Asthma/COPD: sorting out all those inhalers

Pierre Ernst
Respiratory Physician
Jewish General Hospital

Disclosures

- I receive research funds from CIHR.
- I have not received any financial or in kind contributions from PHARMA in the last 8 years.
- Therefore, the opinions I express are my own.

Learning objectives

- To become familiar with the new combination inhalers for the treatment of asthma and COPD.
- To recognize when these inhalers are indicated according to current asthma and COPD treatment guidelines.
- To learn the challenges patients face in the use of each type of inhaler.


MÉDICATION INHALÉE ET DISPOSITIFS D'INHALATION
BRONCHODILATATEURS
AGONISTES BETA-2 À COURTE DURÉE D'ACTION
Salbutamol (sulfate)
Terbutaline (sulfate)
AGONISTES BETA-2 À LONGUE DURÉE D'ACTION
Formotérol (fumarate)
Indacatérol (maléate)
Salmétérol (xinafoate)
AIROMIR Aérosol-doseur 100 mcg
VENTOLIN HFA Aérosol-doseur 100 mcg
VENTOLIN Diskus 200 mcg
BRICANYL Turbuhaler 0,5 mg
FORADIL Aérolizer 12 mcg
OXEZE Turbuhaler 6 mcg
OXEZE Turbuhaler 12 mcg
ONBREZ Breezhaler 75 mcg
SEREVENT Diskus 50 mcg
ANTICHOLINERGIQUE À COURTE DURÉE D'ACTION
Ipratropium (bromure)
ANTICHOLINERGIQUES À LONGUE DURÉE D'ACTION
Aclidinium (bromure)
Glycopyrronium (bromure)
Tiotropium (bromure)
Uméclidinium (bromure)
ATROVENT HFA Aérosol-doseur 20 mcg
TUDORZA Genuair 400 mcg
SEEBRI Breezhaler 50 mcg
SPIRIVA Handihaler 18 mcg
SPIRIVA Respimat 2,5 mcg
INCRUSE Ellipta 62,5 mcg
CORTICOSTÉROÏDES INHALÉS
Béclométhasone (dipropionate)
Budésonide
Ciclésonide
Fluticasone (furoate)
QVAR Aérosol-doseur 50 mcg
QVAR Aérosol-doseur 100 mcg
PULMICORT Turbuhaler 100 mcg
PULMICORT Turbuhaler 200 mcg
PULMICORT Turbuhaler 400 mcg
ALVESCO Aérosol-doseur 100 mcg
ALVESCO Aérosol-doseur 200 mcg
ARNUITY Ellipta 100 mcg
ARNUITY Ellipta 200 mcg
Fluticasone (propionate)
Mométasone (furoate)
FLOVENT HFA Aérosol-doseur 50 mcg
FLOVENT HFA Aérosol-doseur 125 mcg
FLOVENT HFA Aérosol-doseur 250 mcg
FLOVENT Diskus 50 mcg
FLOVENT Diskus 100 mcg
FLOVENT Diskus 250 mcg
FLOVENT Diskus 500 mcg
ASMANEX Twisthaler 100 mcg
ASMANEX Twisthaler 200 mcg
ASMANEX Twisthaler 400 mcg
ASSOCIATIONS (DUO)
CORTICOSTÉROÏDES / AGONISTES BETA-2 À LONGUE DURÉE D'ACTION
Budésonide / Formotérol (fumarate)
Fluticasone (furoate) / Vilantérol (trifénatate)
Fluticasone (propionate) / Salmétérol (xinafoate)
SYMBICORT Turbuhaler 100/6 mcg
SYMBICORT Turbuhaler 200/6 mcg
BREO Ellipta 100/25 mcg
BREO Ellipta 200/25 mcg
ADVAIR Diskus 100/50 mcg
ADVAIR Diskus 250/50 mcg
ADVAIR Diskus 500/50 mcg
ADVAIR Aérosol-doseur 125/25 mcg
ADVAIR Aérosol-doseur 250/25 mcg
Mométasone (furoate)
Formotérol (fumarate)
ANTICHOLINERGIQUES / AGONISTES BETA-2 À LONGUE DURÉE D'ACTION
Aclidinium (bromure) Formotérol (fumarate)
Glycopyrronium (bromure) Indacatérol (maléate)
Tiotropium (bromure) Olodatérol (chlorhydrate)
Uméclidinium (bromure) Vilantérol (trifénatate)
ANTICHOLINERGIQUE / AGONISTE BETA-2 À COURTE DURÉE D'ACTION
Ipratropium (bromure)
Salbutamol (sulfate)
ZENHALE Aérosol-doseur 100/5 mcg
ZENHALE Aérosol-doseur 200/5 mcg
DUAKLIR Genuair 400/12 mcg
ULTIBRO Breezhaler 50/110 mcg
INSPIOLTO Respimat 2,5/2,5 mcg
ANORO Ellipta 62,5/25 mcg
COMBIVENT Respimat 20/100 mcg
ASSOCIATION (TRIO)
CORTICOSTÉROÏDE/ ANTICHOLINERGIQUE/ AGONISTE BÊTA-2 À LONGUE DURÉE D'ACTION
Fluticasone (furoate) / Uméclidinium (bromure) / Vilantérol (trifénatate)
TRELEGY Ellipta 100/62,5/25 mcg
BICL pour diffusion électronique.
Autorisation accordée le 1er avril 2019.
RQESR
solo
solo design

Newer ICS

ALVESCO 200

ARNUITY 100

ASMANEX 200

EQUIVALENT TO FLOVENT 125, PULMICORT 200; CAN ALL BE TAKEN ONCE A DAY

ICS ALONE CONTRA-INDICATED IN COPD!!!!!!!!!

Corticostéroides ihnalés (CSI)

- **Anti-inflammatoire**
- **Effets sec.: Enrouement et mal de gorge, candidose buccale.**

Table 1: Comparative inhaled corticosteroids (ICS) dosing categories in children, adolescents and adults

	Pediatric Daily ICS Dose (mcg) (6 to 11 years of age)			Adolescent and Adult Daily ICS Dose (mcg) (12 years of age and over)		
PRODUCT (Trade Name)	LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
Beclomethasone dipropionate HFA (QVAR®)	≤200	201–400[a]	>400[a]	≤250	251–500	>500
Budesonide* (Pulmicort® Turbuhaler®)	≤400	401–800	>800	≤400	401–800	>800
Ciclesonide* (Alvesco®)	≤200	201–400[a]	>400[a]	≤200	201–400	>400
Fluticasone propionate (Flovent® MDI and spacer; Flovent® Diskus®)	≤200	201–400	>400[a]	≤250	251–500	>500
Fluticasone furoate* (Arnuity® Ellipta®)	N/A	N/A	N/A	100		200
Mometasone furoate* (Asmanex® Twisthaler®)	100	≥200–<400	≥400[a]	100–200	>200–400	>400

NOTE: Dosing categories are approximate, based on a combination of approximate dose equivalency as well as safety and efficacy data rather than available product formulations. *Licensed for once daily dosing in Canada (a: Daily doses of beclomethasone dipropionate HFA>200 mcg/day, ciclesonide >200 mcg/day are not approved for children under age 12 years in Canada, and fluticasone >400 mcg/day is not approved for children under the age of 16 years in Canada [highlighted])

From CanadianRespiratory Guidelines 2018

LABA/ICS Combinations in COPD

- RE 172 to START
- RE 173 to RENEW
- (RE 41 remains for asthma to replace ICS)
- For patients with features suggestive of asthma (ACO) OR with continuing symptoms and exacerbations on LAMA therapy.
- My order of preference: (compatibility of inhaler techniques a strong consideration).
  - Symbicort200 2bid, Zenhale**100** 2 bid, Breo**100** qd

Why not prescribe LABA/ICS in COPD?

Side effects are significant:

- Severe pneumonia
- Mycobacterial infections
- Diabetes onset and progression
- Osteoporosis
- Adrenal insufficiency
- Cataracts

Inhaled corticosteroids in COPD: the clinical evidence

Pierre Ernst[1,2], Nathalie Saad[1] and Samy Suissa[2,3]

Affiliations: [1]Dept of Medicine, Pulmonary Division, Jewish General Hospital, Montreal, Canada. [2]Centre for

TABLE 2 Indicators of a probable response to inhaled corticosteroids in patients with chronic obstructive pulmonary disease

History of childhood asthma or atopy
Onset of respiratory disease prior to the age of 40 years
Cumulative smoking history <20 pack-years
FEV_1 bronchodilator response ⩾12% and ⩾400 mL
Normal diffusing capacity
Peripheral blood eosinophilia
Sputum eosinophilia
Not FEV_1 <50% predicted
Not history of frequent exacerbations

ERJ 2015

DOI: 10.1183/09031936.00128914

ICS/LABA

SYMBICORT 200

BREO 100

ONCE A DAY

ZENHALE 100

EQIVALENT TO ADVAIR 125 X2, ADVAIR DISKUS 250
SYMBICORT and ZENHALE can be used as SINGLE INHALER
FOR ASTHMA RE41; BREO 200 CONTRA-INDICATED IN COPD
FOR COPD RE172 NEW, RE173 RENEW

Long-Acting Anti-Cholinergics LAMAs

- First line as addition to short-acting beta-agonist ((salbutamol MDI or Ventilon Diskus for powder device (code RE113) or again Bricanyl))
- Spiriva Handihaler, Spiriva Respimat, Tudorza (bid), Incruse, Seebri.
- No code required.

LAMAs

SPIRIVA

2 INH DIE

INCRUSE

SEEBRI

TUDORZA

b.i.d.

1st line maintenance tx in COPD

LAMA/LABA combinations

- RE 176 to START
- RE 177 to RENEW
- For patients with continuing symptoms and/or exacerbations on single long-acting bronchodilator therapy BUT without characteristic suggestive of concurrent asthma.
- My order of preference: type of inhaler most important
  - Ultibro=Inspiolto=Anoro>Duaklir (not covered)
  - Once a day

LABA/LAMA

INSPIOLOTO

2 inh die

ULTIBRO

ANORO

RE176 NEW; RE177 RENEW. COPD ONLY

ICS-LABA-LAMA triple inhaler

Once a day

BREO 200 WILL SOON BE AVAILABLE FOR SEVERE ASTHMA
WILL BE CONTRA-INDICATED IN COPD

Problématique

Patient	Prof. santé	Dispositifs
• Dextérité • Limitation cognitive • Niveau éducationnel • Age • Croyances • Préférences • …	• Manque de temps • Manque personnel • Manque connaissances • Rx de différents inhalateurs simultanément • …	• Coordination • Force inspiratoire • Trop d'étapes • Demande éducation préalable • Multitude de dispositifs sur le marché • …

Catégories d'inhalateurs

Aérosol-doseur

- Inspiration lente & profonde et tenir 10s
- Privilégier utilisation avec chambre d'espacement:
  - Élimine la problème de coordination
  - Diminue la déposition oropharyngée
  - Alternative de technique à volume courant.

Bruine (soft mist)

- Préparation initiale
- TOP:
  - Tourner
  - Ouvrir
  - Presser
- Inspiration lente & profonde et tenir 10s.

Poudres sèches

- Inspiration rapide & profonde et tenir 10 s
- Préparation selon le type d'inhalateur
- Plusieurs étapes avec certains dispositifs
- Demande un débit inspiratoire élevé pour certains dispositifs (jusqu'à 60L/min)

Erreurs potentielles

Aerosol-doseur

- Préparation
- Manque de coordination
- Inhalation trop rapide ou superficielle
- Inhalation par le nez
- Ne pas retenir souffle post inhalation
- Inhalateur vide
- 2 inhalations à la fois
- Problème de dextérité (arthrite,..)

Chambre d'espacement

- Préparation
- Manque de coordination/dextérité
- Inhalation trop rapide ou superficielle
- Inhalation par le nez
- Ne retenir son pas souffle post inhalation
- Inhalateur vide
- 2 inhalations à la fois

Bruine sèche

- Mauvaise préparation de la dose
- Manque de coordination
  - Inhalation trop rapide ou superficielle
  - Inhalation par le nez
  - Ne retenir pas souffle post inhalation
  - Occlusion de trappes d'air

- Préparation initiale (Insertion capsule & amorçage) peut être difficile.
- Faire demande au pharmacien

Poudres sèches

- Débit inspiratoire insuffisant
- Expiration dans l'inhalateur
- Inhalation par le nez
- Ne retenir pas souffle post inhalation
- Agiter après préparation de la dose
- Occlusion de trappes d'air
- Avaler la capsule
- Inhalateur vide (sauf Genuair)
- Ne pas préparer la deuxième dose
- Mauvaise préparation de la dose

Poudres sèches: Différents mécanismes de préparation

Turbuhaler: À la verticale: tourner la base allez-retour

Twisthaler: Prêt dès qu'on retire couvert à la verticale

Compteur de doses

Ellipta : abaisser couvercle

Diskus: abaisser couvercle puis levier

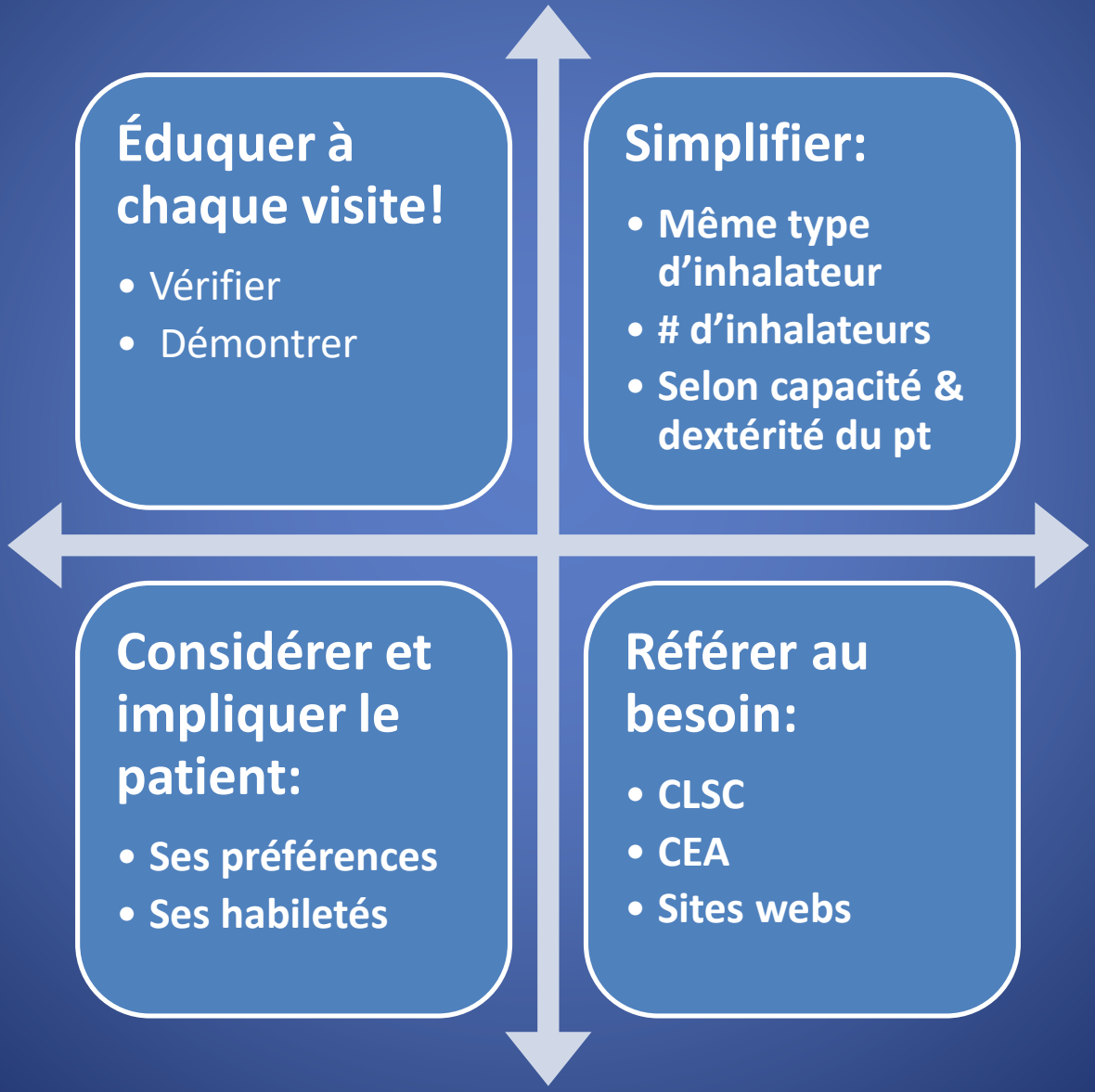
Genuair: Presser bouton de couleur; renforcement positif (bruit & couleur)

Compteurs de doses

Handihaler: et Breezhaler: insertion de capsule, pression d'un bouton pour percer la capsule

Capsule claire avec Breezhaler

Pas de solution magique mais…



Recommendations de GINA 2019

- Choose (Choisir)
- Check (Constater)
- Correct (Corriger)
- Confirm (Confirmer)

DRY POWDER INHALERS AS 1ST CHOICE

- Consider lower carbon footprint (1/20th) of DPI vs MDIs
- MDIs must be used with an aerochamber!
- INHALER TECHNIQUE NEEDS TO BE CHECKED AGAIN and AGAIN and AGAIN……..

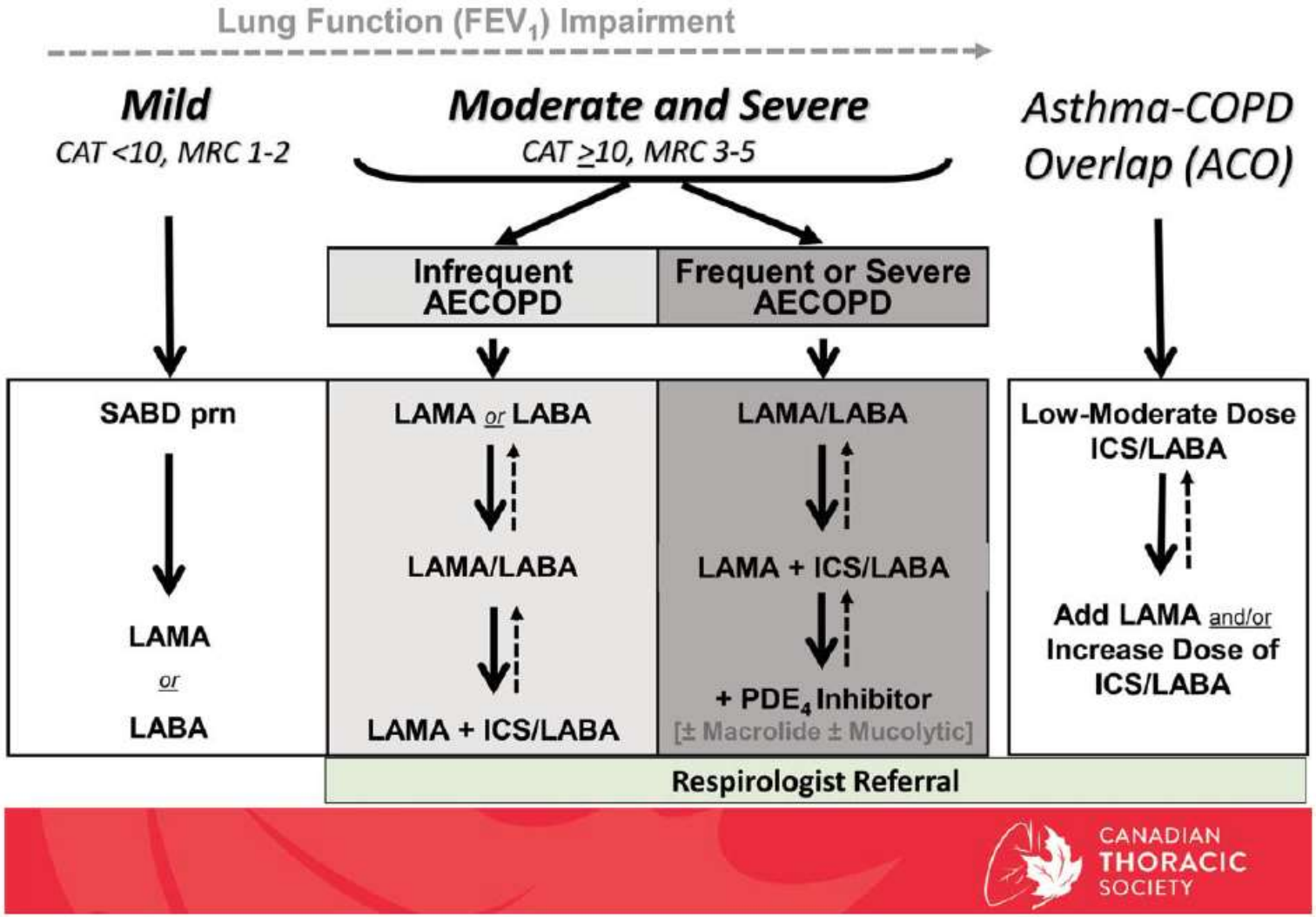
Vidéos sur techniques d'inhalations

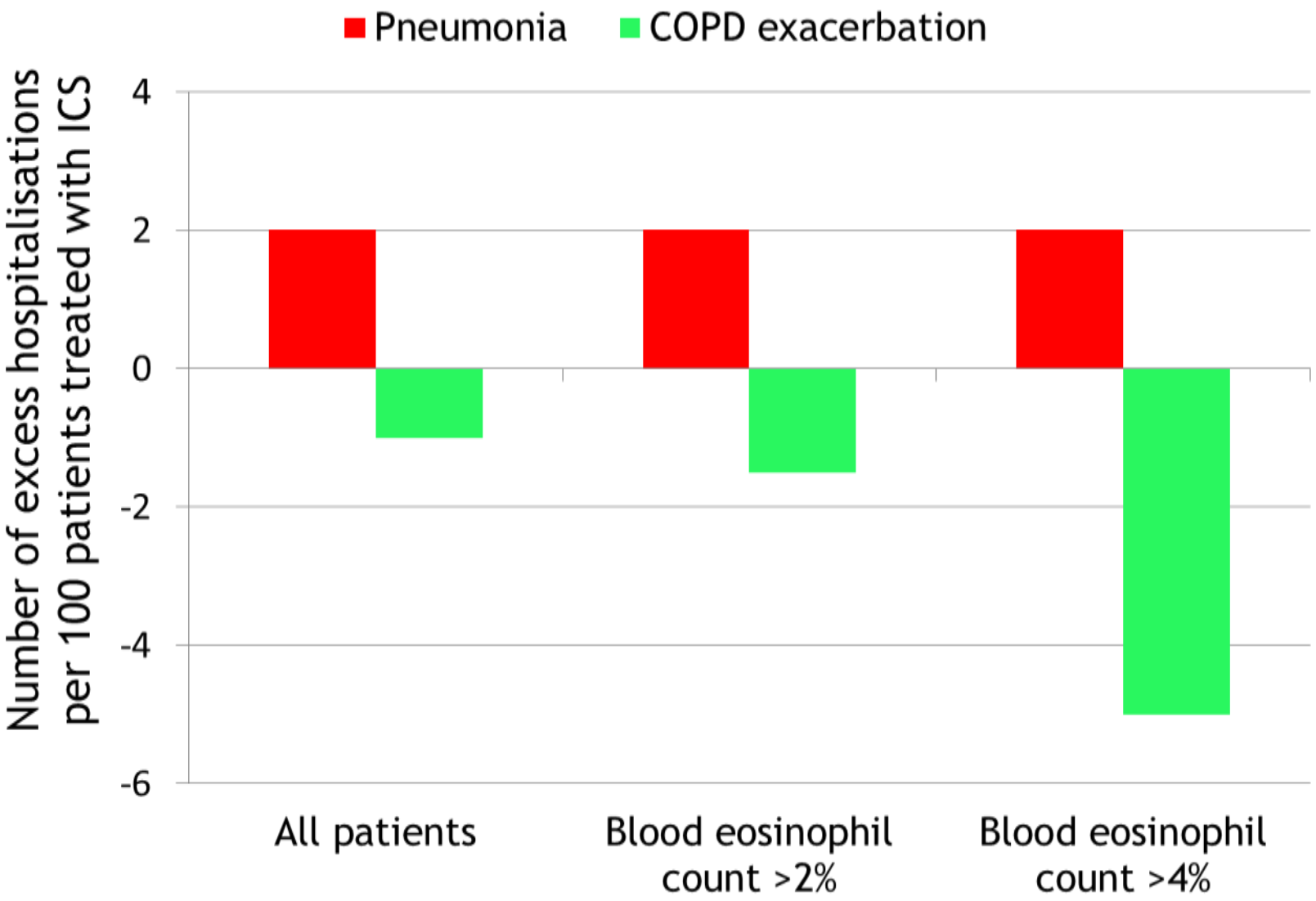
- **Association pulmonaire de l'Ontario:** www.on.lung.ca/inhalationdevicevideos

- Association pulmonaire canadienne: www.poumon.ca/santé-pulmonaire/demandez-de-laide/comment-utiliser-votre-inhalateur

- National Asthma Council Australia: www.nationalasthma.org.au/living-with-asthma/how-to-videos

J. BOURBEAU ET AL.



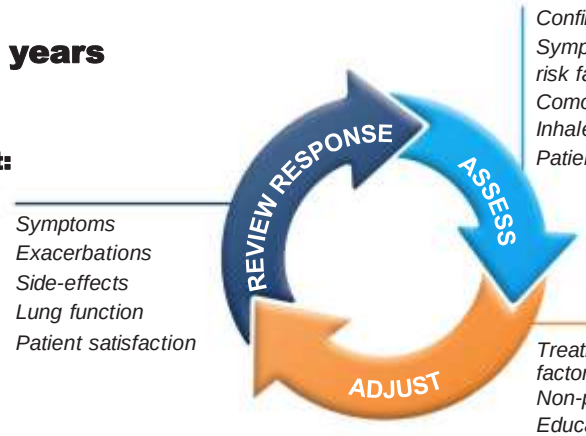


Suissa, Ernst. CHEST 2017

Box 3-5A

Adults & adolescents 12+ years

Personalized asthma management:
Assess, Adjust, Review response



Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (including lung function)
Comorbidities
Inhaler technique & adherence
Patient goals

Symptoms
Exacerbations
Side-effects
Lung function
Patient satisfaction

Treatment of modifiable risk factors & comorbidities
Non-pharmacological strategies
Education & skills training
Asthma medications

Asthma medication options:
Adjust treatment up and down for individual patient needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms	As-needed low dose ICS-formoterol *	Daily low dose inhaled corticosteroid (ICS), or as-needed low dose ICS-formoterol *	Low dose ICS-LABA	Medium dose ICS-LABA	High dose ICS-LABA Refer for phenotypic assessment ± add-on therapy, e.g.tiotropium, anti-IgE, anti-IL5/5R, anti-IL4R
Other controller options	*Low dose ICS taken whenever SABA is taken †*	*Leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken †*	*Medium dose ICS, or low dose ICS+LTRA #*	*High dose ICS, add-on tiotropium, or add-on LTRA #*	*Add low dose OCS, but consider side-effects*
PREFERRED RELIEVER	As-needed low dose ICS-formoterol *		As-needed low dose ICS-formoterol ‡		
Other reliever option	*As-needed short-acting β_2 -agonist (SABA)*				

* Off-label; data only with budesonide-formoterol (bud-form)
† Off-label; separate or combination ICS and SABA inhalers
‡ Low-dose ICS-form is the reliever for patients prescribed bud-form or BDP-form maintenance and reliever therapy
# Consider adding HDM SLIT for sensitized patients with allergic rhinitis and FEV >70% predicted

GINA 2019 – landmark changes in asthma management

- For safety, GINA no longer recommends SABA-only treatment for Step 1
  - This decision was based on evidence that SABA-only treatment increases the risk of severe exacerbations, and that adding any ICS significantly reduces the risk
- GINA now recommends that all adults and adolescents with asthma should receive symptom-driven or regular low dose ICS-containing controller treatment, to reduce the risk of serious exacerbations
  - This is a population-level risk reduction strategy, e.g. statins, anti-hypertensives