Learning the Asthma Guidelines by Case Studies

Timothy Craig, DO
Professor of Medicine and Pediatrics
Distinguished Educator
Penn State University
Hershey Medical Center

Objectives

- 1. Learn the Asthma Guidelines
- 2. Be able to classify asthma severity
- 3. Be able to determine asthma control
- 4. Be able to successfully treat asthma
- 5. Be able to improve patient outcomes
- 6. Pass your boards

- 19 yo male with asthma since age 5
- Presents with EIB and year round nasal congestion
- Denies daytime symptoms
- Night time symptoms 2 times per month
- Uses albuterol pre-exercise only
- He has moderate limitation on ability to exercise despite albuterol
- No ER visits or Hospitalizations
- What is his asthma severity?
- What would you do now?

- What is his asthma severity?

a. Mild intermittent asthma
b. Mild persistent asthma
c. Moderate persistent asthma
d. Severe persistent asthma

Ans:

- What is his asthma severity?
  a. Mild intermittent asthma
  b. Mild persistent asthma
  c. Moderate persistent asthma
  d. Severe persistent asthma

  Ans: C

Classifying Severity in Patients ≥12 Years Not Currently Taking Long-Term Controllers

Components of Severity		Classification of Asthma Severity (Youths ≥12 of age and adults)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment Normal FEV_1/FVC: 8-19 yr 85% 20-39 yr 80% 40-59 yr 75% 60-80 yr 70%	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3-4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting $beta_2$-agonist use for symptom control	≤2 days/week	>2 days/week but >1x/day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	• Normal FEV_1 between exacerbations • FEV_1 >80% predicted • FEV_1/FVC normal	• FEV_1 >80% predicted • FEV_1/FVC normal	• FEV_1 >60% but <80% predicted • FEV_1/FVC reduced 5%	• FEV_1 <60% predicted • FEV_1/FVC reduced >5%
Risk	Exacerbations requiring oral systemic corticosteroids	0-1/year	>2 in 1 year		
		Relative annual risk of exacerbations may be related to FEV_1			

- What would you do now?

a. Start a LABA
b. Start a low dose ICS
c. Start a high dose of ICS with LABA
d. Start a low dose of ICS with a LABA

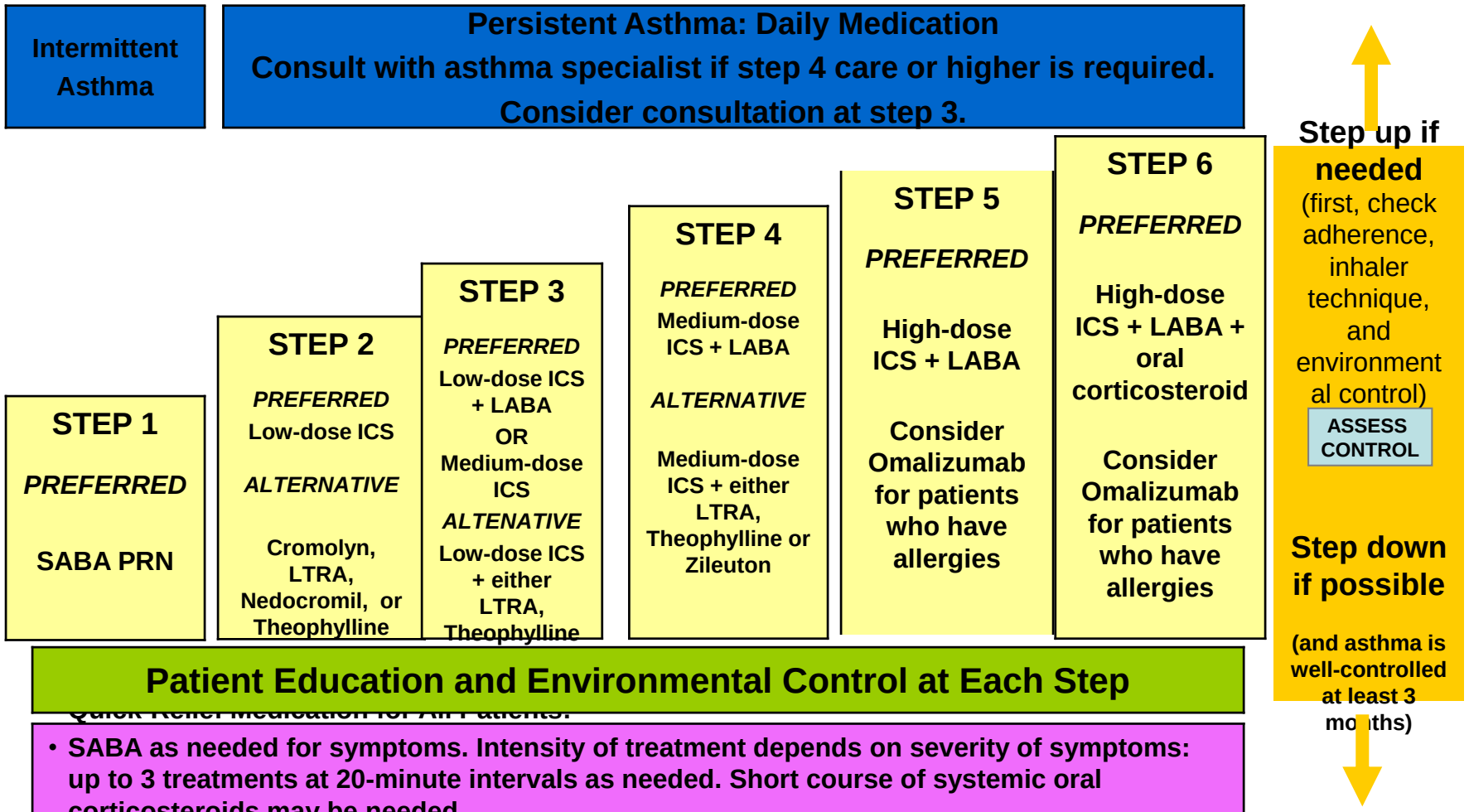
Ans:

- What would you do now?

a. Start a LABA
b. Start a low dose ICS
c. Start a high dose of ICS with a LABA
d. Start a low dose of ICS with a LABA

Ans: D

Stepwise Approach for Managing Asthma in Patients ≥ 12 Years of Age



NHLBI. National Asthma Education and Prevention Program. Expert Panel Report 3. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed 8.30.07.

- FVC was 90%, FEV-1 was 80% and his ratio was 85%
- CXR was normal
- Skin tests were positive for house dust mites
- Prescribed a low dose of inhaled steroid and a LABA
- Started on nasal steroid
- Albuterol as needed
- Prednisone for severe asthma
- Educated on technique, adherence, acute asthma action plan and mite avoidance

- Returns in 3 month
- He has been using his ICS and LABA regularly
- Denies nighttime, daytime symptoms, or exercise related symptoms
- His QOL is good.
- Albuterol in the last week has been pre-exercise only.
- He used prednisone three times for asthma attacks over the past 12 weeks
- FEV-1 was 80% with a ratio of 83%
- What is his asthma control?
- What would you do?

- What is his asthma control?

A. Moderate persistent asthma
B. Well controlled asthma
C. Not well controlled asthma
D. Very poorly controlled

Ans:

- What is his asthma control?

A. Moderate persistent asthma
B. Well controlled asthma
C. Not well controlled asthma
D. Very poorly controlled

Ans: D

Assessing Asthma Control in Patients ≥12 Years of Age

Components of Severity		Classification of Asthma Control (Youths ≥12 years of age & adults)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week	>2 days/week	Throughout the day
	Nighttime awakenings	≤2/month	1-3x/week	≥4x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting $beta_2$-agonist use for symptom control	≤2 days/week	>2 days/week	Several times per day
	FEV_1 or peak flow	>80% predicted/personal best	60-80% predicted/personal best	<60% predicted/personal best
	Validated questionnaires* ATAQ ACQ ACT	 0 ≤0.75 ≥20	 1-2 ≥1.5 16-19	 3-4 N/A ≤15
Risk	Exacerbations	0-1/year	≥2/per year	≥2/per year
	Progressive loss of lung function	Evaluation requires long-term follow-up care.		
	Treatment-related adverse effects			

*Consider severity and interval since last exacerbation.

- What would you do?

  a. Add mepolizumab

  b. Increase ICS to a high dose and continue the LABA

  c. Add a short acting anticholingeric

  d. Add zileutin (a lipo-oxygenase inhibitor)

  e. Add omalizumab

Ans:

- What would you do?

  a. Add mepolizumab

  b. Increase ICS to a high dose and continue the LABA

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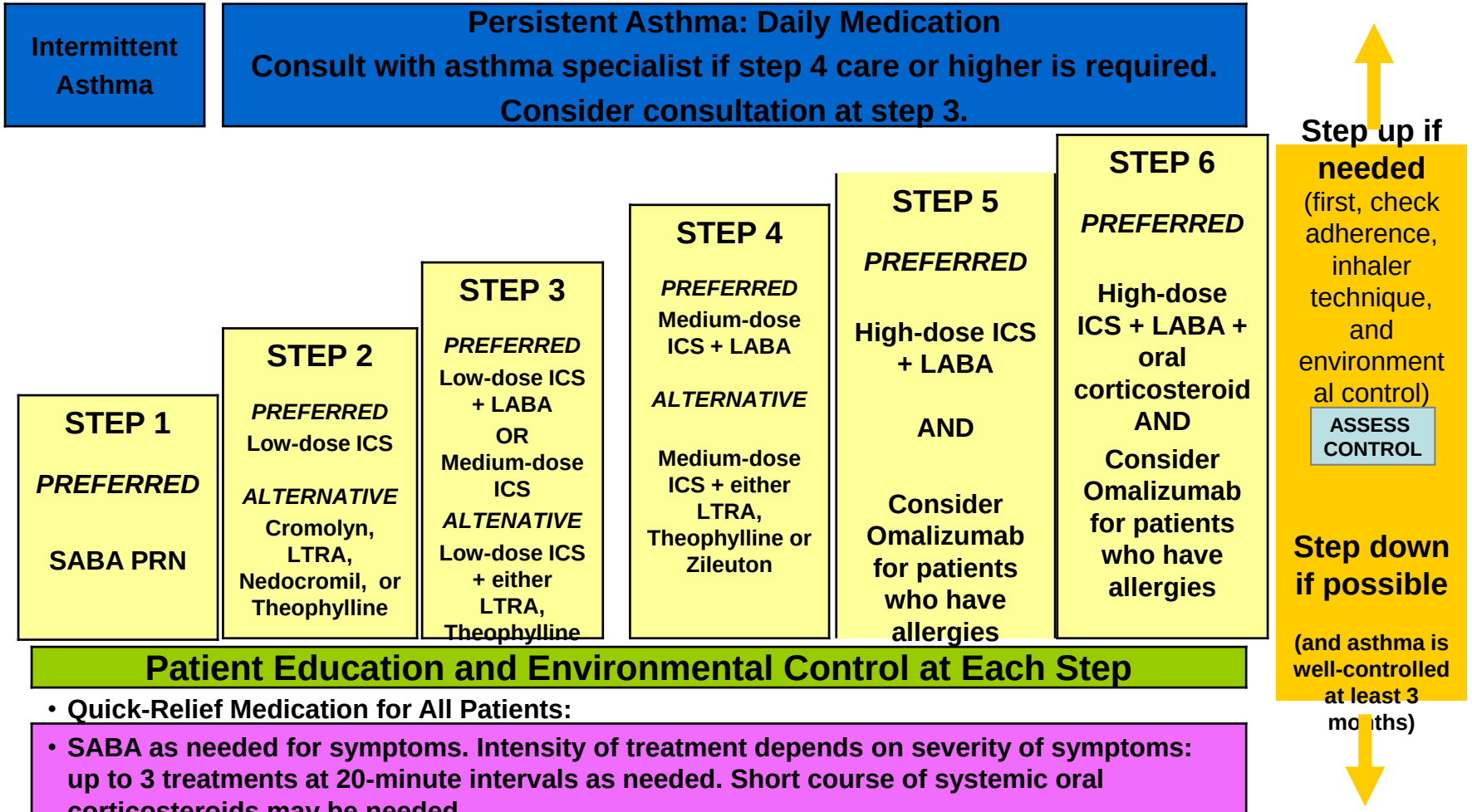
  d. Add zileutin (a lipo-oxygenase inhibitor)

  e. Add omalizumab

Ans: B

Stepwise Approach for Managing Asthma in Patients ≥ 12 Years of Age



Patient Education and Environmental Control at Each Step

- **Quick-Relief Medication for All Patients:**
- **SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute intervals as needed. Short course of systemic oral corticosteroids may be needed.**
- **Caution: Increasing of β-agonist or use >2x/week for symptoms control indicates inadequate control and the need to step up treatment.**

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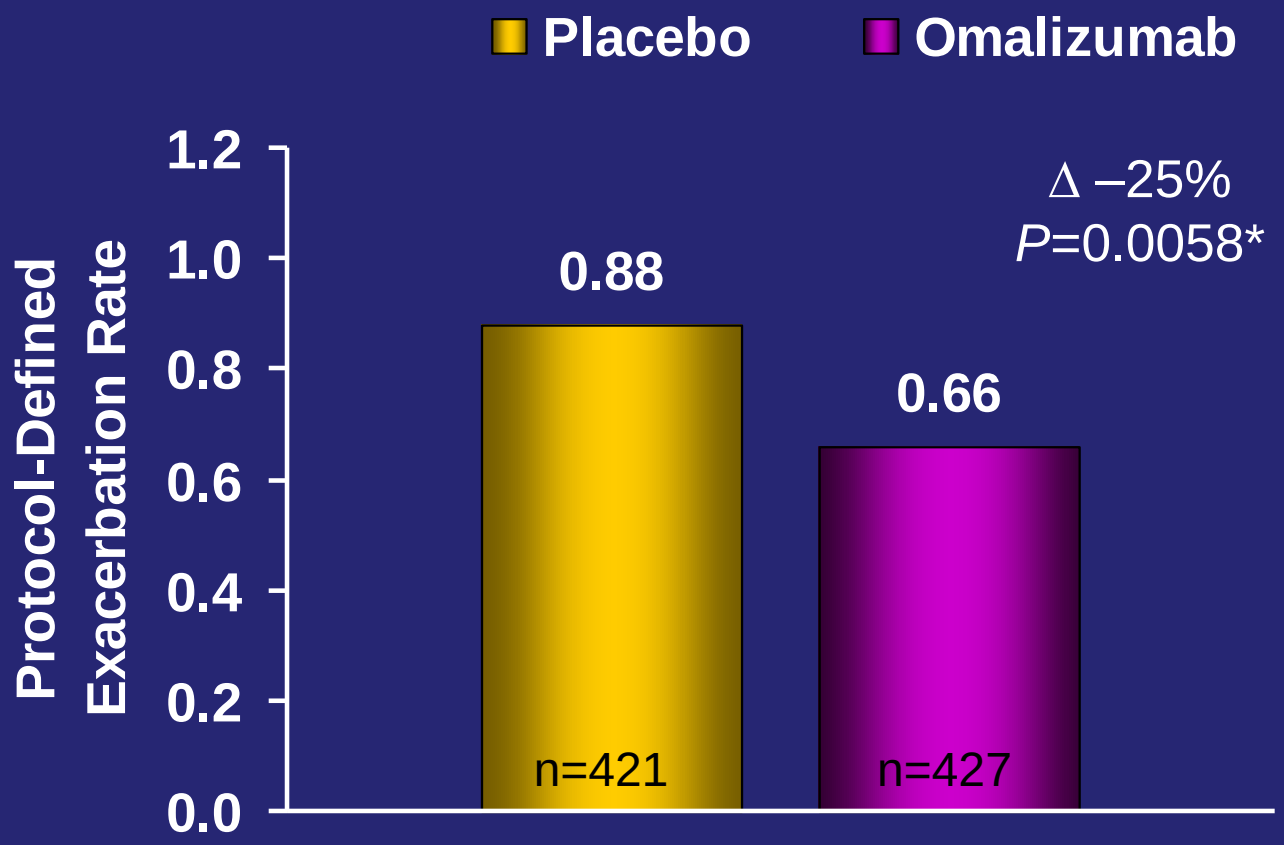
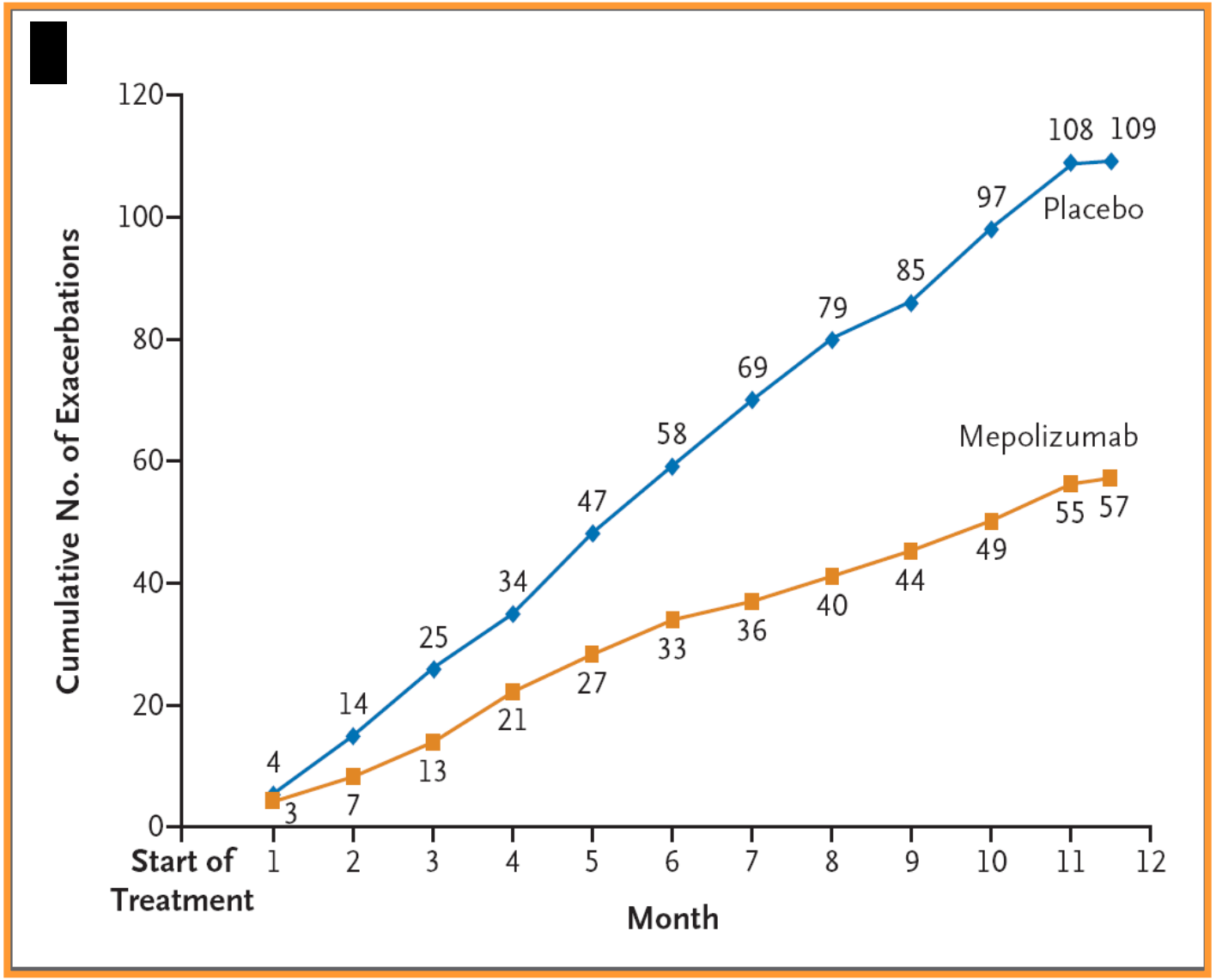
- Prescribe a peak flow meter
- High dose inhaled corticosteroid plus LABA
- Consider omalizumab or mepolizumab
- SABA PRN and pre-exercise
- Increase albuterol for yellow zone
- Prednisone for red zone
- F/U in 1 month

Primary Endpoint: Rate of Asthma Exacerbations Over 48 Weeks



*Poisson regression including terms for treatment, concomitant asthma medication strata, dosing regimen, and number of exacerbations in the prior year.

Exacerbations comparing mepolizumab to placebo



Haldar, et al. NEJM 2009; 360:973-984.

Review the Guidelines

Classifying Severity in Patients ≥12 Years Not Currently Taking Long-Term Controllers

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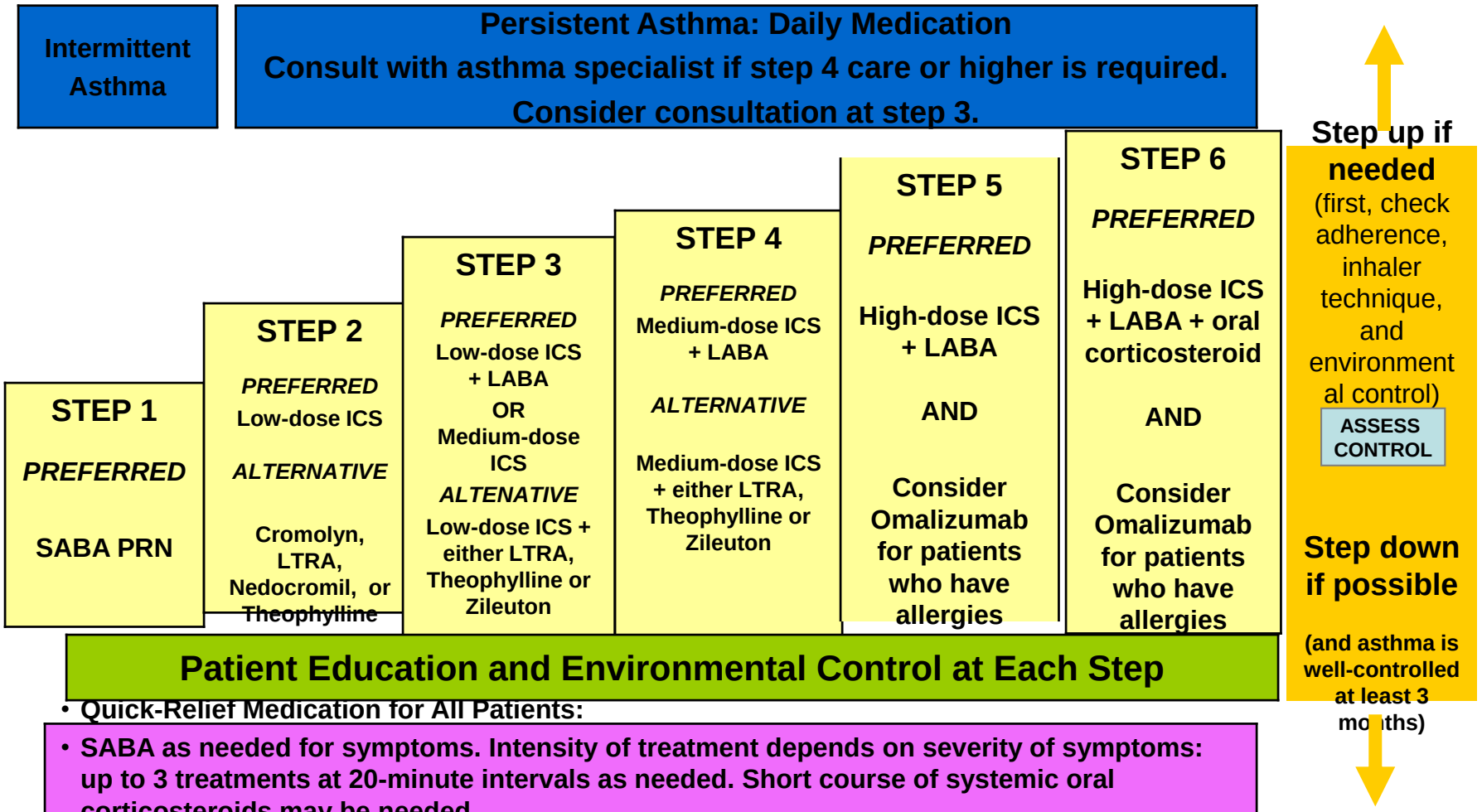
Stepwise Approach for Managing Asthma in Patients ≥ 12 Years of Age



- **Quick-Relief Medication for All Patients:**
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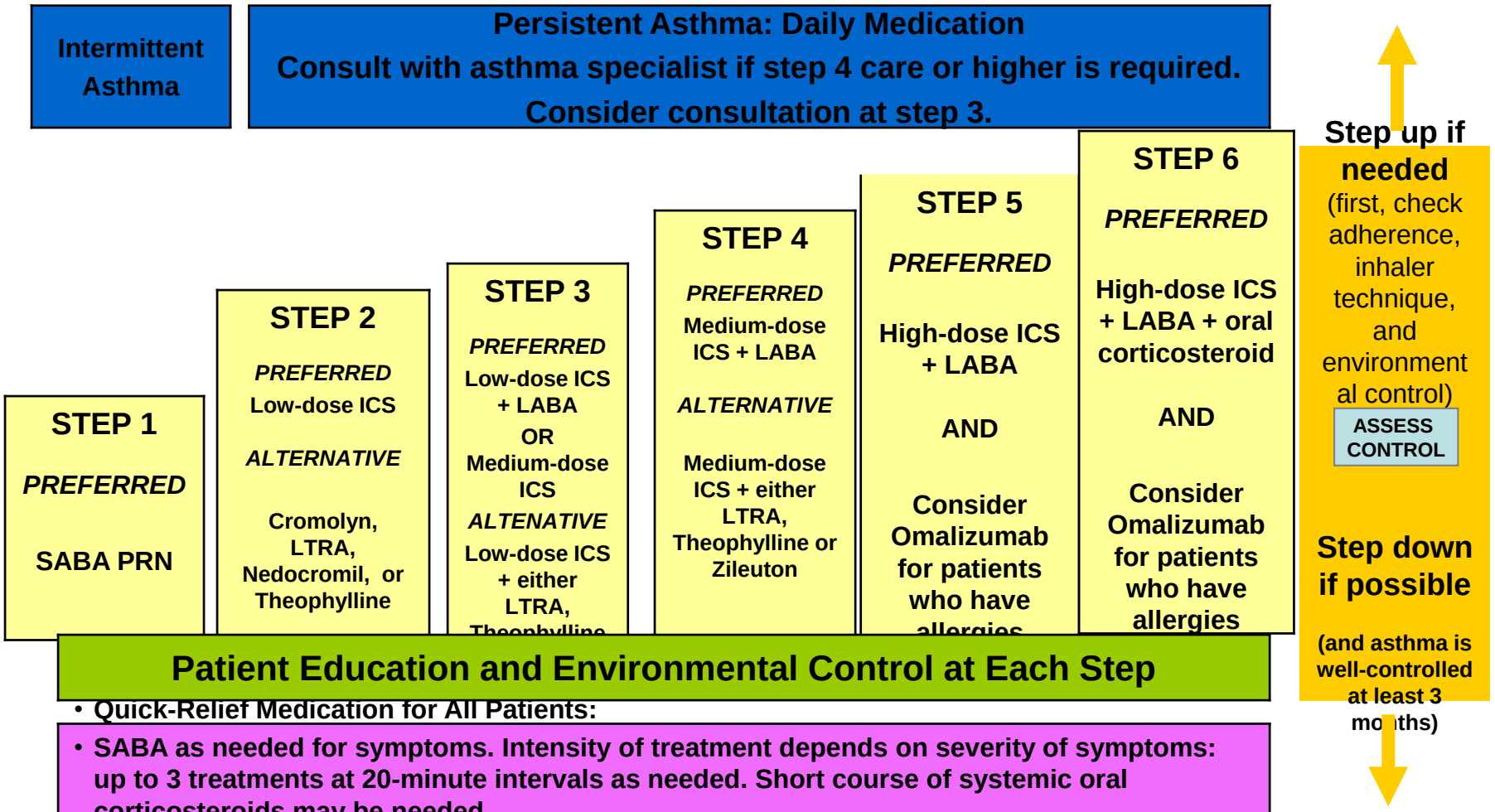
*Consider severity and interval since last exacerbation.

Stepwise Approach for Managing Asthma in Patients ≥ 12 Years of Age



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New develops that have been published since the guidelines have been published:

- 1. Tiotropium Bromide can be added in place of a LABA to a moderate to high dose of ICS if the patient is not controlled or to a ICS/LABA combination for poor control
- 2. Ipratropium bromide can be used in the ED when albuterol use in maximized and patient still has symptoms. This may decrease risk for hospitalization.
- 3. Mepolizumab is approved for severe asthma and inhibits IL-5 and decreases influx of eosinophils into the airway and decrease exacerbations.
- 4. Omalizumab decreases exacerbations and is now approved to use in child.

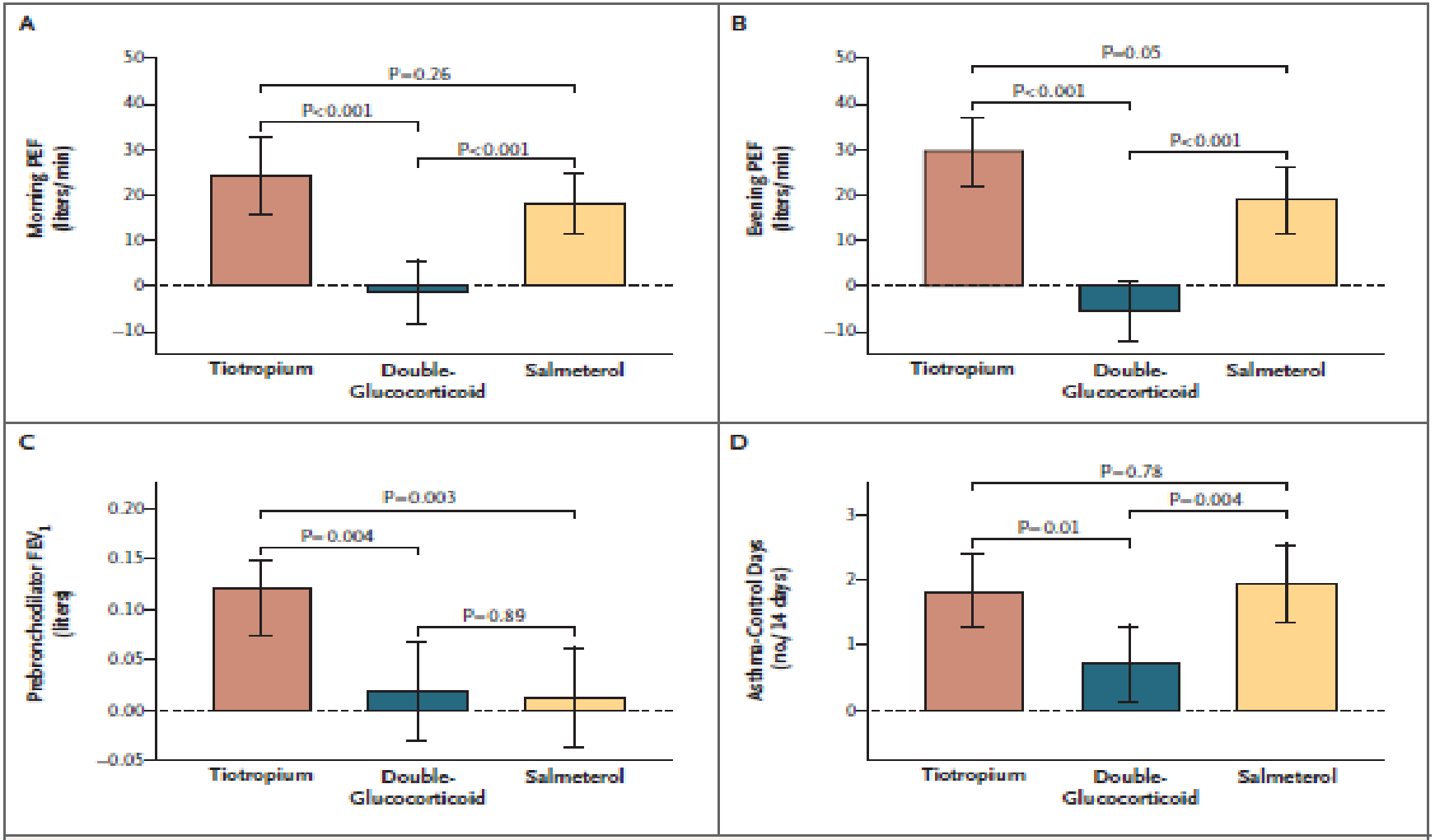


Figure 3. Primary and Secondary Outcomes.

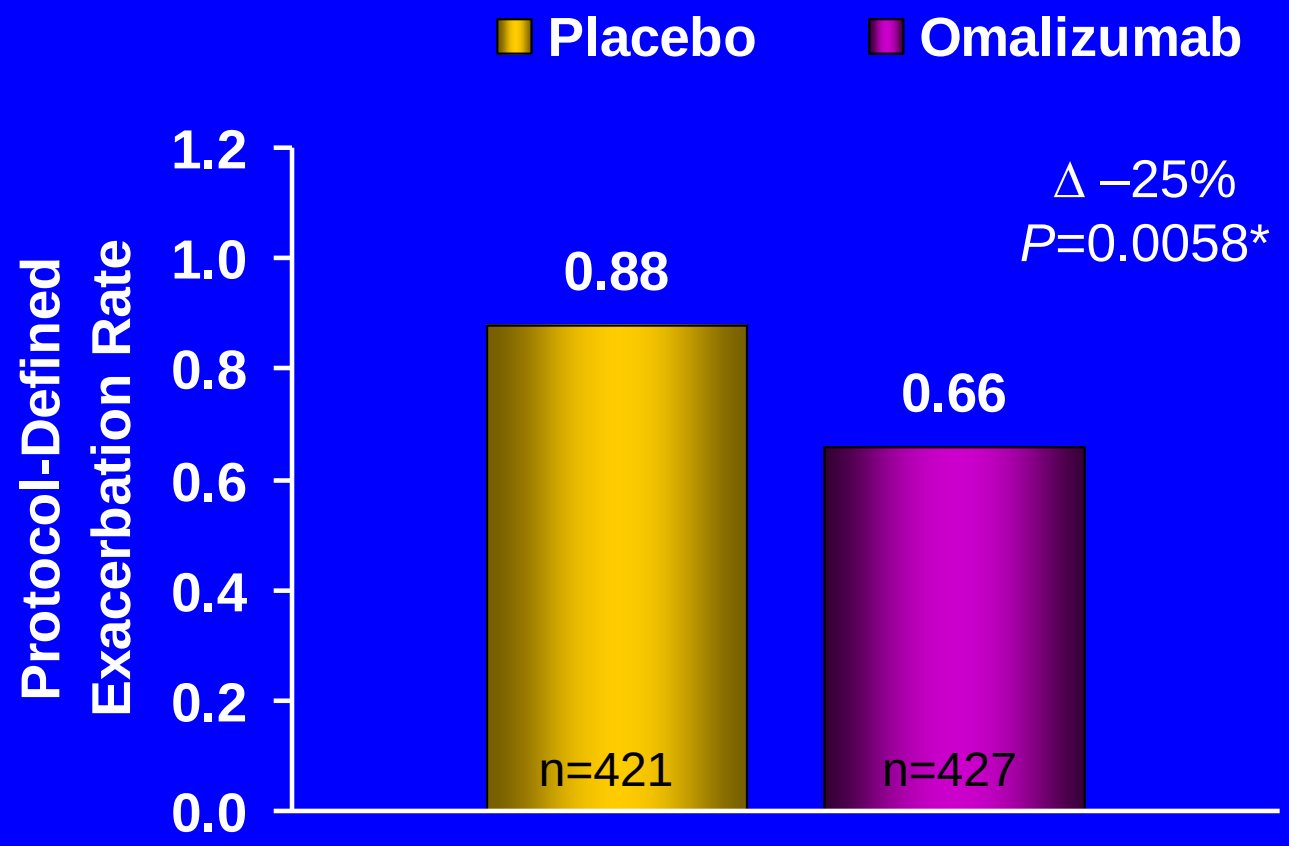
Shown are the mean differences among patients receiving tiotropium, those receiving double-glucocorticoid, and those receiving salmeterol with respect to the morning peak expiratory flow (PEF) (Panel A), the evening PEF (Panel B), the prebronchodilator forced expiratory volume in 1 second (FEV_1) (Panel C), and the proportion of asthma-control days per 14-day period (Panel D). The I bars indicate 95% confidence intervals.

NEJM 363;18;1715

Increased exacerbations in the beclo group

Decrease response to albuterol in the salmeterol group

Primary Endpoint: Rate of Asthma Exacerbations Over 48 Weeks



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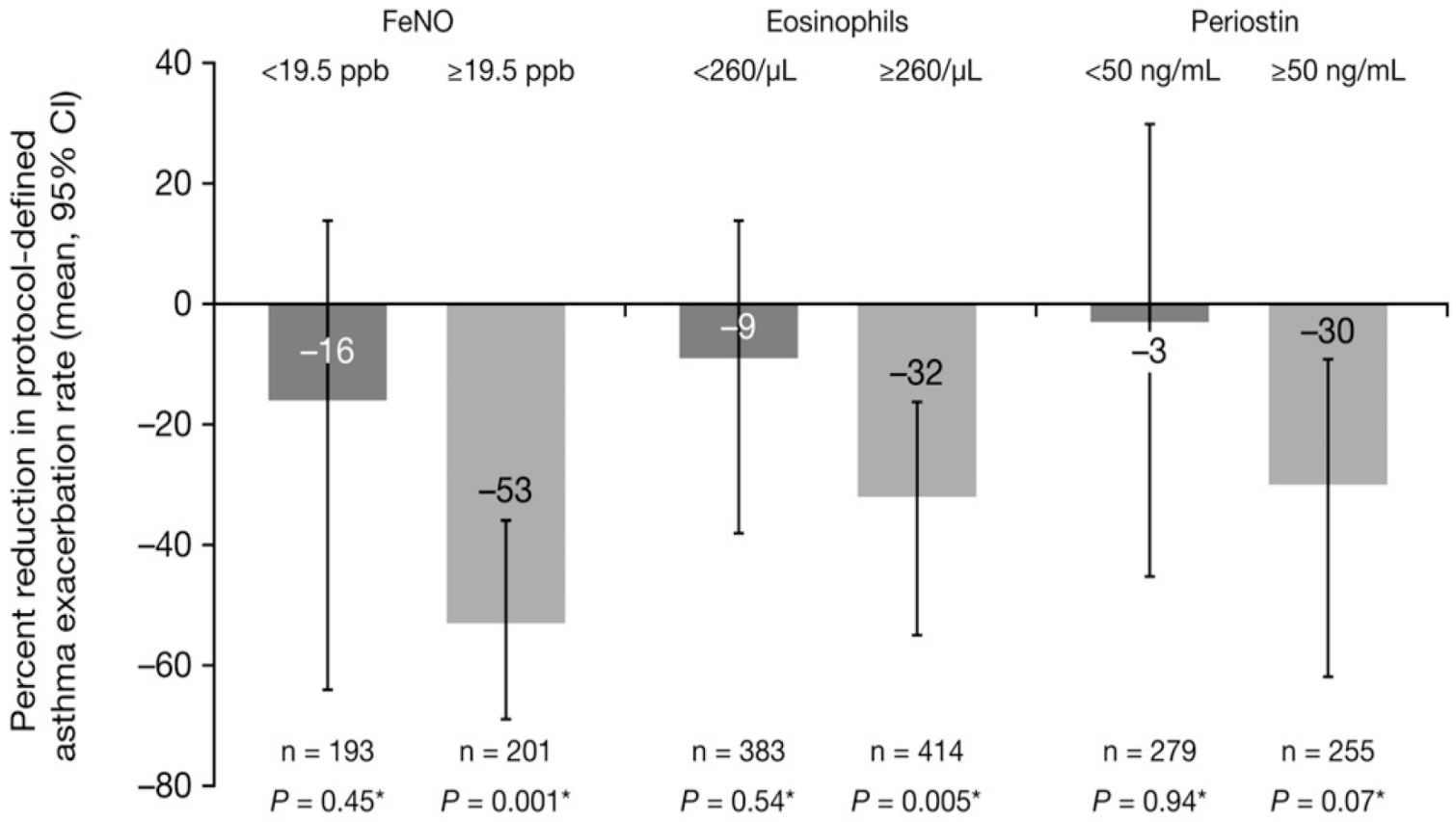
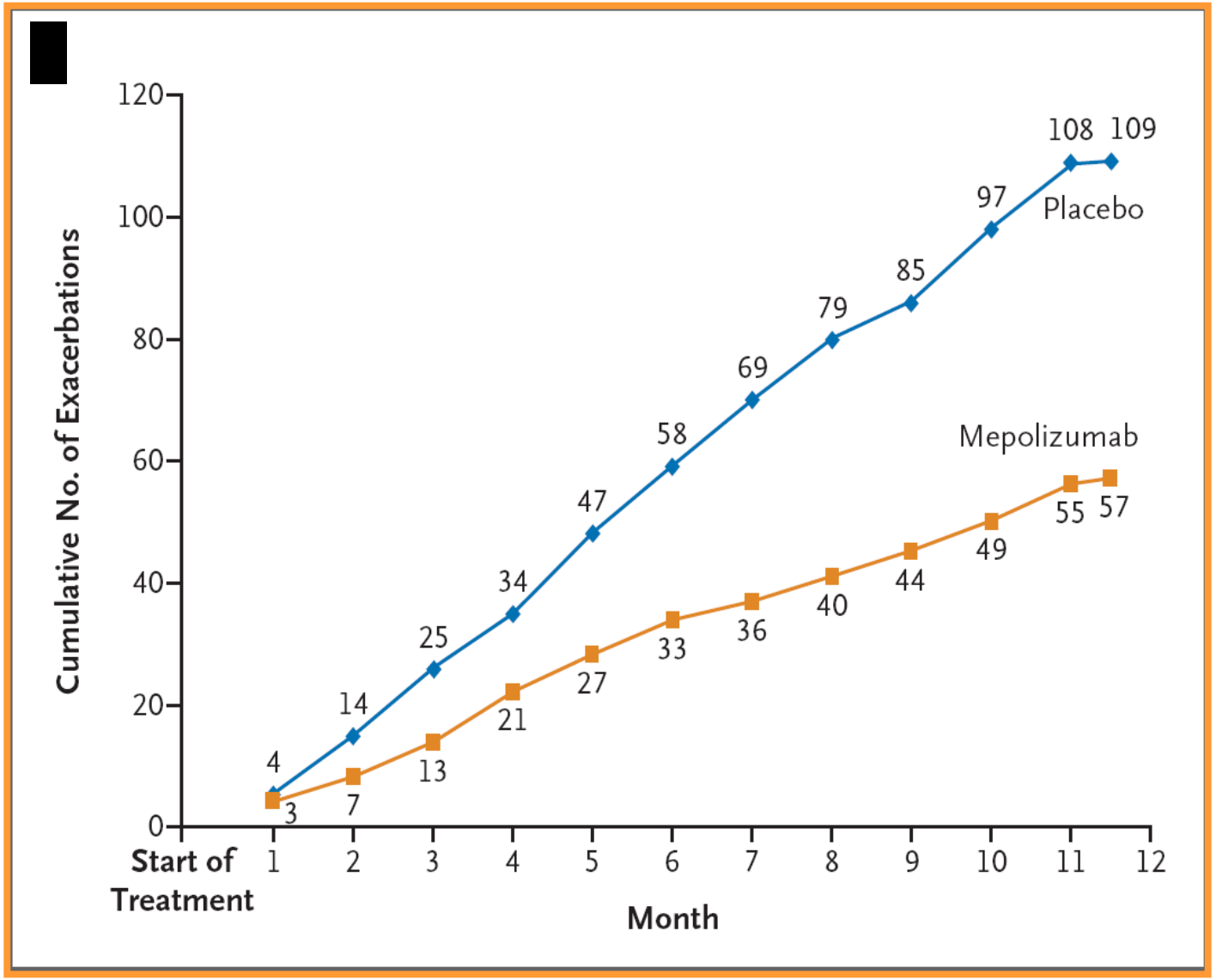


Exacerbation rates						
	Low FeNO at baseline	High FeNO at baseline	Low eosinophils at baseline	High eosinophils at baseline	Low periostin at baseline	High periostin at baseline
Omalizumab	0.60	0.50	0.65	0.70	0.73	0.66
Placebo	0.71	1.07	0.72	1.03	0.72	0.93

Hanania NA, et al. Am J Respir Crit Care Med 2013;187:804-811.



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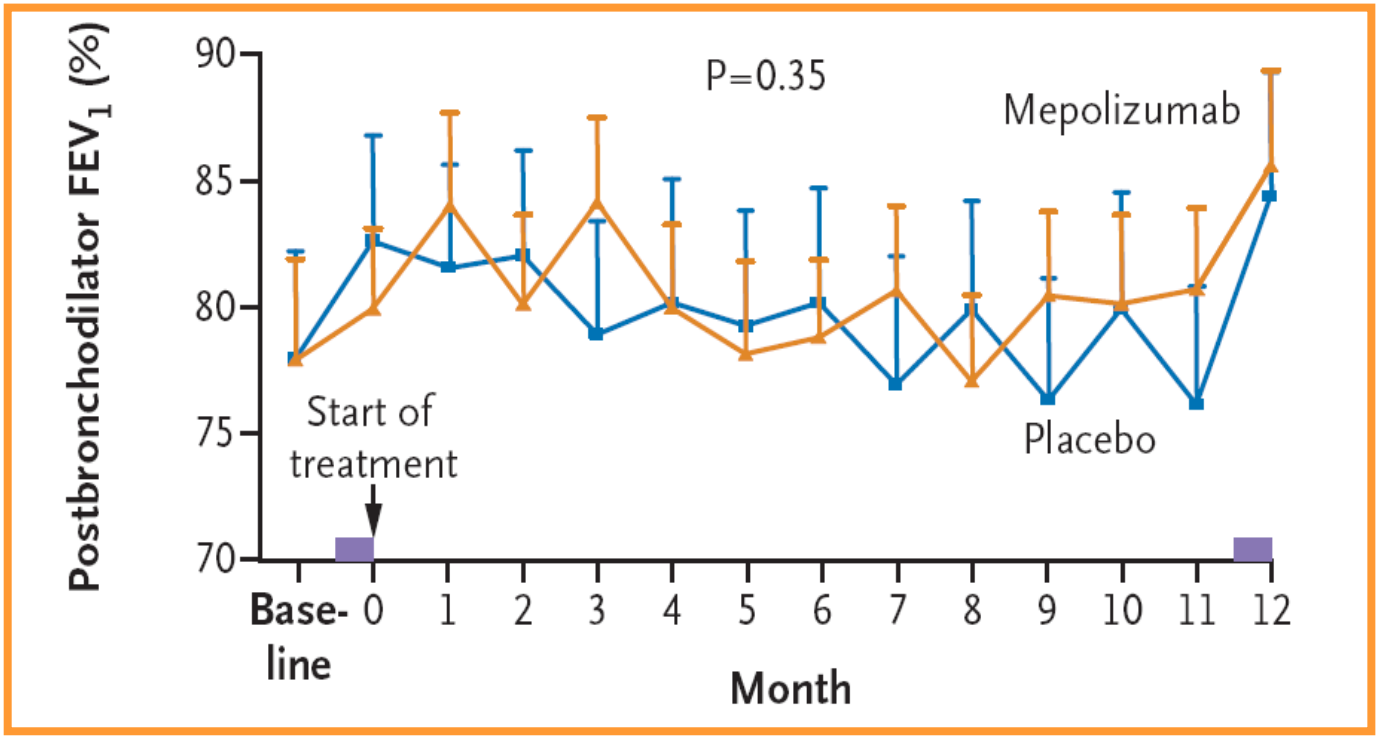

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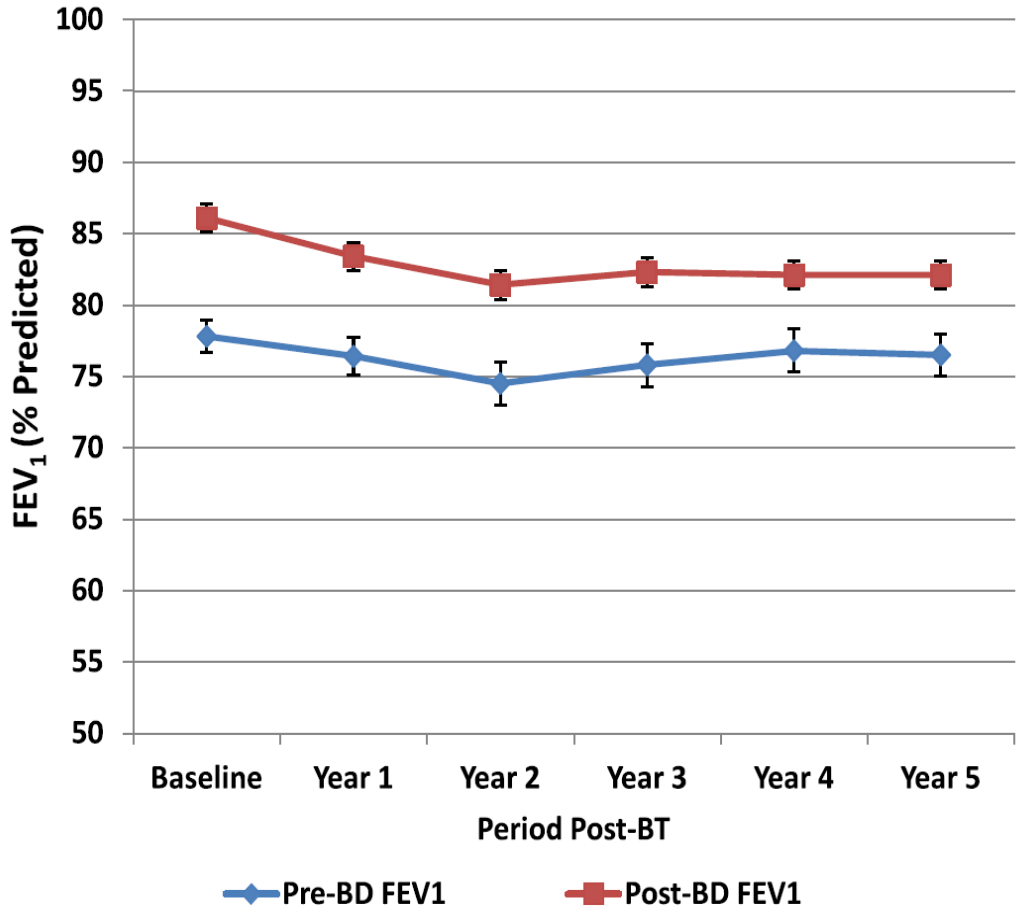
Wechsler ME et al. Bronchial thermoplasty: Long-term safety and effectiveness in patients with severe persistent asthma. J Allergy Clin Immunol 2013;132:1295-302.

- 5 year follow-up of patients in AIRE2 Trial (Asthma Intervention Research 2)
- Double-blind, sham-controlled, randomized trial of BT
  - 32% reduction in exacerbations
  - 84% reduction in ED visits
  - 66% reduction in time lost from work



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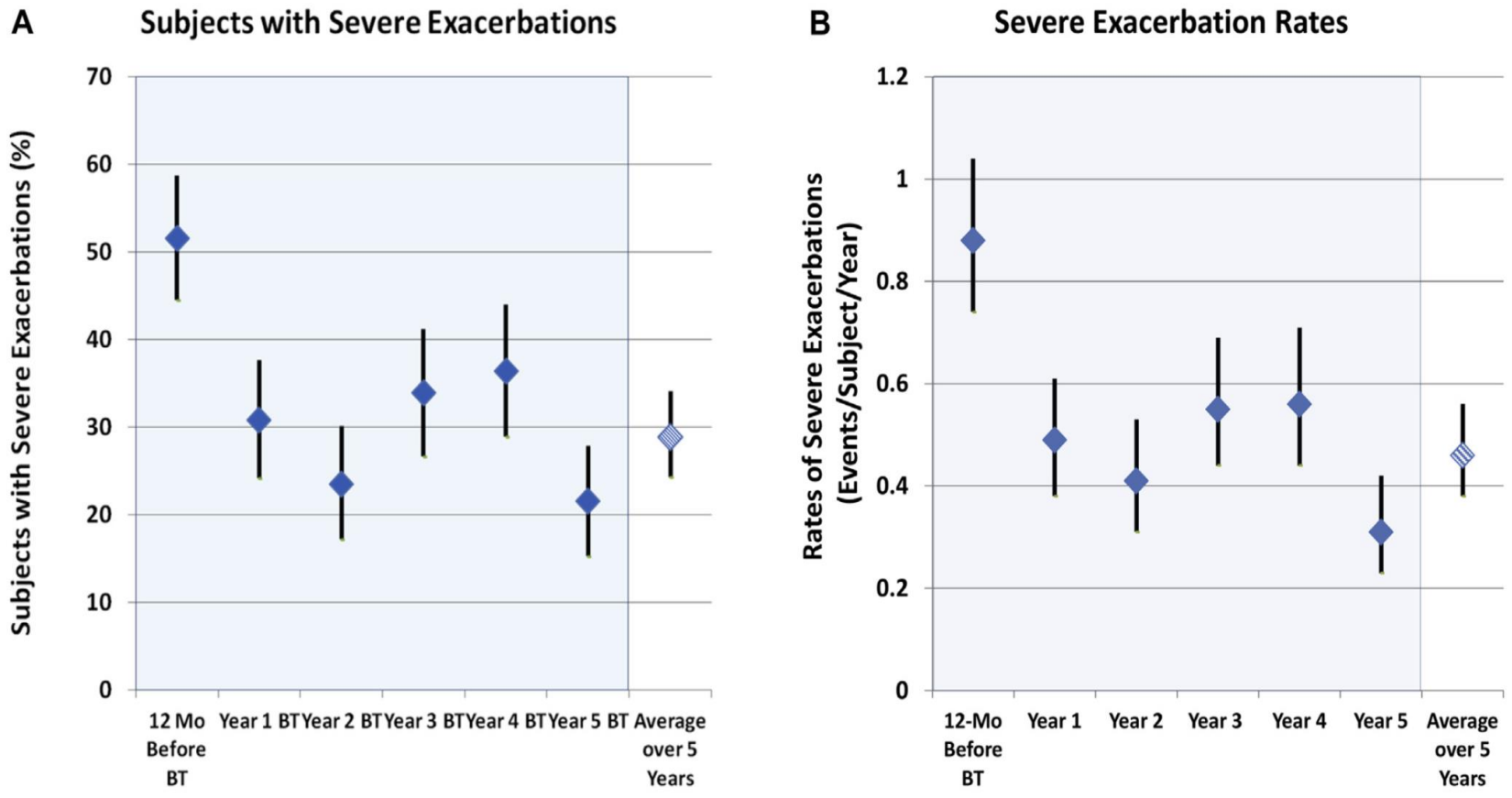

Wechsler et al. J Allergy Clin Immunol 2013; 132:1295-302.

Other new developments that have been published since the guidelines have been published:

- Montelukast is not as effective as ISC, but compliance is better and for this reason over many years the benefits may be equal to ICS (NEJM)
- Montelukast is not as effective as adding LABA to ICS, but due to better compliance over many years the benefits may be equal to adding LABA to ICS (NEJM)
- Aerobic exercise is effective in reducing asthma symptoms
- Vitamin D deficiency is common in asthma and replacement may decrease steroid resistance.
- Adding macrolides may not be of significant benefit in most asthma patients

Assessing Asthma Control: "Rules of Two"

- If the answer to following questions is yes, a long term controller may be needed or you need to increase care
  - Do you take your quick relief inhaler more than TWO TIMES A WEEK?
  - Do you awaken at night with asthma more than TWO TIMES A MONTH?
  - Do you have daytime symptoms more than twice a week?
  - Do you have attacks more than twice a year
  - OR is there any limitation on exercise or QOL

Summary: what is stressed in the guidelines

- Severity classification on first visit.
- Asthma control on subsequent visits.
- Different guidelines for ages 0 to 4, 5 to 12 and greater than 12.
- Addition of functional ability and exacerbations to both severity and control.
- Stresses that ICS are the drug of first choice.
- Addition of omalizumab or mepolizamab for severe uncontrolled asthma.
- Addition of zileutin for moderate asthma.
- Increase importance of prednisone for severe asthma and very poorly controlled asthma

Thank you and enjoy your day.

Tim

tcraig@psu.edu