ASTHMA MANAGEMENT

PRISE EN CHARGE DE L'ASTHME

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DISCLOSURES DIVULGATIONS

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Diagnosis of Asthma

- This can actually be a tricky diagnosis to make
- Classically, we have the constellation of symptoms- cough, wheeze, chest tightness, shortness of breath, classically episodic, may be allergy/exposure, exercise, weather triggered
- Are there sinonasal symptoms? Atopic Symptoms?
- Nocturnal symptoms- cough, wheeze, dyspnea, chest tightness are important differentiating factors, and are a hallmark of asthma
- Reversible airflow obstruction--- except, not always

Diagnostic de l'asthme

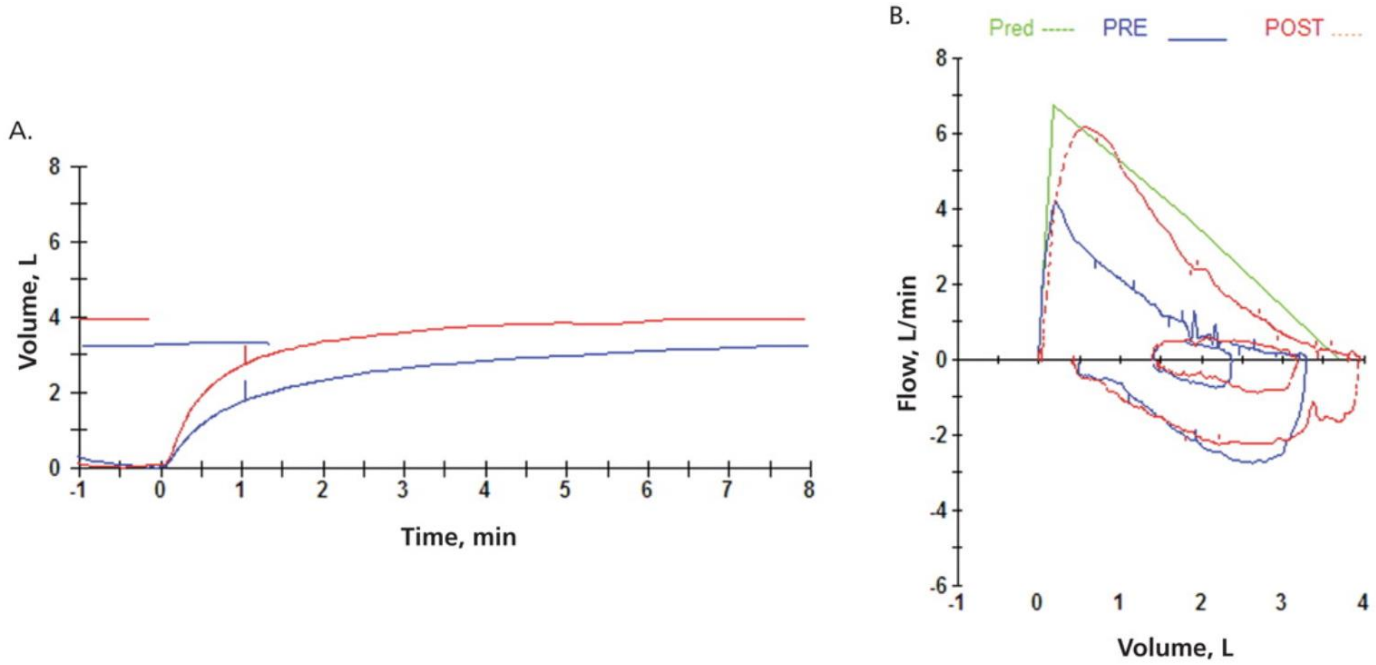
- Ce diagnostic peut s'avérer délicat à établir.
- Typiquement, nous avons une panoplie de symptômes – toux, respiration sifflante, oppression thoracique, essoufflement, classiquement épisodiques, qui peuvent être liés à une allergie/exposition, à l'activité physique, à la température.
- Y a-t-il des symptômes naso-sinusiens? Des symptômes atopiques?
- Les symptômes nocturnes – toux, respiration sifflante, dyspnée, oppression thoracique – constituent d'importants facteurs de différenciation, caractéristiques de l'asthme.
- Obstruction réversible des voies respiratoires – pas toujours, cependant.

A NOTE ON REVERSIBLE AIRFLOW OBSTRUCTION

- Although this is the classic teaching, it isn't always present
- Classically- pre-bronchodilator airflow obstruction, which resolves post-bronchodilator, with a complete response to bronchodilators (12% AND 200 mls)
- Chronic asthma can lead to a component fixed airflow obstruction.
- Sometimes, the spirometry can even look like COPD…
- This is where the historical features come in handy- don't forget smoking history
- Generally, COPD has at least a 15 pack year history. Smoking for a few years early in life is generally not enough to cause COPD

REMARQUE CONCERNANT L'OBSTRUCTION RÉVERSIBLE DES VOIES RESPIRATOIRES

- Bien qu'il s'agisse de l'enseignement classique, cette obstruction n'est pas toujours présente.
- Typiquement – obstruction des voies respiratoires avant l'utilisation d'un bronchodilatateur, qui se résout après bronchodilatateur, avec réponse complète aux bronchodilatateurs (12 % ET 200 ml)
- L'asthme chronique peut entraîner une obstruction fixe des voies respiratoires.
- Parfois, la spirométrie peut même évoquer une BPCO…
- C'est là que les antécédents se révèlent utiles – n'oubliez pas les antécédents de tabagisme.
- En général, la BPCO est associée à la consommation d'au moins 15 paquets/an. Fumer pendant quelques années en début de vie n'est généralement pas suffisant pour développer une BPCO.



C.

Spirometry measure	Predicted	Before bronchodilator		After bronchodilator		% change
		Best	% of predicted	Best	% of predicted	
FVC, L	3.70	3.30	89	3.95	107	20
FEV_1, L	2.94	1.80	61	2.76	94	53
Ratio FEV_1/FVC, %	80	55	NA	70	NA	NA

Figure 1: Spirometry results for a patient with asthma: volume–time curves (A), flow–volume loops (B) and data table (C). Obstruction is indicated by the ratio of forced expiratory volume in 1 second (FEV1) to forced vital capacity (55%); significant reversibility is indicated by the improvement in FEV1 after administration of bronchodilator (0.96 L or 53%). These results are diagnostic for asthma.

THERE ARE OTHER DIAGNOSTIC METHODS

IL EXISTE D'AUTRES MÉTHODES DE DIAGNOSTIC

Table 1. Diagnosis of asthma.

CLINICAL HISTORY COMPATIBLE WITH ASTHMA
Paroxysmal or persistent symptoms such as dyspnea, chest tightness, wheezing, sputum production, and cough
and
CONFIRMATION OF REVERSIBLE AIRFLOW OBSTRUCTION

	Children (1-5 years of age)	Children (6 years of age and over)	Adults (18 years of age and over)
Preferred	Documentation by trained health care provider of wheeze and other signs of airflow obstruction with documented improvement with SABA +/- oral corticosteroids	Spirometry showing reversible airflow obstruction $FEV_1/FVC < LLN$ (<0.8-0.9[a]) AND increase in FEV_1 after a bronchodilator or after a course of controller therapy of ≥12%	Spirometry showing reversible airflow obstruction $FEV_1/FVC < LLN$ (<0.75-0.8[a]) AND increase in FEV_1 after a bronchodilator or after a course of controller therapy of ≥12% and a minimum of ≥200mL
Alternative	Convincing caregiver report of wheezing or other symptoms of airflow obstruction with symptomatic response to a 3-month trial of a medium dose of ICS and as needed SABA or symptomatic response to SABA[b]	Peak expiratory flow ≥20% increase after a bronchodilator or after a course of controller therapy[c]	Peak expiratory flow 60L/min (minimum ≥20%) increase after a bronchodilator or after a course of controller therapy[c] OR Diurnal variation >8%[12] based on twice daily readings; >20% based on multiple daily readings[d]
Alternative		Positive challenge test Methacholine PC_{20} <4 mg/ml or PD_{20} <0.5 µmol (100 mcg) PC_{20} 4-16 mg/mL or PD_{20} 0.2-2 µmol (100-400 mcg) is borderline PC_{20} >16 mg/mL or PD_{20} >2 µmol (>400 mcg) is negative[13] OR Exercise challenge with ≥10-15% decrease in FEV_1 post-exercise	

UNFORTUNATELY

- Many other methods- methacholine challenge, exercise testing are very difficult to access in NS especially, and remain specialty access only in many areas

MALHEUREUSEMENT

- De nombreuses autres méthodes – test de bronchoprovocation à la méthacholine, épreuve d'effort – sont très difficiles d'accès, en particulier en Nouvelle-Écosse, et demeurent exclusivement accessibles aux spécialistes dans de nombreuses régions.

PEARL #1

- If it seems like asthma clinically, and even if spirometry is normal, it is generally still worth a trial of asthma therapy
- Spirometry can be normal for a few reasons
- Aeroallergen is no longer present
- Exposure/Trigger has passed
- Asthma is classically intermittent
- -> All of this being said….say we are treating for cough, if no response to asthma treatment, withdrawal of therapy can and should be done

PERLE N° 1

- Si la présentation clinique évoque l'asthme, même si la spirométrie est normale, il vaut généralement la peine d'essayer un traitement contre l'asthme.
- La spirométrie peut être normale pour plusieurs raisons.
- L'aéroallergène n'est plus présent.
- L'exposition/le déclencheur sont passés.
- L'asthme est généralement intermittent.
- -> Tout cela étant dit… supposons que nous traitions la toux, si le traitement de l'asthme n'engendre aucune réponse, il peut – et doit – être interrompu.

MIMICS

- There are a few other disease states that can mimic asthma
- EGPA
- Chronic Sinus Disease
- Chronic Cough
- Acid Reflux
- Anxiety
- Vocal Cord Dysfunction

AFFECTIONS SIMILAIRES

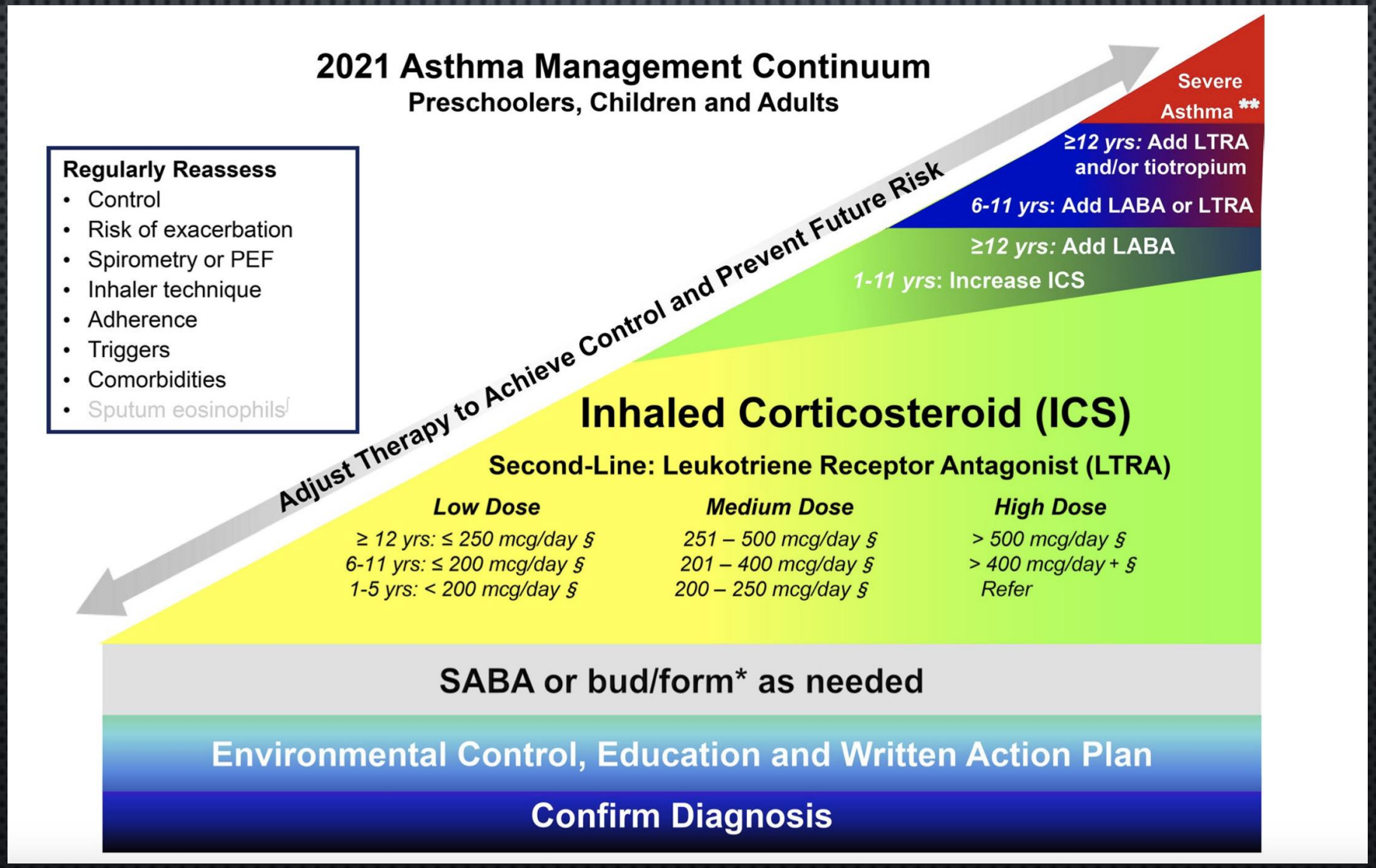
- Il existe un certain nombre d'autres affections de présentation similaire à celle de l'asthme :
- Granulomatose éosinophile avec polyangéite (GEPA)
- Maladie chronique des sinus
- Toux chronique
- Reflux acide
- Anxiété
- Dysfonctionnement des cordes vocales

Comorbid Conditions

- Nasal Polyps
- Eczema/Atopic Dermatitis
- Chronic Sinus Symptoms
- Food Allergies
- GERD
- OSA
- Anxiety

Affections comorbides

- Polypes nasaux
- Eczéma/dermatite atopique
- Symptômes sinusaux chroniques
- Allergies alimentaires
- GERD
- Apnée obstructive du sommeil
- Anxiété


2021 Asthma Management Continuum
Preschoolers, Children and Adults
Regularly Reassess
• Control
• Risk of exacerbation
• Spirometry or PEF
• Inhaler technique
• Adherence
• Triggers
• Comorbidities
• Sputum eosinophils
Adjust Therapy to Achieve Control and Prevent Future Risk
Severe Asthma **
≥12 yrs: Add LTRA and/or tiotropium
6-11 yrs: Add LABA or LTRA
≥12 yrs: Add LABA
1-11 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 §
1-5 yrs: < 200 mcg/day §
Medium Dose
251 – 500 mcg/day §
201 – 400 mcg/day §
200 – 250 mcg/day §
High Dose
> 500 mcg/day §
> 400 mcg/day + §
Refer
SABA or bud/form* as needed
Environmental Control, Education and Written Action Plan
Confirm Diagnosis

A FEW NOTES

- This slide is outdated
- Historically tiotropium (specifically Respimat device) was the only indicated LAMA in Asthma (Spiriva Respimat)
- Now, both glycopyrronium (Enerzair) and umeclidnium (Trelegy 200mcg) are both indicated and used in asthma
- I can't overemphasize the importance of trigger avoidance, control, adherence and technique
- No treatment will be effective if incorrectly or not used….
- And treatments will be less effective with ongoing triggers- smoking, pets…
- Steroid dose escalation is felt to be less important than adding a second controller

QUELQUES REMARQUES

- Cette diapositive est obsolète.
- Historiquement, le tiotropium (plus précisément le dispositif Respimat) était le seul AMLA indiqué dans le traitement de l'asthme (Spiriva Respimat).
- Aujourd'hui, le glycopyrronium (Enerzair) et l'uméclidinium (Trelegy 200 mcg) sont tous deux indiqués et utilisés.
- Je ne saurais trop insister sur l'importance de l'évitement des déclencheurs, du contrôle, de l'observance du traitement et de la technique.
- Aucun traitement ne sera efficace s'il est mal utilisé, ou non utilisé…
- De plus, les traitements seront moins efficaces en présence de déclencheurs permanents – tabagisme, animaux domestiques…
- L'augmentation de la dose de stéroïdes est jugée moins importante que l'ajout d'un deuxième médicament de contrôle.

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ASTHMA INHALED MEDICATIONS

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Corticosteroids

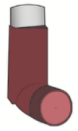
ICS
(Inhaled Corticosteroid)
Controller

Aermony Respiclick™
(fluticasone propionate)
55; 113; 232 mcg/actuation

Duration: 12h
Company: TEVA

Asmanex™ Twisthaler™
(mometasone furoate)
100; 200; 400 mcg/actuation

Duration: 24h
Company: Organon



Alvesco® MDI
(ciclesonide)
100; 200 mcg/actuation

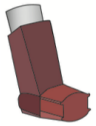
Duration: 24h
Company: Covis

Flovent® Diskus®
(fluticasone propionate)
100; 250; 500 mcg/blister

Duration: 12h
Company: GSK

Arnuity™ Ellipta®
(fluticasone furoate)
100; 200 mcg/actuation

Duration: 24h
Company: GSK



Flovent® MDI
(fluticasone propionate)
50; 125; 250 mcg/actuation

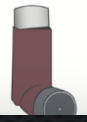
Duration: 12h
Company: GSK

Company Key

AZ - AstraZeneca Canada Inc.
Bausch - Bausch Health Canada Inc.
BI - Boehringer Ingelheim Canada Ltd.
Covis - Covis Pharma
GSK – GlaxoSmithKline Inc.
Novartis – Novartis Pharmaceuticals Canada Inc.
Organon - Organon Canada Inc.
Takeda – Takeda Canada Inc.
TEVA – TEVA Canada
Valeo – Valeo Pharma Inc.

Pulmicort® Turbuhaler®
(budesonide)
100; 200; 400 mcg/actuation

Duration: 12h
Company: AZ
*nebules also available

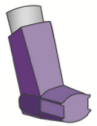


Qvar™ MDI
(beclomethasone dipropionate)
50; 100 mcg/actuation

Duration: 12h
Company: Bausch

Combination Inhalers

ICS/LABA
(Inhaled Corticosteroid and Long-Acting Beta2-Agonist)
Controller



Advair® MDI
(fluticasone propionate /salmeterol xinafoate)
125/25; 250/25 mcg/actuation

Duration: 12h
Company: GSK

Advair® Diskus®
(fluticasone propionate/ salmeterol xinafoate)
100/50; 250/50; 500/50 mcg/blister

Duration: 12h
Company: GSK

Atectura® Breezhaler®
(indacaterol/ mometasone furoate)
150/80; 150/160; 150/320 mcg/capsule

Duration: 24h
Company: Valeo

Breo™ Ellipta®
(fluticasone furoate/ vilanterol trifenatate)
100/25; 200/25 mcg/actuation

Duration: 24h
Company: GSK

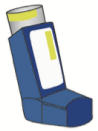
*May also be used as a reliever

Symbicort® Turbuhaler®
(budesonide/ formoterol fumarate)
100/6*; 200/6*; 400/12 mcg (FORTE) mcg/actuation

Duration: 12h
Company: AZ

Wixela® Inhub®
(fluticasone priopionate/ salmeterol xinafoate)
100/50; 250/50; 500/50 mcg/actuation

Duration: 12h
Company: Viatris



Zenhale™ MDI
(mometasone furoate/ formoterol fumarate)
100/5; 200/5 mcg/actuation

Duration: 12h
Company: Organon

ICS/LAMA/LABA

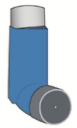
Enerzair® Breezhaler®
(indacaterol / glycopyronium mometasone furoate)
150/50/160 mcg/capsule

Duration: 24h
Company: Valeo

Trelegy™ Ellipta™
(fluticasone furoate/ umeclidinium / vilanterol)
100/62.5/25; 200/62.5/25 mcg/actuation

Bronchodilators

SABA
(Short-Acting Beta2-Agonist)
Reliever



Airomir™ MDI
(salbutamol sulphate)
100 mcg/actuation

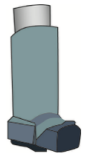
Duration: 3-6h
Company: Bausch

Bricanyl® Turbuhaler®
(terbutaline sulphate)
0.5 mcg/actuation

Duration: 4-7h
Company: AZ

Ventolin® Diskus®
(salbutamol sulphate)
200 mcg/blister

Duration: 3-6h
Company: GSK



Ventolin® MDI
(salbutamol sulphate)
100 mcg/actuation

Duration: 4-6h
Company: GSK
*generic brands available

LABA
(Long-Acting Beta2-Agonist)
Controller
Never used on its own for asthma without an ICS

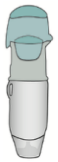
Oxeze® Turbuhaler®
(formoterol fumarate)
6; 12 mcg/actuation

Duration: 12h
Company: AZ

Serevent® Diskus®
(salmeterol xinafoate)
50 mcg/blister

Duration: 12h
Company: GSK

LAMA
(Long-Acting Muscarinic Antagonist)
Controller
*Never used on its own for asthma without an ICS



Spiriva® Respimat®
(tiotropium bromide monohydrate)
2.5 mcg/actuation

Duration: 24h
Company: BI

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Some more pearls

- Avoid mixing and matching inhalers
- Makes things confusing for patients and reduces adherence
- Makes proper technique a lot Less likely
- Patients are more likely to discontinue their ICS in favour of a LABA or LAMA when prescribed on it's own- which is dangerous. Do not recommend a LABA in isolation

Quelques perles supplémentaires

- Évitez de mélanger les inhalateurs.
- Cela risque d'engendrer de la confusion pour les patients, et réduit l'observance.
- Il est alors beaucoup moins probable qu'ils adoptent une bonne technique.
- Les patients sont plus susceptibles d'interrompre leur corticostéroïde en inhalation en faveur d'un bêta agoniste à longue durée d'action (BALA) ou d'un AMLA lorsque celui-ci est prescrit seul, ce qui est dangereux. Ne pas recommander un BALA de façon isolée.

A NOTE ON MONTELUKAST

- Although useful in the pediatric population, not as useful in adults
- Useful in Samter's Triad
- Can be helpful in cough variant asthma and exercise induced bronchospasm
- Can also be helpful as an additional controller, although I would chose a LAMA first

REMARQUE CONCERNANT LE MONTÉLUKAST

- Bien qu'utile dans la population pédiatrique, il ne l'est pas autant chez les adultes.
- Utile dans le traitement de la triade de Samter.
- Peut être utile dans les cas d'asthme tussif et de bronchospasme induit par l'exercice.
- Il peut également être utile en tant que médicament de contrôle supplémentaire, mais je choisirais d'abord un AMLA.

COMORBIDITY CONTROL

- Allergies
- GERD
- OSA
- All important

CONTRÔLE DES COMORBIDITÉS

- Allergies
- GERD
- Apnée obstructive du sommeil
- Toutes importantes

LAMAS

- Can be very useful as an additional controller
- Proven to reduce exacerbations and increase lung function
- Can cut down on cough
- Very useful in persistent dyspnea, but also any degree of fixed airflow obstruction, or hint of COPD

LES AMLA

- Peuvent être très utiles en tant que médicaments de contrôle supplémentaires.
- Efficacité éprouvée dans la réduction des exacerbations et l'augmentation de la fonction pulmonaire.
- Peuvent réduire la toux.
- Très utiles en cas de dyspnée persistante, mais aussi de tout degré d'obstruction fixe des voies respiratoires, ou soupçon de BPCO.

ON ASTHMA CONTROL CONTRÔLE DE L'ASTHME

Table 2. Well-controlled asthma criteria.

Characteristic	Frequency or value
Daytime symptoms	≤ 2 days/week
Nighttime symptoms	< 1 night/week and mild
Physical activity	Normal
Exacerbations	Mild and infrequent*
Absence from work or school due to asthma	None
Need for a reliever (SABA or bud/form)†	≤ 2 doses per week
FEV_1 or PEF	≥ 90% of personal best
PEF diurnal variation	< 10-15%#
Sputum eosinophils	< 2-3%•

Table 3. Assessing risk for severe exacerbation.

Individuals with any one of these risk factors are at higher risk for asthma exacerbation:
1. any history of a previous severe asthma exacerbation (requiring any of the following: systemic steroids, ED visit, or hospitalization) 2. poorly controlled asthma as per CTS criteria 3. overuse of SABA (defined as use of more than 2 inhalers of SABA in a year) 4. current smoker

These risk factors were chosen based on OR of >1.5 for severe exacerbations, certainty of the effect and ease of use in clinical practice.[1,14]

Table 4. Risk factors associated with severe asthma exacerbations.

Greatly increased risk (Odds Ratio (OR) > 2.5*)		
≥ 12 years of age	**6-11 years of age**	**< 6 years of age**
History of previous severe exacerbation	• History of previous severe exacerbation • Poorly-controlled asthma • FEV_1 < 60% predicted	• History of previous severe exacerbation
Moderate increased risk (OR 1.5-2.5*)		
• Poorly-controlled asthma • Excessive SABA use (> 2 inhalers/year[16]) • Current smoker**	• Excessive SABA use (> 2 inhalers/year) • Comorbid atopic/allergic disease • Low socioeconomic status • Vitamin D deficiency (< 30 nmol/L) • FEV_1 60-80% predicted	
Slightly increased risk (OR 1.1-1.5*)		
• Older age (especially > 55 years of age) • Female sex • FEV_1 < 70% predicted • Obesity • Previous smoker** • Depression	• Exposure to environmental tobacco smoke** • Younger age • Obesity • Low parental education	• Comorbid atopic/allergic disease • Raised blood eosinophils (> 300/μL) • Younger age • Low socioeconomic status • Male sex • Underweight

Table 5. Risk factors associated with near-fatal or fatal asthma.[19,20]

Any previous near-fatal asthma exacerbation (eg, previous intensive care unit (ICU) admission, ventilation, respiratory acidosis)
Recurrent hospitalizations or ED visits in last year
Severe asthma
Overuse of SABA
Poor adherence to treatment plans
Failure to attend clinic appointments
Depression, anxiety or other psychiatric illness
Alcohol or other substance use
Obesity
Severe domestic, marital, employment, local stress
Denial of illness or severity of illness

BEYOND INHALERS

- Chronic prednisone is often not the answer in asthma anymore
- We have great therapies- limited access of course- to prevent asthma exacerbations
- Biologic therapies- injectable, immunomodulatory therapy can prevent the need of going on prednisone
- These therapies were largely designed to get people off prednisone

AU-DELÀ DES INHALATEURS

- La prise de prednisone chronique n'est souvent plus la solution pour l'asthme.
- Nous disposons d'excellents traitements – d'accès limité, bien entendu – pour prévenir les exacerbations de l'asthme.
- Traitements biologiques – les traitements immunomodulateurs injectables peuvent éviter au patient d'avoir à prendre de la prednisone.
- Ces traitements ont été aussi été conçus, dans une large mesure, pour permettre aux patients de se passer de prednisone.

EXAMPLES INCLUDE

- Mepolizumab (Nucala)- anti-IL-5
- Benralizumab (Fasenra)- Anti-IL-5 RA
- Dupilumab (Dupixent)- Anti- IL4/13
- Tezepelumab (Tezspire)- Anti-TSLP
- Omalizumab (Xolair)- Anti-IgE

VOICI QUELQUES EXEMPLES

- Mépolizumab (Nucala) - anti-IL-5
- Benralizumab (Fasenra)- Anti-IL-5 RA*
- Dupilumab (Dupixent) - anti IL4-13
- Tezepelumab (Tezspire) - anti-TSLP
- Omalizumab (Xolair) - anti-IgE

- Eligible patients includes those who exacerbate frequently, requiring prednisone
- The first three- need high eosinophils, anti-TSLP does not
- Anti-IgE therapy requires elevated IgE and sensitization to a perennial allergen on skin prick testing

- Les patients admissibles sont ceux qui présentent une exacerbation fréquente, exigeant la prise de prednisone.
- Les trois premiers nécessitent un taux élevé d'éosinophiles, mais pas l'anti-TSLP.
- Le traitement anti-IgE nécessite des IgE élevées et la sensibilisation à un allergène apériodique lors d'un test de piqûre cutanée.

- These are designed to reduce prednisone requirements, and not symptom profile
- They often do improve symptom profile, and in selected patients, can even lead to remission
- They are expensive, but pharmacare coverage does exist
- These are life changing medications for patients
- If asthmatics are needing prednisone, there is something wrong. Need to reassess adherence, triggers, smoking, technique, and if a change in therapy needs to be made

- Ils sont conçus pour réduire les besoins en prednisone, et non le profil des symptômes.
- Ils améliorent souvent le profil des symptômes et, chez certains patients, peuvent même mener à une rémission.
- Ils sont chers, mais peuvent être couverts par l'assurance-médicaments.
- Ces médicaments changent la vie des patients.
- Si les asthmatiques ont besoin de prednisone, c'est que quelque chose ne va pas. Il faut alors réévaluer l'observance, les déclencheurs, le tabagisme, la technique et déterminer si un changement de traitement s'impose.

When to refer

- Asthmatics exacerbating and still symptomatic on maxmimal inhaled therapies
- Those requiring prednisone
- Asthmatics on Chronic Prednisone
- Please obtain a CBC with differential and an IgE
- Spirometry if available
- And a Chest X-ray

Quand procéder à un aiguillage

- Asthmatiques en exacerbation et toujours symptomatiques sous traitement inhalé maximal
- Ceux qui ont besoin de prednisone
- Asthmatiques sous prednisone chronique
- Obtenir une FSC avec différentiel et un dosage des IgE
- Spirométrie si disponible
- Et une radiographie du thorax

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