Asthma Exacerbations

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Disclosures

David B. Peden, MD, MS

- Personal financial interests in commercial entities that are relevant to my presentation(s)

No relevant commercial interests.

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### DRAFT Recommendations: Ages ≥ 12

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<tr>
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### DRAFT Recommendations: Ages ≥ 12

| Core Outcomes: | | |
| 1. Systemic corticosteroids for asthma* | 1. Systemic corticosteroids for asthma* | |
| 3. Asthma-specific Emergency Department visits (includes Urgent Care [UC] visits where they can be differentiated) | 4. ICU/intubations | |
| 5. Death (all cause & asthma-related) | | |

### Emerging Outcomes:
- Biomarkers of exacerbation:
  - FeNO, sputum, exhaled breath condensate analytes
- Stratification of exacerbations by severity
- Short course of high dose ICS as a definition of an asthma exacerbation.
- Night use as a definition of an asthma exacerbation.
- Use of other medications (e.g., SABA) as a definition of an asthma exacerbation.
- Total corticosteroid dose

* For patients on a stable maintenance dose, an increase in the dose of systemic corticosteroids
**DRAFT Recommendations:**

**0-4 and 5-11 years of age**

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**Characterization of Study Population for Prospective Clinical Trials (i.e. baseline information)**

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| - FeNO, sputum, exhaled breath condensate analytes ** | - Stratification of exacerbations by severity | ** | Age 5-11 years only, the ability to perform the technique for some biomarkers, such as FeNO and EBC, is age-dependent and difficult to use reliably in young children

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**Standardized Reporting: Exacerbation Rates**

- **Preferred methodology**
  - # Events requiring systemic corticosteroids/ per participant/per time interval
  - Annual rates are preferred
    - Extrapolation to annual rates from studies of shorter duration is not recommended
    - Calculated as weighted mean rate of occurrence
    - Total exacerbations/ total person time
- **Additional methodology**
  - Time to first exacerbation
  - Percentage of study group with an exacerbation

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**Key Discussion Points**

- Tremendous variation exists in the literature regarding the terminology for asthma “exacerbation”
  - 15 different terms in use to refer to an asthma exacerbation
- Makes comparison across studies problematic
  - Exacerbation is rarely defined by a single component
  - Treatment with systemic corticosteroids is most commonly used
  - Variation in how subjects with asthma present supports the use of a definition that includes multiple components
- Yet little evidence exists to support a specific set of components or the thresholds for any individual component within a given definition
Key Discussion Points

- Variation exists in how the severity of an exacerbation is classified
  - Most studies do not distinguish levels of severity
- The ability to distinguish between poorly controlled asthma and an “moderate” exacerbation is difficult and characterized by vague and inconsistent terminology
  - Limits the ability to reliably classify levels of severity for exacerbations

Key Discussion Points: Pediatrics

- The use or the increase in the use of SABA is a more commonly used criterion/factor in defining exacerbation in children
  - The threshold criterion for distinguishing between loss of control and an asthma exacerbation has not been defined

Call for New Outcome Measures

- Component-based definition of exacerbations
  - Defines threshold values for each component used to collectively define an exacerbation
    - Can levels of severity be distinguished by such component measures?
Physiological measures (i.e. FEV1) are age-dependent and difficult to use reliably in young children, and as such are not useful to define exacerbations.

Currently, biomarkers are not useful in defining exacerbation.
- For older children, age 5-11 years, they may be useful in better understanding the biology/mechanisms of exacerbation and in defining the population at risk for exacerbation.
- The ability to perform techniques, such as FeNO and EBC, is age-dependent and difficult to use reliably in young children.

Asthma exacerbations in children ages 0-4 years of age are particularly difficult to identify for several reasons:
- The differentiation of changes in daily symptoms from a potential cluster of symptoms sufficient to be termed an exacerbation is based on the perception of the caregiver and not the child.
- The threshold for symptom identification and initiation of therapy depends on the education level and personality of the caregiver.

Characterization of exacerbation by precipitating factor:
- Viral illness
- Allergen exposure
- Pollutant exposure
- Medication non-adherence

Characterization of factors that contribute to the decision to use systemic corticosteroids or seek urgent health care utilization are especially variable for children.
- A checklist or standard format to define those factors is needed.
Summary

- An exacerbation is a worsening of asthma requiring the use of systemic corticosteroids to prevent a serious outcome
  - For patients on a stable maintenance dose, an increase in the dose of systemic corticosteroids
  - This recommendation is the same for Adult/Adolescent and Pediatric populations
  - Emphasis on standardized methodology and reporting