Thunderstorm Asthma

Professor Amanda Barnard
ANU – Rural Clinical School
Chair, Guidelines Committee, Australian Asthma Handbook

Please close your eyes !

BUSY !!

What other words come to mind?
Would you and your workplace be able to cope?

Thunderstorm asthma – an unprecedented emergency

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Seminar format

- Thunderstorm asthma – background
- Who is at risk?
- Cases

Prevention and management strategies for at risk groups

Brief review diagnosis and management of asthma

- Proactive approach – be prepared!

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History in Australia

- 1987: November Melbourne
- 1989: November Melbourne
- 1990: Tamworth NSW
- 1997: October Wagga Wagga NSW
- 1998: Newcastle NSW
- 2010: November Melbourne
- 2014: Canberra ACT
- 2016: 21 November Melbourne – 9 deaths

Several incidents have also be recorded internationally

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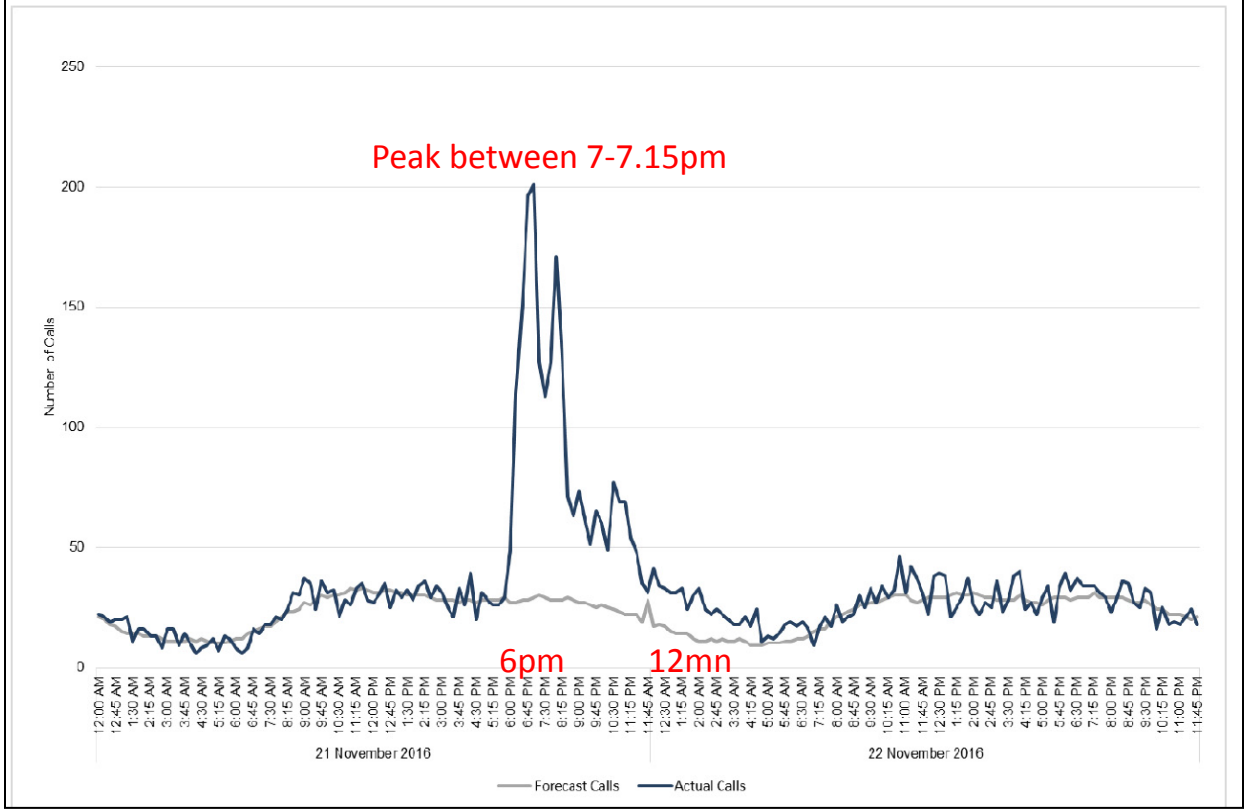
Emergency ambulance calls

Figure 8: Triple Zero (000) emergency ambulance calls presented to ESTA for 21–22 November 2016



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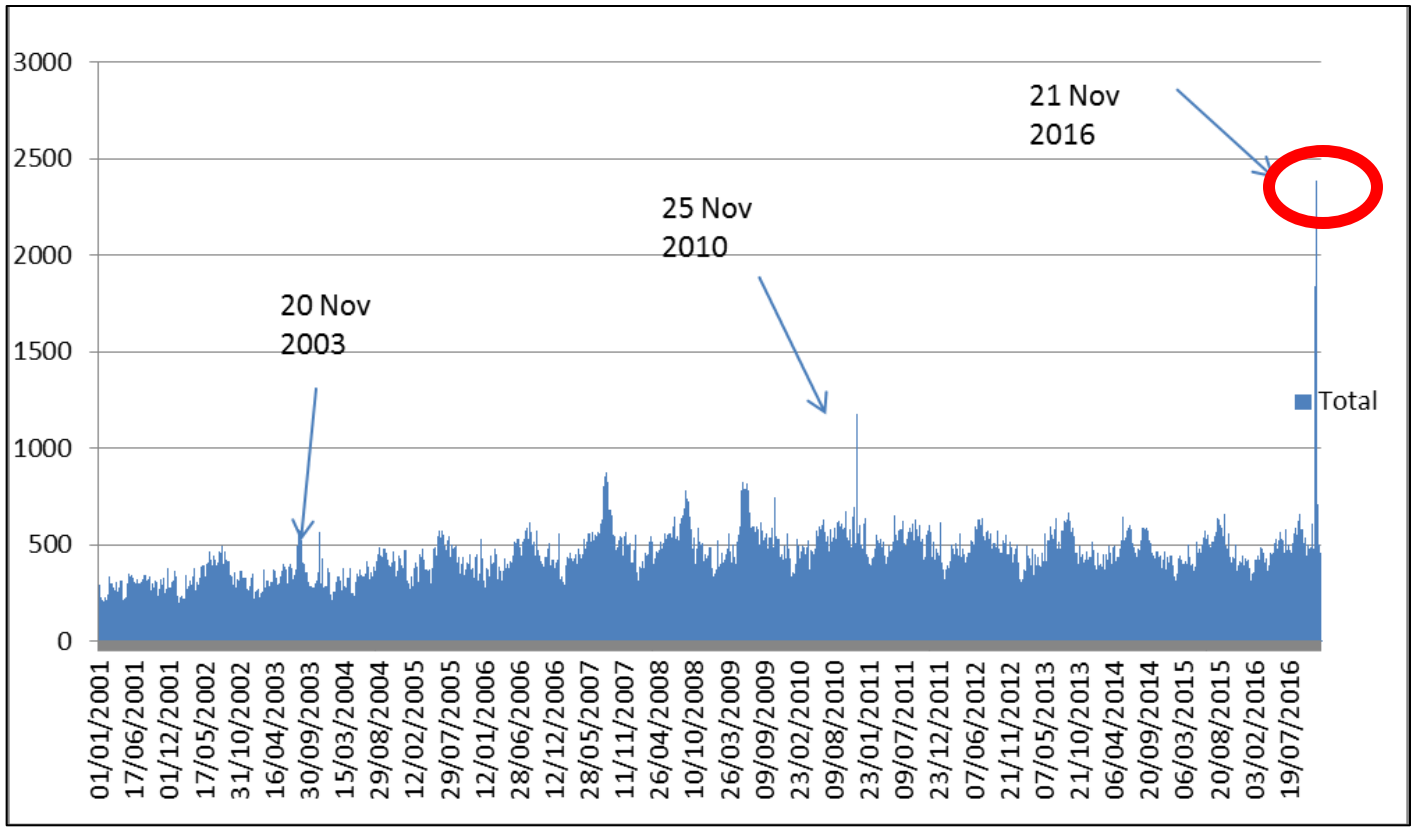
Respiratory presentations to Victorian Emergency Departments, 2001-2016



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When and why...

- Occurs during the rye grass pollen season
  - Between October and December (majority in Nov.)
- Large pollen grains rupture
  - One hypothesis is moisture in the cloud fragments the pollen into smaller particles
- Smaller starch particles are inhaled into the very small airways
  - Larger particles are usually filtered in the nose

G B Marks et al. Thorax 2001;56:468-471

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Proposed pre conditions:

- High concentrations of allergenic material:
  - mainly rye grass pollen also could be fungi and/or dust
- Thunderstorm outflow
- Respirable sized particles (<10 microns)
- Exposure of people who are sensitive to the relevant allergen – can be either allergic rhinitis and/or asthma

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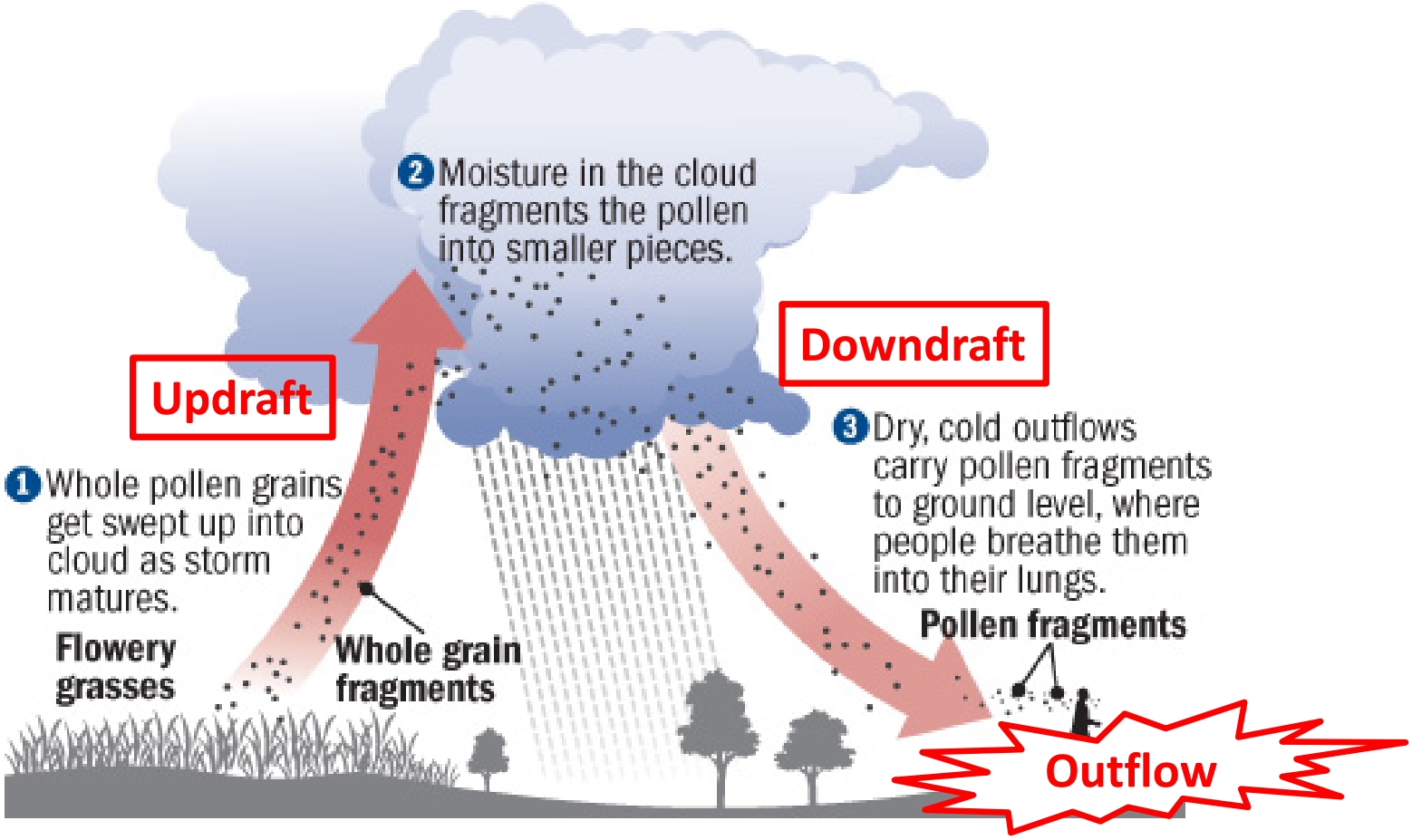
Type of thunderstorm

Visual representation of one hypothesis for the mechanism of thunderstorm asthma



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The challenges of epidemic thunderstorm asthma are...

- Largely invisible
- Geographically dispersed and widespread
- Has a rapid onset
- Unfamiliar - with less practiced response protocols

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Who is at risk and what do we know?

- Data sources from Melbourne event limited
- ED visits and follow up
- Asthma Australia survey
- ? Characteristics of those who came to primary care- GP and pharmacy

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Melbourne inter-hospital group data of ED presenters (1435 patients)*

Almost all had hayfever

- 28% had known current asthma (in last 12 months)
- 26% had symptoms suggesting undiagnosed asthma
- 15% had past asthma (> 12 months prior)
- 30% had never had asthma symptoms

*METSARC (Melbourne ETSA research collaboration)

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Asthma Australia survey

N = 3,396 responses (Self reported) from people “affected” by the thunderstorm asthma event.

- 79% experienced an asthma “attack”
- Hay fever (allergic rhinitis)
  - **92% suffered from hay fever**
  - 60% were treating hay fever
- History of asthma
  - 40% no previous diagnosis of asthma
- Asthma & hay fever
  - Over half had both
- Asthma first aid awareness
  - 53% of people with asthma were aware of first aid steps
  - 25% of people not diagnosed were aware of asthma first aid
- Asthma diagnosis and experiencing an asthma attack
  - **73.5% had been prescribed a preventer**
  - **Only half were** taking it daily in the lead up to the 21st Nov 2016
- Asthma Action Plans
  - 28% yes; 57% no, 15% never heard of one

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Who is at risk?

- Allergy to ryegrass pollen
- Allergic rhinitis (with or without known asthma)
- Asthma (especially if poorly controlled)
- Those not taking asthma preventer (inhaled corticosteroid -ICS)
- Exposed to open air before and during thunderstorm in pollen season
  - Risk is greatest during the first 30 mins of thunderstorm, but can continue into next day
  - Living in an area prone to high pollen counts, historically South Eastern Australia

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Be prepared!

"*if you wheeze or sneeze be proactive for spring*"

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4 risk groups

- Current asthma
- Ever asthma
- Allergic rhinitis - no asthma

- No allergic rhinitis, no asthma

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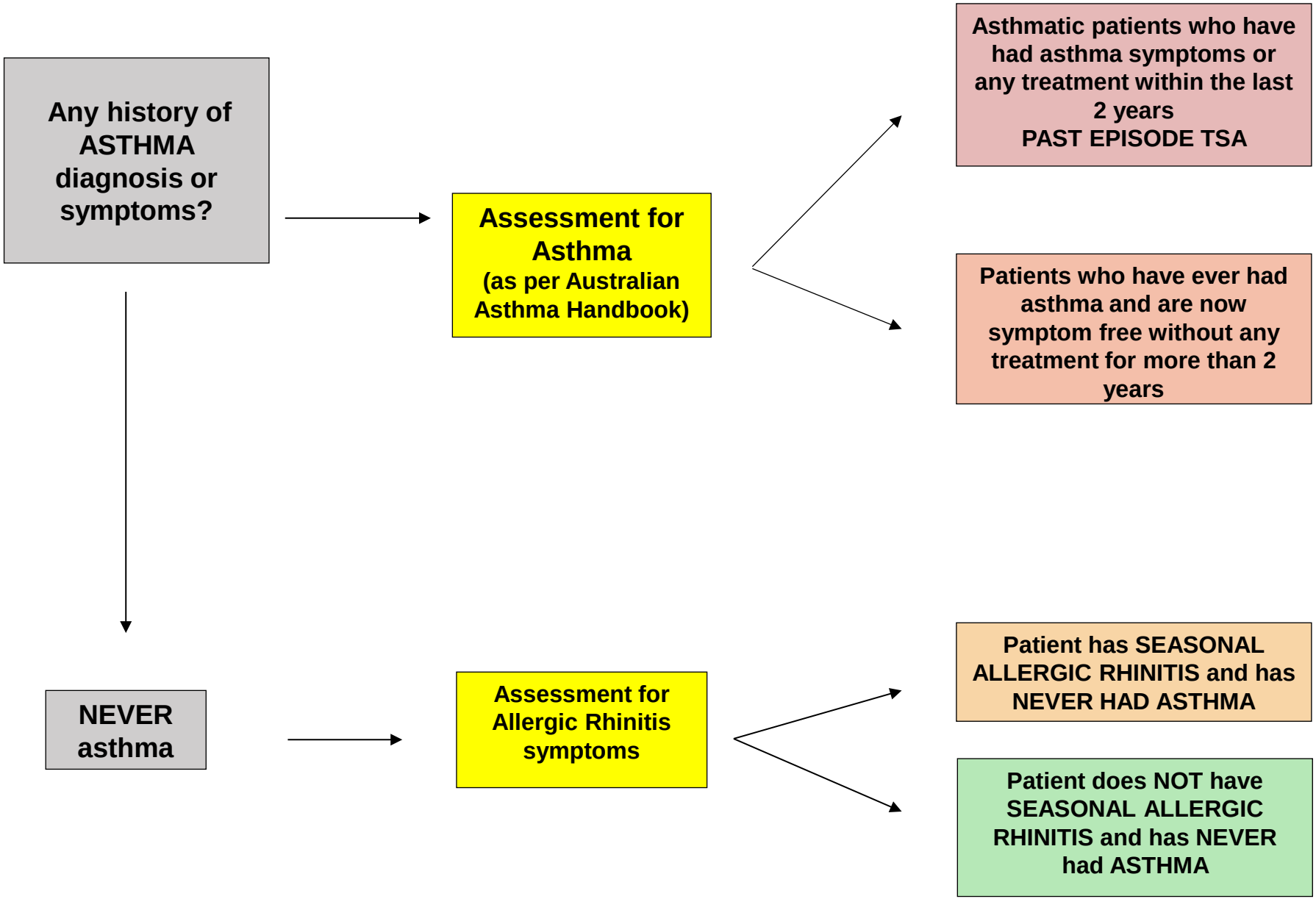

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George K

- 47 year old landscape gardener
- Asthma since childhood
- Prescribed an ICS/LABA

- What else do you need to know?
- What are your prevention/management strategies?

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Andrew

- 28 year old, moved to your regional area 2 years ago for work
- Hayfever last year
- Asthma as a child/young adolescent but says he “grew out of it”

- What else do you need to know?
- What are your prevention/management strategies?

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Gheeta N

- 35 year old accountant
- Hayfever every year since she moved to Australia15 years ago
- Uses OTC nasal decongestants and antihistamines
- Not history of asthma, no wheeze

- What else do you need to know?
- What are your prevention/management strategies?

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Janet S

- 67 year old retired teacher
- NIDDM, hypertension, osteparthritis, hypothyroidism
- No asthma or hayfever
- Son in law and 2 grandchildren have asthma

- What else do you need to know?
- What are your prevention/management strategies?

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Thinking about these patietns

- What else do you need to know?
- What are your prevention/management strategies?

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How can thunderstorm asthma be prevented?

Review patients with asthma for allergic rhinitis and those with allergic rhinitis for asthma

- Good asthma control
  - Use regular preventer if prescribed (most adults with asthma)
- Good allergic rhinitis control
  - Regular intranasal corticosteroid
- Written Asthma Action Plan
- Education
  - Understanding of risk factors, having reliever and knowing how to use it, avoid breathing outdoor air during a thunderstorm
- Know asthma first aid

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Risk group - current asthma George

- Manage as per current guidelines – most will be on regular low dose inhaled corticosteroids (ICS)
- Ensure correct use of inhalers, check adherence
- Review for allergic rhinitis and treat if present - intranasal corticosteroids 6 weeks prior to and throughout pollen season
- Always carry reliever
- Current Written Asthma Action Plan
- Warn against being outdoors during thunderstorms in grass pollen season

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Risk group - current asthma not on ICS (few)

Assess individual current and past history

- Only seasonal asthma - commence low dose ICS 6 weeks prior to pollen/thunderstorm season (suggest 1 September 2017)
- No reported seasonal tendency for asthma but has seasonal allergic rhinitis - commence low dose ICS 6 weeks prior to pollen/thunderstorm season (suggest 1 September 2017)

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Risk group - any history of asthma Andrew

- Review for seasonal allergic rhinitis
  - If present, treat with intranasal corticosteroids 6 weeks prior to and throughout pollen season
- Evaluate need for inhaled corticosteroids (ICS)
  - Consider allergies, seasonality of symptoms, how long since last asthma episode, severity of previous asthma, other medical, psychological and social factors
  - If only ever ETSA –commence low dose ICS 6 weeks prior to pollen/thunderstorm season (suggested 1 September 2017)
- Explanation of how to recognise asthma symptoms and what to do
  - **Carry a reliever** and know how to use it, ensure correct device use (see NAC videos www.nationalasthma.org.au/health-professionals/how-to-videos)
  - Provide Asthma First Aid information (and spare for child minders)
  - Updated written AAP
- Warn against being outdoors during thunderstorms in grass pollen season

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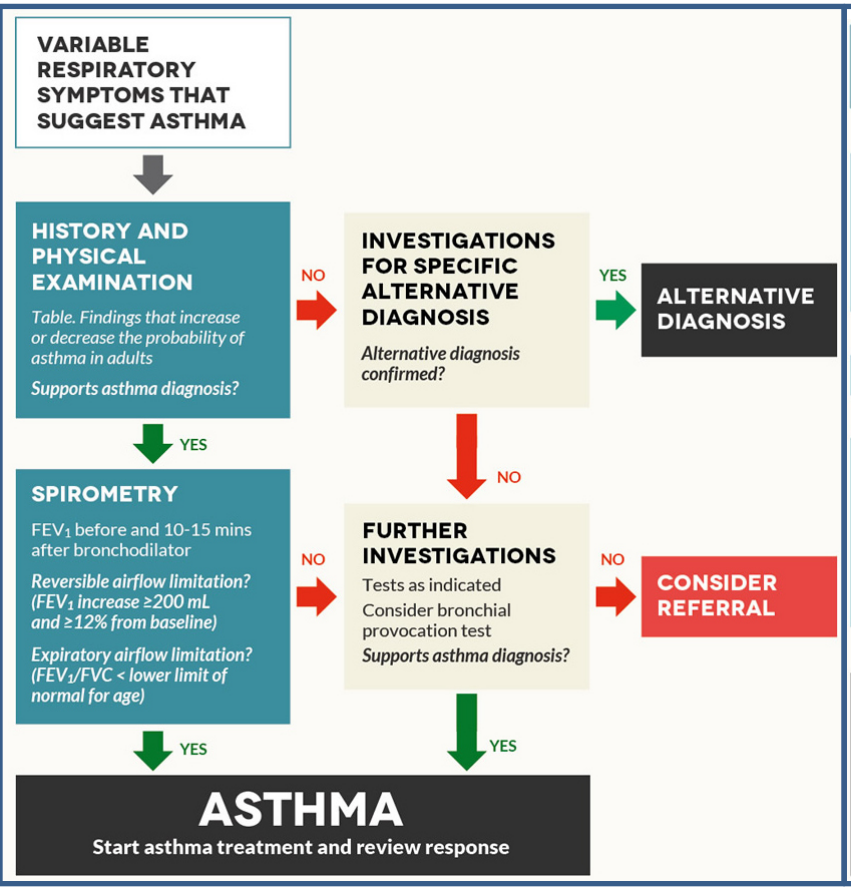
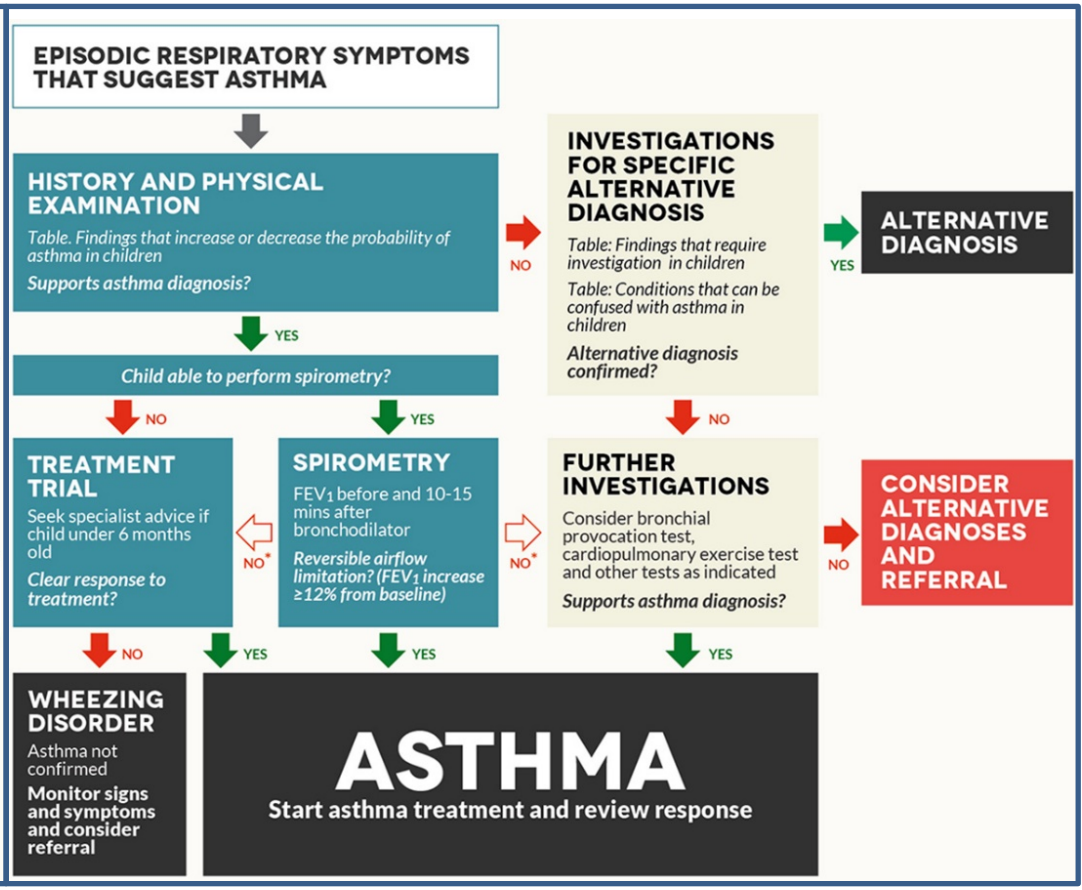
Steps in the diagnosis of asthma in adults



Steps in the diagnosis of asthma in children



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Asthma management principles

- Asthma is a chronic disease
  - Needs ongoing care
  - Not just about treating asthma attack
  - Ongoing self-management education
    - Asthma Action Plans
- Need to consider
  - Lifestyle issues
  - Medical management
  - Comorbidities

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Asthma control

- Involves both:
  - Assessment of recent asthma symptom pattern and severity, reliever use and effect on activities
  - Assessment of risk factors for future adverse events e.g. past flare ups, life threatening asthma, adverse effects of treatment

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Current recommendations

Prescribe a regular inhaled corticosteroid for all adults and adolescents who report any of the following:

- asthma symptoms twice or more during the past month
- waking due to asthma symptoms once or more during the past month
- an asthma flare-up in the previous 12 months.

When starting regular inhaled corticosteroids, begin at a low dose

- review response 6–8 weeks later.

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Step up – Step down principles

- Aim of medication management is to maintain good asthma control with the lowest effective dose of ICS
- Step up if asthma not well controlled
- Step back when asthma well controlled
- Need to consider
  - Potential risks e.g. previous serious events/hospitalisations
  - Severity of asthma
  - Treatment-related adverse effects
  - Achieved therapeutic benefits
  - Patient's wishes
- Once asthma well controlled, review 3-6 months

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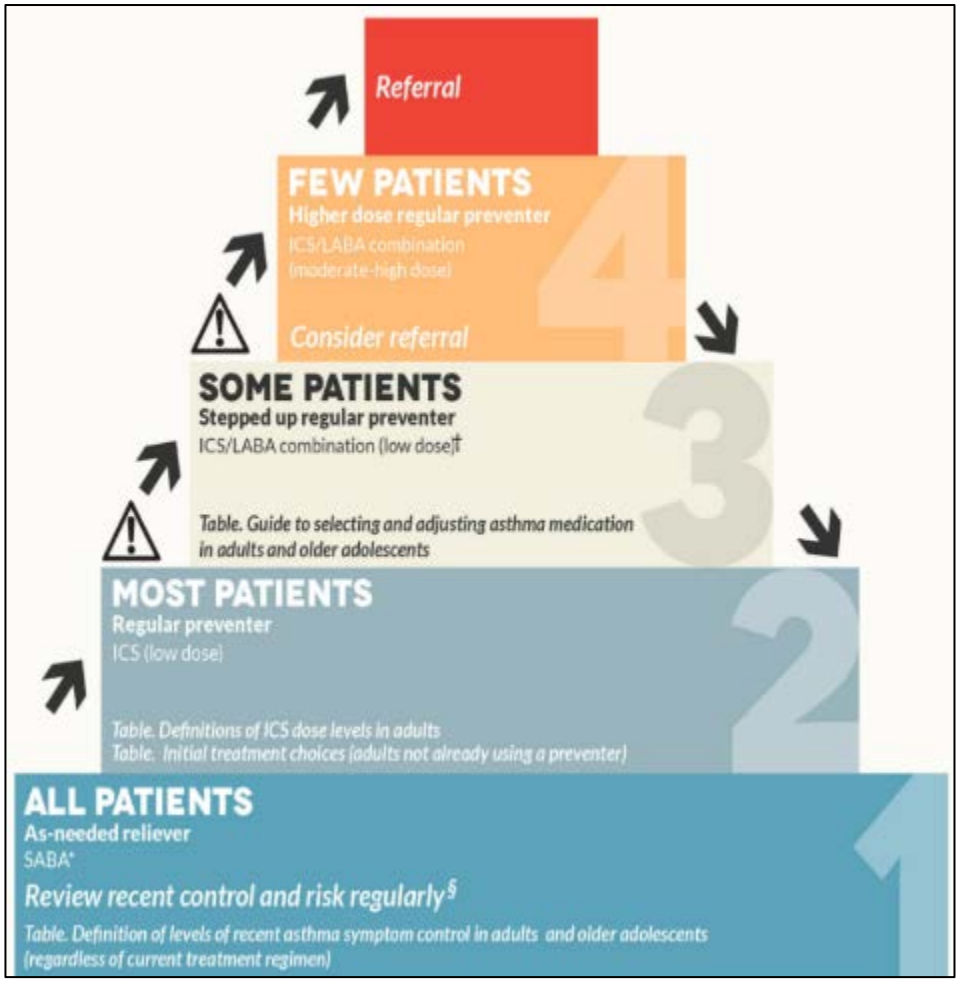
Step up step down.....

Adults



Children

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Definitions of ICS dose levels in adults

Inhaled corticosteroid	*Daily dose (mcg)*		
	Low	*Medium*	*High*
Beclomethasone dipropionate †	100–200	250–400	>400
Budesonide	200–400	500–800	>800
Ciclesonide	80–160	240–320	>320
Fluticasone propionate	100–200	250–500	>500

† Dose equivalents for *Qvar* (CFC-free formulation of beclomethasone dipropionate currently available in Australia).

Note: The potency of generic formulations may differ from that of original formulations. Check TGA-approved product information for details.

Source

Respiratory Expert Group, Therapeutic Guidelines Limited. *Therapeutic Guidelines: Respiratory, Version 4*. Therapeutic Guidelines Limited, Melbourne, 2009.

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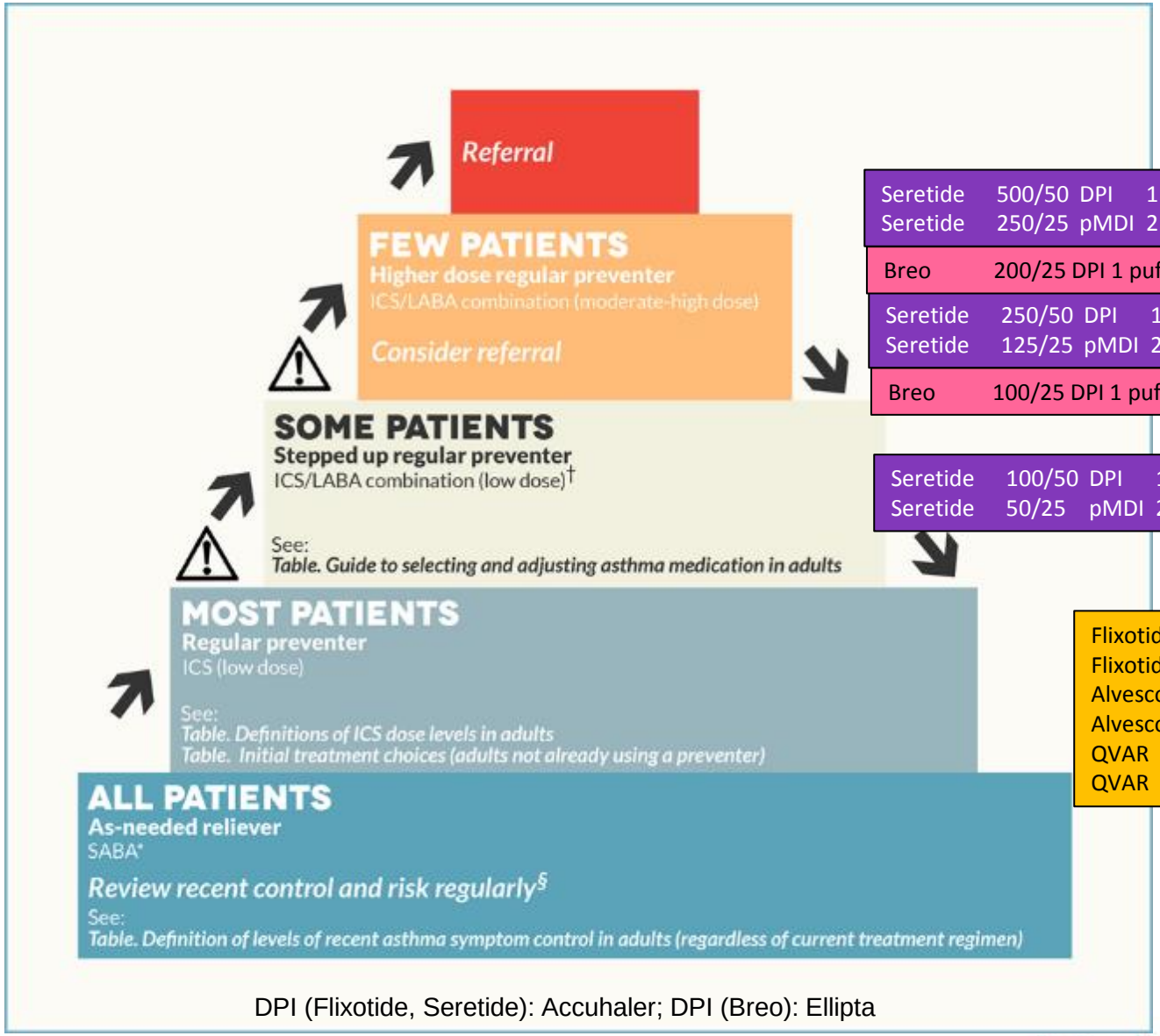
Stepped approach to adjusting asthma medications in adults



Seretide	500/50 DPI	1 puff bd
Seretide	250/25 pMDI	2 puffs bd
Breo	200/25 DPI	1 puff mane
Seretide	250/50 DPI	1 puff bd
Seretide	125/25 pMDI	2 puffs bd
Breo	100/25 DPI	1 puff mane
Seretide	100/50 DPI	1 puff bd
Seretide	50/25 pMDI	2 puffs bd

Flutiform 250/10 pMDI 1-2 puff bd

Flutiform 125/5 pMDI 1-2 puff bd

Flutiform 50/5 pMDI 1-2 puff bd

Flixotide	100 DPI	1 puff bd
Flixotide	50 pMDI	2 puffs bd
Alvesco	80 pMDI	1-2 puffs daily
Alvesco	160 pMDI	1-2 puffs daily
QVAR	50 pMDI	1-2 puffs daily
QVAR	100 pMDI	1-2 puffs daily

DPI (Flixotide, Seretide): Accuhaler; DPI (Breo): Ellipta

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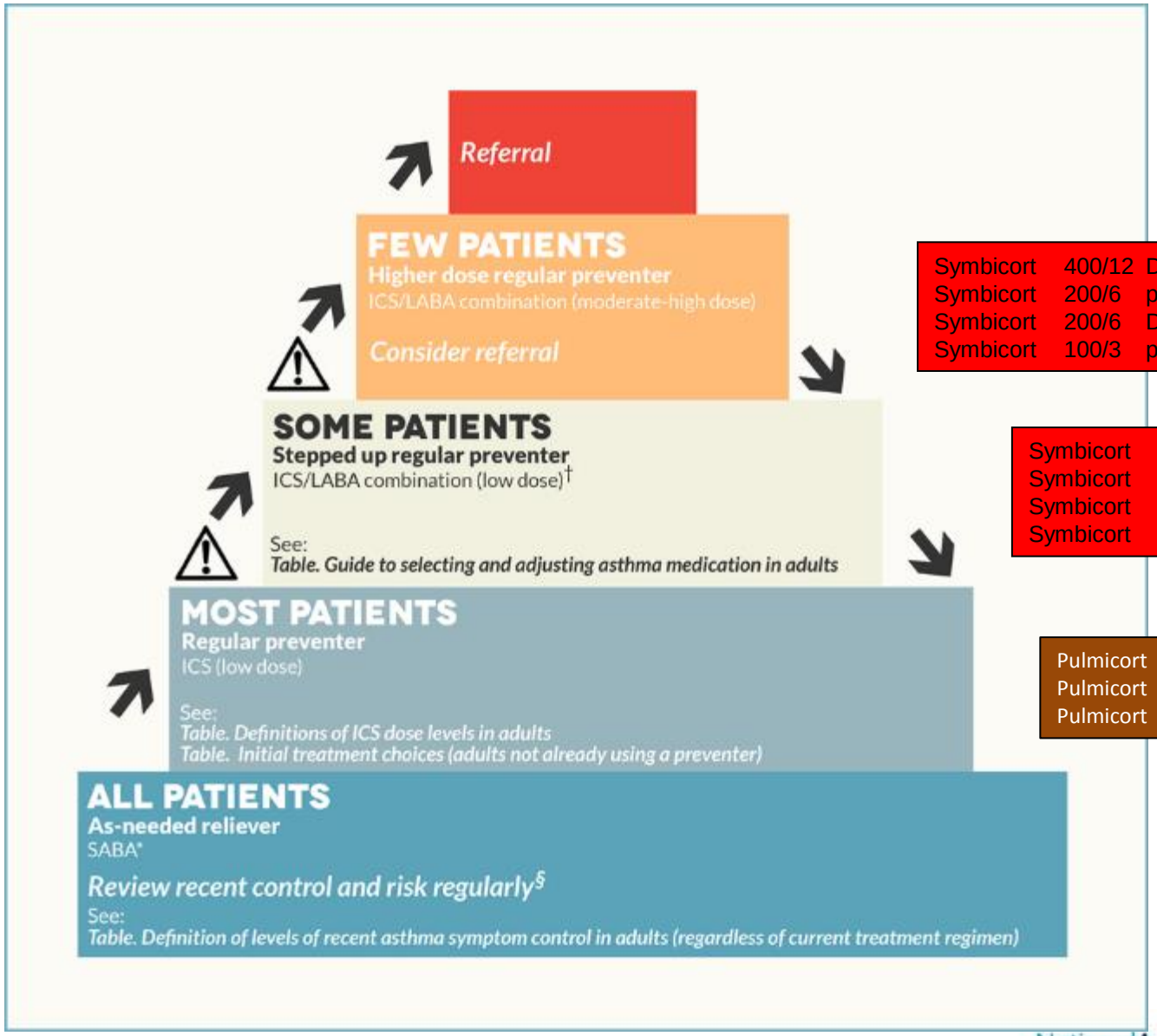
Stepped approach to adjusting asthma medications in adults



Symbicort	400/12	DPI	1-2 puffs bd
Symbicort	200/6	pMDI	2-4 puffs bd
Symbicort	200/6	DPI	2 puffs bd*
Symbicort	100/3	pMDI	4 puffs bd*

Symbicort	200/6	DPI	1 puff bd*
Symbicort	100/3	pMDI	2 puffs bd*
Symbicort	100/6	DPI	1 puff bd*
Symbicort	50/3	pMDI	2 puffs bd*

*Conventional or SMART

Pulmicort	400	DPI	1 puff od
Pulmicort	200	DPI	1 puff bd or od
Pulmicort	100	DPI	1 puff bd or od

DPI: Turbuhaler; pMDI: Rapihaler

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Remember

- Before introducing further treatment
  - Check device technique (up to 90% use incorrectly)
  - Check adherence
- Medication
  - Lowest effective dose to minimise side effects
- When on multiple inhaled medications aim for consistent devices
  - Less variety of devices = Less room for error

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Risk group - allergic rhinitis but never asthma (Gheeta)

For people with allergic rhinitis but no history of asthma at any stage:

- Identify those allergic to grass pollens- seasonal, “hayfever”
  - Treat with intranasal corticosteroids (INCS) beginning 6 weeks before and throughout pollen season
- Manage allergic rhinitis as per current guidelines

- Explanation of how to recognise asthma symptoms and what to do
  - **Carry a reliever and know how to use it**, ensure correct device use (see NAC videos www.nationalasthma.org.au/health-professionals/how-to-videos)
  - Provide Asthma First Aid information

- Warn against being outdoors during thunderstorms in grass pollen season

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Allergic rhinitis review – management

National Asthma Council Australia
leading the attack against asthma

VICTORIA State Government

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Allergic rhinitis treatment

- Intranasal corticosteroids (INCS)
  - **Most effective medication for controlling symptoms**
  - Also effective for ocular symptoms associated with allergic rhinitis
  - May also help with asthma symptoms
- Antihistamines
  - Mild allergic rhinitis
  - Children who cannot tolerate INCS
- Montelukast (S*ingulair*® and generics)
  - **Those with concurrent asthma**
  - Young children
  - Children who cannot tolerate INCS

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Allergic rhinitis treatment *cont'd.*

- Antihistamine nasal spray may be used in combination with INCS
- Allergen avoidance
  - Important to confirm allergen
- Specific allergen immunotherapy (desensitisation)
  - Sublingual or subcutaneous immunotherapy
  - Can modify allergic immune responses
- Oral corticosteroids should be avoided

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ALLERGIC RHINITIS TREATMENTS

CORTICOSTEROID

Flixonase
fluticasone propionate
50mcg

Telnase
triamcinolone
55mcg

Avamys
fluticasone furoate
27.5mcg

Omnaris
ciclesonide
50mcg

Beconase
beclometasone
50mcg

Rhinocort Hayfever • Rhinocort
budesonide[1]
32mcg • 64mcg

Nasonex Allergy • Nasonex
mometasone[1]
50mcg

[1]*generic brands also available*

ANTIHISTAMINE

Azep
azelastine
125mcg

Livostin
levocabastine
0.5mg/mL

Zyrtec
levocabastine
0.5mg/mL

COMBINATION

Dymista
azelastine /fluticasone propionate
125mcg/50mcg

DECONGESTANT

Decongestant
xylometazoline

Decongestant
oxymetazoline

short-term use only
multiple brands available

SALINE

Saline spray — Saline irrigation

multiple brands available

RESOURCES

National Asthma Council Australia
'How-to' videos for nasal spray technique
Clinical recommendations for asthma & allergies
Patient advice, factsheets and brochures

nationalasthma.org.au

This chart shows the main intranasal treatment options available in Australia. Check TGA-approved product information for indications and precautions.

It was developed independently by the National Asthma Council Australia with support from Meda Pharmaceuticals Australia.

ANTICHOLINERGIC

Atrovent Nasal • Atrovent Nasal Forte
ipratropium
22mcg • 44mcg

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SUMMARY -Thunderstorm asthma prevention in adults with grass pollen allergy

	Regular INCS	Regular ICS	Written asthma action plan	Thunderstorm avoidance
Allergic rhinitis	✓		*	✓
Asthma		✓	✓	✓
Asthma and allergic rhinitis	✓	✓	✓	✓

ALL SHOULD CARRY A RELIEVER

*Patient with allergic rhinitis should have a written allergic rhinitis plan.
See ASCIA website: www.allergy.org.au

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General advice for those at risk

- Avoid breathing outdoor air before and during a springtime thunderstorm, especially during wind gusts just before the storm breaks
- Stay indoors with windows closed and air conditioner off or on recirculation mode, or shut car windows and recirculate air.
- Note: Wearing a protective mask is not currently recommended as part of standard prevention

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NO asthma and no allergic rhinitis (Janet)

- People without either asthma or allergic rhinitis are at very low risk
- Reassure them their risk is low
- Educate about asthma symptoms
- Encourage to learn Asthma First Aid so they can help others
- Prudent avoidance of wind gusts before thunderstorms

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Proactive approach is the key .....How do we prepare?

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Advice for patients if a thunderstorm is forecast in spring

- Always carry a reliever puffer
- If prescribed, take daily preventer as instructed
- Know the signs of worsening asthma and the asthma first aid steps
- If any signs of asthma follow a personal asthma action plan or if no personalised WAP then follow the asthma first aid steps
- If asthma symptoms are rapidly worsening, call 000 and state having an asthma attack
- For those with known sensitivity to pollen and who get allergic rhinitis stay inside on high pollen and windy days, and just before, during and after a thunderstorm

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At your clinic

- Be aware of thunderstorm asthma forecast
- Ensure bronchodilators are in date and have adequate supply
- Have a supply of spacers
- Have a clinic policy for patients presenting with an asthma flare up/attack
  - For all staff, including medical receptionists, practice nurses and general practitioners to know their responsibilities
  - Train all staff in asthma first aid and have chart on display
- Utilise recall systems for people with asthma to have regular review of their asthma

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At your hospital/ED

- Be aware of thunderstorm asthma forecast
- Ensure bronchodilators are in date and have adequate supply
- Have a supply of spacers
- Review policy and protocols for management of actor asthma
- Review policy and protocols for epidemics/ surge of presetnations

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At your pharmacy

- Ensure adequate supply of bronchodilators
- Maintain adequate supply of spacers
- Have a pharmacy policy for patients presenting with an asthma flare up/attack
  - For all staff, including pharmacy assistants, dispensing technicians and pharmacists to know their responsibilities and prioritise these patients
  - Train all staff in asthma first aid and have chart on display
  - Know which GP clinics are open and able to assist if appropriate
- For patients requesting hay fever medications, ask about asthma symptoms. Suggest GP review if asthma symptoms are identified.

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In summary

- Be proactive leading up to spring
  - Don't wait for something to happen
- Ensure correct diagnosis of asthma and/or allergic rhinitis
  - Ensure patients know and understand management of triggers
- Address both lifestyle and medical management of asthma and allergic rhinitis
  - Take preventer every day if prescribed
  - If seasonal symptoms or prior thunderstorm asthma only, ideally start before 1st September (the first day of Spring), but make sure everyone is started by 1st October (AFL/NRL grand final weekend)
- All people with asthma to have a current Written Asthma Action Plan and know how to use it
- Awareness of Asthma First Aid for all
- Have access to a "reliever" and know how to use it

State Government "Public Health Campaign" early Spring Asthma Australia COACH Program: 1800 ASTHMA

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References

- *The November 2016 Victorian epidemic thunderstorm asthma event: an assessment of the health impacts*. The Chief Health Officer's Report, 27 April 2017
- State Government Victoria, *Review of response to the thunderstorm asthma event of 21-22 November 2016,* April 2017
- National Asthma Council Australia (NAC) *Australian Asthma Handbook Version 1.2* www.asthmahandbook.org.au
- Also
  - *NAC Information paper "thunderstorm asthma", soon to be released*
  - *Asthma in Australia 2011*
  - *Global Initiative for Asthma (*GINA) 2017

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Objectives

- Describe the phenomena of thunderstorm asthma and environmental circumstances
- Identify who is at greater risk of thunderstorm asthma
- How to manage patients with increased risk of thunderstorm asthma
- Apply current, evidence – based best practice of asthma and allergic rhinitis to professional practice

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www.nationalasthma.org.au

Ph: 1800 032 495

National Asthma Council Australia
Australian Asthma Handbook

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