Asthma Action Plan: Yellow Zone Alternatives

Michael Zacharisen, M.D.

Disclosures and Conflicts of Interest

I will be discussing off label use of medications.
Speaker:
- TEVA Respiratory
- Thermofisher Scientific

Goals

- Effectively identify when a pt enters the yellow zone.
- Treat acute loss of asthma control in the yellow zone.
- Types:
  - Scheduled Dosing
  - Dynamic Dosing
  - Adjustable Maintenance Dosing (AMD)
Are we all on the same page?

- Who sees patients with asthma?
- Who provides them with an Asthma Action Plan?
- If you answered “yes” then...
- Caution: You Are Entering the Yellow Zone!

Management of acute loss of asthma control in the yellow zone: A Practice Parameter (2014)
C. Dinakar et al. Ann Allergy Asthma Immunol 113 (2014) 143e159

Review of the literature:
- Relies on MEDLINE- and PubMed-referenced publications
- To determine an evidence-based guide to effectively recognize and treat acute loss of asthma control in the yellow zone.
- Recommendations apply to home setting only, not office, ER or hospital

Some interventions are not approved by the FDA!

Yellow Zone: What is it?

- Period of time 30 minutes to 2 weeks (average 5.1 days) of asthma symptoms that precedes an asthma exacerbation

Acute loss of asthma control
**Asthma Action Plan: What is it?**

NHLBI/EPR-3 Guidelines for Diagnosis and treatment of Asthma
Asthma Action Plan since 1995 (21 years)
Narrow window of opportunity!

**Use Stop Light Colors**
(Recommendation: B Evidence)

---

**Do Asthma Action Plans work?**

- Evidence-based reviews: providing pt with written asthma action plans decreases sx and unscheduled use of health care resources
- Providing instructions indicating when to increase ICS and when to begin oral steroids are key features for inclusion in asthma action plans
- Controversial whether the mere act of providing pts with a written action plan improves outcomes (eg, asthma QOL and hospital admits)

---

**Reason for the Yellow Zone**

- Early tx to prevent progression to full blown severe asthma attack
- Minimize recurrent courses of oral steroids
- Decrease need for urgent care or ED visits
- Recent studies: oral steroids may not provide clinical benefit in preschool children with acute wheezing episodes
- Individualized for the pt; educate to enable & motivate your pt to act.
- Self-management improves QOL
I’m in the **Yellow Zone** if:

**Compared to baseline:**
- Increase in asthma **symptoms** (>2x per day)
- Increase use of reliever med (effect not lasting 4 hrs) or incomplete response to SABA
- PEF decrease >15% or PEF <80% of best (more reliable for adults than kids & poor perceivers)
- Presence or increase in nocturnal asthma symptoms (more reliable for adults than kids)
- Inability to go to work/school for 2 consecutive days
- Onset of Upper Respiratory Infection (URI)

*(Strong Recommendation: B Evidence)*

**Case**

12 y/o girl with asthma. Moved to Montana 6 months ago and family desires to establish continued care.
She feels well and believes her asthma is controlled. She takes beclomethasone inhaler and montelukast daily with albuterol prn.
Exam: Normal Spirometry: Normal
At the end of the visit, you provide a **written Asthma Action Plan.**

**In the Yellow Zone, do you write?**

A. Use SABA 2-4 puffs every 4 hrs x 2 days
B. Start low dose ICS
C. Start High dose ICS
D. Double ICS
E. Triple ICS
F. Quadruple ICS
G. Increase ICS/LABA
H. Start montelukast
I. Start LAMA (eg. Spiriva)

May choose more than 1 above
Yellow Zone: Keep it...

- Practical
- Convenient
- Cost effective
- Safe with acceptable and minimal side effects
- Designed to work rapid enough
- Portable (MDI vs nebulizer)
- Individualized: depends on severity and past experience

Updated Practice Parameter

Yellow Zone: SABA Use

Albuterol MDI:
- Proair MDI or RespiClick, Ventolin, Proventil
- If SABA use >12 puffs/day, advise pts to contact provider for further guidance.
- Nebulizer: 1 ampule every 4 hrs x 2 days

Lev-albuterol
- Xopenex MDI or nebulizer

Combination: ipratropium/albuterol
- (Combivent MDI or Duoneb)

In ER/office:
- Epinephrine, SAMA (ipratropium)
  (Recommendation: C Evidence)
Albuterol: How Much?

- **2007 NHLBI guidelines**: 2 to 6 puffs of SABA via MDI or nebs every 3 to 4 hours for 24 to 48 hrs
- **2011 Global Strategy for Asthma Management & Prevention guidelines**: 2-4 puffs of SABA every 20 min for 1 hr, 2-4 puffs every 3-4 hours if there is a good response or 6-10 puffs for a moderate attack.

(OFF LABEL)

Yellow Zone: Start ICS

- Start low or high dose ICS
  - Not studied in steroid naïve pts or those on intermittent therapy
  - Episodic high-dose ICS was comparable to daily low-dose ICS in risk of exacerbation
- High dose ICS early with URI
  A. Fluticasone 750 mcg bid decreased rate of prednisone use by 50% (growth effects)
  B. Budesonide 1 mg bid (decrease sx but no decrease in use of prednisone).
  C. If <6 yr with URI-induced asthma and positive modified API. 3 small trials in 1990s showed no benefit; more recent larger trials showed some benefit.

(OFF LABEL)  (Option: B Evidence)

Modified Asthma Predictive Index (API)

<table>
<thead>
<tr>
<th>Major Criteria</th>
<th>Minor Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parental MD asthma 7</td>
<td>1. MD atopic rhinitis 7</td>
</tr>
<tr>
<td>2. MD eczema 7</td>
<td>2. Wheezing apart from colds</td>
</tr>
<tr>
<td>3. Eosinophilia (&gt;4%)</td>
<td></td>
</tr>
</tbody>
</table>

* Loose index for the prediction of asthma: early wheezer plus at least one of two major criteria or two of three minor criteria. Stringent index for the prediction of asthma: early wheezer plus at least one of the two major criteria or two of three minor criteria. History of a physician diagnosis of asthma. (Physician diagnosis of atopic dermatitis at age 2 or 3. (Physician diagnosis of allergic rhinitis at age 2 or 3.)
**Yellow Zone: Scheduled ICS Dosing Step Up** (at 1st sign of worsening sx x 7 days).

- If already on low-moderate dose ICS daily:
  - Double ICS
    - Studies: Helpful in some, not helpful in recent studies (timing is key!)
  - Triple ICS
    - Studies: not done
  - Quadruple ICS (divided bid to qid)
    - Studies: helpful especially in divided doses

(OFF LABEL) (Option: B Evidence)

**Yellow Zone: Dynamic Dosing Step Up**

Use ICS along with reliever (concomitant dose of ICS with each reliever dose) (OFF LABEL)

- Pt receives a larger amount of ICS as they experience increasing loss of asthma control and a smaller amount of ICS as control is achieved
  1. Separate use of controller and reliever
  2. Quick-acting LABA (formoterol)+ICS

Studies show that pts already do this!

(Option: B Evidence)

**Yellow Zone: Adjustable Maintenance Dosing (AMD)**

ICS–Formoterol AMD therapy (symptom-driven delivery) Effective (studies from Europe)

- Decrease attacks requiring oral steroids compared with current best-practice strategies
- More convenient (single inhaler)
- For adults >18 yr

OFF LABEL (Option: B Evidence)
### Yellow Zone: Add on other

- Start Montelukast (Singulair)
  - Not helpful in preventing prednisone use
  - Helpful in decreasing severity of symptoms
  - Helpful for children <6 yr with URI trigger or positive modified API (European Respir Society)
- Start LAMA: no data

**OFF LABEL** (Option: B Evidence)

### In the Yellow zone, do you write?

A. SABA 2-6 puffs q3 to 4 hrs x 2 days: Yes
B. Start low dose ICS: Probably not
C. Start High dose ICS: Maybe/maybe not
D. Double ICS: Maybe/maybe not
E. Triple ICS: ?
F. Quadruple ICS: Yes
G. Increase ICS/LABA: Yes
H. Start montelukast: Depends
I. Start LAMA (eg. Spiriva): ?

### Yellow Zone: Take Home Points

- No one right way (need to individualize)
- Start early; add or increase anti-inflammatory
- Continue for 1-2 weeks (sxs improve before PFT)
- Based on age and allergy status
- If it doesn’t work, change approach
- Health Insurance may not pay for more Rx of ICS or ICS/LABA

⚠️ CAUTION ⚠️