

Building Your Mastery and Confidence in Dealing with Asthma



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Disclosures

- Retired from Med Univ S Carolina
- No financial relationships relevant to this talk; Monaghan speakers bureau and consultant
- Will speak about medications as indicated and on-label
- Multiple commonly-used asthma medications are often used in children off-label
- Will identify when medications are off-label or carry FDA warnings

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Learning Objectives

Members of the audience will be able to:

- Outline the pathobiology and clinical manifestations of asthma and the role of triggers;
- Describe current evidence-based approaches to asthma management and trigger reduction, including adjustments of therapy;
- Identify effective communication patterns for teaching patients, parents, caregivers;
- Identify patients with severe asthma and outline their special needs for therapy.

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Introduction

Asthma Burden

- Asthma is the most common chronic disease and can be fatal; ~14M school & ~14M work days lost
- Seasonal up-ticks
- Effective control requires a team of caregivers which is hard to pay for. Prevention \$ < acute care \$\$\$
- There are marked disparities in asthma outcomes among minorities – ER, admissions, death.
- Multiple social factors make asthma more difficult to control – these MUST be recognized / addressed!
- Overall, asthma is estimated to cost over \$80 B/yr

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Introduction, II

Why is this worth talking about?

- Key factors -- Fragmented care, using rescue only;
Wechsler et al. NEJM 2007;356:2083-2091
- Overall incidence was ~ 5% in 1980, ~9% now
- Hispanics: Puerto Rican > Mexican heritage;
- Native Americans: High incidence of smoking/ETS;
- Poverty worsens incidence and outcome;
- ANY asthma death should be considered an excess/avoidable death!
- “Asthma is a disease of communication as much as inflammation” – R Brown, MD, U Michigan

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Guidelines

We're quite fortunate!

- Often, chronic illnesses have widely variant approaches to treatment
- Asthma is different – guidelines have existed since 1992 – providing research-based best practices
- American guidelines – the Expert Panel Report – have been revised intermittently (2007 – 2021)
- **G**lobal **I**nitiative for **A**sthma (GINA) Guidelines started in 1995 and get revised every year
- Remember that the FDA requires 2 American studies to make a recommendation for drug approval

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Current Asthma Incidence

Nat'l Center for Environ Health, 2018

Children (\leq 17 yo)	<u>2016</u>	<u>2018</u>
• All	8.4%	7.5%
• White, non-Hispanic	6.7%	6.8%
• Black, non-Hispanic	15.4%	14.2%
• Hispanic	6.8%	7.5%*
* Puerto Rican 13.6% , Mexican 6.6%		
• Native American/Alaskan	16.1%	10.2%
• Asian	4.0%	3.8%
• Black/White bi-racial	13.4%	13.0%
• Poverty	10.7%	10.8%
• Not poor	6.7%	6.5%

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Asthma Under-world **Why is asthma still such a problem?**

- **Under** – diagnosis
 - “It’s just another cold”
 - “He’s just shy” (exercise)
 - “You know she’s in daycare”
- **Under** – treatment
 - “The albuterol worked well”
 - “I don’t want him on so many drugs”
- **Under** – referral to asthma specialists
 - “It’s just her sinuses”
 - “The prednisone works really well”



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What is Asthma? A Syndrome

Recurrent, reactive, airway obstructive disease

This means that the patient has to:

- Show appropriate symptoms **repeatedly**,
- **Respond** at some time to bronchodilator therapy,
- Show symptoms/evidence of airway **obstruction**
 - Wheeze
 - Cough
 - Shortness of breath / dyspnea
 - Spirometry \pm bronchodilator
- Patient must adhere to prescribed therapy and report response

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The Asthma Syndrome

Asthma is not one single disorder, but is now considered a syndrome with multiple phenotypes and endotypes

- Symptoms may overlap but the pathology and molecular mechanisms may vary;
- The more detailed the understanding, the better the chance for effective individualized therapy;
- Genes + Exposures + management
- Phenotypes are the observed abnormalities
- Endotypes are the mechanisms causing symptoms

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Asthma Pathophysiology

Phenotypes vs Endotypes

- An area of new and evolving understanding
- Endotype-mechanisms causing asthma expression
 - T2-high (eosinophilic) – different cells and mediators
 - Non-T2 (non-eosinophilic)
- Phenotype (clinical expression of the condition)
 - Eosinophilic – early atopic, late-onset, aspirin
 - Non-eosinophilic – non-atopic, smokers, obesity, elderly
- Complex biological mechanisms
- Personalized medicine – matching treatment to the specific mechanism; rapidly changing

Kuruvilla et al. Clin Rev All Imm (2019) 56:219-233

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Asthma Symptoms

- Extrinsic (observable)
 - Noisy breathing – cough or wheeze
 - Respiratory distress, pursed – lip breathing, talking
 - Exercise intolerance
 - Won't play or symptoms appear with exercise
- Intrinsic (felt by the patient)
 - Chest tightness, can't breathe, can't get air out
 - Reduced comfort / enjoyment of exercise
- Physical examination (symptomatic at the time?)
 - Air flow is CRUCIAL (localized or general)
 - Cough, wheeze, hyperinflation, allergic manifestations
- Quite variable, can mimic a "cold"

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The Key – Accurate Diagnosis

- History
 - Symptoms, occurrence, severity, exercise tolerance
 - Identify likely triggers and co-morbidities
- Physical examination (symptomatic at the time?)
 - Cough, wheeze, hyperinflation, allergic manifestations
- Laboratory studies
 - Spirometry, FeNO, allergy testing (blood or skin), IgE, eosinophils
- Response to therapy – previous, going forward
- Education – asthma, triggers, management
- Patient / family adherence

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Asthma Mimics

- Must have careful history and exam
 - Symptoms, occurrence, severity, exercise tolerance
 - Has there ever been responsiveness to albuterol?
- Cough vs wheeze
- Common problems (acute, chronic)
 - Vocal cord dysfunction
 - Exercise intolerance
 - Aspiration (from above or below)
 - Hypersensitivity pneumonitis
 - Tracheo- / bronchomalacia or stenosis
 - Foreign body aspiration in acute setting



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Asthma Severity

- The rule of 2's – symptom frequency
 - > 2 times a week or > 2 nights a month
 - Kids should exercise every day!
- Classify as intermittent vs. persistent
 - Intermittent needs only rescue medication
 - Most albuterol inhalers have 200 puffs!
 - Persistent (mild, moderate, severe) utilize controller / daily meds, increasing strength
- Assess severity only at the start of treatment!
- Assess risk based on history
- Assess control at every contact



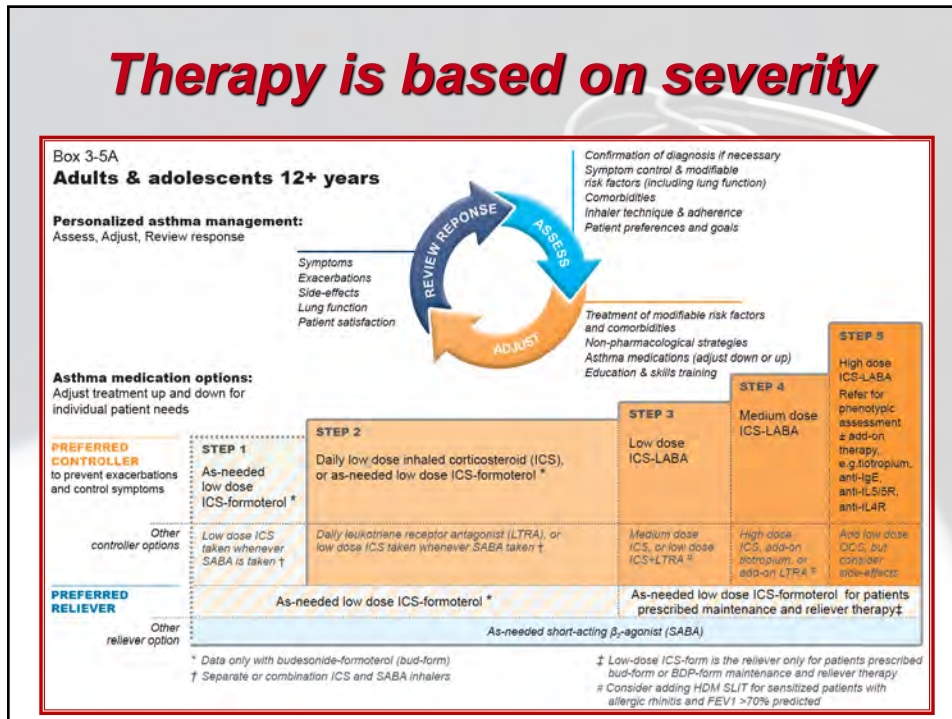
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Therapy is based on severity

- Classification by step in EPR-3/4 and GINA guidelines (intermittent vs persistent)
- Understand the bar graphs for step therapy
- Always use rescue, consider adding controller
- Treat 2 – 4 weeks, reevaluate, adjust Rx (up or down); education is crucial with every visit!
- Goals are to get excellent symptom control on minimum therapy; changes usually made every 1-4 months in follow-up
- Remove / minimize trigger impact; recognize seasonality, school; treat co-morbidities

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Therapy is based on severity



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Co-morbidities

Conditions that can make asthma worse

- Allergic symptoms – “single airway concept”, asthma previously thought to be totally allergic
- GE reflux -- \pm aspiration, especially associated with night – time symptoms
- Obesity – vicious circle of exercise intolerance
- Tobacco Smoke (ETS) exposure – recognize in all settings of care
- Non-adherence – general feature of families, crucial to improve for all health and school success

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Asthma Triggers

- Allergic – nose, skin, eyes, lungs
 - Assess the child and the home (and school)
 - Trees, pet dander, dust mites, mold, pollen, cockroaches
- Non-allergic / intrinsic – viral illnesses, aspiration, GE reflux, obesity
- Irritant – exhaust, smoke, scents
- Exercise – “exercise-induced bronchospasm” vs “asthma triggered by exercise”
- Kids should generally NOT get albuterol before recess or PE
- Full normal exercise / sports should be expected!

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Asthma Triggers -- Recognition

- History – when do symptoms appear or worsen?
 - Seasons, activities, locations, other symptoms
- Testing for allergen responses
 - IgE blood testing (total, specific)
 - Skin testing
 - Eosinophil levels
- Irritant exposures – do they affect the child?
- Exercise – what happens when they play hard?
Has albuterol reduced or prevented the symptoms?
- Colds – symptoms, duration, treatments given
- Nocturnal symptoms

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Asthma Triggers

- Parental understanding – asthma is a modifiable disease; recognize future gains as being possible!
- Everyone has their own set of triggers which the prescriber needs to identify
- Many are environmental
 - Inhalants, allergens, smoke / fumes
- Others are intrinsic
 - GE reflux, aspiration, viral infection, exercise
- Reducing exposures are important
- Treatment works WITH trigger reduction



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Allergic Recognition and Treatment

- Assessment, testing for all with persistent asthma
- Avoidance – when known specifically
 - Skin testing, immunocap IgE testing
- Immuno-therapy increasingly available
 - Significant symptoms
 - Major commitment by family
- Treatment of upper airway disease symptoms
- Role of consultant(s) – allergist vs pulmonologist

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Asthma Risk

- How likely is an adverse outcome?
- Based on history
- Higher risk suggests need for stronger treatment (and trigger reduction)
- Hospitalizations
- Intubations
- Steroid courses
- Prevention is key!
- Some patients can't perceive dyspnea



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Influences on Asthma Outcomes

- Parental understanding – asthma is a modifiable disease; recognize future gains as possible!
- Treatments – effective, available
- Treatments in the patient – do the medications get in, device compliance?
- Pt / parent understanding – illness, treatment routine—NOT “just a cold”!
- Compliance – appointments, chronic treatments, acute care
- Patient supervision / age of self – care
- Caregivers often have not been to clinic



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Asthma Control Assessment

- How have things been going?
 - Symptoms, exercise, sleep, PEFRs
- What medications have been used?
 - Controller adherence, need for rescue
- What exposures have occurred?
 - Season, viral illnesses, sports participation, inhalants, allergen exposures, *etc.*
- Utilize ACT for last month
- Increase meds if not doing well; decrease meds if doing well for > 3 months
- Reteach device usage



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Asthma Control Test (ACT)

Childhood Asthma Control Test for children 4 to 11 years old.
Know the score.

The ACT will provide you with the most helpful questions to answer. For further information, visit www.aacpi.org.

How to take the Childhood Asthma Control Test

1. For your child, request the ACT for questions 11 to 18. If your child needs help reading or understanding the questions, parents, guardians, teachers, or an adult can read the questions. Complete the remaining questions 11 to 18. If your child needs help reading or understanding the questions, parents, guardians, teachers, or an adult can read the questions. Complete the remaining questions 11 to 18. If your child needs help reading or understanding the questions, parents, guardians, teachers, or an adult can read the questions. Complete the remaining questions 11 to 18.
2. If the child cannot read, parents, guardians, teachers, or an adult can read the questions. Complete the remaining questions 11 to 18. If your child needs help reading or understanding the questions, parents, guardians, teachers, or an adult can read the questions. Complete the remaining questions 11 to 18.
3. Add up your score by 40.
4. Take the test to determine how well your child is doing.

Have your child complete these questions:

1. How often do you have asthma symptoms?
2. How often do you have asthma symptoms that interfere with your school or sports?
3. How many times in the last 12 months have you had an asthma attack?
4. How often do you have asthma symptoms that interfere with your school or sports?

Please complete the following questions on your own.

5. During the last 12 months, on average, how many days per week did your child have any asthma symptoms?
6. During the last 12 months, on average, how many days per week did your child miss school or sports because of asthma?
7. During the last 12 months, on average, how many days per week did your child miss school or sports because of asthma?
8. During the last 12 months, on average, how many days per week did your child miss school or sports because of asthma?

Please turn this page over to see what your child's total score means.

4 – 11 yrs

FOR PARENTS:

Take the Asthma Control Test® (ACT) for people 12 yrs and older.
Know your score. Share your results with your doctor.

Using the ACT, you can determine how well your asthma is controlled. This score will help you and your doctor decide if you need to change your asthma treatment.

How to take the Asthma Control Test

1. To take the ACT, you need to be able to read and understand the questions.
2. To take the ACT, you need to be able to read and understand the questions.
3. To take the ACT, you need to be able to read and understand the questions.
4. To take the ACT, you need to be able to read and understand the questions.

FOR PARENTS:

The ACT is:

- A quick, easy-to-use questionnaire.
- A questionnaire that is easy to use.
- A questionnaire that is easy to use.

Please turn this page over to see what your score means.

≥ 12 yrs

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Tobacco Effects

- Parental understanding – tobacco smoke (ETS) is an irritant, not an allergy. ALL environments need to be kept smoke – free (grandparents, alternate parent, *etc.*)
- 1-800-QUITNOW – quit lines
- Prenatal smoke exposure effects
- Having a smoking room in a house is like having a peeing section in a swimming pool!



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Tobacco Control

- Smokers need to be totally away from the child with asthma; smoke outside, and never in the car (even if the child isn't there); changing clothes after smoking is nice, but take what you can get!
- It takes 3 hrs for the smoke from one cigarette to clear from a room.
- E-cigarette risk hasn't yet been defined
- Urge parents to quit as a New Year's resolution or a Christmas gift to the family (and themselves) – family support is crucial for success
- Quit lines 1-800-QUITNOW
- Pts ≥ 13 yrs need to take rescue when they go out!

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Therapeutic Approach to Asthma

Education (disease, treatment) is the key

Be sure they understand!

Health Literacy Universal Precautions toolkit

Goals:

- Patient / family understanding
- Normal daily function
- Minimal symptoms, even with trigger exposure
- Minimal intrusion on pt / family function
- Minimal costs
- Minimal medication side - effects

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Therapeutic Approach to Asthma

Needed actions:

- Correct diagnosis and assessment
 - Severity & Triggers
- Effective education – patient / family
- Assemble the needed asthma team
- Appropriate chronic therapy, adjust as needed
- Reduce / eliminate trigger exposures / co-morbidities
- Appropriate response to acute symptoms (for all home caregivers!)
- Appropriate follow-up (don't ignore no-shows)

See 3 “yardstick” articles Annals Allergy Asthma Immunol

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Gaining Asthma Control

- Make the correct diagnosis – not over- or under-diagnosis
- Assess severity (EPR 3&4, GINA annual guides)
- Assess triggers
- Educate
- Prescribe appropriate medications / environmental control; utilize asthma action plans (AAP)
- Enlist schools and other needed community resources for services
- Follow-up, assess control and adherence (including correct device usage)

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Asthma Therapy

Relief / rescue:

- Bronchodilation – short-acting beta agonists (SABA) with new broader recommendations

Control medications:

- Anti-inflammatory, generally inhaled cortico-steroids (ICS)
- Combinations – ICS + long-acting beta agonist (LABA) – now also suggested for rescue
- Anti-cholinergics
- Anti-leukotrienes

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Rescue Therapy

- Treat for symptoms
 - Most commonly, albuterol 2 puffs as needed
 - Problem is how often are they needed
- New recommendations (GINA 2019, EPR4) suggest use of combination drugs (budesonide/formoterol) for rescue at the start of a flare
- How quickly it is accepted scientifically and by payers in US is unknown
- Challenges classical asthma categorization

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Controller Therapy -- Evolving

- Used for persistent asthma – daily medication
- Symptoms need to be severe +/- risky to warrant use of 7 – 14 treatments a week for months
- Remember that children should be able to play hard every day; many parents restrict them
- Most important feature is to convince the family / pt that they must take medicine even if they “aren’t sick”. Generally, controllers give no sensation. This expectation should be repeated frequently!
- Almost every study shows ~3 cannisters / yr used
- Strength of treatment – medication, dose, frequency

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Biologics

- Considered only for severe uncontrolled asthma
- Monoclonal antibodies target molecules / mediators in the pathologic chain of trigger -> symptom
- All currently need to be injected
- Mediator molecules may affect more than airways
- Effectiveness depends on accurate categorization of the patient, dosing, trigger exposure
- Duration of need is currently unknown
- Coverage by payers may be problematic

McGregor MC et al Am Jour Resp Crit Care Med 2019; 199(4):433-445.

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Devices in Asthma Therapy

Nebulizers:

- Used at home, often in Emergency Departments

Metered – dose inhalers (MDI):

- Controllers, rescue; generally used with spacers

Dry-powder inhalers (DPI):

- ICS, combinations, rescue

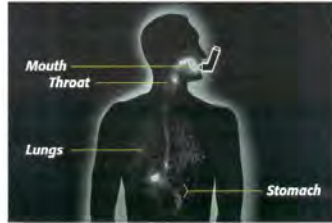
Age and understanding are crucial!

- Pros, cons and cautions for each
- Self-carry permissions in schools

Technique MUST be taught & retaught!

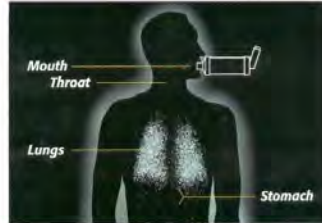
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Why use a Spacer with an Inhaler?



Inhaler alone

When an inhaler is used alone, medicine ends up in the mouth, throat, stomach and lungs.



Inhaler used with spacer device

When an inhaler is used with a spacer device, more medicine is delivered to the lungs.

*Comparative respiratory deposition of ^{99m}Tc labeled particles of albuterol using a metered dose inhaler, a metered dose inhaler with AeroChamber® spacer and OptiChamber® spacer in healthy human volunteers using gamma-scintigraphy.† R. Beher, PhD, Scintipex, Inc., Indianapolis, IN and D. Doherty, MD, Dept. of Pulmonology, University of Kentucky Medical Center, Lexington, KY, 1997.

Images kindly provided by Respiromics HealthScan Inc.

Allies Against Asthma, Center for Pediatric Research, 855 W. Brambleton Ave., Norfolk, VA 23510, 757-668-6435

Effective use is age-, cooperation- and teaching-dependent!

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Asthma Therapy Treatments 2021

Use for EVERY patient to show devices and dose-counters! Distinguish rescue from controller devices!

Available from www.allergyasthmanetwork.com

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Impact of Managed Care Formularies

- Every managed care plan has their own formulary for all of their drugs (including feds for Native Americans); these are based on contracts (\$\$)
- They can change quickly – age, medication, refills
- They generally follow FDA labeling, regardless of patient compliance (eg, DPI ages as low as 4)
- Changes lead to surprises for patients which often come at the pharmacy with high costs if not covered – always a risk for medication discontinuation
- Try to establish a relationship with the pharmacy manager for each plan you deal with

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Asthma Action Plans (AAP)

- Instructions for managing asthma in all settings
 - Daily medications
 - Emergency medications, admin related to speed of deterioration of symptoms
 - “Take 2 puffs” vs “call EMS”, and everything in between
- Prescriber contact information, 24 hrs/d
- Everyone caring for the patient needs this
 - Many haven’t been to clinic & don’t know inhalers
- Many templates, most colored like stop lights
- MUST be understandable to everyone
- Essential for school settings

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Asthma Action Plans SAMPRO



The image shows a form titled "Asthma Action Plan for Home & School" with the SAMPRO logo. The form is divided into four color-coded zones: Green (top), Yellow (middle), Red (bottom), and a final section for the Asthma Action Plan. The Green Zone includes instructions for daily medication and a section for "Controller Medication Given in School" with fields for "Rescue Medication" and "Controller Medication". The Yellow Zone includes instructions for when symptoms worsen and a section for "Rescue Medication" and "Controller Medication". The Red Zone includes instructions for when symptoms are severe and a section for "Rescue Medication". The final section includes a signature line for the Asthma Provider and a date field.

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Adherence With Therapy

The BEST medication can't help if it isn't given!

- Rescue medications given as needed (rarely pre-exercise); usually with some sensation / relief
- Controllers given every day (BID or QD) regardless of symptoms; there's often no feeling by patient
- Almost all devices have dose-counters – must teach pts / families to USE THEM!
- Must always assess adherence before changing medications – follow documented refills, not history
- Must be concerned about too many rescue and too few controller refills
- EPR-4 suggests FeNO is not helpful here

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Markers of Effective Asthma Control

What should we and our patients / families expect?

- Rare use of rescue medications
- Full, normal activity – no lung limitations
- No hospitalizations
- ≤ 2 courses of prednisone per year
- ≤ 2 albuterol treatments per week (unless URI)
- ≤ 2 nights per month with respiratory symptoms
- Successful amelioration of trigger exposures
- Brief viral illnesses (≤ 5 d vs > 2 weeks)
- Control of any co-morbidities
- Normal spirometry, no bronchodilator response

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Pulmonary Function Testing (PFTs)

Spirometry

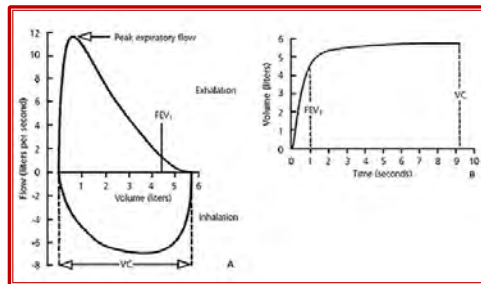
- Goal: objectively measure air flow rates and volumes by breathing into a device
- Valuable to assess all types of lung disease
- Age, understanding, cooperation
- Air flow rate is a marker of airway diameter; exhaled volumes show lung “size”
- Standards based on sex, race, height
- Exhalation maneuver is crucial for accuracy – total effort, repeatedly
- Air leaving the lungs comes first from the large airways, then medium, then small.

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Pulmonary Function Testing (PFTs)

Spirometry – flows and volumes

- FEV_1 = Forced Expiratory Volume in 1 second
- FVC = Forced Vital Capacity – all the air you can blow out from maximal inhalation
- PEFR = Peak Expiratory Flow Rate
- FEV_1 / FVC = how much of your air can you exhale in 1 sec?



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Pulmonary Function Testing (PFTs)

Responses to bronchodilators and exercise

- Measuring airway opening or closing
- Perform baseline spirometry, then inhale standard albuterol and repeat spirometry
- A + bronchodilator response is $\geq 12\%$
- Measures degree of airway constriction
- Hand-held portable spirometer, usually PEFR, although FEV_1 is preferable – check “on site” values
- VERY important assessment for exercise intolerance
- It’s also possible to do a more formal exercise tolerance test in the PFT lab to look for a decrease in FEV_1 with measured exercise or as a response to specific or general trigger inhalation

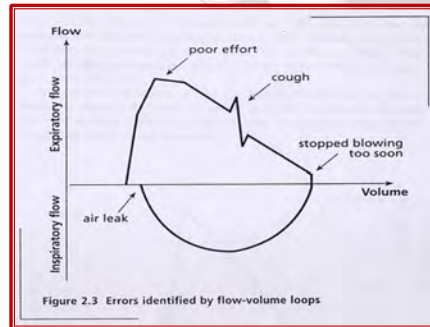
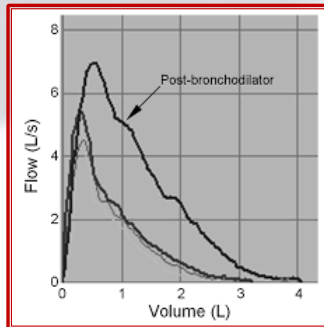


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Pulmonary Function Testing (PFTs)

Flow-volume loops and percent predicted values

- Report data depends on the device used
- Percent predicted values compared to standards



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Asthma and Exercise

What should we and our patients / families expect?

- Rare use of rescue medications for exercise
- Full, normal activity – no lung limitations/symptoms
- Activity does not directly equal sports participation
- If exercise triggers bronchospasm, it is a VERY uncomfortable situation – child doesn't know others can play without that feeling
- Key is to encourage participation for fun
- Many star athletes have asthma

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Dealing With Asthma Flares

What should we and our patients / families expect?

- Rare use of rescue medications
- What are the key symptoms in this patient?
- All caregivers **MUST** know how to respond (need AAPs for all care settings)
- Key determination: What triggered the flare?
- Give albuterol, watch closely for improvement
- GINA guidelines say to use budesonide/formoterol
- Repeat treatment when symptoms reappear
- Call MD or EMS if symptoms worsen

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Home Visitation

- Multiple potential issues that families may not describe, or even recognize
- Understanding the family's condition provides great insight for caregivers – compliance, triggers, chaos
- Families often wary of visitors
- Multiple home visitation programs exist (see <https://mchb.hrsa.gov/node/50>)
- Use of Community Health Workers (CHW) can be very helpful (see [www:FamiliesUSA.org](http://www.FamiliesUSA.org))
- Minimum can be a Skype call with the family showing their home, medication area, *etc.*

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Barriers to Effective Asthma Control

- Incorrect diagnosis of disease and triggers
- Poor education / understanding of disease
- Poor understanding of use of medications
- Access to guide-lines – driven care – by providers, payers, pharmacies
- Inner-city life, poverty, fragmentation of care (not hopeless, but families do need coaching/assistance)
- Limited health literacy / understanding
 - Must know that asthma can be modified by their action
 - Spoken language does NOT mean literacy / understanding
- Lack of follow-up – multiple situations

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Asthma Not Under Control **Recognition**

- Frequent symptoms and rescue medication use (remember albuterol inhalers have 200 puffs)
- Poor exercise tolerance (should play every day)
- Hospitalizations for asthma
- Multiple courses of prednisone per year
- Medication side effects
- Prolonged viral illnesses
- Abnormal spirometry with persisting bronchodilator response
- Increased regular follow – up needed

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Hard to Control Asthma

- What makes asthma hard to control?
 - Non-adherence to treatment plan
 - Persistence of triggers, others not yet identified
 - Confusion over treatment plan (multiple providers)
 - Inability of patient to perceive dyspnea
 - Incorrect diagnosis
 - Insufficient medications prescribed or not picked up
 - Poor medication technique
- Each patient has a different cause
- Always assess accurately medication use prior to changing medications (dose or medication)

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Severe Asthma

- Asthma w/ frequent flares, life – threatening
- Poor symptom control, quality of life
- Patient should be followed by asthma specialist
- Patient / family is adherent to treatment plan, but still has frequent and severe symptoms
- Must go beyond “normal” asthma treatment and seek unrecognized / persisting triggers
- What does the patient / family recognize and worry about?
- Remember that asthma deaths come from all severity classifications

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GINA Guideline Changes

2019

- Use ICS/LABA for rescue treatment

Redded HK et al. Eur Respir J 2019;53:1901046

2020

- Includes Covid-19 information/recommendations

<https://GINAsthma.org>

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EPR4 Guideline Changes

EPR3 2007 (guidelines started in 1992 Q 5 yrs)

“EPR4” 2020

- 6 questions to be addressed – 4 revisions and 2 new topics; implementation guidelines included (new)
- Data gathering only up to Nov, 2018 – biologics not included
- Assessments of Indoor allergen mitigation; Intermittent ICS use; Immunotherapy; FeNO; LAMA use; Bronchial thermoplasty

Cloutier M et al JACI 2020; 145 (6):1207-1270

Several other relevant articles/editorials nearby

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Learning Objectives

Members of the audience will be able to:

- Outline the pathobiology and clinical manifestations of asthma and the role of triggers;
- Describe current evidence-based approaches to asthma management and trigger reduction, including adjustments of therapy;
- Identify effective communication patterns for teaching patients, parents, caregivers;
- Identify patients with severe asthma and outline their special needs for therapy.

DID WE ACHIEVE THEM?

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Disclaimer re: NAECB Exam

- This talk is intended to help members of the audience improve their asthma care. It should also help one prepare for the asthma educator certification exam; however, it is focused on excellent asthma care. It is NOT “teaching to the exam”.
- Those planning to take the exam should utilize other resources focused specifically on the NAECB exam such as the self-evaluation test.
- There are multiple changes in asthma care being discussed right now. It is unclear how and when those changes will appear on the exam.

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General References

- AHRQ: Health Literacy Universal Precautions Toolkit: https://www.ahrq.gov/sites/default/files/publications/files/healthlitoolkit2_3.pdf
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- Brondolo E *et al.* Stress and Health Disparities. 2018; www.apa.org/pi/health-disparities/resources/stress-report.pdf
- CDC Asthma Surveillance Data: <https://www.cdc.gov/asthma/asthmadata.htm>
- CDC national asthma program “Breathing Easier”: https://www.cdc.gov/asthma/pdfs/breathing_easier_brochure.pdf
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Relevant Websites

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- CDC asthma data: www.cdc.gov/asthma/most_recent_data.htm
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- GINA '19 (Global Initiative for Asthma) www.ginasthma.org
- Health literacy toolkit (2nd edit): <https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>
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For more information on the Allergy & Asthma Network and the Community Asthma & COPD Experts program, visit:
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