Asthma

Disclaimer:
Read the disclaimer at medimaps.co.uk/disclaimer

References:
1. cks.nice.org.uk
2. British thoracic society guidelines
3. Joanne Hamilton, Respiratory nurse specialist, Dudley Trust, lecture June 2017
4. Dudley asthma treatment guidelines, May 2017
5. Walsall Manor Hospital GP Connect lecture, June 2017
6. Allergy UK lecture Birmingham, July 2017
7. Respiratory lectures Alliance Federation Nov 2017
8. Paediatric consultant Alliance Federation July 2018
9. Dr Will Carroll, allergy conference, Oct 2018.
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11. Dr Ian Balfour-Lynn paediatric consultant, webinar April 2021
12. Maternal health Black Country webinar autumn 2024.

DIAGNOSIS

- There is no 100% definitive test for asthma.
- Asthma is incorrectly diagnosed in 10-30% of pt's.
- Cannot diagnose in one appointment.
- You need objective evidence i.e. use spirometry or peak flow.
- Can try putting them into a low, intermediate and high risk category.
- Ask them to video 'wheezy' episode.
- No wheeze = no asthma.
- Cough alone is NOT asthma usually.

Assess probability

- Attempt to place them within one of the 3 categorise (see right).

↑ probability

- Wheeze.
- Cough.
- Breathless.
- Chest tightness.
- FHx of atopy (1o relative).
- A high eosinophil count.

- Parents often say it's a wheeze but it is not in reality.
- Ratty noise from secretions is NOT a wheeze.
- So ask them to record the noisey episodes.

especially if

- Frequent and recurrent
- Worse at night and early morning
- Worse with exercise, cold, pets, emotions
- Occur when no cold symptoms

Note: children often express abdo or back pain, when in fact they mean chest tightness.

Can have a delayed reaction/allergy to pets.

↓ probability

- With cold only
- Cardiac disease
- Dizzy, tingling
- Chronic productive cough with no wheezing
- Normal exam when symptomatic
- Excessive vomiting
- Croup like but well

consider

Multi trigger wheeze

- Treat like asthma if needed.
- Use ICS rather than lots of salbutamol.

Viral induced wheeze

- Age 1-5y.
- 7-10 coughs and colds in a yr in kids.
- Due to small airways because they are a child.
- Episodic viral wheeze.
- The pathology behind viral induced is different to asthma, hence standard asthma treatments will not work.
- No evidence for ICS or montelukast.
- Oral pred has no evidence but the ones who come to hosp get it.
- Either give nothing or give salbutamol PRN.

consider

Bronchiectasis

- Persistent wet cough is NOT asthma.
- It might be recurrent bacterial bronchitis which can lead to bronchiectasis.
- If significant phlegm think of undiagnosed bronchiectasis.
- In asthmatic, phlegm is usually yellow and small amount.

Reflux

Psychogenic cough

- Sounds like croup.
- Drives everyone mad apart from the pt.
- Rx = placebo inhaler i.e. atrovent for 6/52.
- Works 100% of the time.
- "Your cough wil melt away and never come back to bother you again.

Obesity

Vocal cord dysfunction

Breathing dysfunction (hyperventilation, panic attack)

- Refer if any following:
- Symptoms from birth. → Laryngomlacia, CF, GORD
- Nasal polyps.
- Failure to thrive. → CF → Neonatal screening misses 10/million.
- Wet cough.
- +ve FHx unusual chest disease. → Primary cilliary dysdiadokinesia
- Recurrent chest infections if < 5y.

- Next steps depend on age (see right).

< 5 y

- Cannot perform spirometry reliably.
- So code as 'suspected asthma'.
- Treat as if it is asthma.
- When 5y try spirometry to get objective evidence of reversible airways obstruction.
- If fails to perform, try to repeat test every 6-12/12 until you get objective evidence to confidently diagnose.

≥ 5 y

Spirometry

- Spirometry is vital, and better than peak flow.
- Can use spiro in some kids from >5y, and all >7y.
- Ideal time to do spirometry is when they are symptomatic.
- Normal spirometry while symptomatic, ↓ the probability of asthma.
- Normal spirometry while assymptomatic, does not rule out asthma.

- First you are looking for evidence of obstruction.
- i.e. FEV1 / FVC < 0.7.
- If present you then check for reversibility testing.

- 4 puffs of salbutamol (total dose 400mcg) via spacer.
- Then perform spirometry again to check for reversibility.

aged 5- <12y

- Can perform reversibility testing.

- A positive result is:
- ↑ FEV1 by ≥ 12%.

- If negative result perform peak flow.

aged ≥ 12

- Perform reversibility testing.

- A positive result is:
- ↑ FEV1 by ≥ 12%.
AND
↑ FEV1 by ≥ 200ml.

- If negative result perform peak flow.

$$\frac{\text{Post FEV1 - Pre FEV1}}{\text{Pre FEV1}} \times 100 = \%\ \text{improvement}$$

Peak flow

- Be aware, up to to 80% of patients do not perform accurately.
- Peak flow monitoring could act as a feedback mechanism for children so they can see whats happening with their lungs i.e. something objective for them to see.

- Diurnal variation is normal, due to the diurnal release of cortisol.
- Peak flow is usually highest at 3pm and lowest in morning.
- But in asthmatic more pronounced variation.
- Record best of 3 attempts.
- However, further attempts should be done if the largest two readings are not within 40 L/min of each other.
- If they can only do 2 x per day, perform mid morning and mid afternoon.
- If they can do 3 x per day, perform additionally in evening.
- Can also look for a decrease ≥15% after 6 min of running.

- Prescribe mini Wright Peak Flow.
- Monitor for 2-4/52.
- Can use Asthma UK peak flow diary.

- A positive result is:
- >20% variability.
- Tell the pt to calculate the variability each day using the following formuale:
- The days highest reading - days lowest reading.
- Divided by the mean of the days highest + days lowest.
- Multiply by 100.
- e.g. 450 (highest reading) 320 (lowest reading) = 130.
- 130 ÷ [(450+320) ÷ 2] x 100 = 33% variability
- Average the variability for each day for the 2-4/52 of recordings.

- If negative result:
- Consider alternative diagnosis or referral to 2o care.

Hx and tests point to asthma

Asthma Control Test AND

- ICS in < 5 yr is better in RCT. But in real world data monteleukast is better due to compliance (as its easier to give).
- So if chaotc child running around the clinic room give monteleukast. If more docile give the more effective treatment i.e. ICS.

Issue a high dose ICS:
< 12 yrs
- Clenil 100 MDI, 1-2p BD, for 6-8/52.

≥ 12 yrs
- Clenil 200 MDI, 1-2p BD, for 6-8/52.

- This is a high dose just for a short time period, to help in clarifying the diagnosis.
- Prescribe by brand (national guidance).
- Note: It is not compulsory to issue a salbutamol inhaler at this stage.

AND Code as 'Suspected asthma'

6-8/52 review

Asthma Control Test

significant improvement

- Stop treatment, and watch and wait.

if symptoms return confirms diagnosis

Code as 'Asthma'

- Keep code as 'Suspected asthma' if under 5 yr.
- Even professors of asthma do not diagnose in < 5 yrs age.

- Stop high dose steroid.
- Restart ICS at lower dose (follow 'Maintenance Management as below).
- Ensure prescribed salbutamol.

if remains assymptomatic

Watch and wait.

- No diagnosis of asthma needed.

no significant improvement

- Ask about compliance.
- Assess inhaler technique

good use

- Think of differentials:
- Breathing dysfunction (panic attack or hyperventilation.
- Cystic fibrosis.
- Bronchiectasis.
- Tracheal/laryngeal problem.
- GORD.
- Anxiety, depression.
- Vocal cord dysfunction.
- Psychogenic cough.
- Obesity.

poor use

- 'If you dont like the treatment, try the disease'.
- See 'Technique' and 'Compliance' information below.
- 6-8/52 review.

TREATMENT

MAINTENANCE MANAGEMENT

STEP UP

Step up treatment is not well controlled:

- Using salbutamol ≥ 3 x per week
OR
- Symptomatic ≥ 3 x per week
OR
- Waking ≥ 1 x per week

- Step up in winter if required.
- Do not allow lower tolerance of symptoms for asthmatic kids.
- Do not not allow SOB and absence from PE lessons.
- But if doing vigorous exercise they might simply be demanding too much from their body. So you dont necessarily have to increase therapy. Just reduce intensity of exercise.
- If asthma is well controlled should only need to use 2 salbutamol inhalers per year.
- 39 of the 195 that died in the 2014 asthma review, used ≥ 12 salbutamol per year.
- However, be aware that some severe asthmatics will need to over use.
- Also they might need multiple inhalers as they will need one for school, one for dad's house, one for moms house etc.
- What if they only use salbutamol at speific times in the year e.g. winter. Then in these situations do not necessarily have to use ICS.

STEP DOWN

Step down treatment (see guide below) if well controlled for at least 3/12:

- No daytime symptoms.
- No night time waking.
- No need for rescue medication.
- No exacerbations.
- No limitation on activities including exercise.

- Try to step down in summer if possible e.g. can stop theophyline or montelukast in summer.

Seek specialist advice before stepping down if:
- Previous near-fatal asthma, or ICU.
- Exacerbation needing oral steroids within 6/12.

Seretide 250/25, 2p BD	Flutiform 250/10, 2p BD	Fostiar 200/6, 2p BD	Symbicort 400/12, 2p BD	Relvar 184/22, 1p BD
Seretide 125/25, 2p BD	Flutiform 125/5, 2p BD	Fostiar 100/6, 2p BD	Symbicort 200/6, 2p BD	Relvar 92/22, 1p BD
Seretide 50/25, 2p BD	Flutiform 50/5, 2p BD	Fostiar 100/6, 1p BD	Symbicort 100/6, 2p BD	

< 5 yrs

- If only using salbutamol few times a week then that's fine. You do not need to force them to use a steroid inhaler.

VERY LOW DOSE ICS

Clenil 50 MDI, 2p BD (via spacer)

AND

SABA

Salbutamol MDI, 2p PRN (via spacer)

if fails

ADD LTRA

Montelukast 4mg chewtab ON
OR
Montelukast 4mg granules ON (mix with food only)

if fails after 4/52

STOP LRTA
Refer to paediatrics

- Asthma clinic will find it useful if you test:
- Total IgE (if raised may indicate atopic status).
- Specific IgE for house dust mite, tree, grass .
- Note: Cat dander lasts for years.

5 - 11 yrs

VERY LOW DOSE ICS

Clenil 50 MDI, 2p BD (via spacer)
OR
Pulmicort 100 turbohaler, 1p BD

AND

SABA

Salbutamol MDI, 2p PRN (via spacer)
OR
Salamol 100 Easi-breathe MDI, 2p PRN
OR
Bricanyl 500 turbohaler, 1p PRN

STOP VERY LOW DOSE ICS
START LOW DOSE ICS

Clenil 100 MDI, 2p BD (via spacer)
OR
Flixotide 50 MDI, 2p BD (via spacer)
OR
Pulmicort 200 turbohaler, 2p BD

OR

STOP VERY LOW DOSE ICS
START VERY LOW DOSE ICS + LABA

Symbicort 100/6 turbohaler, 1p BD

Note: licenced in ≥ 6 yrs

OR

ADD LTRA FOR 4/52

6m - 5 yrs
Montelukast 4mg chewtab OM or ON
OR
Montelukast 4mg granules OM or ON (mix with food only)

6 - 14 yrs
Montelukast chewtab 5mg OM or ON

Try all three options before uptitrating

if fails

LOW DOSE ICS + LABA

Symbicort 100/6 turbohaler, 2p BD
OR
Flutiform 50/5 MDI, 2p BD (via spacer)

Note: Symbicort licenced in ≥ 6 yrs.

if fails

Refer to paediatrics

- Asthma clinic will find it useful if you test:
- Total IgE (if raised may indicate atopic status).
- Specific IgE for house dust mite, tree, grass .
- Note: Cat dander lasts for years.

12 - 17 yrs

LOW DOSE ICS

Clenil 100 MDI, 2p BD (via spacer)
OR
Pulmicort 200 turbohaler, 1p BD

AND

SABA

Salbutamol MDI, 2p PRN (via spacer)
OR
Salamol Easi-breathe MDI, 2p PRN
OR
Bricanyl 500 turbohaler, 1p PRN

LOW DOSE ICS + LABA

Symbicort 200/6 turbohaler, 1p BD
OR
Relvar 92/22, 1p OD
OR
Flutiform 50/5, 2p BD

OR

Switch to SMART low dose regime (see below).

OR

ADD LTRA FOR 4/52

6 - 14 yrs
Montelukast chewtab 5mg OM or ON

≥ 15 yrs
Montelukast 10mg OM or ON

Try all three options before uptitrating

MEDIUM DOSE ICS + LABA

Symbicort 200/6 turbohaler, 2p BD
OR
Relvar 92/22, 1p OD
OR
Flutiform MDI/KHaler, 125/5, 2p BD
(KHaler = breath-actuated MDI)

OR

Switch to SMART medium dose regime (see below).

OR

MEDIUM DOSE ICS

Try all three options before referring

Refer to paediatrics/adult respiratory

- Asthma clinic will find it useful if you test:
- Total IgE (if raised may indicate atopic status).
- Specific IgE for house dust mite, tree, grass .
- Note: Cat dander lasts for years.

SYMBICORT (SMART regime)
Maintenance And Reliever Therapy

- Only for ≥ 12 yrs.
- Use Symbicort as both the preventer and the reliever.
- How? Because the LABA works as quick as salbutamol.
- STOP SABA (salbutamol).
- Baseline LOW dose Symbicort 200/6 1p BD. To be used every day.
- Baseline MEDIUM dose Symbicort 200/6 2p BD. To be used every day.
- Then on top of this, they can use 1p PRN if symptomatic.
- If few min later still symptomatic can use further puff(s) every few min.
- Should not use more than 6 on one occasion. Seem medical review.
- Max 12p per day.
- But if using more than 8p per day should seek medical review as something is obviously not right.

≥ 18 yrs

LOW DOSE ICS

Clenil 100 MDI, 2p BD (via spacer)
OR
Pulmicort 200 turbohaler, 1p BD

AND

SABA

Salbutamol MDI, 2p PRN (via spacer)
OR
Salamol Easi-breathe MDI, 2p PRN
OR
Bricanyl 500 turbohaler, 1p PRN

LOW DOSE ICS + LABA

Symbicort 200/6 turbohaler, 1p BD
OR
Relvar 92/22, 1p OD
OR
Flutiform 50/5, 2p BD
OR
Fostair 100/6 DPI/MDI, 1p BD

OR

Switch to SMART low dose regime (see below).

OR

ADD LTRA FOR 4/52

Montelukast 10mg OM or ON

Try all three options before uptitrating

MEDIUM DOSE ICS + LABA

Symbicort 200/6 turbohaler, 2p BD
OR
Relvar 92/22, 1p OD
OR
Flutiform MDI/KHaler, 125/5, 2p BD
(KHaler = breath-actuated MDI)
OR
Fostair 100/6 DPI/MDI, 2p BD

OR

Switch to SMART medium dose regime (see below).

OR

MEDIUM DOSE ICS

Try all three options before uptitrating

ADD LAMA

Spiriva Respimat 2p OD

if fails

Refer to respiratory

Maintenance And Reliever Therapy

SYMBICORT (SMART regime)

- Only for ≥ 12 yrs.
- Use Symbicort as both the preventer and the reliever.
- How? Because the LABA works as quick as salbutamol.
- STOP SABA (salbutamol).
- Symbicort 100/6 or Symbicort 200/6, use 1-2p BD every day.
- Then on top of this, they can use 1p PRN if symptomatic.
- If few min later still symptomatic can use further puff(s) every few min.
- Should not use more than 6 on one occasion.
- Max 12p per day.
- But if using more than 8p per day should seek medical review as something is obviously not right.

FOSTAIR (MART regime)

- Only for ≥ 18 yrs.
- Use Fostair as both the preventer and the reliever.
- How? Because the LABA works as quick as salbutamol.
- STOP SABA (salbutamol).
- Baseline dose Fostair 100/6 1p BD. To be used every day.
- Then on top of this, they can use 1p PRN if symptomatic.
- If few min later still symptomatic can use further puff(s) every few min.
- Max 8p per day.
- But if needing frequent PRN doses should seek medical review.

Symbicort (budesonide/formoterol) Asthma Licence and Dosing Guide

Medicine & strength	Maintenance *Children* 6+ years	Maintenance *Adolescents* 12 -17 years	Maintenance *Adults* 18+ years	MART *Adolescents and adults* 12+ years		Reliever Therapy *Adolescents and adults* 12+ years
Asthma Severity				Moderate Asthma	Moderate to Severe Asthma	Mild Asthma
Symbicort 100/6 Turbohaler DPI[1] *120 doses* **Shelf life: 3 years**	2 inh. BD	1-2 inh. BD	1-2 inh. BD Some patients may require up to a max of 4 inh. BD	2 inh. per day, given either as 1 in the morning and evening or as 2 inh. in either the morning or evening. 1 additional inh. as needed in response to symptoms. If symptoms persist after a few minutes, 1 additional inh. should be taken. Not more than 6 inh. should be taken on any single occasion. Patients using more than 8 inh. daily should be strongly recommended to seek medical advice. No more than 12 inh. to be taken in a single day.		
Symbicort 200/6 Turbohaler DPI[2] *120 doses* **Shelf life: 3 years**		1-2 inh. BD	1-2 inh. BD Some patients may require up to a max of 4 inh. BD		2 inh. per day, given either as 1 in the morning and evening or as 2 inh. in either the morning or evening. For some patients a maintenance dose of 2 inh. BD may be appropriate. 1 additional inh. as needed in response to symptoms. If symptoms persist after a few minutes, 1 additional inh. should be taken. Not more than 6 inh. should be taken on any single occasion. Patients using more than 8 inh. daily should be strongly recommended to seek medical advice. No more than 12 inh. to be taken in a single day.	1 inh. as needed in response to symptoms. If symptoms persist after a few minutes, 1 additional inh. should be taken. Not more than 6 inh. should be taken on any single occasion. Patients using more than 8 inh. daily should be strongly recommended to seek medical advice. No more than 12 inh. to be taken in a single day.*
Symbicort 400/12 Turbohaler DPI[3] *60 doses* **Shelf life: 3 years**		1 inh. BD	1 inh. BD Some patients may require up to a max of 2 inh. BD			
Symbicort 100/3 pMDI[4] *120 doses* **Shelf life: 2 years, after 1st open: 3 months**		2-4 act. BD	2-4 act. BD Some patients may require up to a max of 8 act. BD	4 act. per day, 2 act. in the morning and evening or 4 act. in either the morning or evening. For some patients, a maintenance dose of 4 act. BD may be appropriate. 2 additional act. as needed in response to symptoms. If symptoms persist after a few minutes, 2 additional act. should be taken. Not more than 12 act. should be taken on any single occasion. Total daily dose of 16, with a max of 24 under medication supervision for a limited period.		

ACUTE MANAGEMENT

LIFE THREATENING — if any of the following

- Peak flow < 33% best/predicted
- Sats < 92%
- Silent chest
- Cyanosis
- ↓ HR
- ↓ BP

- 999
- Oxygen driven NEBS
- Salbutamol 5mg NEB (1m - 4 yr 2.5mg)
- Ipratropium 500mcg NEB (1m -11 yr 250mcg)
- Prednisolone STAT, will start working while being taken to A&E (can be life saving).

> 12 yr = 40 mg STAT.
6 - 12 yr = 30 40 mg STAT.
2 - 5 yr = 20 mg STAT.
< 2 yr = 10 mg STAT.

SEVERE ACUTE — if any of the following

- Peak flow 33-50% best/predicted
- Cannot complete sentence
- Sats ≥ 92% (<12 yr <92%)
- ↑ RR
- ↑ HR

Age	HR	RR
2 - 5 yr	> 140	> 40
5 - 12 yr	> 125	> 30
> 12 yr	≥ 110	≥ 25

- 999
- Oxygen driven NEBS
- Salbutamol 5mg NEB (1m - 4 yr 2.5mg)
- Ipratropium 500mcg NEB (1m -11 yr 250mcg)
- Prednisolone STAT, will start working while being taken to A&E (can be life saving).

> 12 yr = 40 mg STAT.
6 - 12 yr = 30 40 mg STAT.
2 - 5 yr = 20 mg STAT.
< 2 yr = 10 mg STAT.

POST DISCHARGE

- If peak flow > 75% of best, they discharge on salbutamol 10 p 4 hrly, and 3/7 of prednisolone.
- However, steroids should be continued until all the inflammation has gone.
- Hence, GP to review within 2 days to assess if might need to have an extended supply to make it 4 - 7/7 in total.
- Assess RR, HR, Sats, speaking sentences (could get them to count to 20 instead), peak flow.

- Refer to respiratory team if:
- ≥ 2 oral prednisolone in last yr.
- ≥ 2 A&E in last yr.

MODERATE ACUTE — if any of the following

- Peak flow >50% best/predicted
- Completes sentence
- Sats ≥ 92%
- RR within normal limits
- HR within normal limits

Age	HR	RR
2 - 5 yr	≤ 140	≤ 40
5 - 12 yr	≤ 125	≤ 30
> 12 yr	< 110	< 25

- Can manage in 1 care, but assess response over next 3-4 hrs
- 2-10 puffs salbutamol INH via spacer
- Repeat every 10-20 min.
- Should be able to stetch out to 4 hrs. If not go to A&E.
- Prednisolone (3/7 is usally enough in children).
- Asthma exacerbation is nearly always viral, so no Abx needed unless temp > 38.5oC and resp distress.
- If apyrexial do not give Abx regardless of what you hear on the chest.

Adult or child over the age of 12 years 40 50 mg once a day for 5 days.
Child 6 to 12 years 30 40 mg once a day for 3 days.
Child 2 to 5 years 20 mg once a day for 3 days.
Child under 2 years 10 mg once a day for 3 days.

TIPS & TRICKS

Smoking

- Parents to stop smoking.
- "I smoke out side", makes no difference as the particles that cause harm are still on your clothes.
- Your choice if you want to damage your child.

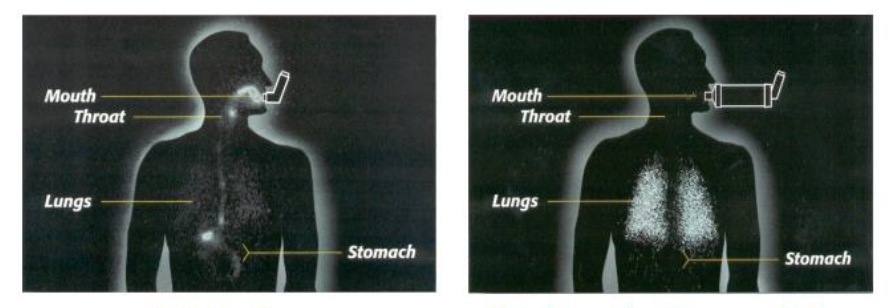
Obesity

- Wt loss works because it is a pro inflammaory state.

Technique

- Only 8% of patients use MDI correctly. And only 8% of healthcare professionals use MDI correctly.
- Only 2 in 10 children in paediatric cllinic use inhaler properly.
- Unless spot on, the medication will not go to the lungs.
- Use 'In Check Dial' to assess inhaler technique. Can use a normal peakflow mouthpiece, but remove the filter.
- If dont shake, you will get propellent, not medication.
- Tell them the speed of an MDI = 70mph !
- Hence, the benefit of a spacer (See below).

Why use a Spacer with an Inhaler?



Inhaler alone

When an inhaler is used alone, medicine ends up in the mouth, throat, stomach and lungs.

Inhaler used with spacer device

When an inhaler is used with a spacer device, more medicine is delivered to the lungs.

Compliance

- 'If you dont like the treatment, try the disease'.
- If compliance is an issue, ask the patient to trace out where they think their lungs are.
- Then highlight to them the actual area.
- Explain it is a huge area, and if the lungs are not working properly, it will impact on the entire body.
- Important to explain pathophysiology at initial diagnosis to parents.
- Ask directly if any concerns e.g. stunted growth with steroid inhlaer, getting addicted or immune to the inhaler.
- Steroid inhaler will take 4-6/52 to work.
- Explain montelaukast can cause nightmares in some.
- Tell the child, 3 kids in every classroom will have asthma. So nothing to be ashamed off. Use your inhalers.
- Children are unlikely to use MDI with a spacer when they go to secondary school. So switch to a breath actuated inhaler instead e.g. salbutamol easibreath instead of ventolin MDI.
- Be realistic. 80% adherence is acceptable.
- Even in tertiary centres there can be only 60% adherence, even when they know they are being monitored !
- Most people have their mobile with them so put reminder apps on there.
- Weekends are the worst for adherence.

Spacers

- MDI with spacer has been proven to be superior to neuliser treatment.
- Only reason to give a nebuliser is if hypoxic, as the nebs are oxygen driven if used in hospital.
- Home nebuliser is driven through air so it is dangerous.
- If screaming child, even with a spacer and mask, they will still not get good intake into the lungs (unlike the myth that states it gets in when they inhale).
- So try to give when calm to get into lungs rather than throat and lung apices.
- Yes, you can give when asleep.
- Good idea to let kids play with them when well, so they get used to it.

AEROCHAMBER

- Prescribe 2 spacers if required e.g. for school and home.
- Issue Aerochamber rather than Volumatic as it is easier for parents to administer, and easier to can be carried around.
- Ensure prescribe correct size.
- When first removed from plastic wrapper must wash as static will have built up from wrapper.
- If emergency situation and just been removed from wrapper, prime with 10 puffs of salbutamol, then give whatever dose you desire.
- Wash once a month using washing up liquid.
- Leave it to air dry, because if you rub dry then static will build up.
- Dont worry if looks cloudy (it's not dirt).
- Replace at least every 6-12 months.
- Aerochamber = noise (whistle) is bad i.e. breathing in too quickly, (as compared to Volumatic = noise is good when used.)
- Deliver one spray in the spacer, and then take 5 breaths.
- For a second dose, shake inhaler (either still attached to the spacer or can remove), and deliver the dose into spacer. i.e. all seperate puffs.
- Between each puff wait 30 sec, to allow particle size to get back to normal.
- Tell them to bring spacer when come for their asthma review.
- Note: You can re-use spacer on other patients in the GP practice, you just need to clean it.

Aerochamber infant with mask (ORANGE)
0 - 18 m
→ - Chubby/chunky babies might need yellow aerochamber rather than the orange.

Aerochamber child with mask (YELLOW)
1 - 5 yrs

Aerochamber plus (BLUE)
Aerochamber plus with mask (BLUE)
> 5 yrs
→ - Aerochamber plus comes in two versions.
- One version has a hard plastic mouthpiece, just like an MDI mouthpiece. This is more effective than the other version which has a mask instead of a mouthpiece.

AEROCHAMBER FLOW-VU

- Updated version of Aerochamber which has a valve.
- The valve moves towards the patient when breathing in, and away from them when they breathe out.
- You can use it to ensure a good seal is present and hence, you are getting the dose into the lungs.
- Aerochamber = noise (whistle) is bad i.e. breathing in too quickly, (as compared to Volumatic = noise is good when used.)
- No need to wash at first use, as there is no static build up.
- Replace every 12 months.

Aerochamber flow-vu small mask (ORANGE)
0 - 18 m

Aerochamber flow-vu medium mask (YELLOW)
1 - 5 yrs

Aerochamber flow-vu youth (GREEN)
> 5 - 16 yrs
→ - Has a low resistance valve.
- Kid friendly design.

Aerochamber flow-vu mouthpiece (BLUE)
> 5 yrs

Aerochamber flow-vu adult small mask (PURPLE)
> 5 yrs
→ - If adult with difficulty with mouthpiece, or prefers mask.

Aerochamber flow-vu large mask (BLUE)
> 5 yrs

Medication

LABA

- Same receptors that ventolin works on is also what LABA works on.
- So should work physiologically.
- So no medical reason it would not work.
- Consider informing pt before adding so they will not suffer a psychological reason for finding it does not work.

ICS

- Children lose just 1cm in height with normal dose steroid inhaler.
- If using 1600mcg or more of beclomethasone, they need a steroid card.
- If they suddenly stop seretide 500 BD, they can get addisonian crisis.
- Have to use Short Synacthen test if acidentally been on high dose seretide.

- Inhaled steroids do not supress growth if used appropriately.
- ICS 50mcg or 100mcg is not going to reduce growth in kids. Risks are low.
- The 0.5- 1cm loss of height is from an old study with high steroid doses which we do not use now.
- Also consider the effects of repeated oral steroid courses, for poorly controlled asthma flare ups.

SALBUTAMOL

- It's a myth that will not work in babies do to not having receptors.
- Onset within few min.
- Peaks at 20min
- Lasts for 4 hrs.

PREDNISOLONE

- Safe in pregnancy.
- If the steroid course if > 14/7 then need to taper the dose.

LEUKOTRIENE

- Works within 4 hrs.
- 1/3 significant improvment with montelukast, 1/3 mod, and 1/3 nil benefit.
- Can be continued in pregnancy.
- Can take in morning (no good reason given by manufacturer as to why needs to be at night).
- Can use PRN at start of cough & cold for about 1/52 instead of regular, especially useful if kid and terrible at using inhalers.
- But do not start in pregnancy.

THEOPHYLLINE

- 1/3 cannot tolerate theophylline.
- S/e headache, nausea.
- So only at night for 2/52, then BD.
- Perservere as gets better if possible.

Allergy testing

- Only test for allergens to identify triggers in pt's who are not easily controlled.
- Only test once a diagnosis of asthma is confirmed.
- Varied opinions about trying to remove house dust mite (HDM).
- Worth getting checked for an allergy to HDM first, before spending money on eradication.
- Most fatalities in asthma have food allergies.
- Ensure parents understand they wont identify a sinlge trigger for asthma i.e. it is multifactrial.
- Can have -ve SPT or IgE and still be allergic to a dog as they are different reactions for different dogs.
- No such thing as hypoallergenic pets !
- 48 hr exposure on two occasions will test if they will be able to tolerate or not.
- Keeping pets outside does not solve the problem as takes 4/12 for allergens to get out of house once a pet is removed.

- Start antihistamines 2/12 before the season starts.
- Can give the once daily antihistamine in half dose am half dose pm if the symptoms not controlled throughout 24 hrs.
- So the body has built up an immunity.
- Vaseline under nose to help avoid inhalation of pollen.
- Put the most effort into reducing the HDM in bedrooms and living areas.
- Do not steam clean mattresses. Just hoover.
- Soft toys have lots of HDM, so just keep one with them and get rid of the others. Keep toy in freezer once a month overnight.
- Dont buy new pets.
- Wash animal bedding weekly.
- Wash cats and dogs 1-2 x a week.

Pregnancy

- Treat same as non-pregnant.
- Give oral steroids if needed, but ensure midwife team know (↑ risk of DM). Only 10% reaches fetus. No evidence of affecting fetus. Can breast feed.
- Continue all inhalers. Can breast feed.
- Continue montelukast if it's needed to stabalise asthma. Can breast feed.

Beta Blockers in asthma

- Cardio selective B1 beta blockers are safe to use.

- Bisoprolol.
- Nebivolol.
- Atenolol.

Reference:
https://pmc.ncbi.nlm.nih.gov/articles/PMC7917232/