



Measure Fact Sheet – The AHRQ-CMS Pediatric Quality Measures Program (PQMP)

## Measure: Initial Baseline Screen of Nutritional Status for Every Patient Within 24 Hours of Pediatric Intensive Care Unit (PICU) Admission

Measure Developer: Pediatric Measurement Center of Excellence (PMCoE)

Numerator	Denominator	Exclusions	Data Source(s)
Number of PICU patients for whom a screening of nutritional status was documented with use of a standardized nutrition screening tool* within 24 hours of admission.	All patients admitted to the PICU for at least 24 hours during a monthly or quarterly reporting period.	None.	Electronic health record. Paper medical record.

\* Standardized nutrition screening tool: Screening tool should be applied in a standardized manner to each patient admitted to the PICU and should be based on a nutrition screening tool that has been validated for the majority of the institution's PICU patients. Examples of this would include STAMP<sup>1</sup> and the Paediatric Yorkhill Malnutrition Score,<sup>2</sup> as well as potentially institution-derived nutrition screening tools.

### Measure Importance

Children who develop critical illness or injury may be malnourished at the time of admission to the pediatric intensive care unit (PICU). Malnutrition is associated with an increased PICU length of stay and an increased risk-adjusted mortality.<sup>3</sup>

The benefits of nutritional support in critically ill patients include improved wound healing, a decreased catabolic response to injury, and improved gastrointestinal structure and function.<sup>4,5</sup>

Critically ill patients have complex nutritional needs, and providers must assure that adequate nutrition is met for the wide range of ages of children cared for in the PICU.



An initial baseline screen of nutritional status for every PICU patient increases awareness of his/her nutritional state, identifies patients at risk for malnutrition, and allows providers to adjust the timing, content, and quantity of nutrition therapy to meet the individual patient's needs.

## **Evidence Base for Focus of the Measure**

The Joint Commission requires that hospitals complete nutrition screening within 24 hours after inpatient admission.<sup>6</sup> The Joint Commission's standard PC.01.02.01 states: "The hospital assesses and reassesses its patients. Based on the patient's condition, information gathered in the initial assessment includes the following:

- Physical, psychological, and social assessment.
- Nutrition and hydration status.
- Functional status.
- For patients who are receiving end-of-life care, the social, spiritual, and cultural variables that influence the patient's and family members' perception of grief. (See also RC.02.01.01, EP 2.)"

While there is no single, validated screening tool that is considered appropriate for critically ill and injured children, those available (including institution-derived nutrition screening tools) typically take about 5 minutes to administer, can be done at the bedside, and do not generally require a dietitian.

## **Advantages of the Measure**

- This measure is specified for construction in electronic health records (EHRs).
- This measure has also been specified to be constructed to assess performance through manual chart review.
- This measure fills a gap in the CHIPRA initial core set, which currently does not include any measures for the pediatric critical care unit.
- This measure is publicly available for noncommercial use.

## **Levels of Aggregation Applicable to the Measure**

This measure is intended for aggregation and comparison at the State, regional, payment model, health plan, hospital, and unit levels.

## **Reliability and Validity of the Measure**

Reliability testing was performed at three children's hospitals in the Chicago area in the Chicago Pediatric Quality and Safety Consortium (CPQSC). One site performed parallel-forms testing and compared the construction of this eMeasure against manual chart reviews, using a reporting period of January 1 – March 31, 2015. The other two sites conducted reliability assessment across two time periods of performance measurement as a chart review measure: January 1– June 30, 2015 and July 1 – December 31, 2015.

The site performing parallel-forms testing assessed this eMeasure electronically, providing electronic output for 110 unique patients representing 121 events; this same site also performed five chart reviews and compared the results of the electronic output with the results of the manual chart reviews on the same patients.

The other two sites assessed this measure as a chart review measure, providing complete chart reviews (i.e. the patient met the denominator criteria) for 315 patients.

The face validity of the measure was also assessed by an Expert Technical Panel of key stakeholders and through a public comment and was determined to have both understandability and face validity for key pediatric critical care stakeholders.

## Measure Development and Testing

- Feasibility testing of the eMeasure was conducted at four Chicago area hospitals, which are a part of the CPQSC. A Data Element Table (DET) tool was used to assess sites' EHR systems, which included Epic and Cerner.
- At three of the sites, the measure was determined to have both technical feasibility and implementation feasibility.
- At the fourth site, the measure was determined to be "feasible with workflow modifications or changes to the EHR," because the numerator and denominator elements either could not be identified in the hospital's EHR system or were captured only as free text.
- Reliability assessments were conducted at the three sites in which the measure was considered feasible. At one site, the measure was implemented in the EHR using an electronic algorithm. Manual chart abstraction was then compared to the automated report of the constructed measure to determine the reliability of the overall measure and individual measure elements calculated
- At the remaining two sites, the reliability assessment of this measure as a chart review measure was conducted across two time periods of performance measurement: January 1 – June 30, 2015 and July 1 – December 31, 2015. Using an electronic algorithm, charts were identified that met the denominator criteria, were stratified by age group (0 - < 6 years, 6 - < 12 years, 12 - < 18 years). Charts were then randomly selected for abstraction within each age stratum.

## Selected Results from Tests of the Measure

- Overall (N=110), for this eMeasure, clinical performance was reasonably high, with 90 percent of patients meeting the measure and 92 percent of all screens meeting the measure.
- Across all three sites (N=320), for this measure chart reviews revealed poor clinical performance, with 18 percent of patients meeting the measure. The largest number of chart reviews were conducted at two sites (N=315) where nutrition screening is not routinely performed.

- In parallel-forms reliability testing of the eMeasure, agreement was 100 percent for measure elements: admission date, race, ethnicity, payer, and whether a nutrition screening tool was used to assess nutritional status within 24 hours of admission; agreement was also 100 percent for overall clinical performance of the measure.
- In parallel-forms reliability testing of the chart review measure, the clinical performance was comparable across two time periods of performance measurement (N1 = 179, N2 = 85), with 15 percent of patients who had a nutrition screen between January 1 – June 30, 2015 meeting the measure, as compared to 19 percent of patients who had a nutrition screen between July 1 – December 31, 2015. This difference was not statistically significant (p=0.33).
- Feasibility testing indicated that in order to increase feasibility of this measure, all elements of the measure—including numerator, denominator, and exception elements—should be entered in structured, queryable fields as opposed to free text or associated paper forms that are scanned into the medical record.

## Caveats

- Use of the eMeasure is limited to sites documenting relevant clinical information in structured, queryable fields available in the EHRs and with all of the measure elements documented in structured fields.
- There is a possibility that missing data or ambiguous information from poor documentation of care can lead to calculation errors and low performance on the measure.
- Workflow modifications or changes to the site’s EHR system may be necessary in order to calculate the measure.
- Good nutrition and nutritional assessment are an important aspect of PICU care, and this measure is the first in what we recommend to be a family of measures regarding nutrition.

## More Information

- AHRQ: [CHIPRAqualitymeasures@ahrq.hhs.gov](mailto:CHIPRAqualitymeasures@ahrq.hhs.gov)
- COE: Lisa Krams, [lkrams@aap.org](mailto:lkrams@aap.org) and Ramesh Sachdeva, [rsachdeva@chw.org](mailto:rsachdeva@chw.org)
- Coming soon: Link to measure details on AHRQ Web site.

For more information about the PQMP, visit [www.ahrq.gov/chipra](http://www.ahrq.gov/chipra).

## Notes

<sup>1</sup>Wong S, Graham A, Hirani SP, et al. Validation of the Screening Tool for the Assessment of Malnutrition in Paediatrics (STAMP) in patients with spinal cord injuries (SCIs). *Spinal Cord* 2013; 51:424-9.

<sup>2</sup>Gerasimidis K, Macleod I, Maclean A, et al. Performance of the novel Paediatric Yorkhill Malnutrition Score (PYMS) in hospital practice. *Clinical Nutrition* 2011; 30:430-5.

<sup>3</sup>Goday PS, Kuhn EM, Sachdeva RC et al. Does admission weight influence mortality and morbidity in the pediatric intensive care unit (PICU)? *J Parenter Enteral Nutr* 2008; 32:316-7.

<sup>4</sup>Arnold M, Barbul A. Nutrition and wound healing. *Plast Reconstr Surg* 2006; 117(Suppl 7):42S-58S.

<sup>5</sup>Wray CJ, Mammen JMV, Hasselgren P. Response to stress and potential benefits of nutrition support. *Nutrition* 2002; 18:971-7.

<sup>6</sup>The Joint Commission. Standards and elements of performance. PC.01.02.01, Eps 2 and 3; RC.02.01.01, EP 2. Washington, DC: The Joint Commission.

The Children's Health Insurance Program Reauthorization Act (CHIPRA) called for establishment of a Pediatric Quality Measures Program (PQMP) as a followup to identifying the initial core set of children's health care quality measures. This measure fact sheet was produced by the Agency for Healthcare Research and Quality, based on information provided by the AHRQ-CMS CHIPRA Pediatric Measurement Center of Excellence (PMCoE), which was funded by an AHRQ-CMS award. A listing of all submitted CHIPRA Centers of Excellence measures can be found at [www.ahrq.gov/chipra](http://www.ahrq.gov/chipra). All CHIPRA COE-developed measures are publicly available for noncommercial use.



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