

What Do the EPR3 Expert Asthma Guidelines Tell Us?

How Can We Implement Best Practices and Reduce Asthma Burden in Missouri?

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Disclosure

- Dr. Francisco has no financial interest in any commercial entity discussed in this presentation
- Dr. Francisco will not discuss experimental or off-label use of medications or devices

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Objective One

- Identify priorities for implementing asthma best practices for: a) assessing and monitoring, b) education for a partnership in care, c) managing contributing factors, and d) pharmacotherapy for asthma control

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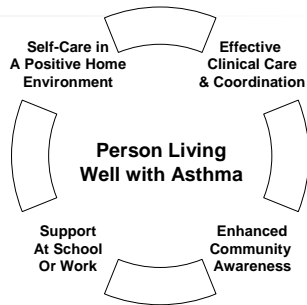
Objective Two

- Review progress in asthma workforce development and evaluation of asthma interventions in Missouri

Who will lead local efforts to implement asthma best practices across settings of care? Which concepts, tools, resources, system changes and policies are critical?

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Dimensions of Improved Asthma Outcomes



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Eight Critical Clinical Strategies

(Adapted from "Partners Putting Guidelines Into Action", 2008)

- 1) EPR3-compliant care in the medical home
- 2) Use better measures of airflow- FEV1, ratio
- 3) Deliver effective asthma education (record)
- 4) Increase inhaled corticosteroid (ICS) use
- 5) Assess & improve inhalation technique
- 6) Reduce triggers & manage co-morbidities
- 7) Share written asthma action plans
- 8) Collaborate across settings, actionable data

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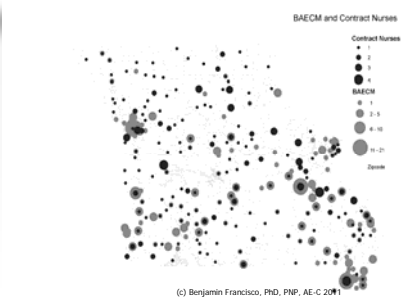
Public Health Approaches

"What Clinicians Don't Do Very Well"

- 1) Assess disease burden, needs of populations
- 2) Build partnerships, leadership & capacity
- 3) Increase workforce size and competencies
- 4) Design, deploy and evaluate interventions
- 5) Disseminate effective strategies
- 6) Advocate necessary systems change
- 7) Adopt policy to sustain improvements

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>1300 ARC-trained, Mid-level (6 hrs) Asthma Health Professionals



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Missouri Asthma Educator Network
www.asthmaready.org

- PACE and BAECM graduates (ID/PW)
- Access to continuing education credit
- E-newsletter – MAEN Street Press
- Access resources, order supplies online
- Credentialing, standardized curriculum
- Log asthma self-management classes to request reimbursement

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School Asthma Best Practice Goals

- School nurses can implement best practices from the Expert Panel Report 3, Guidelines for Managing Asthma
- Assess impairment, ICS adherence, and airflow – forced expiratory vol. in 1 sec. (FEV1) and peak flow (PEF)
- Assess and coach students for optimal inhalation technique, use objective measures (AF resistance, IFR, IFT)

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School Asthma Services Goals (2)

- Provide competent care and support to students/families w/asthma
- Develop asthma leaders in the school
- Keep staff informed and prepared
- Enforce policies that protect students
- Stay current w/asthma care advances
- "Asthma literacy" for all students with persistent asthma

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What Do the EPR3 Expert Asthma Guidelines Tell Us?

- Identify priorities for implementing asthma best practices for: a) assessing and monitoring, b) education for a partnership in care, c) managing contributing factors, and d) pharmacotherapy for asthma control

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<http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

**Unless otherwise noted
all citations and page numbers
reflect references to
Expert Panel Report 3**

Google "asthma guidelines"
Full text - 416 pages
Executive summary 70 pages

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NHLBI Guidelines for the Diagnosis and Treatment of Asthma

Department of Health and Human Services • National Institutes of Health
National Heart Lung and Blood Institute
People Science Health

Information for... Health Professionals

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Guidelines for the Diagnosis and Management of Asthma (EPR-3)

Health topics on this page

- The Guidelines
- Status
- Writing Review Groups
- Methodology
- Supporting Materials and Tools

See also:

- Join the Health Information Network
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Information for Health Professionals

- Information for Patients & the Public
- Information for Health Professionals
- Clinical Practice Guidelines
- About Guidelines
- Current Guidelines and Reports
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- Guideline Archive
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Information for Researchers

- Funding, Training, & Policies
- Clinical Trials
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- News & Events Center
- About NHLBI

The Guidelines

- Full Report - Prepublication copy
- Summary Report

Press Release

Status

- Publication Date: July 2007

Version History

- EPR-2 Update on Selected Topic II, 2002
- EPR-2 published in 1997
- EPR-1 published in 1991

Writing and Review Groups

- Expert Panel Members
- Conflicts of Interest

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Asthma Guidelines - EPR-3

Expert Panel Report (EPR)

- National Heart, Lung, and Blood Institute (NHLBI)
- National Asthma Education and Prevention Program (NAEPP)
- EPRs critical review >50,000 citations
 - EPR1 1991, EPR2 1997, EPR2 Update 2002, EPR3 2007

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EPR3 - rigorous, systematic review of the scientific literature

- 10 committees, dozens of national experts
- 3 years screening 15,444 abstracts
- Reviewed full-text of 2,122 articles
- Found 1,654 contributed new evidence
- Constructed 20 evidence tables to analyze data from 316 articles on critical topics.
- EPR3 recommendations are weighted by evidence level (Categories A, B, C, & D).

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Key Concerns

Look for Impairment!

Asthma & What?
Focus on control
Anticipate variability – plan ahead
Schedule self-care education
Rx self-management education

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A four component approach is effective for controlling asthma

- 1) Measures of Assessment & Monitoring
- 2) Education for a Partnership in Care
- 3) Control of Environmental Factors and Comorbid Conditions that Affect Asthma
- 4) Medications

(p. 35)

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Measures of Assessment & Monitoring

(p. 36-92)



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Clinical Nomenclature

- Significant changes in clinical language
- Greater specificity (3 age groups)
- Logical approach spelled out
- Assess, intervene, reassess strategies for achieving control & managing asthma exacerbations

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Assessment Domains

- **Severity:** new patient
- **Control:** recheck (on therapy)
- **Responsiveness:** exacerbations

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Assessment Components

- **Impairment**
- **Risk**
- Exacerbations – assessment elements for responsiveness to treatment specified for home (p. 382) & clinic/ED (p. 380)

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Severity Level → Rx Step

- **Intermittent**
- **Mild persistent**
- **Moderate persistent**
- **Severe persistent**

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Exacerbation – Treatment Response

- Good Response
- Incomplete response
- Poor response (life-threatening)

FEV1 is the vital sign of asthma!!!

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Overview-Asthma Management

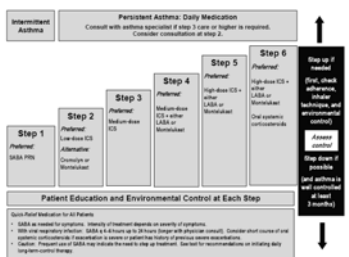
- Initiate therapy based on Severity
- Modify therapy based on Control
- Manage exacerbations based on initial assessment and ongoing evaluation of Responsiveness to treatments

Use EPR3 tables to guide care decisions.

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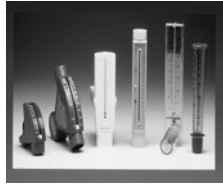
Stepwise approach (Rx use)

FIGURE 4-18. STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 0-4 YEARS OF AGE



Home Peak Flow Meters

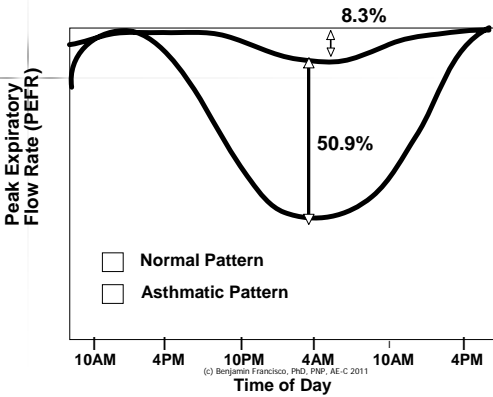
- Home monitoring
- Poor perceivers
- Hx of severe attacks
- \$25 (Internet price)
- Diurnal variability
- When Sx are present or Rx changing



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Diurnal Variation In PEFr

AAE©



Symptom/Peak Flow Diaries

- Use during transitional times
 - New dx, exacerbations, Rx change
- Might be accurate for 2-4 weeks
- Recording? how, who & when (self-report or caregiver report?)

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Key Findings NHIS 2003 (for children 0-17 years)

- 40% - ever had an asthma plan
- 57% - taught to monitor peak flow
- 16% - taken a class on asthma
- 72% - taught to recognize attacks
- 78% - taught to respond to attacks
- 53% - advised to change environment

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Coordinated Strategy

- Clinicians deliver 12 or more key messages over 4 office visits
- School nurses -asthma literacy training during routine health room visits
- Formal asthma self-management courses by trained asthma educators (school, clinic or community) for at risk children and their families

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Clinic - Delivers Key Messages

Key Asthma Messages for the Patient and Family:
Teach information in simple language. Teach or review and demonstrate asthma skills.

YHHEE!

1. **What is Asthma?** Asthma is a chronic lung disease. The airways are very sensitive. In an asthma attack, you have trouble breathing because a) the airway lining swells and produces too much mucus (inflammation) and b) the muscles around the airways squeeze them partly shut (bronchospasm).
2. **How Medicines Work.** Two types of medicines are needed in the treatment of asthma: long-term control and quick-relief medications. Long-term control medications prevent symptoms, often by reducing inflammation. Anti-inflammatories don't give an immediate feeling of relief, but are crucial to reducing inflammation and preventing its return. Quick-relief medicines or short-acting bronchodilators relax the muscles that have tightened around the airways. Stress the importance of long-term control medicines and not to expect quick relief from them.
3. **How to Take Medicines.** Inhaler Use - (patient to demonstrate, use In-Check Dial if appropriate). Spacer holding chamber use, nebulizer treatment: Use the step by step instructions at home.

Key Message	Visit #	Date	Visit #	Date	Visit #	Date
O.1. Message #1			O.6. Message #6		O.11. Message #11	
O.2. Message #2			O.7. Message #7		O.12. Message #12	
O.3. Message #3			O.8. Message #8		O.13. Message #13	
O.4. Message #4			O.9. Message #9		O.14. Message #14	
O.5. Asthma Plan Provided			O.10. Plan Reviewed/Modified		O.15. Plan Reviewed/Modified	

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School – Student Asthma Literacy Teaming Up for Asthma Control©

IMPACT Asthma Kids©, evidence-based



TUAC Multimedia Demo

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Provide Asthma Work Sheets for Home Use to Engage Parents Around Same 4 Literacy Themes

How to Use Your Metered-Dose Inhaler (MDI)

Take your time and don't rush. Each step is important to get the most from your medicine.

1. Many inhalers need to be shaken to mix the contents, so be sure to check the package instructions for your inhaler.
2. Take the cap off of the lungs, filling the lungs with new air and medicine. Teens and adults may be able to breathe in longer than 3 to 5 seconds.
9. Hold your breath for 10 seconds or as long as you can comfortably do so.
10. After 10 seconds, breathe out.

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Formal Asthma Self-Management Education

- Needed by our at risk students
- Proven effective, reduces absences
- Improves adherence & control
- Reduces asthma exacerbations
- New CPT codes for individual & groups of 2-4 or 5 or more
- New opportunities for reimbursement

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New CPT Codes - 2006

- "Education and training for self-management"
- Codes exist now, reimbursement ???
- "Prescribed by a physician and provided by a qualified non-physician health care professional"
- Asthma & diabetes cited as sample chronic illnesses
 - 98960, single patient, 30 minute increments
 - 98961 2-4 patients, 30 minute increments
 - 98962, 5-8 patients, 30 minute increments
- Must use standardized curriculum
- Educator certification not required

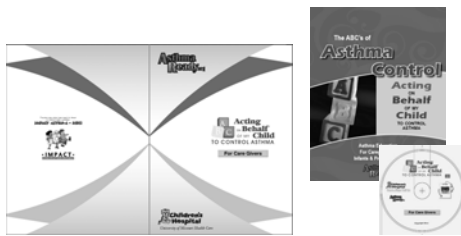
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Standardized Curriculum (MU)

- 40 minutes of multimedia (DVD) using IMPACT Asthma Kids© and integrated video (parent of infant or preschooler, parent of school age child, teen)
- 20 minutes of "semi-structured" interview time using "Asthma Inhaler Chart", "Asthma Home Environment Checklist", Asthma Symptom diary use

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Acting on Behalf of My Child for Asthma Control (ABC)



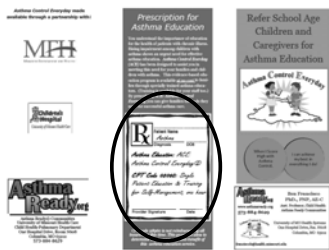
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Asthma Control Everyday (ACE)



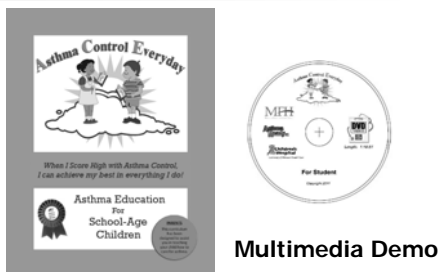
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Prescription for Education



Training for Asthma Ready® Clinics
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Asthma Control Everyday®



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Environmental Interventions

- Home trigger “search” activities in student asthma literacy training
- Clinician’s “key messages”, eg. VOC
- Trigger education – Preventive Medicine Counseling for Asthma Risk Reduction (99402)
- NEEF detailed history
- Trigger education in 98960
- In-home trigger reduction & education

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Asthma & What?

- Co-morbidities are commonplace
 - Allergic rhinitis
 - GERD
 - Sinusitis
 - Overweight: nutrient intake, conditioning

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Medications

(p. 213-276)



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Inhaled corticosteroids (ICS) are the foundation of asthma therapy.

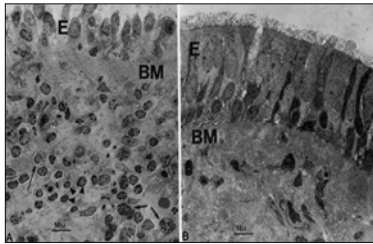
- Intermittent Asthma requires only SABA
- **Preferred treatment** for all levels of persistent asthma includes ICS
- Both SABA & ICS are inhaled medications!!!
- Comparative dose tables are available to aid in the determination of low, medium, or high dose ICS therapy for the various age groups. (The cut-off points have changed.)

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Effects of Inhaled Corticosteroids on Inflammation

Slide from AAE ©

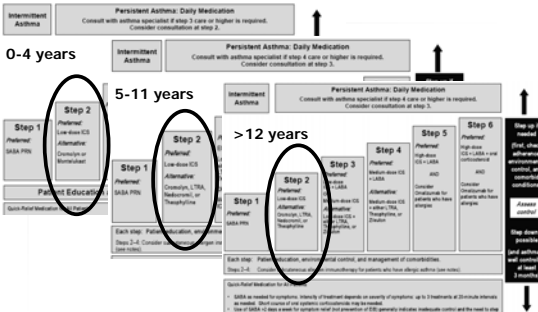
E = Epithelium
BM = Basement Membrane



Pre- and post-3-month treatment with budesonide (BUD) 600 mcg b.i.d. n =14

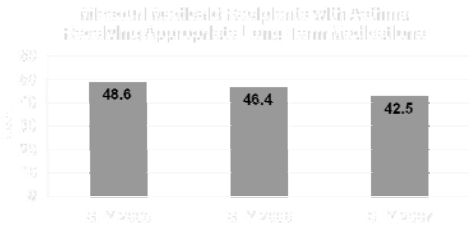
Laitinen et al. *J Allergy Clin Immunol.* 1992;90:52-62.

For all age groups ICS preferred



(c) B.

Declining Dispensing Pattern for Long-term Asthma Control Medications



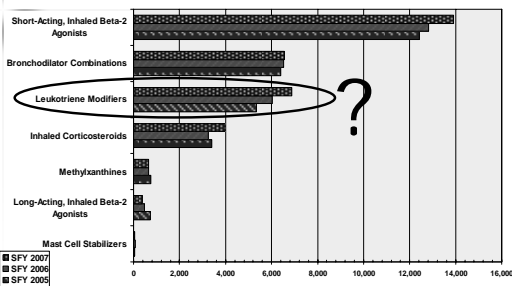
64

Missouri Medicaid FFS

Only 17% of children with the diagnosis of asthma received a prescription for an ICS in 2008. The refill rate for these children was only 38%! (APS, 5/2009)

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What are the different asthma medications that Medicaid recipients are receiving?



66

Comparable ICS doses (p. 314, 349)

FIGURE 4-4B. ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN

Drug	Low Daily Dose		Medium Daily Dose		High Daily Dose	
	Child 9-4	Child 5-11	Child 9-4	Child 5-11	Child 9-4	Child 5-11
Beclometasone HFA 40 or 80 mcg/puff	NA	85-160 mcg	NA	>160-320 mcg	NA	>320 mcg
Budesonide DPI 50, 100, or 200 mcg/inhalation	NA	180-400 mcg	NA	>400-800 mcg	NA	>800 mcg
Budesonide inhaler inhalation suspension for nebulization (not listed)	0.25-0.5 mg	0.5 mg	>0.5-1.0 mg	1.0 mg	>1.0 mg	2.0 mg
Flunisolide 250 mcg/puff	NA	500-750 mcg	NA	1,000-1,250 mcg	NA	>1,250 mcg
Flunisolide HFA 50 mcg/puff	NA	160 mcg	NA	320 mcg	NA	640 mcg
Fluticasone FFA/MDI: 44, 110, 220 mcg/puff DPI: 10, 100, or 200 mcg/inhalation	170 mcg	85-170 mcg	>170-352 mcg	>352 mcg	>352 mcg	>352 mcg

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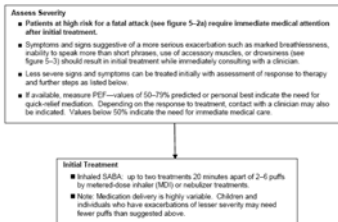
Managing Asthma Exacerbations

- More aggressive use of SABA at home or school, 2-6 puffs, may repeat in 20 minutes if needed, use VHC (p. 382)
- More aggressive use of SABA and ipratropium in office, ED, & hospital, 4-8 puffs of albuterol and ipratropium by VHC, repeat every 20 minutes x3 (p. 386)

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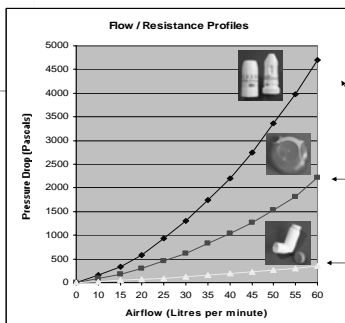
Prepare Families for Managing Life-threatening Attacks at Home

FIGURE 5-4. MANAGEMENT OF ASTHMA EXACERBATIONS: HOME TREATMENT



Inhalation technique is critical and requires correct use of assistive devices and objective assessment of inspiratory flow rate & time for MDIs and DPIs.

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Resistance of 3 Common Inhalers at different flow rates
(placebo versions)

Dry powder device

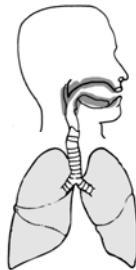
pMDI aerosol "puffer"

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Ref: J Bell 2004, data on file: jon@carday/freeserve.co.uk

Inspiratory Flow Influences Drug Deposition

Inspiratory Flow	Drug Deposition	
Too Slow	Mouth	<input type="checkbox"/>
Too Fast	Throat	<input type="checkbox"/>
Correct Speed	Lungs	<input type="checkbox"/>



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EPR3 Specifies IFR and IFT

- IFR= inspiratory flow rate
- IFT= inspiratory flow time

- MDI – 30 LPM or 3-5 seconds (p. 250)
- DPI – 60 LPM or 2-3 seconds (p. 249)

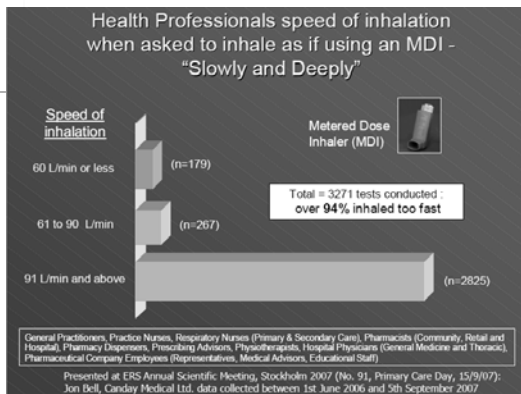
How do you measure IFR & IFT?

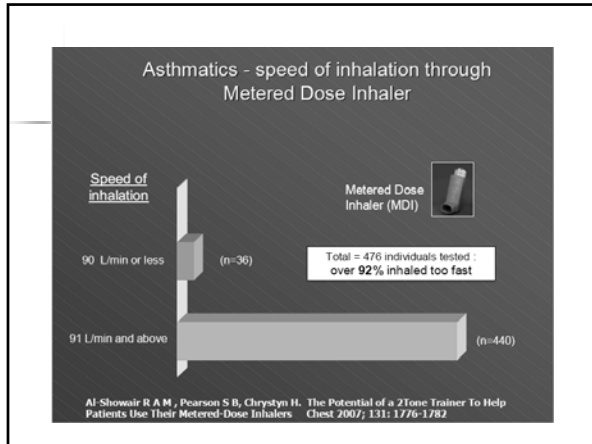
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Common MDI Inhalation Errors

- Failure to exhale fully prior to dose resulting in inadequate volume of inhaled air with lower net dose
- Inhalation too rapid, leading to impaction of drug against pharynx and bifurcations of the airway

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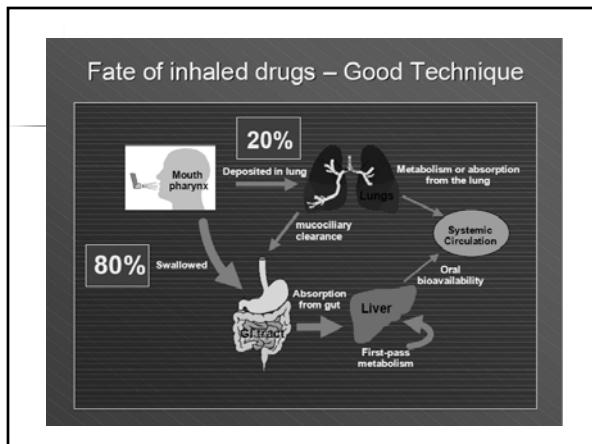


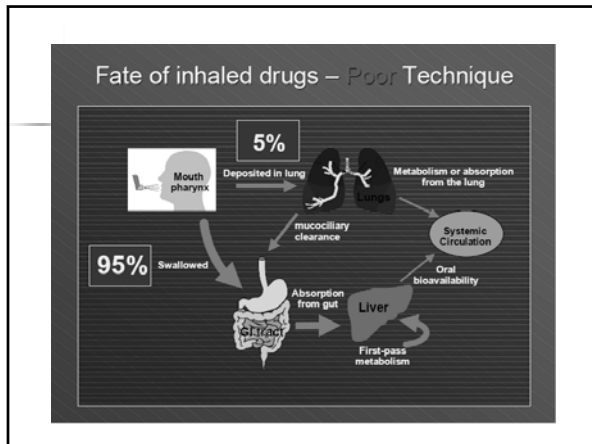



In-Check Dial™ Device

- Set resistance for inhaler type
- Use disposable one-way filter
- Train for optimal IFR and IFT
- MDI IFT=2xFEV1

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1. Many people are living with impairment due to asthma. They are often unaware of underlying airflow obstruction and accepting of significant limitations in day-to-day life. They need to know that asthma can be controlled.

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2. EPR3 is the result of a rigorous, systematic review of the scientific literature. Ten committees composed of dozens of national experts spent 3 years screening 15,444 abstracts. They reviewed the full-text of 2,122 articles and judged 1,654 to contribute evidence relating to asthma best practices. Twenty evidence tables were constructed to integrate findings from 316 articles on critical topics. EPR3 recommendations are weighted by evidence level (Categories A, B, C, & D).

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3. A four component approach is effective for achieving control of asthma.
i) Measures of Asthma Assessment & Monitoring, ii) Education for a Partnership in Asthma Care, iii) Control of Environmental Factors & Comorbid Conditions that Affect Asthma and iv) Medications

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4. Assessment of severity, evaluation of control and stepwise treatment of asthma differ for three age groups – 0-4 years, 5-11 and those 12 and above.

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5. Initiation of therapy requires assessment of asthma severity. Continuation of therapy should be based on assessment of asthma control. Use of medications should be based on evidence of effectiveness among the target age group.

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6. Inhaled corticosteroids (ICS) are foundation of asthma pharmacotherapy. Whereas, the treatment of Intermittent Asthma requires only SABA, preferred treatment for all levels of persistent asthma includes ICS. Comparative dose tables are available to aid in the determination of low, medium, or high dose therapy for the various age groups.


Inhalation technique is critical and requires correct use of assistive devices and objective assessment of inspiratory flow rate & time for MDIs and DPIs.

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7. Spirometric parameters improve assessment of severity, control, exacerbations and response to therapy (FEV1, FEV1/FVC ratio and PEF). Symptom reports are also useful, but under-estimate the degree of airway obstruction in many individuals.

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8. Effective initial management of exacerbations is based on aggressive use of SABA and ipratropium, guided by reassessment & evaluation of response to therapy.

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9. Evaluation of contributing factors (comorbidities & inhalant triggers) is essential for achieving optimal control with the lowest possible doses of medications.



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10. Regular office visits are required to develop a partnership that enhances adherence by reassessment, mutual goal-setting, written plans and education for self-care.

Poorly controlled – 2 weeks
Not well controlled – 2-6 weeks
Well controlled – 1-6 months



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www.asthmaready.org



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Educational Solutions Global Network
(Missouri School Boards Association)



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Asthma Ready Schools®

- Voluntary participation
- Local & state recognition
- Training for staff, 6 hours
- Equipment, supplies and templates
- Ed. Materials – students, parents & staff
- Web-based CEUs & updates



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Asthma Ready Clinics™

- PACE part 1, 2 hours category 1 CME
- PACE part 2, 4 hours, at the clinic
- Becoming an Asthma Educator & Care Manager, 6 CEUs
- Application to be completed
- Public recognition
- Annual updates



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AAAAI - American Academy of Allergy, Asthma & Immunology



<http://www.aaaai.org>

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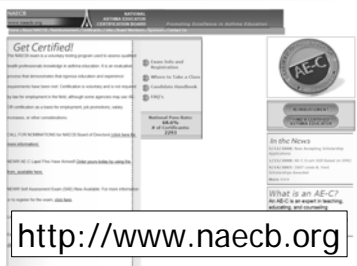
AAE – Association of Asthma Educators



<http://www.asthmaeducators.org>

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NAECB – National Asthma Educator Certification Board



<http://www.naecb.org>

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PACE – Physician Asthma Care Education



<http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

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AANMA- Allergy & Asthma Network, Mothers of Asthmatics



<http://www.aanma.org>

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The End

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