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This self-help leaflet will support you to include important lifestyle

This self-help leaner changes for improving airway health are rising worldwide, and so is the prescribing of steroid nasal sprays/steroid inhalers, antihistamines, antibiotics and leukotriene inhibitors. **Surgical treatments** may also be considered.

Approximately **1 in 5** people in the Western world are estimated to be living with allergic rhinitis

3 in 10 with asthma

These long-term conditions are not only known to adversely affect mental health and quality of life but have economic implications too. The estimated global annual cost of both of these diseases combined is nearly equal to the yearly NHS budget!

The urbanised Western lifestyle is thought to be promoting the increase in allergic diseases. Whilst we cannot change the whole environment, there are **changes**

we can make to our environment, and habits which improve both airway and general health.

Why change lifestyle for airway health?

Airway health is complex and is affected by many factors.

Experts believe that these conditions should be seen as

'one airway disease'. For example, 80% of people with asthma have rhinitis and treating this may significantly reduce asthma symptoms¹. Likewise, good control of asthma improves nose symptoms.

Optimal functioning of our airways (nose/sinuses and lungs) can be linked to our overall general health.

As part of a holistic approach to health and in particular airway conditions, lifestyle changes can be beneficial. In some cases, the inclusion of lifestyle changes may even help to reduce the dose of medications. However, any changes to your medication should always be discussed with your healthcare professional.





Promoting Sustainable Health and Nutrition

The goals are to ...



- Promote function of the mucosal lining or airway barrier
- Reduce inflammation and number of infections
- Prevent complications
- Improve quality of life

A brief understanding of how the mucosal lining of our airways work will make it easier to understand why the following changes may be helpful.

Our airways have an active mucosal lining with very important functions rather than 'just an air passage'.

What are the

goals of

treatment?

Respiratory epithelium, the mucosal lining, is a 'ciliated columnar epithelium', which helps to lubricate and protect the airways. In health, the airways produce about two pints of mucus every day, which helps to moisten and warm the inhaled air. Most of the time, we swallow this mucus without knowing.

Cilia are small, slender, hair-like structures on the lining of the airways (epithelium). They beat in one direction, moving mucus towards the throat. The cilia beat at **10-15** times per second to move the old mucus coated with air pollutants, whilst a new layer of mucus is formed every 10-15 minutes. This beating of cilia and mucus



Fig 1: Mucociliary function

action happens together in a very sophisticated manner to protect the airways and is called mucociliary function². See Figure 1.

What changes shall I make?

PuFF

The most common changes which have shown to be of benefit are:

Indoor air pollution

There is a strong link between indoor pollution and airway health³.

Minimise exposure to toxic chemicals such as **smoking** and **vaping**⁴.

Cigarette smoking during pregnancy can affect the baby's lung function and increases the chances of wheezing, as does passive smoke in early childhood⁵.

Breastfeeding has been found to be protective.



"Green cleaning"- this is not a fad and can help reduce indoor pollution⁶. Conventional chemical products used for cleaning release 75% more VOCs (volatile organic compounds) into the air^{7,8}. These have a direct impact on your airways and general health. Cosmetics and air fresheners can have the same effect⁹.

Regular cleaning of bed linen and surfaces along with vacuuming is recommended along with good ventilation to reduce indoor air pollution.

2 Diet

There is a concept of better eating for better breathing¹⁰.

The current Western diet is thought to **be pro-inflammatory. This is** due to the **high** consumption of processed foods and meat and **low** consumption of food groups which are naturally rich in **anti-inflammatory compounds**.

An anti-inflammatory diet is rich in essential vitamins, minerals, antioxidants, polyphenols and pre and probiotics. It includes plenty of:



Vegetables

Fruits

Wholegrains

<u>Mediterranean</u> type diets which have been shown to be beneficial for general health may also be useful for prevention of asthma and allergic conditions¹¹.

Dairy
productsRefined
sugarsProcessed
foods12,13

This has been proposed as an additional <u>treatment</u> in chronic rhinosinusitis¹⁴.



Herbs and spices

Beans

Avoiding shellfish, eggs, and meat

has been shown in a small study to reduce facial pressure and nasal discharge symptoms¹⁸.

A diet <u>high in vegetables and fruits</u> has been shown to improve allergic rhinitis symptoms and <u>asthma control</u>^{15, 16}.

Antioxidants in the diet seem to be beneficial in asthma, particularly in children¹⁷.



3 Don't blow your nose forcefully

Believe it or not, there have been <u>studies</u> of nose blowing with and without pinching and measuring the resulting pressure and its side effects¹⁹. Forceful nose blowing or pinching while blowing the nose not only has potential to **cause injuries** leading to bleeding, but it also **causes the mucus to move** towards the <u>sinuses</u> or ears²⁰.

In chronic rhinosinusitis and allergic rhinitis, a lot of mucus is produced, so **instead of constant blowing to clear the mucus, it is recommended that <u>saline nose irrigation</u> is used regularly²¹. This is very effective** at removing the inflammatory mucus by using low pressure methods and improves the function of the cilia. It also improves hydration of the top mucus layer helping it to work even better and improves effectiveness of <u>nasal steroid sprays</u>²².

Saline irrigation

You can buy sinus rinse bottles and premade sachets or make your own isotonic salt solution at home.

For homemade saline solution

- Mix half pint of boiled cooled water
- Half teaspoon of salt
 - Half teaspoon of bicarbonate of soda.

After making the solution you can **sniff it up gently through the nose and let it drain** or use a **syringe or saucer** to help.

Be gentle.

You can do this twice daily alongside brushing your teeth.

Right breathing techniques

It is ideal to breathe through the nose²³.

We breathe about **10,000 litres of air every day**, and this needs to be **warmed** and **moistened** before reaching the lungs, as well as **filtered** to **reduce infections**. Hence nose breathing is always preferred.



Airway resistance also **stops the collapse of smallest alveoli** which is very important for gas exchange as well as for reducing infections. There has also been recent interest in nitric oxide produced by the nose and sinuses, which seems to be beneficial for lung function as well as for its antimicrobial properties".

Nasal breathing promotes nasal and sinus nitric oxide production.

There are also various breathing <u>exercises</u> like **Butyeko, yogic breathing** or **diaphragmatic breathing** which can be of benefit in some individuals²⁵.

Microbiome

5

Our body is not only made of human cells

but also has a large team of almost equal number of **helpful and friendly bacteria, viruses** and **fungi**.

They are collectively called **the microbiome** and mainly found in the **gut**, **skin**, **nose**, **mouth**, **genital areas**. These areas are exposed directly to the **external environment**. Study of the microbiome is an active area of research in all fields of medicine and has **implications for airway health** too. For example, there seems to be a **lower incidence of asthma** among children **raised on farms**. This could be due to the **complex interaction between the microbiome and**

other environmental factors. In general, maintaining a

6 Allergen <u>reduction</u>

- Common allergens include:
- tree or grass pollen
- pets
- mould
- house dust

If you know these trigger your allergies, **reducing exposure** can help. However, it is not always possible or practical and **trying 'too hard' can also cause anxiety**. A **balanced approach** is recommended here. In general **good ventilation** is advised, but **for pollen sufferers it**

may be best to stay inside when the pollen count is high.

Don't hang washing outdoors, shower before bed, use sunglasses.

Adequate hydration also helps normal functioning of airways²⁸.

The amount of water intake varies between individuals but on average 6-8 glasses per day for sedentary individual is adequate. One study showed cough can be reduced in adolescents with asthma if they were well hydrated, but they usually need to be reminded²⁹.



This emphasises the need to **maintain a diet and environment** which **supports the microbiome**, as well as **reducing unnecessary medications**. Dietary components associated with a healthier microbiome include a variety of whole plant foods, fibre, polyphenols (found in brightly coloured fruit and vegetables) and fermented foods.

In patients with airway diseases, the bacterial burden in the lungs is <u>increased</u> when compared to lungs with no airway disease ²⁷.



Knowing your allergen triggers helps to target them better⁵.

House dust mite love warm and damp conditions. The WHO recommends twice weekly hot wash of your beddings at 55-60 °C and regular cleaning. HEPA (High Efficiency Particle Arresting) air filters can also help.

> **If companion animals** cause allergy symptoms than do not bring them into the bedroom.

Cat allergy is most common.

Stress management. There are suggestions that stress m

can be a <u>potential cause</u> of asthma by **altering how our genes are expressed** (epigenetics)³⁰.

It is also important from a holistic point of view to manage stress, as it can have an impact on the risk of many other diseases.

HEPA

8

Sleep

The symptoms of nasal blockage in <u>rhinitis</u> and nighttime worsening of breathing in asthma causes broken sleep and reduced daytime functioning, which may affect recovery³¹.

Good sleep hygiene, including an evening routine of **saline nasal irrigation** followed by any **prescribed treatments**, may help to break the cycle.

10 Vitamin D

There is some evidence that vitamin D deficiency is associated with increased risk of airway allergies.

Vitamin D deficiency worsens the inflammation in patients with <u>chronic</u> <u>rhinosinusitis</u> with polyps³². As vitamin D is an essential vitamin, it makes sense to continue to <u>supplement</u> this especially during autumn and winter months³³. This is commonly available over the counter and should be taken with meals to increase absorption.



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