

Asthma

Dr. John Bergman

What is Asthma?

“Asthma is a chronic (long-term) lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing, chest tightness, shortness of breath, and coughing.”

According to the National Heart, Lung, and Blood Institute ¹



The Grim Outlook of Asthma

“Asthma has no cure. Even when you feel fine, you still have the disease and it can flare up at any time. However, with today's knowledge and treatments, most people who have asthma are able to manage the disease.”

National Heart, Lung, and Blood Institute ¹



Asthma Statistics

In the US Asthma affects:

- 25 million people but can be as much as 40 million including the undiagnosed
- 1 in 12 adults
- 1 in 10 children

Worldwide

- Asthma affects an estimated 300 million people
- Over 480,000 annual deaths are attributed to asthma ⁶
- **The number of people with asthma is expected to grow by more than 100 million by 2025**

(American Academy of Allergy, Asthma, and Immunology ²)

The Business of Asthma

The cost of asthma in the US = \$56 Billion per year

(American Academy of Allergy, Asthma, and Immunology ²)



The Varying Prices of Asthma Medication

Cost of inhalers= **\$20 to \$250 per inhaler**

-The same inhalers sold in different countries can cost different amounts

- Qvar: \$250 will buy **2** inhalers in the US and **37** of the same inhalers in Greece
- Advair: \$250 will buy **1** inhaler in the US and **7** inhalers in France
- Rhinocort: \$250 will buy **2** bottles in the US and **51** bottles in Romania
- Augmentin: \$250 will buy **19** pills in the US and **445** pills in Belgium
- Colcrys: \$250 will buy **51** pills in the US and **9,158** pills in Saudi Arabia

(The New York Times ³)

Why does medication cost more in the U.S?

- Pharmaceutical Companies will often charge more in the US because of **co-payments** from medical insurance companies.
- They assume the insurance company will pay a significant portion of the medication
- Other countries don't have insurance companies that offer co-payments so **in order to actually sell their medications**, pharmaceutical companies reduce their prices.

(The New York Times ³)

The New York Times

What causes Asthma?

“The fundamental causes of asthma are not completely understood. The strongest risk factors for developing asthma are a combination of **genetic predisposition with **environmental exposure** to inhaled substances and particles that may provoke allergic reactions or irritate the airways, such as:”**

- indoor allergens (house dust mites in bedding, carpets and stuffed furniture, pollution and pet dander)
- outdoor allergens (such as pollens and molds)
- tobacco smoke
- chemical irritants in the workplace
- air pollution

(According to the WHO ⁴)

Genetics and Asthma

“This is an exciting time in the field of asthma and allergy genetics, as a list of well validated susceptibility genes are emerging and defining important biological pathways.”

“The **great challenges** that we now face are to elucidate the effects of associated variation on gene regulation or function and of associated genes on asthma pathogenesis.”



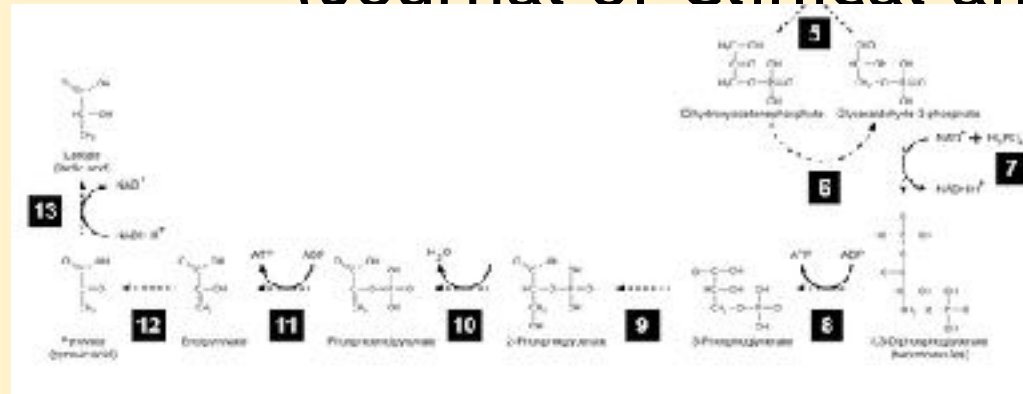
(Immunology Review ¹⁵)

Genetics and Asthma

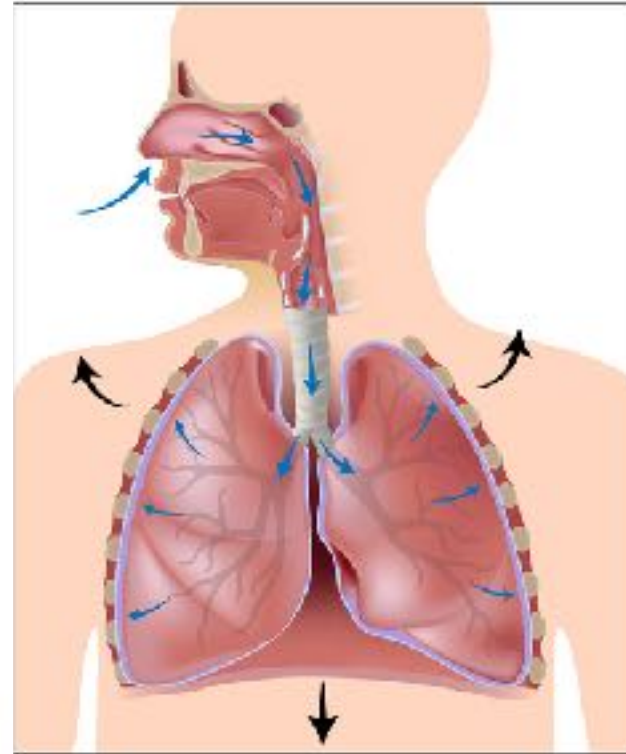
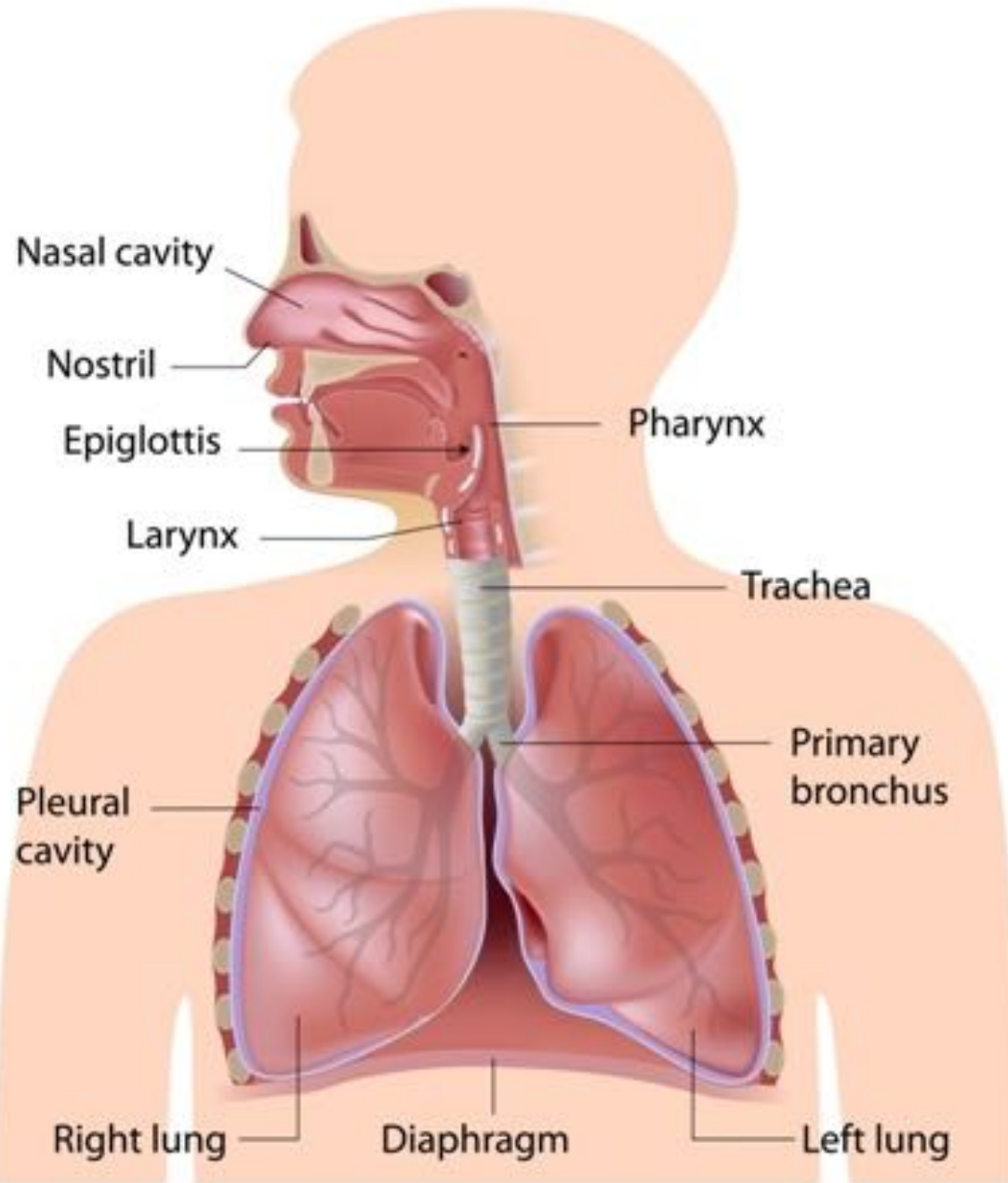
“We still have a long way to go, before the available data is assimilated to design effective intervention strategies and check asthma menace.

We need to put more focused efforts to chalk out **molecular pathways** and draw a comprehensive map of **molecular interactions** that underlie asthma pathogenesis.”

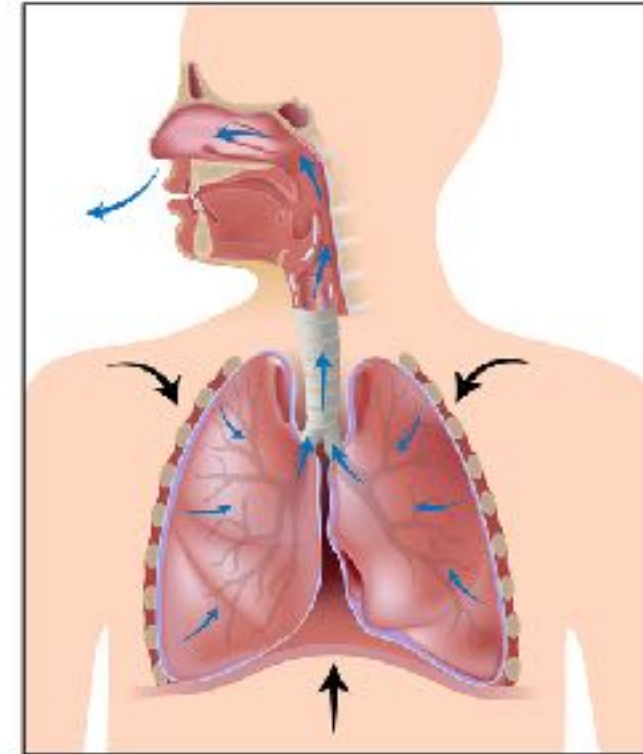
(Journal of Clinical and Molecular Allergy ¹⁷)



The Respiratory System

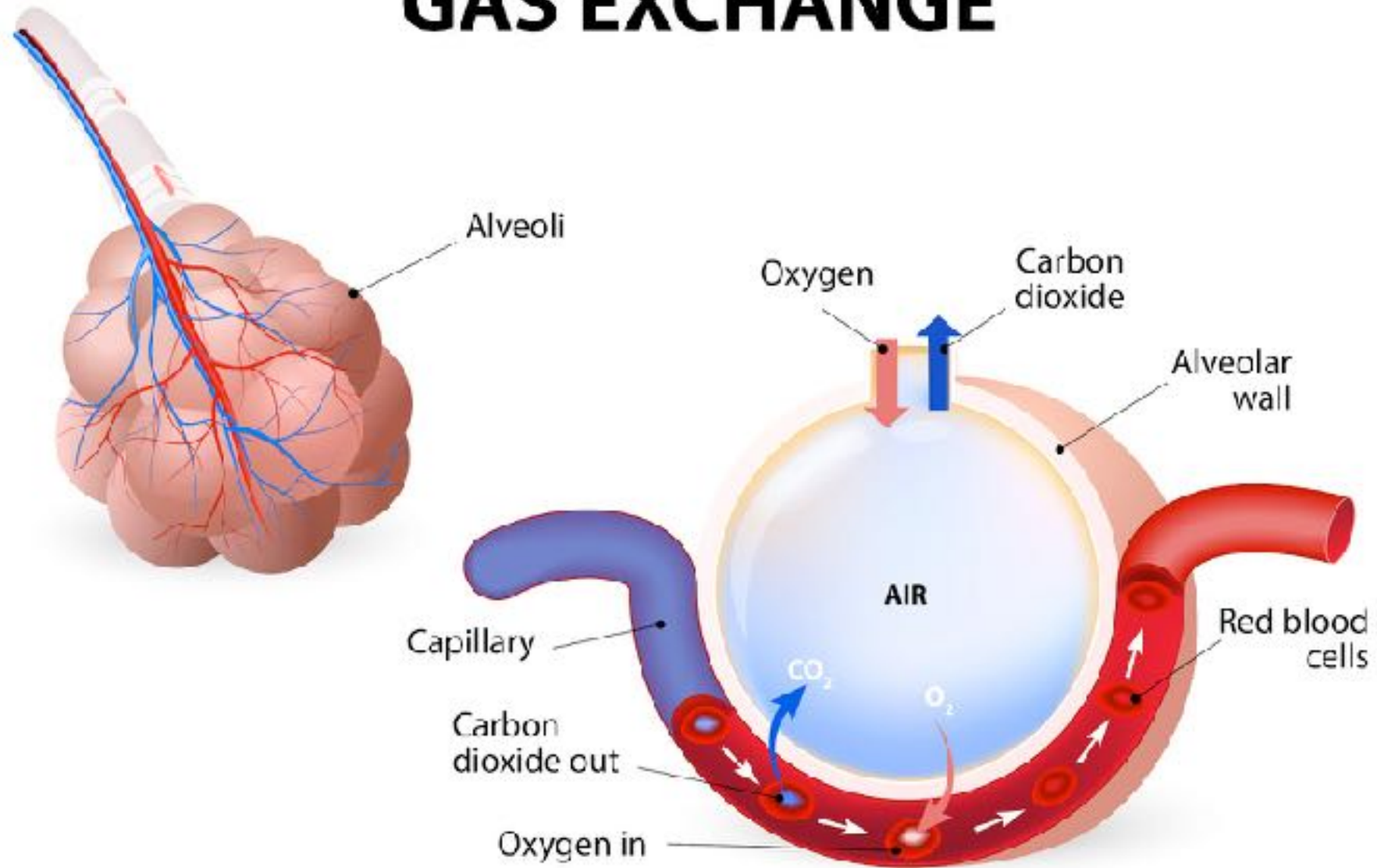


Inspiration

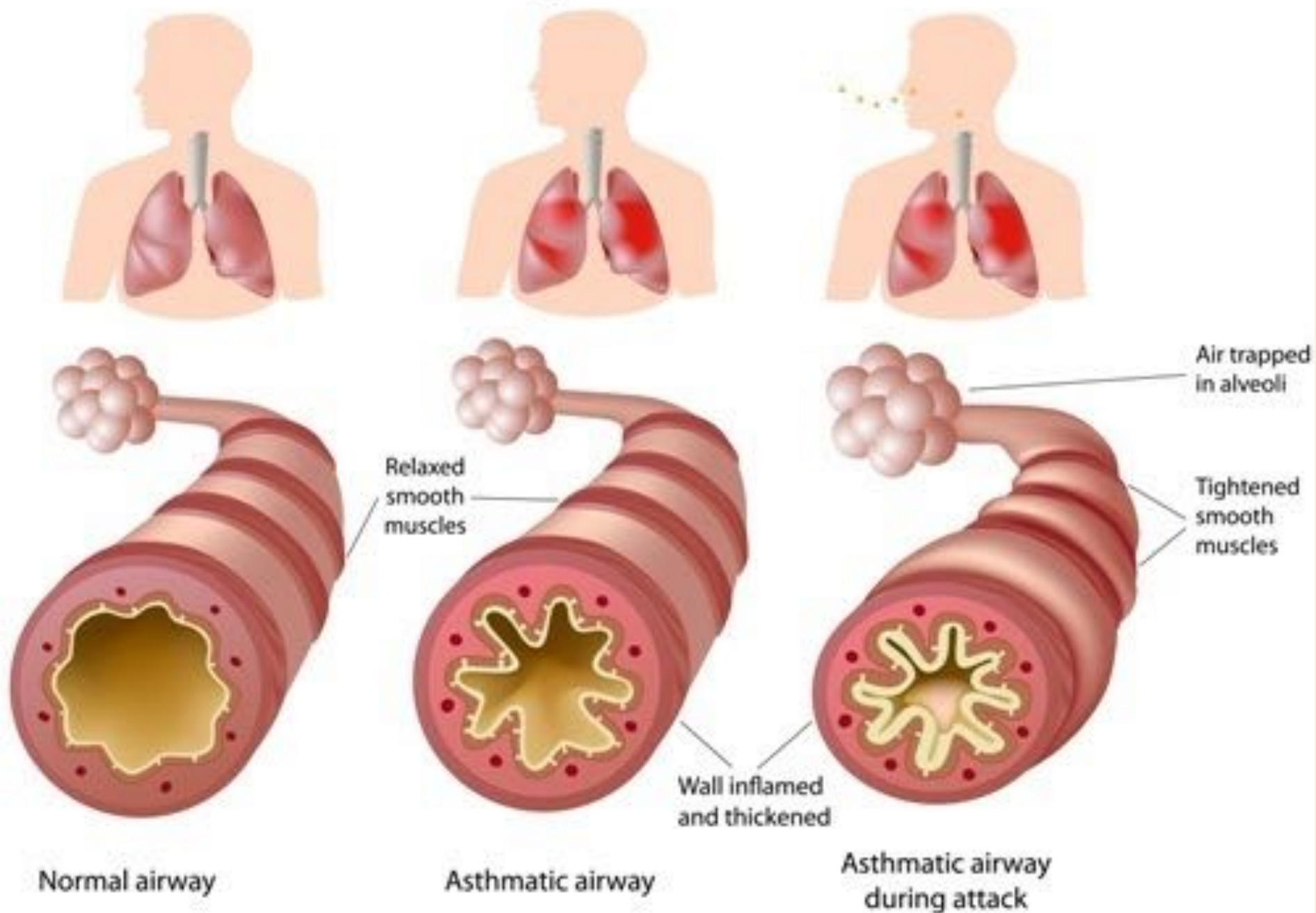


Expiration

ALVEOLUS GAS EXCHANGE



Pathology of Asthma



Pathophysiology or Intelligence?

The Normal Lung Response to Inhaled Substances

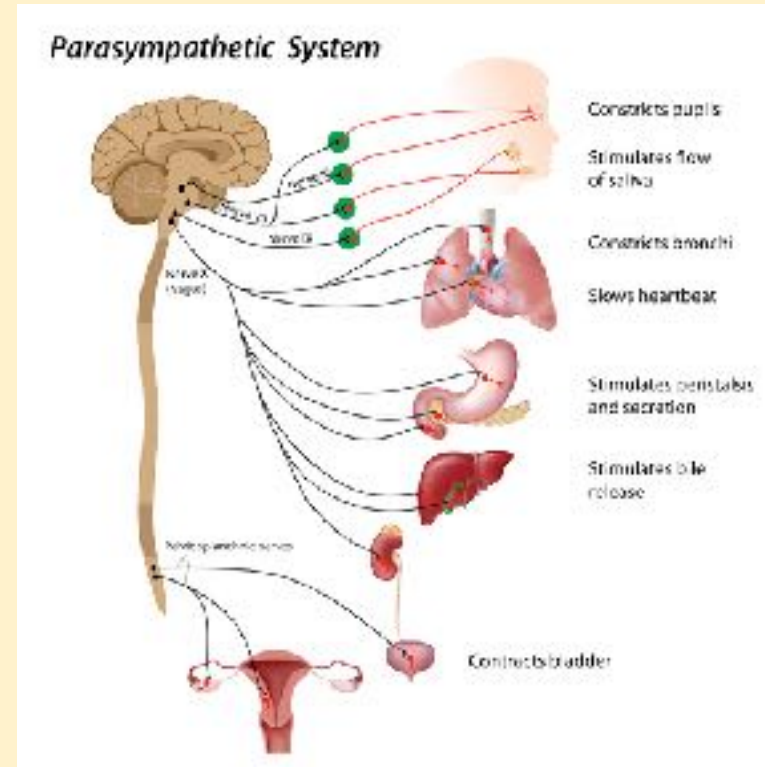
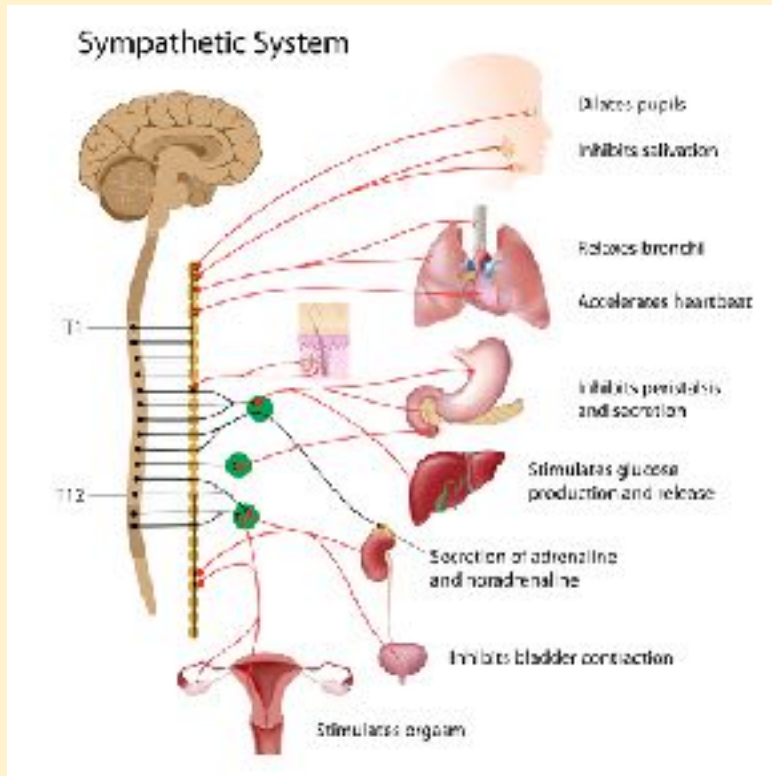
- Exposure to environmental triggers like smoke, dust or pollen
- Airways become narrow and inflamed to draw more blood to the area and utilize the immune system defenses
- Mucus is produced to trap the substances

The Asthmatic Lung Response to Inhaled Substances

- Airways of asthmatics are “hypersensitive” to certain triggers
- Response to triggers involves bronchoconstriction, inflammation, and excessive mucus production
- The response is the same as a normal healthy person but the asthmatic person is hypersensitive to things that a healthy is not

Nervous system Control of the Lungs

- The normal caliber of the bronchus is maintained by a balanced functioning of the autonomic nervous system
- The parasympathetic reflex loop innervates the lining of the bronchus and initiates bronchoconstriction



The Immune System Response of the Lungs

1. Allergen enters the lungs and is ingested by **Antigen-presenting cells (APC's)**
2. APC's then “present” pieces of the allergen to immune system cells known as T_H0 cells (**T cells**)
3. The T_H cell “checks” the allergen molecule and **usually ignores it**

The Immune System Response of the Lungs

In asthmatic patients

- The T cell transforms into a T_H2 cell which activates the immune system
- **Antibodies are produced** against the inhaled allergen so when the person is exposed to the same allergen the antibodies “recognize” it
- **Inflammation results:** airways thicken, mucus is produced, bronchospasms occur

“In essence, asthma is the result of an immune response in the bronchial airways.”

(Annual Review of Medicine ³⁷)

The Hygiene Hypothesis

“The hygiene hypothesis postulates that an imbalance in the regulation of these T_H cell types in early life leads to a long-term domination of the cells involved in allergic responses over those involved in fighting infection.

The suggestion is that for a child being exposed to microbes early in life, taking fewer antibiotics, living in a large family, and growing up in the country stimulate the T_H1 response and reduce the odds of developing asthma”

(Source ³⁸)

Asthma: The “Disease of Civilizations”

“Asthma is predominantly a disease of the privileged classes and a higher level of education and income is in general associated with a higher prevalence of disease in children”

(According to the WHO ⁹)

“Although asthma is at present a disease of affluent societies, the increasing westernization and urbanization of populations elsewhere in the world are leading to increases in prevalence”

(Lancet ¹⁴)

Proof of the Hygiene Hypothesis

- A rural lifestyle is consistently associated with low prevalence of asthma
- Exposure to farm animals and drinking unpasteurized milk is protective against asthma
- The presence of pets in the house and large family sizes are protective against asthma

According to the European Respiratory Journal,
Lancet, British Medical Journal,
and Journal of Pediatrics ¹⁰⁻¹³

Proof of the Hygiene Hypothesis

“These findings suggest that an environment rich in microbial organisms is beneficial in building infants resistance to asthma”

(British Medical Journal ¹²)

“The search for the environmental agents that protect against asthma is extremely important and probably holds the best chance for successful prevention and control of the disease in the global context”

(According to the WHO ⁹)

Th1 and Th2 Immune Responses

Th1 immunity

- Is responsible for normal reactions to anything in your environment, from pollen to animal dandruff, dust mites, chemicals, food.
- Th1 is **kept robust and healthy by your gut flora.**
- TH1- cell mediated response from **mucus membranes**
- If your gut flora is abnormal, your Th1 become increasingly disabled

Th2 immunity

- TH2-vaccines (puncture wound so the body needs an immediate response this is why there is **no lifetime immunity** from vaccinations, because the proper immune system cells are not built)
- **inflammatory reaction = inflammatory cytokines**
- **allergies and intolerances**

Vaccinations and Asthma

“The odds of having had any allergy-related respiratory symptom in the past 12 months was 63% greater among vaccinated subjects than unvaccinated subjects. The associations between vaccination and subsequent allergies and symptoms were greatest among children aged 5 through 10 years.”

Conclusion:

“DTP or tetanus vaccination appears to increase the risk of allergies and related respiratory symptoms in children and adolescents.”

(UCLA School of Public Health, Department of Epidemiology ³⁹)

49 DOSES OF 14 VACCINES BEFORE AGE 6? 69 DOSES OF 16 VACCINES BY AGE 18?

Before you take the risk, find out what it is.

BIRTH (12 hours)

Hepatitis B

2 MONTHS

Diphtheria

Tetanus

Pertussis

Polio

HIB

Rotavirus

Hepatitis B

PCV

4 MONTHS

Diphtheria

Tetanus

Pertussis

Polio

HIB

Rotavirus

PCV

6 MONTHS

Diphtheria

Tetanus

Pertussis

Polio

Rotavirus

Hepatitis B

PCV

Influenza

7 MONTHS

Influenza

12 - 18 MONTHS

Diphtheria

Tetanus

Pertussis

Measles

Mumps

Rubella

HIB

PCV

Varicella

Hepatitis A (2)

2 - 6 YEARS

Diphtheria

Tetanus

Pertussis

Polio

Measles

Mumps

Rubella

Varicella

Influenza (5)

7-18 YEARS

Diphtheria

Tetanus

Pertussis

Influenza (12)

HPV (3)

Meningococcal (2)



Viruses are Beneficial for Asthma

Objective of the Study:

“To investigate the association between early childhood infections and subsequent development of asthma.”

Conclusion:

“Repeated viral infections other than lower respiratory tract infections early in life may reduce the risk of developing asthma”

(British Medical Journal ¹⁶)

“Asthma: an Epidemic of Dysregulated Immunity”

“Infectious organisms, including commensal bacteria in the gastrointestinal tract and hepatitis A virus, may normally induce the development of regulatory T (T_R) cells and protective immunity that limit airway inflammation and promote tolerance to respiratory allergens.

In the absence of such infections, T_H2 cells develop instead and coordinate the development of asthmatic inflammation.”

“The associations between viral respiratory tract infections and the development of asthma are undoubtedly complex. There is strong epidemiological evidence in favor of the hypothesis that increased exposure to microbiological agents in early life, probably including the overall load of respiratory tract viruses, protects against the later development of asthma.

This inverse relationship is probably due to the effect of infections on suppressing type 2 immune responses in the developing immune system.”

(European Journal of Allergy and Clinical Immunology ⁴⁷)

Antibiotics and Asthma

“One of the mechanisms evoked to explain the increasing prevalence of asthma and allergy, in particular among children, is the ‘Western lifestyle’ or ‘hygiene’ hypothesis. As early childhood infections are assumed to hold a protective effect on the development of asthma and allergies, the use of antibiotics at that sensitive age may lead to an increased risk of asthma and allergy.

Early childhood use of antibiotics is associated with an increased risk of developing asthma and allergic disorders in children”

(Journal of Clinical and Experimental Allergy ⁴²)

Antibiotics and Asthma

“Antibiotic use in infancy may be associated with an increased risk of developing asthma.”

(Journal of Clinical and Experimental Allergy ⁴⁰)

“There is an association between antibiotic use in the first year of life and current symptoms of asthma, rhinoconjunctivitis, and eczema in children 6 and 7 years old.”

(Journal of Allergy and Clinical Immunology ⁴⁴)

Antibiotics and Asthma

“We found increased risk of asthma associated with maternal antibiotic use in a clinical study of a birth cohort. This supports a role for bacterial ecology in pre- or perinatal life for the development of asthma.”

(Journal of Pediatrics ⁴³)



Non-Prescription Antibiotic Exposure

CAFO's- Concentrated Animal Feeding Operations

- American factory farms used *29 million pounds* of antibiotics in 2009
- Estimated non-therapeutic use of antibiotics in livestock accounted for 70 percent of the total antibiotic use in the US (FDA)

“Clinical levels of antibiotics can cause oxidative stress that can lead to damage to DNA, proteins and lipids in human cells”

Non-Prescription Antibiotic Exposure

Glyphosate

“Glyphosate is a **very powerful selective antibiotic** that kills beneficial, but not pathogenic, microorganisms in the soil and intestine.”

“Residue levels permitted in food are 40 to 800 times the antibiotic threshold and concentrations shown in clinical studies to damage mammalian tissues.”

“Glyphosate is possibly the most important factor in the development of multiple chronic diseases and conditions that have become prevalent in Westernized societies.”

Dr. Stephanie Seneff,
Research scientist at the Massachusetts Institute of Technology (MIT)

The Importance of Microflora

Bacteria

- 80 percent of your immune system resides in your Gut
- Bacteria outnumber your cells **10 to 1**
- 100 trillion bacteria—about *two to three pounds* worth of bacteria
- You should have about **85 percent "good" bacteria** and 15 percent “bad.”
- Beneficial bacteria keep the bad bacteria and yeasts in check
- Produce nutrients your body needs, such as B vitamins.

The Importance of Microflora

Viruses

- Bacteriophages: beneficial viruses in your body
- Outnumber your body's bacteria 10 to 1
- Roughly 4 Quadrillion viruses in your body

“Viral elements are a large part of the genetic material of almost all organisms,”

“We humans are well over 50 percent viral”

Dr. Phillip Sharp,

Nobel Prize Winner

Center for Cancer Research M.I.T.

Tylenol and Asthma

- The majority of babies are given Tylenol (acetaminophen) within the first six months of life

European Journal of Public Health: A study involving over 20,000 children

- 10,371 children ages 6-7
- 10,372 adolescents ages 13-14

“The children in the younger age group who had received the medicine only once per year were at 70% greater risk for asthma while those receiving Tylenol once a month or more were shockingly 540% more likely to have asthma.”

“Children who had even a single dose of Tylenol before their first birthday had a 60% risk of developing asthma”

Tylenol and Asthma

Researchers found:

- Tylenol may reduce Glutathione, a potent antioxidant which protects the lungs and blood
- **Depletion of glutathione** can result in damage to the lung tissue

European Journal of Public Health ²³



The 5 Keys to Health and Healing



Proper nerve supply



Regular Exercise



Proper Nutrition



Sufficient Rest

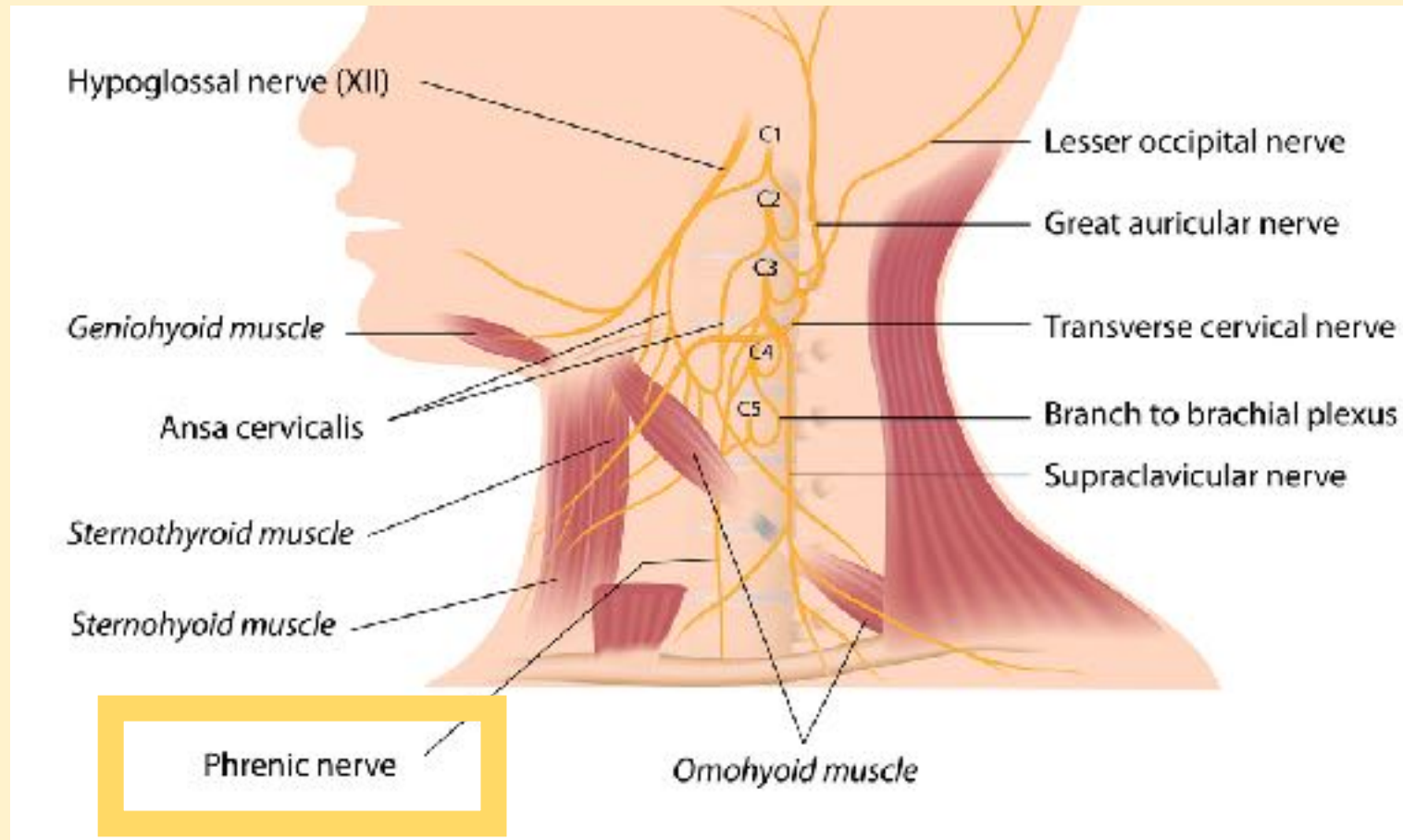


Prayer and Meditation

The Nervous System

- The nerves that originate from C3-C5 innervate the diaphragm
- Mnemonic for remembering the Innervation of the Lungs:

C3, C4, C5 Keep you Alive!



Optimize Your Gut Flora

- Avoid Antibiotic Exposure
- Eliminate processed foods, especially sugar
- Organic plant based diet
- Healthy fats such as coconut oil
- Fermented Vegetables
- Probiotic Supplements



Fish Oil and Asthma

“Western diets are deficient in omega-3 fatty acids, and have excessive amounts of omega-6 fatty acids compared with the diet on which human beings evolved and their genetic patterns were established.

Excessive amounts of omega-6 polyunsaturated fatty acids (PUFA) and a very high omega-6/omega-3 ratio, as is found in today's Western diets, promote the pathogenesis of many diseases, including cardiovascular disease, cancer, and inflammatory and autoimmune diseases, whereas increased levels of omega-3 PUFA (a low omega-6/omega-3 ratio) exert suppressive effects.”

(Journal of Biomedicine and Pharmacotherapy ⁴⁹)

Fish Oil and Asthma

“Our results provide evidence that promotion of a diet with increased Omega-3 fatty acids and reduced Omega-6 fatty acids to protect children against symptoms of asthma is warranted.”

Journal of Asthma ⁵⁰

“Our data suggest that fish oil supplementation may represent a potentially beneficial nonpharmacologic intervention for asthmatic subjects”

CHEST Journal, American College of Chest Physicians ⁴⁸

Black Seed

Also Known as:

- Nigella Sativa
- Roman coriander
- Black sesame
- Black cumin
- Black caraway
- Onion seed



Black Seed

Over **800** published, peer reviewed studies proving the benefits of Black Seed including:¹⁹

- Analgesic (pain killing)
- Anti-Bacterial
- Anti-Inflammatory
- Anti-Ulcer
- Anti-Fungal
- Antioxidant
- Antiviral
- Bronchodilator
- Gluconeogenesis Inhibitor (Anti-Diabetic)
- Insulin Sensitizing
- Hepatoprotective (Liver Protecting)
- Hypotensive
- Interferon Inducer
- Renoprotective (Kidney Protecting)

Black Seed and Asthma

“The results of the present study showed that *Nigella sativa* has a relatively potent anti-asthmatic effect on asthmatic airways.”

(Journal of Phytomedicine ²¹)

“These results showed a preventive effect of thymoquinone, one constituent of *N. sativa*, on tracheal responsiveness and inflammatory cells... which was comparable or even greater than that of the inhaled steroid.”

(Journal of Ethnopharmacology ²²)

Raw Milk and Asthma

- Children who drank raw milk had a **41% reduced chance of developing asthma** and a 50% reduction in hay fever.
- Children who drank raw milk that was boiled before drinking had no less asthma than those children drinking pasteurized milk
- Only unheated raw milk from farm to glass provided the protective effects against asthma and allergies

“The findings suggest that the protective effect of raw milk consumption on asthma might be associated with the whey protein fraction of milk.”

(Journal of Allergy and Clinical Immunology ²⁷)

Whey and Asthma

“We have previously demonstrated that we can increase intracellular GSH levels in healthy young adults using a whey-based oral supplement.

We hypothesized that such supplementation in children with atopic asthma, a Th2 cytokine disease, would improve lung function and decrease atopy.”

Journal of Experimental Botany ³¹

Glutathione and Asthma

- Master antioxidant
- Main detoxification system

Food Sources:

- Whey Protein
- Sulfur rich compounds (cruciferous family)

“Glutathione is a vital intracellular and extracellular protective pulmonary antioxidant. It plays a key role in regulating oxidant-induced lung epithelial cell function and also in the control of pro-inflammatory processes.”

(Annals of Allergy, Asthma and Immunology ⁵¹)

Breastfeeding and Asthma

“Breast-feeding during the first months after birth is associated with lower asthma rates during childhood.”

Journal of Pediatrics ³⁰

“Prolonged breastfeeding was shown to reduce the risk of allergic and respiratory diseases.”

“Therefore, we recommend breastfeeding is as one possible way to reduce the risk of onset asthma and allergic diseases in developing countries.”

European Annals of Allergy and Clinical Immunology ³⁴

Vitamin D and Asthma

Meta-analysis of Vitamin D and Asthma

- 3,424 cases of vitamin D deficiency
- 2,756 cases of vitamin D insufficiency

“Results from this meta-analysis suggested that vitamin D deficiency and insufficiency might **increase the risk of childhood asthma.”**

(International Journal of Clinical Experimental Medicine ²⁸)

Vitamin D and Asthma

Vitamin D deficiency was higher among children with asthma, allergic rhinitis, atopic dermatitis, acute urticaria, and food allergy.”

European Annals of Allergy and Clinical Immunology ³⁵

“Vitamin D may protect against wheezing illnesses through its role in upregulating antimicrobial proteins or through its multiple immune effects.”

Current Opinion in Allergy and Clinical Immunology ³²

Healthy Diet and Asthma

“Findings from recent studies suggest that a high level of adherence to the Mediterranean diet early in life protects against the development of asthma and atopy in children.”

Journal of Public Health and Nutrition ²⁹

“High intake of fruit and vegetables may reduce the risk of asthma and wheezing in adults and children.”

Nutrition Reviews Journal ³³

“The results of this study suggest a beneficial effect of commonly consumed fruits, vegetables and nuts, and of a high adherence to a traditional Mediterranean diet during childhood on symptoms of asthma and rhinitis.”

Journal of Thorax ⁴⁶

The 5 Keys to Health and Healing



Proper nerve supply



Regular Exercise



Proper Nutrition



Sufficient Rest



Prayer and Meditation

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Facebook**

**Power
Points**



VIDEOS

Handouts

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Bergman Family Chiropractic Patient**

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