Respiratory Problems in Pregnancy

Steve Holmes, General Practitioner, The Park Medical Practice, Shepton Mallet, Somerset

Primary Care Show, NEC, Birmingham

Thursday 15th May 2025

Steve Holmes Declaration of Interests (1)

- General practitioner, Park Medical Practice, Shepton Mallet
- Somerset ICB Clinical Respiratory Lead / Integrated Care Lead
- NHS England (National CVD and Respiratory Programme Board)
- NHS England (Educational Supervisor (trainer) and Appraiser)
- Primary Care Respiratory Society (Policy Lead; Service development and Conference committees)
- International Primary Care Respiratory Group (IPCRG) Education Committee Chair
- RCGP (Chair Severn Faculty Board) RCGP Rep for Taskforce for Lung Health and National Respiratory Audit Programme)
- Recent guideline involvement (Air Travel, Asthma, COPD, Respiratory disease in athletic individuals, Spirometry, Tobacco Dependency)

Declarations of Interest (2)

Speaker engagements, educational projects, conference attendance, advisory board work (in the last three years)

Academic work

University College, London; Universities of Birmingham, Cambridge, Edinburgh

Other providers

Asthma and Lung UK, Best Practice, Doctorology, Education for Health, EQUIP, Guidelines in Practice, InterYem, MedAll, Mediconf, MIMS, Omniamed, Pulse, RCGP Conferences, Respiratory Professional Care, Somerset GP Education Trust

Pharmaceutical / device companies

Aide Health, Astra Zeneca, Boehringer Ingelheim, Chiesi, Pulmonx, Sanofi, Teva, Trudell Medical International

No tobacco shares.

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Respiratory Problems in Pregnancy - covering

- Common causes of breathlessness in pregnancy
- Pulmonary embolus
- Immunisation against respiratory disease
- Smoking cessation
- Asthma – common problem – common issues

Common causes of breathlessness in pregnancy – the progesterone effect

- Progesterone gradually increases during the course of pregnancy, from 25 $ng \cdot mL^{-1}$ at 6 weeks' to 150 $ng \cdot mL^{-1}$ at 37 weeks' gestation [1–5]. Progesterone acts as trigger of the primary respiratory centre by increasing the sensitivity of the respiratory centre to carbon dioxide, as indicated by the steeper slope of the ventilation curve in response to alveolar carbon dioxide changes [6].
- Progesterone alters the **smooth muscle tone** of the airways resulting in a bronchodilator effect. It also mediates **hyperaemia and oedema of mucosal surfaces**, causing nasal and to a lesser extent respiratory congestion.

LoMauro A, Aliverti A. Respiratory physiology of pregnancy: Physiology masterclass. Breathe (Sheff). 2015;11(4):297-301.

Common causes of breathlessness in pregnancy – the progesterone effect (2)

Increased respiratory rate (caused by progesterone)

Though often quoted a large reference trial has shown no increase in respiratory rate (at rest) during pregnancy with a respiratory rate median of 12 (range 9-22)[1]

Ligament laxity

Accounts for some of the changes in spine (and there is splaying of ribs) though lung function parameters remain the same in trials[2]

1. Green LJ, Mackillop LH, Salvi D, Pullon R, Loerup L, Tarassenko L, et al. Gestation-Specific Vital Sign Reference Ranges in Pregnancy. Obstetrics & Gynecology. 2020;135(3):653-64.
2. LoMauro A, Aliverti A. Respiratory physiology of pregnancy: Physiology masterclass. Breathe (Sheff). 2015;11(4):297-301.

Common causes of breathlessness in pregnancy – other normal effects

- **Uterine growth** affects the ability of breathing – deep breathes are harder
- **Increased blood volume and demand for oxygen** (placenta and baby)
- Anaemia (haemodilution or nutrition)

- **ANXIETY**
- **BREATHING PATTERN DISORDER**
- **DECONDITIONING**

LoMauro A, Aliverti A. Respiratory physiology of pregnancy: Physiology masterclass. Breathe (Sheff). 2015;11(4):297-301.

Breathing pattern disorder in pregnancy

- Common disorder during pregnancy
- Affecting 60-70% of women.
- It's usually caused by a combination of physiological changes, including the growing uterus pushing on the lungs and hormonal shifts.

LoMauro A, Aliverti A. Respiratory physiology of pregnancy: Physiology masterclass. Breathe (Sheff). 2015;11(4):297-301.

Breathing Pattern Disorder

- Previously called “dysfunctional breathing”

- 8% UK population F>M

Denton E, Bondarenko J, Hew M. Breathing pattern disorder. Complex Breathlessness (ERS Monograph) Sheffield, European Respiratory Society. 2022:109-22.

Causes of BPD

- Asthma
- COPD
- Pneumonia
- Cardiac
- PE
- Nasal Problems
- Anxiety
- Depression
- Stress
- Pain
- Worry
- Fear
- Hormonal
- Caffeine
- Alcohol
- “Learnt behaviour”

Cambridge University Hospitals NHS Trust (access 30/9/2022)
https://www.cuh.nhs.uk/patient-information/breathing-pattern-disorders-an-overview/

Symptoms of BPD

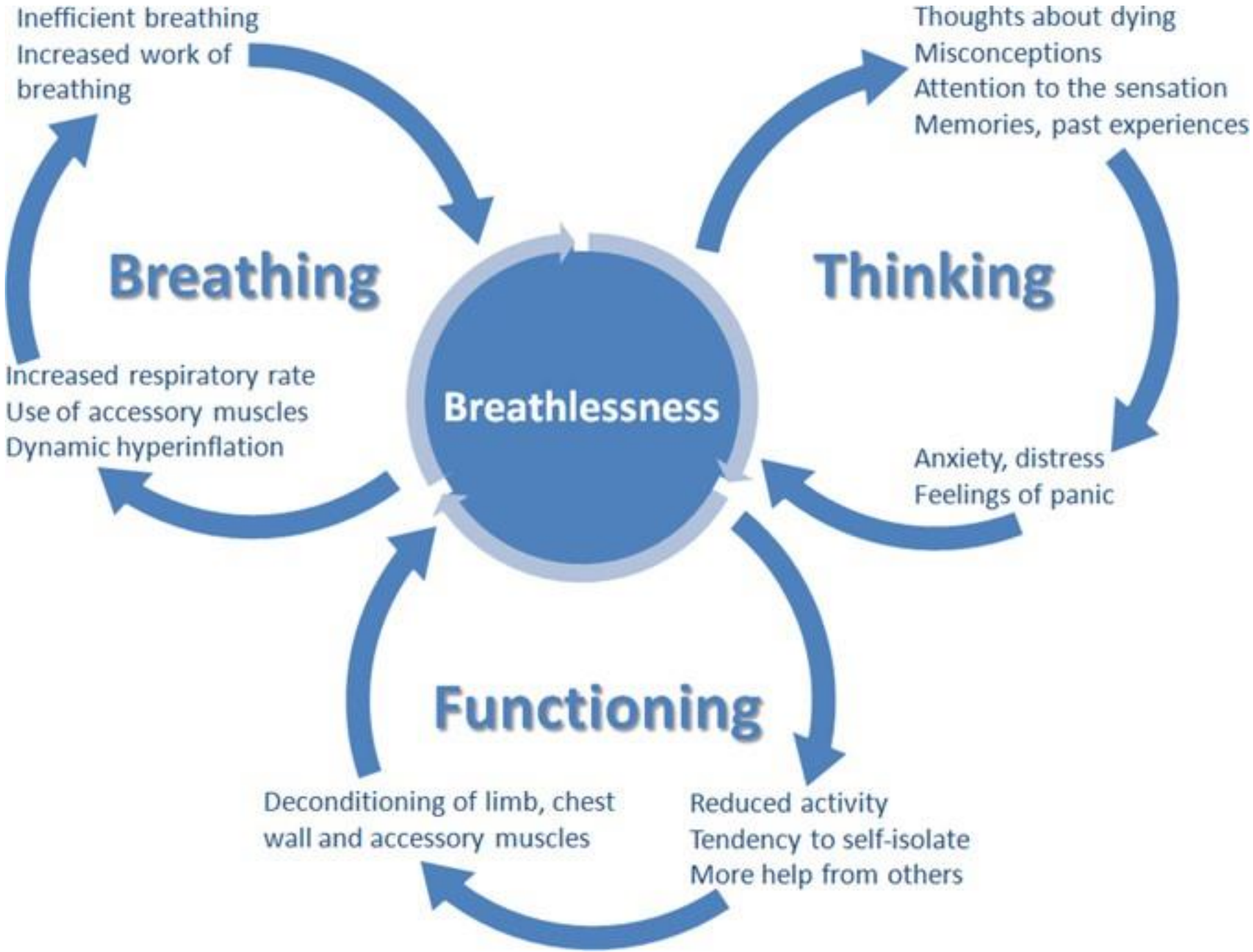
- Inability to take deep breath
- Sensation of not enough air in the chest
- Tightness around chest or throat
- Chest pain
- Yawning
- Sighing
- Dizziness of light headedness
- Blurred vision
- Sensation of fast or irregular heart beats
- Bloating feeling in the stomach
- Tingling fingers
- Cold hands or feet

Cambridge University Hospitals NHS Trust (access 30/9/2022)
https://www.cuh.nhs.uk/patient-information/breathing-pattern-disorders-an-overview/

Breathing Pattern Disorders

1. Hyperventilation Syndrome
2. Periodic deep sighing (irregular pattern)
3. Thoracic dominant breathing
4. Forced abdominal expiration
5. Thoraco-abdominal asynchrony

1. Boulding R, Stacey R, Niven R, Fowler SJ. Dysfunctional breathing: a review of the literature and proposal for classification. European Respiratory Review. 2016;25(141):287-94.
2. Association of Chartered Physiotherapists in Respiratory Care


Inefficient breathing
Increased work of breathing
Breathing
Increased respiratory rate
Use of accessory muscles
Dynamic hyperinflation
Thoughts about dying
Misconceptions
Attention to the sensation
Memories, past experiences
Thinking
Anxiety, distress
Feelings of panic
Breathlessness
Functioning
Deconditioning of limb, chest wall and accessory muscles
Reduced activity
Tendency to self-isolate
More help from others

Deconditioning following admission to hospital

- Inactivity (eg resting at home) is associated with atrophy and a **loss** of muscle strength at a rate of **12% a week**[1,2]
- After 3 to 5 weeks of bed-rest, almost 50% of the muscle strength is lost.[1,2]
- Effective measures to promote physical activity available in hospital (20 trials)[3]

1. Porth C, Matfin G, Porth C. Pathophysiology : concepts of altered health states. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2009.2. Knight J, Nigam Y, Jones A. Effects of bedrest 5: the muscles, joints and mobility. Nurs Times. 2019;115(4):54-7.3. Taylor NF, Harding KE, Dennett AM, Febrey S, Warmoth K, Hall AJ, et al. Behaviour change interventions to increase physical activity in hospitalised patients: a systematic review, meta-analysis and meta-regression. Age and Ageing. 2021;51(1).

Deconditioning

- Increases falls[1]
- Worsens mental health[2]
- Increases risk of infection[3,4]
- Worse respiratory outcomes[5,6,7]
- Worse cardiovascular outcomes[8]

Summary

- More osteoporosis[9,10]
- Muscle atrophy[9,10]
- Reduced exercise tolerance[9,10]
- Worse diabetes outcomes and obesity outcomes[11]
- Higher blood pressure[12]

1 - Sherrington C et al. Exercise for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews 2019. 2- Conn VS. Anxiety outcomes after physical activity interventions: meta-analysis findings. Nurs Res 2010;59:224-231 3-Woods J et al. The COVID-19 Pandemic and Physical Activity. Sports Medicine and Health Science 2020. 4- Silver JK. Prehabilitation could save lives in a pandemic. BMJ 2020;369:m1386 5 - Puhan MA, Gimeno-Santos E, Cates CJ, Troosters T. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews 2016. 6 - McCarthy B, Casey D, Devane D, Murphy K, Murphy E, Lacasse Y. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane database of systematic reviews 2015. 7 - Bolton CE, Bevan-Smith EF, Blakey JD et al. British Thoracic Society guideline on pulmonary rehabilitation in adults: accredited by NICE. Thorax 2013;68:ii1-ii30 8- Myers J, Prakash M, Froelicher V, Do D, Partington S, Atwood JE. Exercise Capacity and Mortality among Men Referred for Exercise Testing. New England Journal of Medicine. 2002;346(11):793-801. 9-Cartee GD, Hepple RT, Bamman MM, Zierath JR. Exercise Promotes Healthy Aging of Skeletal Muscle. Cell metabolism. 2016;23(6):1034-47. 10-Kell RT, Bell G, Quinney A. Musculoskeletal fitness, health outcomes and quality of life. Sports Med. 2001;31(12):863-73. 11 - Sigal RJ, Armstrong MJ, Colby P, Kenny GP, Plotnikoff RC, Reichert SM, et al. Physical Activity and Diabetes. Canadian Journal of Diabetes. 2013;37:S40-S4. 12 Fox K, Hillsdon M. Physical activity and obesity. Obesity reviews. 2007;8(Suppl. 1):115-21

Deconditioning in pregnancy (especially through activity restriction eg bed rest)

- increased risks of preterm birth
- maternal health complications
  - DVT
  - Gestational Diabetes
  - Fatigue
  - Headache
  - Low back pain
- psychosocial distress (anxiety, depression, stress)

Palacio M, Mottola MF. Activity Restriction and Hospitalization in Pregnancy: Can Bed-Rest Exercise Prevent Deconditioning? A Narrative Review. Int J Environ Res Public Health. 2023;20(2).

Rarer but important causes of breathlessness

- Cardiac (valvular problems, arrhythmias, cardiomyopathy)
- Thyroid function (hyperthyroidism)
- Respiratory
  - bronchiectasis, ciliary dyskinesia, cystic fibrosis
  - Pneumothorax
  - pneumonia

Normal recovery from pneumonia (often in those admitted but also some in primary care)

- No studies on COVID-19 as yet
- Likely to fit with previous coronavirus respiratory infections (SARS, MERS) influenza and community acquired pneumonia
- Learning from other infections (1-3) remembering speed of improvement will vary according to severity, co-morbidity and initial frailty
- **4 weeks** — muscle aches, chest pain and sputum production should have substantially reduced (significant sputum production is less common in COVID-19)(4)
- **6 weeks** — cough and breathlessness should have substantially reduced.
- **3 months** — most symptoms should have resolved but fatigue might still be present.
- **6 months** — symptoms should have fully resolved unless the patient has had a complicated ITU stay, in which case mobility and/or respiratory difficulties may

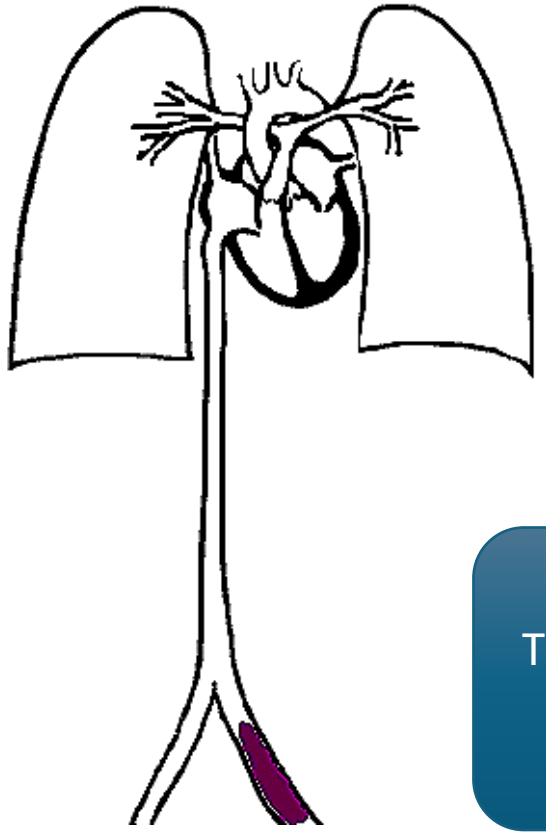
1. National Institute for Clinical Excellence. CG 191 Pneumonia in adults: diagnosis and management Clinical guideline [CG191]. London: NICE; 2019. 2. British Thoracic Society. BTS Guidelines for the Management of Community Acquired Pneumonia in Adults: update 2009. London: British Thoracic Society; 2009. 3. National Institute for Clinical Excellence. Clinical Knowledge Summary: Chest infections - adult. London: NICE; 2019.
4. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. The Lancet. 2020;395(10229):1054-62.

Pulmonary embolism

3.5-11.5 per 10,000 people per year[1]

5-20 cases per 1000 pregnancies[2]

11% of maternal deaths[2]



Think increased risk of thromboembolism

1. Konstantinides SV, Meyer G, Becattini C, Bueno H, Geersing G-J, Harjola V-P, et al. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS): The Task Force for the diagnosis and management of acute pulmonary embolism of the European Society of Cardiology (ESC). European Heart Journal. 2019;41(4):543-603. 2. Cueto-Robledo G, Cervantes-Naranjo F-D, Gonzalez-Hermosillo L-M, Roldan-Valadez E, Graniel-Palafox L-E, Castro-Escalante K-Y, et al. Pulmonary Embolism During Pregnancy: An Updated Review With Case Series Description. Current Problems in Cardiology. 2023;48(7):101683

•Suspect pulmonary embolism (PE) in a person with any of the following:

- Dyspnoea — this is the most common feature and is present in 50% of people with PE.
  - It may be acute and severe in central PE, but mild and transient in a small peripheral PE.
- Haemoptysis.
- Pleuritic chest pain — present in 39% of people with PE.
  - Pain is normally localised to one side.
- Syncope or pre-syncope.
- Tachypnoea — present in 21-39% of people with PE.

When to admit…. (**all** if pregnant or postnatal)

- **Arrange immediate admission for people with suspected pulmonary embolism (PE) if:**
- **They have signs of haemodynamic instability.** In PE, haemodynamic instability is defined as at least one of the following on presentation:
  - Cardiac arrest — need for cardiopulmonary resuscitation.
  - Obstructive shock — systolic blood pressure (BP) of less than 90 mmHg or vasoactive drugs required to achieve a BP of 90 mmHg or more despite adequate filling status, plus end-organ hypoperfusion (altered mental status, cold, clammy skin, oliguria/anuria, increased serum lactate).
  - Persistent hypotension — systolic BP less than 90 mmHg or a drop in systolic BP of 40 mmHg or more, lasting longer than 15 minutes and not caused by new-onset arrhythmia, hypovolaemia, or sepsis.
- **They are pregnant or have given birth within the past 6 weeks.**

Immunisation in pregnancy

Flu immunisation in pregnancy

Flu vaccine

- During pregnancy, your immune system (the body's natural defence) is weakened to protect the pregnancy. This can mean you're less able to fight off infections such as flu.
- Pregnant women are more likely to get flu complications (such as pneumonia) than women who are not pregnant, and are more likely to be admitted to hospital. Having the flu vaccine means you're less likely to get flu, or if you do catch flu, it is less likely to be severe.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

Whooping Cough Vaccine

- Whooping cough can be a very serious infection, and young babies are most at risk. Most babies with whooping cough will be admitted to hospital.
- When you have the whooping cough vaccination in pregnancy, your body produces antibodies to protect against whooping cough. These antibodies pass to your baby giving them high levels of protection against serious whooping cough illness until they're able to have their whooping cough vaccination at 8 weeks old.
- You usually have the whooping cough vaccine at 20 weeks pregnant, but you can have it from 16 weeks.
- To give your baby the best protection against whooping cough, you should have the vaccine before 32 weeks of pregnancy. If for any reason you miss having the vaccine before 32 weeks, you can still have it later.
- If you are 20 weeks pregnant and have not been offered the whooping cough vaccine, contact your midwife or GP surgery.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

Respiratory syncytial virus (RSV) vaccine

- Respiratory syncytial virus (RSV) is a common virus that causes coughs and colds. RSV usually gets better by itself, but it can be serious for babies.
- RSV can cause serious lung infections (including pneumonia and bronchiolitis), which can make it difficult for babies to breathe and feed. These illnesses may need to be treated in hospital.
- When you have the RSV vaccine in pregnancy, the protection from the vaccine is passed to your baby. This means your baby is less likely to get severe RSV for the first 6 months after they're born.
- You should be offered the RSV vaccine around the time of your 28-week antenatal appointment. Getting vaccinated as soon as possible from 28 weeks will provide the best protection for your baby. But it can be given later if needed, including up until you go into labour.
- Speak to your maternity service or GP surgery if you are 28 weeks pregnant or more and have not been offered the vaccine.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

COVID-19 vaccine

- If you're pregnant, or think you might be, it's recommended you get vaccinated against COVID-19 to protect you and your baby.
- You're at higher risk of getting seriously ill from COVID-19 if you're pregnant. If you get COVID-19 late in your pregnancy, your baby could also be at risk.
- It's safe to have the vaccine during any stage of pregnancy, from the first few weeks up to your expected due date.
- The COVID-19 vaccines do not contain any live viruses and cannot give you or your baby COVID-19.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

Vaccines not usually advised (live vaccines)

Live vaccines include:

- BCG (vaccination against tuberculosis)
- MMR (measles, mumps and rubella)
- oral typhoid
- yellow fever

Sometimes used (risk of baby developing the infection – no risk of defects etc) if benefit likely to outweigh risk

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

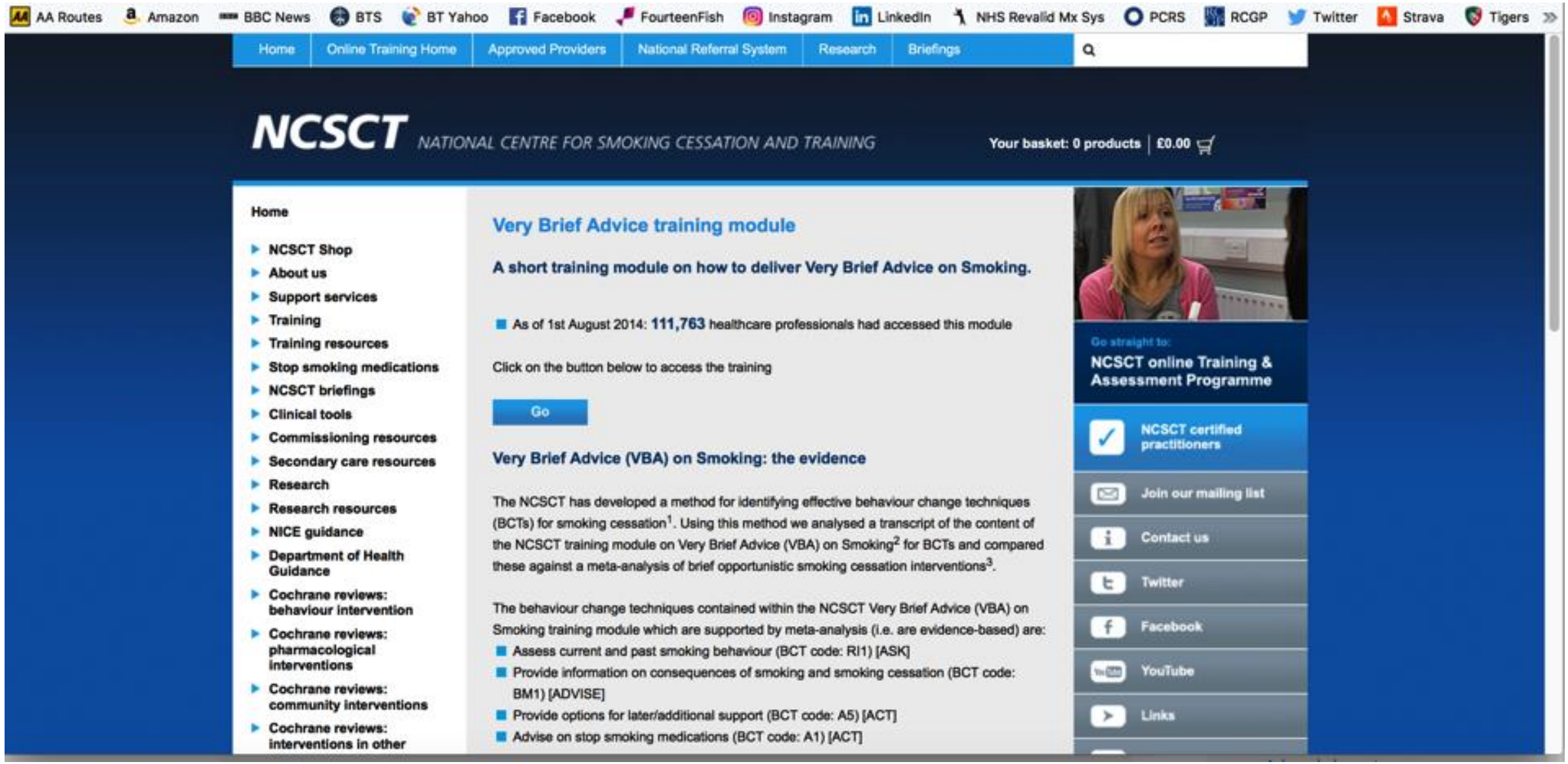
Very brief advice for smoking cessation

Treating Tobacco Dependency

- The evidence
  - People who smoke are 50-60% more likely to quit with Nicotine Replacement Therapy (NRT)[1]
  - Varenicline is about 25% more effective than a single form of NRT[2]
  - Nicotine-containing e-cigarettes are 50% more effective than NRT[3]

1. .Hartmann-Boyce J, Chepkin SC, Ye W, Bullen C, Lancaster T. Nicotine replacement therapy versus control for smoking cessation. Cochrane database of systematic reviews. 2018(5).
2. Livingstone-Banks J, Fanshawe TR, Thomas KH, Theodoulou A, Hajizadeh A, Hartman L, Lindson N. Nicotine receptor partial agonists for smoking cessation. Cochrane Database of Systematic Reviews. 2023(5).
3.Hartmann-Boyce J, Livingstone-Banks J, Ordonez-Mena JM, Fanshawe TR, Lindson N, Freeman SC, et al. Behavioural interventions for smoking cessation: an overview and network meta-analysis. Cochrane Database of Systematic Reviews. 2021(1)

Very Brief Advice Training (NCSCT)



How to influence people and change lives?

- **Ask** – do you smoke?
- **Advice** – the best way to stop is with professional support and the medications available to help
- **Act** – shall I send a referral for you to have a discussion with the team

Asthma – common problem, common issues

National guidance (BTS/SIGN/NICE) – review early and stop smoking

People with asthma should have an asthma review during early pregnancy and in the postpartum period. Emphasise the importance and safety of maintaining good control of asthma during pregnancy and of continuing asthma medicines to avoid problems for themselves and their baby. **[BTS/SIGN 2019]**

Advise anyone who is pregnant and who smokes about the dangers for themselves and their babies and give appropriate support to stop smoking. See the NICE guideline on tobacco for more information. **[BTS/SIGN 2019]**

British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Asthma - use of medications

Advise use of medicines as normal during pregnancy:

- short-acting and long-acting beta2 agonists
- inhaled corticosteroids
- oral theophyllines. **[BTS/SIGN 2019]**

Exacerbations

- Offer oral corticosteroids during pregnancy if needed to treat exacerbations of asthma. Advise that the benefits of treatment with oral corticosteroids outweigh the risks. **[BTS/SIGN 2019, amended BTS/NICE/SIGN 2024]**

British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Asthma medications - continued

- If leukotriene receptor antagonists or long-acting muscarinic receptor antagonists are needed to achieve asthma control, they should not be stopped during pregnancy. **[BTS/SIGN 2019, amended BTS/NICE/SIGN 2024]**

- **Breastfeeding**
- Use medicines as normal when breastfeeding in line with recommendations in the BNF. **[BTS/SIGN 2019, amended BTS/NICE/SIGN 2024]**

British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Tips for patients – managing your asthma during pregnancy

See your doctor / nurse early on to discuss your asthma as soon as you know you are pregnant

Ensure you have an updated asthma action plan (share with midwife)

Medications – continue unless advised otherwise

Avoid Triggers: Identify and avoid asthma triggers like allergens, smoke, and irritants.

Pay attention to any changes in your asthma symptoms and seek medical advice if they worsen.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

Potential complications for patients

- **Uncontrolled asthma can lead to complications**: for both the mother and baby, including preeclampsia, preterm labor, and low birth weight.

Asthma attacks can reduce oxygen levels: in the blood, potentially affecting the baby's development.

- **It's crucial to maintain good asthma control**: throughout pregnancy to minimize these risks.

NHS Website access May 2025 - https://www.nhs.uk/pregnancy/keeping-well/vaccinations/

Asthma in pregnancy

- *Majority have normal pregnancies and risk of complications small*
- *Several physiological changes occur during pregnancy that could worsen or improve asthma, but it is not clear which, if any, are important in determining the course of asthma during pregnancy.*
- *Pregnancy can affect the course of asthma and asthma and its treatment can affect pregnancy outcomes.*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Rule of one thirds

- *Conclusions of meta-analysis (14 studies) in agreement with commonly quoted generalisation that during pregnancy about one third of asthma patients experience an improvement in their asthma, one third experience a worsening of symptoms, and one third remain the same.*
- *There is also some evidence that the course of asthma is similar in successive pregnancies.788, 791*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

More severe asthma more likely to worsen

- *Studies suggest that 11–18% of pregnant women with asthma **followed up in specialist care** will have at least one emergency department visit for acute asthma and of these 62% will require hospitalisation.*

- *Severe asthma is more likely to worsen during pregnancy*

than mild asthma, but some patients with very severe asthma may experience improvement, whilst symptoms may deteriorate in some patients with mild asthma.

- *In a large study in the USA, the rates of asthma attack were 13%, 26%*

and 52% in those with mild, moderate and severe asthma respectively.789
The corresponding rates of hospitalisation were 2%, 7% and 27%.

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

When will the asthma get worse

- *Symptoms tend to worsen in second and third trimester (peak in sixth month) – systematic review (24-36 weeks)*

- *In the last four weeks and 90% of patients had no asthma symptoms during labour or delivery. Of those who did, only two patients required anything more than inhaled bronchodilators.*

- *A further study has confirmed that patients are least likely to have an asthma attack in the last month of pregnancy.795*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

But.....

Pregnant women with non atopic asthma have more severe asthma during pregnancy compared to those with atopic asthma (and more pre-eclampsia)

Adequate surveillance and treatment avoids pregnancy and delivery complications

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Uncontrolled asthma associated with many maternal and fetal complications including

- *hyperemesis,*
- *hypertension,*
- *pre-eclampsia,*
- *vaginal haemorrhage,*
- *complicated labour,*
- *fetal growth restriction,*
- *preterm birth,*
- *increased perinatal mortality, and*
- *neonatal hypoxia*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Mx of acute asthma

- *Give steroids if needed (study in US showed that outcomes worse and clinicians tried to avoid in an emergency department in those that were pregnant)*
- *No cause for concern re side effects to mother and fetus (much more from undertreated)*

- *Confidential enquiry into maternal deaths 22 deaths were from asthma (1994-2008)*
- *Those admitted to adult critical care units (2009-2012)*
  - *Pregnant women (1188) 94 (8% were admitted with acute asthma)*
  - *Post natal (5605) 32 (0.6% were admitted with acute asthma)*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Drug therapy for breast feeding mothers

- *Medicines used to treat asthma (including oral steroids) appear to be safe*
- Less experience with biologics

- *Hence*
- *Encourage women with asthma to breastfeed.*
- *Use asthma medications as normal during lactation, in line with manufacturers' recommendations.*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Common questions – primary and secondary prevention for children

- If I **breast feed** will my child be less likely to develop asthma?
  - ***Breastfeeding should be encouraged for its many benefits, including a potential protective effect in relation to early asthma.***
- **Pets in the home**
  - A lot of studies but no convincing answer whether harm or benefit
  - **Health care professionals should not offer *advice on pet ownership as a strategy for preventing childhood asthma***
- ***Modified infant milk formulae***
  - *In the absence of any evidence of benefit from the use of modified infant milk formulae it is not possible to recommend it as a strategy for preventing childhood asthma*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

Common questions – primary and secondary prevention for children

- *Weaning*
  - *In the absence of evidence on outcomes in relation to asthma no recommendationson modified weaning can be made*

British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

The new British Asthma Guidelines and beyond – better management

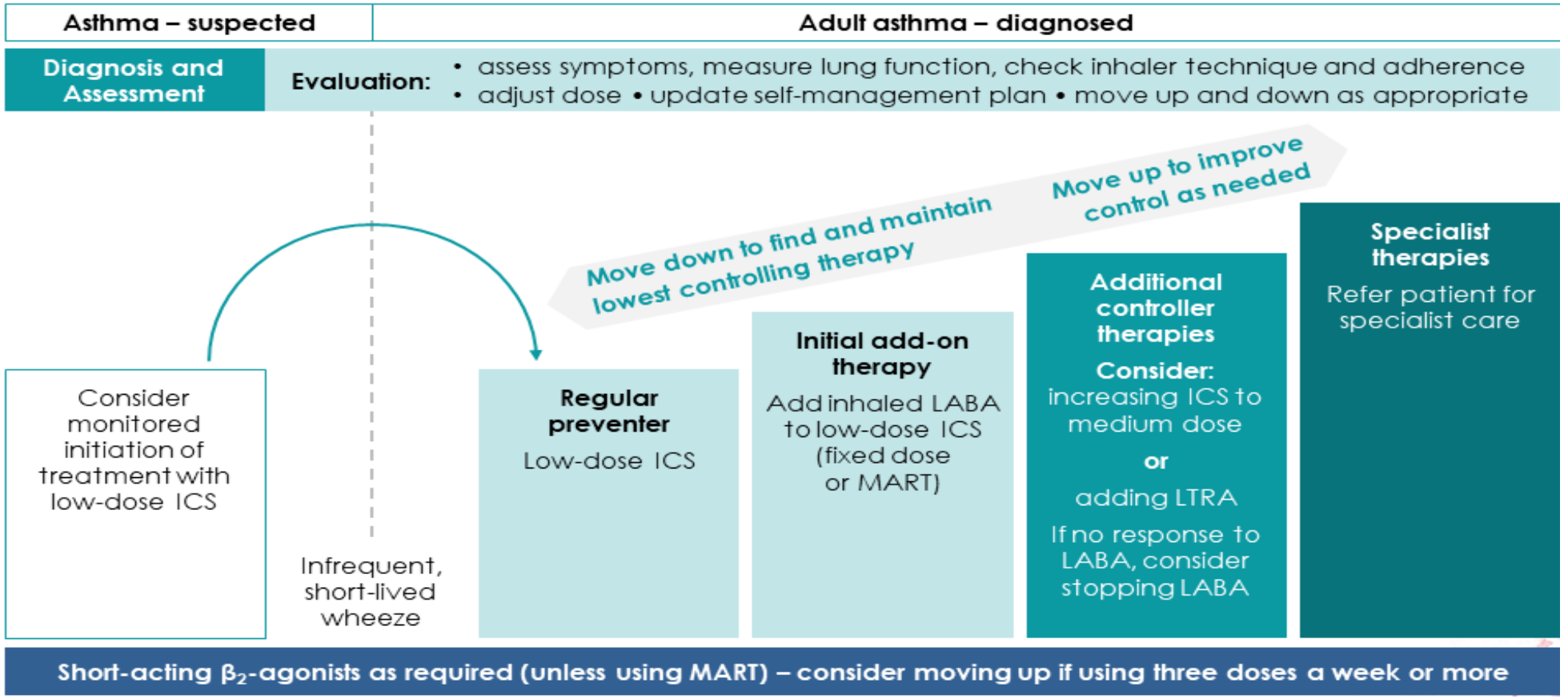
The Old Days (1999 – 2019)

Pharmacological management strategies: adults

Good practice point:

Before initiating a new drug therapy practitioners should:

- Check adherence with existing therapies
- Check inhaler technique
- Eliminate trigger factors



Adapted from BTS/SIGN 158 British Guideline on the Management of Asthma 2019 https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/ [last accessed 25th Jan 2023];

How many people?

- Have a mobile phone can only take telephone calls?
- Have a black and white TV?
- Carry only cash?
- Have no power assisted steering in their car

Do you want a more modern alternative – fancy an upgrade?

Why should we stop treating with SABA alone?

- Inhaled SABA has been first-line treatment for asthma for 50 years
  - Asthma was thought to be a disease of bronchoconstriction
  - Role of SABA reinforced by rapid relief of symptoms and low cost
- Regular use of SABA, even for 1–2 weeks, is associated with increased AHR, reduced bronchodilator effect, increased allergic response, increased eosinophils *(e.g. Hancox, 2000; Aldridge, 2000)*
  - Can lead to a vicious cycle encouraging overuse
  - Over-use of SABA associated with ↑ exacerbations and ↑ mortality *(e.g. Suissa 1994, Nwaru 2020)*
- Starting treatment with SABA trains the patient to regard it as their primary asthma treatment
- The only previous option was daily ICS even when no symptoms, but adherence is extremely poor
- **GINA changed its recommendation in 2019 once evidence for a safe and effective alternative was available**

EDITORIAL
GINA 2019

GINA 2019: a fundamental change in asthma management

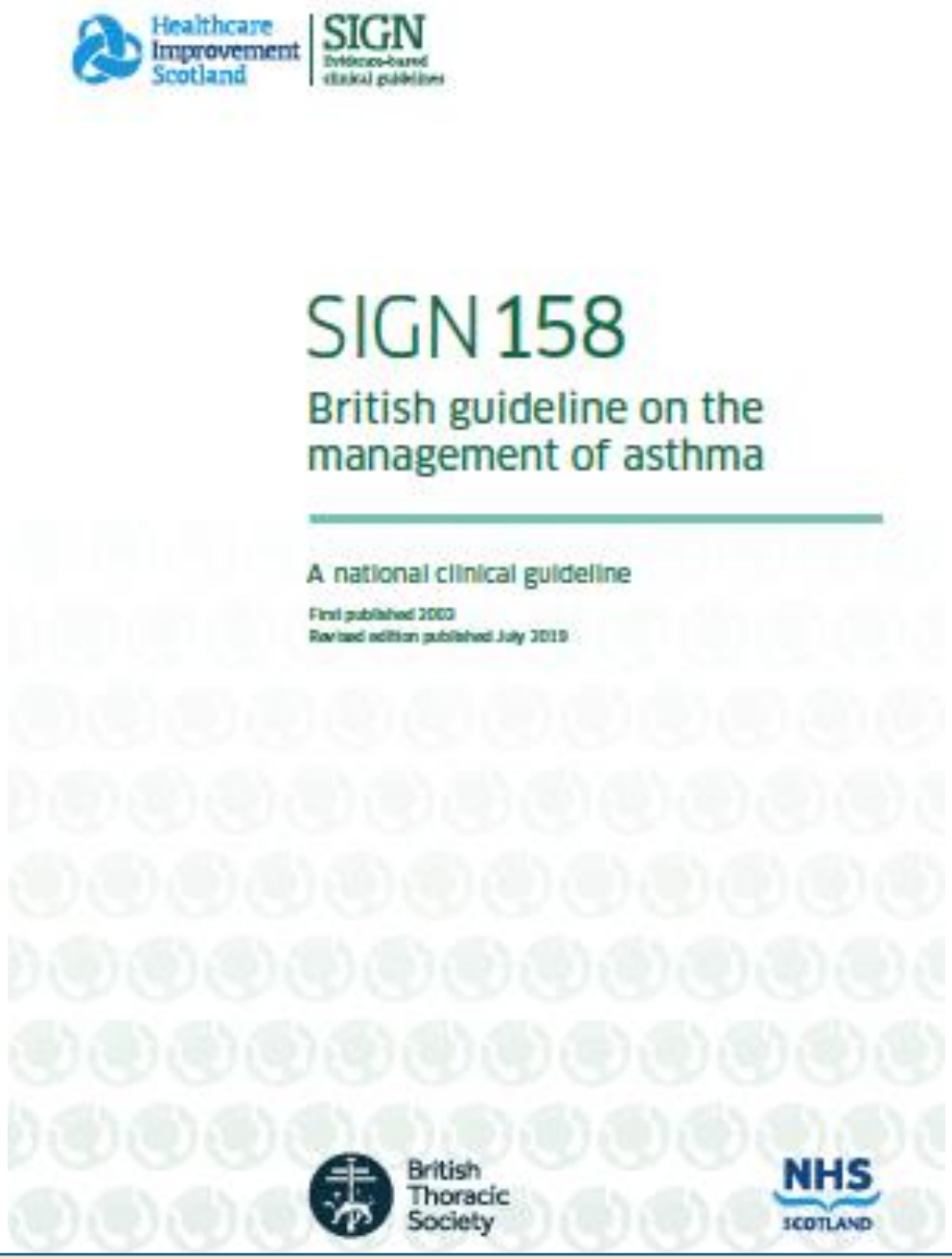
Treatment of asthma with short-acting bronchodilators alone is no longer recommended for adults and adolescents

Helen K. Reddel[1], J. Mark FitzGerald[2], Eric D. Bateman[3], Leonard B. Bacharier[4], Allan Becker[5], Guy Brusselle[6], Roland Buhl[7], Alvaro A. Cruz[8], Louise Fleming[9], Hiromasa Inoue[10], Fanny Wai-san Ko[11], Jerry A. Krishnan[12], Mark L. Levy[13], Jiangtao Lin[14], Søren E. Pedersen[15], Aziz Sheikh[16], Arzu Yorgancioglu[17] and Louis-Philippe Boulet[18]

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention (2022). 2022 available at www.ginaasthma.org

Maintenance And Reliever Therapy (MART)

- “Consider the option of combined maintenance and reliever therapy in adult patients who have a history of asthma attacks on medium dose ICS or ICS/LABA.” (Grade A recommendation)



British Thoracic Society, Scottish Intercollegiate Guideline Network. SIGN 158 British Guidelines for the Management of Asthma. Guideline. 2019.

MART and AIR – THE BASICS

- Not all combinations are licenced for AIR and for MART
- “Licensed indications for asthma inhalers vary between different medicines, different doses and different devices. Not all asthma inhalers are licensed for use in line with the recommendations in this guideline. See NICE's information on prescribing medicines or SIGN's information on prescribing licensed medicines out with their marketing authorisation and refer to the summary of product characteristics for individual products. ”

- Who keeps to licenced indications with salbutamol inhaler?

British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Algorithm C: Pharmacological management of asthma in people aged 12 years and over

BTS, NICE and SIGN guideline on asthma

Take into account and try to address the possible reasons for uncontrolled asthma before starting or adjusting medicines for asthma. For example: alternative diagnoses or comorbidities; suboptimal adherence; suboptimal inhaler technique; active or passive smoking (including e-cigarettes); psychosocial factors; seasonal factors; environmental factors (such as air pollution and indoor mould exposure)

Symptom relief

MART

Maintenance therapy

When changing from low- or moderate-dose ICS (or ICS/LABA combination inhaler) plus supplementary therapy to MART, consider whether to stop or continue the supplementary therapy based on the degree of benefit achieved when first introduced

Existing diagnosis of asthma on the treatment pathway recommended by previous NICE and BTS/SIGN guidelines

SABA only → Offer low-dose ICS/formoterol combination inhaler to be taken as needed (AIR therapy)

With a SABA: If asthma is uncontrolled on low-dose ICS; low-dose ICS/LABA; low-dose ICS plus LTRA; or low-dose ICS/LABA plus LTRA → **Consider** Low-dose MART

With a SABA: If asthma is uncontrolled on moderate-dose ICS; moderate-dose ICS/LABA; moderate-dose ICS plus LTRA and/or LAMA; moderate-dose ICS/LABA plus LTRA and/or LAMA → **Consider** Moderate-dose MART

If asthma is uncontrolled on high-dose ICS → Refer people to a specialist in asthma care

Newly diagnosed asthma in people aged 12 and over

Offer low-dose ICS/formoterol combination inhaler to be taken as needed (AIR therapy)

If asthma is uncontrolled, **offer** Low-dose MART

If asthma is uncontrolled, **offer** Moderate-dose MART

If asthma is uncontrolled, despite good adherence → Check FeNO level, if available, and blood eosinophil count

If either is raised → Refer people to a specialist in asthma care

If neither is raised → Consider a trial of either LTRA or LAMA used in addition to moderate-dose MART for 8 to 12 weeks unless there are side effects. At the end of the trial:

- if asthma is controlled, continue the treatment
- if control has improved but is still inadequate, continue the treatment and start a trial of the other medicine (LTRA or LAMA)
- if control has not improved, stop the LTRA or LAMA and start a trial of the alternative medicine (LTRA or LAMA)

If asthma is uncontrolled → Refer people to a specialist in asthma care

If highly symptomatic or there are severe exacerbations, offer low-dose MART

If asthma is controlled, consider stepping down → Low-dose MART

Uncontrolled asthma: Any exacerbation requiring oral corticosteroids **or** frequent regular symptoms (such as using reliever inhaler 3 or more days a week or night-time waking 1 or more times a week)

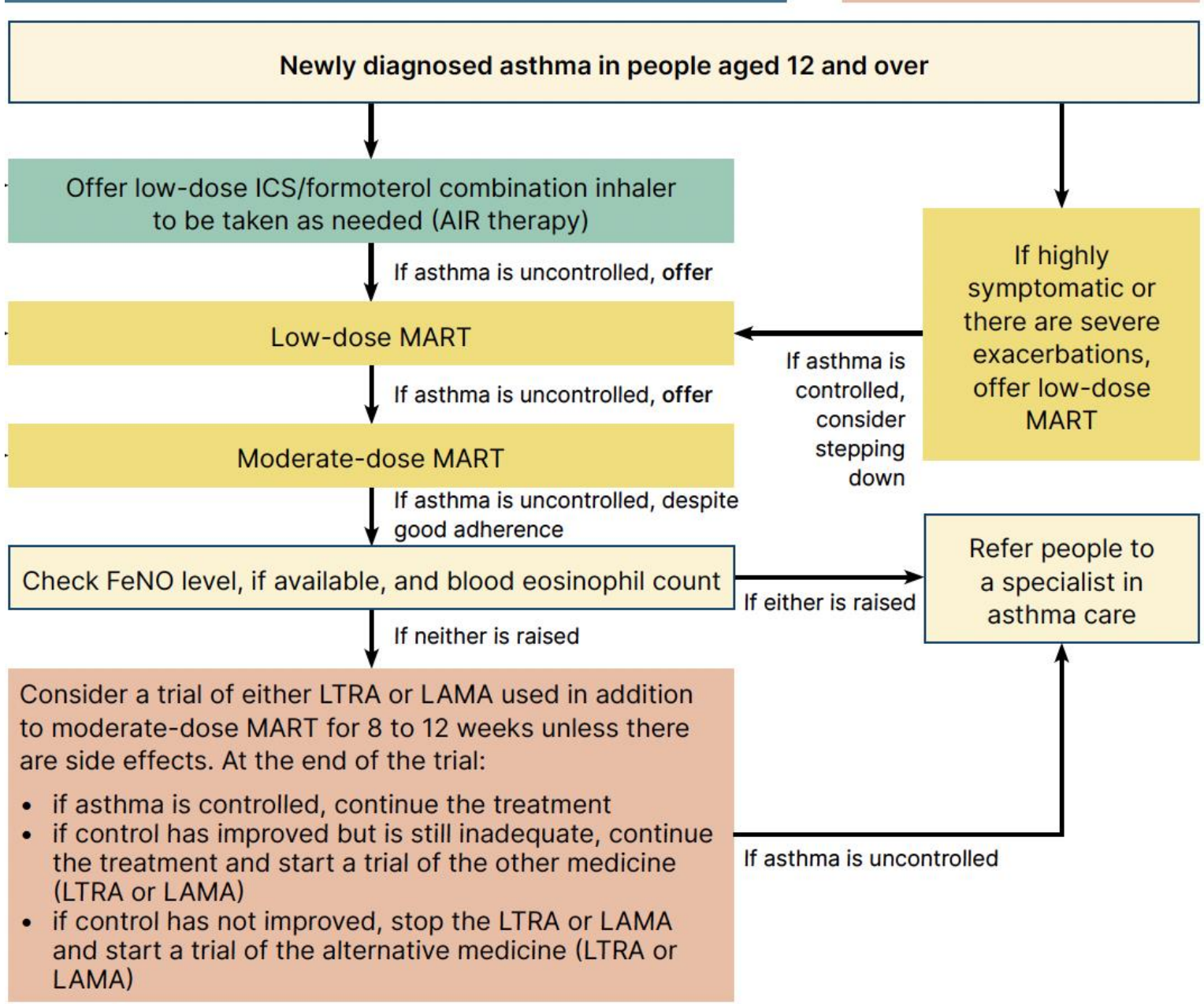
ICS, inhaled corticosteroid; **LABA**, long-acting beta$_2$ agonist; **LAMA**, long-acting muscarinic receptor antagonist; **LTRA**, leukotriene receptor antagonist; **MART**, maintenance and reliever therapy (using ICS/formoterol combination inhalers); **SABA**, short-acting beta$_2$ agonist.

British Thoracic Society

NICE National Institute for Health and Care Excellence

Healthcare Improvement Scotland | SIGN

BTS ISBN: 978-1-917619-28-8. NICE ISBN: 978-1-4731-6639-4. SIGN ISBN: 978-1-909103-97-9.



British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Table 1. ICS dosages for people aged 12 years and over

	Low dose	Moderate dose	High dose
Beclometasone dipropionate			
Standard particle metred dose and dry powder inhalers	200 to 500 micrograms per day in 2 divided doses	600 to 800 micrograms per day in 2 divided doses	1,000 to 2,000 micrograms per day in 2 divided doses
Extra-fine particle metered dose inhalers [1]	100 to 200 micrograms per day in 2 divided doses	300 to 400 micrograms per day in 2 divided doses	500 to 800 micrograms per day in 2 divided doses
Budesonide			
Dry powder inhalers	200 to 400 micrograms per day as a singe dose or in 2 divided doses	600 to 800 micrograms per day as a single dose or in 2 divided doses	1,000 to 1,600 micrograms per day in 2 divided doses
Ciclesonide			
Metered dose inhalers	80 to 160 micrograms per day as a single dose	240 to 320 micrograms per day as a single dose or in 2 divided doses	400 to 640 micrograms per day in 2 divided doses
Fluticasone propionate			
Metered dose and dry powder inhalers (excluding Seffalair Spiromax) [2] [3]	100 to 250 micrograms per day in 2 divided doses	300 to 500 micrograms per day in 2 divided doses	600 to 1,000 micrograms per day in 2 divided doses
Fluticasone furoate			
Dry powder inhalers [4]	Not available	100 micrograms per day as a single dose	200 micrograms per day as a single dose
Mometasone furoate			
Dry powder inhaler	200 micrograms per day as a single dose	400 micrograms per day as a single dose or in 2 divided doses	600 to 800 micrograms per day in 2 divided doses
Inhalation powder capsules [5]	80 micrograms per day as a single dose	160 micrograms per day as a single dose	320 micrograms per day as a single dose

British Thoracic Society, National Institute for Clinical Excellence, Scottish Intercollegiate Guideline Network. NG245 Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN). 2024.

Respiratory Problems in Pregnancy - covering

- Common causes of breathlessness in pregnancy
- Pulmonary embolus
- Immunisation against respiratory disease
- Smoking cessation
- Asthma – common problem – common issues

Thank you any questions?