Optimising Management of Paediatric Asthma

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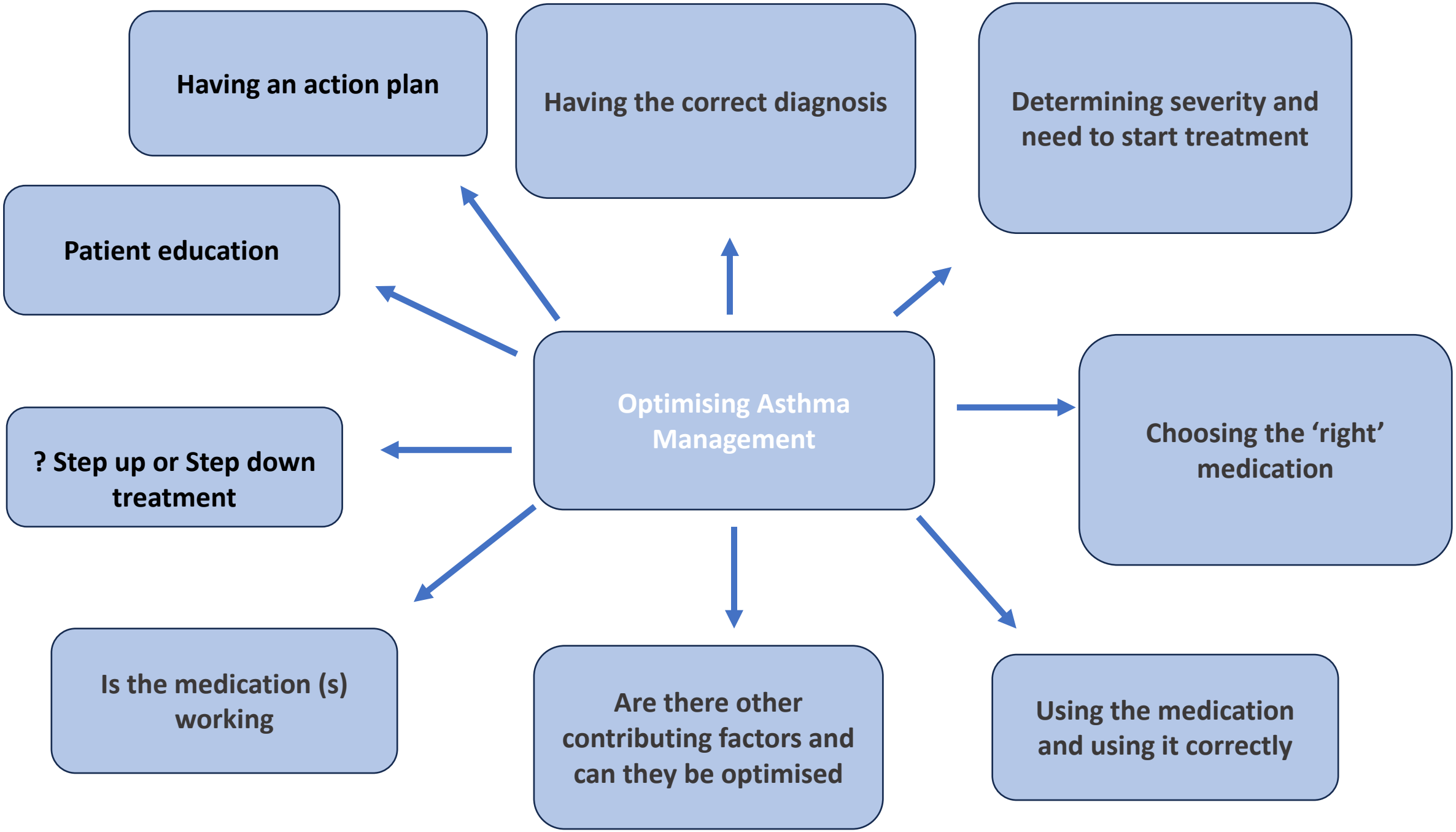
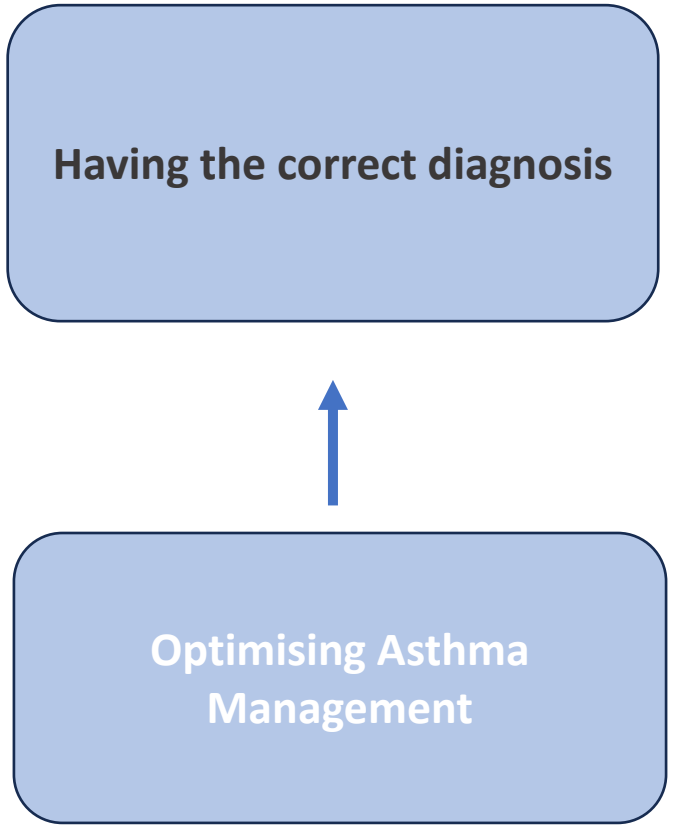
Paediatric Respiratory and Sleep Physician


Having an action plan
Having the correct diagnosis
Determining severity and need to start treatment
Patient education
Optimising Asthma Management
? Step up or Step down treatment
Choosing the 'right' medication
Is the medication (s) working
Are there other contributing factors and can they be optimised
Using the medication and using it correctly


Having the correct diagnosis
Optimising Asthma Management

Approach to diagnosis

- Age groups
  - < 12 months
  - 1 – 5 years
  - 6 years – 12 years
  - > 12 years
- Symptoms
- Clues on history
  - Personal or family history of atopy
- Phenotypes of severe asthma
  - Clinical characteristics eg childhood onset allergic asthma, adult onset atopic asthma
  - Biomarker characteristics Type 2/eosinophilic asthma vs neutrophilic asthma

Age groups

< 12 months	1-5 years	6-12 years	> 12 years
• Bronchiolitis • Viral induced wheeze • Genetic respiratory diseases – CF, Primary Ciliary dyskinesia • Laryngomalacia • Tracheomalacia • GORD • Aspiration • Bronchopulmonary dysplasia • *Asthma*	• Viral induced wheeze • Asthma • Protracted bacterial bronchitis • Genetic respiratory disease • Foreign bodies	• Asthma • Habit cough	• Asthma *(exercise induced symptoms)* • VCD • Dysfunctional breathing • Habit cough • Anxiety • Poor cardiopulmonary fitness

Age groups

< 12 months	1-5 years	6-12 years	> 12 years
• Bronchiolitis • Viral induced wheeze • Genetic respiratory diseases – CF, Primary Ciliary dyskinesia • Laryngomalacia • Tracheomalacia • Vascular ring • GORD • Aspiration • Bronchopulmonary dysplasia • *Asthma*	• Viral induced wheeze • Asthma • Protracted bacterial bronchitis • Genetic respiratory disease • Foreign bodies	• Asthma • Habit cough	• Asthma *(exercise induced symptoms)* • VCD • Dysfunctional breathing • Habit cough • Anxiety • Poor cardiopulmonary fitness

Age groups

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Lung function testing

- Infants who wheeze – 80% in a UK longitudinal cohort admitted for bronchiolitis, did not have repeat wheeze until 8 years of age (Marlow et al 2019)

- 80% of asthmatic subjects will have the disease in first years of life (Yunginger et al 1992)

- 30% pre-schoolers with recurrent wheeze will have asthma at 6 years of age (Taussig et al 2003)

- Not all infants who wheeze have asthma
- Children with asthma will most likely have presented in the first year of life, especially those toddlers who wheeze repeatedly

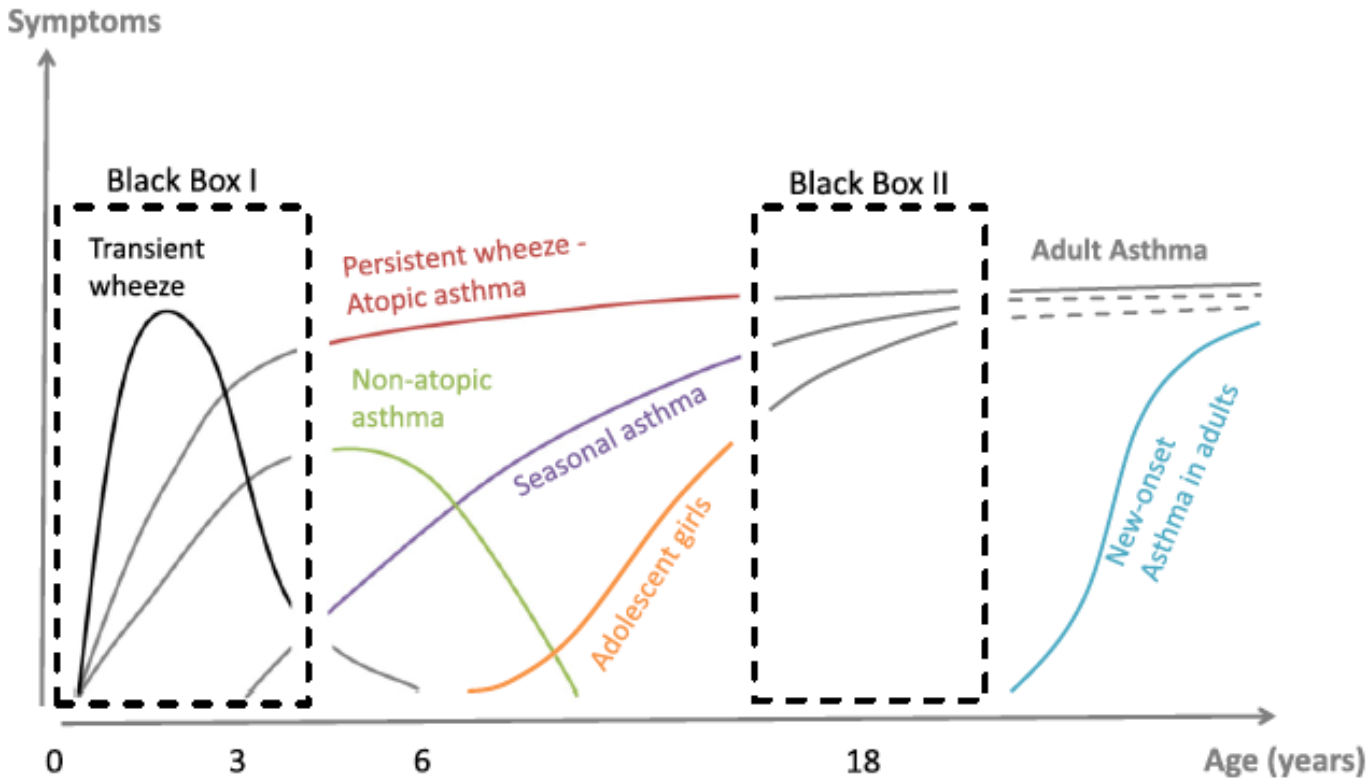
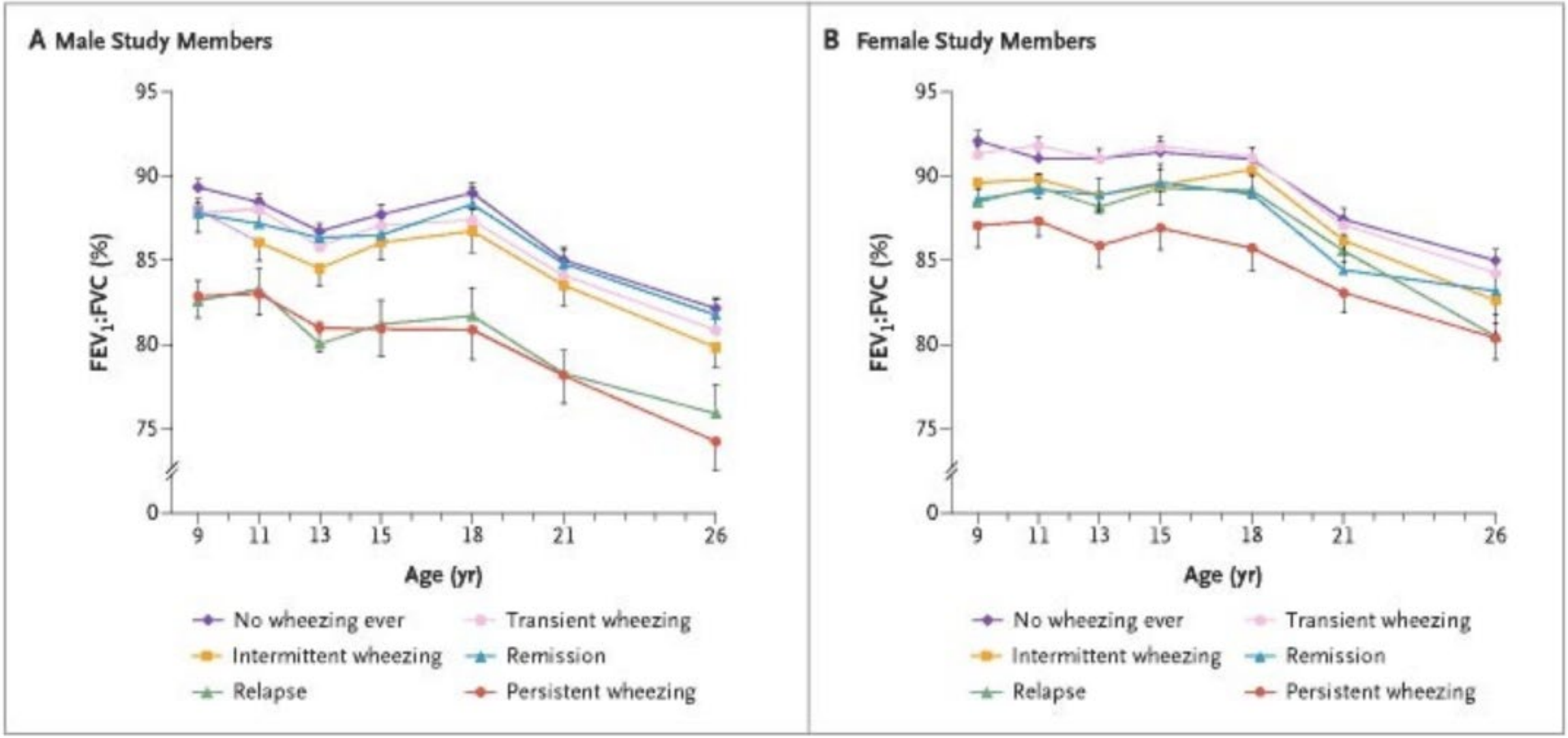


Fig. 1 Wheeze and asthma phenotypes during childhood and adulthood. About 25–30% of children have at least one episode of wheeze before their 3rd birthday, but considerable clinical heterogeneity exists (broken line box I). Children with transient wheeze become symptom-free before school-age, those with non-atopic asthma after about 8 years of age. However, some, especially those with persistent atopic wheeze and seasonal triggers of wheeze go on to persistent asthma in later childhood and adulthood. Interestingly, girls present with new-onset asthma in significant numbers during adolescence, thereby adding to turning the sex-based bias from male towards female sex. While there is also new-onset-asthma during adulthood, it is unclear whether differences between persistent childhood asthma phenotypes continue throughout transition (broken line box II) into adulthood

Fuchs, O., Bahmer, T., Weckmann, M. *et al.* The all age asthma cohort (ALLIANCE) - from early beginnings to chronic disease: a longitudinal cohort study. *BMC Pulm Med* **18**, 140 (2018).



Sears, Malcolm R. et al. "A Longitudinal, Population-Based, Cohort Study of Childhood Asthma Followed to Adulthood." *The New England Journal of Medicine* 349.15 (2003): 1414–1422.

Symptoms

- Cough, wheeze and shortness of breath
  - Don’t necessary have to have wheeze
- Cough
  - Nocturnal cough
  - Seasonal cough or cough in response to specific exposures (eg cold air, exercise, allergens, laughing or crying)
  - Cough that lasts > 2-3 weeks
  - Most common cause of chronic cough in children > 3 years is asthma, even in the absence of wheeze
  - Dry or productive (* sometimes hard to differentiate with protracted bacterial bronchitis)
- Wheeze
  - Polyphonic, high pitched (variable airway constriction) - can be inspiratory and expiratory
  - Central airway pathology – wheeze tends to be harsh, monophonic
- Videos to demonstrate

Other clues on history

- Seasonal symptoms
  - Trees in spring (pollination), grasses in summer, weeds in the fall
  - Mould during rainy seasons or indoor dampness exposure
  - Thunderstorm asthma
- Features of allergies
  - Aeroallergens or food sensitisation, atopic dermatitis
  - Atopy to multiple allergens at early ages predict asthma at the age of 8 years (Simpson et al 2010)
- Exercise induced symptoms
  - Symptoms develop Several minutes in to exercise and resolves with rest over 30-60 minutes.
  - The biggest change or fall in lung function testing is 5-10 minutes after stopping exercise
  - Certain exercises like running more provocative than swimming
- Family history – 1 parent, odds ratio 2.6, 2 parent odds ratio 5.2 (Dold et al, 1992)
- Maternal smoking history

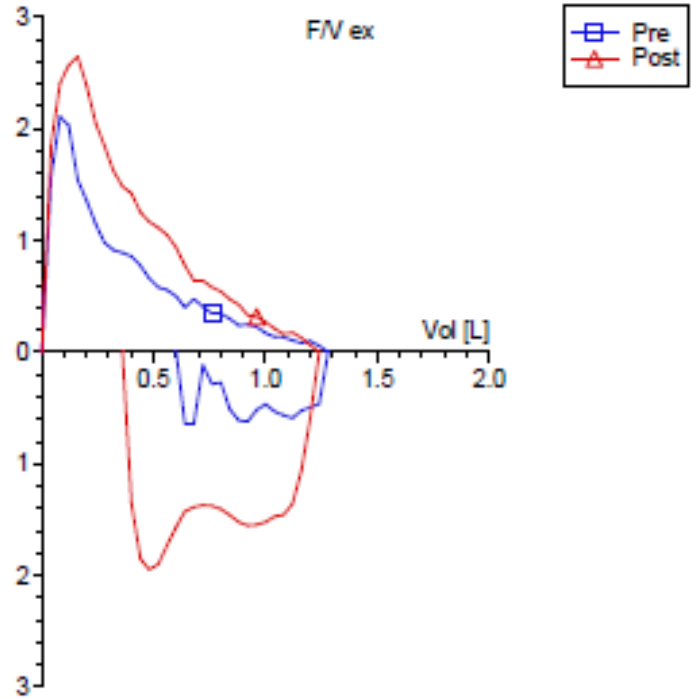
Diagnosis

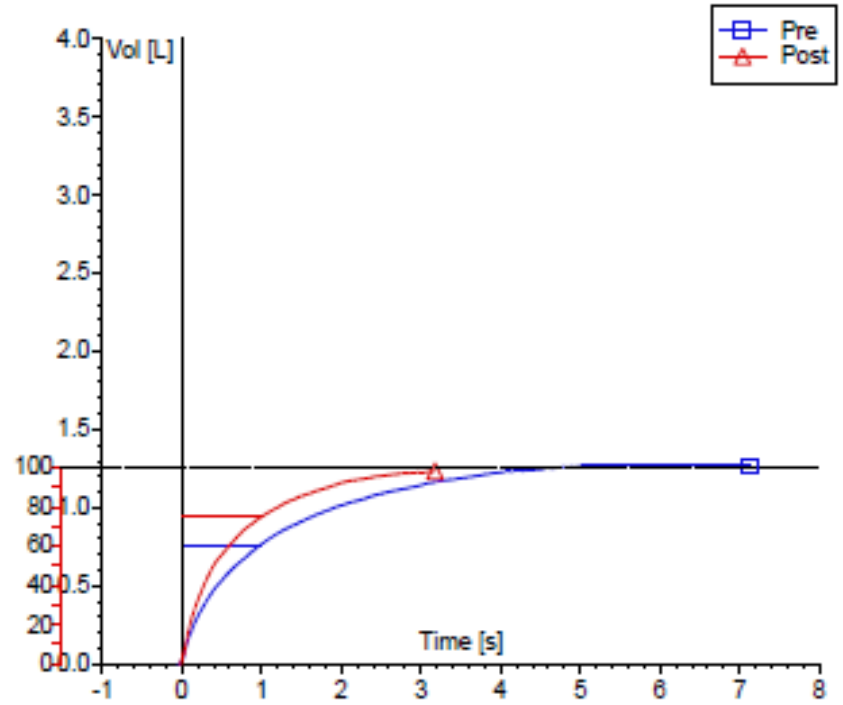
- Key elements
  - Variable expiratory airflow limitation (eg with spirometry)
  - Reversible obstruction
  - Exclusion of alternative diagnosis
- Spirometry
  - If positive → diagnosis
  - If negative → does not exclude
  - Variable technique
- FeNO
- Bronchoprovocation testing – those with normal spirometry, atypical response to treatment
  - Mannitol, HTS, Exercise

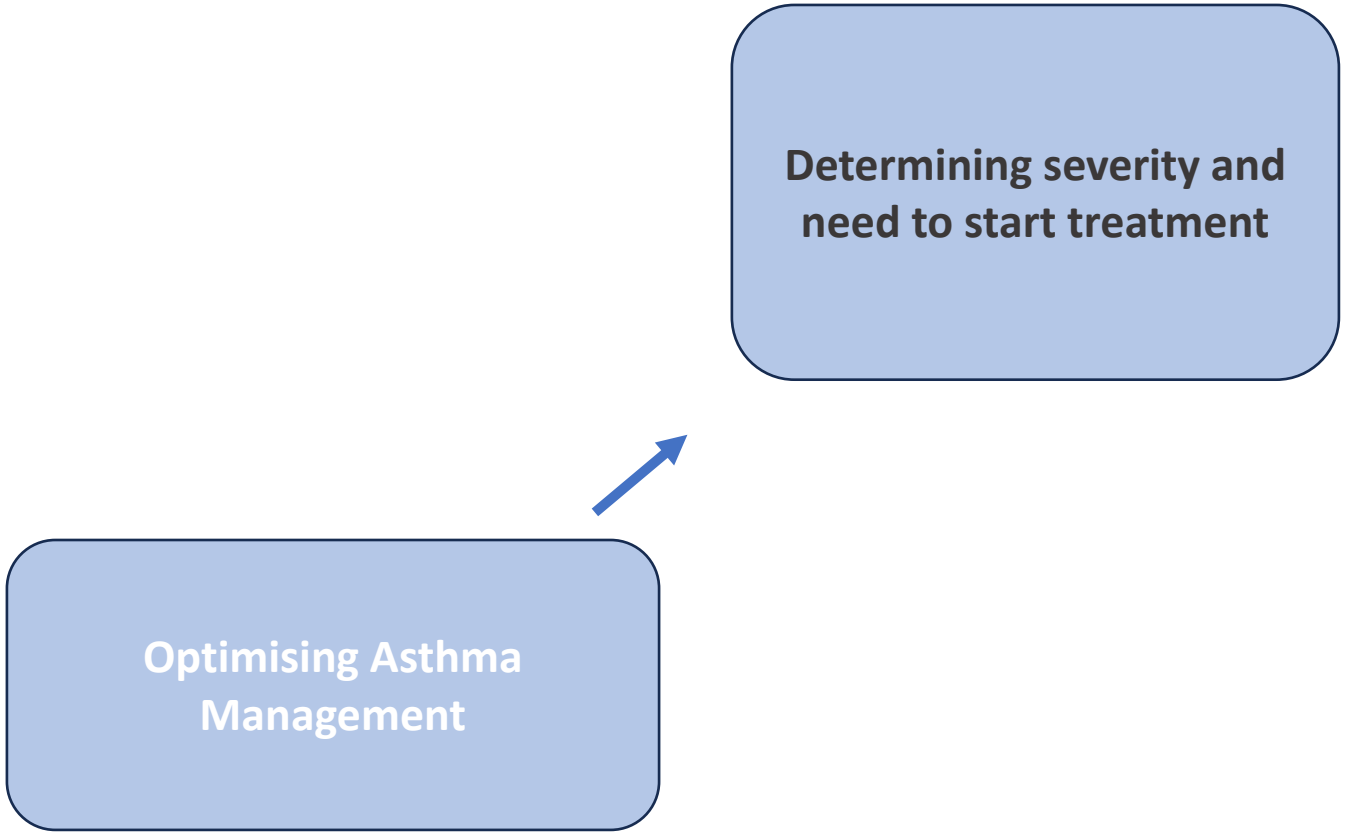
Spirometry

	Pred	LL	Pre Meas	Pre %	Z-Score	Z-Score	PostMeas	Post %	BDR %
FEV1 L	1.40	1.11	0.76	54	-3.63		0.94	67	13
FVC L	1.58	1.26	1.26	80	-1.65		1.23	78	-2
FEV1/FVC %	89	78	60		-3.17		76		
FEF25-75% L/s	1.73	1.08	0.43	25	-3.92		0.74	43	18
PEF L/s			2.11				2.90		
Level time			12:37PM				12:49PM		

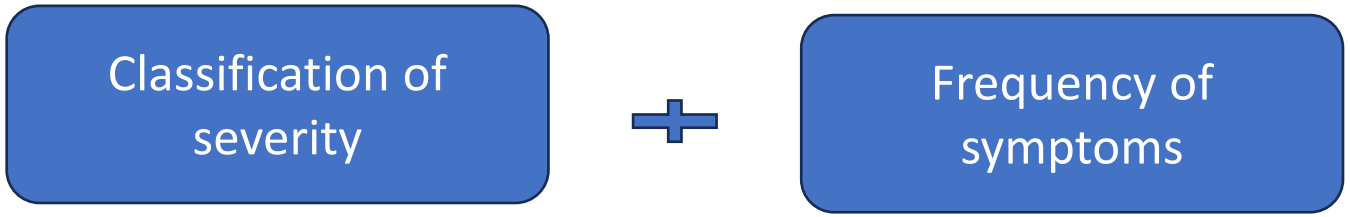
Predicted Reference: Quanjer GLI 2012 (PEF: NHAINES III 1999)






Determining severity and need to start treatment
Optimising Asthma Management

When to start preventer medications?



Classification - AAH

- Severity of Flare ups
  - Mild
    - salbutamol *as needed* at home
  - Moderate Severe
    - requiring *systemic corticosteroids* and or *emergency department* presentations
  - Life threatening
    - requiring *hospitalisation* or *intensive care*

Frequency of symptoms (1-5 years)

- Symptoms every 6 months of less
- Symptoms every 3-4 months
- Symptoms every 4-6 weeks
- Symptoms at least once per week

Indications for preventer treatment (1-5 years)

	Symptoms every 6 months or less	Symptoms every 3-4 months	Symptoms every 4-6 weeks	Symptoms at least once per week
Mild flare ups	Not indicated	Not indicated	Consider	Indicated
Moderate Severe flare	Indicated	Indicated	Indicated	Indicated
Life threatening flare	Indicated	Indicated	Indicated	Indicated

Adapted from AAH

Indications for preventer treatment (1-5 years)

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Adapted from AAH

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	Symptoms every 6 months or less	Symptoms every 3-4 months	**Symptoms every 4-6 weeks**	Symptoms at least once per week
Mild flare ups	Not indicated	Not indicated	Consider	Indicated
Moderate Severe flare	Indicated	Indicated	Indicated	Indicated
Life threatening flare	Indicated	Indicated	Indicated	Indicated

Adapted from AAH

Frequency of symptoms 6-11 years

- Flare ups < every 6 weeks and no interval symptoms
- Flare ups > every 6 weeks and no interval symptoms
- Interval symptoms
  - Daytime more than once per week
  - Night time symptoms > 2 times a month
  - Limited activity or sleep due to symptoms

Indications for preventer treatment (6-11 years)

	< every 6 weeks + no interval symptoms	> Every 6 weeks + no interval symptoms	Interval symptoms
Mild flare ups	Not indicated	Consider	**Indicated**
Moderate Severe flare	Consider	Indicated	**Indicated**
Life threatening flare	**Indicated**	**Indicated**	**Indicated**

Adapted from AAH

Indications for preventer treatment (6-11 years)

	< every 6 weeks + no interval symptoms	> Every 6 weeks + no interval symptoms	Interval symptoms
Mild flare ups	Not indicated	Consider	Indicated
Moderate Severe flare	**Consider**	**Indicated**	Indicated
Life threatening flare	Indicated	Indicated	Indicated

Adapted from AAH

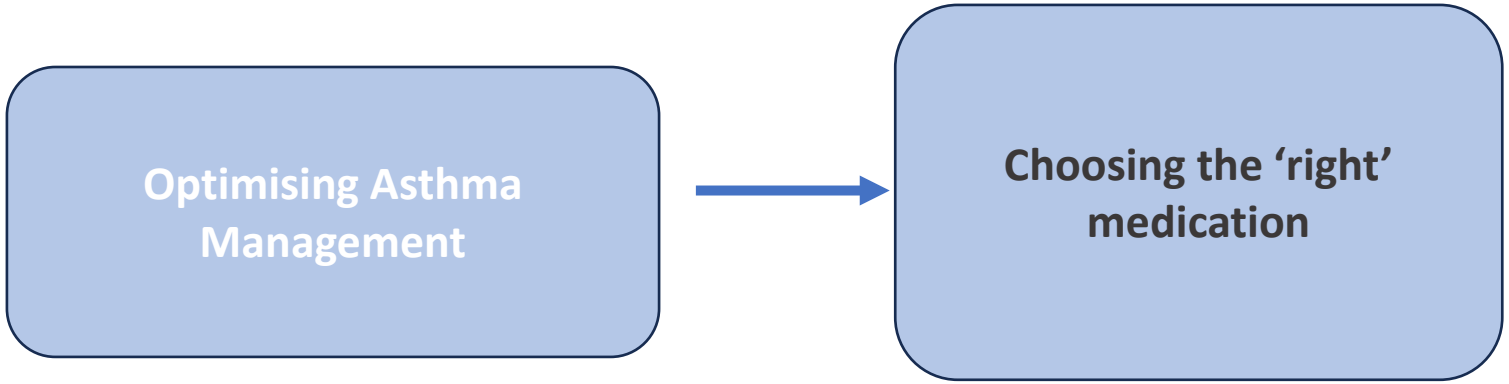
Indications for preventer treatment (6-11 years)

	< every 6 weeks + no interval symptoms	> Every 6 weeks + no interval symptoms	Interval symptoms
Mild flare ups	**Not indicated**	**Consider**	Indicated
Moderate Severe flare	Consider	Indicated	Indicated
Life threatening flare	Indicated	Indicated	Indicated

Adapted from AAH

Key aspects

- Nocturnal symptoms → poor control
- Symptoms or frequent use of short acting beta agonists (out side of pre-emptive tx with exercise) → poor control
- Oral glucocorticoids or ED presentations >2 times a year → poor control
- Severe life threatening episode → PICU admission


Optimising Asthma Management
Choosing the ‘right’ medication

Choosing the ‘right’ medication

- Severity and characteristics of symptoms
- Device type
  - Age
  - Compliance
    - Adult and paediatric studies 30-60%
    - Adolescent
      - Must ensure correct technique

Guidelines

National Asthma Council | Australian Asthma Handbook

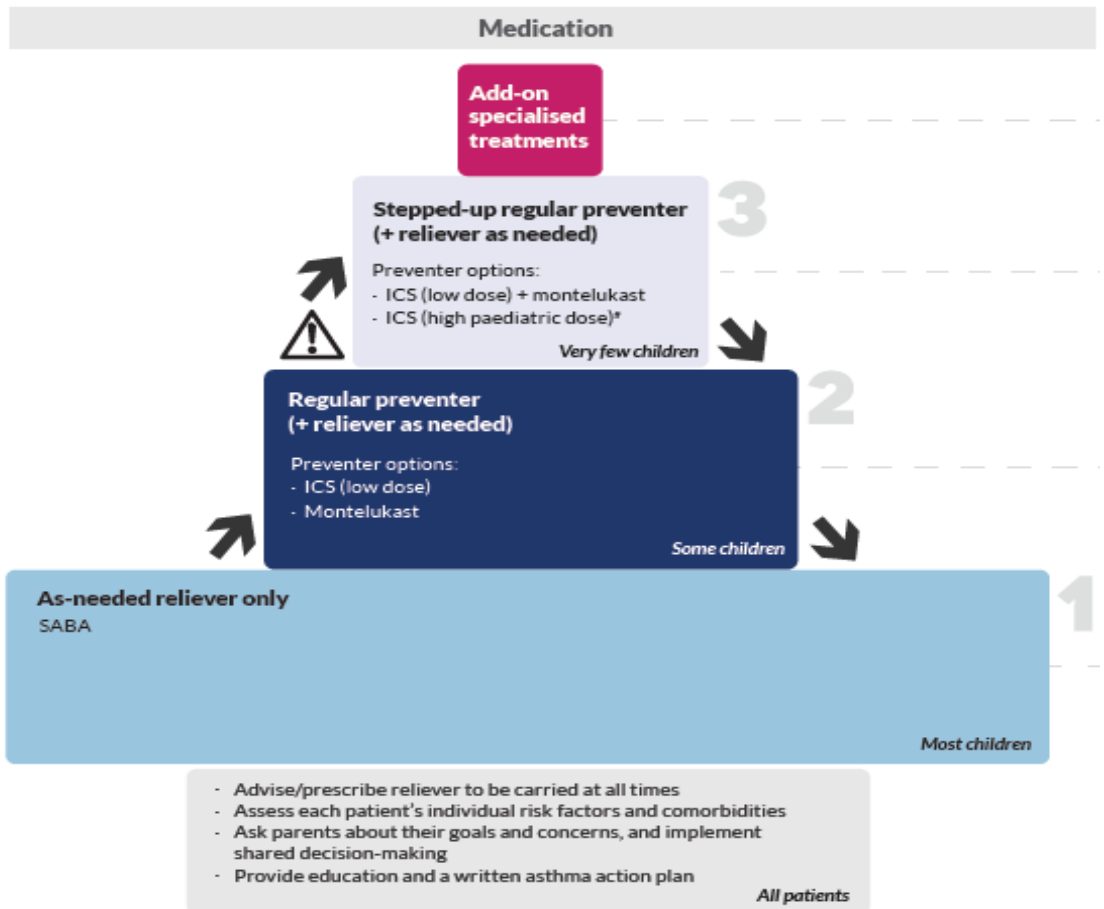
GLOBAL INITIATIVE FOR ASTHMA

National Asthma Education and Prevention Program (NAEPP)

Convened by the National Institutes of Health

Age 1-5 years

Figure. Stepped approach to adjusting asthma medicatio in children aged 1-5 years



Children 5 years and younger

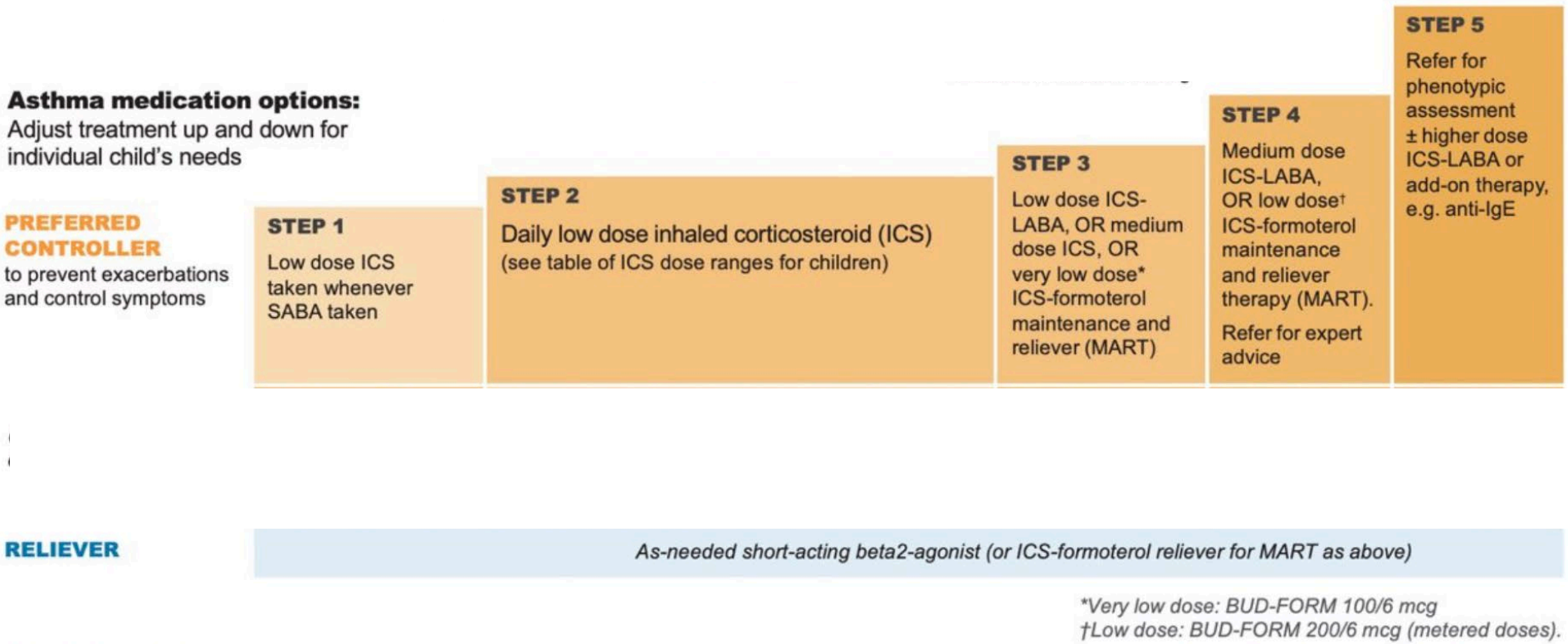
Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE		Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for pre-school children)	Double 'low dose' ICS	Continue controller & refer for specialist assessment
Other controller options		*Daily leukotriene receptor antagonist (LTRA), or intermittent short courses of ICS at onset of respiratory illness*	*Low dose ICS + LTRA Consider specialist referral*	*Add LTRA, or increase ICS frequency, or add intermittent ICS*
RELIEVER	*As-needed short-acting β_2-agonist*			
CONSIDER THIS STEP FOR CHILDREN WITH:	Infrequent viral wheezing and no or few interval symptoms	Symptom pattern not consistent with asthma but wheezing episodes requiring SABA occur frequently, e.g. ≥3 per year. Give diagnostic trial for 3 months. Consider specialist referral.	Asthma diagnosis, and asthma not well-controlled on low dose ICS	Asthma not well-controlled on double ICS
		Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbations per year.	Before stepping up, check for alternative diagnosis, check inhaler skills, review adherence and exposures	

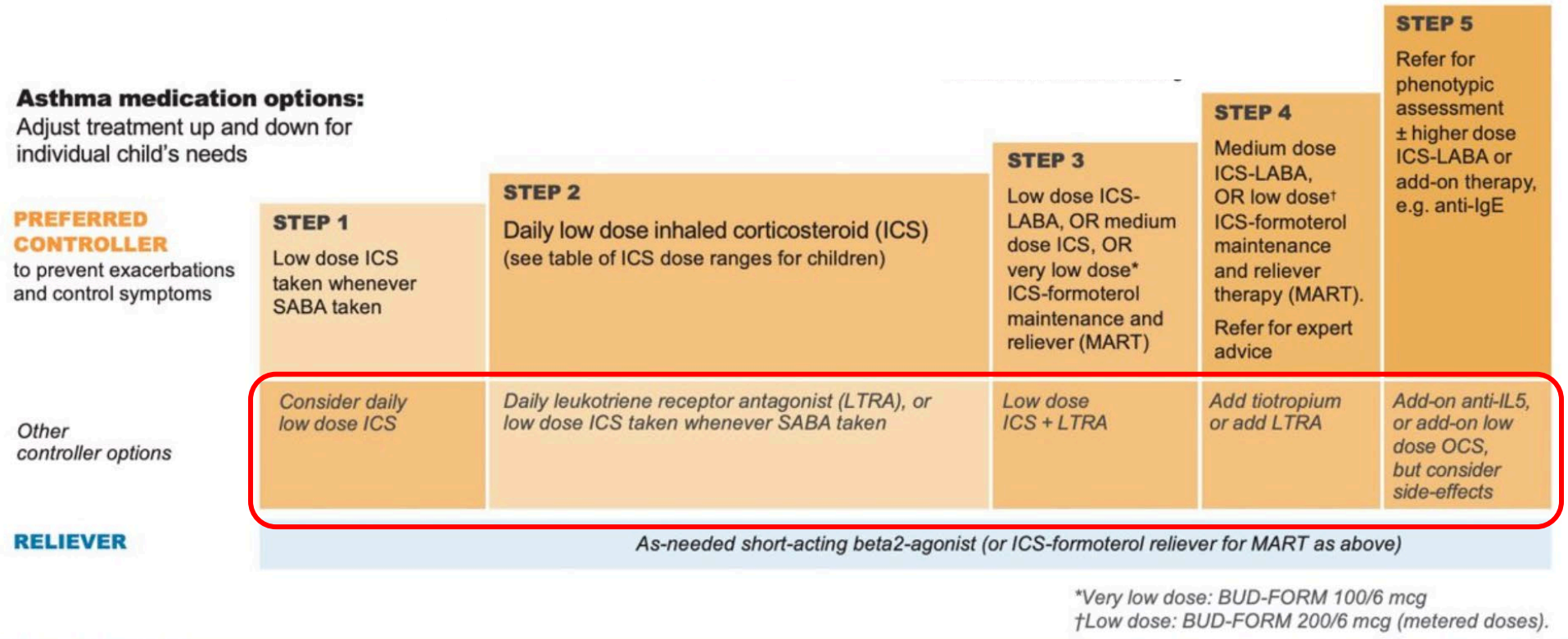
Age 6- 11 years

Figure. Stepped approach to adjusting asthma medication in children aged 6-11 years

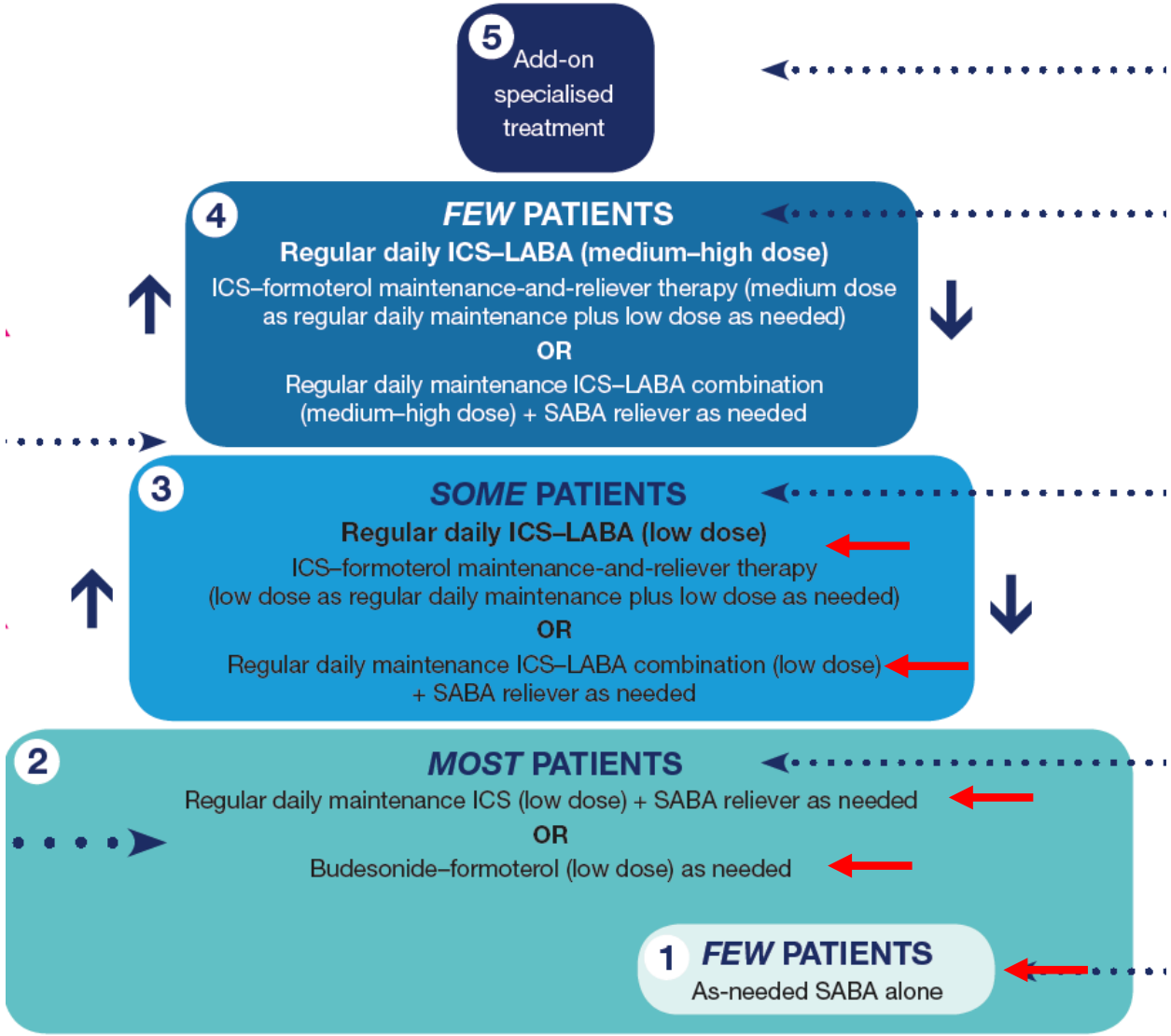
Children 6-11 years



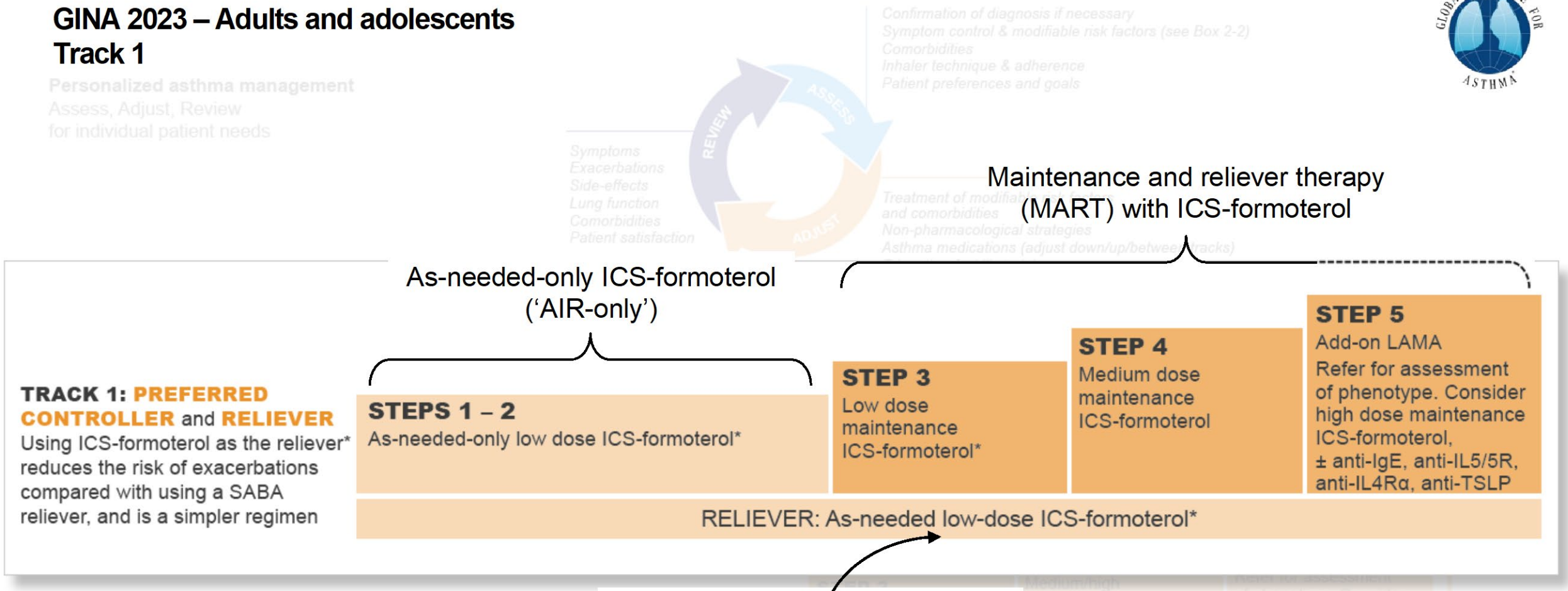
Children 6-11 years



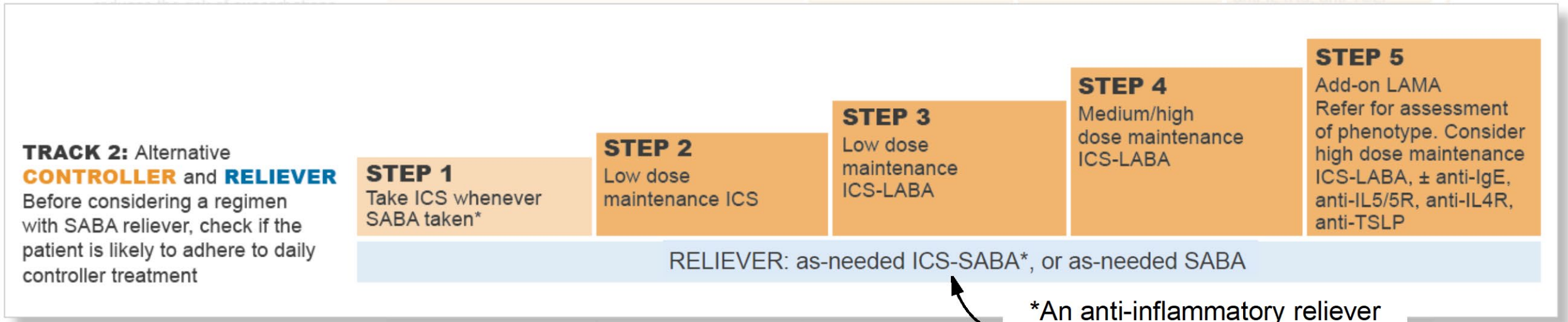
Age > 12 years


5
Add-on specialised treatment
4
FEW PATIENTS
Regular daily ICS–LABA (medium–high dose)
ICS–formoterol maintenance-and-reliever therapy (medium dose as regular daily maintenance plus low dose as needed)
OR
Regular daily maintenance ICS–LABA combination (medium–high dose) + SABA reliever as needed
3
SOME PATIENTS
Regular daily ICS–LABA (low dose)
ICS–formoterol maintenance-and-reliever therapy (low dose as regular daily maintenance plus low dose as needed)
OR
Regular daily maintenance ICS–LABA combination (low dose) + SABA reliever as needed
2
MOST PATIENTS
Regular daily maintenance ICS (low dose) + SABA reliever as needed
OR
Budesonide–formoterol (low dose) as needed
1
FEW PATIENTS
As-needed SABA alone

GINA 2023 – Adults and adolescents
Track 1



GINA 2023 – Adults and adolescents
Track 2



SMART/MART therapy

- Single Maintenance And Reliever Therapy or Maintenance and Acute Reliever Therapy
- Large trials are overwhelmingly in adults and adolescents with smaller portion of adolescents in each trial.
- Jorup et al 2018
  - Pooled analysis of RCTs adolescents with persistent asthma favoured SMART when compared to other maintenance regimens
    - Number of severe exacerbations
    - Time to first exacerbation
    - SMART group → lower as needed dose, lower mean daily dose of ICS
  - Caution
    - different comparators, dosages,
    - asthma severity in adolescents lower,
    - assumed compliance (mean daily ICS doses based on prescribed dose, e diaries of additional doses).

Device Type

Educate
Demonstrate
Practice
Reminders

National Asthma Council AUSTRALIA

ASTHMA & COPD MEDICATIONS

SABA RELIEVERS


Ventolin Inhaler † ^
salbutamol 100mcg


Asmol Inhaler † ^
salbutamol 100mcg


Bricanyl Turbuhaler [a] [c]
terbutaline 500mcg


Airomir Autohaler ‡ #
salbutamol 100mcg

ICS PREVENTERS


Flixotide Inhaler †
fluticasone propionate
50mcg* • 125mcg • 250mcg
Flixotide Junior


Fluticasone Cipla Inhaler †
fluticasone propionate
125mcg • 250mcg


Flixotide Accuhaler †
fluticasone propionate
100mcg* • 250mcg • 500mcg


QVAR Inhaler †
beclometasone
50mcg • 100mcg


Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg


QVAR Autohaler ‡
beclometasone
50mcg • 100mcg


Alvesco Inhaler †
ciclesonide
80mcg • 160mcg


Arnuity Ellipta †
fluticasone furoate
50mcg • 100mcg • 200mcg

LAMA MEDICATIONS


Spiriva Respimat # ‡/[a]
tiotropium 2.5mcg


Spiriva Handihaler #
tiotropium 18mcg


Braltus Zonda #
tiotropium 13mcg


Bretaris Genuair #
aclidinium 322mcg


Seebri Breezhaler #
glycopyrronium 50mcg


Incruse Ellipta #
umeclidinium 62.5mcg

LAMA/LABA COMBINATIONS


Spiolto Respimat [c]
tiotropium/olodaterol
2.5/2.5


Brimica Genuair [c]
aclidinium/formoterol
340/12


Ultibro Breezhaler [c]
indacaterol/glycopyrronium
110/50


Anoro Ellipta [c]
umeclidinium/vilanterol
62.5/25

all units in mcg

ICS/LABA COMBINATIONS


Seretide MDI [a]
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 [c]


Fluticasone + Salmeterol Cipla Inhaler [a]
fluticasone propionate/salmeterol
125/25 • 250/25 [c]


Seretide Accuhaler [a]
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 [c]


Flutiform Inhaler [a]
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10


Symbicort Turbuhaler [a]
budesonide/formoterol
100/6 • 200/6 • 400/12 [c]


DuoResp Spiromax [a]
budesonide/formoterol
200/6 • 400/12 [c]


Symbicort Rapihaler [a]
budesonide/formoterol
50/3 • 100/3 • 200/6 [c]


Breo Ellipta [a]
fluticasone furoate/vilanterol
100/25 [c] • 200/25


Fostair Inhaler [a]
beclometasone/formoterol
100/6


Atectura Breezhaler [a]
Indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260

all units in mcg

SAMA MEDICATION


Atrovent Metered Aerosol † ^
ipratropium 21mcg

NON STEROIDAL PREVENTER


Montelukast Tablet [a]
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers

LABA MEDICATIONS


Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg


Serevent Accuhaler ‡
salmeterol
50mcg


Onbrez Breezhaler #
indacaterol
150mcg • 300mcg

ICS/LAMA/LABA


Trelegy Ellipta [a] [c]
fluticasone furoate/
umeclidinium/vilanterol
100/62.5/25mcg


Enerzair Breezhaler [a]
Indacaterol/glycopyrronium/
mometasone
114/46/136mcg • 114/46/68mcg


Trimbow Inhaler [c]
Beclometasone/Formoterol/
Glycopyrronium
100/6/10mcg

RESOURCES

TREATMENT GUIDELINES

Australian Asthma Handbook:
asthmahandbook.org.au

COPD-X Plan:
copdx.org.au

COPD Inhaler Device Chart Poster:
lungfoundation.com.au/resources/copd-inhaler-device-chart-poster/

INHALER TECHNIQUE

How-to videos, patient and practitioner information
nationalasthma.org.au

Inhalers/MDIs should be used with a compatible spacer

HOW-TO VIDEOS

SCAN ME

ICS, inhaled corticosteroid | LABA, long-acting beta, agonist | LAMA, long-acting muscarinic antagonist | SABA, short-acting beta, agonist | SAMA, short-acting muscarinic antagonist

This chart was developed independently by the National Asthma Council Australia with support from AstraZeneca Australia, Chiesi Australia and Cipla Australia.

PBS PRESCRIBERS †Asthma unrestricted benefit ‡Asthma restricted benefit [a]Asthma authority required ^ COPD unrestricted benefit # COPD restricted benefit [c]COPD authority required
Check TGA and PBS for current age and condition criteria

Device Type

Educate
Demonstrate
Practice
Reminders

National Asthma Council AUSTRALIA

ASTHMA & COPD MEDICATIONS

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fluticasone propionate
100mcg* • 250mcg • 500mcg


QVAR Inhaler †
beclometasone
50mcg • 100mcg


Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg


QVAR Autohaler ‡
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glycopyrronium 50mcg


Incruse Ellipta #
umeclidinium 62.5mcg

LAMA/LABA COMBINATIONS


Spiolto Respimat [c]
tiotropium/olodaterol
2.5/2.5


Brimica Genuair [c]
aclidinium/formoterol
340/12


Ultibro Breezhaler [c]
indacaterol/glycopyrronium
110/50


Anoro Ellipta [c]
umeclidinium/vilanterol
62.5/25

all units in mcg

ICS/LABA COMBINATIONS


Seretide MDI [a]
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 [c]


Fluticasone + Salmeterol Cipla Inhaler [a]
fluticasone propionate/salmeterol
125/25 • 250/25 [c]


Seretide Accuhaler [a]
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 [c]


Flutiform Inhaler [a]
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10


Symbicort Turbuhaler [a]
budesonide/formoterol
100/6 • 200/6 • 400/12 [c]


DuoResp Spiromax [a]
budesonide/formoterol
200/6 • 400/12 [c]


Symbicort Rapihaler [a]
budesonide/formoterol
50/3 • 100/3 • 200/6 [c]


Breo Ellipta [a]
fluticasone furoate/vilanterol
100/25 [c] • 200/25


Fostair Inhaler [a]
beclometasone/formoterol
100/6


Atectura Breezhaler [a]
indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260

all units in mcg

RESOURCES

TREATMENT GUIDELINES

Australian Asthma Handbook:
asthmahandbook.org.au

COPD-X Plan:
copdx.org.au

COPD Inhaler Device Chart Poster:
lungfoundation.com.au/resources/copd-inhaler-device-chart-poster/

INHALER TECHNIQUE

How-to videos, patient and practitioner information
nationalasthma.org.au

Inhalers/MDIs should be used with a compatible spacer

HOW-TO VIDEOS

SCAN ME

SAMA MEDICATION


Atrovent Metered Aerosol † ^
ipratropium 21mcg

NON STEROIDAL PREVENTER


Montelukast Tablet [a]
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers

LABA MEDICATIONS


Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg


Serevent Accuhaler ‡
salmeterol
50mcg


Onbrez Breezhaler #
indacaterol
150mcg • 300mcg

ICS/LAMA/LABA


Trelegy Ellipta [a] [c]
fluticasone furoate/
umeclidinium/vilanterol
100/62.5/25mcg


Enerzair Breezhaler [a]
indacaterol/glycopyrronium/
mometasone
114/46/136mcg • 114/46/68mcg


Trimbow Inhaler [c]
Beclometasone/Formoterol/
Glycopyrronium
100/6/10mcg

ICS, inhaled corticosteroid | LABA, long-acting beta2 agonist | LAMA, long-acting muscarinic antagonist | SABA, short-acting beta2 agonist | SAMA, short-acting muscarinic antagonist

This chart was developed independently by the National Asthma Council Australia with support from AstraZeneca Australia, Chiesi Australia and Cipla Australia.

PBS PRESCRIBERS †Asthma unrestricted benefit ‡Asthma restricted benefit [a]Asthma authority required ^COPD unrestricted benefit #COPD restricted benefit [c]COPD authority required
Check TGA and PBS for current age and condition criteria

Device Type

Educate
Demonstrate
Practice
Reminders

National Asthma Council AUSTRALIA

ASTHMA & COPD MEDICATIONS

SABA RELIEVERS

Ventolin Inhaler † ^
salbutamol 100mcg

Asmol Inhaler † ^
salbutamol 100mcg

Bricanyl Turbuhaler [a c]
terbutaline 500mcg

Airomir Autohaler ‡ #
salbutamol 100mcg

ICS PREVENTERS

Flixotide Inhaler †
fluticasone propionate
50mcg* • 125mcg • 250mcg
Flixotide Junior

Fluticasone Cipla Inhaler †
fluticasone propionate
125mcg • 250mcg

Flixotide Accuhaler †
fluticasone propionate
100mcg* • 250mcg • 500mcg

QVAR Inhaler †
beclometasone
50mcg • 100mcg

Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg

QVAR Autohaler ‡
beclometasone
50mcg • 100mcg

Alvesco Inhaler †
ciclesonide
80mcg • 160mcg

Arnuity Ellipta †
fluticasone furoate
50mcg • 100mcg • 200mcg

LAMA MEDICATIONS

Spiriva Respimat # ‡/[a]
tiotropium 2.5mcg

Spiriva Handihaler #
tiotropium 18mcg

Braltus Zonda #
tiotropium 13mcg

Bretaris Genuair #
aclidinium 322mcg

Seebri Breezhaler #
glycopyrronium 50mcg

Incruse Ellipta #
umeclidinium 62.5mcg

LAMA/LABA COMBINATIONS

Spiolto Respimat [c]
tiotropium/olodaterol
2.5/2.5

Brimica Genuair [c]
aclidinium/formoterol
340/12

Ultibro Breezhaler [c]
indacaterol/glycopyrronium
110/50

Anoro Ellipta [c]
umeclidinium/vilanterol
62.5/25

all units in mcg

ICS/LABA COMBINATIONS

Seretide MDI [a]
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 [c]

Fluticasone + Salmeterol Cipla Inhaler [a]
fluticasone propionate/salmeterol
125/25 • 250/25 [c]

Seretide Accuhaler [a]
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 [c]

Flutiform Inhaler [a]
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10

Symbicort Turbuhaler [a]
budesonide/formoterol
100/6 • 200/6 • 400/12 [c]

DuoResp Spiromax [a]
budesonide/formoterol
200/6 • 400/12 [c]

Symbicort Rapihaler [a]
budesonide/formoterol
50/3 • 100/3 • 200/6 [c]

Breo Ellipta [a]
fluticasone furoate/vilanterol
100/25 [c] • 200/25

Fostair Inhaler [a]
beclometasone/formoterol
100/6

Atectura Breezhaler [a]
Indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260

all units in mcg

SAMA MEDICATION

Atrovent Metered Aerosol † ^
ipratropium 21mcg

NON STEROIDAL PREVENTER

Montelukast Tablet [a]
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers

LABA MEDICATIONS

Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg

Serevent Accuhaler ‡
salmeterol
50mcg

Onbrez Breezhaler #
indacaterol
150mcg • 300mcg

ICS/LAMA/LABA

Trelegy Ellipta [a c]
fluticasone furoate/
umeclidinium/vilanterol
100/62.5/25mcg

Enerzair Breezhaler [a]
Indacaterol/glycopyrronium/
mometasone
114/46/136mcg • 114/46/68mcg

Trimbow Inhaler [c]
Beclometasone/Formoterol/
Glycopyrronium
100/6/10mcg

RESOURCES

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Inhalers/MDIs should be used with a compatible spacer

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SCAN ME

ICS, inhaled corticosteroid | LABA, long-acting beta, agonist | LAMA, long-acting muscarinic antagonist | SABA, short-acting beta, agonist | SAMA, short-acting muscarinic antagonist

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Check TGA and PBS for current age and condition criteria.

Device Type

Educate
Demonstrate
Practice
Reminders

National Asthma Council AUSTRALIA

ASTHMA & COPD MEDICATIONS

SABA RELIEVERS

Ventolin Inhaler † ^
salbutamol 100mcg

Asmol Inhaler † ^
salbutamol 100mcg

Bricanyl Turbuhaler [a c]
terbutaline 500mcg

Airomir Autohaler ‡ #
salbutamol 100mcg

ICS PREVENTERS

Flixotide Inhaler †
fluticasone propionate
50mcg* • 125mcg • 250mcg
*Flixotide Junior

Fluticasone Cipla Inhaler †
fluticasone propionate
125mcg • 250mcg

Flixotide Accuhaler †
fluticasone propionate
100mcg* • 250mcg • 500mcg

QVAR Inhaler †
beclometasone
50mcg • 100mcg

Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg

QVAR Autohaler ‡
beclometasone
50mcg • 100mcg

Alvesco Inhaler †
ciclesonide
80mcg • 160mcg

Arnuity Ellipta †
fluticasone furoate
50mcg • 100mcg • 200mcg

LAMA MEDICATIONS

Spiriva Respimat # ‡/[a]
tiotropium 2.5mcg

Spiriva Handihaler #
tiotropium 18mcg

Braltus Zonda #
tiotropium 13mcg

Bretaris Genuair #
aclidinium 322mcg

Seebri Breezhaler #
glycopyrronium 50mcg

Incruse Ellipta #
umeclidinium 62.5mcg

LAMA/LABA COMBINATIONS

Spiolto Respimat [c]
tiotropium/olodaterol
2.5/2.5

Brimica Genuair [c]
aclidinium/formoterol
340/12

Ultibro Breezhaler [c]
indacaterol/glycopyrronium
110/50

Anoro Ellipta [c]
umeclidinium/vilanterol
62.5/25

all units in mcg

ICS/LABA COMBINATIONS

Seretide MDI [a]
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 [c]

Fluticasone + Salmeterol Cipla Inhaler [a]
fluticasone propionate/salmeterol
125/25 • 250/25 [c]

Seretide Accuhaler [a]
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 [c]

Flutiform Inhaler [a]
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10

Symbicort Turbuhaler [a]
budesonide/formoterol
100/6 • 200/6 • 400/12 [c]

DuoResp Spiromax [a]
budesonide/formoterol
200/6 • 400/12 [c]

Symbicort Rapihaler [a]
budesonide/formoterol
50/3 • 100/3 • 200/6 [c]

Breo Ellipta [a]
fluticasone furoate/vilanterol
100/25 [c] • 200/25

SAMA MEDICATION

Atrovent Metered Aerosol † ^
ipratropium 21mcg

NON STEROIDAL PREVENTER

Montelukast Tablet [a]
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers

LABA MEDICATIONS

Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg

Serevent Accuhaler ‡
salmeterol
50mcg

Onbrez Breezhaler #
indacaterol
150mcg • 300mcg

ICS/LAMA/LABA

Trelegy Ellipta [a c]
fluticasone furoate/
umeclidinium/vilanterol
100/62.5/25mcg

Enerzair Breezhaler [a]
Indacaterol/glycopyrronium/
mometasone
114/46/136mcg • 114/46/68mcg

Trimbow Inhaler [c]
Beclometasone/Formoterol/
Glycopyrronium
100/6/10mcg

Fostair Inhaler [a]
beclometasone/formoterol
100/6

Atectura Breezhaler [a]
Indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260

all units in mcg

RESOURCES

TREATMENT GUIDELINES

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asthmahandbook.org.au

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COPD Inhaler Device Chart Poster:
lungfoundation.com.au/resources/copd-inhaler-device-chart-poster/

INHALER TECHNIQUE

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nationalasthma.org.au

Inhalers/MDIs should be used with a compatible spacer

HOW-TO VIDEOS

SCAN ME

ICS, inhaled corticosteroid | LABA, long-acting beta, agonist | LAMA, long-acting muscarinic antagonist | SABA, short-acting beta, agonist | SAMA, short-acting muscarinic antagonist

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Device Type

Educate
Demonstrate
Practice
Reminders

National Asthma Council AUSTRALIA

ASTHMA & COPD MEDICATIONS

SABA RELIEVERS


Ventolin Inhaler † ^
salbutamol 100mcg


Asmol Inhaler † ^
salbutamol 100mcg


Bricanyl Turbuhaler [a c]
terbutaline 500mcg


Airomir Autohaler ‡ #
salbutamol 100mcg

ICS PREVENTERS


Flixotide Inhaler †
fluticasone propionate
50mcg* • 125mcg • 250mcg
Flixotide Junior


Fluticasone Cipla Inhaler †
fluticasone propionate
125mcg • 250mcg


Flixotide Accuhaler †
fluticasone propionate
100mcg* • 250mcg • 500mcg


QVAR Inhaler †
beclometasone
50mcg • 100mcg


Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg


QVAR Autohaler ‡
beclometasone
50mcg • 100mcg


Alvesco Inhaler †
ciclesonide
80mcg • 160mcg


Arnuity Ellipta †
fluticasone furoate
50mcg • 100mcg • 200mcg

LAMA MEDICATIONS


Spiriva Respimat # ‡/[a]
tiotropium 2.5mcg


Spiriva Handihaler #
tiotropium 18mcg


Braltus Zonda #
tiotropium 13mcg


Bretaris Genuair #
aclidinium 322mcg


Seebri Breezhaler #
glycopyrronium 50mcg


Incruse Ellipta #
umeclidinium 62.5mcg

LAMA/LABA COMBINATIONS


Spiolto Respimat [c]
tiotropium/olodaterol
2.5/2.5


Brimica Genuair [c]
aclidinium/formoterol
340/12


Ultibro Breezhaler [c]
indacaterol/glycopyrronium
110/50


Anoro Ellipta [c]
umeclidinium/vilanterol
62.5/25

all units in mcg

ICS/LABA COMBINATIONS


Seretide MDI [a]
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 [c]


Fluticasone + Salmeterol Cipla Inhaler [a]
fluticasone propionate/salmeterol
125/25 • 250/25 [c]


Seretide Accuhaler [a]
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 [c]


Flutiform Inhaler [a]
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10


Symbicort Turbuhaler [a]
budesonide/formoterol
100/6 • 200/6 • 400/12 [c]


DuoResp Spiromax [a]
budesonide/formoterol
200/6 • 400/12 [c]


Symbicort Rapihaler [a]
budesonide/formoterol
50/3 • 100/3 • 200/6 [c]


Breo Ellipta [a]
fluticasone furoate/vilanterol
100/25 [c] • 200/25


Fostair Inhaler [a]
beclometasone/formoterol
100/6


Atectura Breezhaler [a]
Indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260

all units in mcg

SAMA MEDICATION


Atrovent Metered Aerosol † ^
ipratropium 21mcg

NON STEROIDAL PREVENTER


Montelukast Tablet [a]
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers

LABA MEDICATIONS


Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg


Serevent Accuhaler ‡
salmeterol
50mcg


Onbrez Breezhaler #
indacaterol
150mcg • 300mcg

ICS/LAMA/LABA


Trelegy Ellipta [a c]
fluticasone furoate/
umeclidinium/vilanterol
100/62.5/25mcg


Enerzair Breezhaler [a]
Indacaterol/glycopyrronium/
mometasone
114/46/136mcg • 114/46/68mcg


Trimbow Inhaler [c]
Beclometasone/Formoterol/
Glycopyrronium
100/6/10mcg

RESOURCES

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SCAN ME

ICS, inhaled corticosteroid | LABA, long-acting beta, agonist | LAMA, long-acting muscarinic antagonist | SABA, short-acting beta, agonist | SAMA, short-acting muscarinic antagonist

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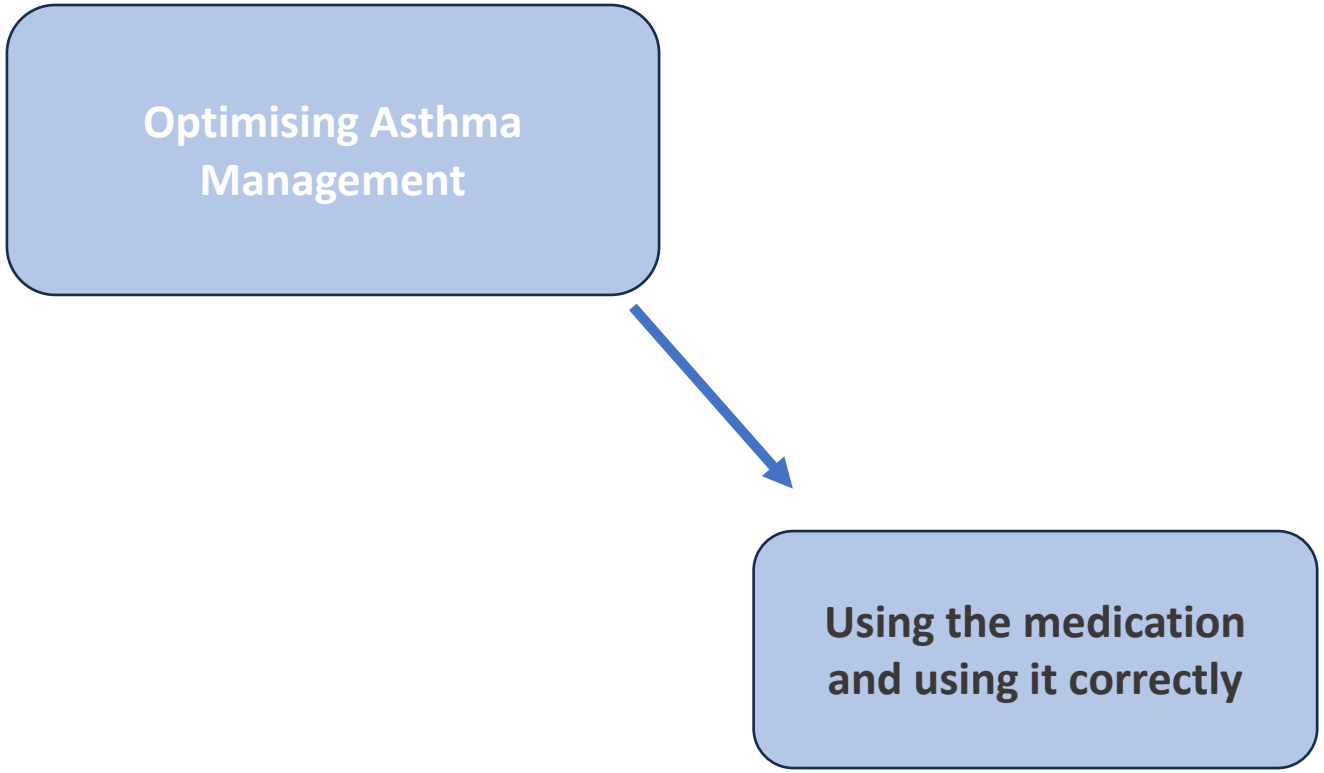
Check TGA and PBS for current age and condition criteria


Optimising Asthma Management
Using the medication and using it correctly

Reviews

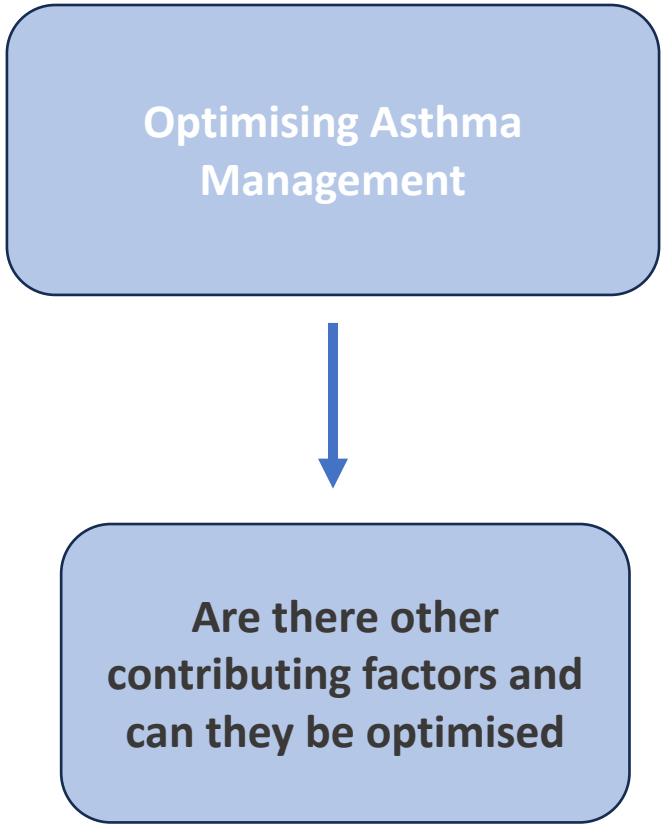
- Check response to treatment – symptoms diary
- How many doses do you miss in a week
  - Compliance 30-60%
- Show me your technique
- Check inhaler – expiry, empty cannister

Videos: using asthma devices

https://www.schn.health.nsw.gov.au/find-a-service/health-medical-services/asthma-improvement

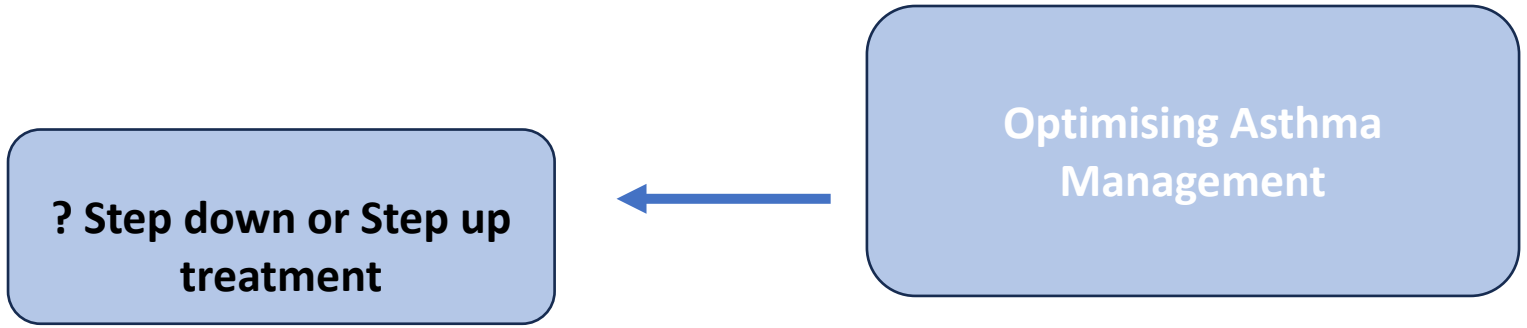
How to improve compliance

- Explore reasons for poor compliance
- Medication reminders – alarms on phones, Apps
- Parental supervision
- Place inhalers next to toothbrushes or a location that provide visual reminder
- Sticker charts
- Counter on devices


Optimising Asthma Management
Are there other contributing factors and can they be optimised

Contributing factors

- Allergen minimisation
  - HDM, Mould, animal dander, grasses, pollens
  - SPT – 1 week without antihistamines
- Environmental exposure to smoke
- Obesity
- GORD
- OSA features – increased respiratory viruses


Optimising Asthma Management
? Step down or Step up treatment

Good Control

- Infrequent daytime symptoms (two days a week or less)
- No nocturnal symptoms
- No limitation on play, physical activity or school attendance

4. Indications and requirements for stepping down preventer medicine

Indications

- Excellent symptom control
- No evidence of reversible airflow obstruction on spirometry*
- No recent hospital presentations or OCS courses

Requirements

- Avoid coinciding with return to school after holidays and 'back to school flares'
- Aim to wean in spring and summer
- Schedule a planned follow-up appointment within four to six weeks (reliable attendance record required)
- Ensure carer is able to recognise and respond to worsening asthma control
- Confirm no significant parental psychological or socioeconomic problems

* In children able to perform spirometry. We recommend referring children aged 5 years and over for spirometry.

Abbreviation: OCS = oral corticosteroid.

Duration of symptom stability

Time of the year

How to step down

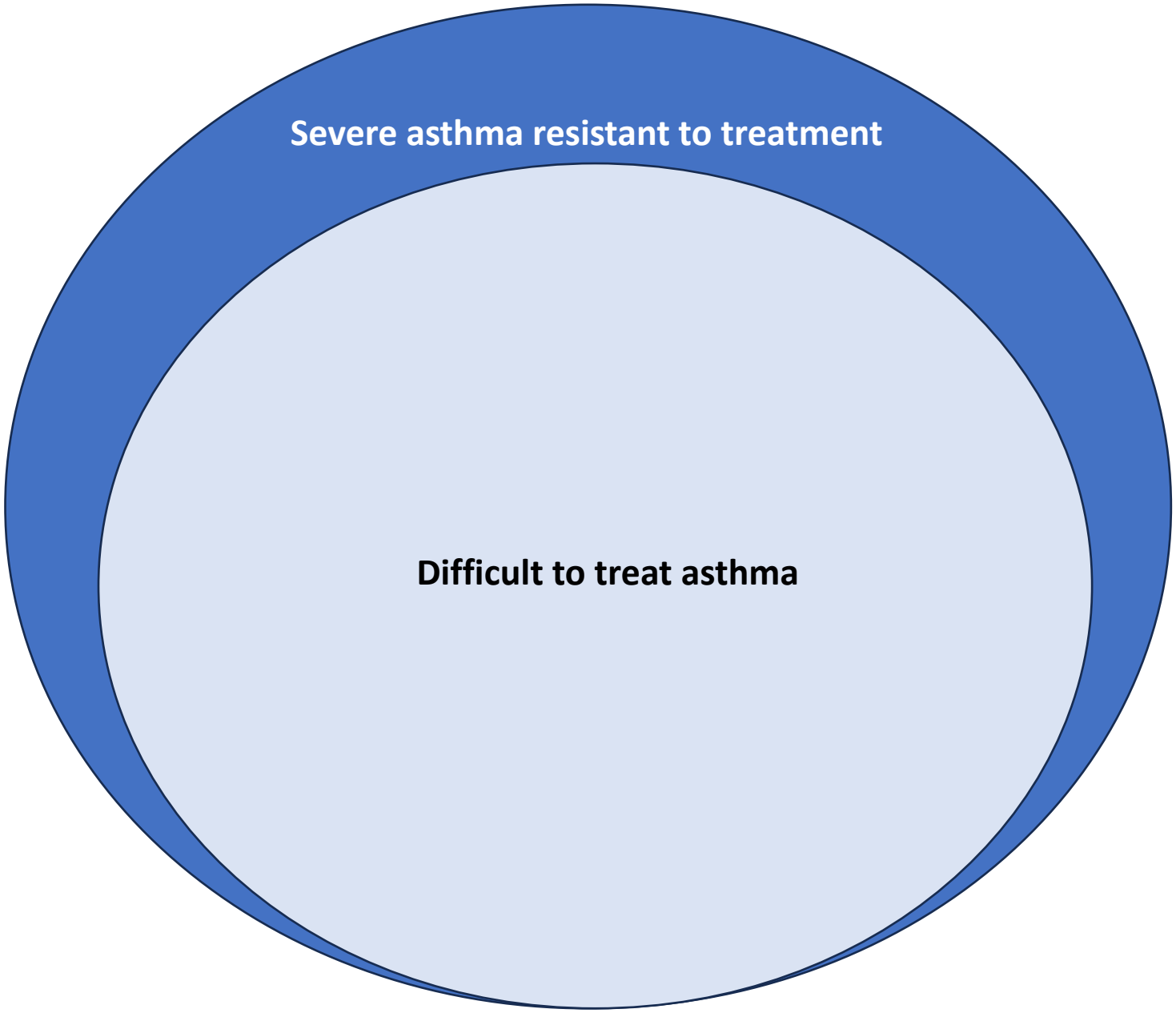
Haggie et al 2020. Paediatric Asthma, update on the stepwise management approach. Respiratory Medicine Today 2020;5(2):6-17

1. Indications for stepping up preventer medicine

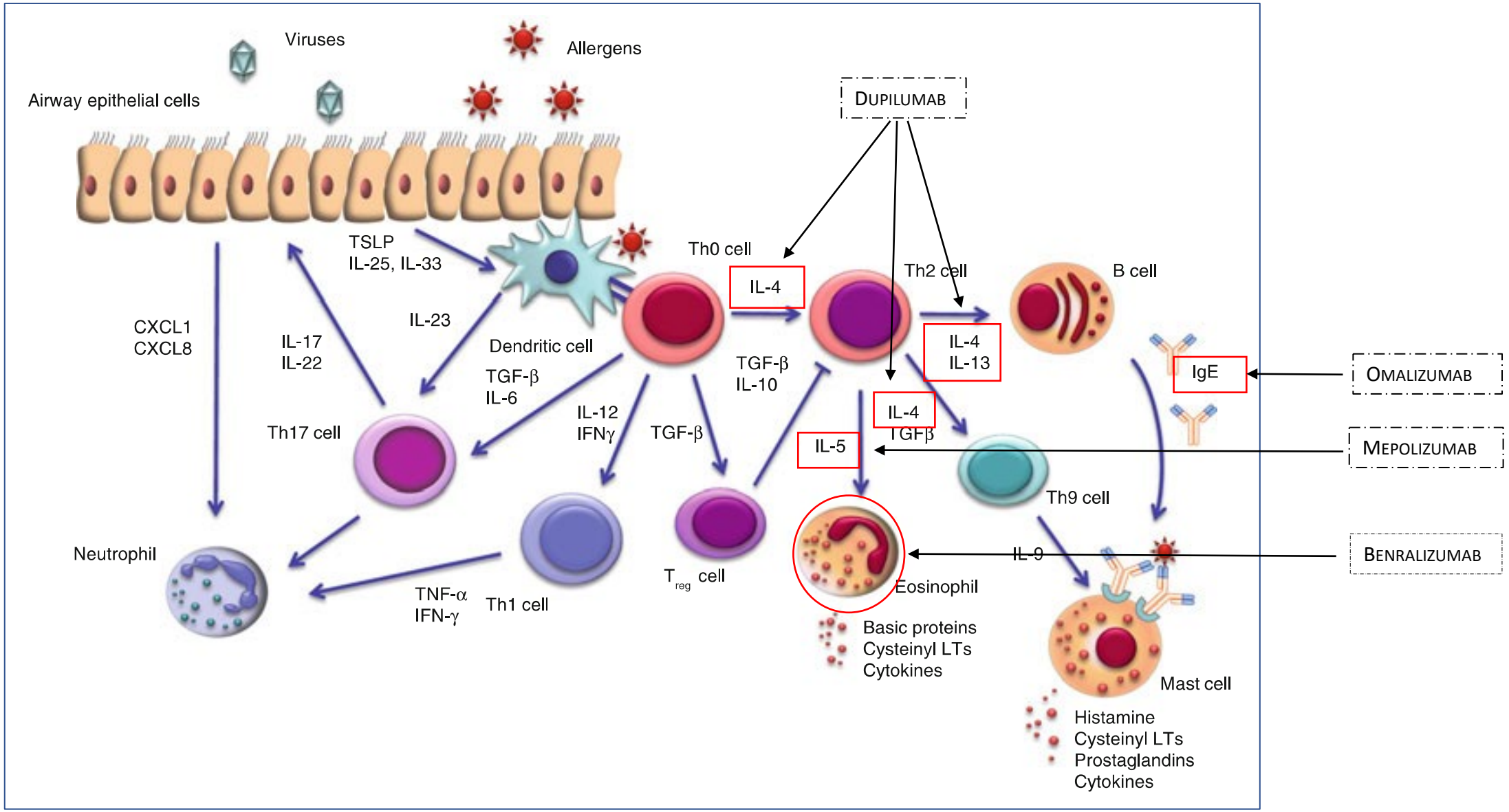
- Poor symptom control
  AND
- Diagnosis confirmed (if patient aged over 5 years, refer for spirometry to assist diagnosis)
- Adherence and technique optimised
- Allergen and environmental tobacco smoke triggers avoided
- Symptoms not better explained by comorbidities (e.g. anxiety, obesity, low aerobic fitness, gastro-oesophageal reflux disease and vocal cord dysfunction)

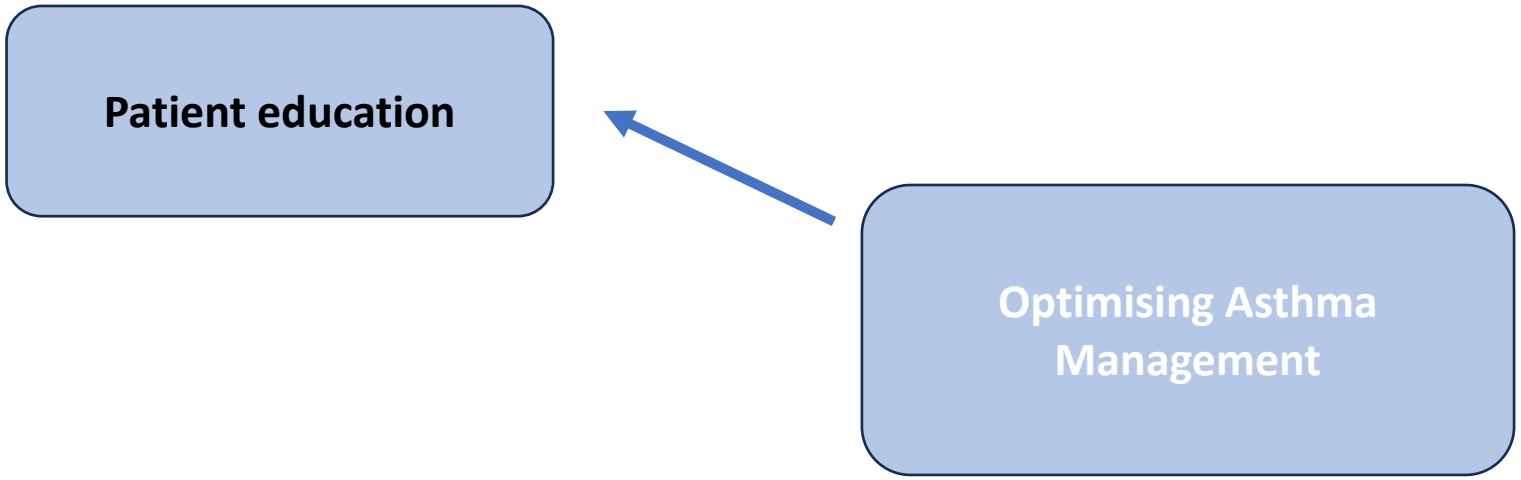
Haggie et al 2020. Paediatric Asthma, update on the stepwise management approach. Respiratory Medicine Today 2020;5(2):6-17

Referral


Severe asthma resistant to treatment
Difficult to treat asthma

Phenotyping asthma for Biologics




Patient education
Optimising Asthma Management

Education

- What is asthma
- What are the triggers
- How do preventers vs relievers work
- Device technique
- How to improve poor compliance – reminders, alarms, apps
- Discuss potential side effects
- Other comorbidities
  - Obesity
  - GORD
  - OSA
  - Rhinosinusitis
- Consider immunotherapy
- Written action plan

ASTHMA ACTION PLAN

Take this ASTHMA ACTION PLAN with you when you visit your doctor

ACTION PLAN FOR	DOCTOR'S CONTACT DETAILS	EMERGENCY CONTACT DETAILS
Name	Name	Name
Date	Phone	Phone
Next asthma check-up due		Relationship

WHEN WELL

Asthma under control (almost no symptoms) — ALWAYS CARRY YOUR RELIEVER WITH YOU

Peak flow* (if used) above:

Your preventer is: Flixotide 125mcg (NAME & STRENGTH)

Take 1 puffs/tablets 2 times every day

☑ Use a spacer with your inhaler

Your reliever is: Ventolin (NAME)

Take 4 puffs Ventolin 100mcg

When: You have symptoms like wheezing, coughing or shortness of breath

☑ Use a spacer with your inhaler

OTHER INSTRUCTIONS (e.g. other medicines, trigger avoidance, what to do before exercise)

Pre sporting actvity

4 puffs Ventolin using spacer 10minutes beoforte

WHEN NOT WELL

Asthma getting worse (needing more reliever than usual, having more symptoms than usual, waking up with asthma, asthma is interfering with usual activities)

Peak flow* (if used) between ____ and ____

Keep taking preventer: Flixotide 125mcg (NAME & STRENGTH)

Take 1 puffs/tablets 2 times every day

☑ Use a spacer with your inhaler

Your reliever is: Ventolin (NAME)

Take 6 puffs Ventolin 100mcg

Every 6-8 hours

☑ Use a spacer with your inhaler

OTHER INSTRUCTIONS ☑ Contact your doctor

(e.g. other medicines, when to stop taking extra medicines)

IF SYMPTOMS WORSEN

Severe asthma flare-up/attack (needing reliever again within 3 hours, increasing difficulty breathing, waking often at night with asthma symptoms)

Peak flow* (if used) between ____ and ____

Keep taking preventer: Flixotide 125mcg (NAME & STRENGTH)

Take 1 puffs/tablets 2 times every day

☑ Use a spacer with your inhaler

Your reliever is: Ventolin (NAME)

Take 12 puffs Ventolin 100mcg

Every 3- 4 hours

☑ Use a spacer with your inhaler

OTHER INSTRUCTIONS ☑ Contact your doctor today

(e.g. other medicines, when to stop taking extra medicines)

Prednisolone/prednisone:

Take Redipred 25mg= 5ml each morning for 1 days

If needing Ventolin less than every 3 hours & given Redipred,there is no or little improvement please go to nearest emergency department

DANGER SIGNS

Asthma emergency (severe breathing problems, symptoms get worse very quickly, reliever has little or no effect)

DIAL 000 FOR AMBULANCE

Peak flow (if used) below:

Call an ambulance immediately

Say that this is an asthma emergency

Keep taking reliever as often as needed

☐ Use your adrenaline autoinjector (EpiPen or Anapen)

* Peak flow not recommended for children under 12 years.

National Asthma Council AUSTRALIA

nationalasthma.org.au

ASTHMA ACTION PLAN

WHAT TO LOOK OUT FOR

WHEN WELL

THIS MEANS:
- you have no night-time wheezing, coughing or chest tightness
- you only occasionally have wheezing, coughing or chest tightness during the day
- you need reliever medication only occasionally or before exercise
- you can do your usual activities without getting asthma symptoms

WHEN NOT WELL

THIS MEANS ANY ONE OF THESE:
- you have night-time wheezing, coughing or chest tightness
- you have morning asthma symptoms when you wake up
- you need to take your reliever more than usual
- your asthma is interfering with your usual activities

THIS IS AN ASTHMA FLARE-UP

IF SYMPTOMS GET WORSE

THIS MEANS:
- you have increasing wheezing, cough, chest tightness or shortness of breath
- you are waking often at night with asthma symptoms
- you need to use your reliever again within 3 hours

THIS IS A SEVERE ASTHMA ATTACK (SEVERE FLARE-UP)

DANGER SIGNS

THIS MEANS:
- your symptoms get worse very quickly
- you have severe shortness of breath, can't speak comfortably or lips look blue
- you get little or no relief from your reliever inhaler

CALL AN AMBULANCE IMMEDIATELY: DIAL 000
SAY THIS IS AN ASTHMA EMERGENCY

DIAL 000 FOR AMBULANCE

ASTHMA MEDICINES

PREVENTERS

Your preventer medicine reduces inflammation, swelling and mucus in the airways of your lungs. Preventers need to be taken **every day**, even when you are well.

Some preventer inhalers contain 2 medicines to help control your asthma (combination inhalers).

RELIEVERS

Your reliever medicine works quickly to make breathing easier by making the airways wider.

Always carry your reliever with you – it is essential for first aid. Do not use your preventer inhaler for quick relief of asthma symptoms unless your doctor has told you to do this.

To order more Asthma Action Plans visit the National Asthma Council website.
A range of action plans are available on the website –
please use the one that best suits your patient.
nationalasthma.org.au

National Asthma Council AUSTRALIA

NSW Health

Schools and Child Services
ACTION PLAN FOR ASTHMA FLARE-UP

Child's photo

Child's name: _____

Date of birth: / /

This child has confirmed food, insect, or medication allergies:

Yes ☐ No ☐

This child has an ASCIA Action Plan:

Yes ☐ No ☐

This child requires medication prior to planned exercise:

Yes ☐ No ☐

Name and dose of medication: _____

Name of Medical / Nurse Practitioner completing this form: _____

Signature: _____

Date: ____/____/____

Please review this plan in 12 months.

How to use a puffer with a spacer

1 Remove cap, shake puffer well and insert into spacer.

2 Place mouthpiece of spacer between teeth, closing lips to form a seal. Push down on top of puffer to release 1 puff of medicine into spacer.

3 Take 4 normal breaths in and out through spacer. For each additional puff of medicine shake puffer and repeat steps 2 & 3.

Masks can be attached to spacers for children under 4 years or for those with developmental/cognitive delay.

Note for Medical or Nurse Practitioner: This form has been developed specifically for use within the Education and Care sector and is to be completed and signed by a Medical or Nurse Practitioner only (emergency contact details can be completed by parent or guardian). If the child's school or child's service asthma first aid instructions differ from this Action Plan for Asthma Flare-up, please provide parent/guardian with written detailed instructions.

SIGNS OF A MILD TO MODERATE ASTHMA FLARE-UP*

- Mild or moderate difficulty in breathing
- Wheezing (high pitched whistling sound, generally heard when breathing out)
- Dry and irritable cough
- Chest tightness or sore chest
- Mostly able to talk in full sentences

* Not all need to be present

ACTION FOR A MILD TO MODERATE ASTHMA FLARE-UP

Be calm and reassuring. If possible, get someone to help.

STEP 1: Place the child in a seated upright position.

STEP 2: Shake blue/grey puffer (e.g. Ventolin®, Asmol®, Airomir®), give 4 separate puffs, preferably with a spacer, allowing child to take 4 breaths in and out through spacer with each puff. Shake puffer before each puff.

STEP 3: Wait 4 minutes. If the child still cannot breathe normally, give another 4 separate puffs of the blue/grey puffer as in STEP 2.

STEP 4: If no improvement in the child's breathing, call an ambulance - DIAL 000 and continue to give 4 separate puffs of blue/grey puffer every 4 minutes until the ambulance arrives.

SIGNS OF A SEVERE / LIFE-THREATENING ASTHMA FLARE-UP*

- Extreme difficulty in breathing-unable to talk freely
- Sucking in at the base of the throat/caving in of the rib cage
- Bluish tinge to the lips, pale, sweaty
- Distressed, anxious, exhausted, confused, drowsy

* Not all need to be present

ACTION FOR A SEVERE / LIFE-THREATENING ASTHMA FLARE-UP

Place child in a seated upright position.

CALL AN AMBULANCE - DIAL 000

Be calm and reassuring. If possible, get someone to help.
Shake blue/grey puffer (e.g. Ventolin®, Asmol®, Airomir®), give 4 separate puffs, preferably with a spacer, allowing child to take 4 breaths in and out through spacer with each puff. Shake puffer before each puff. Repeat every 4 minutes until the ambulance arrives.

Note: If child with known anaphylaxis to food/s, insects or medication/s has sudden breathing difficulty (including wheeze, persistent cough or hoarse voice) even if there are no skin symptoms always give adrenaline autoinjector first, if available, then blue/grey puffer.

Attention Parents / Guardian

Please complete the below information and return this form to your child's school or childcare.

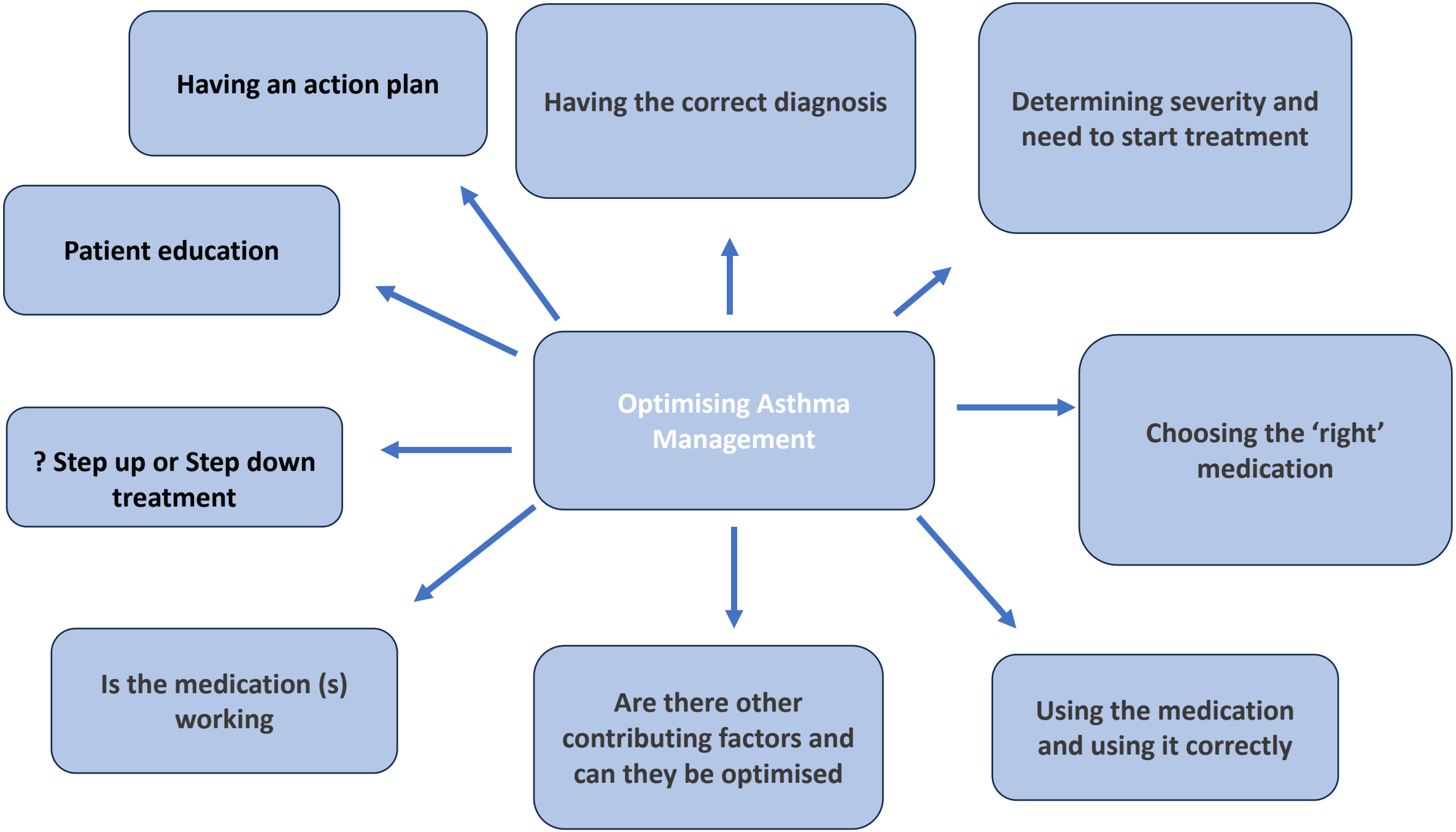
Emergency contact details:

Name: _____ Relationship to child: _____

Best contact phone number/s: _____

Developed by the Sydney Children's Hospitals Network Aiming for Asthma Improvement in Children Program, in collaboration with NSW Ministry of Health and NSW State and National Education Sectors. December 2016.
Acknowledgment: Australasian Society of Clinical Immunology and Allergy (ASCIA) for their review of document.
Reference www.nationalasthma.org.au/uploads/content/22-NAC-First-Aid-for-Asthma-ChartKids-FINAL.pdf
SPHN (SCHN) 210590

https://www.schn.health.nsw.gov.au/fact-sheets/asthma-schools-and-child-services-action-plan-for-asthma-flare-up


Having an action plan
Having the correct diagnosis
Determining severity and need to start treatment
Patient education
Optimising Asthma Management
? Step up or Step down treatment
Choosing the 'right' medication
Is the medication (s) working
Are there other contributing factors and can they be optimised
Using the medication and using it correctly

Resources

https://www.nationalasthma.org.au/

- https://www.asthmahandbook.org.au/
- https://www.nationalasthma.org.au/living-with-asthma/how-to-videos
- https://www.nationalasthma.org.au/living-with-asthma/resources/patients-carers/factsheets/asthma-inhaler-and-medication-tips

https://ginasthma.org/

- https://ginasthma.org/2023-gina-main-report/

https://www.schn.health.nsw.gov.au/fact-sheets

- https://www.schn.health.nsw.gov.au/files/factsheets/asthma_and_your_child_a_resource_pack_for_parents_and_carers-en.pdf
- https://www.schn.health.nsw.gov.au/find-a-service/health-medical-services/asthma-improvement
- https://www.schn.health.nsw.gov.au/fact-sheets/asthma-medication-inhalation-devices

https://thoracic.org.au/

- https://thoracic.org.au/resources/patient-and-professional-resources/

Boston Children's How to use an Ellipta Inhaler

- https://www.youtube.com/watch?v=E6X0zW4HQLk