monitoring using this metric.