A Proposed Dashboard for Pediatric Hospital Medicine Groups

Paul D. Hain, MD\(^1\), Jennifer Daru, MD\(^2\), Elizabeth Robbins, MD\(^3\), Ryan Bode, MD\(^4\), Chad Brands, MD\(^5\), Matthew Garber, MD\(^6\), Craig Gosdin, MD\(^7\), Michelle Marks, DO\(^8\), Jack Percelay, MD\(^9\), Sofia Terferi, MD\(^{10}\), Donna Tobey, RN, BSN, CPHQ\(^{11}\)

\(^1\)Monroe Carell Jr. Children’s Hospital at Vanderbilt, Nashville, Tennessee
\(^2\)California Pacific Medical Center, San Francisco, California
\(^3\)Anne Arundel Medical Center, Annapolis, Maryland
\(^4\)Phoenix Children’s Hospital, Phoenix, Arizona
\(^5\)All Children’s Hospital Johns Hopkins Medicine, St Petersburg, Florida
\(^6\)University of South Carolina, Columbia, South Carolina
\(^7\)Cincinnati Children’s Hospital, Cincinnati, Ohio
\(^8\)Cleveland Clinic, Cleveland, Ohio
\(^9\)Children’s Health Associates, Vorhees, New Jersey
\(^{10}\)Bon Secours, St Mary’s Hospital, Richmond, Virginia
\(^{11}\)California Pacific Medical Center, San Francisco, California

In February of 2009, the Society of Hospital Medicine, the Section on Hospital Medicine of the American Academy of Pediatrics, and the Academic Pediatric Association sponsored a strategic planning meeting to create a vision of the future for Pediatric Hospital Medicine (PHM). One of the outcomes of that meeting was a mandate to create a dashboard for PHM groups. Given that PHM is the fastest growing area of pediatrics,\(^1\) and that pediatric hospitalists and their groups are becoming responsible for more patients and more processes in hospitals,\(^2\) an important part of the growth of the specialty will be continuous improvement and monitoring. As with all areas of medicine, improvement comes from identification of gaps in performance or services and the subsequent improvement cycles that follow. This proposed dashboard attempts to build a framework for groups to monitor, compare, and improve performance. In addition to groups monitoring their own performance over time, it is envisioned that, as groups begin to populate this dashboard, there will be a transparent repository for the dashboards that allow for comparison among similar groups.

**METHODS**

In July 2009, a call for participation in the creation of the dashboard was sent to the PHM Listserv of the American Academy of Pediatrics. In addition to the 3 original hospitalists named to start the project (P.H., J.D., E.R.), 8 others volunteered to form the PHM Dashboard Committee (the Committee). The Committee
met numerous times via conference call and agreed to the following guiding principles:

1. The dashboard should be as broadly applicable as possible
2. The dashboard should focus on the PHM group, and not the individual hospitalist
3. The dashboard should use the simplest possible methods for achieving measurement aims
4. Dashboard items should be selected and/or customized to best help each unique PHM group: each group’s dashboard may look different

Subsequently, the Committee, by discussion and group consensus, came to form the categories of the dashboard. Those categories were then broken down into metrics that the Committee felt adhered to the guiding principles. It is noteworthy that it was very clear to the Committee that, in most areas, there was a dearth of evidence supporting clear metric choices. Thus, whereas the Committee endeavored to use evidence to the fullest extent possible, the dashboard represents more of a consensus document than evidence-based review.

In July 2010, this dashboard was presented at the Pediatric Hospital Medicine Annual Meeting, and then an open comment period was established from August 11 to September 10, 2010. All comments were then considered by the Committee before publication of the dashboard.

DASHBOARD ITEMS
The Committee divided the dashboard metrics into 6 categories.

1. Descriptive data
2. Clinical quality data
3. Nonclinical quality data
4. Productivity measures
5. Resource utilization
6. Group sustainability

Each category is then subdivided into “recommended” metrics that the Committee felt were central to all PHM groups, and into metrics to “consider.” Decisions on use of the consider metrics are left to the individual groups, and it is expected that each group will weigh both the applicability of a metric with the burden that collecting the data will place on the group or hospital.

It is suggested that each PHM group define which patients and reporting periods best fit its dashboard for metrics that require those definitions. For example, patients may be all the patients on a PHM service, all the patients on a pediatric ward, or all the pediatric patients requiring admission to the hospital. Reporting periods may be monthly, quarterly, semiannually, or yearly. This information should be recorded next to the title of each metric or, if they are the same for all metrics, at the top of the section of the dashboard.

For space considerations, all calculations and examples for the “consider” metrics are listed in the Appendix.

DESCRIPTIVE DATA
Descriptive data (Table 1) are intended to allow for comparison among PHM groups to facilitate more accurate benchmarking, as well as internal comparisons.

Recommended Metrics Detail
Type of Hospital
Types of hospitals include a freestanding children’s hospital, children’s hospital within a larger full-service hospital, and some number of floors or areas dedicated to pediatric care within a community hospital.

<table>
<thead>
<tr>
<th>TABLE 1 Descriptive Data</th>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended</strong></td>
<td>Type of hospital:</td>
<td>Hospital</td>
</tr>
<tr>
<td>Freestanding children’s hospital, hospital within a hospital, pediatric area (floor or section) in parent hospital</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>Hospitalist in house overnight (yes or no)</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>Physician extenders used (yes or no)</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>Areas covered by PHM group:</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>General wards, PICU, step-down/intermediate care unit, newborn nursery, NICU, sedation services, emergency department, observation unit, multiple hospitals (number, type), other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 10 ICD-9-CM Codes and/or DRGs</td>
<td>Hospital financials</td>
<td></td>
</tr>
<tr>
<td>% patients in each ICD-9-CM and/or DRG</td>
<td>Hospital financials</td>
<td></td>
</tr>
<tr>
<td>Total number of discharges per year</td>
<td>Hospital financials</td>
<td></td>
</tr>
<tr>
<td>Payer mix</td>
<td>Hospital financials</td>
<td></td>
</tr>
<tr>
<td><strong>Consider</strong></td>
<td>Case mix index for hospitalist medicine group</td>
<td>Hospital financials</td>
</tr>
<tr>
<td>% patients discharged in observation status</td>
<td>Hospital financials</td>
<td></td>
</tr>
<tr>
<td>% patients covered by resident teams</td>
<td>Hospital director</td>
<td></td>
</tr>
<tr>
<td>Nonclinical FTEs</td>
<td>Hospital director</td>
<td></td>
</tr>
</tbody>
</table>
Rationale for Metric: This metric allows for more accurate comparison among different PHM groups for other metrics such as productivity measures and resource utilization.

**Hospitalist in House Overnight**

Hospitalist in-house overnight (y) refers to groups that regularly schedule a hospitalist to be present through the entire night (not home call); groups that provide in-house service as needed (on-call to come in or remaining in-house only under certain circumstances) should report “no” (n).

Rationale for Metric: Hospitalist groups that provide 24-hour in-house coverage have different staffing/full-time equivalent (FTE) needs than groups that do not. This information allows for more accurate comparison among PHM groups for other metrics such as productivity measures and resource utilization.

**Physician Extenders Used**

Physician extenders used (y) refers to groups that routinely use nurse practitioners, physician assistants, or other physician extenders.

Rationale for Metric: PHM groups that use physician extenders have different staffing/FTE needs than groups that do not. This information allows for more accurate comparison among PHM groups for other metrics such as productivity measures and resource utilization.

**Areas Covered by PHM Group**

This metric describes the various areas of the hospital(s) covered and the service lines offered by a PHM group. Areas include, but are not limited to general inpatient wards, PICU, step-down PICU, NICU, newborn nursery, observation unit, and sedation services.

Rationale for Metric: This metric allows for more accurate comparison among different PHM groups.

**Clinical FTEs**

This term describes the number of physician clinical FTEs required to cover the service regardless of how many hours are assigned to the FTE. Administrative, research, and academic time should not be calculated in this number.

Each hospitalist medicine group will define what it means to be a purely clinical hospitalist in terms of the amount of clinical work. Each person in the group can then be assigned an amount of clinical work in proportion to the “Clinical FTE.” For each person, this will range from 0 to 1. If moonlighters are used, then the number of FTEs needed to fill the moonlighting slots should be added. Physician extenders are not added to this number.

Rationale for Metric: This metric allows for more accurate comparison among different PHM groups.

How to Calculate: Sum the total of the clinical FTEs required to fully staff all areas covered.

**Top 10 International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9 CM) Codes and/or Diagnosis-Related Groups (DRGs)**

This metric is a list of the most common diagnoses seen by the PHM group reported.

**Percentage of Patients in Each ICD-9-CM and/or DRG**

This metric is a measure of the relative frequency of diagnoses that are treated by the PHM group.

**Diagnosis-related groups are systems of patient classification that take administrative data from inpatient hospitalizations (including ICD-9-CM diagnosis and procedure codes) and place patients into clinically recognizable and mutually exclusive categories.**

A commonly used type of DRG in children’s hospitals are all patient refined (APR)-DRGs. With APR-DRGs, the DRG is further broken into 4 levels of severity, numbered sequentially from 1 to 4, indicating, respectively, minor, moderate, major, and extreme severity of illness. Medicaid Services-DRGs also exist, but are rarely used in children’s hospitals because they have been derived from adult data alone.

**Total Number of Discharges per Year**

This metric is a measure of the volume managed by the PHM group and includes discharges from both observation and inpatient status.

Rationale for Metrics: Although acuity and volume vary considerably from 1 hospital to another, internal year-to-year comparisons of these metrics will provide a consistent way to measure changes in overall activity of the PHM group. It can also provide meaningful comparisons between groups or between a PHM group and patients admitted to other physicians.

How to Calculate: Financial offices of hospitals should be able to provide the recommended metrics (top 10 ICD-9 CM codes and/or DRGs, % patients in each ICD-9 CM and/or DRG, total number of discharges per year). If these data are unavailable, a PHM group can track these data internally by using a spreadsheet. Regardless of the method used to obtain the data, it should include all ward patients primarily managed by the hospitalist service, including those patients in both inpatient and observation status. Because many PHM groups are also involved in the care of other patients...
(eg, PICU and step-down unit, newborn nursery and NICU, surgical patients, sedation services, specialty patients, etc), a group may elect to include other patients in these data. To facilitate comparison between groups, this inclusion should be clearly noted on the Dashboard under Areas Covered by PHM group.

**Payer Mix**

Payer mix is the percentage of patients with different third-party payers managed by the PHM group.

Rationale for Metric: Payer mix is of great importance to hospital administration in terms of projecting revenue, negotiating with third-party payers, and strategic planning.

How to Calculate: The financial offices of hospitals should be able to provide the payer mix. This metric can be reported on a yearly or quarterly basis. We recommend use of the following types of payer: Medicaid, private insurance, self-pay, Medicare, and other.

**Consider Metrics Detail**

**Case Mix Index for PHM Group**

This metric is a measure of the complexity of patient cases treated by a PHM group.

“Case mix index” is a measure of the variety and complexity of patients treated. It is a weighted average of the numerical acuity assigned to the DRG of each patient, so that a higher case mix index indicates a greater average degree of complexity managed by the PHM group.

Rationale for Metric: The case mix index allows a PHM group to consistently measure the average degree of complexity of the patients managed by the group over time. It can also provide measurable comparisons between groups or between a PHM group and patients admitted to other physicians.

**Percentage of Patients Discharged in Observation Status**

This metric is a measure of the relative proportion of total patient volume managed and discharged in observation status.

**Percentage of Patients Covered by Resident Teams**

This metric is the percentage of patients managed by the PHM group that are admitted to a resident/teaching service.

Rationale for Metric: Other metrics such as productivity measures, quality data; clinical, quality data; nonclinical, and resource utilization might vary with or depend on the percentage of patients covered by resident teams. This metric allows for more accurate comparison among different PHM groups. A group may elect to report other metrics stratified by resident and nonresident/attending-only teams to allow for internal comparison among resident and nonresident/attending-only teams. This reporting should be clearly noted on the Dashboard.

**Nonclinical FTEs**

Rationale for Metric: This information allows for more accurate comparison among PHM groups for other metrics such as productivity measures and resource utilization and sustainability.

Each group will define what it means to be a purely clinical hospitalist in terms of amount of clinical work. Each person in the group can then be assigned an amount of clinical work in proportion to the “FTE.” For each person, this will range from 0 to 1. The number of nonclinical FTEs is the difference between the total FTEs hired minus the clinical FTEs.

**CLINICAL QUALITY DATA**

Clinical quality data (Table 2) are intended to be used to track those metrics that have been proven to be either evidence based, required by a reporting agency, or both. Readmission rates are still being studied as an evidence-based metric, but some agencies are already requiring reporting.

**Recommended Metrics Detail**

**Length of Stay**

This metric refers to time from admission to discharge of patient. Most hospitals do not include patients who were seen and discharged under observation status, but they will include observation time in the length of stay of a patient converted from observation to inpatient status.

Rationale of Metric: This marker gives groups a sense of efficiency of services

<table>
<thead>
<tr>
<th>TABLE 2 Clinical Quality</th>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended</td>
<td>Length of stay</td>
<td>Hospital financials</td>
</tr>
<tr>
<td>Consider</td>
<td>Asthma—The Joint Commission core measures</td>
<td>Hospital data or PHIS</td>
</tr>
<tr>
<td></td>
<td>Severity adjusted length of stay index</td>
<td>Hospital data or PHIS</td>
</tr>
<tr>
<td></td>
<td>Readmission rates (15 d unplanned)</td>
<td>Hospital data or PHIS</td>
</tr>
<tr>
<td></td>
<td>Bronchiolitis guideline compliance</td>
<td>Self-tracked/ CPOE system/PHIS</td>
</tr>
<tr>
<td></td>
<td>CLABSI</td>
<td>Infection control</td>
</tr>
<tr>
<td></td>
<td>(CAUTI)</td>
<td>Infection control</td>
</tr>
<tr>
<td></td>
<td>Codes outside the ICU</td>
<td>Self-tracked/hospital data</td>
</tr>
<tr>
<td></td>
<td>Hospital-acquired pressure ulcers</td>
<td>Hospital data</td>
</tr>
</tbody>
</table>

CPOE, computerized provider order entry; PHIS, pediatric health information system.
and, to a lesser extent, of severity of illness.

How to Calculate: Hospital financial offices should be able to provide this number. It should be clarified if this number includes observation patients or includes observation times in the length of stay (LOS) for patients converted from observation to inpatient status. This metric is reported in days, eg, 2.3 days. Hospital financials typically provide this number as a mean.

Asthma Core Measures

This metric is a measure of quality of asthma care delivered. The Committee notes that there is conflicting evidence supporting some of these measures, but feels that, because they are still reportable, that they should remain on the Dashboard until they are no longer reportable.

The term asthma refers to patients with a primary discharge ICD-9-CM of asthma, including exacerbation and status asthmaticus. This metric is for patients aged 2 to 17 years. It does not cover the ICD-9-CMs of wheeze or bronchiolitis.

Measures:

1. use of relievers
2. use of systemic corticosteroids
3. home management plan of care completed

Rationale of Metric: The Joint Commission requires collection and reporting of these data when caring for these types of patients to promote improved outcomes.

How to Calculate: For each measure, the number of patients meeting the standard for each measure is divided by the total number of patients meeting inclusion (ICD-9-CM of asthma). The result for each measure is reported as a percentage, between 0% and 100%. The Committee recommends that all patients be included in this metric, regardless of inpatient or observation status.

Consider Metrics Detail

Severity Adjusted LOS Index

This number is a ratio that compares overall-severity adjusted LOS with the average-severity adjusted LOS as a sum of individual conditions.

Severity adjusted LOS refers to the LOS for the APR-DRG severity level calculated for each patient.

Severity Adjusted LOS Index is the ratio of the sum of the actual lengths of stay for a given population to the expected LOSs for that population as determined by the APR-DRG severity level for each patient. A ratio of 1 is average. Less than one shows a lower LOS than expected.

Rationale of Metric: This metric shows the PHM group how their actual severity adjusted LOS compares with the expected.

Readmission Rates (15 Day Unplanned)

This metric is a measure of patients who are readmitted to an institution within 15 days after discharge.

“Readmission” refers to patients discharged from inpatient or observation status within the hospital setting who are then readmitted to inpatient or observation status in the hospital within 15 days.

Rationale of Metric: PHM groups should be aware of patients who require repeat admissions within a defined period of time, as an increased rate of readmissions can signal shortcomings of the previous admission. However, the appropriate period of time within which to monitor this is uncertain. Fifteen days is picked because it is a common metric currently being used.

It is important to note that there are few data to support a correct baseline for this metric. It is intended to provide a trend at each institution, not to state what an optimal readmission rate is.

Bronchiolitis Guideline Compliance

This is a measure of the ability to follow evidence-based guidelines.

Bronchiolitis is an acute inflammatory disease of the lower respiratory tract resulting from obstruction of the small airways. The most common cause is respiratory syncytial virus, but bronchiolitis may be caused by any one of a number of respiratory viruses.

Rationale of Metric: Bronchiolitis is one of the most common reasons for a pediatric admission. Evidence shows that many commonly used therapies are ineffective or harmful. Adherence to the guidelines is a measure of quality of care. Although not all of the metrics listed below are always under the direct control of a hospitalist, the Committee felt that hospitalists should be influencing the hospital’s practice pattern, and therefore tracking of the metrics was warranted.

Guidelines:

1. Routine testing for viruses not be performed
2. Routine use of Chest X-ray not be performed
3. Routine use of bronchodilators is discouraged
4. Routine use of steroids is discouraged
5. Routine use of antibiotics is discouraged
6. Routine use of chest physiotherapy is discouraged

**Central Line–Associated Blood Stream Infection Rate**

This metric is a measure of blood stream infections that are a result of having a central line.

CLABSI stands for central line–associated blood stream infection.

Central lines include any catheter terminating in a large vessel (eg, percutaneously inserted central catheter lines, umbilical lines, subclavian lines, femoral lines).

Rationale of Metric: The metric for Central Line–Associated Blood Stream Infection (CLABSI) is currently being reported out of intensive care units per The Joint Commission standards. Hospitalists participate in the care of patients with central lines. They may play a role in placing these lines. Patients in non-ICU settings should also be monitoring this metric with a goal of zero.

**Catheter-Associated Urinary Tract Infection Rate**

This metric is a measure of urinary tract infections as a result of having an indwelling urinary catheter.

CAUTI stands for catheter associated urinary tract infection.

Rationale of Metric: The metric for CAUTI is currently being reported out of ICUs per the Joint Commission standards. Hospitalists participate in the care of patients with urinary catheters. Patients in non-ICU settings should also be monitoring this metric with a goal of zero.

**Codes Outside the ICU on Ward Coverage Areas**

This is a measure of the ability to detect and act upon patients who may be deteriorating outside the ICU.

“Code” is an instance in which a patient requires chest compressions, electric shock, or emergency-assisted ventilation (including mouth to mouth, bag valve mask, or invasive airway).

Rationale of Metric: Ideally, codes do not occur outside the intensive care environment. This metric gives insight into patient safety in the hospital setting, including issues of rapid-response team use, decision-making on patient location, patient assessment, and procedures outside the ICU.

**Hospital-Acquired Pressure Ulcers**

This is a measure of the ability to prevent pressure ulcers from occurring.

A “pressure ulcer” is localized injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction.

Rationale of Metric: Hospitalists participate in the care of patients at risk for pressure ulcers. All pediatric patients should be monitored by this metric with a goal of zero. Pressure ulcers are of great interest to hospitals, because the Centers for Medicare and Medicaid Services (CMS) has begun to disallow hospital-acquired pressure ulcers (not documented as present on admission) as a billable ICD-9-CM.

**NONCLINICAL QUALITY DATA**

Nonclinical quality data (Table 3) are intended to be used to track metrics that are related to satisfaction of both patients and referring physicians. However, the data will vary by survey company and by individual surveys. Internal year-to-year comparisons are likely to be the most useful, although it is recommended that these data be posted in the dashboard repository as well.

### Table 3 Nonclinical Quality

<table>
<thead>
<tr>
<th>Nonclinical Quality</th>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended Patient satisfaction</td>
<td>Hospital satisfaction survey</td>
<td>Individual surveys</td>
</tr>
<tr>
<td>Consider Referring physician satisfaction</td>
<td>Individual surveys</td>
<td>Individual surveys</td>
</tr>
</tbody>
</table>
assess provider satisfaction with the PHM group. Groups can develop their own survey instruments with variable terms.

Rationale: This information can help increase referrals and improve quality of care and communication. Questions should focus on physician performance and communication. Coordination of care, utility to the primary care physician, and impact of patient care in terms of quality and patient satisfaction should be addressed.

**PRODUCTIVITY MEASURES**

Productivity measures (Table 4) are intended for comparison among similar types of groups, as well as internal comparisons year by year for individual groups.

**Recommended Metrics Detail**

**Number of Billable Encounters per Calendar Day**

This metric is a measure of the number of billable encounters by the group in 1 day. It is a marker for the workload of the group and proxy for the number of patients seen.

“Encounter” is any evaluation and management (E/M) or current procedural terminology (CPT) code that is generated by seeing a patient. It is understood that a patient may be seen many times in 1 day, but only the actions that generate charges are counted.

Rationale for Metric: PHM groups can track this metric as the total number of billable interactions and proxy for patients seen. This is a more useful metric than average daily census, because the average daily census is a snapshot and does not accurately reflect the work throughout the day.

How to Calculate: Sum the number of bills (unique E/M and CPT) created by the PHM group over a period of time, mostly commonly, 1 year. Divide that sum by the number of days in the time period. The result is encounters per day.

**Consider Metrics Detail**

**Number of Relative Value Units per 24 Hours**

This is a measure of the generally accepted proxy for money generated or work done in 24 hours.

Relative value unit (RVU) is a number assigned to a CPT code that, when compared with other CPT codes, shows their relative value in the estimation of CMS.

Rationale for Metric: Most measures of productivity are RVU based, because RVUs are easy to track and compare.

**Distribution of E/M codes**

This metric is a measure of the intensity of service provided by the PHM group.

E/M codes are found in the section of the CPT manual devoted to nonprocedural bill-generating events. E/M codes generally range from level 1 (low) to level 3 (high) for inpatient codes.

Rationale for Metric: It is a source that measures both intensity of service and appropriate documentation and coding by the group.

**Number of Billed Procedures per Calendar Day**

This metric is a measure of the average number of procedures being performed by the group.

“Billed procedure” is a procedure that has a CPT code assigned to it.

Rationale for Metric: Procedures are well reimbursed, and each PHM group will want to ensure that all procedures are being billed, and possibly track trends in procedures.

**RVU per Clinical FTE**

This metric is a measure of the intensity of service that each FTE performs. It is a proxy for how hard the hospitalists are working.

“RVU” is a number assigned to a CPT code that, when compared with other CPT codes, shows their relative value in the estimation of CMS.

Regarding the FTE, each group will define what it means to be a purely clinical hospitalist in terms of amount of clinical work. Each person in the group can then be assigned an amount of clinical work in proportion to the FTE. For each person, this will range from 0 to 1.

Rationale for Metric: This is a way to measure “how hard” the PHM group is working on a per person basis. This metric may be used to decide when to expand the group.

**RESOURCE UTILIZATION**

Resource utilization (Table 5) data are intended for internal year-by-year comparisons for each group, as well as
a data source for discussions with the hospital administration to help show value.

**Recommended Metrics Detail**

**Average Hospital Charge per Common DRG Condition**

This is a measure of the use of hospital resources per standardized patient admission.

“Hospital charge” comprises itemized charges generated for a specific hospitalization. This list of charges is created and tracked by the financial department of each hospital. This list does not include physician charges.

Diagnosis-related groups are systems of patient classification that take administrative data from inpatient hospitalizations (including ICD-9-CM diagnosis and procedure codes) and group patients into clinically recognizable and mutually exclusive categories. A commonly used DRG in children’s hospitals are APR-DRGs. With APR-DRGs, the DRG is broken further into 4 levels of severity, numbered sequentially from 1 to 4, indicating, respectively, minor, moderate, major, and extreme severity of illness. Medicaid Services-DRGs also exist, but are less useful in children’s hospitals because they have been derived from adult data alone.³

Rationale for Metric: Although hospital charges vary considerably from 1 hospital to another, internal comparison year over year of charges/DRG will provide a consistent way to measure changes in hospital utilization from the PHM group. It can also provide meaningful comparisons between groups or between a PHM group and patients admitted to other physicians.

How to Calculate: Financial offices of hospitals should be able to provide a total hospital charge and an APR-DRG for each patient seen by the PHM group. By selecting 1 DRG (or even a subset severity level of that DRG) and adding all charges for patients in that DRG, then dividing by number of patients, an average charge per DRG can be generated and tracked for whatever time period is most useful (eg, quarterly or annually).

**Consider Metrics Detail**

**Opportunity Days**

This metric is a measure of the contribution of the PHM group to the overall efficiency of throughput of the hospital.

“Opportunity days” are the difference between a patient’s actual LOS and target LOS. A positive result indicates performance worse than the established benchmark, whereas a negative number indicates performance better than the established benchmark.

Rationale for Metric: Hospital throughput is of great importance to hospital administration. The number of negative opportunity days demonstrates value to the hospital. This metric could be used to compare groups across institutions for common diagnoses as APR-DRGs, and severity of illness scales are standardized measures generated by outside agencies not affected by negotiated contracts.

**GROUP SUSTAINABILITY**

Group sustainability (Table 6) data are intended to help gauge overall stability and viability of a particular hospitalist group. Comparisons among different groups should prove useful as a warning when the group is in danger of burnout/poor working conditions.

**Recommended Metrics Detail**

**Hospitalist Turnover**

This is a measure of the number of hospitalists who have left the group relative to the size of the group. It is expressed as a percentage.

“Number departed” (ND) is the number of hospitalists who have left the group during the year being analyzed. ND is expressed as the FTE rather than as the number of persons.

“Average staff” (AS) is the average number of hospitalists (average number of FTE) that were staffing the group for the year.

Rationale for Metric: Hospitalist turnover may indicate potential areas of improvement within a group, including, but not limited to compensation, nature of the work and work environment, work hours and work-life balance, professional development, and recruitment and retention strategies.

**TABLE 6 Sustainability**

<table>
<thead>
<tr>
<th>Sustainability</th>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consider</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalist turnover</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>% of group attending PHM meeting</td>
<td>Hospitalist director</td>
<td></td>
</tr>
<tr>
<td>Hours worked per FTE (clinical)</td>
<td>Hospitalist director</td>
<td></td>
</tr>
</tbody>
</table>
A higher turnover rate may indicate that a group lags in any of the above areas.

How to Calculate: Hospitalist turnover = (ND/AS) × 100. This metric is expressed as a percentage.11

Consider Metrics Detail

Percent of Group Attending PHM Annual Meeting

This metric is a measure of the percentage of the group attending the PHM annual meeting.

“Number attending” (NA) is the number of hospitalists who attend the meeting. This is expressed in number of persons, not in FTEs.

“Average staff” (AS) is the average number of hospitalists (average number of persons) that were in the group during the year. Count all physicians hired to a percentage of clinical FTE. Do not count moonlighters.

Rationale for Metric: Continuing Medical Education activities promote professional skills and development. The conference also offers networking and a sense of career identification and satisfaction. Groups may choose to include other hospital medicine–focused meetings as well, but this should be pre-defined each year, not decided at year’s end. If other meetings are included, these meetings should be listed next to the metric’s title.

Average Annual Hours Worked per Clinical FTE

This is a measure of the actual number of clinical hours worked for each FTE. It does not include administrative, research, or protected time or paid time off. Specific teaching hours are not counted, but teaching on rounds is counted because it is patient contact.

“Clinical hours worked” are the actual clinical hours spent on patient care, or in house on a shift (if the group is set up as shifts). These hours do not include home calls, but do include hours spent in the hospital whether a hospitalist is called in to see a patient.

Each group will define what it means to be a purely clinical hospitalist in terms of amount of clinical work. Each person in the group can then be assigned an amount of clinical work in proportion to the FTE. For each person, this will range from 0 to 1.

SUMMARY

This proposed dashboard for PHM is intended to foster internal and external monitoring and comparison among PHM groups. It is expected that this dashboard will provide a step toward meaningful measurement and improvement for pediatric inpatient care and the PHM practitioners who provide it. Some measures may be proven adequate, some inadequate in measuring quality. Limitations of the Dashboard include variations in data collection and patient populations. However, given the demand for metric measurement to the future of quality care and reimbursement the Committee has attempted to create a common starting point for data collection and comparison.

REFERENCES

Appendix

Descriptive Data (Table 1)

Case Mix Index for PHM Group

How to Calculate

Financial offices of hospitals should be able to directly provide the case mix index. If not, it can be calculated by using the following formula:

\[
\text{Case Mix Index} = \sum W_n \times P_n + W_2 \times P_2 + W_3 \times P_3 + \ldots
\]

where

- \( W \) = weight for each DRG (1, 2, 3…)
- \( P \) = % of patients with each DRG (1, 2, 3…) managed by the PHM group (from Ozcan YA. Quantitative Methods in Health Care Management. Hoboken, NJ: Wiley & Sons; 2005)

Percent Patients Discharged In Observation Status

How to Calculate

Hospital financial offices should be able to provide the total number of observation discharges and the total number of discharges. The metric is easily calculated as the ratio of these 2 values times 100%.

Percent Patients Covered By Resident Teams

How to Calculate

The financial offices of hospitals should be able to provide the total number of patients admitted to hospitalist resident teams and the total number of admissions to the hospitalist service (both teaching and nonteaching). The percentage of patients covered by resident teams is the ratio of these numbers times 100%.

Clinical Quality Data (Table 2)

Severity Adjusted LOS Index

How to Calculate

Hospital financial offices should be able to provide this number. Sum the actual number of inpatient days for the defined cohort of patients. For each patient in that cohort, obtain an APR-DRG. Sum the expected number of hospital days from each corresponding APR-DRG. Divide the total number of actual days by the expected number of days.

Readmission Rates (15 Day Unplanned)

How to Calculate

Select a patient population, either patients discharged from the hospitalist service or from the hospital as a whole (in both inpatient and observation status). For that population, divide the number of patients readmitted (into either inpatient or observations status) within 15 days of discharge by the total number of discharges for that patient population. Multiply that number by 100 and display it as a percentage. Of note, to create a readmission rate that excludes planned readmission or readmissions for other causes, one can filter the search to exclude patients not from the emergency department or patients with different DRGs (or ICD-9-CMs) on their second admission.

Example

- Patient cohort: all pediatric patients
- Reporting period: monthly
- Return time period: 15 days

In January 2012, 200 patients ≤18 years are discharged from the hospital. Five are readmitted within 15 days with related ICD-9-CMs. One additional patient is readmitted with a different code (initial code, asthma; readmit code, trauma (due to car accident)). The readmission rate is \( \frac{6}{200} \times 100 = 3 \) patients per 100 or 3%.

Bronchiolitis Guideline Compliance

How to Calculate

For each guideline, report the percentage of patients admitted with a primary ICD-9-CM of bronchiolitis without ICD-9-CM of bacterial pneumonia or fever or asthma who receive each treatment numbered under the guideline section above for a given time period (by month or quarter).
Example for guideline 1

Patient cohort: all patients on the fifth-floor pediatric ward
Reporting period: monthly. In July, 10 patients are admitted with bronchiolitis without secondary diagnosis of pneumonia or asthma. Three receive respiratory syncytial virus testing. Report 70% (this is the percentage of patients who met the guideline).

CLABSI Rate
How to Calculate

The hospital’s infection control practitioners should be able to provide data regarding the number of infections in patients with central lines. Number of line days per time period should be tallied (on a given day, total the number of lines and sum this total across the time period being reported). To get the rate, divide number of infections by the total number of line days. Multiply by 1000 and report as number of infections per 1000 line days.

Example

Patient cohort: all patients on the fifth-floor pediatric ward
Reporting period: annualized, updated monthly
Number of central lines with positive blood cultures in last 12 months: 1
Number of line days: 420
Rate: $\frac{1}{420} \times 1000 = 2.4$ infections per 1000 line days

CAUTI Rate
How to Calculate

The hospital’s infection control practitioners should be able to provide data regarding number of infections in patients with urinary catheters. Number of catheter days per time period should be tallied (on a given day, total the number of catheters in place and sum this total across the time period being reported). To get the rate, divide number of infections by the total number of device days. Multiply by 1000 and report as number of infections per 1000 device days.

Example

Patient cohort: all patients on the fifth-floor pediatric ward
Reporting period: annualized, updated monthly
Number of patients with indwelling urinary catheters and positive urine cultures in the last 12 months: 1
Number of catheter days: 420
Rate: $\frac{1}{420} \times 1000 = 2.4$ infections per 1000 catheter days

Codes Outside the ICU on Ward Coverage Areas
How to Calculate

Report number of codes that occur outside the ICU (pediatric and neonatal). Do not include patients in the emergency department, delivery room, or burn unit. This metric should include all pediatric patients (hospitalist and nonhospitalist).

Hospital-Acquired Pressure Ulcers
How to Calculate

Report the absolute number of full-thickness pressure ulcers (grade 3, 4, or unstageable) during the reporting period that were not documented as “present on admission.” As a clarification, if a patient develops 2 separate ulcers during a stay, then the number from that stay is 2 (count the ulcers, not each individual patient).

Example

Patient cohort: hospitalist patients
Reporting period: monthly
Number of patients obtaining grade 3 or higher ulcer: 0

NONCLINICAL QUALITY DATA (TABLE 3)

Referring Physician Satisfaction
How to Calculate

General surveys (as opposed to surveys on a particular admission) should be sent to all referring physicians periodically (ideally, every 6 months; timing will vary) by mail, e-mail, or fax. The group may decide to only survey primary care physicians who have admitted more than a minimum number of patients.
PRODUCTIVITY MEASURES (TABLE 4)

Number of RVUs per 24 Hours

How to Calculate

Sum the number of RVUs generated over the year, then divide by the number of 24 periods that year. Express as RVUs per day.

Distribution of E/M Codes

How to Calculate

The PHM group’s financial data source should be able to provide this information. For each type of code (admission, subsequent day, and discharge) create a histogram showing the number of each subset of code and the relative percentage it makes up.

Number of Billed Procedures per Calendar Day

How to Calculate

Sum the number of procedural CPT codes for the year, then divide by the number of days in the year.

RVU per Clinical FTE

How to Calculate

Total the number of RVUs generated through the year by the group, then divide that sum by the number of clinical FTEs the group has.

RESOURCE UTILIZATION (TABLE 5)

Opportunity Days

How to Calculate

Financial offices of hospitals should be able to provide actual LOS and targeted LOS based on APR-DRG for each patient seen by the PHM group. The targeted LOS is subtracted from the actual LOS to generate the performance indicator. The more negative the number the more efficient is your group at throughput. This number can be assessed in total for all diagnoses/APR-DRGs or by individual APR-DRGs.

GROUP SUSTAINABILITY (TABLE 6)

Percent of Group Attending PHM Annual Meeting

How to Calculate

\[ \text{Meeting Attendance} = \left( \frac{\text{NA}}{\text{AS}} \right) \times 100 \]  
This metric is expressed as a percentage.

Average Annual Hours Worked per Clinical FTE

How to Calculate

Add all clinical hours worked for the group, and divide that sum by the sum of all the parts of FTEs that make up the clinical work for the PHM group. This metric is expressed as hours per 1.0 FTE per year.