PERSISTENT ASTHMA

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Review PNAA 2004 and GINA 2009

PNAA 2004
Infrequent episodic asthma
Frequent episodic asthma
Persistent asthma

Terminology Severity of asthma
Intermittent
Mild persistent
Moderate persistent
Severe persistent

GINA 2009
Controlled
Partly controlled
Uncontrolled

Levels of asthma control

Characteristic	Controlled	Partly controlled	uncontrolled
Daytime symptoms	Twice or less/week	**More than twice/week**	Three or more features of party controlled asthma present in any week
Limitation of activities	None	**Any**	
Nocturnal symptoms/ awakening	None	**Any**	
Need for *reliever/ rescue treatment*	Twice or less/week	**More than twice/week**	
Lung function (PEF or FEV1)	Normal	**< 80% predicted or personal best (if known)**	

Asthma

- Episodic disease
- Dynamic chronic illness
  - Variability overtime
  - Imperfect overlap between symptoms frequency and lung function
- Adding lung function measurement → change severity classification → change treatment
- **Needs review and regular monitoring**

Lung Function Measurement

Peak expiratory flow (PEF)

- Inexpensive
- Patients can use at home
  - May be helpful for patients with severe disease to monitor their change from baseline every day
  - Not recommended for all patients with mild or moderate disease to use every day at home
- Effort and technique dependent
- Should not be used to make diagnosis of asthma

Lung Function Measurement

Spirometry

- Recommended to do spirometry pre- and post- use of an albuterol MDI to assess reversibility of airflow obstruction
- ≥ 12% reversibility / increase FEV1 of 200cc is significant
- Obstructive pattern: reduced FEV1/FVC ratio
- Restrictive pattern: reduced FVC with a normal FEV1/FVC ratio

Lung Function Measurement

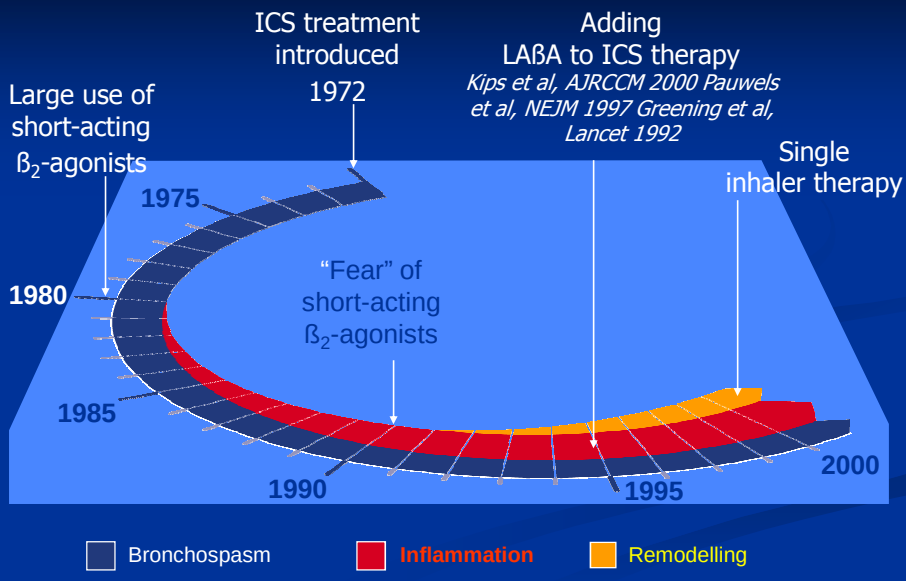
Spirometry

- To identify reversible airway obstruction due to triggers
- To diagnose Exercise-induced asthma (EIA) or Exercise-induced bronchospasm (EIB) by measuring FEV1/FVC before and after exercise, then for 5-10 minute intervals over 20-30 minutes looking for post-exercise bronchoconstriction

Goals in Asthma Control

- Achieve and maintain control of symptoms
- Prevent asthma episodes or attacks
- Minimal use of reliever medication
- No emergency visits to doctors or hospitals
- Maintain normal activity levels, including exercise
- Maintain pulmonary function as close to normal as possible
- Minimal (or no) adverse effects from medicine

Evolving asthma treatment options



Asthma medications:

Reliever

Controller

- to control / prevent symptoms &/ attack
- long term use
- anti-inflammations
- inhaled steroid, ALTR, SRT, LABA, oral steroid
- Inhalation, oral

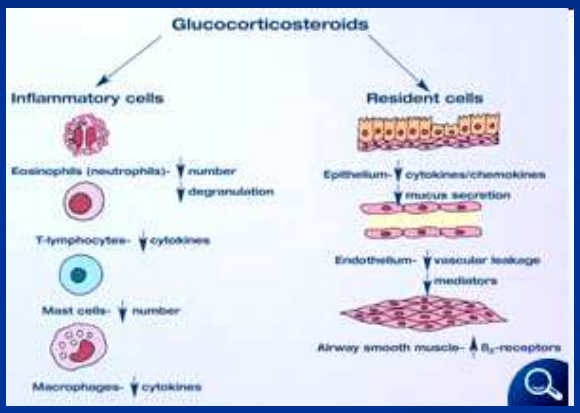
Corticosteroids

- Corticosteroids, inhaled
  - budesonide
  - Fluticasone
- The most effective anti-inflammatory medications
- Improve lung function
- Decrease airway hyper-responsiveness
- Reduce symptoms
- Decrease frequency and severity of exacerbations
- Improve Quality of Life (QoL)

Corticosteroids

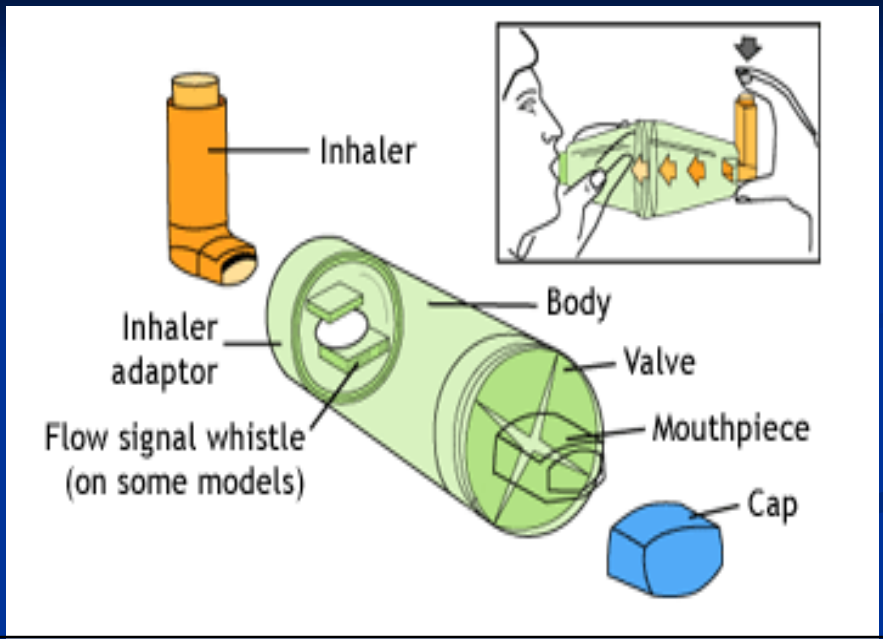
- Inhaled Corticosteroids
  - Anti-inflammatory (but precise MOA not known)
  - Act locally in lungs
    - Some systemic absorption
    - Risks of possible growth retardation outweighed by benefits of controlling asthma
  - **Not intended to be used as rescue medication**
  - Efficacy takes 1-2 weeks
  - Preferred treatment in persistent asthma

Corticosteroids

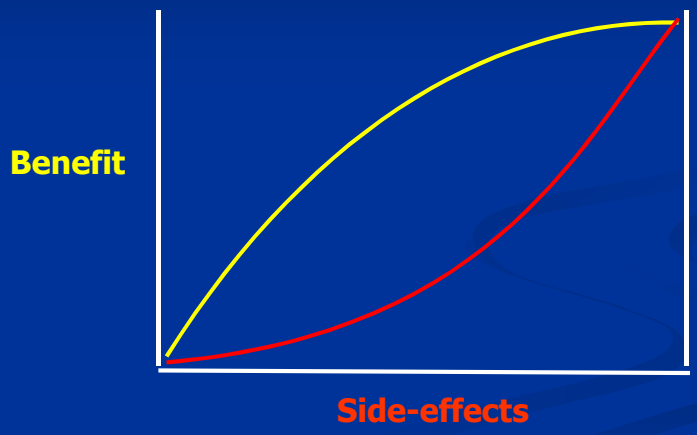


http://www.breathingwell.com/images/immagini/health/asthma_therapy/glucocorticosteroids.jpg

MDI with spacer



Risk-benefit ratio of steroid



Long-Acting Beta2-Agonists (LABA)

- Beta2-receptors are the predominant receptors in bronchial smooth muscle
- Stimulate ATP-cAMP → relaxation of bronchial smooth muscle and inhibition of release of mediators of immediate hypersensitivity
- Inhibits release of mast cell mediators such as histamine, leukotrienes, and prostaglandin-D2

Long-Acting Beta2-Agonists (LABA)

- Salmeterol (Serevent)
- Salmeterol with fluticasone (Advair)
- Should only be used as an **additional treatment** when patients are not adequately controlled with ICS
- Should not be used as rescue medication
- Can be used ≥4 yrs with a DPI
- Deaths associated with inappropriate use as only medication for asthma

Inhaled Steroid + LABA

Adding LABA to BUD:

- Reduces rate of mild exacerbations
- Reduces rate of severe exacerbations
- Improves FEV1

ICS + LABA

Which LABA ?

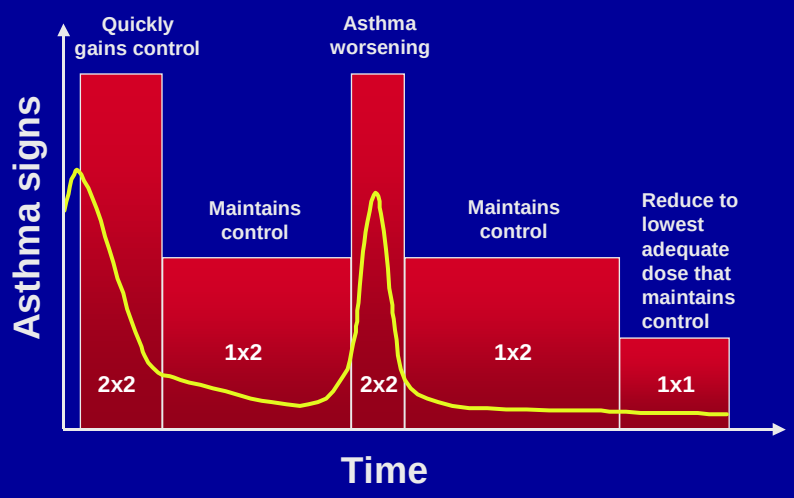
Formoterol:

- Immediate relief (as fast as salbutamol)
- 12 hours effect
- Can be combined with budesonide
  - Formoterol 4.5 ug + Budesonide 100 ug

Salmeterol:

- Salmeterol 50 ug + Fluticasone propionate 100 ug or 250 ug

Formoterol + Budesonide combination
the 'flexible' preventer



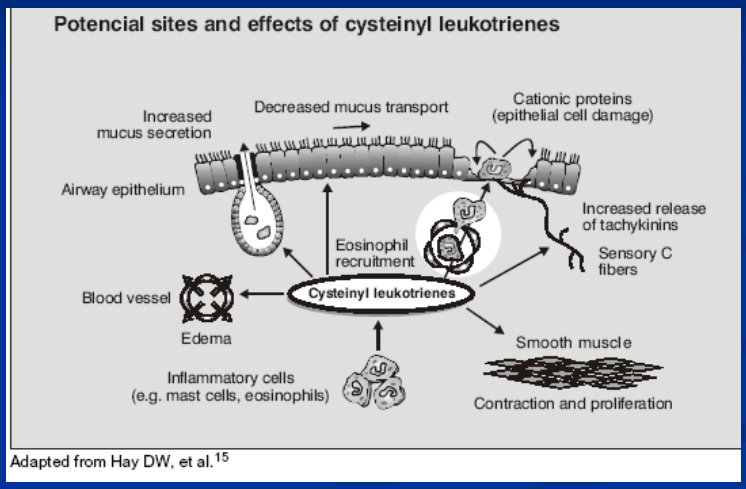
Leukotriene receptor antagonists

- Leukotriene-mediated effects include:
  - Airway edema
  - Smooth muscle contraction
  - Altered cellular activity associated with the inflammatory process
- Receptors in airway smooth muscle cells and macrophages and on other pro-inflammatory cells (including eosinophils and myeloid stem cells) and nasal mucosa

Leukotriene receptor antagonists

- No good long-term studies in pediatrics
- Montelukast as young as 2 yr dose 1 x 4 –5 mg; zarfirlukast age 7 yr dose 2 x 10 mg
- Alternate, but not preferred medication in persistent asthma and as addition to ICS
- Showed a statistically significant, but modest improvement when used as primary medication

Leukotriene



Theophylline

- Narrow therapeutic index, maintain 5-20 mcg/mL
- → **Sustained release Theophylline (SRT) 5- 10 mcg/mL**
- Variability in clearance leads to reach a therapeutic dose
- Mechanism of action
  - Smooth muscle relaxation (bronchodilation)
  - Suppression of the response of the airways to stimuli
  - Increase force of contraction of diaphragmatic muscles
- Interacts with many other drugs

Mast cell stabilizers (cromolyn/nedocromil)

- Inhibits release of mediators from mast cells (degranulation) after specific antigens exposure
- Blocks Ca2+ ions from entering the mast cell
- Safe for pediatrics (including infants)
- Should be started 2-4 weeks before allergy season
- Can be used before exercise (not as good as ICS)
- Alternate th/ for persistent asthma

CONTROLLERS

Corticosteroids
Prednisolone, Betamethasone
Beclomethasone, Budesonide
Fluticasone

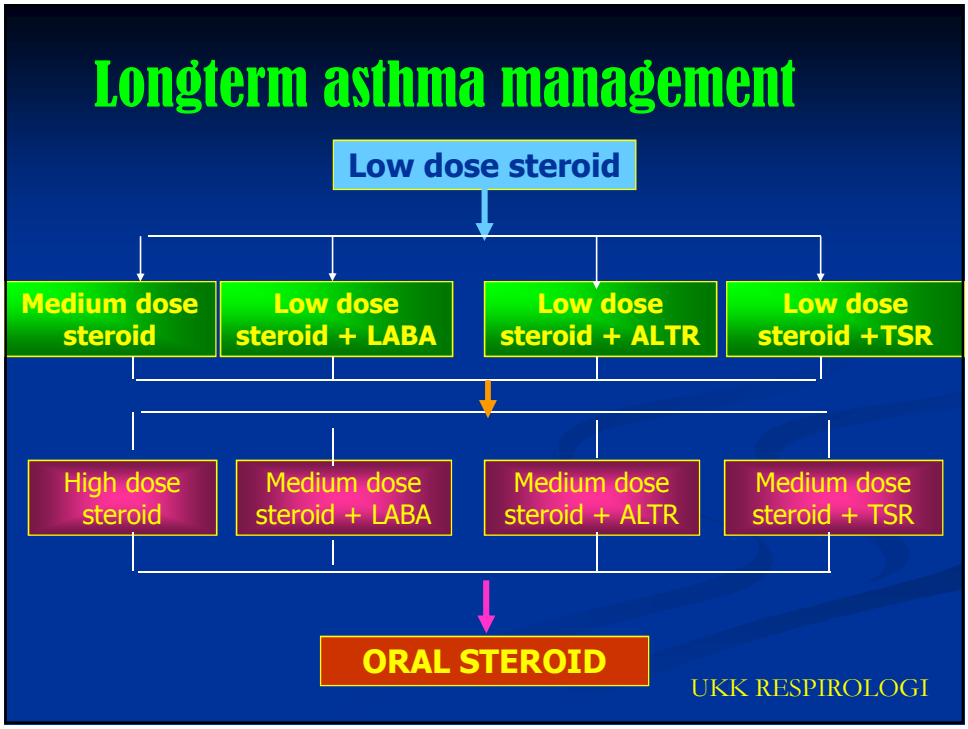
Xanthines
SR Theophylline

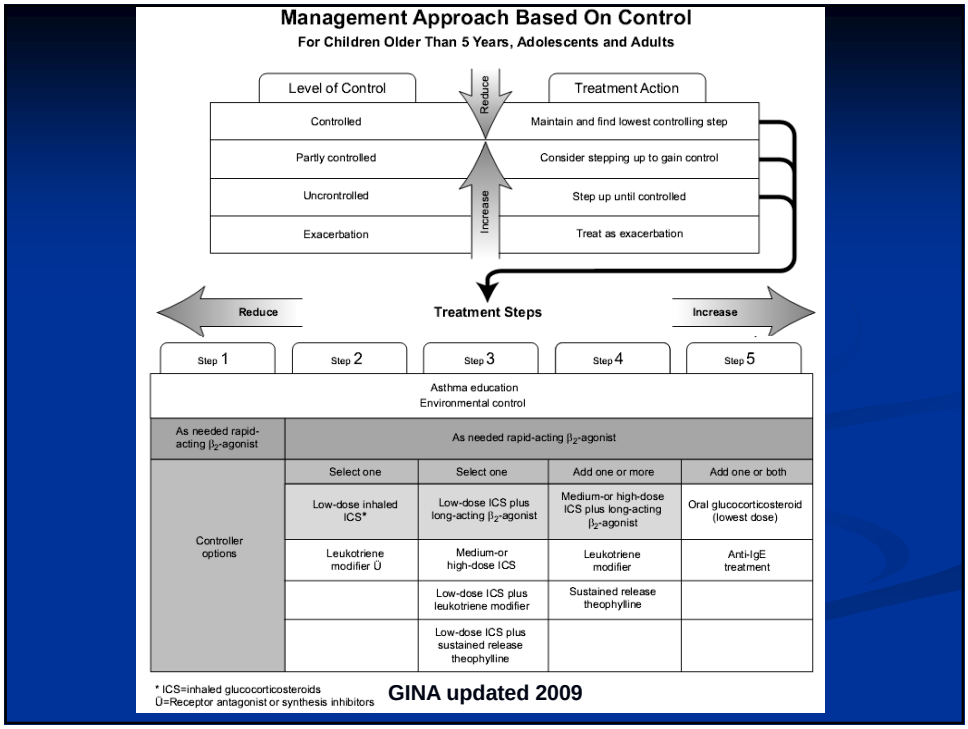
Long acting β2 agonists
Salmeterol
Formoterol

Anti-leukotrienes
Montelukast, Zafirlukast

Combinations
Salmeterol/Fluticasone
Formoterol/Budesonide
Salbutamol/Beclomethasone

Mast Cell Stabilisers
Sodium Cromoglycate

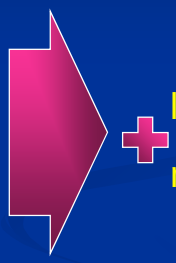

Longterm asthma management
Low dose steroid
Medium dose steroid
Low dose steroid + LABA
Low dose steroid + ALTR
Low dose steroid +TSR
High dose steroid
Medium dose steroid + LABA
Medium dose steroid + ALTR
Medium dose steroid + TSR
ORAL STEROID
UKK RESPIROLOGI


Management Approach Based On Control
For Children Older Than 5 Years, Adolescents and Adults
Level of Control
Treatment Action
Reduce
Controlled
Maintain and find lowest controlling step
Partly controlled
Consider stepping up to gain control
Uncontrolled
Step up until controlled
Increase
Exacerbation
Treat as exacerbation
Reduce
Treatment Steps
Increase
Step 1
Step 2
Step 3
Step 4
Step 5
Asthma education
Environmental control
As needed rapid-acting β2-agonist
As needed rapid-acting β2-agonist
Controller options
Select one
Select one
Add one or more
Add one or both
Low-dose inhaled ICS*
Low-dose ICS plus long-acting β2-agonist
Medium-or high-dose ICS plus long-acting β2-agonist
Oral glucocorticosteroid (lowest dose)
Leukotriene modifier Ü
Medium-or high-dose ICS
Leukotriene modifier
Anti-IgE treatment
Low-dose ICS plus leukotriene modifier
Sustained release theophylline
Low-dose ICS plus sustained release theophylline
* ICS=inhaled glucocorticosteroids
Ü=Receptor antagonist or synthesis inhibitors
GINA updated 2009

Step down

Wheeze free and well for three months:

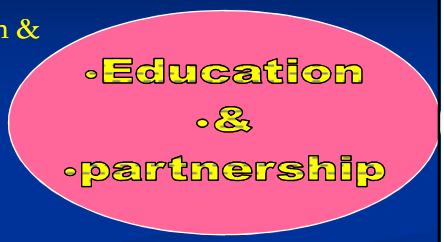
- Oral steroid
  1 mg/kgBW/month, then
- SRT
- Inhaled steroid: 50- 100ug/2-4 weeks



+ lung function monitoring

Interrelated Asthma Management

1. Guided self-management education & communication
   - Written
   - Problem review
   - Coordination & support
2. Asses & monitor asthma (PEFR)
3. Environmental control measures
4. Medication plan (accommodate variability among & within patients)
5. Plan for acute management
6. Regular follow-up care



5 R's EDUCATION

1. Reach agreement of goals
2. Rehearse skills
3. Repeat messages
4. Reinforce
5. Review

(Taggart, 2001)

CURRICULUM VITAE

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Riwayat Pendidikan

- SD Keluarga, Kudus, lulus 1958
- SMP Keluarga, Kudus, lulus 1961
- SMA Sedes Sapientiae, Semarang, lulus1964
- Dokter Umum, FK. UNDIP, lulus 1973
- Dokter Spesialis Anak, FK. UNDIP, lulus 1983
- Dokter Spesialis Anak Konsultan Paru, FKUI-MPPDS IDAI 1992
- M.Sc Clinical Epidemiology, Bangkok 1994

PELATIHAN

Internasional

1. Clinical Training for Consultant on Acute Respiratory Infections. Bangkok, 1991.
2. Pediatric Pulmonology, Vrije Universiteit Amsterdam. Amsterdam, 1995
3. Workshop on Technology Assesment and Management Tools. Thailand, 1998
4. Strategic Planning for Clinical Epidemiology Unit. Manila. 1999

Nasional

1. Workshop of Building Linkages Socialization of ICDC project in the West Region. Palembang,2000
2. Workshop on Curriculum Development and Revision. FK Undip Semarang, 2001
3. Workshop on Evidence Based Medicine. FKUI-FK Undip Semarang, 2001
4. Advanced Pediatric Resuscitation Course. PP IDAI. Semarang, 2002
5. TOT Pembuatan OSCA untuk Uji Kompetensi Tenaga Kesehatan. Semarang, 2003
6. Diagnostic Test for Respiratory Syncytial Virus. WHO-Unpad. Bandung, J2003
7. Pentaloka Penulisan Artikel Ilmiah Kesehatan. Depkes RI. Semarang, 2003
8. National workshop on Integrated Pharmacotherapy Teaching for Medical Undergraduate. 2004
9. Quality Assurance for Medical Education. FK Undip Semarang, 2004
10. Pelatihan Vaksinologi PP IDAI-IDAI Jateng. Semarang, 2006
11. Komite Nasional Etik Penelitian Kesehatan (KNEPK) dengan Komisi-Komisi Etik Penelitian Kesehatan (KEPK). Semarang, 2006
12. Lokakarya Penyusunan Kurikulum Berbasis Kompetensi. FK Undip. Semarang, 2006
13. Pelatihan tutor BBDM. FK UNDIP. Semarang, 2006
14. Lokakarya Nasional Kejadian Ikutan Pasca Imunisasi (KIPI). Jakarta, 2007
15. Lokakarya Contributing Editor Paediatrica Indonesiana., Jakarta 2007