

Management of asthma

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1. Recap – What is asthma?

2. Asthma control

3. Principles of treatment

**4. National Review of Asthma
Deaths**

5. Anti-Inflammatory Relievers

6. Guidelines

7. Supporting your patients

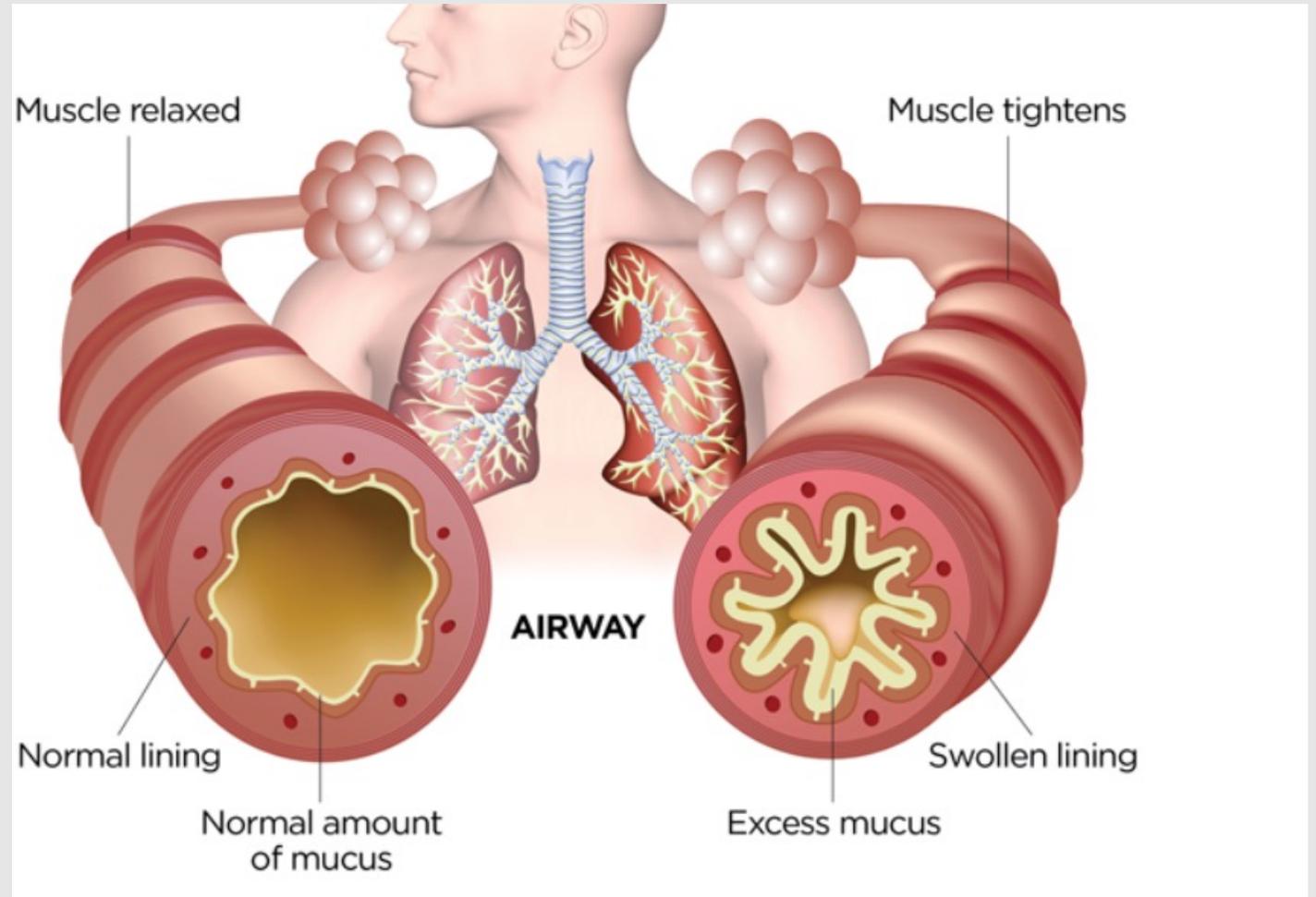
8. Q + A

What is Asthma?

Back to the basics

Asthma triggers cause inflammation to build up in the airways.

Inflammation increases reactivity and leads to symptoms (when exposed to triggers)



Back to the basics

Triggers / symptoms are variable and can be unpredictable

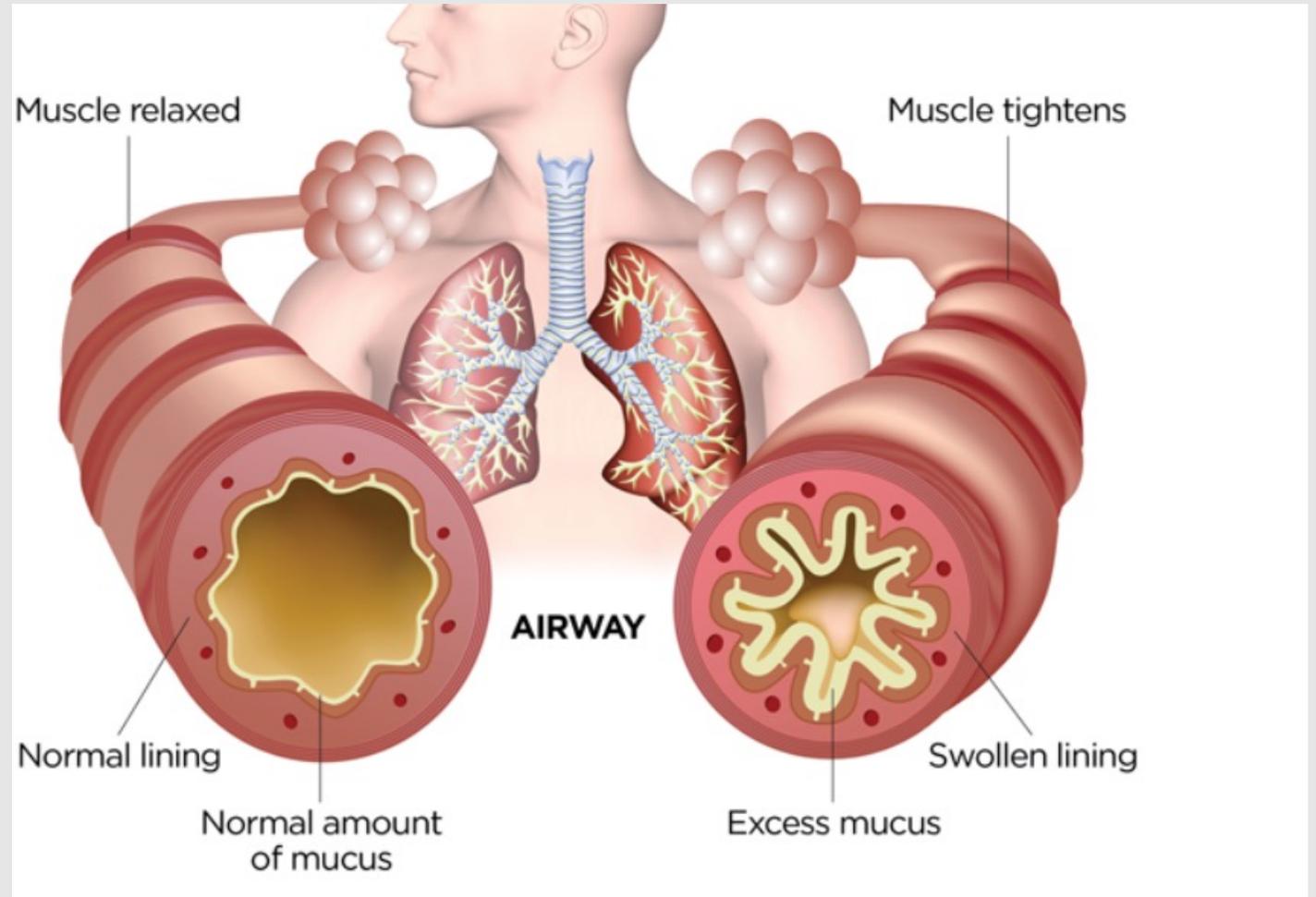
Untreated inflammation leads to:

Bronchoconstriction

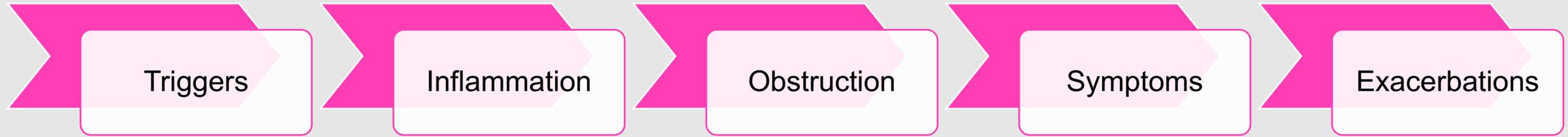
Symptoms

Exacerbations

Asthma attacks



Assessing asthma



Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

- Viruses
- Allergens eg pets, pollens, HDM, mould
- Pollution
- Smoking
- Stress
- Exercise
- Hormones
- Post-nasal drip
- Gastric reflux

Assessing asthma

Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

FeNO
Eosinophils
(not
recommended)

Assessing asthma

Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

FeNO
Eosinophils
(not recommended)

Peak Flow
Spirometry

Assessing asthma

Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

FeNO
Eosinophils
(not recommended)

Peak Flow
Spirometry

History
ACT
Reliever use

Assessing asthma

Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

FeNO
Eosinophils
(not recommended)

Peak Flow
Spirometry

History
ACT
Reliever use

History
OCS use

Asthma control

Assessing asthma

Triggers

Inflammation

Obstruction

Symptoms

Exacerbations

FeNO
Eosinophils
(not recommended)

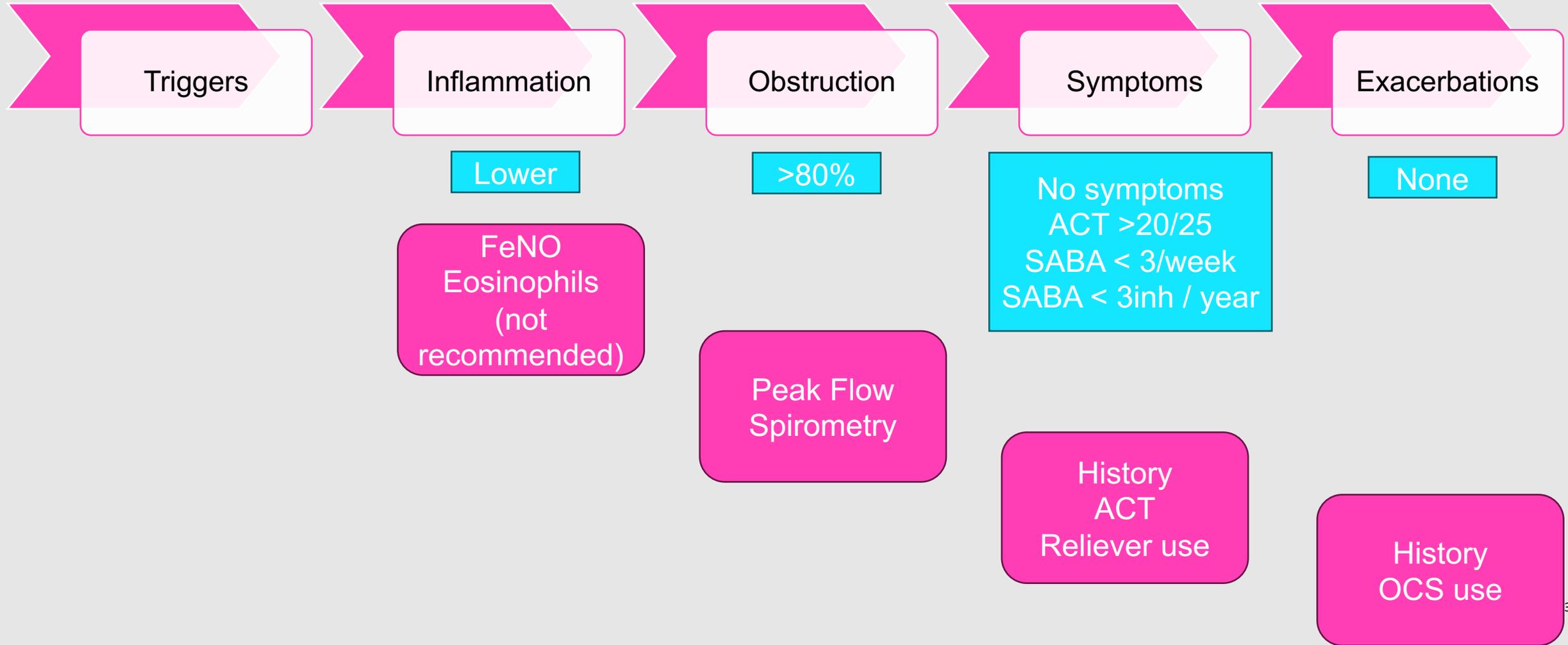
Peak Flow
Spirometry

History
ACT
Reliever use

History
OCS use

Assessing asthma

Good control



Importance of Good Control

- Using ≥ 3 $\times 200$ -dose canisters of SABA a year was associated with double the risk of an asthma-related exacerbation in one study

Stanford, R. H., et al Short-acting β -agonist use and its ability to predict future asthma-related outcomes. *Ann. Allergy Asthma Immunol.* **109**, 403–407 (2012)

- Using 12 or more SABA inhalers per year increases risk of death

Royal College of Physicians. *Why Asthma Still Kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry Report* (RCP, London, 2014).



Overuse of relievers is bad for the environment

236506 people with asthma

- 47.3% had poorly controlled asthma

Poor control caused 3.1x greenhouse gases

- **60.7% due to blue reliever inhaler use**
- 29.3% healthcare use, other medicines, hospital admissions

Wilkinson AJK, Maslova E, Janson C, *et al*

Greenhouse gas emissions associated with suboptimal asthma care in the UK: the SABINA healthCARE-Based enviroNmental cost of treatment (CARBON) study

Thorax Published Online First: 27 February 2024.



Principles of treatment

Conventional treatment

Blue inhaler

- Reliever
- Works fast
- Treats symptoms

- Does NOT treat inflammation



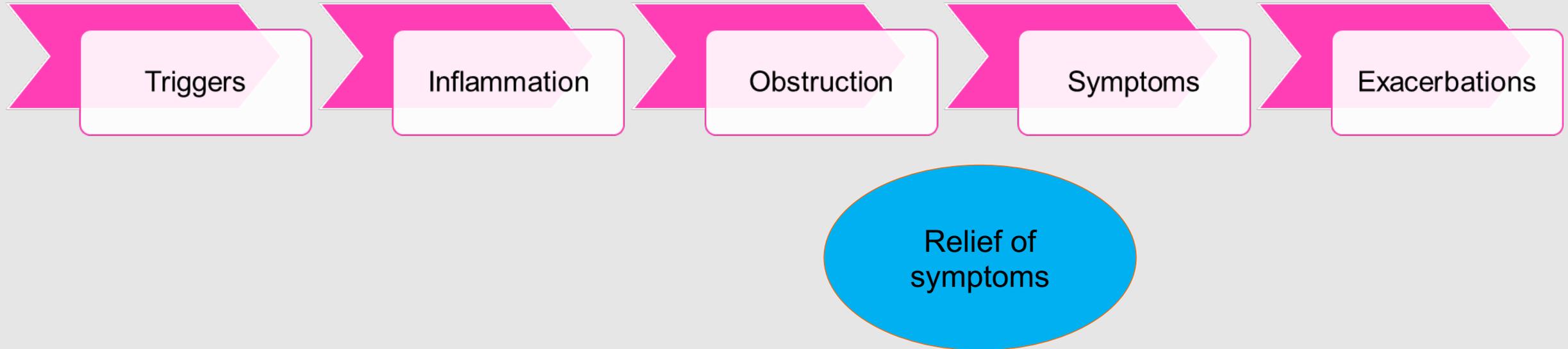
Brown Inhaler

- Preventer
- Builds up over time
- No immediate impact

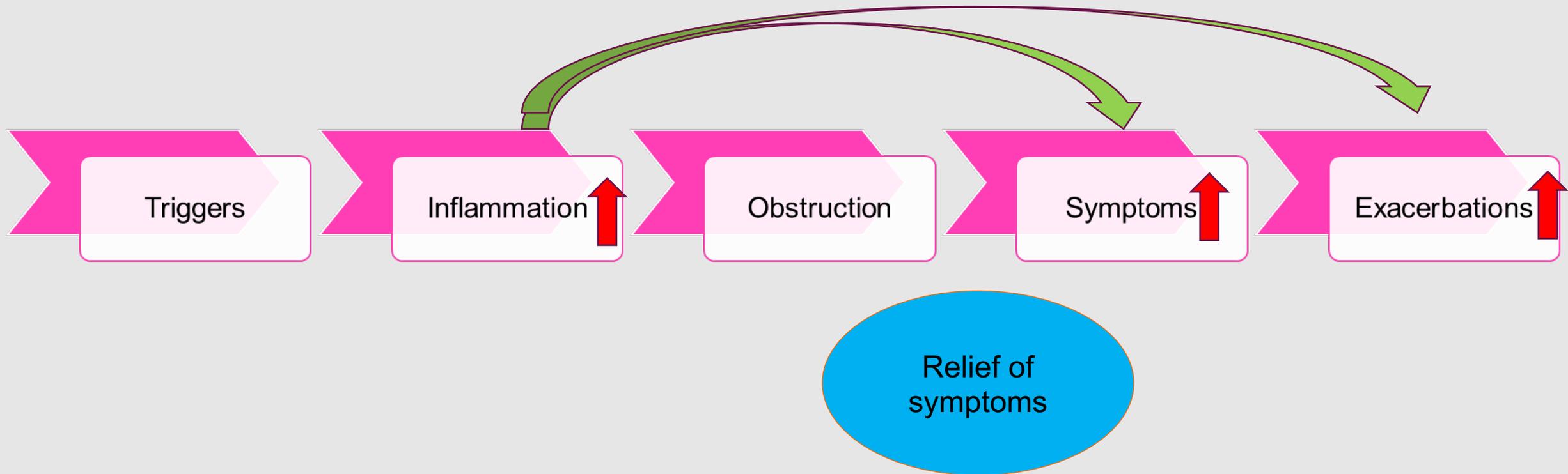
- Dampens down inflammation



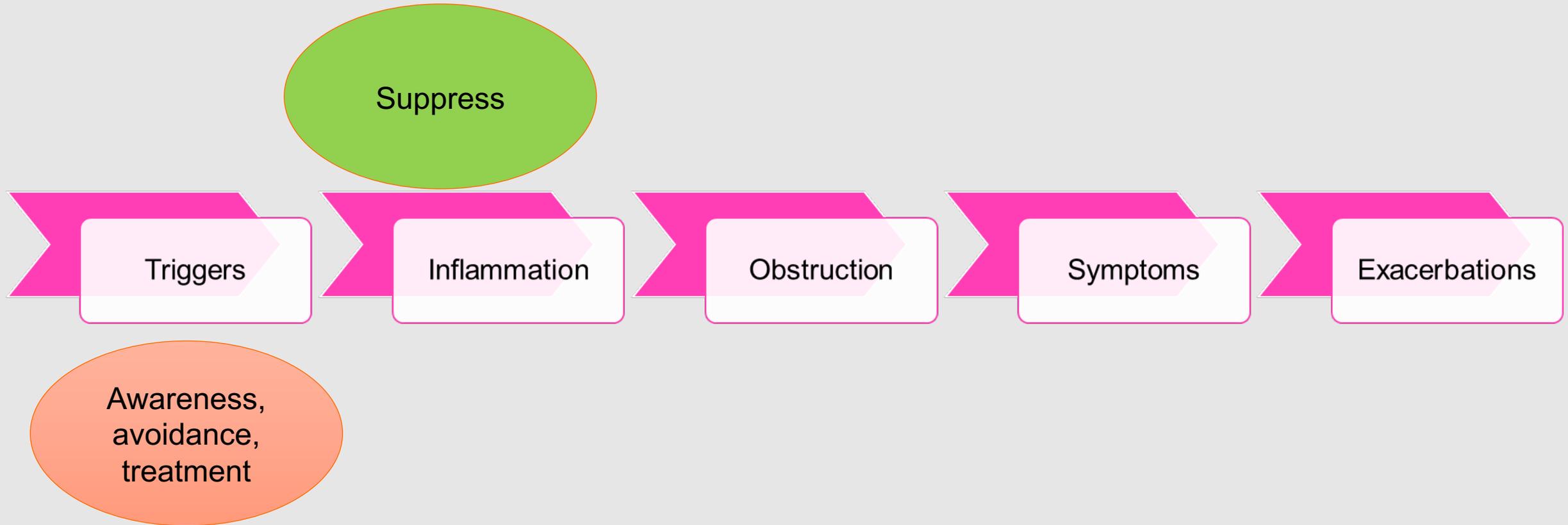
Treating symptoms is important for patients



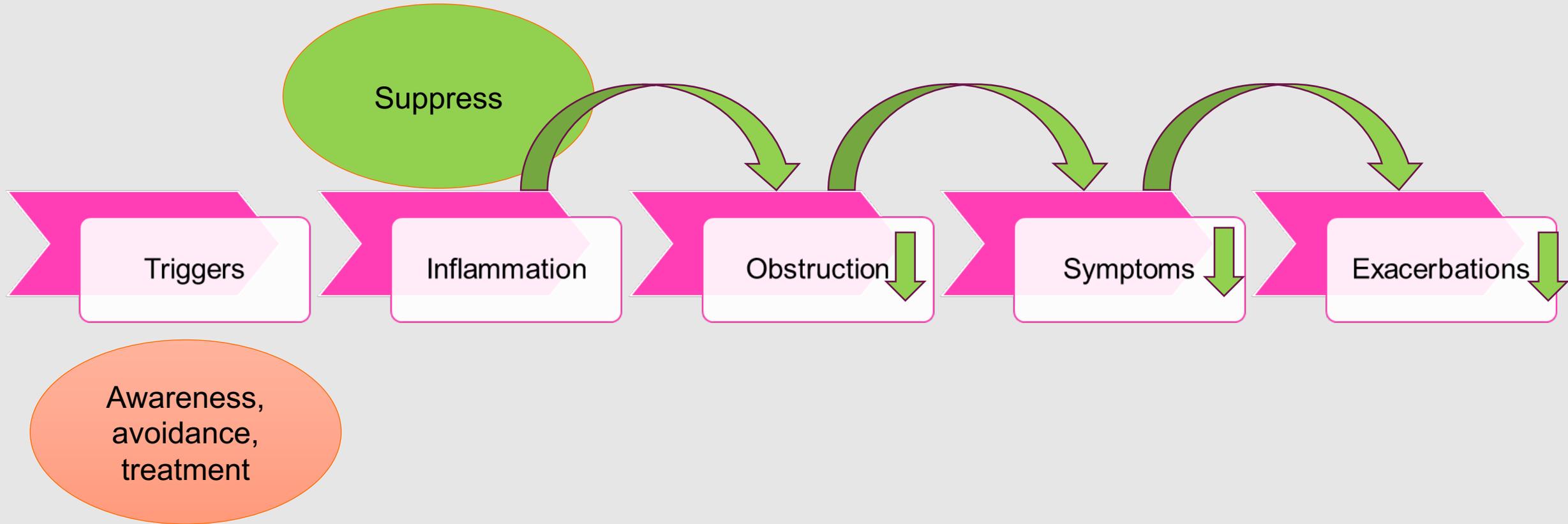
But... Is very short sighted!



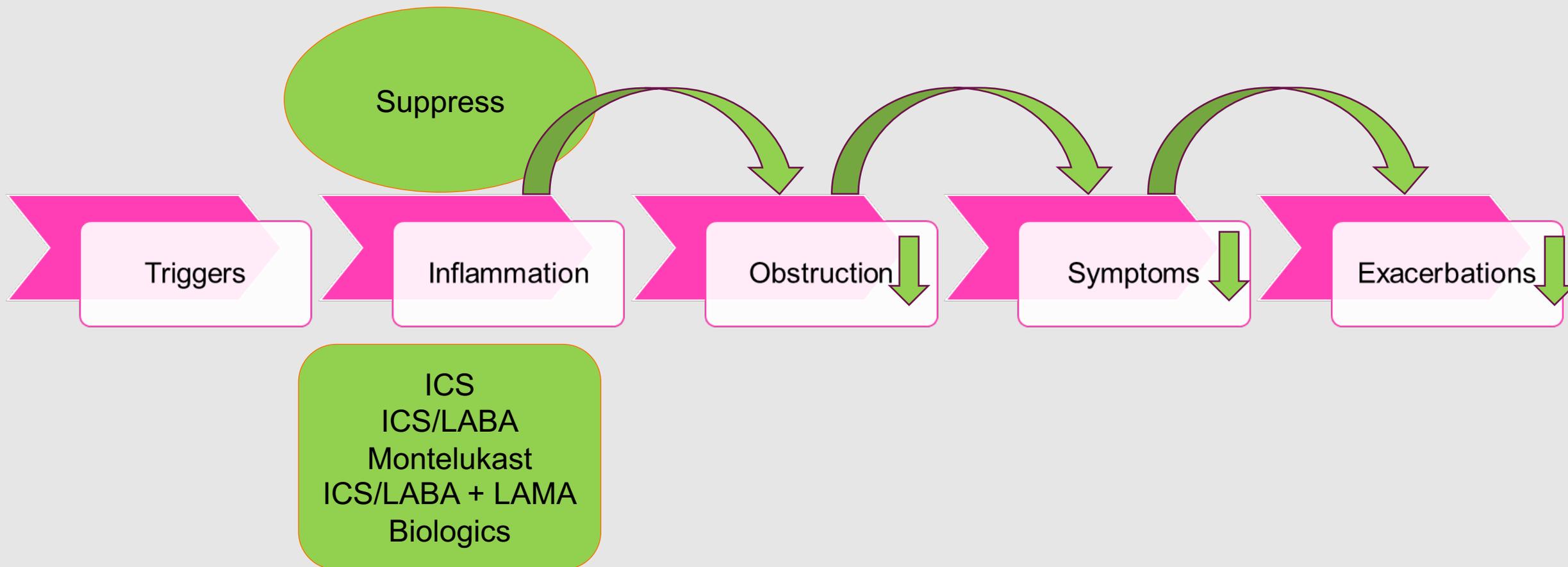
Prevention is key



Prevention is essential



Prevention is essential

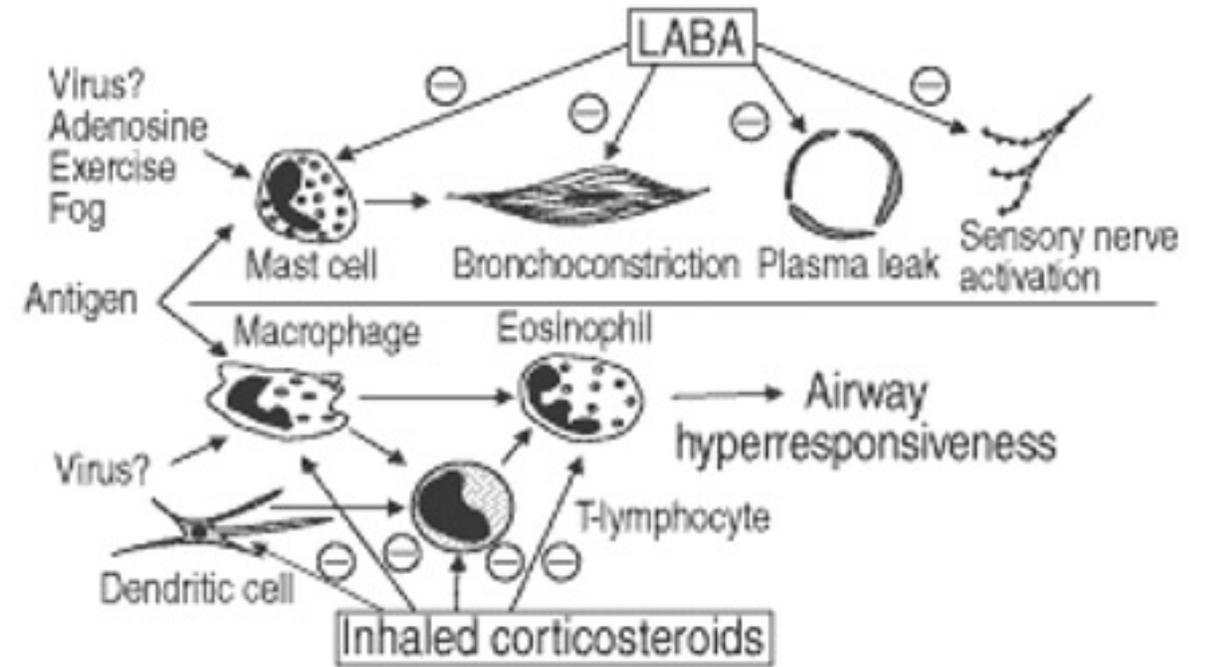


ICS + LABA

Scientific rationale for inhaled combination therapy with long-acting β_2 -agonists and corticosteroids

P.J. Barnes

European Respiratory Journal Jan 2002, 19 (1) 182-191

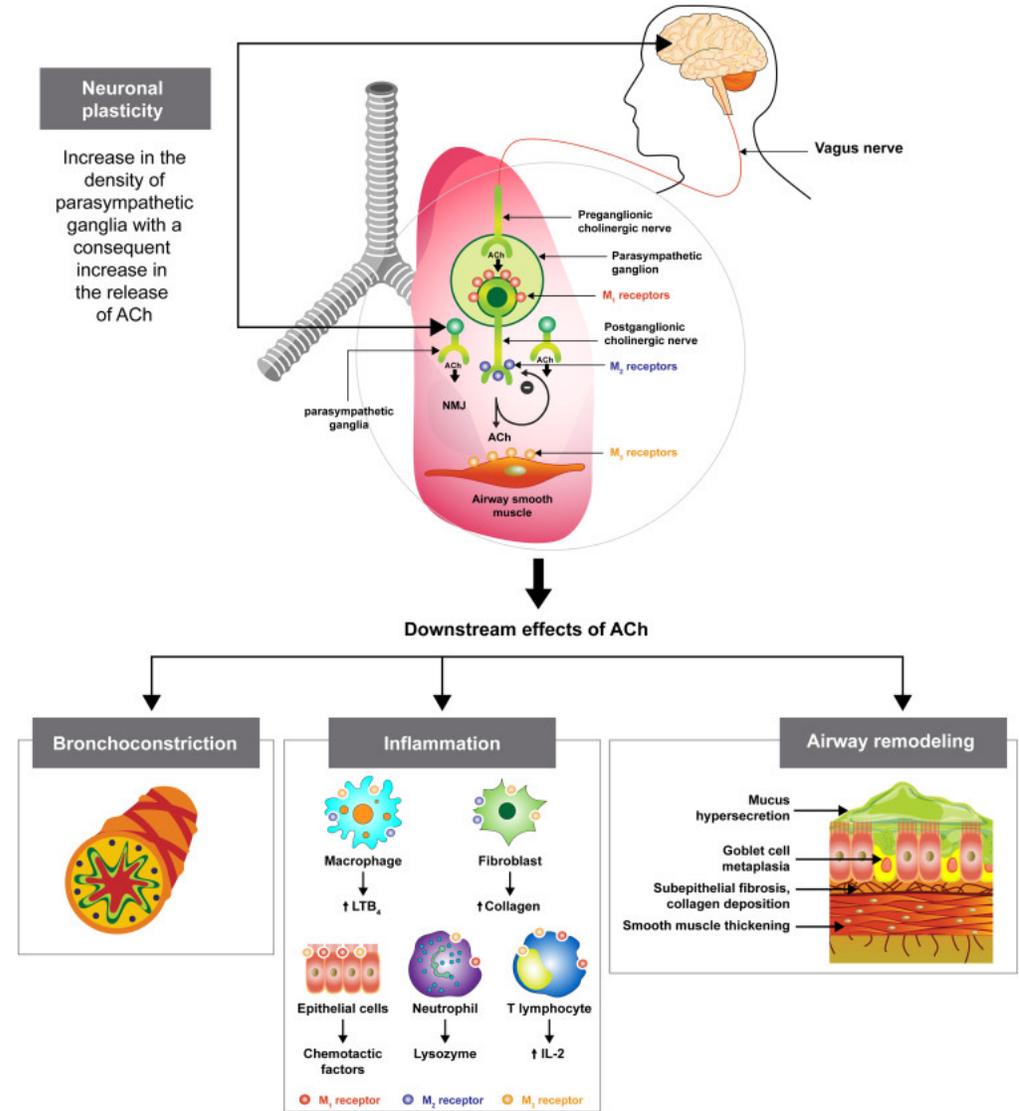


LAMAs in asthma

Casale TB, Foggs MB, Balkissoon RC.

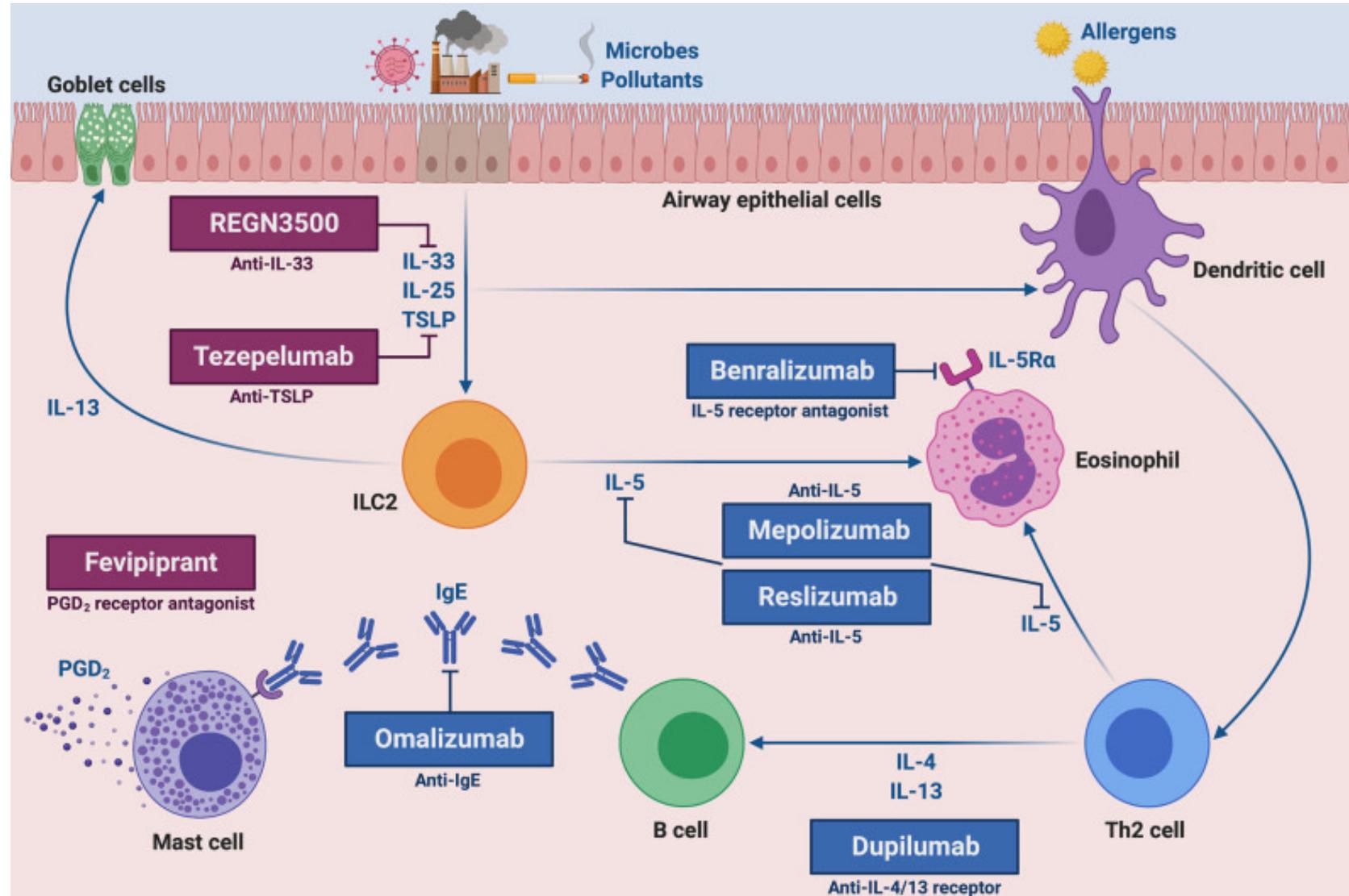
Optimizing asthma management: Role of long-acting muscarinic antagonists.

J Allergy Clin Immunol. 2022 Sep;150(3):557-568.



Biologics in asthma

Pelaia C, et al.
Molecular Targets for
Biological Therapies of
Severe Asthma.
Front Immunol. 2020
Nov 30;11:603312.



National Review of Asthma Deaths 10 year on

- 195 deaths due to asthma
- Their medical notes assessed
- Interviews with family/friends
- Identify factors involved in their death
- Recommendations for preventing future deaths

Royal College of Physicians. Why Asthma Still Kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry Report (RCP, London, 2014).

Why asthma still kills

The National Review of Asthma Deaths (NRAD)

Confidential Enquiry report
May 2014

Use of NHS services

- During the final attack of asthma, 45% died without seeking medical assistance or before emergency medical care could be provided.
- 57% who died from asthma were not recorded as being under specialist supervision during the 12 months prior to death.
- There was a history of previous hospital admission for asthma in 47%.
- 10% died within 28 days of discharge from hospital after treatment for asthma.
- 21% had attended a hospital emergency department with asthma at least once in the previous year and, of these many had attended twice or more

Patient factors and perception of risk

- 65% had patient (or environmental) factors likely to have impacted on their death.
 - 19% tobacco smoking exposure to second-hand smoke in the home, non-adherence to medical advice and non-attendance at review appointments.
- Poor recognition of risk of adverse outcome was found to be an important avoidable factor in 70% children and 83% young people in primary care
- Most people who died, and for whom this information was available, were diagnosed in adulthood
 - Median age at diagnosis was 37
 - 69% diagnosed after the age of 15 years.
- Psychosocial factors contributed to the risk of asthma death in 26% of those who died
 - Depression and mental health issues in 16%
 - Substance misuse in 6%

Medical and professional care

- Only 23% of those who died had been given a personalized asthma action plan (PAAP)
- 43% had no evidence that an asthma review had taken place in general practice in the last year before death
- Exacerbating factors, or triggers, were documented in the records of almost half (95) of patients; they included drugs, viral infections and allergy. A trigger was not documented in the other half.
- 9% had mild asthma and 49% had moderate asthma. It is likely that many poorly controlled undertreated asthma, rather than truly mild or moderate disease.
- The expert panels identified factors that could have avoided death in relation to the health professional's implementation of asthma guidelines in 89 (46%) of the 195 deaths, including lack of specific asthma expertise in 34 (17%) and lack of knowledge of the UK asthma guidelines in 48 (25%)

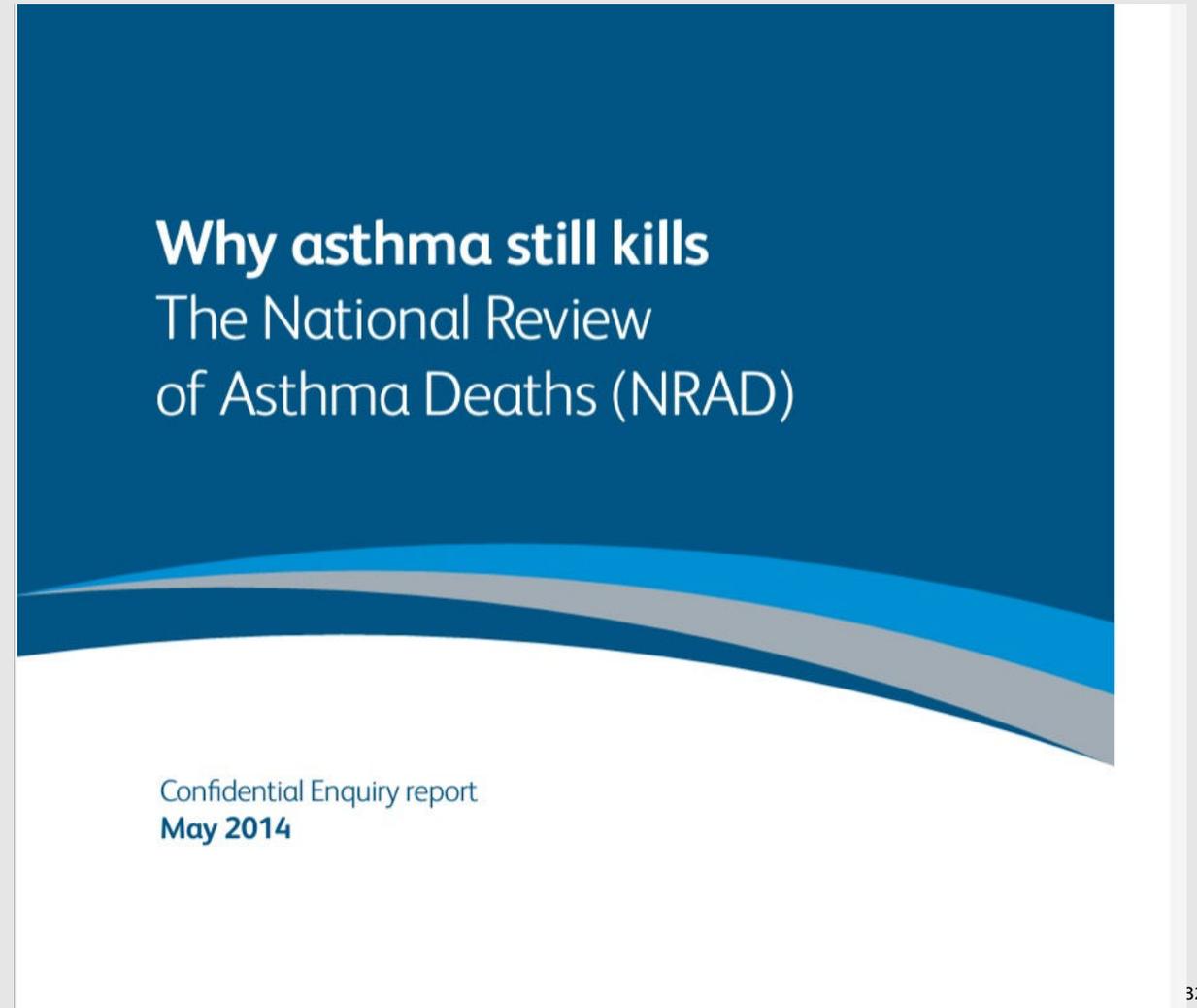
Prescribing and medicines use

- 39% had been prescribed more than 12 short-acting reliever inhalers in the year before they died, while six (4%) had been prescribed more than 50 reliever inhalers.
- There was evidence of under-prescribing of preventer medication. To comply with recommendations, most patients would usually need at least 12 preventer prescriptions per year.
 - 38% were known to have been issued with fewer than four
 - 80% issued with fewer than 12 preventer inhalers in the previous year.
- There was evidence of inappropriate prescribing of long-acting beta agonist (LABA) bronchodilator inhalers.
 - 14% of those who died were prescribed a single-component LABA bronchodilator at the time of death.
 - At least 3% patients were on LABA monotherapy without inhaled corticosteroid preventer treatment

National Review of Asthma Deaths (NRAD) 2014

**Preventer underuse
increases risk of death**

**Reliever overuse
increases risk of death**

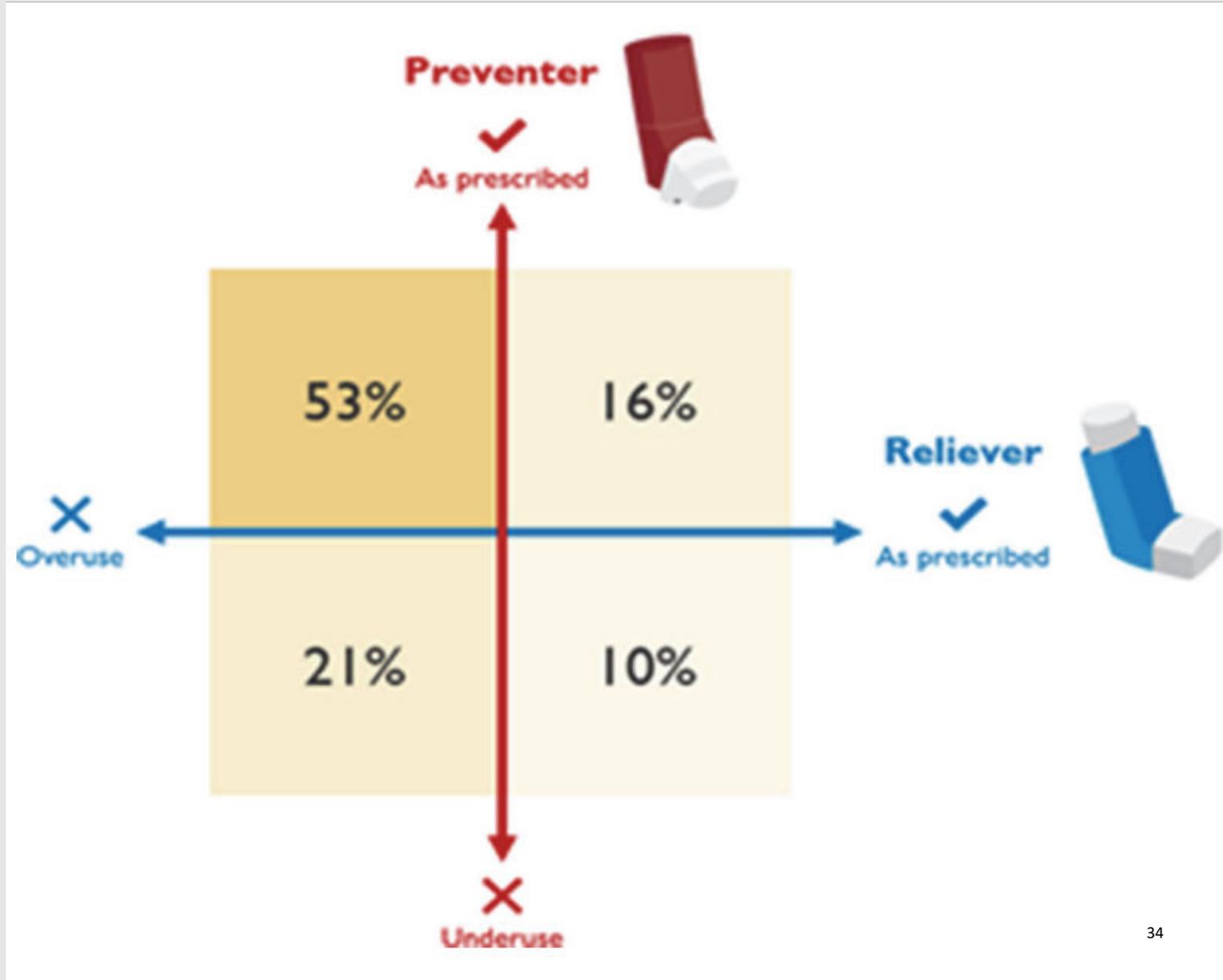


blue?

Issues about blue inhaler thinking



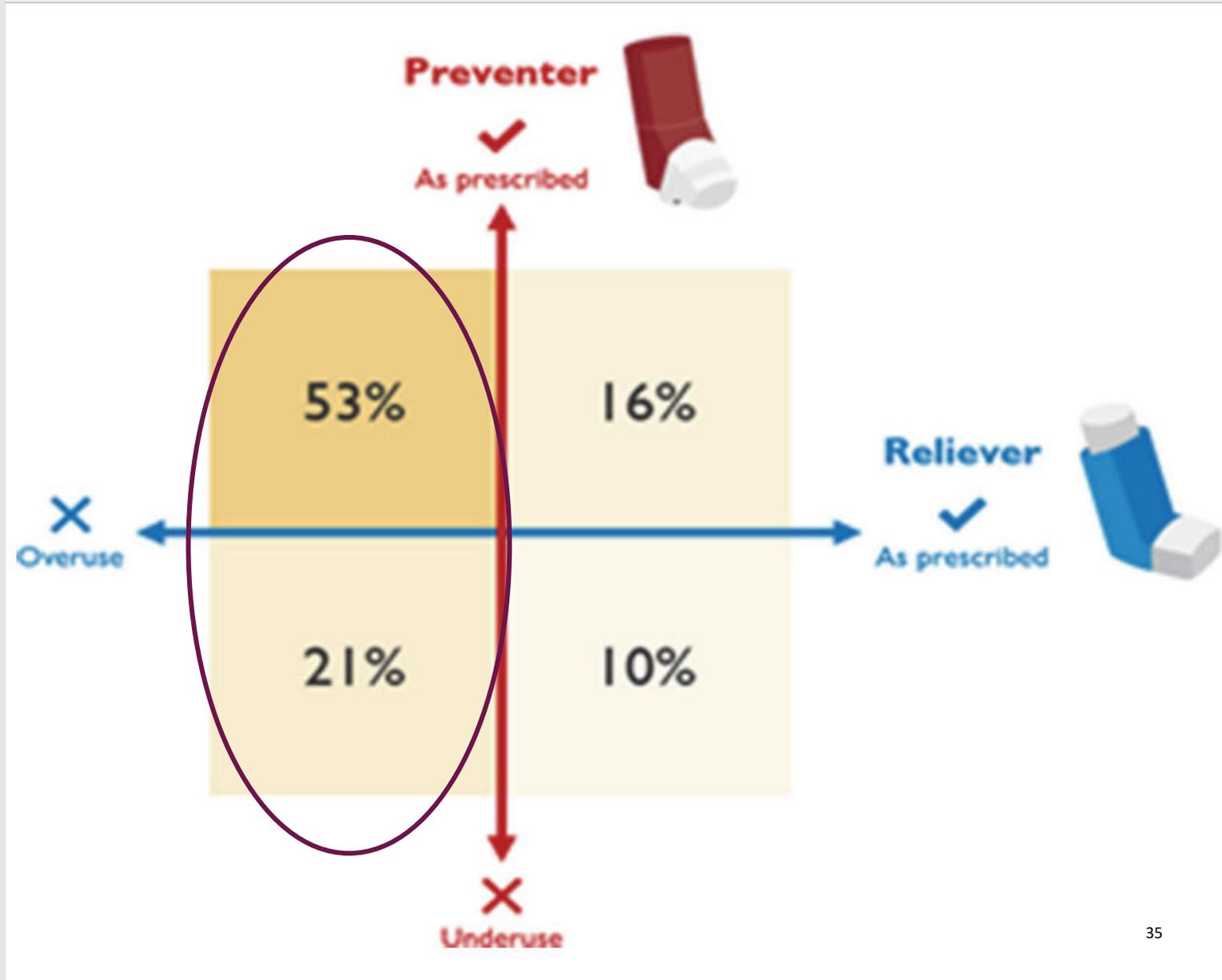
What happens in real life?



from Asthma+Lung UK 2024
(unpublished data)

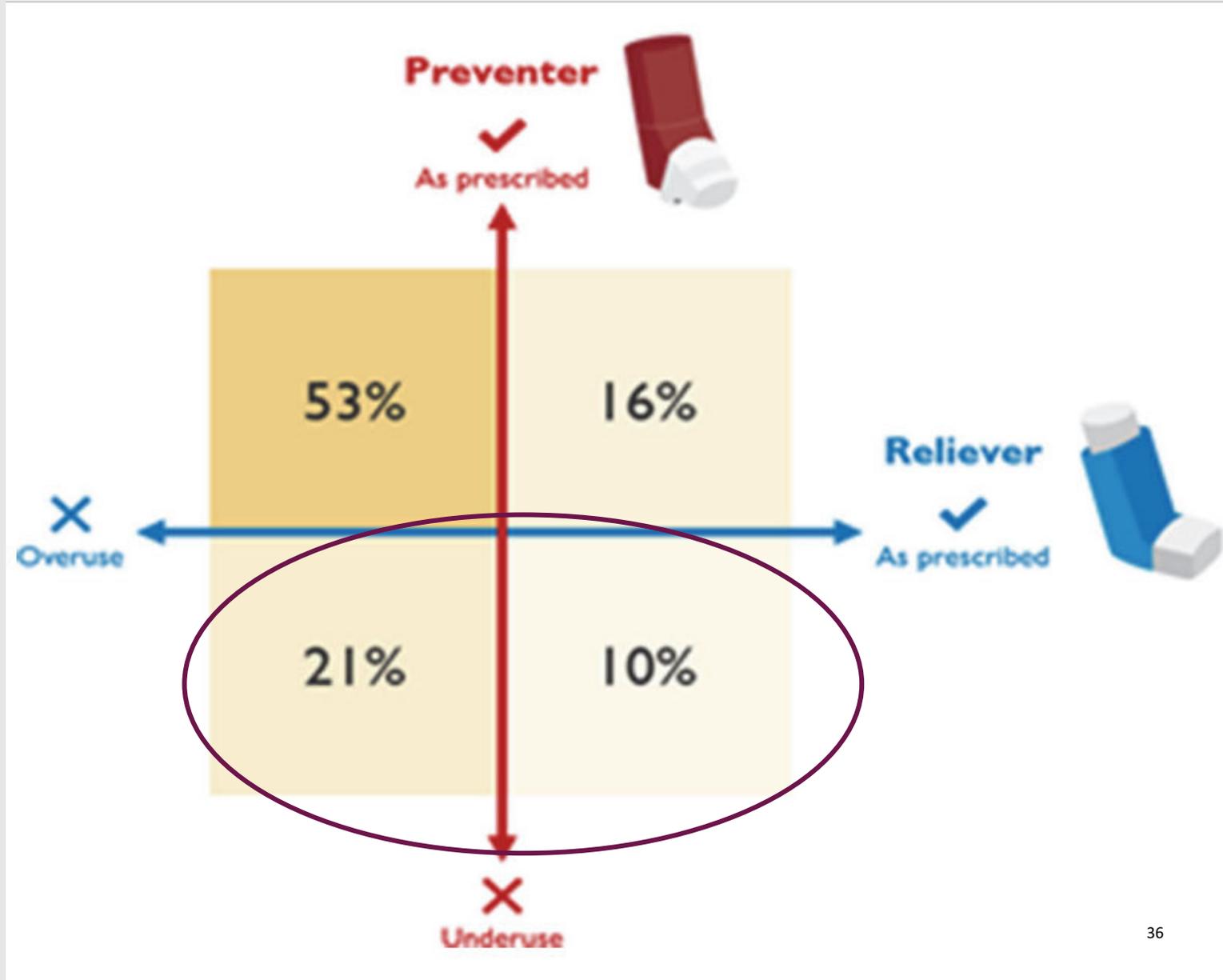
What happens in real life?

74% overuse
their reliever
inhaler



What happens in real life?

31% underuse
their preventer
inhaler





Some people prefer their reliever to their preventer

Some people have only been prescribed a reliever

Some people worry about steroid use

Some people can't afford two prescriptions

Asthma symptoms are variable

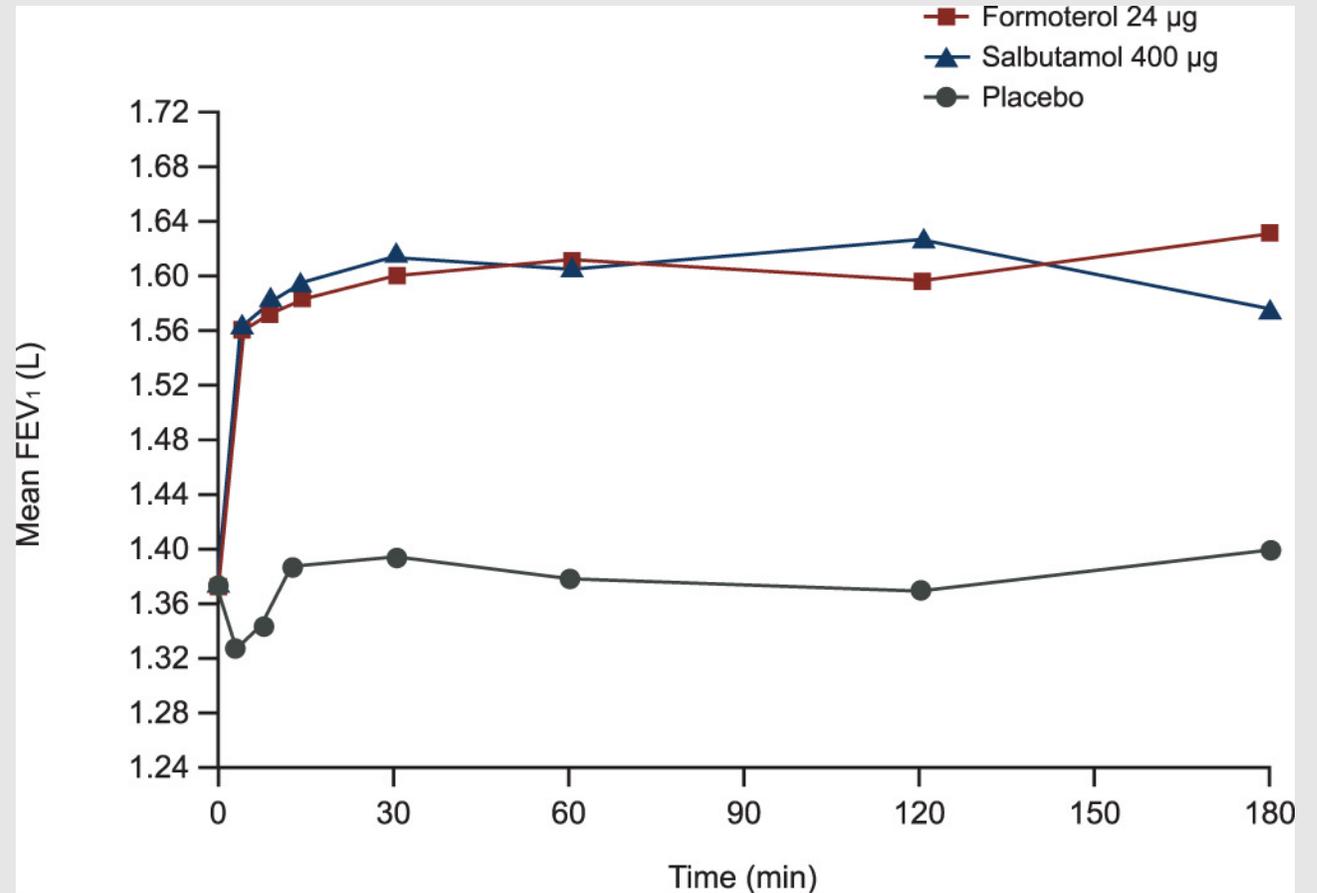
Can be occasional (for example when in contact with pollen, animals etc)



Anti Inflammatory Relievers

An alternative to salbutamol - formoterol

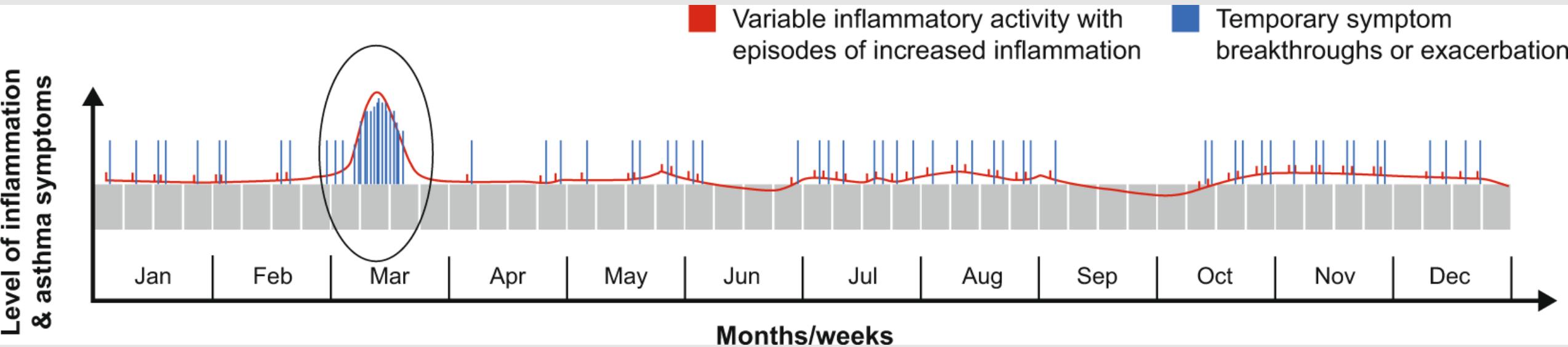
- Formoterol works as quickly at relieving symptoms as salbutamol
- Formoterol is an ingredient in several ICS/LABA inhalers
- Formoterol-ICS can be used to treat symptoms and manage inflammation



Tashkin DP. Formoterol for the Treatment of Chronic Obstructive Pulmonary Disease. *Int J Chron Obstruct Pulmon Dis.* 2020;15:3105-3122

Asthma is variable

- Triggers, inflammation, symptoms and risk will also be variable
- Treatment needs to be variable – Formoterol-ICS would tailor preventative treatment according to symptom frequency
- Salbutamol only treats (hides) the symptoms – Formoterol-ICS will also treat the cause (and risk) ↓



Larsson, K., Kankaanranta, H., Janson, C. *et al.* Bringing asthma care into the twenty-first century. *npj Prim. Care Respir. Med.* **30**, 25 (2020).

What is AIR ?

AIR stands for ... Anti-inflammatory Reliever

- ICS-Formoterol to treat symptoms of asthma
- For most people part of a Maintenance and Reliever Therapy (MART) regime (BTS 3 and above)
- An alternative to conventional “brown + blue” treatment (BTS 2)
- For some people with very occasional symptoms (less than 2/month) can be used as “AIR-only” (BTS 1)

- No unopposed SABA use

The benefits of AIR

- Quick relief of symptoms
- Inflammation (which causes symptoms) is also treated
- No unopposed blue reliever inhaler use
- Fewer symptoms and asthma attacks
- Fewer GP/ED visits
- Lower overall steroid dose
- Better for the environment
- Cheaper for people who pay
- Simpler way of managing asthma



Lowering risk

BTS steps 1 and 2.

- **AIR versus as needed blue reliever inhaler**
- AIR reduces the risk of severe flare-ups by 60–64%
- AIR reduced ED visits or hospitalisations by 65%

- **AIR versus daily brown plus + as needed blue reliever inhaler**
- AIR had 37% lower risk of ED visits or hospitalizations
- The average daily dose of steroid was much lower with AIR



Is AIR/MART for everybody?

- It IS a game-changer!
- HCPs and people with asthma attached to blue relievers
- Better asthma control should always be the priority
- Some people might not be suitable
 - AIR / MART >12's only (for now)
 - Other conditions
 - Inhaler technique
 - Side effects on formoterol
 - Disease severity
- Discussion between HCP and person with asthma is essential
- Both will need support with this culture change!!

Asthma attack advice

Standard – for a blue reliever

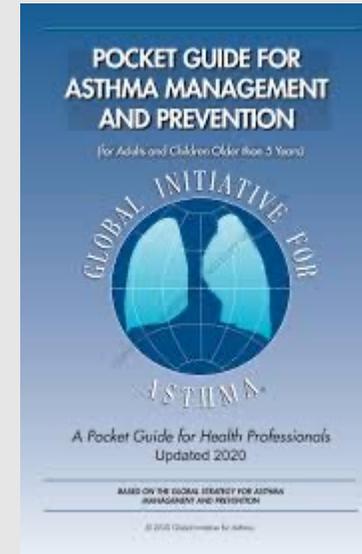
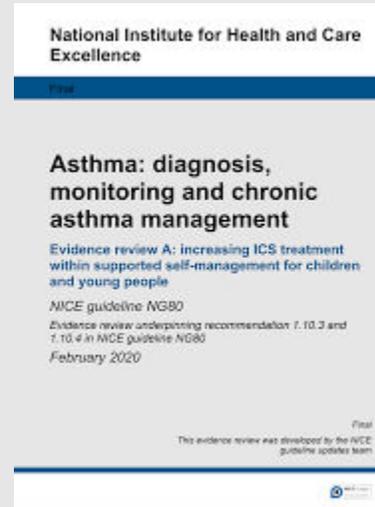
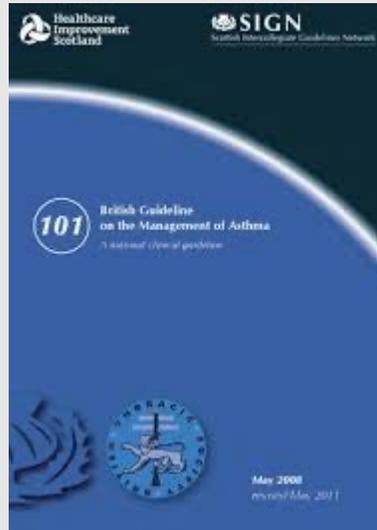
1. Sit up straight - try to keep calm.
2. Take one puff of your blue reliever inhaler every 30-60 seconds up to 10 puffs.
3. If you feel worse at any point OR you don't feel better after 10 puffs call 999 for an ambulance.
4. If the ambulance has not arrived after 10 minutes and your symptoms are not improving, repeat step 2.
5. If your symptoms are no better after repeating step 2, and the ambulance has still not arrived, **contact 999 again immediately.**

MART/AIR – applies to both

- Sit up straight - try to keep calm.
- Take one puff of your MART/AIR inhaler every 1 to 3 minutes up to six puffs.
- If you feel worse at any point OR you do not feel better after six puffs call 999 for an ambulance.
- If the ambulance has not arrived after 10 minutes and your symptoms are not improving, repeat step 2.
- If your symptoms are not better after repeating step 2, and the ambulance has still not arrived, contact 999 again immediately.

Guidelines

Which guideline?

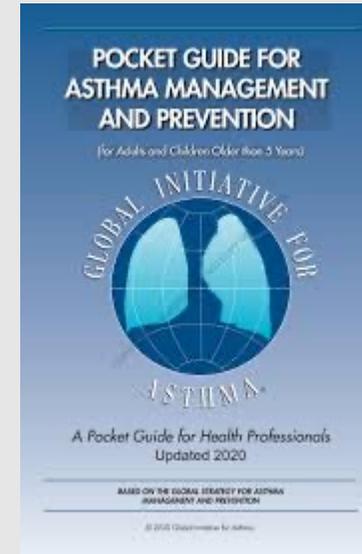
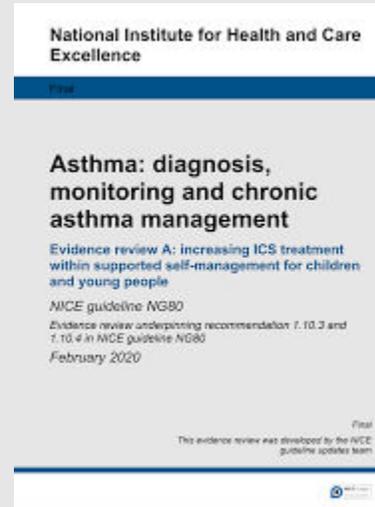
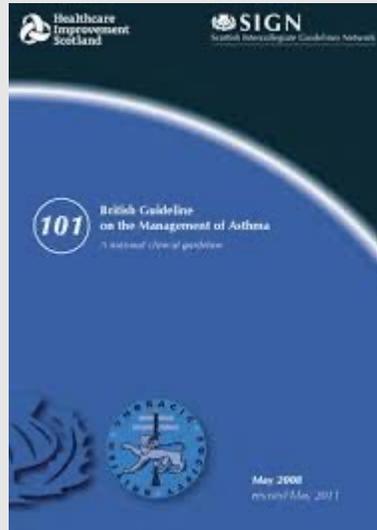


BTS/SIGN

NICE

GINA

Which guideline?



E

**NICE / BTS / SIGN
2024 tbc**

GINA

Which guideline?

- Monitor (at least annual but also when poor control)
- Check causes of symptoms
- Adherence/technique, triggers
- Step up
- Monitor
- Step Down?
- Refer

BTS/SIGN

NICE

GINA

Old versus new thinking

- SABA for relief
- ICS/LABA for relief (AIR)

Old versus new thinking

- SABA for relief
- Prn SABA
- ICS/LABA for relief
- Prn ICS/LABA (AIR-only)

Old versus new thinking

- SABA for relief
- Prn SABA
- ICS
- ICS/LABA for relief
- Prn ICS/LABA (AIR-only)
- ICS/LABA (MART)

Old versus new thinking

- SABA for relief
 - Prn SABA
 - ICS
 - ICS/LABA or ICS+LTRA
- ICS/LABA for relief
 - Prn ICS/LABA (AIR-only)
 - ICS/LABA (MART)
 - ICS/LABA (MART)

Old versus new thinking

- SABA for relief
 - Prn SABA
 - ICS
 - ICS/LABA or ICS+LTRA
 - ICS/LABA + LTRA
- ICS/LABA for relief
 - Prn ICS/LABA (AIR-only)
 - ICS/LABA (MART)
 - ICS/LABA (MART)
 - ICS/LABA (higher dose)

Old versus new thinking

- SABA for relief
- Prn SABA
- ICS
- ICS/LABA or ICS+LTRA
- ICS/LABA + LTRA
- ICS/LABA +/- LTRA + LAMA
- ICS/LABA for relief
- Prn ICS/LABA (AIR-only)
- ICS/LABA (MART)
- ICS/LABA (MART)
- ICS/LABA (higher dose)
- Consider higher dose ICS , LTRA, LAMA

Old versus new thinking

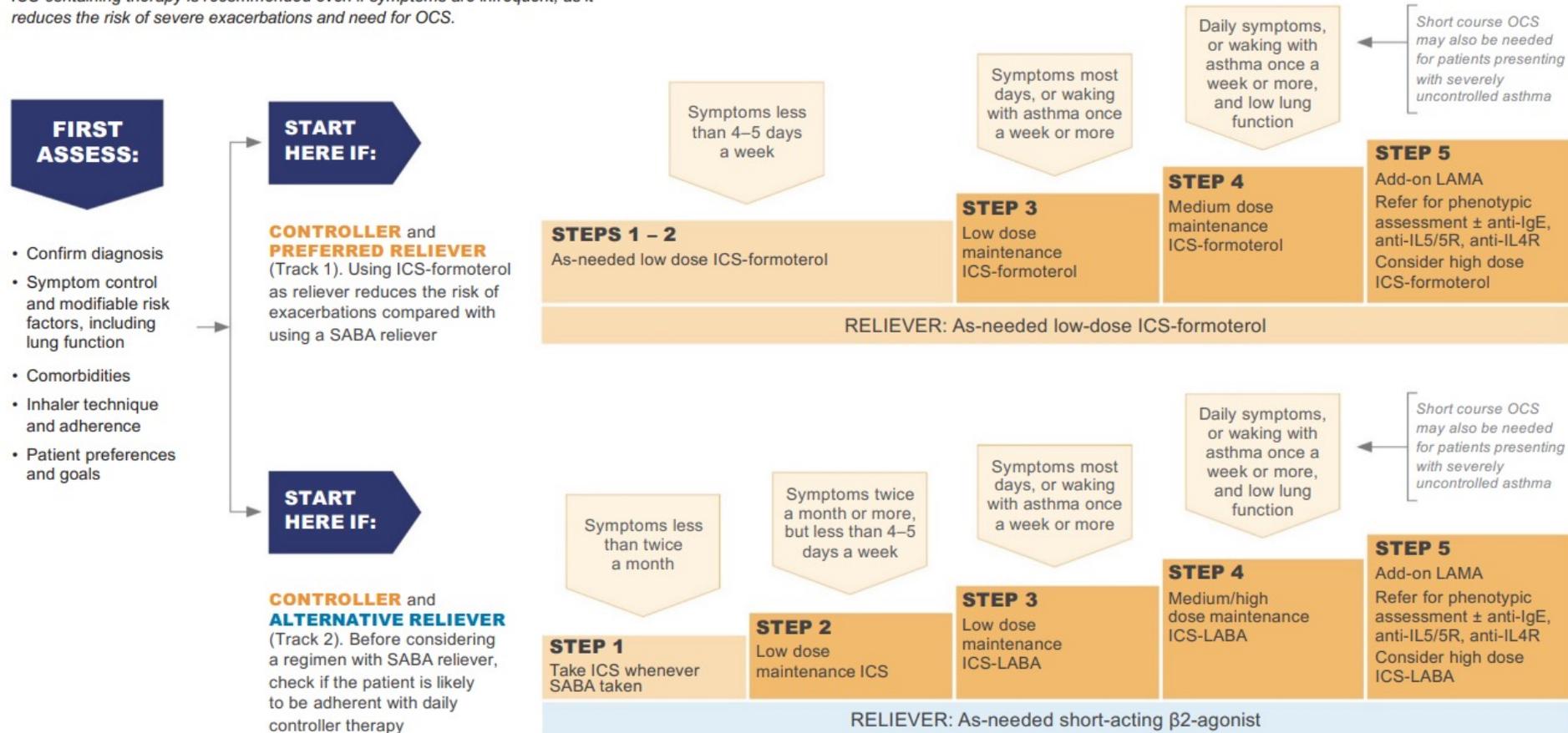
- SABA for relief
- Prn SABA
- ICS
- ICS/LABA or ICS+LTRA
- ICS/LABA + LTRA
- ICS/LABA +/- LTRA + LAMA
- ICS/LABA for relief
- Prn ICS/LABA (AIR-only)
- ICS/LABA (MART)
- ICS/LABA (MART)
- ICS/LABA (higher dose)
- Consider higher dose ICS , LTRA, LAMA

Old versus new thinking

STARTING TREATMENT

in adults and adolescents with a diagnosis of asthma

Track 1 is preferred if the patient is likely to be poorly adherent with daily controller ICS-containing therapy is recommended even if symptoms are infrequent, as it reduces the risk of severe exacerbations and need for OCS.



ICS equivalence

Box 8. Low, medium and high daily doses of inhaled corticosteroids

Low dose ICS provides most of the clinical benefit for most patients. However, ICS responsiveness varies between patients, so some patients may need **medium dose ICS** if asthma is uncontrolled despite good adherence and correct inhaler technique with low dose ICS. **High dose ICS** is needed by very few patients, and its long-term use is associated with an increased risk of local and systemic side-effects.

This is not a table of equivalence, but of estimated clinical comparability, based on available studies and product information.

Inhaled corticosteroid	Adults and adolescents		
	Low	Medium	High
Beclometasone dipropionate (CFC)*	200–500	>500–1000	>1000
Beclometasone dipropionate (HFA)	100–200	>200–400	>400
Budesonide (DPI)	200–400	>400–800	>800
Ciclesonide (HFA)	80–160	>160–320	>320
Fluticasone furoate (DPI)	100	n.a.	200
Fluticasone propionate(DPI)	100–250	>250–500	>500
Fluticasone propionate (HFA)	100–250	>250–500	>500
Mometasone furoate	110–220	>220–440	>440
Triamcinolone acetonide	400–1000	>1000–2000	>2000
Inhaled corticosteroid	Children 6-11 years		
	Low	Medium	High
Beclometasone dipropionate (CFC)*	100–200	>200–400	>400
Beclometasone dipropionate (HFA)	50-100	>100-200	>200
Budesonide (DPI)	100–200	>200–400	>400
Budesonide (nebulas)	250–500	>500–1000	>1000
Ciclesonide (HFA)	80	>80-160	>160
Fluticasone propionate(DPI)	100–200	>200–400	>400
Fluticasone propionate (HFA)	100–200	>200–500	>500
Mometasone furoate	110	≥220–<440	≥440
Triamcinolone acetonide	400–800	>800–1200	>1200

Doses are in mcg. CFC: chlorofluorocarbon propellant; DPI: dry powder inhaler; HFA: hydrofluoroalkane propellant. *Included for comparison with older literature.

For new preparations, the manufacturer's information should be reviewed carefully, as products containing the same molecule may not be clinically equivalent.

Supporting your patients

- Get the diagnosis right
 - Education
 - Identify and address triggers
 - Inhalers – pick the right one for the patient
 - Inhaler technique
 - Medicines adherence
 - Work through an asthma action plan
 - What to do to stay well
 - What to do if symptoms increase
 - What to do in an asthma attack
- www.asthmaandlung.org.uk
 - www.asthmaandlung.org.uk/conditions/asthma/asthma-triggers
 - www.asthmaandlung.org.uk/living-with/inhaler-videos
 - www.asthmaandlung.org.uk/research-health-professionals/health-professionals

Your asthma action plan

Three adult action plans, multiple formats



AIR action plans

Full colour editable download

Black and white printer-friendly

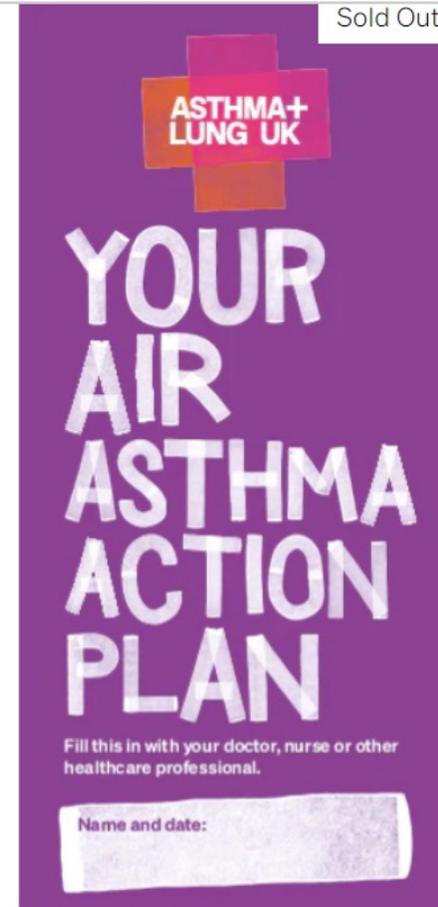
Full colour trifold to order

Translated versions coming soon!



AIR action plan - editable download

Free Download



AIR asthma action plan - full colour

Free



AIR action plan - black and white printer friendly

Free Download

Guidance notes for HCPs

- How to fill out an asthma action plan with your patients
- Step by step guide and advice



On this page

- [When to use this guidance](#)
- [Benefits of AIR](#)
- [Why does my patient need an AIR asthma action plan?](#)
- [Completing the plan – a section by section guide](#)
- [Help your patient make the most of their AIR action plan](#)

These guidance notes are for our AIR asthma action plan which is for patients who are on an AIR (anti-inflammatory reliever) inhaler containing ICS-formoterol, without maintenance doses.

We also have [guidance notes for patients on a MART treatment plan](#) who take ICS-formoterol every day as maintenance, and as required when they get symptoms.

If your patient has been prescribed a preventer inhaler, or combination inhaler with a separate SABA reliever inhaler, please refer to our [preventer/reliever asthma action plan guidance notes](#).

Health advice info page

- Information and advice for people with asthma who have been prescribed an AIR inhaler:
- How they can benefit from it
- How to use it
- How they can download an action plan
- When to seek urgent help

<https://www.asthmaandlung.org.uk/symptoms-tests-treatments/treatments/AIR>



On this page

- [What is an anti-inflammatory reliever \(AIR\)?](#)
- [When is an AIR treatment plan prescribed?](#)
- [How could an AIR inhaler help you manage your asthma?](#)
- [How is AIR different to a blue reliever inhaler?](#)

What is an anti-inflammatory reliever (AIR)?

An anti-inflammatory reliever, known as AIR, is a combination inhaler which contains two types of medicine:

- a steroid anti-inflammatory medicine which treats the inflammation in your airways
- a reliever medicine called formoterol which quickly opens

Q + A