

Topic 10: Allergies

- Allergy: adverse reaction to harmless material
- Allergy requires prior exposure
 - Immune system responds to something
 - Epitopes of molecules from pathogens
 - Immune system 'remember' that material
 - Memory cells
 - Subsequent exposure produces reaction
 - Protection from pathogens
 - Allergy to harmless material
- Hay fever is a reaction to pollen
- Symptoms:
 - Cold like symptoms
 - Geographic tongue
 - Coated tongue
 - Changes appearance
 - Looks like a country on a map
 - Atopic dermatitis from surface exposure
 - Rash where material touched
 - Also sometimes develops due to internal exposure to a food allergy
- Contact dermatitis from irritants (not an allergic reaction, just exposure to an irritant)
 - Hand washing makes it worse
 - Common with industrial powders
- Exposure to large amounts of powder
 - Sand, concrete, flour, sugar can all cause this
 - Industrial exposure
- Poison ivy and poison oak
 - Allergic reaction
 - Cause contact dermatitis
 - Immune reactions at the site of contact
 - Very strong reaction that develops blistering
 - Urushiol is a chemical secreted by the plant
 - Causes the allergic reaction
 - Oily substance
 - Soap helps the chemical move around and spread over your body
- Latex
 - Nitrile is a common substitute in gloves instead of latex
- Nickel
 - Common in button and buckles
 - Will see a rash where it comes into contact with the skin
 - Nickel alloys are very common, they are added to make other substances stronger
- Dust allergies
 - Common
 - The allergy is actually to feces of dust mites
 - Microscopic live in the dust and eat it

- Mattress will often have a lot of droppings
 - They gain weight due to it
- Pet allergies
 - The pet's saliva is the cause of the allergy
 - Protein in the saliva that we become allergic to
- Mold and Fungi
 - Toxins and harmful substances in mold
- Food can give allergy or intolerance
 - Allergy
 - Immune system reacts to the food
 - Rash all over body
 - More severe reactions also possible
 - Bags under eyes
 - Dark under eyes
 - Affect 4% of adults
 - Common food allergens:
 - Milk proteins (goes away as you get older)
 - Fish and seafood
 - On or the other
 - If you are allergic to fish then you are not allergic to shellfish and vice versa
 - Peanuts
 - Only common in North America
 - Early exposure is essential to avoid the allergy
 - Gluten
 - Present in everything
 - Very good additive to thicken and keep things together
 - Allergic to protein in wheat, oats, barley
 - 1/500 people have this allergy
 - Celiac disease
 - Most people go undiagnosed, they do not have a serious case of the disease
 - Can get ulcers in their intestines or skin
 - Therefore life threatening because damage to intestines means you can not digest your other foods properly and do not get all the nutrients you need
- Intolerance
 - Substances in food produce adverse reaction
 - Avoid the food or take something to make it easier to eat it
 - Affects 30% of adults
 - Body cannot digest the food so bacteria does instead, which gives a bad reaction
 - Headaches from food
 - Spices can irritate the stomach

- Spider and insect bites
 - Venoms gets injected into skin and then bloodstream, which causes a quick reaction
- Rare allergies:
 - Sunlight
 - Rashes from sunlight
 - Allergic reaction to a chemical substance that has a light activation
 - Example: marigold have a reactive material that in induced by sunlight
 - Boy doesn't remember the chemical substance, but remembers the sunlight
 - Traces of chemical with UV components and sun cause reactions
 - Aquagenic
 - Allergy to water
 - Man Made substances
 - Allergy to chemicals in man made substances
 - More of a psychological condition
 - Occurs after trauma
 - They become 'allergic' to soap
 - Can have a severe impact on a person's life
 - Covers house in foil
 - Stays inside
- Allergy is a disease of the developed world
 - Occurs in industrialized world
 - Due to modern civilization
 - Did not exist 100 years ago
- It was first thought that the sudden occurrence of allergies were due to industrialized chemicals
 - Not true
 - We have less exposure than in developing parts of the world to industrial pollution
 - Most allergies involve natural substances
- Hygiene hypothesis for allergy
 - We are too clean
 - Historically people lived in disease, human waste and gross environments
 - With in the last 100 years we have gotten clean
- We do not get sick as much anymore, allergies have kind of replaced diseases
- Children in daycare & large families are less likely to develop allergies
- East & West Berlin
 - Were divided by a wall
 - West berlin had good health care and little pollution
 - Higher allergy rates
 - East berlin had poor health care and lots of pollution
 - Virtually no allergies
- Children in rural areas have less allergies
- Allergies require prior exposure

- Involves immune system memory:
 - Mast cells display IgE antibodies
 - Allergen contact the IgE molecule
 - The IgE molecule is like a receptor to the allergen
 - Mast cell degranulation releases histamine
 - Cell explodes in a controlled way and releases histamines
 - 1 pollen can get millions of histamines
 - Histamines produce allergy symptoms
- Managing Allergies:
 - Avoidance
 - Best for food allergy
 - Antihistamines
 - Histamine antagonist
 - Drug occupies space so the receptor can not receive the histamines
 - Also reduce nausea
 - First Generation antihistamines:
 - Enter the brain and act as neurotransmitters, this is where they cause the drowsiness and anti nausea
 - Examples:
 - Diphenhydramine
 - Chlorpheniramine
 - Second Generation antihistamines:
 - Does not enter the brain
 - Non drowsy
 - Examples:
 - Loratadine
 - Body converts it to desloratadine
 - Desloratadine
 - Terfenadine
 - Was discovered that it interacted with antifungal medications
 - Caused heart issues (when both drugs were taken)
 - Toxic and creates heart issues
 - However the liver processes it quickly and converts it to fexofenadine, which is safe
 - The drug to drug interaction effects the bioavailability of the drug
 - Causes a buildup of terfenadine
 - Third generation antihistamines:
 - Non-drowsy
 - Examples:
 - Fexofenadine
 - Cetirizine
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- Decongestants
 - Pseudoephedrine
 - Steroid decongestants (prescription)
- Immune modulators
- Immunotherapy
- Allergy tests look for reactions
- Anaphylaxis
 - Very serious
 - Swell up all over the body
 - Cuts off air supply
- Epipen is used to treat strong allergic reactions