PRIMES: Pediatric Respiratory Illness Measurement System

Medical Record Abstraction Tool

Clinical Guidelines

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I. GENERAL GUIDELINES

1. PRIMES – This abstraction tool collects data to evaluate care provided to children with any of 4 pediatric respiratory conditions treated in an emergency department (ED) and/or acute hospital. The 4 conditions are croup, bronchiolitis, asthma, and community acquired pneumonia (CAP). The standards of care (quality indicators or QIs) applied to the abstracted cases resulted from a review of the medical literature and the input of a panel of experts. (See Appendixes for a summary of the QIs evaluated with this tool.) Patients are included who had an episode of care either in the ED alone or in the acute hospital alone or both (i.e., admission was initiated in the ED). In the case of CAP, evaluated cases are limited to those that were treated as inpatients.

2. Abstraction Tool – Abstracted data are entered directly into the online tool. There are 4 modules, 1 for each study condition. See the separate documentation (PRIMES Help) for information about the operational use of the tool.

3. Time Frame – The abstraction tool will collect data about care provided to patient cases for any time frame specified. Limit the abstracted data entry to the care episode of interest. (See the separate document summarizing the process for selecting cases for abstraction.) The tool also contains a reporting function to summarize overall quality scoring for each condition and for each indicator within a condition.

4. Question Time Periods – Time frames for the care of interest are specified in each question. The eligible time frame for care may be as long as the entire ED or hospital stay or as short as within 15 minutes of ED arrival. The requirements for timeliness of care will depend on the nature of the indicator and the condition to which it refers. NOTE that all times should be entered with a 24-hour notation, where each calendar day starts with 0000 and ends with 2359. Within the PRIMES tool, a clock icon is sometimes included next to selected questions that when clicked will display the end-date and time of the time frame of interest for that question. Other questions will display the time frame of interest within the question text.

5. Source(s) of Care – Some abstraction questions will specify the source of care to be used to answer the abstraction question (e.g., nurses' notes). If this is not specified, use any source during the marker episode of interest. Some items are limited to care provided in the ED and others are limited to care provided during the acute hospitalization. Evaluation of inpatient care is generally limited to care provided on the acute inpatient ward and excludes PICU care.

   In cases where precise timing is important (e.g., treatment of a severe episode of croup with racemic epinephrine within 30 minutes), documentation will be limited to sources that reflect real timing of ongoing care (e.g., medical administration record or MAR, nurses' notes, RT notes) and not utilize MD notes which are often summary statements of recent events since the last MD note that do not reflect care in real time.

   If the patient has received care at another source prior to arrival (e.g., clinic, MD office, other ED, other hospital), the question text will indicate, where applicable, if this information is to be included or excluded in your response to that question.

6. Exclusions – There are some conditions or circumstances that would exclude a patient from being evaluated by the quality indicators in the PRIMES tool. Where applicable, the module will list the criteria so that the abstractor can confirm that the exclusionary conditions do not apply to the study patient before proceeding with the data entry. Age at admission may also be an exclusion factor. In this case, the tool will calculate the age based on the date of birth and the admission date and inform the user if the case is to be excluded.

7. ED Admission – For each module where a patient was seen in the ED you will be asked to enter the date and time of ED arrival or registration. This should be the earliest time of arrival and is distinct from the time of admission, although the two may be the same in some cases.

   You may be asked to enter the time of the first clinical note as well. This is the first documentation by a healthcare provider. This may be the triage note, a rooming note, or other note that care has been initiated for this admission. The content is not important. This should just be the earliest acknowledgment of the patient by the healthcare providers after ED arrival.

8. Medication Lists – Many questions in the abstraction tool ask about the use of certain categories of medications (e.g., short-acting bronchodilators, systemic corticosteroids, etc.). An accessible list of the applicable medications has been provided for your reference within the abstraction questions. The type of medication of interest will be noted at the start of the question with a *<click for list>* option that will bring up a list of relevant medications. In some cases, the screen will display more than one type of medication. Be sure to refer to the correct list of drugs and type of drug for that question (e.g., where *systemic* corticosteroids are referenced, do NOT include *inhaled* corticosteroids). Every attempt has been made to make the medication lists complete and up to date at the time of the tool release, but newer applicable drugs may have been marketed in the meantime.

9. Definitions of Term – Questions may refer to the presence or absence of specific signs or symptoms (e.g., stridor). Definitions of terms of interest are listed within or near the question text.

10. Skip Patterns – The question sequences within the modules sometimes include skip patterns based on the response entered to a prior question. These skip patterns are NOT automated, but rather are spelled out in a shaded bar with white text after the question to which they apply (e.g., "If 4.1.B = Yes, please answer 4.1.B.1 below"). If a required question is left blank, it will generally be defaulted to "no data." In the case of some questions left blank, a warning message will be displayed.

11. On-line Abstraction Issues – If you encounter a problem with the technical functioning of the computerized abstraction tool, report the problem as soon as possible.

II. Clinical Modules

1. Croup

This module collects data to evaluate care provided to children with croup who are treated in an emergency department (ED) and/or acute hospital. Patients are included who had an episode of care either in the ED alone or in the acute hospital alone or both (i.e., admission was initiated in the ED).

Croup is one of the most frequent causes of acute respiratory distress in young children. It is an acute clinical syndrome characterized by a barking cough, hoarse voice, stridor and varying degrees of respiratory distress. Children under 3 years of age are the most likely to get croup. Symptoms are due to edema of the larynx and trachea, usually because of a viral upper respiratory tract infection, most commonly with parainfluenza. *Stridor* is an abnormal, high-pitched sound produced by turbulent airflow through a partially obstructed airway at the level of the supraglottis, glottis, subglottis, and/or trachea and is generally heard on inspiration. The croup cough is tight, low-pitched, and barky like a barking seal (which is different from stridor). A child with croup may tend to breathe very fast and might have *retractions* (when the skin between the ribs pulls inward during breathing). Treatment is medical (dexamethasone, racemic epinephrine) and supportive (patent airway, adequate oxygenation, hydration, monitoring for respiratory distress). The symptoms of croup generally peak in 2 to 3 days. Viral croup usually lasts 3 to 7 days.

The Croup module focuses data collection on the following aspects of care:

Parameter	**Module Content**
Age	0-5 years [Module excludes children >5 years old]
Emergency Department Care	
Focus of evaluation	*Acute assessment and supportive care:* ▪ Severity of croup ▪ Pharmacologic treatment ▪ Response to treatment
Initial assessment	***Within 30 minutes of arrival:*** ▪ Presence/absence of lethargy or agitation ▪ Presence/absence of stridor ▪ Presence/absence of retractions ▪ Lung auscultation
Severity of croup	*Based primarily on:* ▪ Stridor/retractions at rest ▪ Lethargy/agitation
ED discharge counseling (if discharged to home)	▪ Expected course of illness ▪ Signs of respiratory distress/when to seek medical care

Parameter	Module Content
Inpatient Care	
Focus of evaluation (*excluding PICU)*	*Daily monitoring (up to 5 days):* ▪ Vitals signs ▪ SaO_2 ▪ Presence/absence of stridor or retractions *Treatment and response for any severe episodes*

Croup Module Question Guidelines

1. Discharge Diagnoses – Confirm that the patient's diagnoses for this episode of care included croup. If the patient was seen in the ED, the ED record should include a diagnosis of croup, regardless of whether or not the patient was admitted as in inpatient. Include a diagnosis that is anywhere in the record (e.g., provider notes), and include as croup cases that had stridor and were treated as a croup patient.

2. ED Care – Indicate if the patient was treated in the marker hospital ED or was admitted directly (without ED care) to the marker hospital as an inpatient. Choose the first response if the patient spent any time in the ED. If the patient was seen prior to admission in an urgent care that is directly affiliated with the marker hospital, consider the urgent care treatment to be part of the marker ED care if the patient was transferred directly to the marker ED from the affiliated urgent care. In this case, the admission date and time to urgent care should be considered the date and time of the ED admission. If the patient was discharged from the urgent care and only later was admitted to the marker ED, consider the urgent care to be 'prior-to-admission' care.

3. ED Admission and Discharge – For patients admitted to the ED, enter the date and time of ED arrival or registration, ED admission, and ED discharge. The arrival time will most often be earlier than the ED admission or first clinical note. For the discharge time, note the time the patient left the ED or, if not specified, the time of the last clinical note in the ED record. Consider a transfer to an observation bed as a discharge from the ED and admission to inpatient care.

4. Initial Assessment – The initial assessment of a patient presenting to the ED with croup should be made within 30 minutes of arrival since the patient's respiratory condition may worsen rapidly, and timely medical and supportive treatment is essential. Base your data about the assessment on documentation noted ***within 30 minutes of patient arrival and prior to treatment with medication.*** The date and time of the outer limit of this time frame is specified in the text of this question. Base responses on the providers' physical exams, (MD, RN, or RT) but NOT from the chief complaint or review of systems (ROS) which are historical data that do not reflect the patient's condition on presentation to the ED. Also, do not use documentation that refers to the initial assessment but is time-stamped with a time later than the 30-minute cutoff. Disregard any information from pre-arrival transport (e.g., ambulance, EMT, pediatrician's office).

   Reference to a respiratory or asthma score will confer credit for an assessment of presence/absence of retractions since work of breathing is always included in these scores. Many also include aeration, indicating an auscultative exam. (See Appendixes for samples of respiratory scores and asthma scores and their content.) Reference to audible breath

sounds (without a stethoscope) that are normal would confer credit for absence of stridor. However, if any abnormal sounds are noted, specific reference must be made to the presence or absence of stridor.

4.1 Pharmaceutical Treatment in ED – In Q4.1a), note if the patient received any dexamethasone treatment in the 24 hours prior to ED arrival. Indicate in Q4.1b) if dexamethasone was given in the marker ED and if so, in Q4.1b1), enter the date and time of the *first* dexamethasone administered. In Q4.1c), indicate if the patient was given racemic epinephrine in the ED, and if so, enter the date and time of the first 5 doses given in the ED. If a medication was given orally and noted to be vomited up, do NOT give credit for that dose. If a dose was noted to be partially vomited and the vomited portion was re-dosed, give credit for the medication and note the date and time of the initial administration (pre-emesis). Base this information on medication documented as *given* rather than ordered. See medication lists for dexamethasone and racemic epinephrine provided.

For subsequent questions regarding assessed severity of croup symptoms, *use the following severity classifications. Assessed symptoms falling into more than one category always default to the* ***highest*** *level of severity. For timing of assessments, do not use dates and times on summaries where the assessment was done sometime earlier. Rather, rely where possible on more accurately timed notes (e.g., RN, RT or explicitly timed MD notes).*

Severe croup symptoms:
Described as "severe"
OR
Stridor or retractions at rest or not specified AND lethargy/agitation
OR
No assessment, but rEpi treatment WITH lethargy/agitation
OR
Impending/actual respiratory arrest/failure/Code Blue

Moderate croup symptoms:
Described as "moderate"
OR
Stridor or retractions at rest or not specified AND NO lethargy/agitation
OR
No assessment, but rEpi treatment AND NO lethargy/agitation

Mild croup symptoms:
Described as "mild"
OR
NO significant stridor or no stridor at rest AND NO significant chest wall retractions or no chest wall retractions at rest AND NO lethargy/agitation

NOTE: *symptoms "at rest" override any specified level of severity (e.g., mild stridor at rest = stridor at rest).*

5. Severity of Croup – The purpose of this question is to characterize the severity of the patient's croup symptoms **prior to** being treated with dexamethasone or racemic epinephrine (or prior to racemic epinephrine treatment if dexamethasone was received prior to ED arrival). Do not include assessments made prior to ED arrival (e.g., during emergent transport). Consider a noted exam time that is the same as the treatment time to be the

patient's condition just prior to treatment unless otherwise noted. This level of severity will serve as a baseline for assessing response to treatment and making decisions about further needed treatment and/or potential hospitalization. Since the patient's symptoms may vary and different providers' assessments may not agree, you should select the ***WORST symptoms noted prior to treatment.*** Symptoms of stridor and retractions are assumed to be significant and present at rest unless stated otherwise. The key distinction between severe and moderate symptoms (both include stridor and/or retractions that are significant and/or present at rest) is the presence (severe) or absence (moderate) of agitation/lethargy. If a patient has symptoms falling into 2 severity categories (e.g., stridor only with activity, but increased work of breathing), note the more severe (in this case, increased work of breathing). If the timing of the symptoms is variable (stridor noted, agitation noted 5 minutes later), note the time associated with the worst symptom (in this case, agitation). Categories have also been provided for patients who may receive treatment with epinephrine prior to any documentation of symptom assessment. Epinephrine treatment suggests a level of severity above mild (with presence/absence of agitation/lethargy determining whether the severity is moderate or severe).

Sometimes a patient is described as "lethargic" with further modifiers (e.g., sleeping, lethargic). In these cases, lethargy is not worrisome in the context of sleeping or napping. However, if the documentation insinuates that the child is not easily arousable as when a procedure is being performed or the child is otherwise being stimulated, then this should be assumed to be indicative of reduced responsiveness and meeting the criteria for "lethargy."

Enter the time of the first assessment if the severity of that assessment did not change during the remaining time frame of reference. If a later assessment indicated worse symptoms, use those results and use the time of that (later) assessment.

6. Mild Croup: Symptom Progression – Indicate if the patient with mild croup symptoms prior to treatment ever had symptoms in the ED that escalated to the level of either moderate or severe. If not, answer Q6a) asking if the patient had a chest or airway radiograph taken in the ED.

7. *[This question has been deleted.]*

8. Severe Croup: Racemic Epinephrine – Note if the patient with severe presenting symptoms received treatment with racemic epinephrine (IM or nebulized) within 30 minutes of the notation of severe croup symptoms.

9. Severe Croup: Response to Racemic Epinephrine in 30 Minutes – In the case of patients with severe symptoms, it is important to note the response to epinephrine ***within 30 minutes of INITIATING the epinephrine treatment.*** The focus is severity within 30 minutes after *initiation* of treatment since nebulized treatments may exceed this time frame before completion. If there are multiple assessments in the 30-minute time frame, note the ***LAST assessment.*** If the patient's 30-minute post-treatment severity is *severe or moderate*, answer Q9c) asking about a second racemic epinephrine treatment administered within 30 minutes of the post-treatment assessment. Note that another alternative is specified—racemic epinephrine was not administered, but there is documentation that the patient improved significantly within 30 minutes. In some cases, other measures used to calm a distressed child may be appropriate and is acceptable if it results in reduced agitation/lethargy and reduced stridor or retractions.

10. *[This question has been deleted.]*

11. Mild/Moderate Croup: Post Treatment Severity – This question applies to patients whose initial symptoms were NOT severe. It asks for the patient's LAST symptom severity within 4 hours after COMPLETING the dexamethasone (and/or epinephrine) treatment and prior to any subsequent epinephrine treatment. The time frame here is 4 hours as patients with milder symptoms may not be assessed as rapidly as those with moderate/severe symptoms. If post-treatment symptoms were *severe*, answer Q12 and Q14 asking about epinephrine treatment, cyanosis, and airway assessment (see below). If post treatment symptoms were *moderate*, answer Q11c) asking if there was ever an escalation in the ED to severe symptoms. If post treatment symptoms were *mild*, answer Q11d) asking if there was ever an escalation in the ED to moderate/severe symptoms. If the patient was NOT treated with dexamethasone, enter the response "no data" and enter the date and time of assessment or, if none, the time and date of ED discharge.

12. Escalation to Severe Croup: Racemic Epinephrine – This question applies to all patients whose initial symptoms were NOT severe, but progressed to severe at some point in the ED. Note if the patient with now severe symptoms received treatment with racemic epinephrine (IM or nebulized) within 30 minutes of the notation of severe croup symptoms.

13. *[This question has been deleted.]*

14. Escalation to Severe Croup: Airway – This question focuses on patients whose pretreatment symptoms were NOT severe but later escalated to severe and asks whether the patient's airway was assessed while in the ED or the patient was admitted to intermediate care or PICU. If assessed in the ED, the assessment must have been done by personnel from the PICU or ENT or anesthesia services.

15. *[This question has been deleted.]*

16. ED Discharge Destination – Enter the patient's ED discharge destination.

17. ED Counseling – This question only applies to patients discharged from the ED to home (or residential setting). Indicate which of the categories of counseling were addressed with a parent/caregiver prior to discharge. Include relevant content from any printed materials given to the patient that are available for your review. If a croup handout was given to the parent/guardian but you are unable to confirm its content, give credit for c) general counseling

    a) Anticipated course of illness must include some reference to the anticipated characteristics of the disease (e.g.," illness should resolve within 5 days," "may be worse at night," "may be worse in cold temperatures," "disease pathophysiology discussed").

    b) Signs of respiratory distress and/or when to seek medical attention must include some reference to symptoms that would necessitate a return to the ED or for health evaluation (e.g., "return to ED if high fever or no urine") or what would be signs of respiratory distress (e.g., "breathing sounds funny").

    c) General/unspecified counseling includes any otherwise unspecified reference to discharge counseling (e.g., "discharge and follow up instructions reviewed with parent," "croup instructions given," "understands discharge instructions").

18. IP Admission and Discharge – Enter the dates and times of the patient's hospital admission and discharge. For the admission time, note the official admission time or if none, the first nursing note or record of patient arrival on the ward. For discharge time, note the official discharge time, or if none, the time the patient left the ward or the latest entry in the inpatient record.

19. PICU – Indicate whether the patient spent any time in the PICU this admission.

20. Vital Signs and Clinical Assessment – This question is only applicable if the patient was never in PICU during this admission. Based on nurses' and RT notes and/or flow sheets, record all times of noted temperature, heart rate, respiratory rate, SaO_2, and presence/absence of stridor or retractions for up to 5 days of the hospitalization. Do NOT include vital signs and assessments done in the ED. Include all specified assessments for each day using a 24-hour clock from 0000 through 2359. The focus here is monitoring of the patient's status while in the acute inpatient ward. If a patient had no assessments for a day, indicate this in the space provided and advance forward to the next hospital day.

    Limit your entries to specific measurements/assessments. Do NOT include summary statements in MD provider notes (e.g., Sats 94-97% all day on RA), but do include nursing flow sheet notes describing a specific pattern at a specific time (e.g., 2350: desat to 88%, up to 95% on 1L per mask). Entries may be made in any order. Since each screen represents a hospital day, you do not need to enter the date. However, do remember to progress to the next day's screen when 2359 has passed.

21. Racemic Epinephrine Prior to Hospital Discharge – Indicate if the patient received racemic epinephrine during the during the hospital stay (excluding ED). If so, note the first 5 doses given. Base this information on medication documented as *given* rather than ordered. See medication list for racemic epinephrine provided within the tool.

22. Severity of Symptoms during Hospitalization – Indicate if the patient ever had severe croup symptoms (regardless of what the presenting/ED symptoms were) during the hospital stay while in floor care (i.e., excluding PICU care). If provider entries are contradictory, focus on the worst. Use any source of documentation during the hospital stay, including progress notes as long as the information is a timed entry and NOT a provider summary note of past/recent clinical status.

23. Severe Croup during Hospitalization – Enter the dates and times of the first 3 episodes of severe croup symptoms and note whether racemic epinephrine (IM or nebulized) was administered within 30 minutes of the severe episode. Note that another alternative is specified—racemic epinephrine was not administered, but there is documentation that the patient improved significantly within 30 minutes. In some cases, other measures used to calm a distressed child may be appropriate and is acceptable if it results in reduced agitation/lethargy and reduced stridor or retractions.

2. *Bronchiolitis*

This abstraction tool module collects data to evaluate care provided to children with bronchiolitis who were treated in an emergency department (ED) alone, as a direct admit to the hospital, or those treated in both settings (i.e., inpatient admission was initiated in the ED).

Bronchiolitis is a disorder most commonly occurring in infants and children from 1 month to 2 years caused by a viral lower respiratory tract infection (LRTI). It is characterized by acute inflammation, edema and necrosis of epithelial cells lining small airways, increased mucus production, and bronchospasm. Clinical signs and symptoms consist of rhinorrhea, cough, wheezing, tachypnea, and increased respiratory effort manifested as grunting, nasal flaring, and intercostal and/or subcostal retractions. The course of bronchiolitis is variable, ranging from transient events such as apnea or mucus plugging to progressive respiratory distress. Treatment focuses primarily on supportive therapy (e.g., oxygen, suctioning, fluids and oral intake) until the viral condition has run its course.

The Bronchiolitis module focuses data collection on the following aspects of care:

Parameter	**Module Content**
Age	0-24 months [Module excludes children >24 months old]
Emergency Department Care	
Focus of evaluation	*Acute assessment and supportive care:* ▪ Severity of illness ▪ Supportive care
Initial assessment	***Within 30 minutes of arrival:*** ▪ Respiratory rate ▪ Presence/absence of wheezing ▪ Presence/absence of retractions ▪ Color ▪ Hydration
Severity	*Based primarily on:* ▪ Retractions ▪ Oxygen saturation
Inpatient Care	
Focus of evaluation (*excluding PICU)*	*Monitoring on Days 1-3:* ▪ SaO_2 ▪ Presence/absence of retractions
Discharge status	*Day of discharge:* • Reduced work of breathing • Adequate oral intake
Discharge follow-up	Within 1 week

Bronchiolitis Module Question Guidelines

1. Criteria on Admission – Indicate if the patient had any of the listed conditions at the time of admission. These conditions complicate the treatment of bronchiolitis, and therefore, these patients are excluded from this module.

2. Discharge Diagnoses – Confirm that the patient's diagnoses for this episode of care included bronchiolitis. If the patient was seen in the ED, the ED record should include a diagnosis of bronchiolitis, but this is not a requirement if the diagnosis was made as in patient.

3. Emergency Care – Indicate if the patient was treated in the marker hospital ED or was admitted directly (without ED care) to the marker hospital as an inpatient. Choose the first response if the patient spent any time in the ED. If the patient was seen prior to admission in an urgent care that is directly affiliated with the marker hospital, consider the urgent care treatment to be part of the marker ED care if the patient was transferred directly to the marker ED from the affiliated urgent care. In this case, the admission date and time to urgent care should be considered the date and time of the ED admission. If the patient was discharged from the urgent care and only later was admitted to the marker ED, consider the urgent care to be 'prior-to-admission' care.

4. ED Admission and Discharge – For patients admitted to the ED, enter the date and time of ED arrival or registration, ED admission, and ED discharge. The arrival time will most often be earlier than the ED admission or first clinical note. For the discharge time, note the time the patient left the ED or, if not specified, the time of the last clinical note in the ED record. Consider a transfer to an observation bed as a discharge from the ED and admission to inpatient care.

5. Initial Physical Exam – The initial assessment of a patient presenting to the ED with croup should be made within 30 minutes of arrival since the patient's respiratory condition may worsen rapidly and timely medical and supportive treatment is essential. Base your data about the assessment only on documentation noted ***within 30 minutes of patient arrival.*** These responses should come from the providers' physical exams, (MD, RN, or RT) but NOT from the chief complaint or review of systems (ROS) which are historical data that do not reflect the patient's condition on presentation to the ED. Also, do not use documentation that refers to an initial assessment but is time-stamped with a time later than the 30-minute cutoff for this assessment.

   Reference to a respiratory or asthma score will confer credit for an assessment of presence/absence of retractions, since work of breathing is always included in these scores. (See the Appendixes for examples of respiratory and asthma scores.) Reference to an asthma score will confer credit for an assessment of both retractions and wheezing, since asthma scores include assessment of both signs. Reference to audible breath sounds (without a stethoscope) that are normal would confer credit for absence of stridor. However, if any abnormal sounds are noted, specific references must be made to the presence/absence of wheezing.

6. Initial History – This question focuses on the presence or absence of factors associated with risk for severe disease for those children diagnosed with bronchiolitis. The responses could come from providers' (MD or nursing) historical data. There is no timeframe here other than the documentation should come from the ED record. You may include any documentation

found in the ED record from other healthcare facilities or medical transport notes just prior to admission.

7. Other Medical Conditions – These are medical conditions that would indicate that the child is affected by other serious medical issues that might affect medical care choices.

8. Imaging – Indicate if the patient had a chest/airway radiograph performed while in the ED. Do NOT count tests performed prior to admission at other healthcare facilities.

9. Laboratory Tests – Indicate if the patent had bacterial blood cultures (BBC), a complete blood count (CBC) or respiratory syncytial virus (RSV) test [culture, antigen, fluorescent antibody (FA)] while in the ED. Do NOT count tests performed prior to admission at other healthcare facilities.

10.-11. *[These questions have been deleted.]*

12. Severity of Respiratory Symptoms – The purpose of this question is to identify patients whose respiratory symptoms are ONLY mild vs. those who are/progress to moderate or severe. This assessment should be based on data from the ED only. If symptoms changed during the ED stay or documentation is contradictory, note the WORST symptoms noted during the entire ED stay.

13. Feeding – Indicate if the patient was feeding well while in the ED. **ANY** of the criteria listed in the question definition will constitute feeding well. This response should be based on data from the ED record only. If there is no evidence of feeding well OR if the record indicates any concern for dehydration, the child should be determined to be NOT feeding well (Answer = No/No data).

14. ED Discharge – Enter the patient's ED discharge destination.

15. IP Admission and Discharge – Enter the dates and times of the patient's hospital admission and discharge. For the admission time, note the time of the first nursing note or record of patient arrival on the ward. For discharge time, uses the official discharge time or note the time the patient left the ward or the latest entry in the inpatient record.

16. PICU – Indicate whether the patient spent any time in the PICU during this admission.

17. *[This question has been deleted.]*

18. Vital Signs Monitoring – This question only applies to patients who did NOT spend any time in the PICU this admission. Based on nurses' notes and/or flow sheets, record all times of measured temperature, heart rate, respiratory rate, SaO_2, and presence/absence of retractions for up to the first 3 days of the hospitalization. Do not include vital signs and assessments done in the ED. Include all specified assessments for each day using a 24-hour clock from 0000 through 2359. If a patient had no assessments for a day, indicate this in the space provided and move forward to the next hospital day.

    Limit your entries to specific measurements/assessments. Do NOT include summary statements in provider notes (e.g., Sats 94-97% all day on RA), but do include nursing flow sheet notes describing a specific pattern at a *specific* time (e.g., 2350: desat to 88%, up to 95% on 1L per mask). Entries may be made in any order. Because each day is a separate

screen, you do not have to enter the date. However, remember to move to the next day when the time is later than 2359.

19. Elevated Respiratory Rate (RR)/Feeding Difficulty – Indicate if during the hospital stay, the patient was ever noted to have a sustained respiratory rate ≥65 (over a period of 2 hours) OR had a RR <65 but when attempts were made to feed the patient, the RR elevated to ≥65. "Sustained" means that the RR never fell below 65 during the 2 hours. This will require at least 2 measures of RR during that time. If 2 rates are elevated and the time between rates is >2 hours, assume that the elevated rate was persistent during that entire time. If 2 rates are elevated within <2 hours and there are no further rates noted during the remaining 2-hour time frame, assume that the elevated rate persisted for 2 hours. If the RR fell below 65, look for indications that the rate elevated to ≥65 with activities related to feeding or attempted feeding.

20. Supplemental Fluids – For the first episode of elevated RR or related difficulty feeding, indicate if the patient received any supplemental fluids within 2 hours. Give credit for any fluids given within 2 hours prior, during, or 2 hours after the recognized triggering event. The supplemental fluids may of any amount and may be intravenous, subcutaneous, or administered per nasogastric or orogastric tube (or existing gastric tube, if applicable). If no fluids were given within the specified time frame, look for evidence that the RR had fallen below 65 and remained below that threshold even during feeding.

21. Short-Acting Bronchodilators – Refer to the medication list for short-acting bronchodilators. Long-acting bronchodilators and other respiratory medications are not to be included here. Select the "Yes" response if the patient received any short-acting bronchodilators, regardless of dose or frequency of administration, and even if rationale for its use was documented in the record. Select "No/No data" only if there is no evidence of any treatment with a short-acting bronchodilator during this admission.

22. New Asthma/RAD – Indicate if at the time of the bronchodilator use, the patient had a suspected or new diagnosis of asthma or reactive airway disease (RAD). Do not count a diagnosis of rule out asthma/RAD that was later ruled out.

23. Corticosteroids – Q23 specifically refers to *intranasal* steroids only. Q23 a) refers to *systemic or inhaled* steroids only. If the answer to Q23 is "Yes," it is not necessary to answer Q23 a). Do NOT include topical steroid applications or articular injections. Include asthma/RAD diagnoses that are definite and not later ruled out.

24. Antibiotics – Note if the patient was treated with any antibiotics (see medication list) during the admission. If more than 1 course of treatment with antibiotics, focus on the first. If treated with antibiotics, note at the time of the antibiotic order if there was or was not documentation of a possible focus of bacterial infection. This must be specific. Doing lab work for "r/o sepsis," for example, would not be acceptable. In that case, the exception would be very specific documentation that the child was "septic/toxic appearing" and/or "unresponsive/lethargic." Otherwise, there must be a suspected focus of infection documented.

25-26. *[These questions have been deleted.]*

27. IP Discharge – Indicate the patient's disposition at discharge.

28. Status at Discharge – This question applies only to patients discharged to home (or residential setting). Indicate if there was documentation of the listed elements of the patient's status at the time of discharge: a) reduced work of breathing (e.g., "no/minimal/decreased retractions"), and b) tolerating oral intake or G-tube feedings, if applicable (e.g., "urine output of ≥2 cc/kg/hour," "≥50% of meal eaten," "good oral intake"). For ease of abstraction, use the discharge summary as the FIRST source of this information. It is NOT necessary to corroborate discharge summary data with clinical data entries during the day of discharge. If there are no data about the required assessments in the discharge summary, refer to the nurses' notes on the day of discharge. If you need to use nurses' notes and there are multiple assessments, use the LAST assessment prior to discharge.

29. Follow-up Instructions – This question applies only to patients discharged to home (or residential setting). At the time of discharge, indicate if the parents/caregivers were instructed to schedule a follow-up appointment with the child's PCP (or hospital physician who cared for the patient during admission) ***within 1 week*** of discharge. The instructions must either include an appointment for a date within 1 week of discharge OR instructions to the parent to call for an appointment within 7 days or less. Some timeframe must be specified.

3. Asthma

This module collects data to evaluate care provided to children with asthma who are treated in an emergency department (ED) and/or acute hospital. Patients are included who had an episode of care either in the ED alone or in the acute hospital alone or both (i.e., admission was initiated in the ED).

Asthma is a common chronic disorder of the airways that is complex and characterized by variable and recurring symptoms, airflow obstruction, bronchial hyper-responsiveness and underlying inflammation. Among children with chronic medical conditions, asthma is the most common reason for hospitalization. Research suggests that treatment often falls short of recommended care, particularly for children with moderate/severe asthma who did not receive adequate treatment or were not given appropriate controller medications. Asthma exacerbations are acute or subacute episodes of progressively worsening shortness of breath, cough, wheezing, and chest tightness—or some combination of these symptoms. The diagnosis of asthma is not reliably made before the age of 2 years and may still be questionable until age 3 years. The focus of care for asthmatic children is rapid bronchodilation to ease respiratory distress, stabilization of the child's medication regimen, minimization of future exacerbations, and maintenance of an optimal home environment (e.g., minimize asthma triggers).

The Asthma module focuses data collection on the following aspects of care:

Parameter	**Module Content**
Age	1-18 years [Module excludes children <1 year of age]
Emergency Department Care	
Focus of evaluation	*Acute assessment and supportive care:* ▪ Severity of exacerbation ▪ Pharmacologic treatment and response ▪ Oxygen, if indicated
Initial assessment	***Within 15 minutes of arrival:*** ▪ Alertness ▪ Presence/absence of wheezing ▪ Presence/absence of retractions ▪ Aeration ▪ Hydration
Severity of exacerbation	*Based primarily on:* ▪ Respiratory rate for age ▪ Oxygen saturation
ED discharge counseling (if discharged to home)	▪ Proper use of SABA inhaler ▪ Asthma action plan

Parameter	Module Content
Inpatient Care	
Focus of treatment	Treatment of episodes of oxygen desaturation
Discharge status	*Day of discharge:* • Tolerating SABA q4 hours • Stable on room air
Discharge counseling	• Asthma action plan • Medications • Proper use of SABA inhaler
Discharge follow-up	Within 3 days

Asthma Module Question Guidelines

1. Criteria on Admission – Indicate if the patient had any of the listed conditions at the time of admission. These conditions complicate the treatment of asthma, and therefore, these patients are excluded.

2. Discharge Diagnoses – Confirm that the patient's diagnoses for this episode of care included asthma or reactive airway disease (RAD). If the patient was seen in the ED, the ED record should include a diagnosis of asthma/RAD, regardless of whether the patient was admitted as in inpatient.

3. ED Care – Indicate if the patient was treated in the marker hospital ED or was admitted directly (without ED care) to the marker hospital as an inpatient. Choose the first response if the patient spent any time in the ED. If the patient was seen prior to admission in an urgent care that is directly affiliated with the marker hospital, consider the urgent care treatment to be part of the marker ED care if the patient was transferred directly to the marker ED from the affiliated urgent care. In this case, the admission date and time to urgent should be considered the date and time of the ED admission. If the patient was discharged from the urgent care and only later was admitted to the marker ED, consider the urgent care to be 'prior-to-admission' care.

4. ED Admission and Discharge – For patients admitted to the ED, enter the date and time of ED arrival or registration, admission, discharge, and first clinical note. The arrival time will most often be earlier than the first clinical note. The first clinical note is the first documentation by a member of the healthcare team. Note that at some institutions, the time of first clinical note may precede the time of admission. Consider a transfer from ED to an observation bed as a discharge from the ED and admission to inpatient care. For discharge, use the official discharge time, or if none, note the time the patient left the hospital or the time of the last clinical note in the ED record.

5. Initial Physical Exam – The initial assessment of a patient presenting to the ED with asthma should be made within 15 minutes of arrival since the patient's respiratory condition may worsen rapidly and timely medical and supportive treatment is essential. Base your data on documentation ***noted within 15 minutes of patient arrival.*** These responses should come

from the providers' physical exams, (MD, RN, or RT) but NOT from the chief complaint or review of systems (ROS) which are historical data that do not reflect the patient's condition on presentation to the ED. Also, do not use documentation that refers to the initial assessment but is time-stamped with a time later than the 15-minute cutoff for this assessment.

Reference to a respiratory or asthma score will confer credit for an assessment of presence/absence of retractions, since work of breathing is always included in these scores. Reference to an asthma score will confer credit for an assessment of both retractions and wheezing, since asthma scores include assessment for both signs. (See the Appendixes for examples of respiratory and asthma scores.) Reference to audible breath sounds (without a stethoscope) that are normal would confer credit for absence of stridor. However, if any abnormal sounds are noted, specific references must be made to the presence/absence of wheezing.

Note that for assessment of dehydration, reference solely to oral intake is NOT sufficient, but reference to urinary output IS adequate.

Severity of asthma exacerbation:
Several asthma quality measures consider the severity of the asthma exacerbation, both before and after the initiation of treatment. Rules have been built into the asthma module to calculate the level of exacerbation severity to make these assessments as standardized and objective as possible. The severity calculation is based on two factors: respiratory rate related to the age of the patient and the SaO_2. Relevant calculations are based on timed entries of respiratory rate and SaO_2 as well as the timing of SABA treatments administered in the ED.

6. SABA Treatment in the ED – Enter the date and time of all doses of short-acting beta agonists (SABA) given to the patient during the ED stay. Do NOT include any medications administered prior to arrival (e.g., at home, at a clinic or MD's office, other ED or hospital). Indicate if the mode of administration is continuous (administered as nebulized solution via mask over a sustained period of ~1 hour) rather than nebulized (administered as nebulized solution via mask or tube-like face piece), or -puffs (administered by metered-dose inhaler (MDI), propellant metered-dose inhaler (pMDI), or another similar device). Continuous administration is usually done over ~1 hour, whereas medications administered via nebulization/puffs are usually given more frequently, often back-to-back. If a continuous nebulization is significantly shorter than 1 hour (e.g., 15 minutes), do not classify it as "continuous." In column ii), indicate the time the medication was given (if nebulized/puffs) or started (if continuous). If the SABA treatment was continuous, note it as such in the third column, and note in column iv) the time the continuous treatment was completed. If there is no completion time, leave this field blank. Include all SABA treatments, even if an additional medication (e.g., ipratropium) was given in conjunction with the SABA.

7. Systemic Corticosteroids in the ED – In Q7a), note if the patient received any ***systemic*** corticosteroid treatment in the 24 hours prior to ED arrival. Do NOT include treatment with inhaled or intranasal corticosteroids. In Q7b), indicate if the patient received any systemic corticosteroids in the ED. If so, enter the date and time of the *first* 2 doses of systemic corticosteroids administered in the ED at the marker hospital. Do NOT include treatment with inhaled or intranasal corticosteroids. If a dose was noted to be partially vomited and

the vomited portion was re-dosed, give credit for the medication and note the date and time of the initial administration (pre-emesis).

8. Ipratropium in the ED – Indicate if the patient ever received at least 1 dose of ipratropium while in the ED. See medication list provided.

9. Monitoring of Vital Signs – For up to 3 calendar days while the patient was in the ED, give the times of the requested assessments. For lung auscultation and heart rate (RR), only an indication that the exam was done is required. For respiratory rate (RR) and SaO_2, enter the numeric values. Entries do not need to be entered chronologically. Up to 3 calendar days are displayed as needed so that you do not need to enter the dates of assessments. Just remember to enter the times and vital signs on the correct calendar day. If all the ED care occurred on 1 calendar day, only one table of vital sign values will be displayed (Day 1). If care occurred over 2 days, 2 tables will be displayed (Day 1 and 2), and 3 will be displayed in the rare occurrence that ED care extended over 3 calendar days.

10. Desaturation and Oxygen – This question will be applicable only if at least one SaO_2 listed in Q9 was ≤90%. If applicable, indicate if oxygen was administered within 30 minutes of the first episode of desaturation or if not, the saturation rose to at least 91% within that 30-minute period.

11. Initial History – Based on any provider's notes and at any time while the patient was still in the ED, indicate which aspects of the patient's medical history were noted in the ED record.

    a) Onset/duration: Any reference to the timing of the onset of the patient's presenting or prodromal symptoms or the duration of the symptoms is sufficient (e.g., URI symptoms and difficulty breathing for 2 days," "sick since yesterday," etc.).

    b) Asthma triggers: Any reference to what does or does not aggravate the patient's asthma symptoms. This may be illness, foods, pets, dust, etc. If there is no mention of triggers, the provider must at least document that these are unknown.

    c) Unscheduled asthma-related MD/ED visits/hospitalizations in the past year: This is any reference to MD or ED visits that were not planned and were asthma-exacerbation related or asthma-related hospitalizations in the past year. Reference to any one of these is sufficient OR there must be at least documentation that there have been none. The one-year reference is important. Include reference to any specific time that is less than or equal to one year.

    d) Respiratory insufficiency: This is any reference to a prior asthma-related loss of consciousness (LOC) or need for intubation or mechanical ventilation at any time in the past. The provider may also note that there has been no intubation or may note that there have been no prior hospitalizations (which would indicate no prior respiratory insufficiency).

    e) Medical history: Documentation of any positive or negative cardiac, pulmonary, or immunodeficiency history.

12. Current Medications – Any reference to medications taken at home or indication that there are none. Reference to at least 1 medication is sufficient even if the list does not appear to be complete. Do not give credit for a reference to recently started drugs alone (e.g., "started

ampicillin yesterday at MD's office"). There should be some indication of what other medications the patient is taking or that there are none.

13. Current Asthma Medications – Indicate if the patient was taking SABA or ***inhaled*** corticosteroids prior to admission. Do NOT include systemic or intranasal corticosteroids.

14. Recent SABA Use – If the patient was on SABA prior to admission, indicate if any provider noted the quantity of SABA use in the past month or "recently." There should be some indication of how much SABA was used or how recent use compared to the patient's usual SABA use.

15. *[This question has been deleted.]*

16. Sedatives in the ED – Indicate if the patient received any sedatives (at least 1 dose). Base responses on medication administration records (MAR), progress notes, nurses' or respiratory therapy notes.

17. *[This question has been deleted.]*

18. pCO_2 in the ED – Give the date, time, and values of any pCO_2 measurements (up to 5) that were performed while the patient was in the ED. Capillary and nasal/oral cannula methods are acceptable as well as samples measured by more invasive means (e.g., arterial).

19. Respiratory Failure – Note the date and time of the first incident each of impending respiratory failure (described as such), intubation, and respiratory arrest (Code Blue) that occurred while the patient was in the ED.

20. ED Discharge – Enter the patient's discharge disposition.

21. Influenza Vaccination – This question is only relevant if the patient is older than 6 months, was discharged to home (or residential setting), and the ED visit fell within the months of November to March. Indicate if the patient received an influenza vaccination prior to discharge or other reference to why this did not happen (e.g., refusal, contraindication, already received, current influenza). Reference can be to any type of influenza (e.g., Type A, H1N1, etc.). A contraindication includes allergy to eggs, prior Guillan Barré syndrome, or any other reason noted by an MD as making the patient not a candidate for influenza vaccination.

22. Influenza Status – This question is relevant only if the answer to Q23 was "No/No data." Indicate if there was any documentation about the patient's influenza status (e.g., "has not yet received this year's flu shot").

23. Patient Education – Prior to discharge home, all patients should receive asthma education.

    a) SABA instruction: The record should indicate that the patient/parent was taught and observed in the proper technique of SABA use. The technique required for use varies with the type of device used to administer the medication. Good asthma management depends on proper device use. To give credit for this, there must be some indication in the record that SABA or asthma medications were addressed. Do NOT give credit for general asthma education that does not specifically reference medication (e.g., watched asthma education video, asthma education given to parents who demonstrate understanding, given patient

education handouts, etc.). If there is reference to a specific printed handout and you have reviewed the content of that handout and it meets the above criteria, you may give credit for documentation of its use.

b) Asthma action plan: Give credit for any reference to starting, reviewing, or discussing an asthma action plan. Give credit if a copy of an action plan is in the record even if it is not mentioned in provider notes. Do NOT give credit for anticipating creating an action plan in the future. The asthma action plan includes daily asthma treatment, such as what kind of medicines to take and when to take them, and describes how to control asthma in the long term AND how to handle worsening asthma or attacks (exacerbations). The plan explains when to call the doctor or go to the emergency room. The essential content is which medications to take, how to handle exacerbations, and when to seek emergency care.

24. Discharge Medications – Indicate if the patient's discharge medications included ***systemic*** corticosteroids, ***inhaled*** corticosteroids, and SABA. Do NOT include intranasal corticosteroids. To answer "yes," the drug in question must be included as a medication the patient is to continue at home, whether or not the medication is refilled or dispensed at discharge. In other words, patients may still have ample supplies of inhaled corticosteroids and/or SABA at home at the time of discharge.

25. *[This question has been deleted.]*

26. Follow-up Instructions – This question applies only to patients discharged to home (or residential setting). At the time of discharge, indicate if the parents were instructed to schedule a follow-up appointment with the PCP (or hospital physician who cared for the patient during admission) ***within 3 days*** of discharge. The instructions must either include an appointment for a date within 3 days of discharge OR instructions to the parent to call for an appointment within 3 days or less. Some timeframe must be specified.

27. IP Admission and Discharge – Indicate the dates and times of the patient's hospital admission and discharge. For the admission time, note the official admission time, if available, or the time of the first nursing note or record of patient arrival on the ward. For discharge time, note the time the patient left the ward or the latest entry in the inpatient record.

28. Corticosteroids Prior to Arrival – If the patient was a direct admit to the hospital, indicate in a) if the patient's medications prior to arrival included ***inhaled*** corticosteroids (ICS). Do NOT include systemic or intranasal corticosteroids here. Indicate in b) if the patient received any ***systemic*** corticosteroids in the 24 hours prior to admission (e.g., at another ED, physician office, etc.) Do NOT count inhaled or intranasal corticosteroids here.

29. Systemic Corticosteroids – Indicate if of ***systemic*** corticosteroids were administered during the hospital stay. If so, give the dates and times of all doses (up to the first 10) administered. Do NOT include inhaled or intranasal corticosteroids.

30. Ipratropium – Indicate if ipratropium was administered during the hospital stay. If so, give the dates and times of all doses (up to the first 10) administered. Include doses administered with other medication (e.g., SABA).

31. SaO_2 while Hospitalized – Indicate if after hospital admission, the patient ever had a SaO_2 ≤90% while on room air (RA). This item is limited to floor care only.

32. Oxygen – For up to 3 occurrences during the hospitalization of SaO_2 ≤90% on room air, indicate if action was taken within 30 minutes, either application of supplemental oxygen or an indication that the SaO_2 had improved to a level of at least 91% within that time frame.

33. Influenza Vaccination – This question is only relevant if the patient is older than 6 months, was discharged to home, and the ED visit fell within the months of November to March. Indicate if the patient received an influenza vaccination prior to discharge or other reference to why this did not happen (e.g., refusal, contraindication, already received, current influenza). Reference can be to any type of influenza (e.g., Type A, H1N1, etc.). A contraindication includes allergy to eggs, prior Guillan Barré syndrome, or any other reason noted by an MD as making the patient not a candidate for influenza vaccination

34. Influenza Status – This question is relevant only if the answer to Q33 was "No/No data." Indicate if there was any documentation about the patient's influenza status (e.g., "has not yet received this year's flu shot").

35. IP Discharge – Indicate the patient's disposition at discharge.

36. Status at Discharge – Base your answers to this question on information provided in the discharge summary describing the patient's status on the day of discharge. If there are no applicable data in the discharge summary, look for the most recent applicable information noted in the nurses' notes on the day of discharge. Use data in the discharge summary if present, even if there is a contradictory note in the nurses' notes. For a), there should be a notation that the patient is tolerating using SABA no more frequently than every 4 hours or the frequency in the medication administration record (MAR) or RT notes confirm this. For b) there is notation that the patient is stable on room air (SORA) or the SaO_2 data from nurses' or RT notes confirm this (≥92% on room air).

37. *[This question has been deleted.]*

38. Patient Education - Prior to discharge home, all patients should receive asthma education.

    a) SABA instruction: The record should indicate that the patient was taught and observed in the proper technique of SABA use. The technique required for use varies with the type of device used to administer the medication. Good asthma management depends on proper device use. To give credit for this, there must be some indication in the record that SABA or asthma medications were addressed. Do NOT give credit for general asthma education that does not reference medication (e.g., watched asthma education video, asthma education given to parents who demonstrate understanding, given patient education handouts, etc.). If there is reference to a specific printed handout and you have reviewed the content of that handout and it meets the above criteria, you may give credit for documentation of its use.

    b) Asthma action plan: Give credit for any reference to starting, reviewing, or discussing an asthma action plan. Give credit if a copy of a plan is in the record even if it is not mentioned in provider notes. Do NOT give credit for anticipating creating an action plan in the future. The asthma action plan includes daily asthma treatment, such as what kind of medicines to take and when to take them, and describes how to control asthma long term AND how to handle worsening asthma, or attacks (exacerbations). The plan explains when to call the doctor or go to the emergency room. The essential content is which medications to take, how to handle exacerbations, and when to seek emergency care.

39. Discharge Medications – Indicate if the patient's discharge medications included ***systemic*** corticosteroids, ***inhaled*** corticosteroids, and SABA. Do NOT include intranasal corticosteroids. To answer "yes," the drug in question must be included as a medication the patient is to continue at home, whether or not the medication is refilled or dispensed at discharge. In other words, patients may have ample supplies of inhaled corticosteroids and/or SABA at home.

40. Systemic Corticosteroid Doses – This question applies only to patients who received systemic corticosteroids at some time during the admission. f the patient was instructed to take ***systemic*** (NOT inhaled or intranasal) corticosteroids at home after discharge, indicate if the planned ***total*** course of treatment was ≥3 days. This can be determined from adding days where systemic corticosteroids were received during ED care to the number of days systemic corticosteroids were administered as an inpatient and prescribed at discharge. The number of days prescribed may not always be noted in the record. Alternatively, an MD may document the planned duration of the systemic corticosteroid treatment (e.g., "to continue steroids for 10-day course").

4. *Community Acquired Pneumonia (CAP)*

This module collects data to evaluate care provided to children with community acquired pneumonia (CAP) who are treated in an acute hospital setting, with or without related emergency care. Patients seen only in the ED for CAP are excluded.

Community-acquired pneumonia (CAP) refers to a pneumonia in a previously healthy person who acquired the infection outside a hospital. CAP is one of the most common serious infections in children, with an incidence of 34 to 40 cases per 1,000 children in Europe and North America. Group B streptococcus and gram-negative enteric bacteria are the most common pathogens in neonates (i.e., birth to 20 days). Pneumonia in infants aged 3 weeks to 3 months is most often bacterial; *Streptococcus pneumoniae* is the most common pathogen. In infants older than 4 months and in preschool-aged children, viruses are the most frequent cause of CAP, commonly respiratory syncytial virus (RSV). *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* frequently are associated with CAP in pre-school-aged children and older children and adolescents. *Mycobacterium tuberculosis* also may cause CAP in children at risk for exposure. The strongest predictors of pneumonia in children are fever, cyanosis, and more than 1 of the following signs of respiratory distress: tachypnea, cough, nasal flaring, retractions, rales, and decreased breath sounds.

The CAP module focuses data collection on the following aspects of care:

Parameter	**Module Content**
Age	0-18 years [Module excludes children >18 years old]
Inpatient Care	
Focus of evaluation	*Based on age:* ▪ History taking ▪ Imaging and laboratory tests ▪ Choice of therapies
Discharge follow-up	Within 1 week

CAP Module Question Guidelines

1. Criteria on Admission – Indicate if the patient had any of the listed conditions at the time of admission. The CAP quality measures look at care for "typical" cases of CAP, and these conditions complicate the treatment of pneumonia, and so, these patients are excluded.

2. Discharge Diagnoses – Confirm that the patient's diagnoses for this episode of care included pneumonia.

3. Inpatient Care – Indicate if the patient was treated as an inpatient, either through admission via an ED or as a direct admit (without ED care) to the marker hospital. This module does NOT address patients who were treated only in the ED.

4.- 6. *[These questions have been deleted.]*

7. IP Admission and Discharge – Indicate the dates and times of the patient's hospital admission and discharge. For the admission time, note the time listed as such or the first nursing note or record of patient arrival on the ward. For discharge time, note the time listed as such or the time the patient left the ward or the latest entry in the inpatient record. Do not include time the patient may have spent in the ED.

8. *[This question has been deleted.]*

9. Initial History (<6 Months of Age) – This question only applies to patients who are less than 6 months old at the time of admission. Indicate if within the first 24 hours of admission (including ED if applicable), a provider noted the presence or absence of the listed factors:
    a) reference to any prior hospitalizations or note that there were none;
    b) reference to any recent travel or note that there was none;
    c) reference to antibiotics currently or recently taken or reference to no recent/current antibiotic use OR list of current medications at the time of admission or note that there are none;
    d) reference to any recent exposure to a sick person or possible infectious respiratory/childhood disease exposure or note that there was none.

10. Initial History (≥6 Months of Age) – This question only applies to patients who are 6 months old or older at the time of admission. Indicate if within the first 24 hours of admission (including ED if applicable), a provider noted the presence or absence of the listed factors:
    a) reference to any prior hospitalizations or note that there were none;
    b) reference to the patient's childhood immunization status (e.g., up to date, UTD) or an attempt to determine it. Do not include reference to influenza vaccination status; c) reference to any recent travel or note that there was none;
    c) reference to any recent travel or note that there was none;
    d) reference to antibiotics currently or recently taken or reference to no recent/current antibiotic use OR list of current medications at the time of admission or note that there are none;
    e) reference to any recent exposure to a sick person or possible infectious respiratory/childhood disease exposure or note that there was none.

11. TB Exposure – Include any reference to any known or suspected TB exposure. Include patients who were born in a TB-endemic country (see list provided within the tool), regardless of current age. If a patient's race/ethnicity is noted as being of a TB-endemic country, but it is unclear if the patient was born there, assume that birth did NOT occur there. "TB-endemic" is defined here as ≥40 cases of TB per 100,000.

12. TB Skin Test – Indicate if a PPD TB skin test was administered, even if it was not read prior to discharge. Prior receipt of BCG vaccination (which may cause a PPD reaction) is NOT a valid reason to avoid a PPD if indicated by possible TB exposure. However, patients with a prior history of a positive PPD test need not have the test repeated. Patients who were treated in the past for TB or with TB prophylaxis (usually with INH) can be assumed to have had a positive PPD.

13.-15. *[These questions have been deleted.]*

16. Antibiotics: 21-60 Days Old – This question only applies to patients who are 21-60 days old at the time of admission. Indicate if the patient received any antibiotic at any time during the ED care or hospitalization.

17. Laboratory Tests/Imaging: 21-60 Days Old – This question only applies to patients who are 21-60 days old at the time of admission AND who were treated with antibiotics any time during ED care or the hospitalization. Indicate which of the listed tests were performed prior to discharge, including any that may have been performed at another facility in the 24 hours prior to admission.

18. Blood Cultures: >60 Days Old – This question only applies to patients who are more than 60 days old at the time of admission. BBC should be drawn only on those patients who are more severely ill. Indicate if bacterial blood cultures (BBC) were performed during this hospitalization, but do NOT include any that may have been performed at another facility in the 24 hours prior to admission. If the patient had BBC drawn (either in the marker hospital's ED or during the hospitalization), indicate if the patient spent any time in ICU during this admission.

19.-29. *[These questions have been deleted.]*

30. Chest Physiotherapy – Indicate if chest PT was prescribed or received during the admission. Base responses on MD orders, progress notes, nurses' or respiratory therapy notes. Types of chest PT include percussion and postural drainage (PC&D), positive expiratory pressure (PEP), active-cycle-of-breathing technique (ACBT), high-frequency chest compression (HFCC, Vest Airway Clearance System), autogenic drainage (AD), and oscillatory PEP [e.g., Acapella, Flutter, Cornet, intrapulmonary percussive ventilation (IPV)].

31. IP Discharge – Indicate the patient's disposition at discharge.

32. Follow-up Instructions – This question only applies to patients discharged to home (or residential setting). At the time of discharge, indicate if the parents/caregivers were instructed to schedule a follow-up appointment with the child's PCP (or hospital physician who cared for the patient during admission) ***within 1 week*** of discharge. The instructions must either include an appointment for a date within 1 week of discharge OR instructions to the parent to call for an appointment within 7 days or less. Some timeframe must be specified.

Appendixes

Appendix A: Quality Indicators for Croup

Emergency Department Care	
Croup #1	**Assessment:** All patients with a diagnosis of croup should have an exam including: • Presence/absence of lethargy/agitation • Presence/absence stridor • Presence/absence chest wall retractions • Findings on lung auscultation
Croup #2	**Chest/airway radiography:** Patients diagnosed with ***mild*** croup should not have imaging studies performed
Croup #3	**Severity assessment:** All patients diagnosed with croup who present to the ED should have their level of severity documented as part of the initial assessment
Croup #5	**Mild croup discharge:** Patients experiencing ***mild*** croup symptoms should be discharge home after a single dose of dexamethasone
Croup #6	**Observation of moderate croup:** Patients experiencing ***moderate*** croup symptoms should be observed in the ED or observation unit for at least 2 hours after treatment with dexamethasone
Croup #7	**Moderate croup discharge:** Patients with ***moderate*** croup should be discharged home when improvement in respiratory status is observed.
Croup #9	**rEpi for severe croup:** Patients with ***severe*** croup, should be given a dose of nebulized rEpi/rEpi within 30 minutes of arrival (or within 30 minutes of developing severe symptoms)
Croup #10	**Observation of severe croup:** Patients with ***severe*** croup need to be observed for at least 2 hours after treatment with dexamethasone and rEpi.
Croup #13	**Counseling:** All parents/caregivers of children diagnosed with croup should be counseled about the anticipated course of the illness, signs of respiratory distress, and when to see medical assistance
Croup #14	**Airway evaluation:** Patients initially judged to have ***moderate*** croup who progress to have severe croup while in the ED should have their airways evaluated by personnel from PICU, ENT, or anesthesia service
Croup #15	**Continued moderate symptoms:** Children with ***moderate*** croup who continue to have moderate respiratory distress 4 hours after receiving an initial does of dexamethasone should be admitted to the hospital
Croup #16	**Moderate-severe symptoms post treatment:** If the patient with ***severe*** croup symptoms continues to have moderate to severe symptoms 30 minutes after receiving an initial dose of rEpi, then a repeat dose should be given and the child should be admitted to the hospital

Inpatient Care	
Croup #18	**Vital signs:** All patients hospitalized with croup should have vital signs monitored and sequential clinical evaluations of degree of respiratory distress every 4 hours
Croup #19	**Severe symptoms:** If a hospitalized patient continues to experience severe respiratory distress after admission, then nebulized rEpi/rEpi should be administered

Appendix B: Quality Indicators for Bronchiolitis

Emergency Department Care	
Bronch #1	**History:** All patients with a diagnosis of bronchiolitis should have the presence or absence for risk factors for severe disease documented: • History of prematurity • Low birth weight • Underlying cardiopulmonary disease
Bronch #2	**PE:** Patients diagnosed with bronchiolitis should have the presence or absence of the following physical exam findings: • Respiratory rate • Wheezing • Retractions • Color change • Signs of dehydration
Bronch #3	**Blood cultures:** All otherwise healthy children >8 weeks of age diagnosed with bronchiolitis should not have bacterial blood cultures performed
Bronch #5	**CBC:** All otherwise healthy children >8 weeks of age diagnosed with bronchiolitis should not have a complete blood count performed
Bronch #6	**RSV:** All otherwise healthy children >8 weeks of age diagnosed with bronchiolitis should not have a test for RSV performed
Bronch #7	**Chest radiograph:** All otherwise healthy children diagnosed with bronchiolitis should not have a chest radiograph performed
Bronch #8	**ED discharge:** Patients diagnosed with bronchiolitis in the ED who are noted to be feeding well and have no more than mild respiratory symptoms and signs should be discharged home
Inpatient Care	
Bronch #12	**Bronchodilators:** Hospitalized children with a diagnosis of bronchiolitis should not be treated with bronchodilators
Bronch #14	**Antibiotics:** Hospitalized children with a diagnosis of bronchiolitis should not be treated with antibiotics unless the child is also diagnosed with a possible bacterial infection
Bronch #15	**Corticosteroids:** Hospitalized children with a diagnosis of bronchiolitis should not be treated with corticosteroids
Bronch #17	**Supplemental fluids:** If a child is admitted to the hospital with a diagnosis of bronchiolitis has difficulty feeding safely because of respiratory distress, then s/he should receive supplemental fluids

Bronch #20	**Assessments:** Hospitalized children with a diagnosis of bronchiolitis should undergo repeated clinical assessments at least every 4 hours during the first 48 hours of admission
Bronch #22	**Discharge, decreased work of breathing:** Children admitted to the hospital with bronchiolitis should have reduced work of breathing documented on the day of discharge
Bronch #24	**Discharge, oral intake:** Children admitted to the hospital with bronchiolitis should have feedings at a level to prevent dehydration documented on the day of discharge
Bronch #25	**Follow-up:** Parents with children admitted to the hospital with bronchiolitis should be instructed to schedule a follow-up appointment with the child's PCP within 1 week of discharge

Appendix C: Quality Indicators for Asthma

Emergency Department Care	
Asthma #1	**Initial assessment:** All children presenting to the ED with an acute exacerbation of asthma should have an initial assessment that includes: • Level of alertness • Hydration status • Respiratory rate • Heart rate • Use of accessory muscles, retractions • Presence or absence of wheezing • Degree of aeration • Pulse oximetry
Asthma #2	**Time of first assessment:** All children presenting to the ED with an acute exacerbation of asthma should have their initial assessment with 15 minutes of ED arrival
Asthma #3	**History:** All children presenting to the ED with an acute exacerbation of asthma should receive a history that includes: • Time of onset or duration of symptoms • Triggers of exacerbations or documentation that they are not known • Current asthma medications • If on SABA, quantity used in the past month • Estimate of previous unscheduled MD/ED visits or hospitalizations in the past year for asthma or documentation that they are not known • Presence or absence of episodes of respiratory insufficiency due to asthma • Presence or absence of potentially complicating illnesses
Asthma #5	**PCO_2:** All children presenting to the ED with an acute exacerbation of asthma deemed to be ***severe*** should have their PCO_2 measured within 30 minutes of making this assessment
Asthma #8	**Severe symptoms post-SABA assessment:** All children presenting to the ED with an acute exacerbation of asthma who are experiencing ***severe*** symptoms should have vital signs (RR, HR pulse oximetry) and lung sounds reassessed and recorded within 15 minutes of each SABA treatment
Asthma #9	**Mild/moderate symptoms post-SABA assessment:** All children presenting to the ED with an acute exacerbation of asthma who are experiencing ***mild or moderate*** symptoms should have vital signs (RR, HR pulse oximetry) and lung sounds reassessed and recorded within 15 minutes of receiving 3 back-to-back SABA treatments
Asthma #10	**Oxygen:** All children experiencing an acute exacerbation of asthma in the ED and an SaO_2 should receive oxygen

Asthma #11	**SABA:** All children presenting to the ED with a ***moderate or severe*** acute exacerbation of asthma should receive 3 back-to-back inhaled SABA treatments in the first hour after admission to the ED
Asthma #12	**Ipratropium:** Children in the ED experiencing a ***severe*** asthma exacerbation or impending/actual respiratory failure should receive inhaled ipratropium bromide in addition to SABA
Asthma #13	**Moderate/severe symptoms and corticosteroids:** Children in the ED experiencing a ***moderate to severe*** asthma exacerbation should receive systemic steroids within 1 hour
Asthma #18	**Sedatives:** Children admitted to the ED with an acute exacerbation of asthma should not receive sedatives unless part of a rapid sequence intubation
Asthma #20	**Moderate symptoms on reassessment and SABA:** Children in the ED with ***moderate*** asthma exacerbation symptoms during their first reassessment after 3 back-to-back SABA treatments in the ED should be given additional inhaled SABA every 60 minutes for the next 2 hours
Asthma #21	**Severe symptoms on reassessment and SABA:** Children in the ED with ***severe*** asthma exacerbation symptoms during their first reassessment after 3 back-to-back SABA treatments in the ED should be given hourly or continuous nebulized SABA x3 and then every hour until improvement of symptoms
Asthma #23	**Mild symptoms:** Children evaluated in the ED for acute exacerbation of asthma with no more than ***mild*** symptoms at least 60 minutes after SABA treatment should be discharged to home
Asthma #24	**Discharge SABA prescription:** All children evaluated in the ED for acute exacerbation of asthma who are discharged to home should be given SABA prescriptions for new medications or needed refills and instructions for use
Asthma #25	**Discharge corticosteroid prescription:** All children evaluated in the ED for acute exacerbation of asthma who were given systemic corticosteroid treatment and are discharge to home should be given a prescription to continue oral systemic corticosteroids to complete at least a 2-day course
Asthma #27	**Discharge inhaled corticosteroids:** All children evaluated in the ED for acute exacerbation of asthma who were already taking inhaled corticosteroid treatment (ICS) and are discharged to home should be instructed to continue ICS therapy after discharge
Asthma #28	**Flu status:** During flu season (November to March), all children admitted to the ED for acute exacerbation of asthma should have their influenza vaccination status documented
Asthma #29	**Flu vaccination:** During flu season (November to March), all children admitted to the ED for acute exacerbation of asthma that have not yet received an influenza vaccination status and have no documented contraindications should be vaccinated prior to discharge or refusal by patient/parent documented
Asthma #30	**Asthma action plan:** All children admitted to the ED for acute exacerbation of asthma should have documentation that they received a review and/or initiation of an asthma action plan

Asthma #31	**Follow-up:** All children admitted to the ED for acute exacerbation of asthma and discharged home should have parental instruction to contact the child's PCP or an asthma specialist within 72 hours of discharge or given a referral if they lack a PCP or asthma specialist
Asthma #32	**Need for hospitalization – first hour of treatment:** All children admitted to the ED for acute exacerbation of asthma and who have continuing severe symptoms or an arterial PCO_2 ≥42 mmHg in patients with moderate symptoms should be hospitalized
Inpatient Care	
Asthma #34	**Oxygen:** Children hospitalized an acute exacerbation of asthma with an SaO_2 ≤90% should be given supplemental oxygen
Asthma #36	**Corticosteroids:** Children hospitalized an acute exacerbation of asthma should be given systemic corticosteroids
Asthma #37	**Ipratropium:** Children hospitalized an acute exacerbation of asthma should not receive ipratropium bromide after 24 hours of hospitalization
Asthma #40	**Discharge criteria:** Children hospitalized with an acute exacerbation of asthma who meet the following criteria: • Tolerating at least every-4-hour SABA treatments • SaO_2 >92% on room air for at least 4 hours can be discharged to home
Asthma #41	**Discharge SABA and education:** Children hospitalized an acute exacerbation of asthma who are to be discharged to home should be given prescriptions for new medications/refills for SABA treatment and instructions for use
Asthma #42	**Systemic corticosteroids:** Children hospitalized an acute exacerbation of asthma who were given systemic corticosteroid should be discharged with a prescription to continue oral corticosteroids to complete at least a 3-day course
Asthma #44	**Inhaled corticosteroids:** Children hospitalized an acute exacerbation of asthma who were already taking ICS therapy prior to hospitalization should be instructed to continue ICS therapy after discharge
Asthma #45	**Flu status:** During flu season (November to March), all children admitted to the hospital for acute exacerbation of asthma should have their influenza vaccination status documented
Asthma #46	**Flu vaccination:** During flu season (November to March), all children admitted to the hospital for acute exacerbation of asthma that have not yet received an influenza vaccination status and have no documented contraindications should be vaccinated prior to discharge or refusal by patient/parent documented
Asthma #47	**Asthma action plan:** All children admitted to the hospital for acute exacerbation of asthma should have documentation that they received a review and/or initiation of an asthma action plan

Asthma #48	**Follow-up:** All children admitted to the hospital for acute exacerbation of asthma and discharged home should have parental instruction to contact the child's PCP or an asthma specialist within 72 hours of discharge or given a referral if they lack a PCP or asthma specialist

Appendix D: Quality Indicators for Community Acquired Pneumonia (CAP)

Inpatient Care	
CAP #2	**History:** Children hospitalized with pneumonia should have the following history items documented: • Presence/absence of prior hospitalizations • Immunization status (if at least 6 months old) • Presence/absence of recent TB exposure • Presence/absence of recent travel • Presence/absence of recent antibiotic use
CAP #5	**Tests (21-60 days):** Infants 21-60 days old diagnosed with pneumonia and admitted to the hospital and treated with antibiotics should have all the following tests performed: • Blood culture • Urine culture • CBC with differential • Chest radiograph
CAP #8	**Blood cultures (>60 days):** Children >60 days old hospitalized with pneumonia should not have blood cultures obtained
CAP #10	**PPD:** Children hospitalized with pneumonia who have a history of exposure to TB or personal/family travel to a TB-prevalent area should have a PPD skin test performed
CAP #12	**Chest PT:** Children hospitalized with pneumonia should not be treated with chest PT
CAP #18	**Follow-up:** All children admitted to the hospital for pneumonia and discharged home should have parental instruction to contact the child's PCP (or the hospital care physician) within 1 week of discharge or given a referral if they lack a PCP

Appendix E: Seattle Children's Hospital Clinical Asthma Score

Score range: 0 – 12 (< 5 = mild; > 9 = severe)

Variable	**Respiratory Score** *(Circle One)*			
	0 point	1 point	2 points	3 points
Respiratory rate (breaths/min)	COUNT RESPIRATORY RATE FOR ONE FULL MINUTE while patient is awake			
< 2 months		≤ 60	61-69	≥ 70
2-12 mos		≤ 50	51-59	≥ 60
1-2 yr		≤ 40	41-44	≥ 45
2-3 yr		≤ 34	35-39	≥ 40
4-5 yr		≤ 30	31-35	≥ 36
6-12 yr		≤ 26	27-30	≥ 31
> 12 yr		≤ 23	24-27	≥ 28
Retractions	None	Subcostal or intercostal	2 of the following: subcostal, intercostal, substernal, OR nasal flaring (infants)	3 of the following: subcostal, intercostal, substernal, suprasternal, supraclavicular OR nasal flaring or head bobbing (infants)
Dyspnea				
0-2 years	Normal feeding, vocalizations, and activity	1of the following: difficulty feeding; decreased vocalization; OR agitated	2 of the following: difficulty feeding; decreased vocalization; OR agitated	Stops feeding, no vocalizations, OR drowsy or confused
2-4 years	Normal feeding, vocalizations, and play	1 of the following: decreased appetite, increased coughing after play, hyperactivity	2 of the following: decreased appetite, increased coughing after play, hyperactivity	Stops eating or drinking, stops playing, OR drowsy or confused
≥ 5 years	Counts to ≥ 10 in one breath	Counts to 7-9 one breath	Counts to 4-6 in one breath	Counts to ≤ 3 in one breath
Auscultation (as it relates to wheezing)	Normal breathing; no wheezing present	End-expiratory wheeze only	Expiratory wheeze only (greater than end-expiratory wheeze)	Inspiratory and expiratory wheeze OR diminished breath sounds OR both

Appendix F: Cincinnati Children's Hospital WARM/WARME Respiratory Scoring Tool

Select one from each Group:

Wheeze	Score
☐ None	0
☐ End expiratory	1
☐ Entire expiratory / Any inspiratory	2

Air Exchange
Assess the following 4 chest areas: Left and Right Front, Left and Right Back

	Score
☐ Normal	0
☐ One area decreased	1
☐ More than one area decreased	2

Respiratory Rate	Score
☐ Normal	0
☐ Above tachypnea threshold	1

Muscle Use (Retraction)	Score
☐ None	0
☐ Subcostal / Intercostal	1
☐ Any neck or abdominal	2

Prolonged Expiration	Score
☐ Normal	0
☐ Expiration 3x> inspiration	1

Total Score _____

WARME Scale: Used for scoring Asthma Patients. Treatment is indicated for a score of 2 or higher.

WARM Scale: Used for scoring Bronchiolitis Patients. Trial treatment is recommended for a score of 3 or higher. Discontinuation of treatment is recommended when no improvement is assessed

Appendix G: Children's Hospital Association of Texas – Asthma Scores

http://www.childhealthtx.org/wp-content/themes/chat/images/Asthma%20Score.pdf

See next 4 pages

Children's Hospital Association of Texas
Safety and Quality Collaborative
Asthma Management Pathway (ED and IP)

Asthma Scores

1. Pediatric Asthma Score (PAS)

Table 1. The Pediatric Asthma Score (PAS)*

Score	1	2	3
Respiratory rate			
2–3 years	≤34	35–39	≥40
4–5 years	≤30	31–35	≥36
6–12 years	≤26	27–30	≥31
>12 years	≤23	24–27	≥28
Oxygen requirements	>95% on room air	90% to 95% on room air	<90% on room air or on any oxygen
Auscultation	Normal breath sounds to end-expiratory wheeze only	Expiratory wheezing	Inspiratory and expiratory wheezing to diminished breath sounds
Retractions	None or intercostal	Intercostal & substernal	Intercostal, substernal and supraclavicular
Dyspnea	Speaks in sentences, coos and babbles	Speaks in partial sentences, short cry	Speaks in single words/short phrases/grunting

	Scoring Reference		
Asthma severity	Mild	Moderate	Severe
Percent of predicted peak flow	>70%	50%–70%	<50%
Pediatric asthma score	5–7	8–11	12–15

* Values from each category were added to compute total PAS and designation of asthma severity.

2. Pulmonary Score (PS)

TABLE 1. Pulmonary Index Score*

Score	Respiratory Rate (breaths/min)	Wheezing	I:E† Ratio	Accessory Muscle Use
0	<30	None	5/2	0
1	31–45	Terminal expiration	5/3–5/4	+/−
2	46–60	Entire expiration	1/1	++
3	>60	Inspiration and expiration	<1/1	+++

*Reprinted with permission from: Becker AB, Nelson NA, Simons ER. The pulmonary index assessment of a clinical score for asthma. Am J Dis Child. 1984; 138:574–6. Copyrighted 1984, American Medical Association.
†I:E = inspiratory to expiratory.

TABLE 2. Pulmonary Score

Score	Respiratory Rate (breaths/min)		Wheezing	Accessory Muscle Use—Sternocleidomastoid
	<6 Years	≥6 Years		
0	<30	<20	None	No apparent increase
1	31–45	21–35	Terminal expiration with stethoscope	Mild increase
2	46–60	36–50	Entire expiration with stethoscope	Increased
3	>60	>50	Inspiration and expiration without stethoscope	Maximal activity

Children's Hospital Association of Texas
Safety and Quality Collaborative
Asthma Management Pathway (ED and IP)

Asthma Scores

3. Pediatric Respiratory Assessment Measure (PRAM)

Signs	0	1	2	3
Suprasternal retractions	Absent		Present	
Scalene muscle contraction	Absent		Present	
Air entry*	Normal	Decreased at bases	Widespread decrease	Absent/minimal
Wheezing*	Absent	Expiratory only	Inspiratory and expiratory	Audible without stethoscope/silent chest with minimal air entry
O_2 saturation	≥95%	92%-94%	<92%	

Figure 1. *If asymmetric findings between the right and left lungs, the most severe side is rated. Reprinted from The Journal of Pediatrics, Vol. 137, Issue 6. Chalut DS, Ducharme FM, Davis GM. The Preschool Respiratory Assessment Measure (PRAM): A responsive index of acute asthma severity. Pages 762-768, Copyright © 2000, with permission from Elsevier.

4. Respiratory Clinical Score

TABLE 1—Clinical Score

	Clinical score, circle one			
	0 point	1 point	2 points	3 points
Variable	Respiratory rate (breaths/min). Count respiratory rate for one full minute while patient is awake			
<2 months		≤60	61–69	≥70
2–12 months		≤50	51–59	≥60
1–2 years		≤40	41–44	≥45
2–3 years		≤34	35–39	≥40
4–5 years		≤30	31–35	≥36
6–12 years		≤26	27–30	≥31
>12 years		≤23	24–27	≥28
Retractions	None	Intercostal	Intercostal and substernal	Intercostal, substernal and supraclavicular
Dyspnea				
0–2 years	Normal feeding, vocalizations, and activity	1 of the following: difficulty feeding; decreased vocalization; or agitated	2 of the following: difficulty feeding; decreased vocalization; or agitated	Stops feeding, no vocalizations, or drowsy or confused
2–4 years	Normal feeding, vocalizations, and play	1 of the following: decreased appetite, increased coughing after play, hyperactivity	2 of the following: decreased appetite, increased coughing after play, hyperactivity	Stops eating or drinking, stops playing, or drowsy or confused
≥5 years	Counts to ≥10 in one breath	Counts to 7–9 one breath	Counts to 4–6 in one breath	Counts to ≤3 in one breath
Wheeze	Normal breathing; no wheezing present	End expiratory wheeze only	Expiratory wheeze only (greater than end-expiratory wheeze)	Inspiratory and expiratory wheeze or diminished breath sounds or both

Children's Hospital Association of Texas
Safety and Quality Collaborative
Asthma Management Pathway (ED and IP)

Asthma Scores

5. Pediatric Asthma Severity Score (PASS)

TABLE 1. Clinical Findings Assessed

Clinical Finding	Definition	0	1	2
Wheezing	High-pitched expiratory sound heard by auscultation	None or mild	Moderate	Severe wheezing or absent wheezing due to poor air exchange
Air entry*	Intensity of inspiratory sounds by auscultation	Normal or mildly diminished	Moderately diminished	Severely diminished
Work of breathing	Observed use of accessory muscles, retractions, or in-breathing	None or mild	Moderate	Severe
Prolongation of expiration	Ratio of duration of expiration to inspiration	Normal or mildly prolonged	Moderately prolonged	Severely prolonged
Tachypnea	Respiratory rate above normal for age	Absent	Present	
Mental status	Observation of the child's state of alertness	Normal	Depressed	

*Not assessed separately at one of the participating EDs

6. Clinical Respiratory Score (CRS)

Mild ≤3 • Moderate = 4-7 • Severe = 8-12

Assess	Score 0	Score 1	Score 2
Respiratory Rate	<2 months <50 2-12 months <40 1-5 years <30 >5 years <20	<2 months 50-60 2-12 months 40-50 1-5 years 30-40 >5 years 20-30	<2 months >60 2-12 months >50 1-5 years >40 >5 years >30
Auscultation	Good air movement, expiratory scattered wheezing or loose rales/crackles	Depressed air movement, inspiratory and expiratory wheezes or rales/crackles	Diminished or absent breath sounds, severe wheezing, or rales/ crackles or marked prolonged expiration
Use of Accessory Muscles	Mild to no use of accessory muscles, mild to no retractions **OR** nasal flaring on inspiration	Moderate intercostals retractions, mild to moderate use of accessory muscles, nasal flaring	Severe intercostals and substernal retractions, nasal flaring
Mental Status	Normal to mildly irritable	Irritable, agitated, restless	Lethargic
Room Air SpO2	> 95%	90-95%	<90%
Color	Normal	Pale to normal	Cyanotic, dusky

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Asthma Management Pathway (ED and IP)

Asthma Scores

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