

FACTORS CONTRIBUTING TO ACUTE AND CHRONIC ASTHMA



**MSRC
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TRIGGER

Definitions:

- A lever pressed by the finger to discharge a firearm
- The name of Roy Roger's horse
- To set off, initiate
- An event that precipitates other events



ASTHMA TRIGGERS

- Agent/factor contributes to severity
- Exacerbates symptoms
- Additive in nature
- Variable sensitivity
- Step-wise levels of control
- Found in home, school, outdoors, etc.

CATEGORIES

Allergens
Irritants
Weather
Colds/Flu
Exercise
Other

60% of People with

Asthma Have Allergic Asthma



ALLERGENS

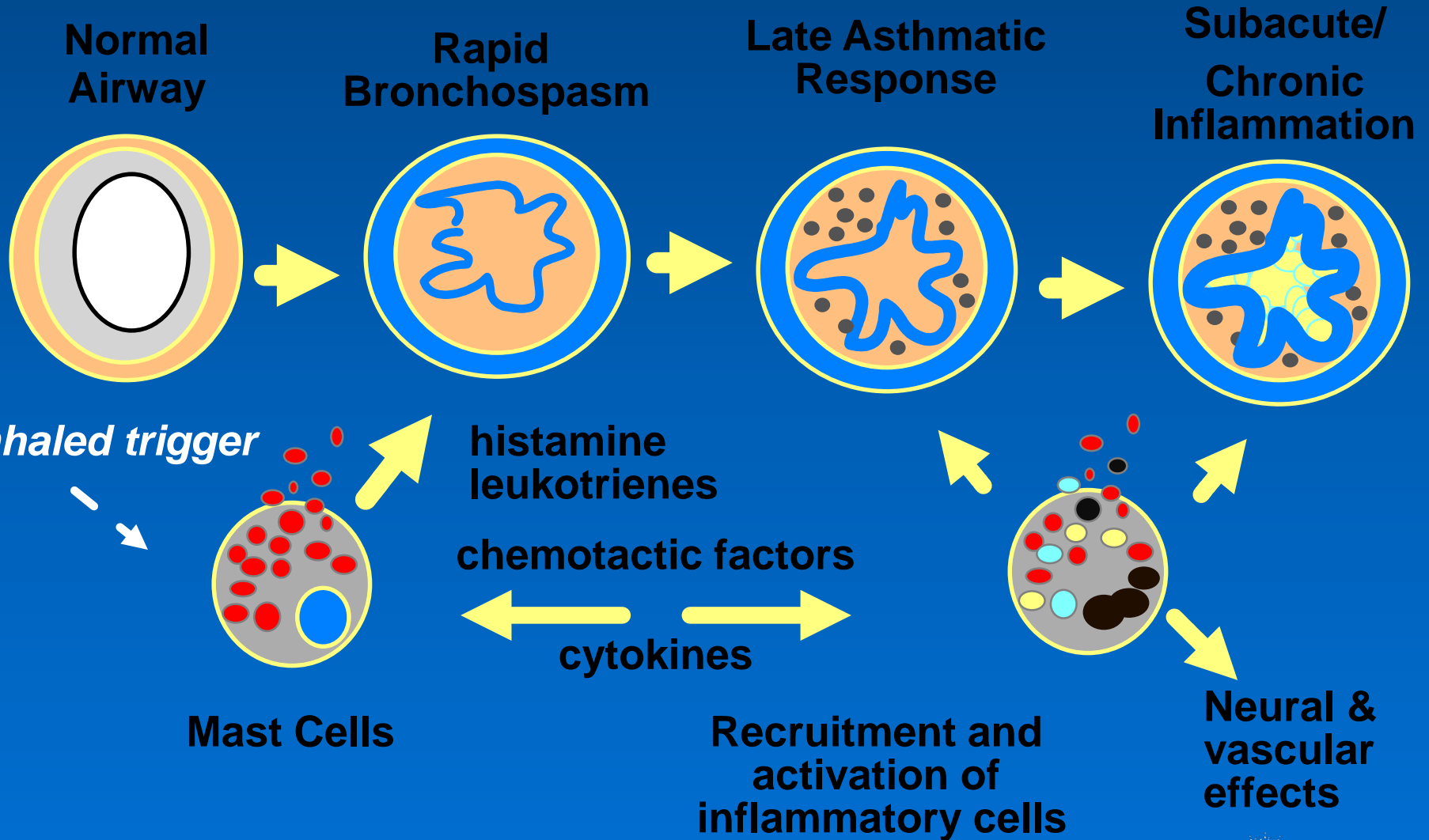
ALLERGENS

- Immune system overreacts to foreign substance (protein) that enters the body
- Inhaled, swallowed, touched or injected
- Anything causing an allergic reaction

Immediate Response: sneezing, itching, watery eyes

Late response: bronchoconstriction and inflammation

ASTHMA PATHOLOGY



ALLERGENS

PETS

- DANDER
- URINE
- FECES
- SALIVA



ALLERGENS

PET CONTROL

- If you don't have one, don't buy one
- Keep out of bedroom
- Limit in main living areas
- Use vacuum cleaner with HEPA filter
(AND DOUBLE-THICKNESS BAGS)
- HEPA filter on furnace
- Bathe pet every week
- Allergen can remain 6 months



ALLERGENS

DUST MITES

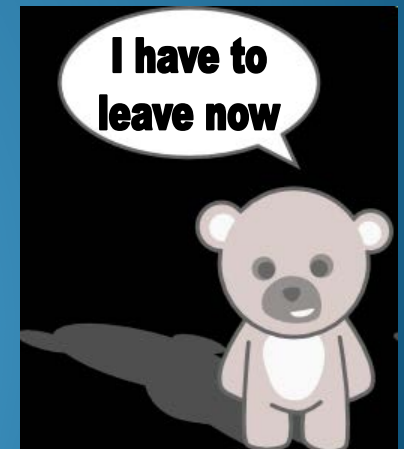
- #1 Indoor Allergen
- Perennial with seasonal increases in summer and fall
- Allergen in fecal pellets & dead bodies
- Most exposure occurs when in intimate contact with them



ALLERGENS

MITE CONTROL

- Encase pillows, mattress and box springs in allergen-impermeable covers
- Wash bed linens weekly $\geq 130^{\circ}$ water
- Reduce clutter
- Clean and dust weekly
- Eliminate stuffed animals/toys



MITE CONTROL

Other Areas:

- Reduce indoor humidity <40%
- Use humidifiers/vaporizers with caution
- Minimize upholstered furniture
- Replace blinds with shades or curtains
- Clean and dust weekly
- If necessary, remove carpeting & other upholstery

ALLERGENS

COCKROACHES

- SALIVA
- FECES
- SKIN SHEDDING
- DEAD BODIES



ALLERGENS

ROACH CONTROL

- Block entrances – caulk/seal cracks
- Dry them out – reduce humidity
- Keep food in plastic containers
- Do not leave garbage exposed
- Use poison bait, gel or traps
- If necessary, use professional exterminator



ALLERGENS

MOLD

- Can also be irritant – sometimes toxic
- Indoor – aspergillus and penicillium
- Outdoor – alternaria and cladosporium
- Perennial with seasonal variation
- Grows best at higher temps and humidity
- Particle sizes range from small to very large



ALLERGENS

MOLD CONTROL

- Repair leaks – clean moldy surfaces
- Reduce indoor humidity to $< 50\%$
- Avoid carpeting on cement floors
- Use bathroom and kitchen exhaust fans
- Avoid handling wet leaves, compost piles, wet newspapers, garden debris or soil
- Professional mold testing may be indicated



ALLERGENS

POLLENS

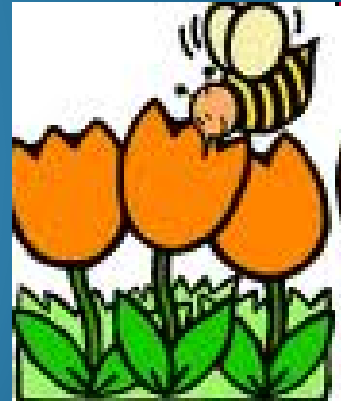
- Coarse powder contained in seed plants
- Allergy to pollen called hayfever
- Spring - oak, birch, elm, maple, hickory
and early grasses (uncut)
- Late Summer/Fall – Ragweed
(not Goldenrod)



ALLERGENS

POLLEN CONTROL

- Limit exposure – stay indoors/close windows
- Use air conditioning, if possible
- Monitor pollen count
- Use antihistamines or other allergy meds
- Bathe – wash hands, face and hair after being outside
- Allergy Shots – if sx's not controlled



ALLERGENS

FOODS

THE BIG 8™

EGGS

PEANUTS

SOY

FISH

COW'S MILK

TREE NUTS

WHEAT

SHRIMP/SHELLFISH

Plus # 9 = Sesame



ALLERGENS

FOODS



PRESERVATIVES IN: (SULFITES)

- Dried Fruits/Vegetables
- Packages Potatoes
- Wine and Beer
- Bottled Lime and Lemon Juice
- Pickled Foods

ALLERGENS

FOODS








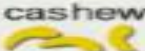


















































- Can trigger coughing and wheezing
- Other symptoms: flushing, hives, itching, swelling or rapid pulse
- Can be life-threatening - anaphylaxis

ALLERGENS

FOODS

CROSS-REACTIVITY

- Birch:** Apple, carrot, walnut, potato, spinach, wheat, peanut, honey (many others)
- Grass:** Potato, melon, tomato, watermelon, orange, cherry, peanut, celery
- Ragweed:** Melon, honey, banana, sunflower seeds
- Latex:** Avocado, potato, banana, chestnut, tomato, kiwi, herbs, carrot

If Allergic to:	Risk of Reaction to at Least One:	Risk:
A legume* peanut 	Other legumes peas  lentils  beans 	5% 
A tree nut walnut 	Other tree nuts brazil  cashew  hazelnut 	37% 
A fish* salmon 	Other fish swordfish  sole 	50% 
A shellfish shrimp 	Other shellfish crab  lobster 	75% 
A grain* wheat 	Other grains barley  rye 	20% 
Cow's milk* 	Beef hamburger 	10% 
Cow's milk* 	Goat's milk goat 	92% 
Cow's milk* 	Mare's milk horse 	4% 
Pollen birch  ragweed 	Fruits/vegetables apple  peach  honeydew 	55% 
Peach* 	Other Rosaceae plum  pear  apple  cherry 	55% 
Melon* cantaloupe 	Other fruits watermelon  banana  avocado 	92% 
Latex* latex glove 	Fruits kiwi  banana  avocado 	35% 
Fruits kiwi  avocado  banana 	Latex latex glove 	11% 

IRRITANTS

IRRITANTS

- Inhaled substances that produce inflammation and bronchospasm
- Irritate nose, mouth and airway
- Non-allergic (no immune response)
- No IgE involvement



IRRITANTS

TOBACCO SMOKE

UNIVERSAL IRRITANT



- ACTIVE (PRIMARY)

Direct Assault on Lungs

- PASSIVE (SECONDARY)

Environmental Tobacco Smoke (ETS)

IRRITANTS

TOBACCO SMOKE

- Profound irritation of upper airway
- Increased lower respiratory tract infections
- Increased asthma exacerbations/symptoms
- Decreased effectiveness of ICS
- Can lead to development of asthma in pre-school age children

IRRITANTS

TOBACCO CONTROL

- DO NOT SMOKE
- Educate about negative health effects
- Won't Quit? Think of others:
 - Smoke outdoors
 - Use “smoking jacket”
 - Wash hands after smoking
 - No smoking in car
 - 800-QUIT-NOW



IRRITANTS

SMOKE

OTHER SOURCES OF SMOKE:

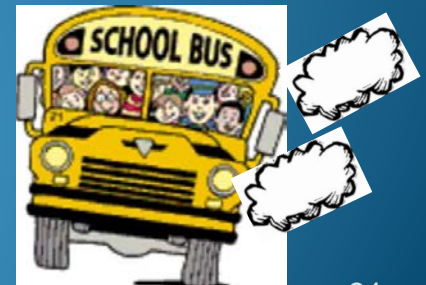
- Fireplaces – Wood-burning Stoves
- Candles -- Incense
- Barbeque Grills
- Camp Fires
- Industrial Pollutants
- Leaf and Grass Fires



IRRITANTS

OTHER IRRITANTS

- Perfumes
- Cleaning Products
- Air Fresheners
- Bug Sprays – Sun Screens
- Pesticides/Chemicals
- Scented Detergents – Dryer Sheets
- Diesel/Airplane Fumes



WEATHER

WEATHER

FALL

- Sudden cold fronts
- Fluctuating Temps

WINTER

- Cold Air
- Freezing Temps

SPRING

- Day-to-Day Variability
- April Showers

SUMMER

- Heat/Humidity
- Ozone Action Day

WIND

WEATHER

THUNDERSTORMS:

- Winds blow in large amounts of allergens
- Ozone – known trigger – is created



BAROMETRIC PRESSURE:

- "Change of Weather"
- ??Temp fluctuations with increased BP??

WEATHER



EFFECT ON POLLUTION:

--"Inversion"

– weather system where air sits still

--Concentrates all airborne pollutants

HEAT/SUNLIGHT + POLLUTANTS
= GROUND-LEVEL OZONE

WEATHER: Climate Change

- Rising Temps and rising carbon dioxide concentrations lead to earlier & longer allergy seasons, earlier & more flowering, and more pollen
- Changes in climate make air pollution worse
 - Leading to increases in asthma cases and worse symptoms

WEATHER “CONTROL”

- Monitor daily local forecasts
- Monitor pollen/particulate count – Smog Index
- Limit exertion in cold, dry air
- Wear scarf or mask in very cold weather
- Pollen Season:
 - Stay indoors – especially if windy
 - Keep windows closed



RESPIRATORY INFECTIONS

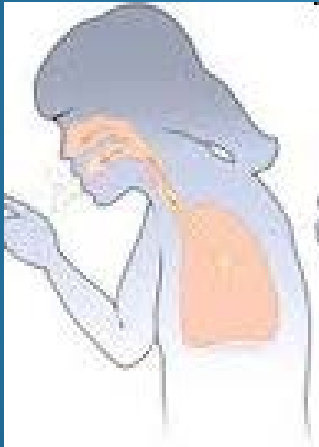
RESPIRATORY INFECTIONS

--Rhinovirus – “common cold”
(over 200 viruses)

--RSV– lower tract
(respiratory syncytial virus)

--Influenza Virus

--Bronchitis



RESPIRATORY INFECTIONS

MECHANISMS:

- May cause epithelial damage/airway inflammation
- Virus potentiates allergic response by increasing the release of inflammatory mediators
- Increase airway hyper-responsiveness - may last for weeks



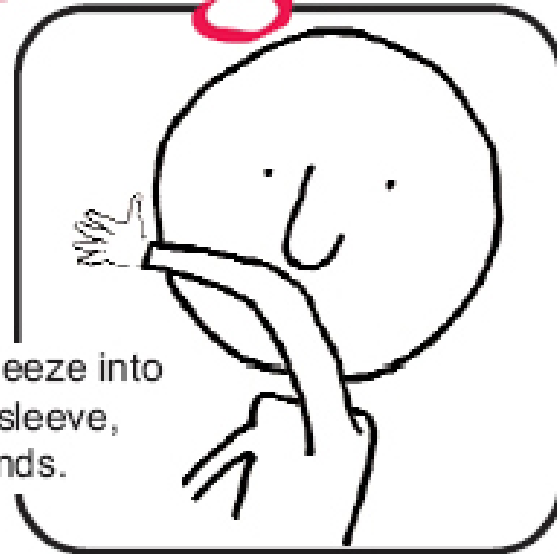
INFECTION CONTROL

- Hand Washing -- #1 defense
- Proper Nutrition and Rest
- Annual Influenza Vaccine
- Keep hands away from face
- Avoid those with active respiratory infection
- Use antibiotics, only IF appropriate



INFECTION CONTROL

Cover
your
Cough



cough or sneeze into
your upper sleeve,
not your hands.

INFECTIONS

RESPIRATORY

THE “ITISES”

--Allergic Rhinitis

--Sinusitis



INFECTIONS

ALLERGIC RHINITIS

- Inflammation of tissue lining inside nose
- Provoked by allergens
- Seasonal –grasses, weeds, trees
- Year-Round – molds, dust mites, dander
- Symptoms – sneezing, runny or itchy nose and or congestion

INFECTIONS

ALLERGIC RHINITIS. . .

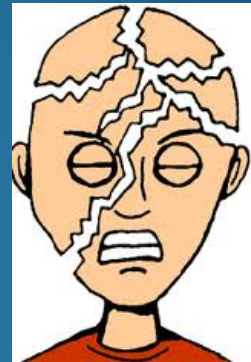
. . .and ASTHMA

- Nasal inflammation contributes to lower airway hyper-responsiveness → asthma sxs
- Increase sensitivity to triggers
- Treatment of upper respiratory tract integral part of asthma management
- Treatment: nasal irrigation, anti-histamines and decongestants, inhaled nasal steroids

INFECTIONS

SINUSITIS

- Inflammation of one or more of the sinuses that drain into the nose
- Inflammation blocks sinus opening – mucus accumulates and bacteria multiply
- Acute – lasts few days or weeks
- Chronic – lasts more than two months
- Symptoms –pain in forehead or around eyes, yellow/green mucus, sore throat

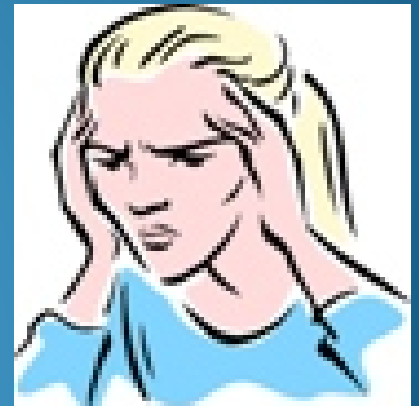


INFECTIONS

SINUSITIS. . .

. . .and ASTHMA

- 50% of asthmatics get sinusitis
- Cause more severe asthma symptoms
- Cause more severe flareups
- Cause disturbed sleep
- Treatment: may need antibiotic



EXERCISE

EXERCISE

- Trigger for 80-90% of asthmatics
- Hyper-responsive reaction to:
 - rapid breathing/hyperventilation
 - loss of heat/water in airways
- Causes bronchospasm → symptoms



EXERCISE

NOTE:

KNOW DIFFERENCE BETWEEN
EXERCISE-INDUCED BRONCHOSPASM
AND
EXERCISE AS A TRIGGER
(sometimes referred to as
Exercised-Induced Asthma)

EXERCISE

CONTRIBUTING FACTORS:

- Poor level of asthma control
- Cold air, low humidity, pollutants
- Duration, type and intensity
- Poor physical shape
- Inhaled allergens
- Respiratory Infections
- Emotional stress/fatigue



EXERCISE “CONTROLS”



- Pre-medicate, as prescribed
- Restrict if symptoms are present or have viral infection
- Adequate warm-up – cool down
- Breathe through nose – if possible
- If weather cold, exercise indoors or wear mask



OTHER TRIGGERS

OTHER TRIGGERS

- Emotions
- Stress
- GERD
- Aspirin
- Beta Blockers

OTHER

EMOTIONS

- Laughing, crying, anger, excitement
- Lead to changes in breathing patterns
 - hyperventilation
 - hypocapnia
 - airway narrowing



- Tightness in chest, shortness of breath
- In Children, emotion signals nervous system to act in way that leads to attack

OTHER



STRESS

- May cause asthma to kick into overdrive
 - SOB, wheezing, coughing
 - Anxiousness -- frightened
 - increases stress
 - more symptoms



- Can impair immune system
- May make asthma more difficult to manage

OTHER

STRESS CONTROL

- Recognize stress as a trigger
- Manage lifestyle to reduce stress
- Learn stress management techniques
- Counseling, when appropriate
- Not all stress is avoidable



OTHER

GERD

GASTROESOPHAGEAL REFLUX DISEASE

- Backward flow of stomach acids into esophagus
 - upper → sour taste
 - lower → heartburn (burning sensation)
- Acid flow causes injury to lining of throat, airways and lungs → persistent cough
- Acid flow triggers a nerve reflex causing airways to narrow (constrict) to prevent acid from entering
 - shortness of breath

OTHER

WHEN TO LOOK FOR GERD:

- Asthma diagnosed in adulthood
- Asthma symptoms worse after a meal or exercise, at night or after lying down
- Asthma doesn't respond to standard treatments
- In Infants – recurrent vomiting, coughing, breathing problems or failure to thrive



OTHER

GERD CONTROL

LIFESTYLE CHANGES:

- Eat meals 3-4 hours before lying down
- Eat smaller meals with moderate portions
- Maintain a healthy weight
- Limit fatty foods, chocolate, peppermint, coffee, tea, colas and alcohol (relax sphincter)
- Avoid tomatoes & citrus fruits/juices (increase acid)
- Stop smoking (relaxes sphincter)

OTHER

ASPIRIN SENSITIVITY

- Affects 3-5% - develops in adulthood
- Can cause sudden, severe attack
- Produces excess leukotrienes
 - bronchial tubes contract
 - wheezing and shortness of breath
- Found in conjunction with nasal polyps -- TRIAD
- Avoid ASA and non-steroid anti-inflammatory medications (NSAID's) – orally, topically or optically



OTHER

ASPIRIN PRODUCTS

Aspirin:

- Ascription
- Empirin
- Bufferin
- Ecotrin

NSAID's

- Ibuprofen
- Aleve
- Nuprin
- Actron
- Orudis KT

--Don't forget prescription medications – Percodan, Anaprox, Naprosyn

Contain Aspirin:

- Doan's
- Excedrin
- Aquaprin
- Alka Seltzer Plus
- Bayer Children's Cold Tablet
- St, Joseph Cold Tablet for Children
- Stanback Headache Power
- Cama Arthritis Pain Reliever
- Vanquish

OTHER

BETA BLOCKERS

- Used to treat hypertension, migraines, glaucoma, angina, heart disease
- Old - Non-Selective
 - block beta receptors 1 (heart) and 2 (lungs)
 - cause bronchoconstriction
- New - Cardio-Selective Beta Blockers
 - Can block either beta receptor 1 or 2



OTHER

OTHER DRUGS

- ACE Inhibitors – can induce cough
“asthma equivalent” respiratory activity
- Exogenous hormones
 - increase wheeze in young women
 - decrease symptoms
 - increase risk of developing asthma



OTHER
“OTHER”

OTHER

SURGERY

- Higher risk of developing problems
- Good control pre-op is imperative
- May require oral steroids – pre-op, intra-op and post-op
- Risks of General Anesthesia
 - Altered diaphragmatic function
 - Impaired ability to cough
 - Decreased mucociliary function
 - Placement of ET tube – irritant – trigger bronchospasm



OTHER

OBESITY

- Question: Asthma to Obesity? Or Obesity to Asthma?
- Theory: Excess weight compresses airways making them smaller and more reactive to triggers
- Increases risk of GERD – triggers asthma
- Pro-inflammatory state may contribute to lung inflammation and asthma
- Require more drugs, more symptomatic -- increased risk of ER visits

OTHER

VOCAL CORD DYSFUNCTION

- Paradoxic adduction (abnormal closing) of cords
 - airway obstruction
 - dyspnea/shortness of breath
 - wheezing inspiratory/expiratory
- No anatomic abnormality
- Disorder is functional
- Exact cause not clearly evident
- Confirm diagnosis with laryngoscopy – “glottic chink”

OTHER

VOCAL CORD DYSFUNCTION

Laryngoscopy figures

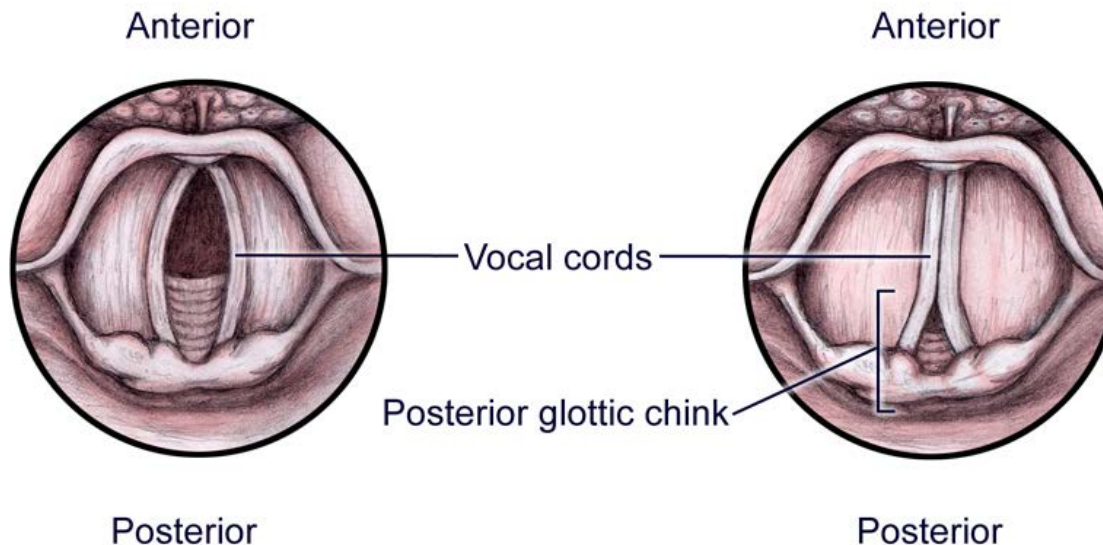


Figure C

Vocal cords during normal inspiration

Figure D

Vocal cords in a symptomatic VCD patient Note- presence of a posterior glottic chink

OTHER

VOCAL CORD DYSFUNCTION

CAUSES:

- GERD/laryngopharyngeal reflux
- Upper airway inflammation (I.e. rhinitis)
- Strenuous exercise
- Post nasal drip
- Exposure to irritant fumes/strong odors
- Environmental allergens and/or pollutants
- Psychogenic causes – emotional stress

OTHER

VOCAL CORD DYSFUNCTION

SYMPTOMS – Mimics asthma

- dyspnea
- throat tightness
- anxiety
- wheezing
- choking
- inspiratory stridor
- dysphonia/hoarseness
- respiratory distress



OTHER

VOCAL CORD DYSFUNCTION

TREATMENT:

- Identify and treat the cause
- relaxation techniques
- deep breathing exercises
- speech therapy
- consider psychotherapy



WORK-RELATED ASTHMA

Asthma caused by exposure to an agent encountered in work (or school) environment

Timing of symptoms:

- Improvement during vacations or days off
- Worsen as work week progresses

WORK-RELATED ASTHMA



TRIGGER

Definitions:

- A lever pressed by the finger to discharge a firearm
- The name of Roy Roger's horse
- To set off, initiate
- An event that precipitates other events



**Questions?
Comments?**

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