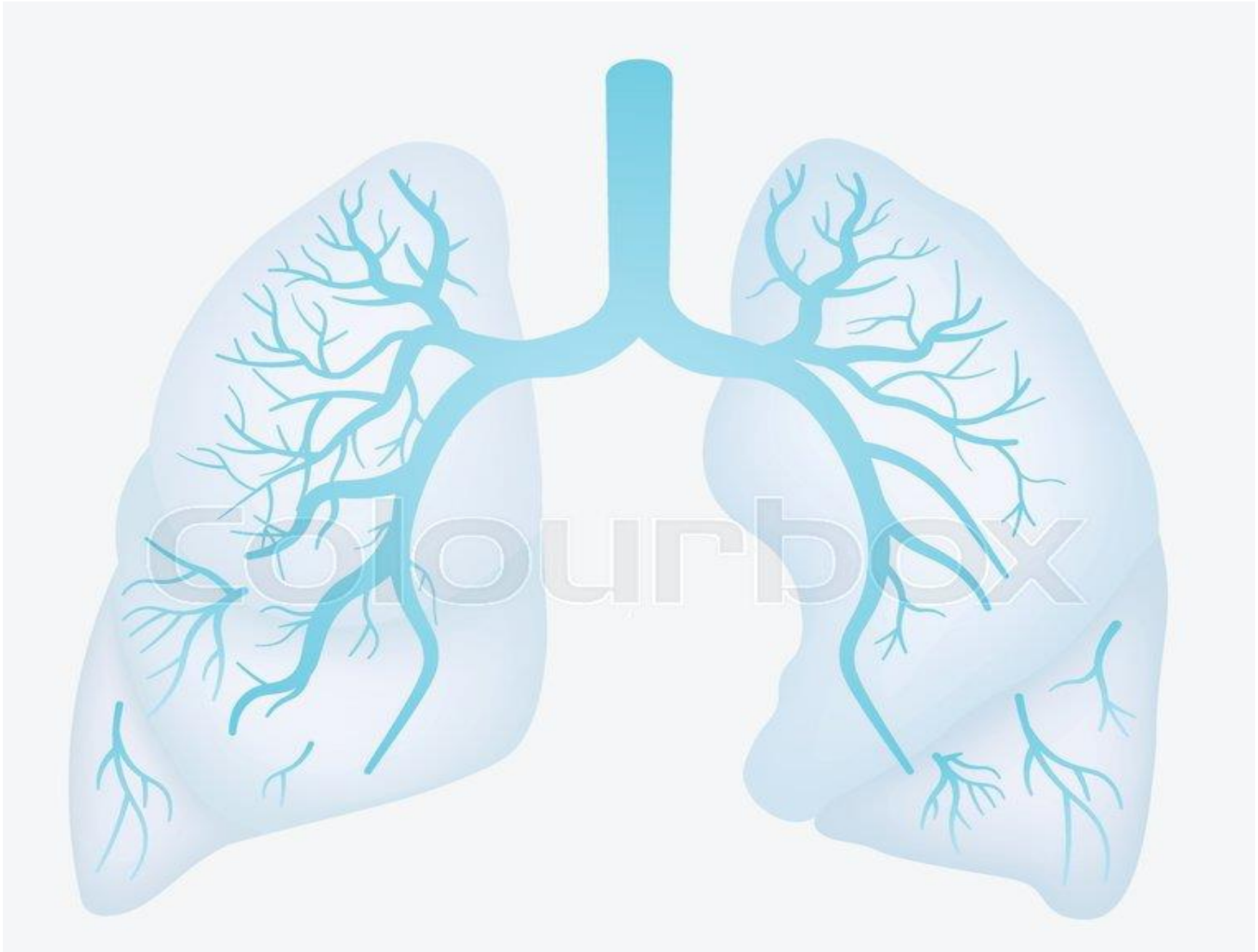
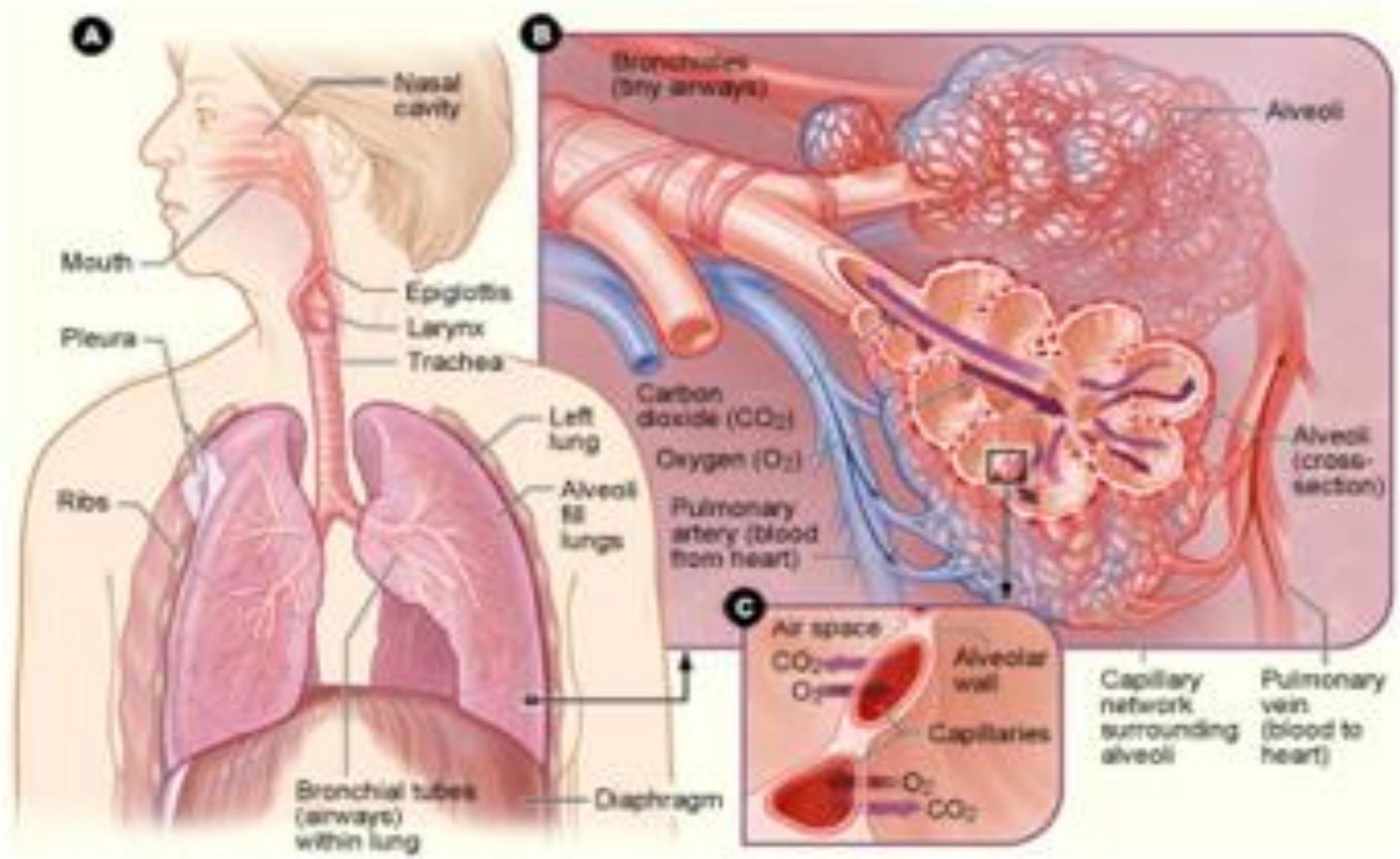

colourbox

The Respiratory System



تعريف الربو حسب المبادرة العالمية للربو
(GINA) Global Initiative For Asthma

- هو مرض التهابي مزمن يصيب السبل التنفسيّة حيث تلعب أنماط من الخلايا والوسائط دوراً في هذا الالتهاب الذي بدوره يرتبط بفرط استجابة السبل التنفسيّة مما ينجم عنه نوبات متكررة من الوزيز، عسر التنفّس، صلابة الصدر، والسعال خاصةً في الليل أو الصباح الباكر.
- عادةً ما تترافق هذه النوبات مع انسداد السبل التنفسيّة ضمن الرئتين انسداداً غالباً ما يكون عكوساً يُصحح عفويّاً أو بالعلاج.

الوبائيات Epidemiology
حسب منظمة الصحة العالميّة (WHO)

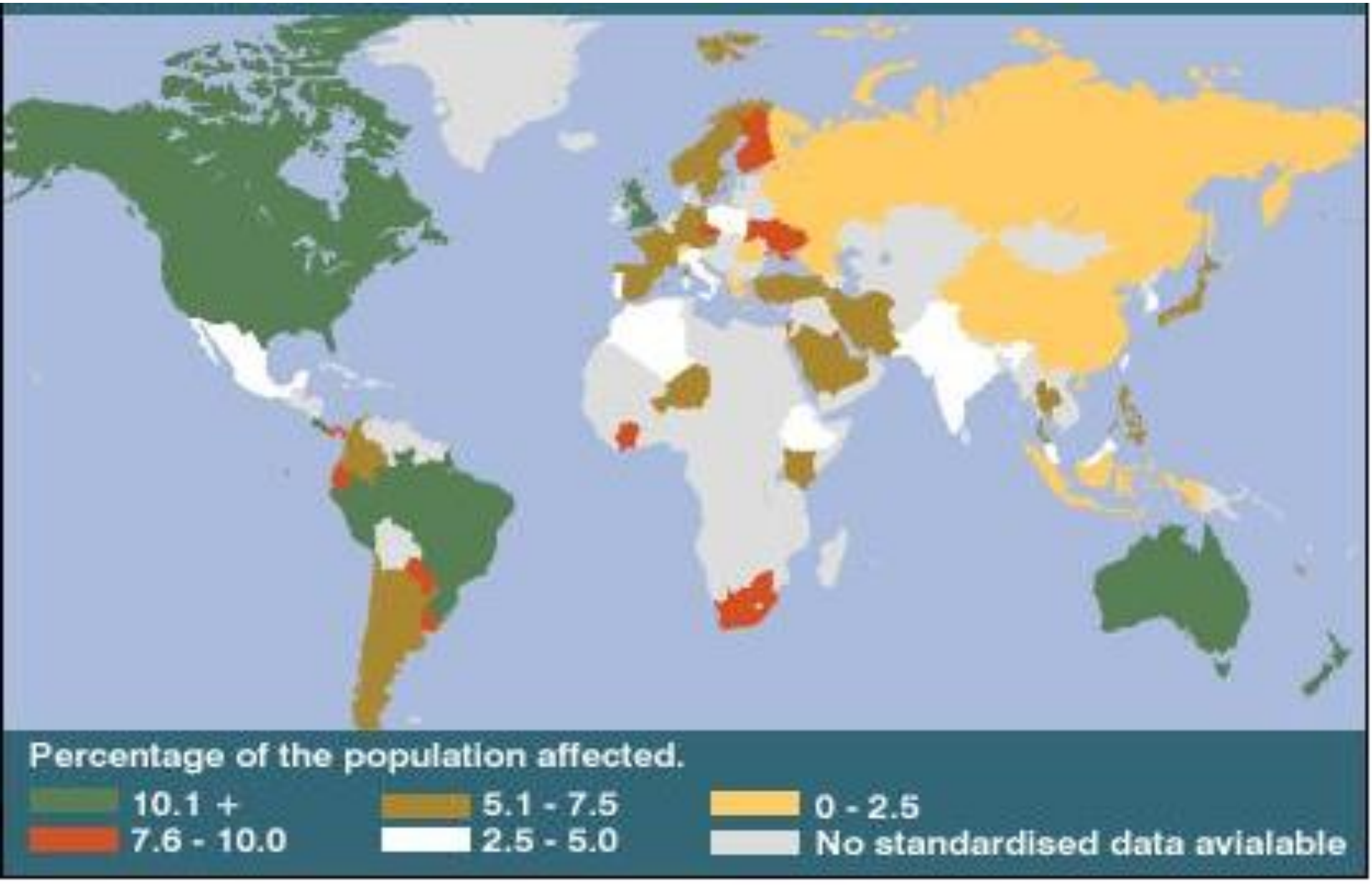
- يُقدّر عدد الأشخاص الذين يعانون حالياً من الربو تقريباً بـ٢٣٥ مليون شخص.

- يعتبر الربو أكثر الأمراض المزمنة شيوعاً بين الأطفال حيث يُقدّر عدد الأطفال المصابين بالربو بـ ٧ مليون طفل.

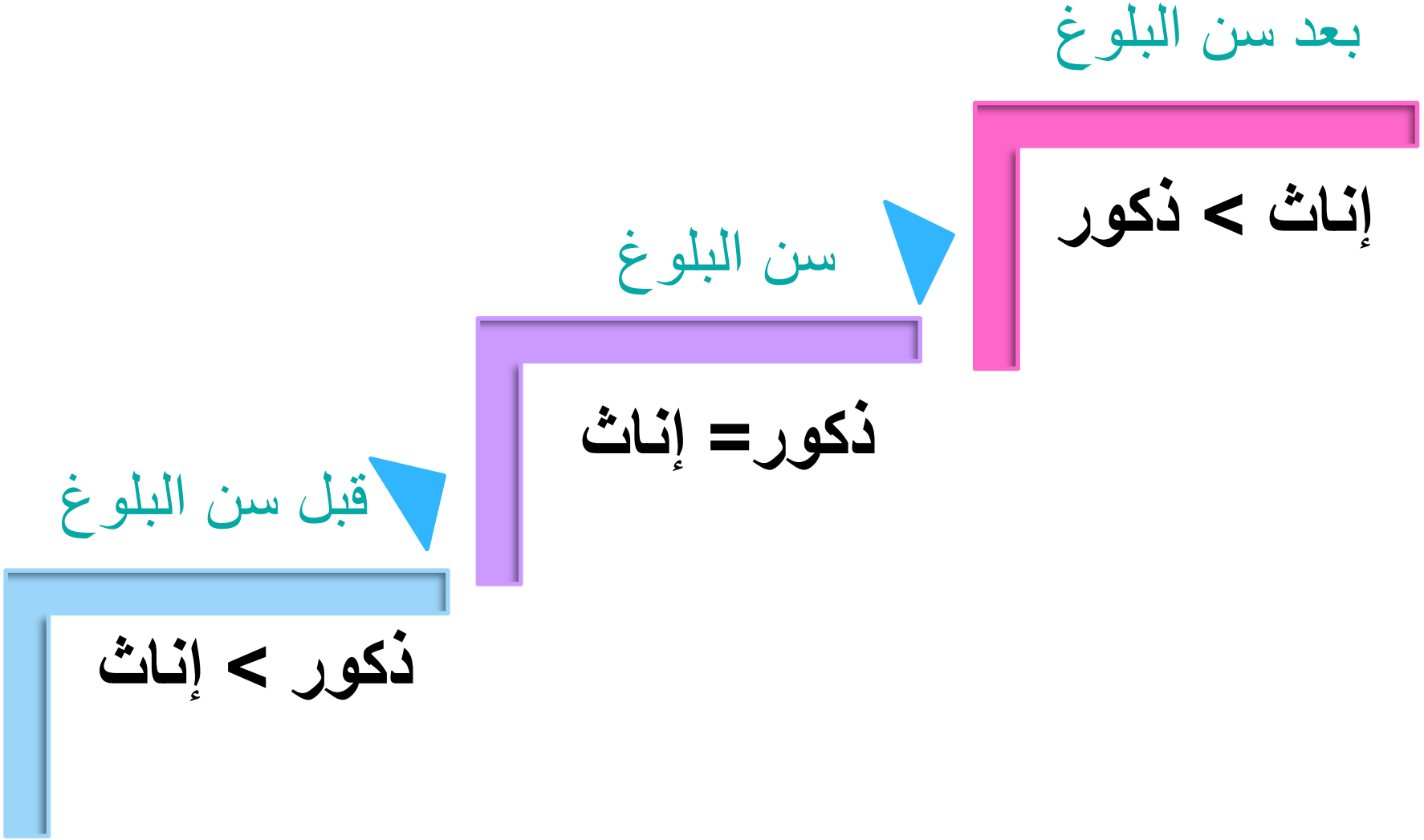
- وصل عدد الوفيات بسبب الربو لـ٢٥٠,٠٠٠ حالة.

- يتم تشخيص ثلثي حالات الربو قبل بلوغ المريض سن ١٨ سنة وما يقارب نصف الأطفال الذين شُخِّصوا في مرحلة الطفولة تختفي لديهم الأعراض عند البلوغ.

Prevalence الانتشار



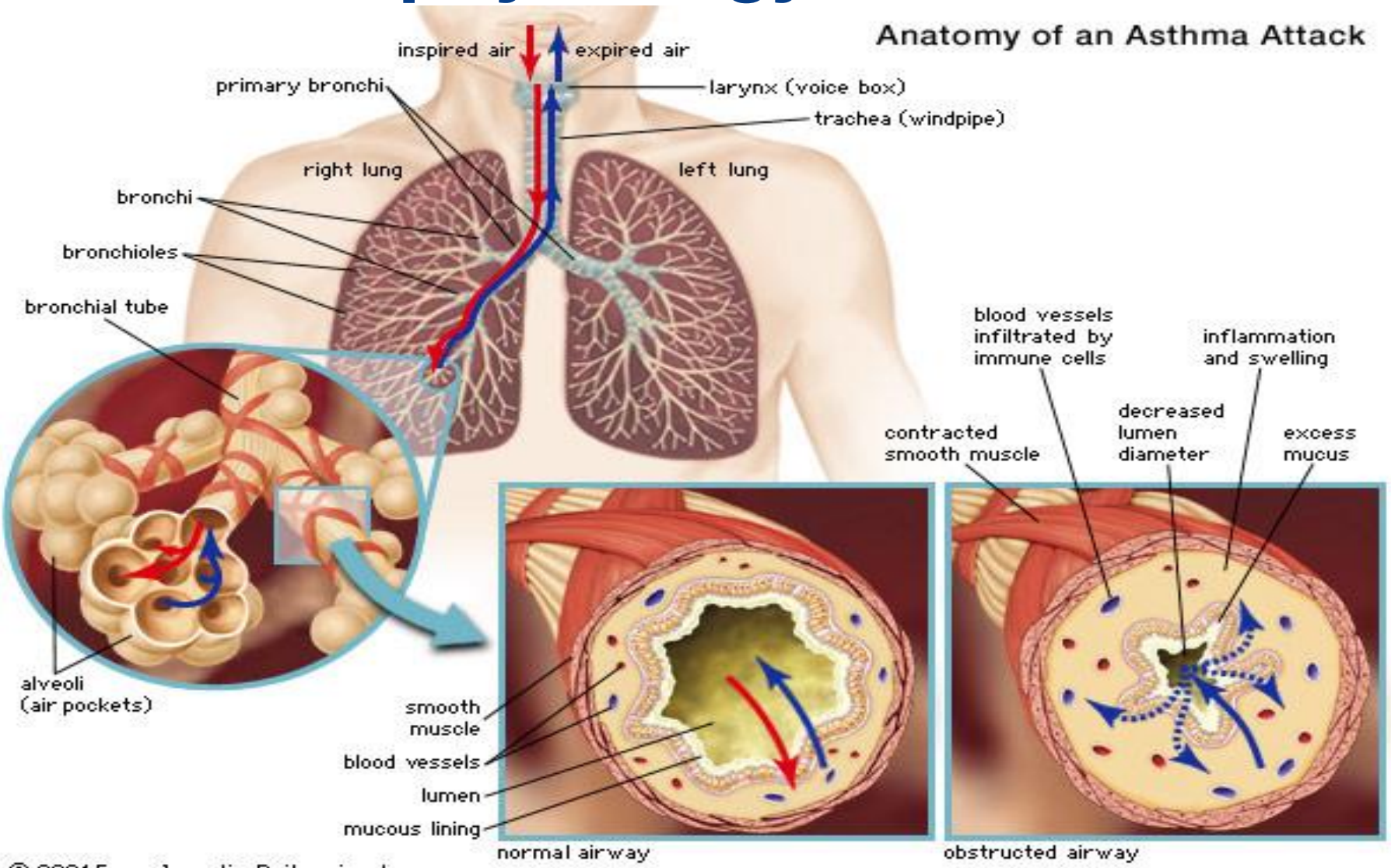
الانتشار تبعاً للجنس:



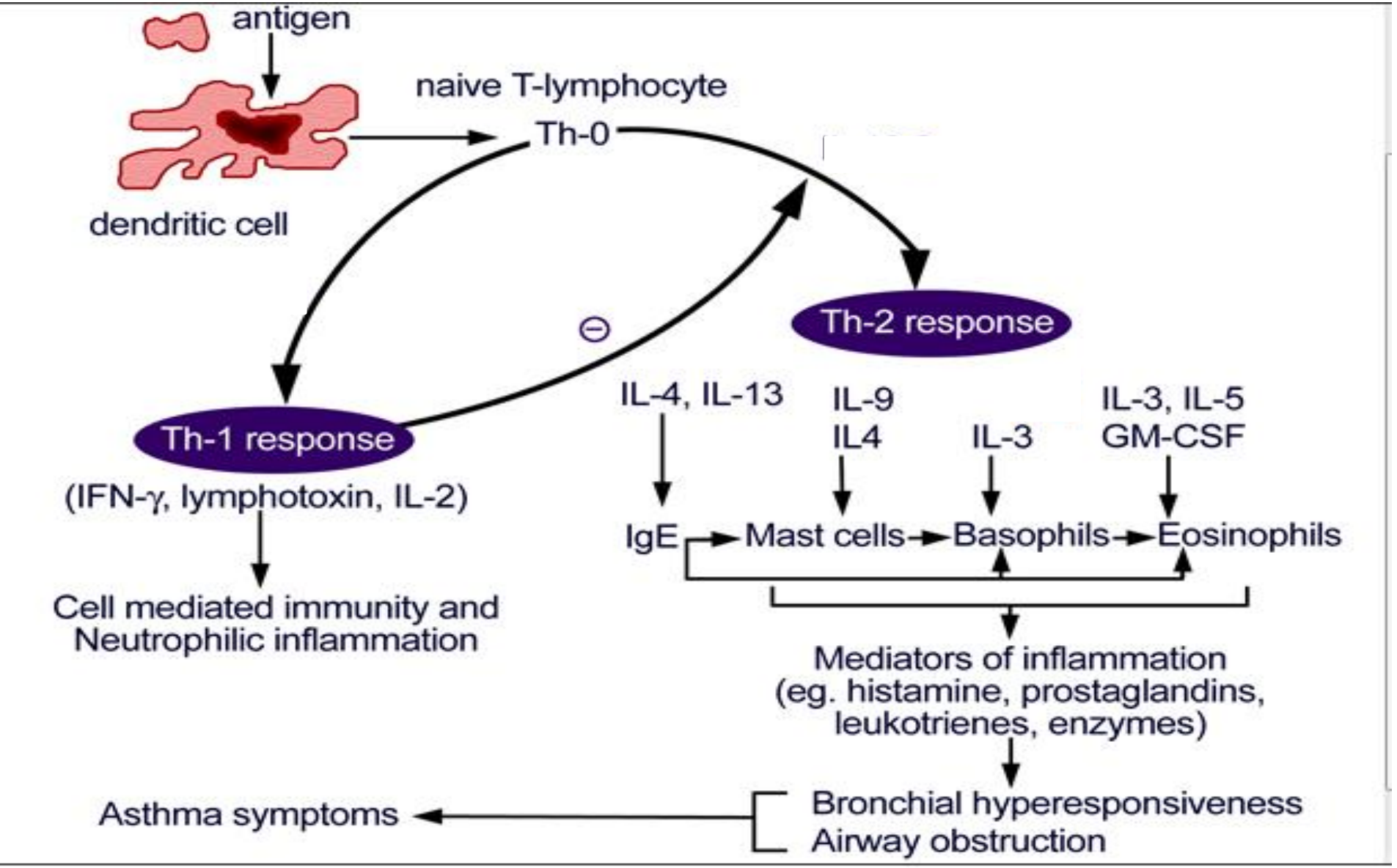
الفيزيولوجيا المرضيّة Pathophysiology

- التهاب المسالك التنفسيّة.
- انسداد المسالك التنفسيّة بشكل عكوس.
- فرط حساسيّة القصبات.

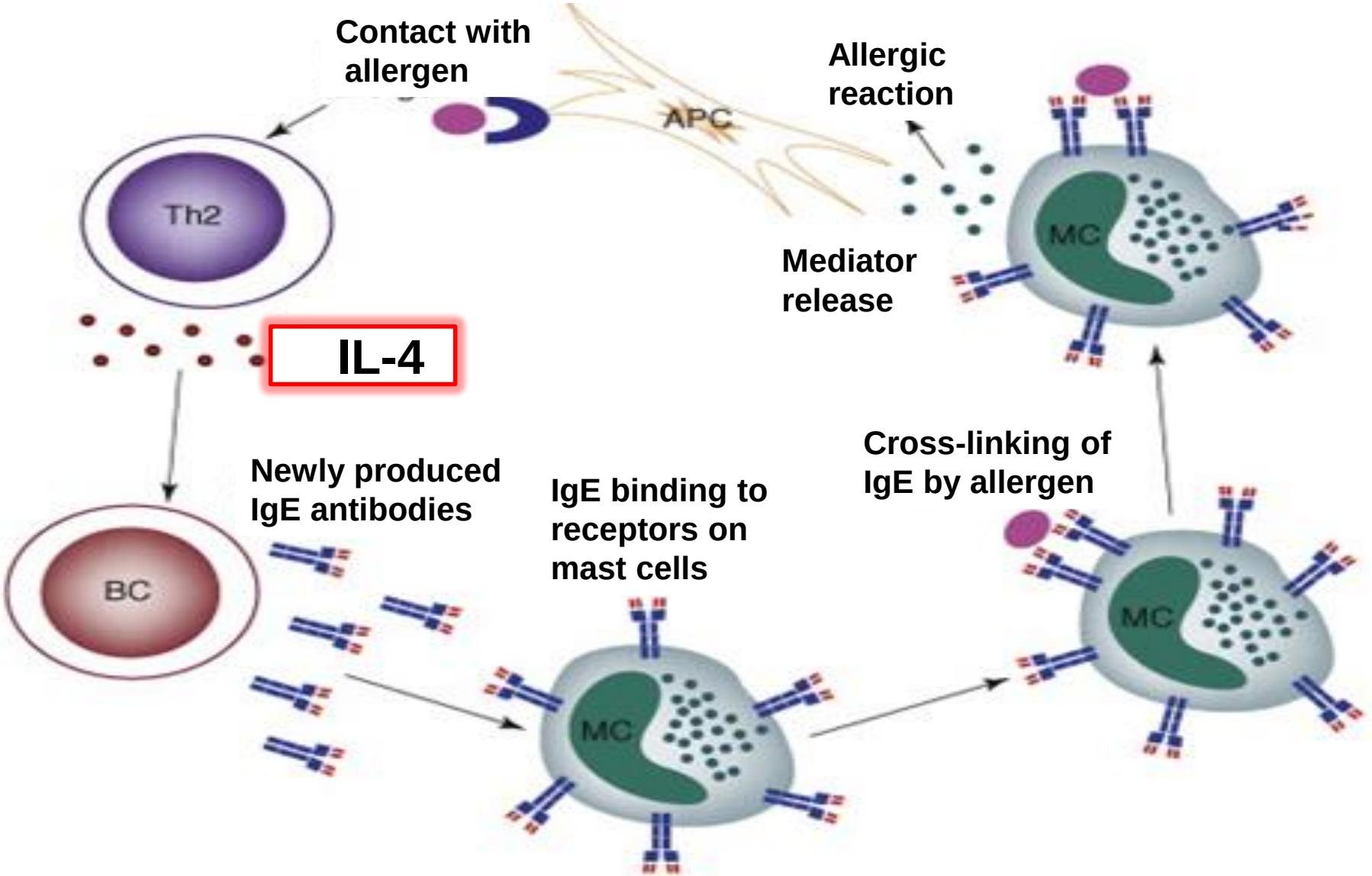
Pathophysiology الفيزيولوجيا المرضيّة



دور الوسائط الالتهابيّة



الدور الوسائط الالتهابيّة



Risk Factors for Developing Asthma: Genetic Characteristics.

- **Atopy**

The body's predisposition to develop immunoglobulin E antibody (IgE) in response to exposure to environmental allergens

Can be measured in the blood

Includes allergic rhinitis, asthma, hay fever, and eczema

Clearing the Air:Indoor Air Exposures & Asthma Development

Biological Agents

- Sufficient evidence of causal relationship
- **House dust mite**
- Limited or suggestive evidence of association
- **Cockroach (among pre-school aged children)**
- **Respiratory syncytial virus (RSV)**

Chemical Agents

Sufficient evidence of association

- **Environmental Tobacco Smoke (among pre-school aged children)**

Indoor Air Exposures & Asthma Exacerbation

- **Biological Agents**
- Sufficient evidence of causal relationship
- **Cat**
- **Cockroach**
- **House dust mite**
- Sufficient evidence of an association
- **Dog**
- **Fungus/Molds**
- **Rhinovirus**
- Limited or suggestive evidence of association
- **Domestic birds**
- **Chlamydia and Mycoplasma pneumonia**
- **RSV**

- **Chemical Agents**
- Sufficient evidence of causal relationship
- **Environmental tobacco smoke**
- Sufficient evidence of an association
- **NO2, NOX (high levels)**
- Limited or suggestive evidence of association
- **Environmental Tobacco Smoke**
- **Formaldehyde**
- **Fragrances**

محرِّضات الربو

أنماط الربو Asthma Types

1. الربو التحسسي Allergic asthma
2. الربو غير التحسسي Non-allergic asthma
3. الربو المحرّض بالأسبرين Aspirin-induced asthma
4. الربو المهني Occupational asthma
5. الربو المحرَّض بالتمارين Exercise-induced asthma
6. الربو المحرّض بالانتانات infectiouse asthma

أعراض الربو Asthma Symptoms

السعال

- غير مُنتج وغير نُوَبي.
- قد يكون هو العرض الوحيد للربو وخاصة الربو المُحرّض بالتمارين أو الربو الليلي.
- بعد منتصف الليل وفي ساعات الصباح الباكر.

صلابة الصدر

- قد تكون موجودة مع أو بدون الأعراض الأخرى .
- خاصةً في الربو المُحرَّض بالتمارين أو الربو الليلي.

الوزيز

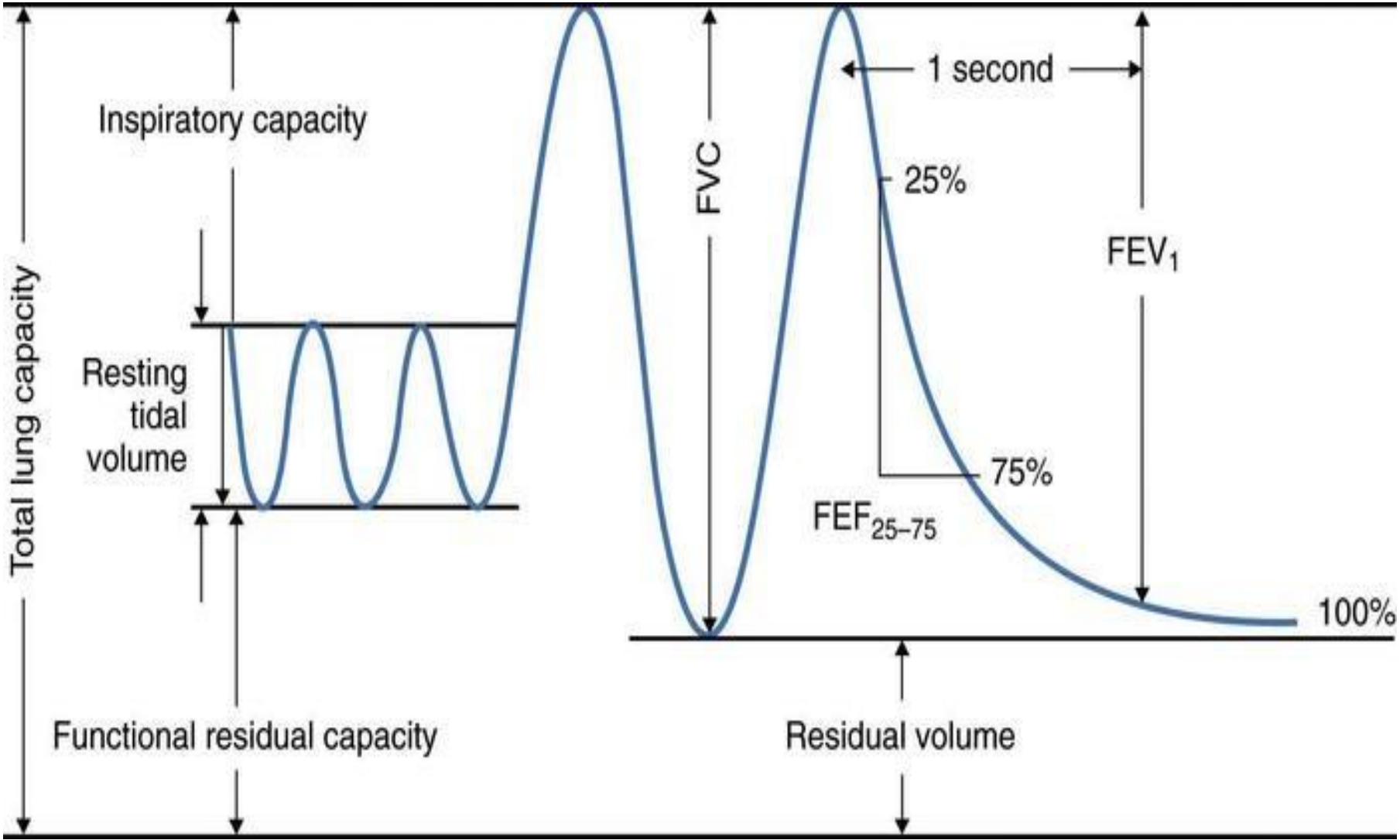
- في حالات الربو الخفيفة يقتصر هذا الصوت على نهاية الزفير.
- في نوبات الربو قد يُسمع صوت الوزيز أثناء الشهيق أيضاً.

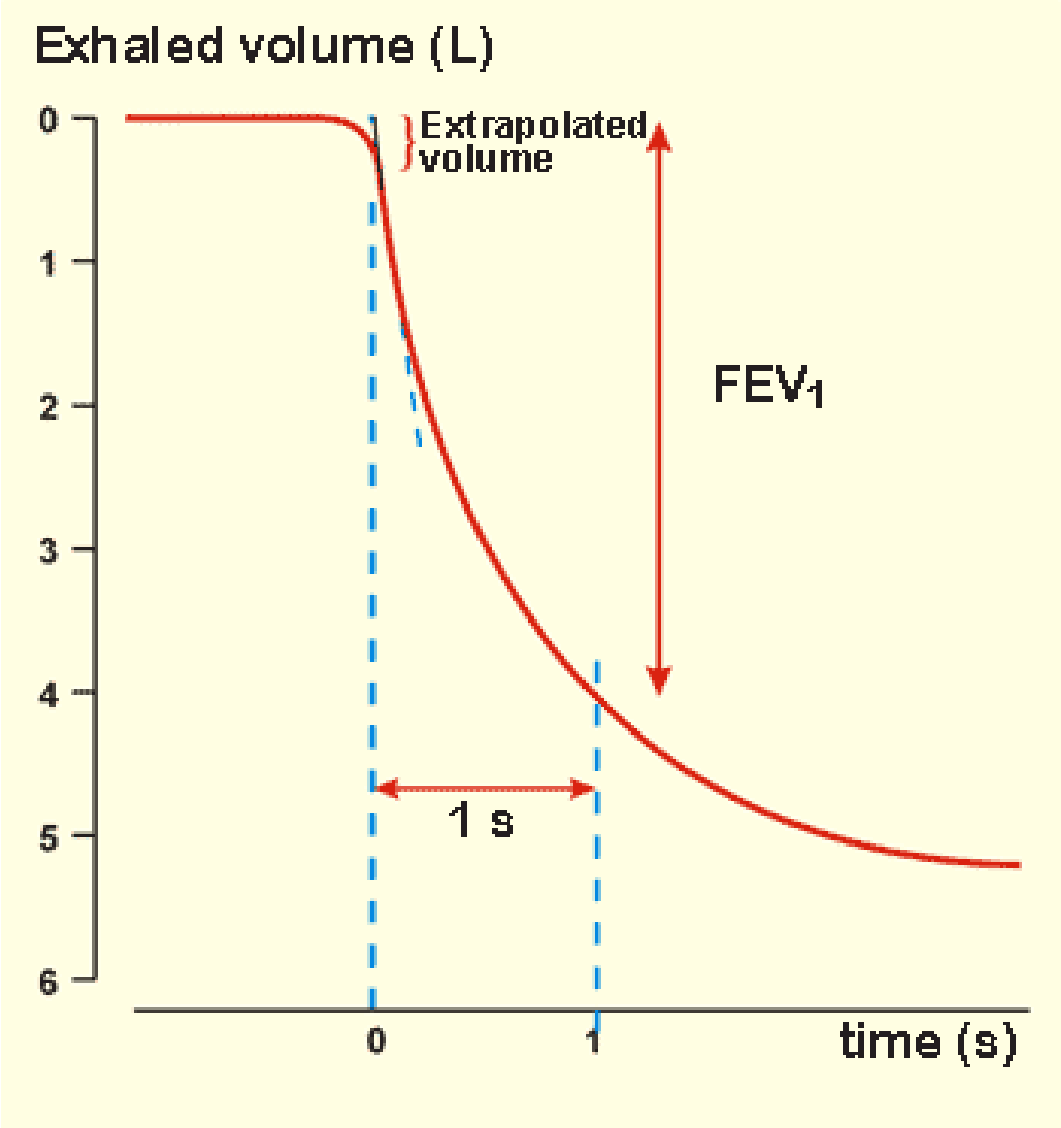
Diagnosing Asthma: Spirometry

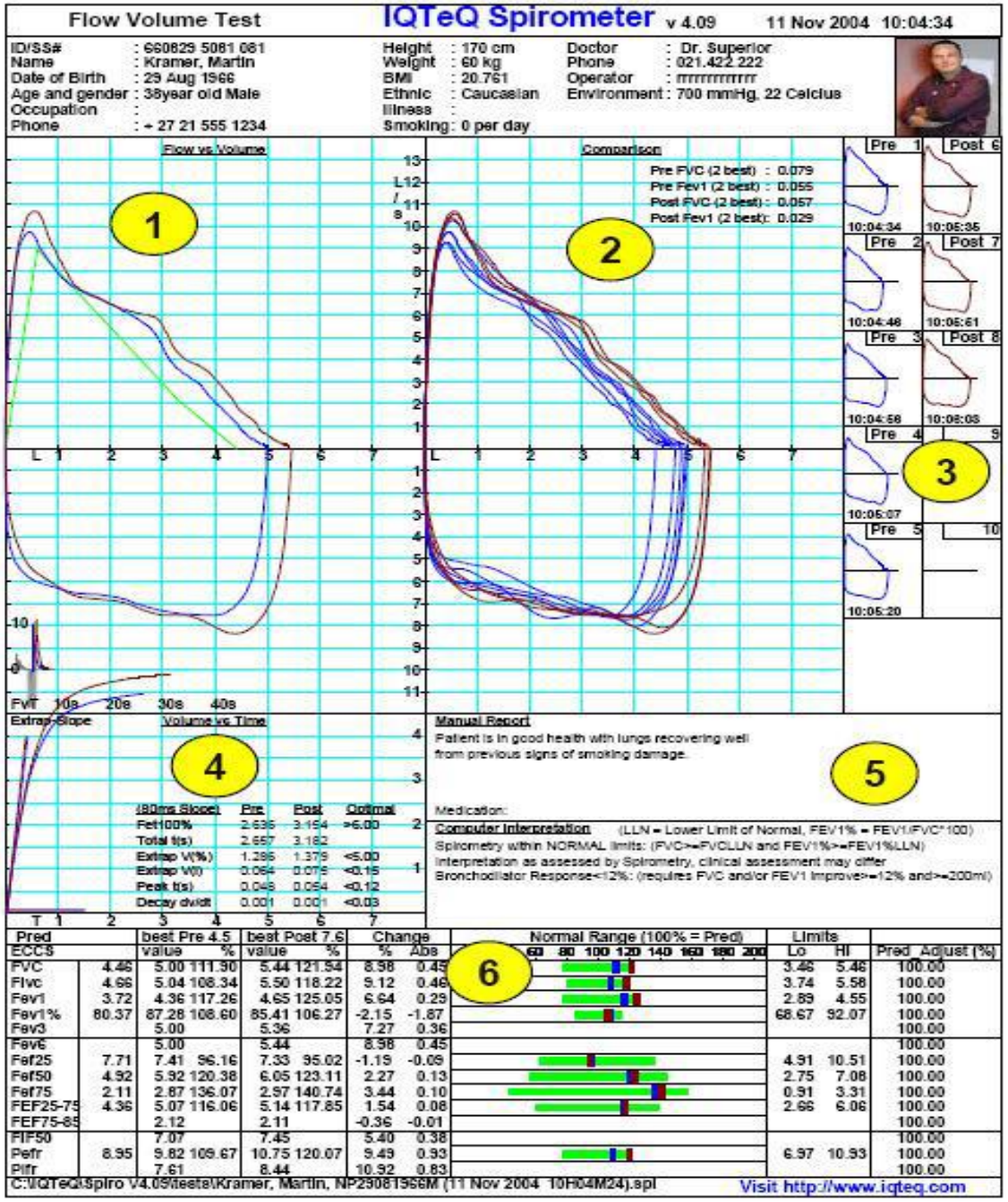
- Lung Function Test (LFT)

الاستقصاءات

اسم الاختبار	عن ماذا يعبّر؟
(Forced Expiratory Volume) FEV	الحجم الزفيري الجهدي يعبر عن FEVكنسبة مئوية من الحجم الكلي للهواء الزفيري وتعطى نتائج الفحص كنسبة FEV1/FVC
FEV1	✓ حجم الهواء الزفيري الجهدي خلال الثانية الأولى. ✓ يعادل ٧٠% إلى ٨٠% من السعة الكلية للرئة (مريض الربو يحتاج ٤-٣ ثواني) ✓ يستنشق المريض بعمق قدر المستطاع ثم يخرج الزفير بشكل قسري وكامل في الجزء الفموي الموصول مع مقياس النفس spirometer ✓ يفيد في تقدير مدى الاستجابة للمعالجة والتنبؤ بحدة النوبة
FVC	القدرة القصوى للزفر القسري للهواء وهو تقييم للهواء الزفيري الأعظمي الجهدي


Total lung capacity
Inspiratory capacity
Resting tidal volume
Functional residual capacity
FVC
1 second
25%
75%
FEV_1
FEF_{25-75}
100%
Residual volume


Exhaled volume (L)
0
1
2
3
4
5
6
Extrapolated volume
FEV1
1 s
0
1
time (s)



1
- Pre and Post Bronchodilator Graphs superimposed
- Automatic best test selection (FVC+FEV1)
- Predicted graph for easy reference and comparison

2
- All selected tests superimposed for repeatability and quality control
- ATS best test selection criteria displayed

3
- Micro display of all tests for easy sequence and selection analysis
- Time of test displayed
- Database storage and retrieval

4
- Volume /Time graphs with start and end of test criteria for easy quality control assessment (ATS 1994)

5
- Comprehensive computer interpretation with rationale for informed decision and assessment of validity
- Interpretation based on ATS and ACOEM requirements

6
- Selection of Reference values
- Bar Chart display of results with normal ranges for easy assessment

هدف المعالجة الدوائيّة:

- ⬇ تكراريّة النوبات وشدتها
- حفاظ على وظائف الرئة قريبة من الطبيعي
- نشاط طبيعي قدر الإمكان
- منع وصول انسداد السبل التنفسيّة لحالة غير عكوسة
- ⬇ زيارة غرفة الإسعاف
- التقليل من التأثيرات الجانبية للعلاج

تصنيف الربو Asthma Classification

علائم الشِدّة	متقطِّع	مستمر persistent		
		خفيف mild	متوسط moderate	شديد severe
الأعراض النهارية	<مرة/ أسبوعيّاً	>مرة/ أسبوعيّاً	يومياً	يومياً
النوبات	نادراً	تؤثر على نمط الحياة	تؤثر على النوم والحياة	متكررة/محدودية النشاط اليومي
الأعراض الليلية	≤مرتين/شهريّاً	>مرتين/ شهريّاً	> مرة / أسبوعيّاً	متكررة
FEV1	≤ ٨٠	≤ ٨٠	٨٠-٦٠%	≤٦٠%
اختلافFEV1	<٢٠%	> ٢٠-٣٠%	<٣٠%	< ٣٠%
استخدام الأدوية الاسعافيّة			يومياً	

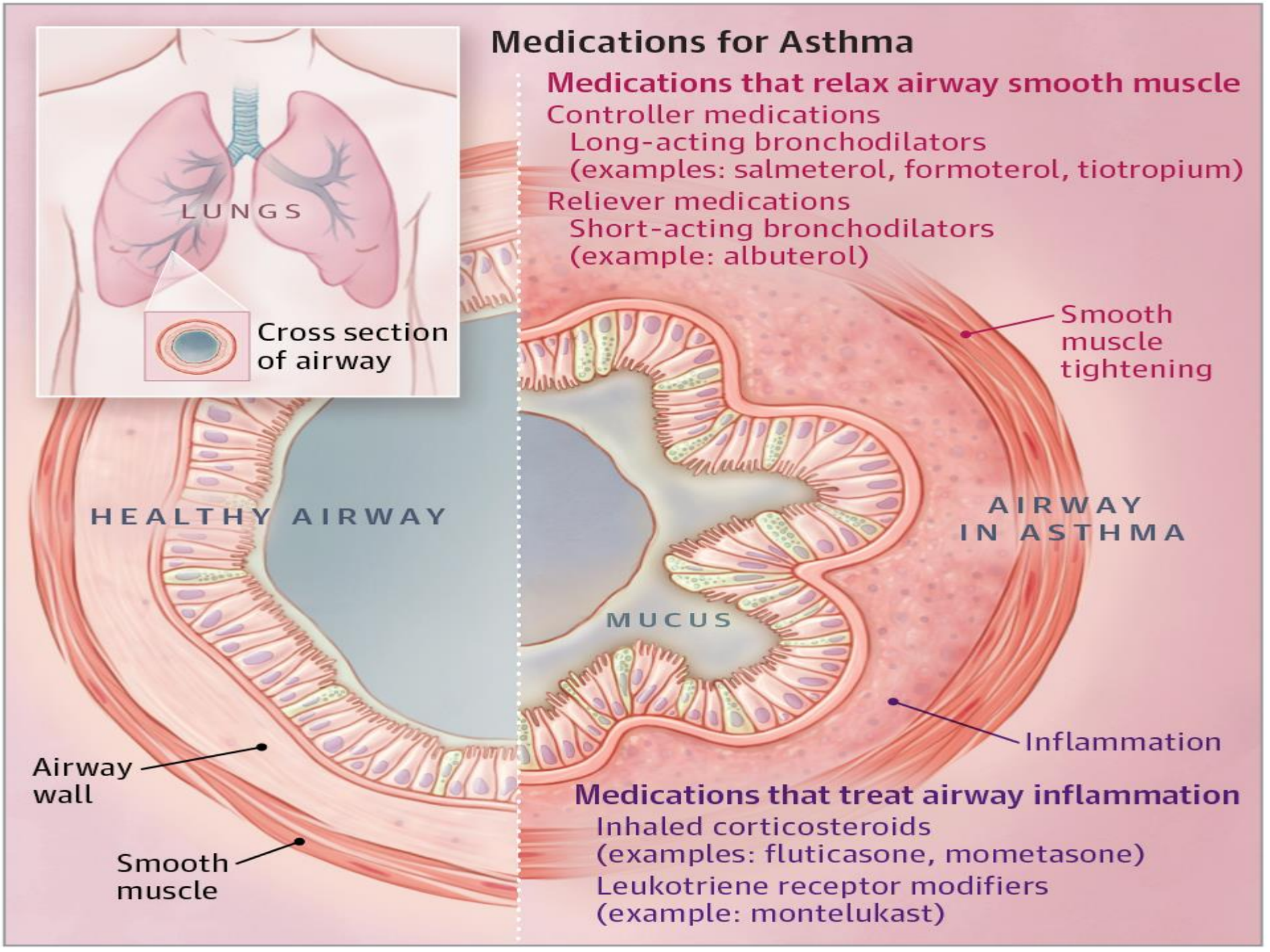
المعالجة الدوائية Pharmacotherapy

الأدوية الاسعافيّة

- ناهضات بيتا -٢ قصيرة المفعول (تيربوتالين – سالبوتامول) SABA
- التيوفيللين
- مضادات الكولين (ايبراتروبيوم)

المعالجة طويلة الأمد

- ناهضات بيتا -٢ طويلة المفعول (سالميترول – فورميترول) LABA
- الكورتيكوستيروئيدات الانشاقية ICS
- الكروموليناات
- معدلات الليكوترينات (مونتيلوكاست)


Medications for Asthma
Medications that relax airway smooth muscle
Controller medications
Long-acting bronchodilators
(examples: salmeterol, formoterol, tiotropium)
Reliever medications
Short-acting bronchodilators
(example: albuterol)
LUNGS
Cross section of airway
Smooth muscle tightening
HEALTHY AIRWAY
AIRWAY IN ASTHMA
MUCUS
Inflammation
Airway wall
Smooth muscle
Medications that treat airway inflammation
Inhaled corticosteroids
(examples: fluticasone, mometasone)
Leukotriene receptor modifiers
(example: montelukast)

ناهضات β 2

- ناهضات β 2 قصيرة المفعول هي الموسّعات القصبيّة المتوافرة الأكثر فعاليّة حيث يفعّل تنبيه مستقبلات β 2 الأدرينرجية الأدنيل سيكلاز الأمر الذي يسبب زيادة في الأدينوزين أحادي الفوسفات الحلقي داخل الخلوي.
- يفضي هذا لارتخاء العضلات الملس وتثبيت غشاء الخلية البدينة وتنبيه العضلات الهيكلية.
- يستطب الألبوتيرول Albuterol وناهضات β 2 الانتقائية الأخرى قصيرة المفعول لعلاج النوبات المتقطّعة من التشنج القصبي.
- إن الفورميترول Formetrol والسالميترول Salmetrol عبارة عن ناهضات β 2 انشاقية مديدة المفعول تستطب بغية المساعدة في الضبط طويل الأمد للمرضى العرضيين المعالجين بجرعات منخفضة أو متوسطة من ICS قبل الاقدام على رفع جرعة الأخيرة ضمن المجال المتوسط أو العالي.

ناهضات β 2

Agent	Selectivity		Duration of Action
	β1	β2	
Albuterol	+	++++	4-8 hours
Terbutaline	+	++++	4-8 hours
Formoterol	+	++++	≥12 hours
Salmeterol	+	++++	≥12 hours

الستيروئيدات القشرية Corticosteroids

- تزيد الستيروئيدات القشرية من عدد مستقبلات β2 الأدينرجية وتحسّن استجابة المستقبلات للتنبيه الأدرينرجي β2 وبالتالي فهي تنقص إنتاج المخاط وفرط المفرزات وتنقص وذمة ونتح المجرى الهوائي.

- تتأخر الاستجابة على الستيروئيدات القشرية الانشاقيّة وتتحسن الأعراض في معظم المرضى في غضون الأسبوع الأول أو أول أسبوعين ليبلغ تحسّنها حده الأعظمي في الأسبوع 4 إلى 8 أسبوع.

- تعد الستيوئيدات الانشاقيّة ICS علاج الضبط طويل المفعول المفضّل للربو المستمر في جميع المرضى بسبب قوتها وفعاليتها.

الستيروئيدات القشرية الانشاقية ICS

- إنّ السميّة الجهازية للستيروئيدات القشرية الانشاقيّة أصغرية خصوصاً مع الجرعات الإنشاقية المنخفضة أو المتوسطة إلّا أنّ اختطار التأثيرات الجهازية يزداد مع الجرعات العالية .

- تشمل التأثيرات الجانبية الموضعيّة المعتمدة على الجرعة داء المبيّضات الفموي البلعومي وبحّة الصوت ويمكن التقليل من كليهما عبر استخدام حجرة انشاق.

- أمّا التأثرات الجهازية المرتبطة مع الجرعات العالية (> ٨٠٠ مكغ/اليوم لمدة ٦ أشهر لدى الأطفال) فتتمثّل بتثبيط المحور النخامي الوطائي مما يسبب قصراً قامة ونقصاً في النمو.

Corticosteroids (inhaled) overview

Drug	Indications	Possible Side effects	Some Potential interactions	Precautions and Contraindications
Beclomethasone **Budesonide** **Ciclesonide** **Fluticasone** **Mometasone** **Triamcinolone**	• Bronchospasm • Seasonal rhinitis • Perennial rhinitis	• Headache • URI/ sinusitis • Nasal/ throat irritation • Cough • Oral candidacies • GI discomfort • Adrenal suppression (↑dose, long-term therapy only)	• Amphotericin B • Antidiabetic agents • Corticorelin • Ritonavir	**Precautions:** • Active untreated infections • Narrow-angle glaucoma • DM/ CVD • Pregnancy/ lactation **Contraindications:** • Hypersensitivity to drug and/or its components **Additional (in Canada)** **Budesonide** • Tuberculosis • Untreated respiratory infection

CVD: Cardiovascular disease; **DM:** Diabetes mellitus; **GI:** gastrointestinal; **URI:** Upper respiratory tract infection

ICS Doses

Drug	Low Daily Dose		Medium Daily Dose		High Daily Dose	
	Child 0–4	Child 5–11	Child 0–4	Child 5–11	Child 0–4	Child 5–11
Beclomethasone HFA 40 or 80 mcg/puff	NA	80–160 mcg	NA	>160–320 mcg	NA	>320 mcg
Budesonide DPI 90, 180, or 200 mcg/inhalation	NA	180–400 mcg	NA	>400–800 mcg	NA	>800 mcg
Budesonide inhaled Inhalation suspension for nebulization (child dose)	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 80 mcg/puff	NA	160 mcg	NA	320 mcg	NA	≥640 mcg
Fluticasone **HFA/MDI:** 44, 110, or 220 mcg/puff	176 mcg	88–176 mcg	>176–352 mcg	>176–352 mcg	>352 mcg	>352 mcg
DPI: 50, 100, or 250 mcg/inhalation	NA	100–200 mcg	NA	>200–400 mcg	NA	>400 mcg
Mometasone DPI 200 mcg/inhalation	NA	NA	NA	NA	NA	NA
Triamcinolone acetonide 75 mcg/puff	NA	300–600 mcg	NA	>600–900 mcg	NA	>900 mcg

Key: HFA, hydrofluoroalkane; NA, not approved and no data available for this age group

Theophylline

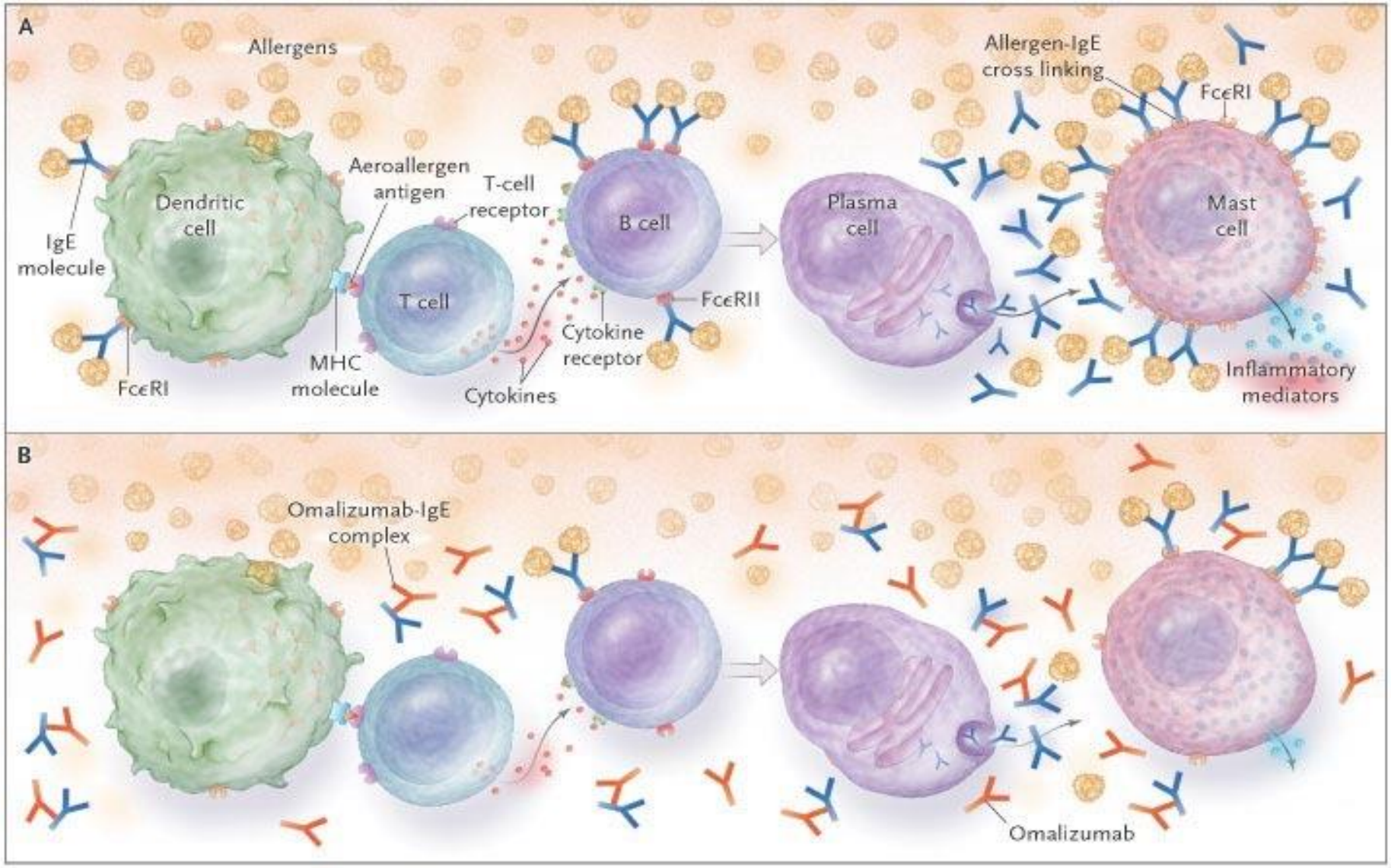
- Theophylline has **two** distinct actions in the airways of patients with reversible obstruction; smooth muscle relaxation (i.e., **bronchodilation**) and suppression of the response of the airways to stimuli (i.e., **non-bronchodilator prophylactic effects**).

- التيوفيللين مديد التحرر مفيد ليلا لتهدئة الأعراض الليلية المزعجة
- قد يصبح ضروريا لدى المرضى غير القادرين على استعمال العلاج الاستنشاقي بشكل
- فعال
- يملك هامشا علاجيّا ضيّقا
- S/E:غثيان، إسهال، هيجان عصبي، صداع


Xolair
Omalizumab
FOR SUBCUTANEOUS USE
Dosage and Administration:
Refrigerate at 2–8°C (36–46°F).
Genentech, Inc., So. San Francisco
US License No.: 1048


NDC 50242-040-62
LIST NO. 13013
SINGLE-USE VIAL
150 mg
Xolair®
Omalizumab
FOR SUBCUTANEOUS USE
KEEP REFRIGERATED. DO NOT FREEZE.
Genentech
NOVARTIS

Omalizumab


A
Allergens
Dendritic cell
IgE molecule
FcεRI
Aeroallergen antigen
MHC molecule
T-cell receptor
T cell
Cytokines
B cell
FcεRII
Cytokine receptor
Plasma cell
Allergen-IgE cross linking
FcεRI
Mast cell
Inflammatory mediators
B
Omalizumab-IgE complex
Omalizumab

Respiratory Inhaler Identification Chart

This is not a complete list of available agents. Please consult the CPS for others.

WHICH INHALERS HAVE BEEN PRESCRIBED FOR YOU?

CONTROLLERS

Anti-Inflammatories

"FLOVENT" HFA
(Fluticasone propionate)
Available in 50, 125 & 250 mcg per dose
GlaxoSmithKline

"FLOVENT" DISKUS"
Inhalation Device
(Fluticasone propionate)
Available in 50, 100, 250 & 500 mcg per dose
GlaxoSmithKline

"PULMICORT" TURBUHALER"
(Budesonide)
Available in 100, 200 & 400 mcg per dose
AstraZeneca

"QVAR"
(Beclomethasone dipropionate)
Available in 50 & 100 mcg per dose
3M Pharmaceuticals

Long-Acting Bronchodilators

"SEREVENT"
(Salmeterol xinafoate)
25 mcg per dose
GlaxoSmithKline

"SEREVENT" DISKUS"
Inhalation Device
(Salmeterol xinafoate)
50 mcg per dose
GlaxoSmithKline

"OXEZE" TURBUHALER"*
(Formoterol fumarate dihydrate)
Available in 6 & 12 mcg per dose
AstraZeneca

* May also be used as a reliever medication.

"SPIRIVA"
HandiHaler Inhalation Device
(tiotropium bromide monohydrate)
18 mcg/capsule
Boehringer Ingelheim

Combination Medications

Inhaled steroids and long-acting β_2-agonists.

"ADVAIR" MDI
(Salmeterol xinafoate/fluticasone propionate)
Available in 125 & 250 mcg per dose
2 puffs BID
GlaxoSmithKline

"ADVAIR" DISKUS"
Inhalation Device
(Salmeterol xinafoate/fluticasone propionate)
Available in 100, 250 & 500 mcg per dose
1 inhalation BID
GlaxoSmithKline

"SYMBICORT" TURBUHALER"
(Budesonide/formoterol fumarate dihydrate)
Available in 100 & 200 mcg per dose
AstraZeneca

- Controllers help prevent respiratory symptoms such as wheezing, coughing and shortness of breath.
- Take your controller medication exactly as your doctor told you.

RELIEVERS

Short-Acting Bronchodilators

"VENTOLIN" HFA
(Salbutamol sulfate)
100 mcg per dose
GlaxoSmithKline

"VENTOLIN" DISKUS"Inhalation Device
(Salbutamol sulfate)
200 mcg per dose
GlaxoSmithKline

"BRICANYL" TURBUHALER"
(Terbutaline sulfate)
0.5 mg per dose
AstraZeneca

"ATROVENT" HFA INHALATION AEROSOL
(Ipratropium bromide)
20 mcg per dose
Boehringer Ingelheim

"COMBIVENT" INHALATION AEROSOL
(Ipratropium bromide/salbutamol sulfate)
20 mcg per dose
Boehringer Ingelheim

"AIROMIR" INHALATION AEROSOL
(Salbutamol sulfate)
100 mcg per dose
3M Pharmaceuticals

- Relievers help relax the tight muscles around airways therefore opening them up and making it easier to breathe. These medications provide quick relief when an asthma attack occurs.
- Relievers should only be taken when needed unless your Doctor tells you otherwise. More than 4 times per week could mean your asthma is getting worse and you should be reassessed by your Doctor.

Seretide


Seretide™ Accuhaler
Powder for inhalation
Each inhalation contains
Salmeterol (as xinafoate) 50 mcg
Fluticasone propionate 100 mcg
1 Accuhaler for 60 inhalations
100
gsk GlaxoSmithKline


Seretide®
Diskus®
Salmeterol y Fluticasona Polvo
50 µg/ 100 µg
Inhalación oral
®Marcas Registradas
1408175
GlaxoSmithKline


Seretide

Symbicort

NDC 0186-0370-20

STORE UPRIGHT

Symbicort® 160/4.5

budesonide 160 mcg/formoterol fumarate dihydrate 4.5 mcg

INHALATION AEROSOL

120 inhalations

For Oral Inhalation only

Dispense with enclosed Medication Guide.

Rx only

Mfd. for: AstraZeneca LP, Wilmington, DE 19850
By: AstraZeneca Dunkerque Production
Dunkerque, France Product of France

AstraZeneca

Symbicort® 160/4.5

budesonide 160 mcg/formoterol fumarate dihydrate 4.5 mcg

INHALATION AEROSOL

Store at controlled room temperature 20–25°C (68–77°F) [see USP].
Store the inhaler with the mouthpiece down.
Shake inhaler well for 5 seconds before using.
Discard within three months after removing from foil pouch.

Dosage: Use only as directed by Physician.
Warning: Avoid spraying in eyes. Contents under pressure. Do not puncture or incinerate. Do not store at temperatures above 120°F. Keep out of the reach of children.
Contents: Each carton contains one canister. Net fill weight 10.2g providing 120 inhalations. Each actuation delivers 160 mcg of budesonide and 4.5 mcg of formoterol fumarate dihydrate. Inactive ingredients include povidone K25, polyethylene glycol 1000, and HFA 227.

NDC 0186-0370-20

STORE UPRIGHT

Symbicort® 160/4.5

budesonide 160 mcg/formoterol fumarate dihydrate 4.5 mcg

INHALATION AEROSOL

120 inhalations

For oral inhalation with SYMBICORT inhaler only.
Use this device for SYMBICORT only.

www.MySymbicort.com

AstraZeneca

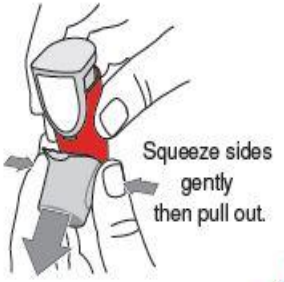
Important: Please read accompanying Medication Guide carefully prior to using.

Symbicort® 160/4.5

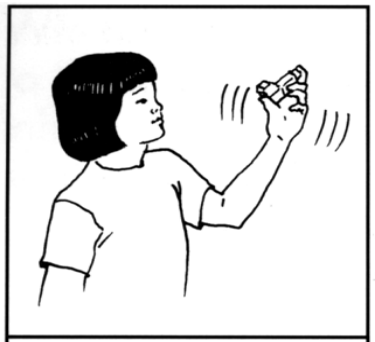
budesonide 160 mcg/formoterol fumarate dihydrate 4.5 mcg

INHALATION AEROSOL

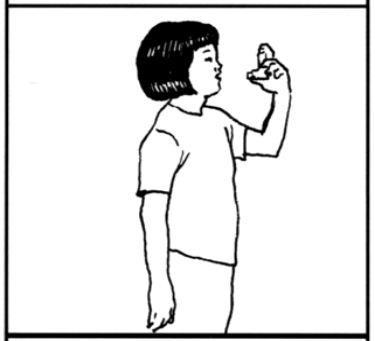
Lift here for Prescribing Information



Remember to breathe in slowly.



1. Take off the cap.
   Shake the inhaler.



2. Stand up.
   Breathe out.

3. Put the inhaler in your mouth or put it just in front of your mouth. As you start to breathe in, push down on the top of the inhaler and keep breathing in slowly.

4. Hold your breath for 10 seconds.
   Breathe out.


Assess asthma severity at the first visit to determine initial treatment.
Use inhaled corticosteroids to control asthma.
Use written asthma action plans to guide patient self-management.
Control exposure to allergens and irritants that worsen the patient's asthma.
Schedule follow-up visits at periodic intervals.
Assess and monitor asthma control at each follow-up visit and adjust treatment if needed.
Aim for Asthma Control

INTER-MITTENT ASTHMA

PERSISTENT ASTHMA: DAILY MEDICATION

STEP 1

PREFERRED:

Rescue inhaler as needed

STEP 2

PREFERRED:

Low-dose inhaled corticosteroid plus a LABA

Rescue inhaler as needed

STEP 3

PREFERRED:

Low-dose inhaled corticosteroid plus a LABA

Rescue inhaler as needed

Consider seeing an asthma specialist

STEP 4

PREFERRED:

Medium-dose inhaled corticosteroid plus a LABA

Rescue inhaler as needed

See an asthma specialist

STEP 5

PREFERRED:

High-dose inhaled corticosteroid plus a LABA

AND

consider omalizumab

Rescue inhaler as needed

See an asthma specialist

STEP 6

PREFERRED:

High-dose inhaled corticosteroid plus a LABA plus oral corticosteroid

AND

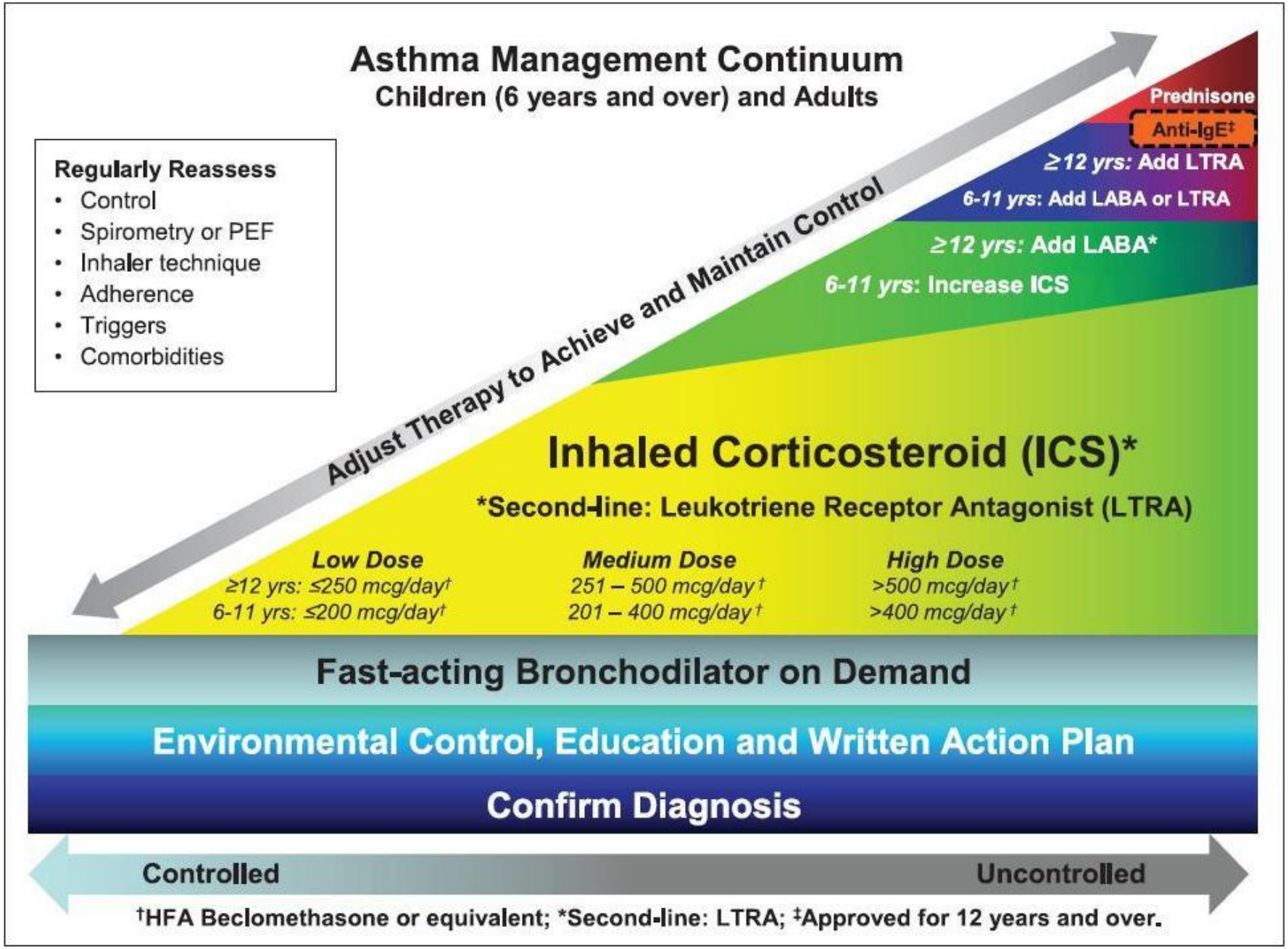
consider omalizumab

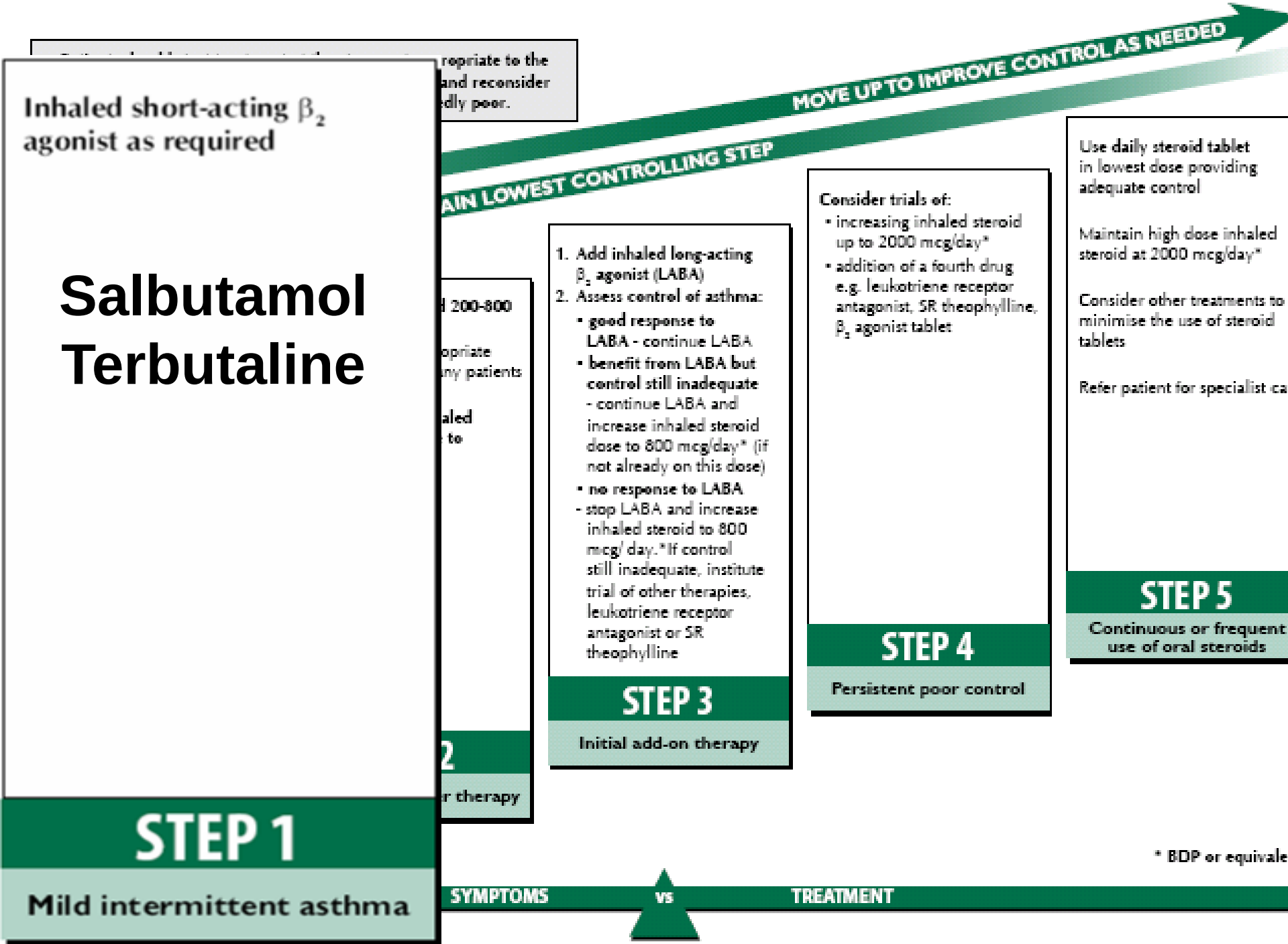
Rescue inhaler as needed

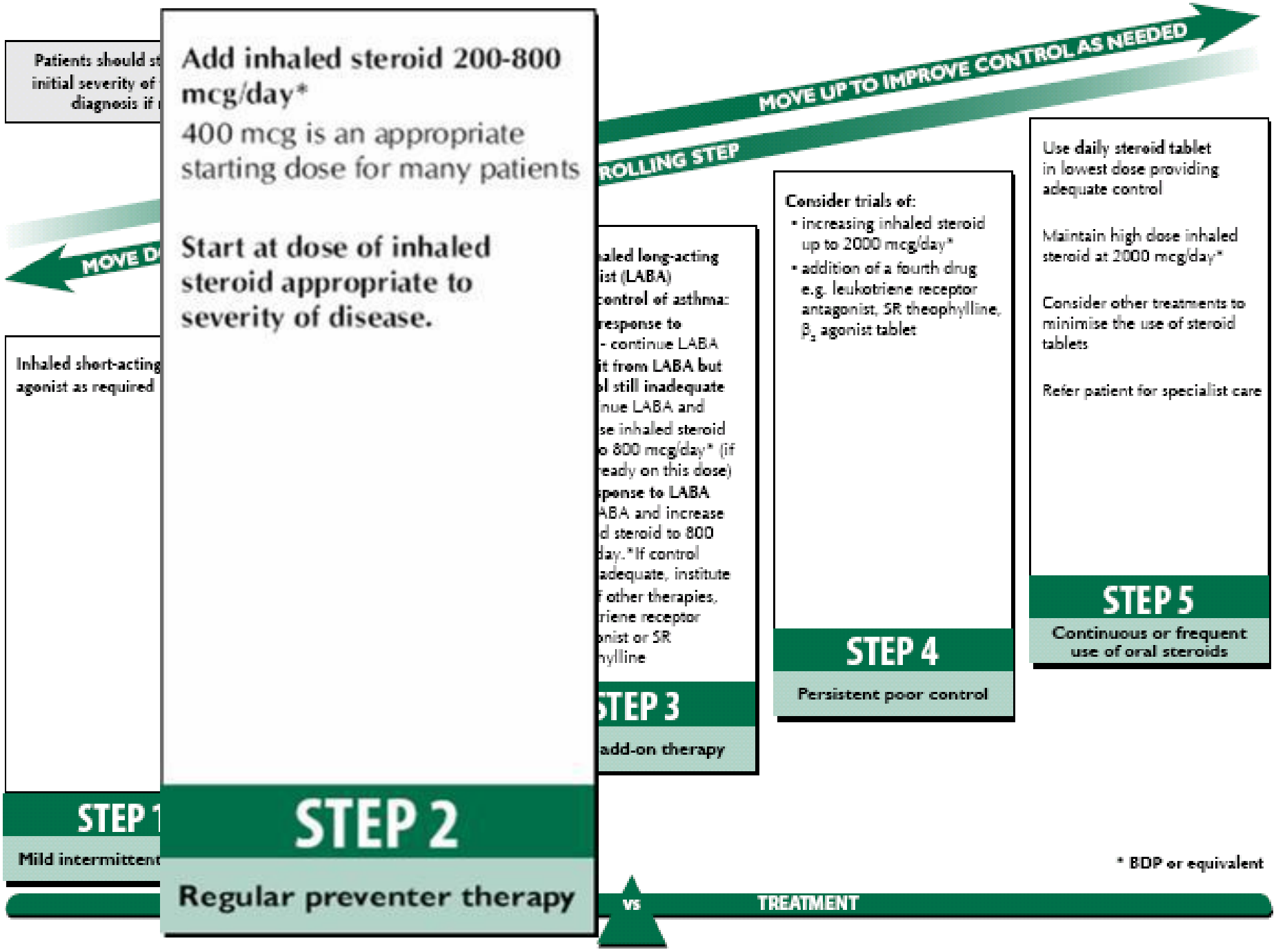
See an asthma specialist

ASTHMA PREVENTION AND CONTROL MEDICATIONS

ASTHMA.NET


Asthma Management Continuum
Children (6 years and over) and Adults
Regularly Reassess
• Control
• Spirometry or PEF
• Inhaler technique
• Adherence
• Triggers
• Comorbidities
Adjust Therapy to Achieve and Maintain Control
Prednisone
Anti-IgE‡
≥12 yrs: Add LTRA
6-11 yrs: Add LABA or LTRA
≥12 yrs: Add LABA*
6-11 yrs: Increase ICS
Inhaled Corticosteroid (ICS)*
*Second-line: Leukotriene Receptor Antagonist (LTRA)
Low Dose
≥12 yrs: ≤250 mcg/day†
6-11 yrs: ≤200 mcg/day†
Medium Dose
251 – 500 mcg/day†
201 – 400 mcg/day†
High Dose
>500 mcg/day†
>400 mcg/day†
Fast-acting Bronchodilator on Demand
Environmental Control, Education and Written Action Plan
Confirm Diagnosis
Controlled
Uncontrolled
†HFA Beclomethasone or equivalent; *Second-line: LTRA; ‡Approved for 12 years and over.


MOVE UP TO IMPROVE CONTROL AS NEEDED
AIN LOWEST CONTROLLING STEP
Inhaled short-acting β_2 agonist as required
Salbutamol
Terbutaline
STEP 1
Mild intermittent asthma
200-800
r therapy
2
1. Add inhaled long-acting β_2 agonist (LABA)
2. Assess control of asthma:
• good response to LABA - continue LABA
• benefit from LABA but control still inadequate - continue LABA and increase inhaled steroid dose to 800 mcg/day* (if not already on this dose)
• no response to LABA - stop LABA and increase inhaled steroid to 800 mcg/ day.*If control still inadequate, institute trial of other therapies, leukotriene receptor antagonist or SR theophylline
STEP 3
Initial add-on therapy
Consider trials of:
• increasing inhaled steroid up to 2000 mcg/day*
• addition of a fourth drug e.g. leukotriene receptor antagonist, SR theophylline, β_2 agonist tablet
STEP 4
Persistent poor control
Use daily steroid tablet in lowest dose providing adequate control
Maintain high dose inhaled steroid at 2000 mcg/day*
Consider other treatments to minimise the use of steroid tablets
Refer patient for specialist ca
STEP 5
Continuous or frequent use of oral steroids
* BDP or equivale
SYMPTOMS
vs
TREATMENT


Patients should st
initial severity of
diagnosis if
MOVE D
Inhaled short-acting
agonist as required
STEP 1
Mild intermittent
Add inhaled steroid 200-800 mcg/day*
400 mcg is an appropriate starting dose for many patients
Start at dose of inhaled steroid appropriate to severity of disease.
STEP 2
Regular preventer therapy
ROLLING STEP
MOVE UP TO IMPROVE CONTROL AS NEEDED
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Consider other treatments to minimise the use of steroid tablets
Refer patient for specialist care
STEP 5
Continuous or frequent use of oral steroids
* BDP or equivalent
vs
TREATMENT

Patients should start treatment at the step most appropr
initial severity of their asthma. Check concordance and
diagnosis if response to treatment is unexpectedly

MOVE DOWN TO FIND AND MAINTAI

Inhaled short-acting β_2 agonist as required

STEP 1

Mild intermittent asthma

Add inhaled steroid 20
mcg/day*

400 mcg is an appropri
starting dose for many

Start at dose of inhaled
steroid appropriate to
severity of disease.

STEP 2

Regular preventer th

1. Add inhaled long-acting β_2 agonist (LABA)
2. Assess control of asthma:
   - good response to LABA - continue LABA
   - benefit from LABA but control still inadequate - continue LABA and increase inhaled steroid dose to 800 mcg/day* (if not already on this dose)
   - no response to LABA - stop LABA and increase inhaled steroid to 800 mcg/ day.* If control still inadequate, institute trial of other therapies, leukotriene receptor antagonist or SR theophylline

STEP 3

Initial add-on therapy

PROVE CONTROL AS NEEDED

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Use daily steroid tablet in lowest dose providing adequate control

Maintain high dose inhaled steroid at 2000 mcg/day*

Consider other treatments to minimise the use of steroid tablets

Refer patient for specialist care

STEP 5

Continuous or frequent use of oral steroids

* BDP or equivalent

SY

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTRO

NEEDED

Inhaled short-acting β_2 agonist as required

STEP 1

Mild intermittent asthma

Add inhaled steroid 200-800 mcg/day*

400 mcg is an appropriate starting dose for many patients

Start at dose of inhaled steroid appropriate to severity of disease.

STEP 2

Regular preventer therapy

1. Add inhale
   β_2 agonist (
2. Assess cont
   - good resp
     LABA - co
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Initial adc

Consider trials of:

- increasing inhaled steroid up to 2000 mcg/day*
- addition of a fourth drug e.g. leukotriene receptor antagonist, SR theophylline, β_2 agonist tablet

+

Montelukast
Zafirlukast
OR

NDC 16571-011-10 PACK:00

Theophylline (Anhydrous) Extended-Release Tablets

400 mg

OR

b2 agonist tablet

STEP 4

Persistent poor control

steroid tablet
dose providing
control

high dose inhaled
2000 mcg/day*

other treatments to
the use of steroid

ient for specialist care

STEP 5

uous or frequent
of oral steroids

* BDP or equivalent

SYMPTOMS

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE

MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTROLLING STEP

Inhaled short-acting β_2 agonist as required

STEP 1

Mild intermittent asthma

Add inhaled steroid 200-800 mcg/day*

400 mcg is an appropriate starting dose for many patients

Start at dose of inhaled steroid appropriate to severity of disease.

STEP 2

Regular preventer therapy

1. Add inhaled long-acting β_2 agonist (LABA)
2. Assess control of asthma:
   - good response to LABA - continue LABA
   - benefit from LABA but control still inadequate - continue LABA and increase inhaled steroid dose to 800 mcg/day* (if not already on this dose)
   - no response to LABA - stop LABA and increase inhaled steroid to 800 mcg/ day.*If control still inadequate, institute trial of other therapies, leukotriene receptor antagonist or SR theophylline

STEP 3

Initial add-on therapy

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SYMPTOMS vs TREATM

Use daily steroid tablet in lowest dose providing adequate control

Maintain high dose inhaled steroid at 2000 mcg/day*

Consider other treatments to minimise the use of steroid tablets

Refer patient for specialist car

STEP 5

Continuous or frequent use of oral steroids

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MOVE UP TO IMPROVE CONTROL AS NEEDED

MAINTAIN LOWEST CONTROLLING STEP

STEP 1

Mild intermittent asthma

Inhaled short-acting β_2 agonist as required

STEP 2

preventer therapy

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STEP 3

Initial add-on therapy

1. Add inhaled long-acting β_2 agonist (LABA)
2. Assess control of asthma:
   - **good response to LABA**
     - continue LABA
   - **benefit from LABA but control still inadequate**
     - continue LABA and increase inhaled steroid dose to 400 mcg/day* (if not already on this dose)
   - **no response to LABA**
     - stop LABA and increase inhaled steroid to 400 mcg/ day.*If control still inadequate, institute trial of other therapies, leukotriene receptor antagonist or SR theophylline

STEP 4

Persistent poor control

Increase inhaled steroid up to 800 mcg/day*

STEP 5

**Continuous or fr
use of oral ste**

Use daily steroid tab
in lowest dose provi
adequate control

Maintain high dose i
steroid at 800 mcg/d

Refer to respiratory
paediatrician

* BDP or

SYMPTOMS vs TREATMENT

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE UP TO IMPROVE CONTROL AS NEEDED

MOVE DOWN TO F

Inhaled short-acting β_2 agonist as required

STEP 1

Mild intermittent asthma

Add inhaled steroid 200-400 mcg/day* (other preventer drug if inhaled steroid cannot be used) 200 mcg is an appropriate starting dose for many patients

Start at dose of inhaled steroid appropriate to severity of disease.

STEP 2

Regular preventer therapy

Increase inhaled steroid up to 800 mcg/day*

STEP 4

Persistent poor control

Use daily steroid tablet in lowest dose providing adequate control

Maintain high dose inhaled steroid at 800 mcg/day*

Refer to respiratory paediatrician

STEP 5

Continuous or frequent use of oral steroids

* BDP or equivalent

TREATMENT

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE UP TO IMPROVE CONTROL AS NEEDED

MOVE DOWN TO FIND AND MAINT

STEP 1

Mild intermittent asthma

Inhaled short-acting β_2 agonist as required

STEP 2

Regular preventer

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drug if inhaled stero
be used) 200 mcg is
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many patients

Start at dose of inh
steroid appropriate
severity of disease.

STEP 3

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2. Assess control of asthma:
   - **good response to LABA**
     - continue LABA
   - **benefit from LABA but control still inadequate**
     - continue LABA and increase inhaled steroid dose to 400 mcg/day* (if not already on this dose)
   - **no response to LABA**
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STEP 4

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STEP 5

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MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTROLLING

Inhaled short-acting β_2 agonist as required

STEP 1

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Start at dose of inhaled steroid appropriate to severity of disease.

STEP 2

Regular preventer therapy

1. Add inhaled long-a agonist (LABA)
2. Assess control of a
   - good response to
     - continue LABA
   - benefit from LAB control still inade
     - continue LABA increase inhaled dose to 400 mcg/ not already on th
   - no response to L
     - stop LABA and i inhaled steroid to mcg/ day.*If cont still inadequate, i trial of other ther leukotriene recep antagonist or SR theophylline

STEP 3

Initial add-on the

SYMPTOMS vs

Increase inhaled steroid up to 800 mcg/day*

STEP 4

Persistent poor control

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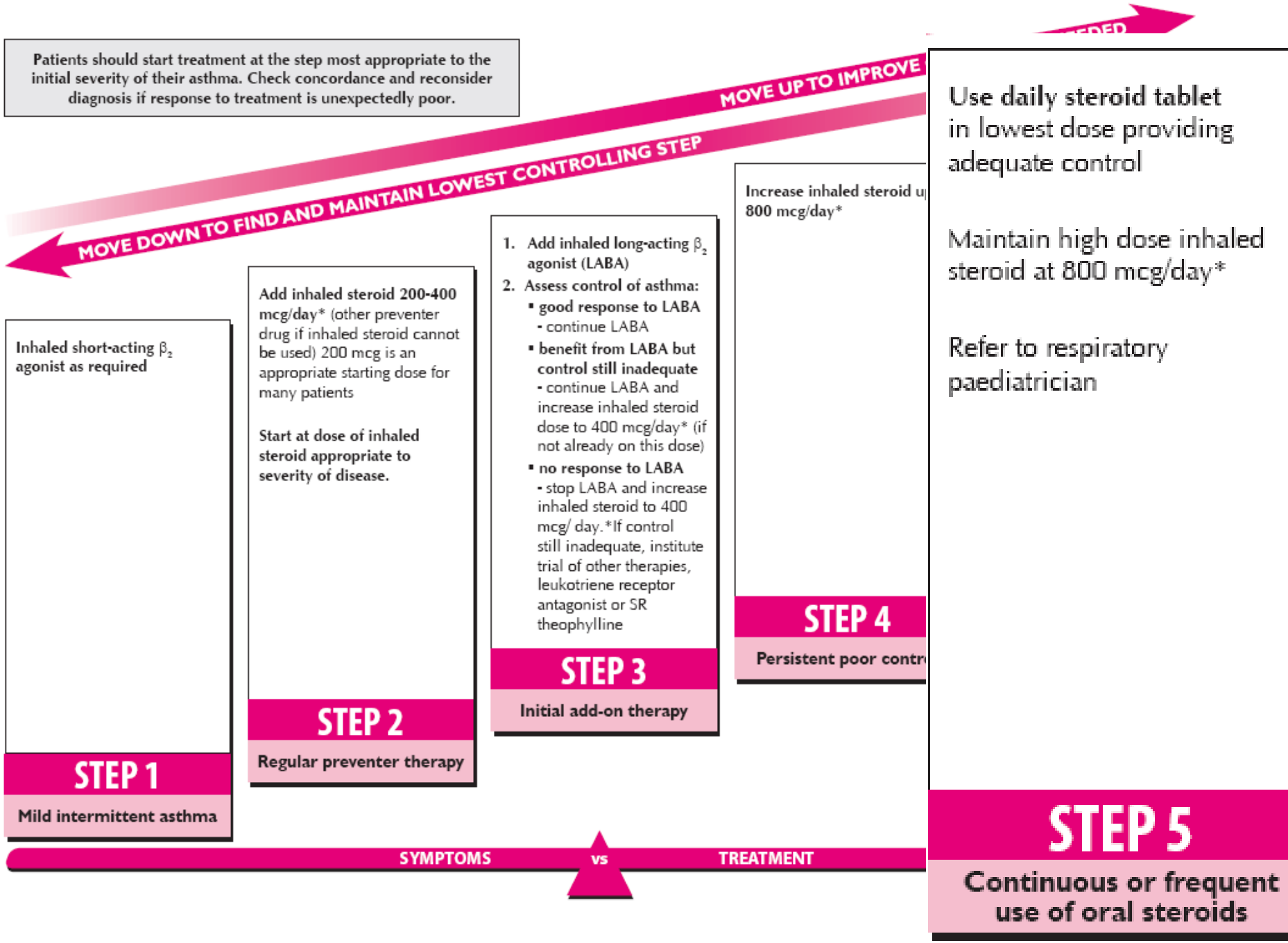
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MOVE UP TO IMPROVE
MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTROLLING STEP
Inhaled short-acting β2 agonist as required
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Refer to respiratory paediatrician
STEP 5
Continuous or frequent use of oral steroids
SYMPTOMS
vs
TREATMENT

Children Less than 5 yrs

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE UP TO IMPROVE CONTROL AS NEEDED

MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTROLLING STEP

STEP 1

Mild intermittent asthma

Inhaled short-acting β_2 agonist as required

STEP 2

Regular preventer therapy

Add inhaled steroid 200-400 mcg/day*†
or leukotriene receptor antagonist if inhaled steroid cannot be used.

Start at dose of inhaled steroid appropriate to severity of disease.

STEP 3

Initial add-on therapy

In those children taking inhaled steroids 200-400 mcg/day consider addition of leukotriene receptor antagonist.

In those children taking a leukotriene receptor antagonist alone reconsider addition of an inhaled steroid 200-400 mcg/day.

In children under 2 years consider proceeding to step 4.

STEP 4

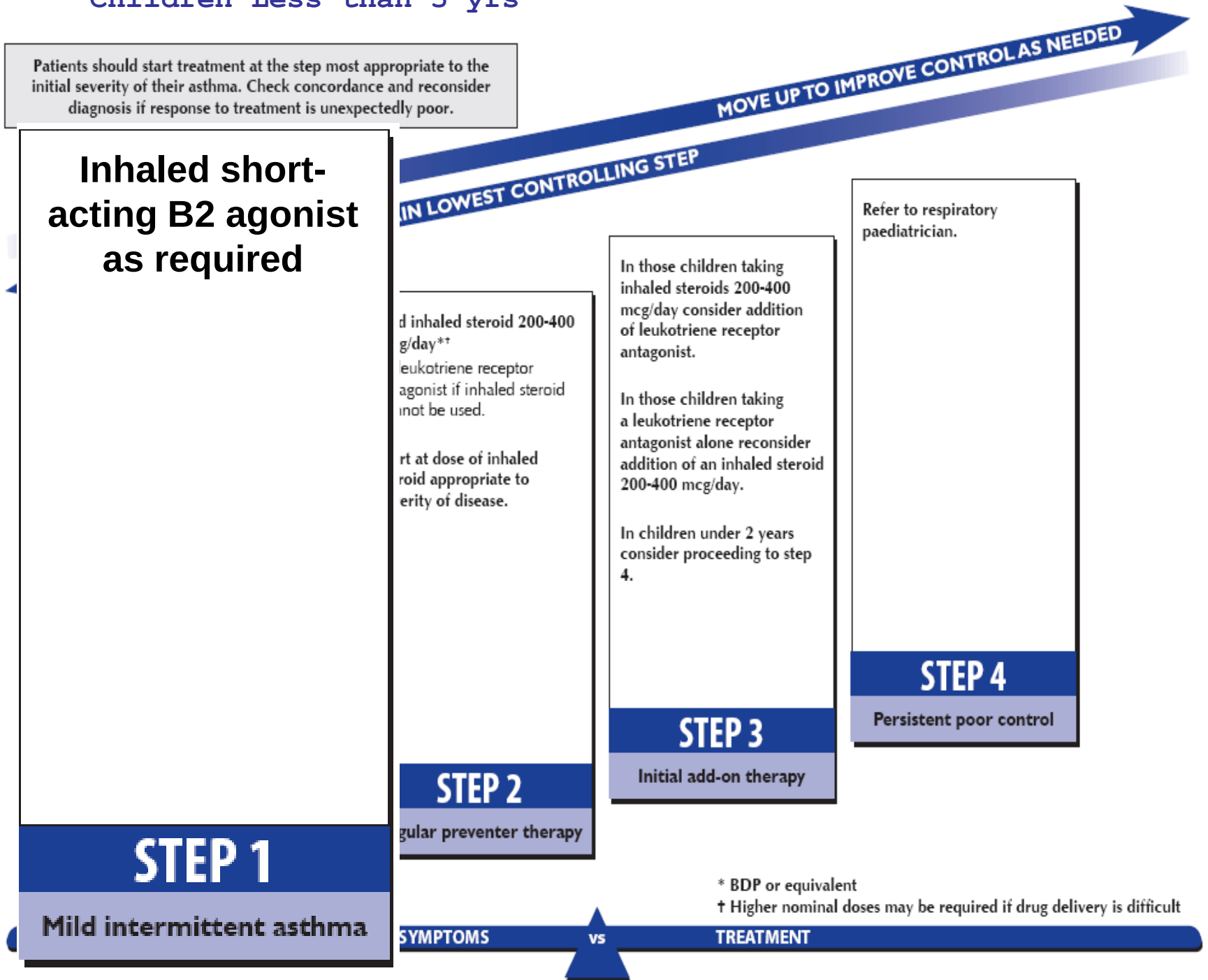
Persistent poor control

Refer to respiratory paediatrician.

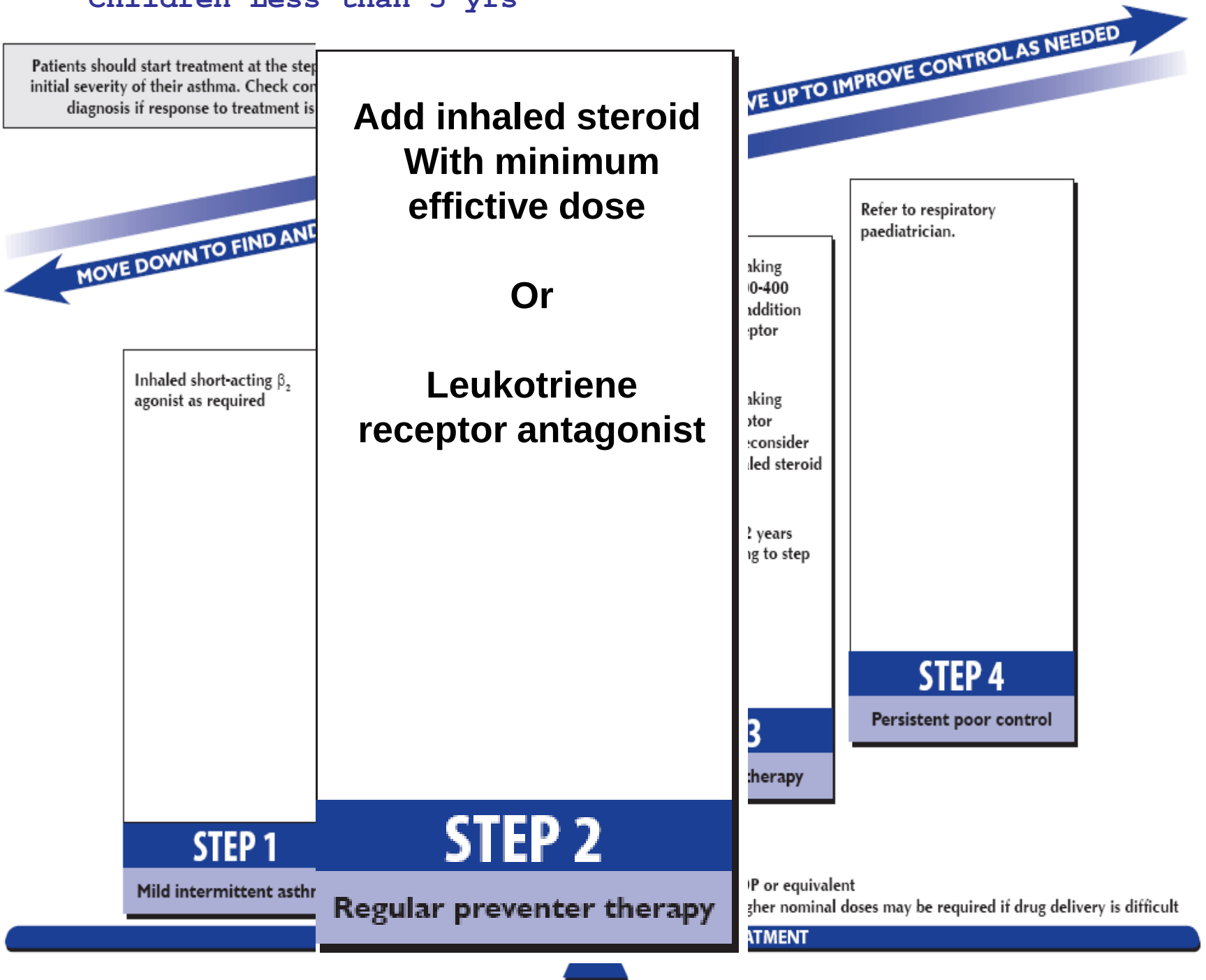
* BDP or equivalent
† Higher nominal doses may be required if drug delivery is difficult

SYMPTOMS vs TREATMENT

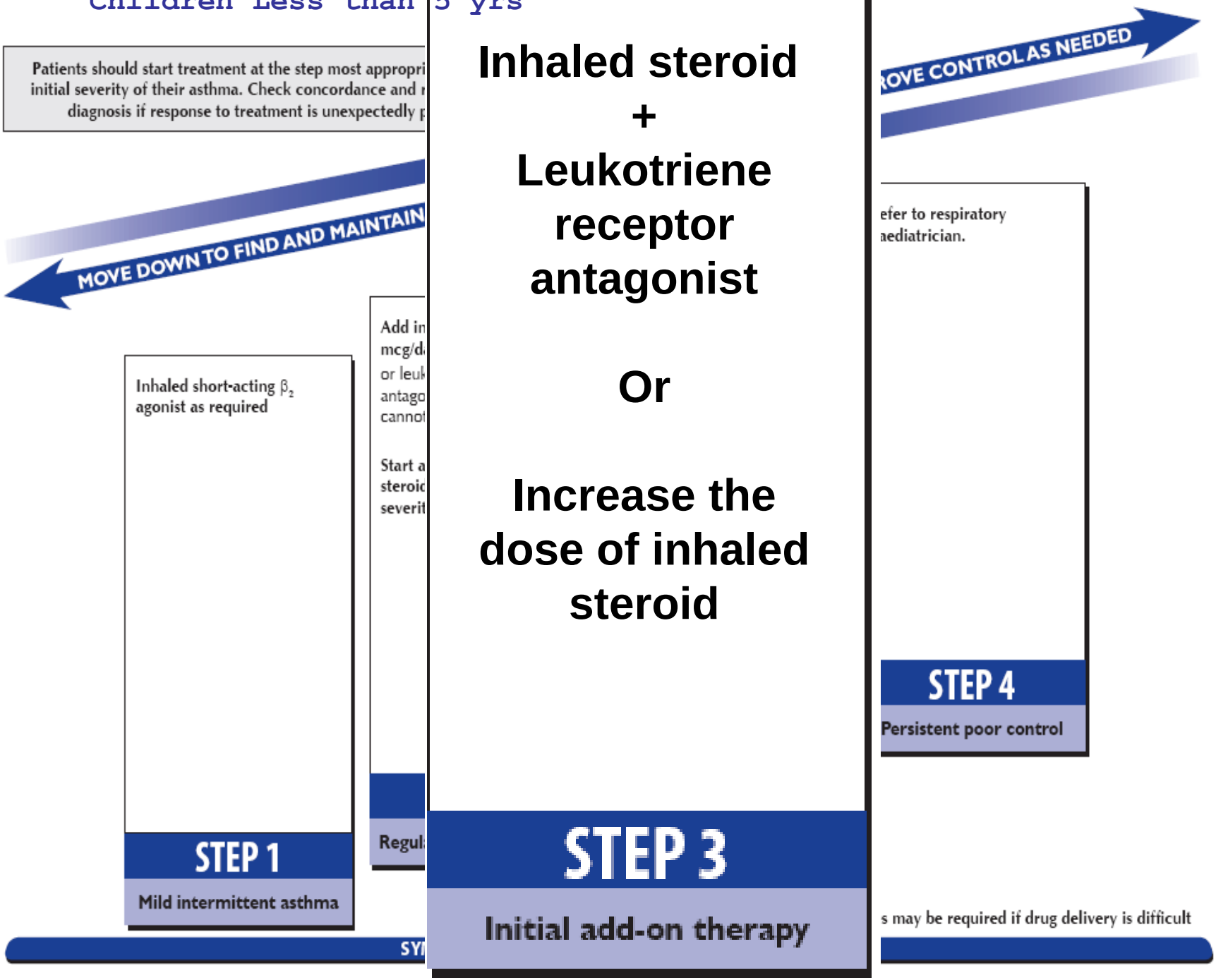
Children Less than 5 yrs



Children Less than 5 yrs



Children Less than 5 yrs



Children Less than 5 yrs

Patients should start treatment at the step most appropriate to the initial severity of their asthma. Check concordance and reconsider diagnosis if response to treatment is unexpectedly poor.

MOVE UP TO I

MOVE DOWN TO FIND AND MAINTAIN LOWEST CONTROLLING STEP

STEP 1

Mild intermittent asthma

Inhaled short-acting β_2 agonist as required

STEP 2

Regular preventer therapy

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Start at dose of inhaled steroid appropriate to severity of disease.

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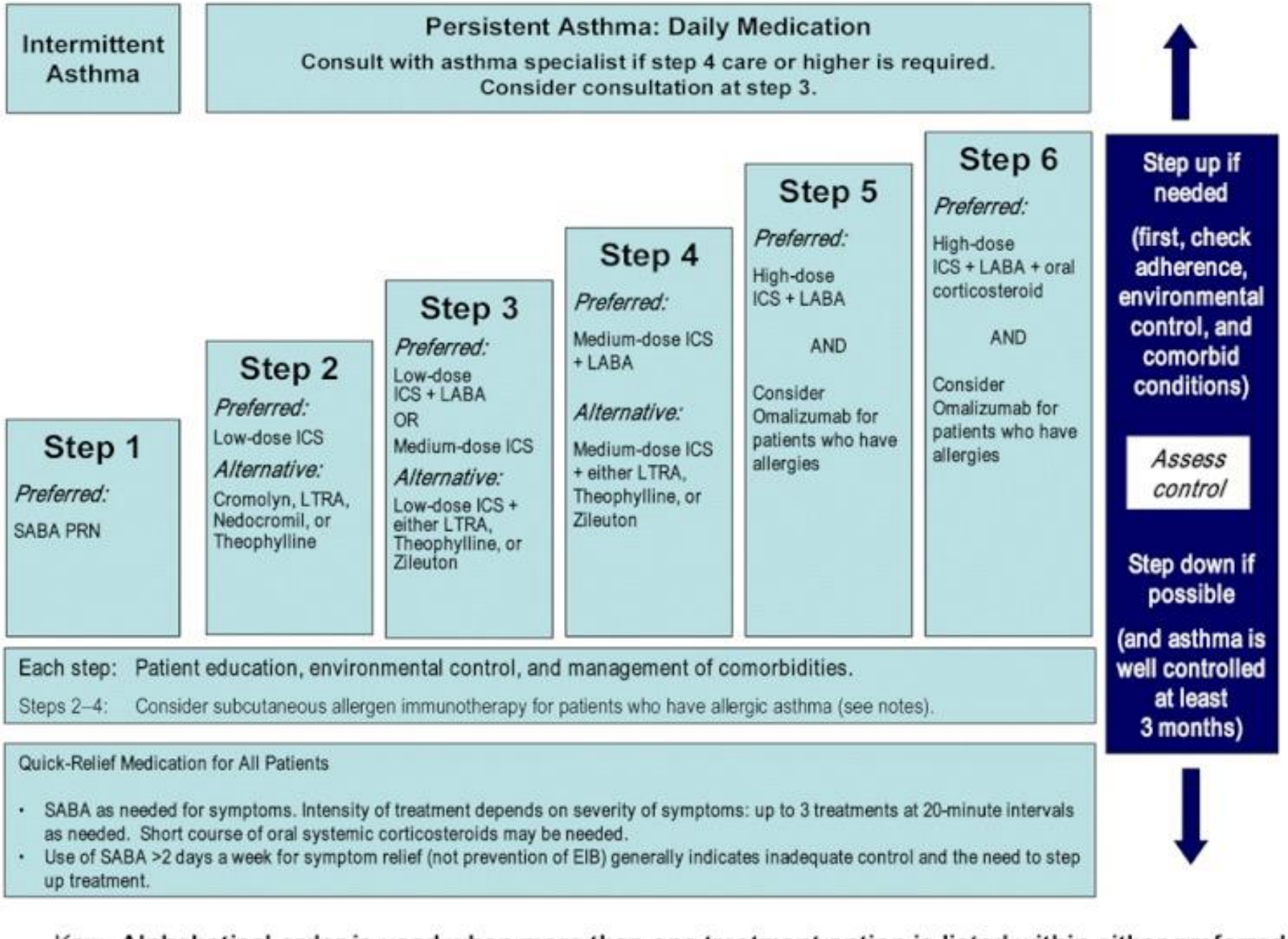
SYMPTOMS vs TREATMENT



— Key: **Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy.** EIB, exercise-induced bronchospasm; ICS, inhaled corticosteroid; LABA, long-acting inhaled beta$_2$-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta$_2$-agonist

GINA assessment of symptom control

A. Symptom control		Level of asthma symptom control		
In the past 4 weeks, has the patient had:		**Well-controlled**	**Partly controlled**	**Uncontrolled**
• Daytime asthma symptoms more than twice a week?	Yes☐ No☐	None of these	1-2 of these	3-4 of these
• Any night waking due to asthma?	Yes☐ No☐			
• Reliever needed for symptoms* more than twice a week?	Yes☐ No☐			
• Any activity limitation due to asthma?	Yes☐ No☐			

B. Risk factors for poor asthma outcomes

- Assess risk factors at diagnosis and periodically
- Measure FEV_1 at start of treatment, after 3 to 6 months of treatment to record the patient's personal best, then periodically for ongoing risk assessment

ASSESS PATIENT'S RISKS FOR:

- Exacerbations
- Fixed airflow limitation
- Medication side-effects

Plan Aksyon Massachusetts Pou Maladi Opresyon

Non:		Dat:
Dat pasyan an fèt:	Non Doktè/Enfimyè an:	Nimewo telefòn Doktè/Enfimyè:
Objektif Pasyan an:	Non Paran/Gadyen ak Telefòn li:	
Enpòtan! Evite tout sa ki ka fè opresyon w lan vin pi mal:		

Pi gwo vitès ou pouse lè sot nan poumon w: _____

Koulè yon limyè trafik ap ede w itilize medikaman pou opresyon w lan.

VÈT se Zòn kote nou avanse!
Sèvi ak medikaman Kontwòl la.

JÒN se Zòn Prekosyon!
Ajoute medikaman ki soulaje rapidman.

WOUJ se Zòn Danje!
Chèche èd yon doktè.

PASE ANNAKSYON — Se trè byen!

Ou *gen* tout sa yo:

- Ou respire byen
- Ou pa touse osnon ou pa gen pwoblèm pou ou respire
- Ou dòmi tout nannuit
- Ou kapab ale lekòl epi jwe

Sèvi ak medikaman ki kontwòle chak jou yo:

Vitès ou pouse lè ant	MEDIKAMAN/WOUT	KANTITE	KONBYEN FWA/KILÈ
ak			

ATANSYON — Fè yon ralanti!

Ou gen *nenpòt* nan sa yo:

- Premye sentòm grip yo
- Sitiyasyon ki ka deklannche maladi a
- Tous
- Respirasyon difisil men ki pa grav
- Pwatrin sere
- Tous, respirasyon ak nen bouche osnon difikilte pou respire nannuit

Kontinye pran medikaman ki nan zòn vèt la epi ajoute:

Vitès ou pouse lè ant	MEDIKAMAN/WOUT	KANTITE	KONBYEN FWA/KILÈ
ak			

RELE DOKTÈ/ENFIMYÈ W: _____

DANJE — Chèche èd!

Opresyon w lan ap anpire vit:

- Medikaman pa bay bon rezilta
- Respirasyon difisil, respirayon rapid
- Twou nen w louvri byen gran
- Zo kòt ou parèt
- Ou pa ka pale byen

Pran medikaman sa yo epi rele doktè w koulye a.

Vitès ou pouse lè ant	MEDIKAMAN/WOUT	KANTITE	KONBYEN FWA/KILÈ
ak			

CHÈCHE ÈD YON DOKTÈ KOULYE A! Pa pè fè bri. Doktè w pral bezwen wè w sanpèdi tan. Pa bliye! Si w pa ka kontakte doktè w, ale toudwat nan saldijans epi mache ak fòm sa a. PA RETE TANN.

Pran yon randevou pou ou wè doktè/enfimyè w sou de (2) jou aprè vizit ou nan saldijans lan oswa apre ou fin al lopital.

Doktè/NP/Pa siyen: _____ DAT _____

Mwen bay pèmisyon pou enfimyè lekòl, doktè/NP/PA pitit mwen osnon _____
pataje enfòmasyon osijè ka opresyon pitit mwen.

Paran/Gadyen siyen: _____ DAT _____

— WÈ DO PAJ KOPI BACK OF SCHOOL LA POU JWENN OTORIZASYON BAY ELÈV YO MEDIKAMAN —

ADAPTE DAPRE PIBLIKASYON NIH (7/20/01)

Make copies of this plan for: patient/parent, provider, and school.

أعراض الربو الوخيم

- سعال جاف متقطّع.
- تسرّع تنفس وتسرّع قلب.
- شحوب أو ازرقاق.
- صدر مفرط الانتفاخ.
- عسر تنفس حتى أثناء الراحة.
- عدم القدرة على اتمام جملة كاملة
- قد يصبح الصدر صامتاً مع الانسداد الوخيم جداً.
- FEV1 أقل من 50% من القيم الطبيعية المتوقّعة .
- يتناقص إشباع الأكسجين الشرياني .
- قد يحدث حماضاً استقلابيّاً وانخفاضاً في الضغط الجزيئي للأكسجين.

Assessment and management of acute asthma in adults in general practice

Moderate asthma	Acute severe asthma	Life threatening asthma
INITIAL ASSESSMENT		
PEF >50% best or predicted	PEF 33-50% best or predicted	PEF <33% best or predicted
FURTHER ASSESSMENT		
• Speech normal • Respiration <25 breaths/min • Pulse <110 beats/min	• Cannot complete sentences • Respiration ≥25 breaths/min • Pulse ≥110 beats/min	• SpO_2 <92% • Silent chest, cyanosis, or poor respiratory effort • Bradycardia, dysrhythmia or hypotension • Exhaustion, confusion or coma

Caution: *Patients with severe or life threatening attacks may not be distressed and may not have all the abnormalities listed. The presence of any should alert the doctor.*

Management of acute asthma. Thorax 2003; 58 (Suppl I): i1-i92

Management of acute severe asthma in adults in A&E

TIME

Measure peak expiratory flow (PEF) and arterial saturations

PEF >75% best or predicted
mild

PEF 33-75% best or predicted
moderate – severe

Features of severe asthma:
- PEF<50% best or predicted
- respiration ≥25 breaths/min
- pulse ≥110 beats/min
- cannot complete sentence in one breath

PEF <33% best or predicted

OR any **life threatening features**:
- SpO_2 <92%
- silent chest, cyanosis, or poor respiratory effort
- bradycardia, arrhythmia or hypotension
- exhaustion, confusion or coma

5 minutes

Give usual bronchodilator

Give salbutamol 5mg by oxygen-driven nebuliser

Obtain senior/ICU help now if any life-threatening features are present

15-30 minutes

Clinically stable and PEF >75%

Clinically stable and PEF <75%

No life threatening features and PEF 50-75%

Life threatening features or PEF<50%

IMMEDIATE MANAGEMENT
- High concentration of oxygen (>60% if possible)
- Give salbutamol 5mg plus ipratropium 0.5mg via oxygen-driven nebuliser
- AND prednisolone 40-50mg orally or IV

Repeat salbutamol 5mg nebuliser
Give prednisolone 40-50mg orally

MEASURE ARTERIAL BLOOD GASES

Markers of severity
- normal or raised $PaCO_2$ ($PaCO_2$>4.6 kPa; 35mm Hg)
- severe hypoxia (PaO_2<8 kPa; 60mm Hg)
- low pH (or high H^+)

60 minutes

Patient recovering and PEF >75%

No signs of severe asthma and PEF 50-75%

Signs of severe asthma or PEF <50%

- Give/repeat salbutamol 5mg with ipratropium 0.5mg by oxygen-driven nebuliser after 15 mins
- Consider continuous salbutamol nebuliser 5-10mg/hr
- Consider IV magnesium sulphate 1.2-2g over 20 minutes
- Correct fluid/electrolytes, especially K^+ disturbances
- Chest x-ray

Observe
monitor SpO_2, heart rate and respiratory rate

120 minutes

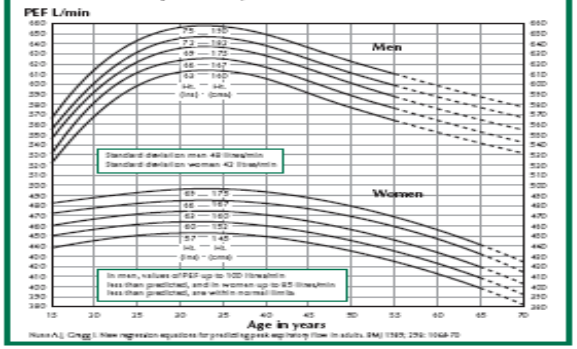
Patient stable and PEF >50%

Signs of severe asthma or PEF <50%

ADMIT
Patient should be accompanied by a nurse or doctor at all times

POTENTIAL DISCHARGE
- In all patients who received nebulised $ß_2$ agonists prior to presentation, consider an extended observation period prior to discharge
- If PEF <50% on presentation, prescribe prednisolone 40-50mg/day for 5 days
- In all patients, ensure treatment supply of inhaled steroid and $ß_2$ agonist and check inhaler technique
- Arrange GP follow up for 2 days post presentation
- Fax discharge letter to GP
- Refer to asthma liaison nurse/chest clinic

Peak expiratory flow in normal adults



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