OSHER Lifelong Learning Institute @ University of Illinois

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Welcome !
Good
Afternoon

OLLI Fall Semester 2022

Fascinating Features and Unusual Manifestations of Disease

Session 1: Diseases with a Color

In Full Color:

White Plague (Tuberculosis)

Yellow plague (Yellow fever)

Red plague (Smallpox)

Blue plague (Bubonic plague)

Purple plague (Spanish flu)

Black plague (Pneumonic plague)

Disease and Colors

Diseases have often been associated with color:

- To describe their appearance.
- To ascribe some meaning to the illness.
- To serve as a warning diagnostic sign.
- To identify them as “plagues”.

Colors and Emotions

- BLUE day
- Feeling BLUE
- GREEN with envy
- Tickled PINK
- WHITE as a sheet
- Seeing RED
- Argue till BLUE in the face
- GREEN with jealousy
- YELLOW-belly coward
- RED in the face
- Be COLORLESS

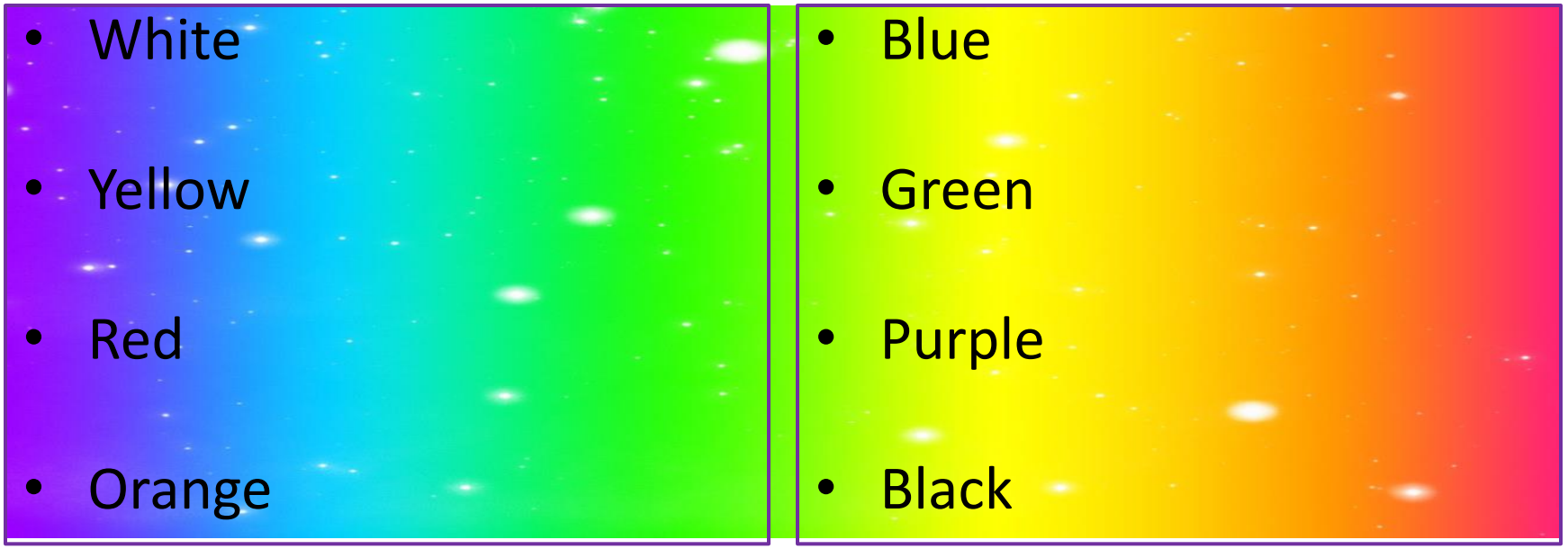
Plan for the Course

- Session 1: Diseases with a color
- Session 2: Diseases with taste or an odor
- Session 3: Diseases with a texture or a sound
- Session 4: Diseases with unusual appearance
- Session 5: Flying, crawling & burrowing critters
- Session 6: Forgotten or ignored epidemics
- Session 7:
- Session 8:

} Medical detectives solve mysterious cases

Plan for the Session

- The so-called “Plagues” and their colors
- Other diseases associated with each color
- Simplified approach to recognizing the diseases



Tuberculosis

Albinism

Piebaldism

Vitiligo

WHITE

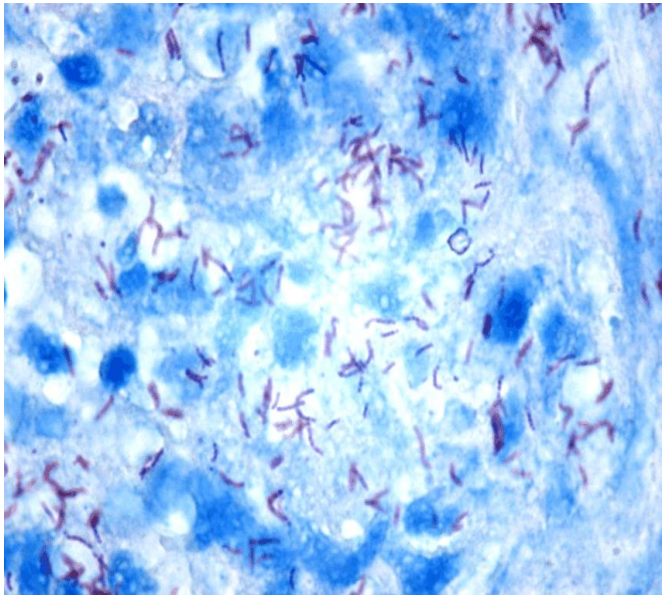
WHITE

Tuberculosis (TB)

- White Plague
- Phantom Plague
- Forgotten Plague
- Spitting Blood
- White Death
- Captain of all men of Death
- Consumption
- Robber of youth
- Phthisis

Tuberculosis (TB)

- *Mycobacterium tuberculosis,* non-motile acid-fast bacillus.
- Airway transmission from respiratory secretions of persons with active TB.
- Mainly attacks lungs, but also brain, bladder, cervical lymph nodes (scrofula), and bones.
- If disseminated by bloodstream to many organs and systems = milliary tuberculosis, potentially fatal.



White Plague

- It was during the 19th century that tuberculosis was dubbed the White Plague, *mal de vivre*, and *mal du siècle*.
- Seen as a "romantic disease“, because individuals with tuberculosis were thought to have heightened sensitivity.
- The disease began to represent, melancholy, spiritual purity and temporal wealth.
- Many young, upper-class women purposefully paled their skin to achieve the consumptive appearance.

Colors of Sputum

Color	Characteristic	Interpretation
Clear, white, gray	Normal ?	Abnormal if profuse
Clear to white	Abundant, fluid	Acute viral Respiratory
Clear to gray	Tenacious	Chronic Bronchitis (COPD)
White or Pink	Frothy	Pulmonary Edema
White to yellow	Thick, sticky	Asthma
Yellow	Thick, fluid	WBC (eosinophils, neutrophils)
Green to Brown	Tenacious, viscous	Bronchiectasis, Cystic Fibrosis
Green	Fluid pus	Bronchopulmonary Infections
Brown to Black	Thick, hard to expectorate	Miner's lung, old blood
Red/Rust	Fluid, easy to expectorate	Fresh bleed, partial clotting
Bright red blood	Tough cough, easy flow	T U B E R C U L O S I S

Tuberculosis

In the *Life and Death of Mr. Badman* (1680), John Bunyan speculated on the demise of his lead character:

> "Pray, of what disease did Mr. Badman die?
>
> I cannot properly say that he died of one disease, for there were many that had consented, and laid their heads together to bring him to his end."

Tuberculosis

- “He was dropsical, he was consumptive, he was surfeited, was gouty, and some say, he had a tang of the pox in his bowels.

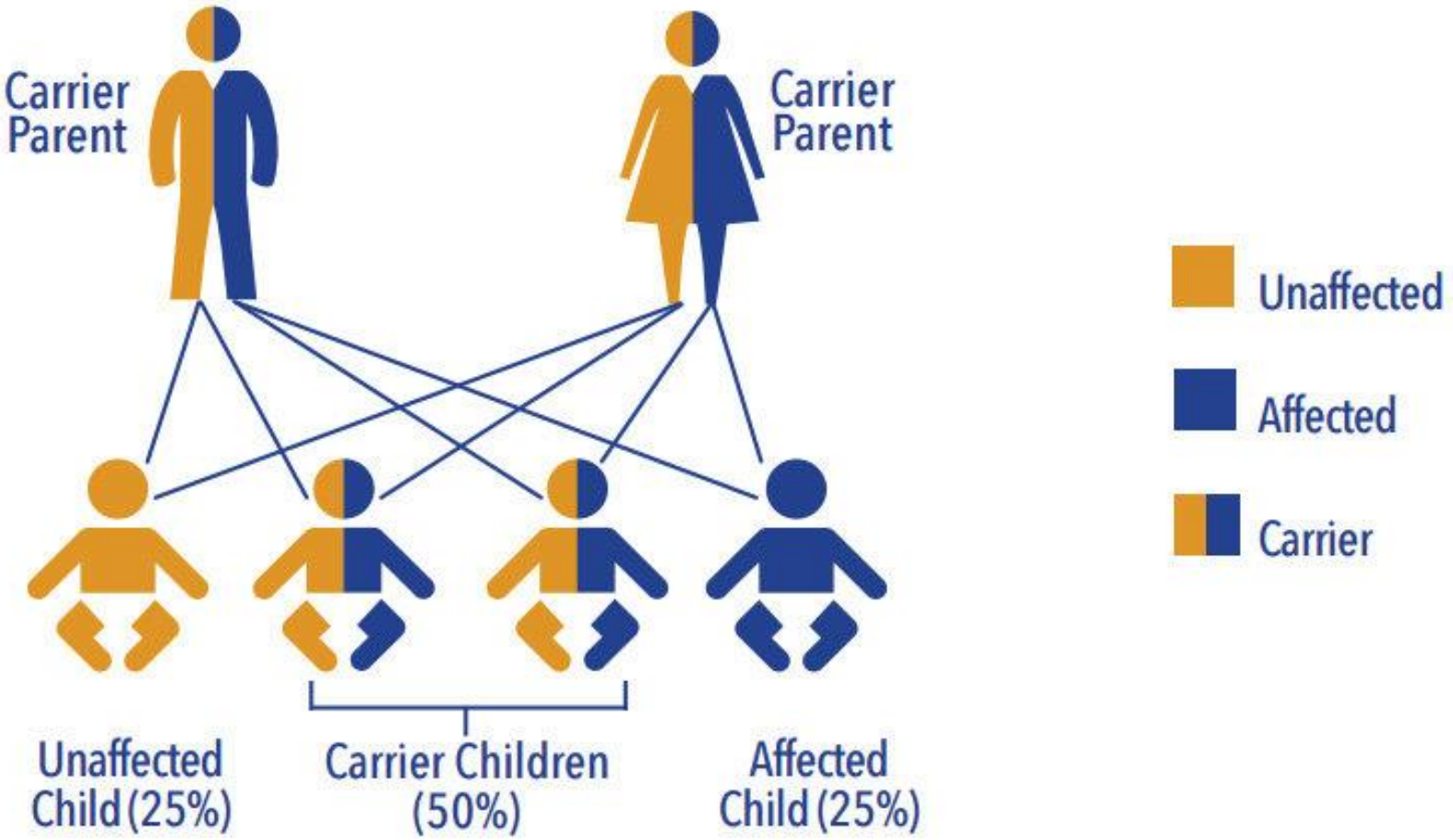
- Yet *the captain of all these men of death* that came against him to take him away was the consumption, for it was that that brought him down to the grave.”

ALBINISM

Albinism

- Rare genetic disorders that cause the skin, hair, or eyes to have little or no color and cause vision problems.
- Absence or reduced amount of melanin production.
- Autosomal recessive disease, present at birth.
- National Organization for Albinism & Hypopigmentation reports that about 1 in 19K people in the US have a form of albinism.

Autosomal Recessive Inheritance Pattern



Albinism

- Albinism has a relatively high prevalence in populations throughout sub- Saharan Africa (1 in 3,000)
- People with *oculocutaneous* albinism (PWA) have little or no pigment in hair, skin and eyes.
- They are visually impaired and extremely sensitive to the damaging effect of the sun.

Albinism
(Africa)

- Risks for PWA in Africa are very serious in areas that associate albinism with legend and folklore.
- PWA may be assaulted and often killed for their body parts to use in witchcraft rites or to make “lucky” charms.
- People believe that these parts would bring easy wealth and cure many ills, or that sex with an albino woman will cure a man of HIV.
- In Tanzania, a complete set of body parts can sell for $75,000.

Albinism
(Africa)

- Some African communities believe that PWA are harbingers of disaster.
- Others mistakenly think that they are mentally retarded and discourage their parents from taking them to school.
- Almost 90 percent of PWA living in a Tanzanian region were raised by single mothers because the fathers thought their wives were having affairs with white men and left.
- See article in the New York Times: https://www.nytimes.com/.../albinos-in-mozambique.html

Albinism
(Africa)

The Kabanaga Protectorate Centre in the town of Kabanaga in the north-west of Tanzania, close to the Burundi border, houses and protects abandoned albino children, who are known as the 'tribe of ghosts', 'zeros' or 'the invisibles'.

PIEBALDISM


The true
Picture of Mary-
Sabina, who was born
Oct^r 12 1736 at maruna, a
Plantation belonging to
y^e Iesuits in y^e City of Ca
rtagena in America of
Martiniano, & Patrona

Piebaldism

- “Piebald" originates from a combination of *pie*, from magpie, and *bald*, meaning "white patch" or spot.
- Bird’s Latin name : *“pica pica”.*
- This refers to the distinctive black-and-white plumage of the magpie.

Piebaldism

- Rare autosomal dominant disorder characterized by the congenital absence of melanocytes in affected areas of the skin and hair.

- Affected individuals present at birth with a white forelock (90%) and a relatively stable and persistent depigmentation of skin in a characteristically symmetrical distribution.

Piebaldism

Piebaldism family (Brazil)

Women with “cow arms & legs”

Piebaldism vs Albinism

Piebaldism	Albinism
• Eye pigmentation is normal • Melanin cells present but inactive • Usually symmetrical • Forehead white skin/hair *hypomelanotic* patch • Autosomal <u>dominant</u> • Heterochromia of irises	• Eye pigmentation absent • Melanine cells absent or unable to produce pigment • Generalized, skin, hair, eyes • Not patchy, body is globally amelanotic • Autosomal <u>recessive</u> • Pinkish irises

Ramírez 2022

VITILIGO

Vitiligo
(Leucoderma)

Long-term, non-congenital condition characterized by patches of skin losing their pigment.

Often beginning on areas that are exposed to the sun.

Most prominent on the face, hands and wrists, and noticeable around body orifices.

Inside of mouth and nose may also be involved.

Patches become white, usually have sharp margins, and hair from that area of skin may also become white.

Vitiligo
(Leucoderma)

- Exact cause is unknown, it is not contagious.

- Thought to be due to genetic susceptibility that is triggered by an environmental factor that makes an autoimmune reaction occur.

- This results in the self- destruction of skin pigment cells.

Vitiligo
(Leucoderma)

- Two types
  - Non-segmental: about 90% of cases, affects both sides, and the affected area expands with time.
  - Segmental: about 10% of cases, mostly involve one side of the body, and the affected area does not expand with time.

- About 1% of people are affected worldwide.

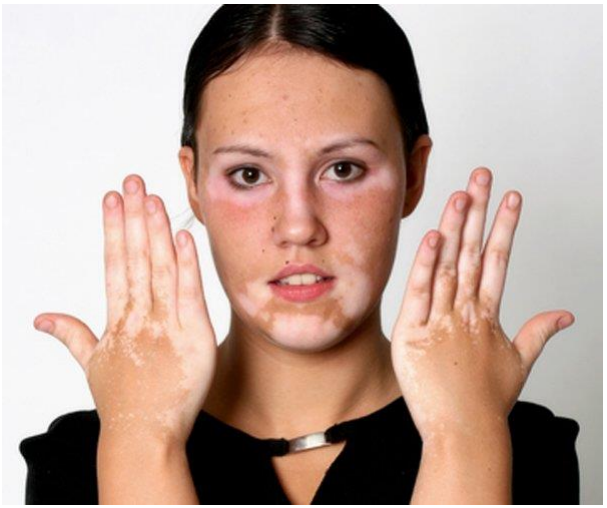
- Males and females are equally affected.

- About 50% develop it before age 20 and most develop it before age 40.

Vitiligo

Many Diverse Treatments

- Steroids
- UVB light (arrow band)
- UVA light + psoralen
- Chinese herbal formulas
- Surgical melanocyte transfer
- Depigmenting creams



Summary

Albinism vs. Piebaldism vs. Vitiligo

Albinism	Piebaldism	Vitiligo
Congenital	Congenital	Acquired/autoimmune
Autosomal recessive	Autosomal dominant	Genetic propensity
Melanocytes absent	Melanocytes inactive	Melanocytes destroyed
Whole body	Lateral Symmetry	Mostly non-segmental
Absent iris pigment	Normal iris pigment	Heterochromia of iris
Permanent	No progression	May increase and grow
No malformations	Malformations frequent	No malformations
Solar UV harmful	YAG Laser treatments	UVA and UVB treatments
Shunning and depression	Shunning and depression	Shunning and depression

Questions?

Jaundice
Yellow Plague of 664
Yellow Fever

YELLOW

JAUNDICE

YELLOW

- Jaundice (French "*jaune*" = yellow).
- Condition manifested as yellow coloring on the skin and the whites of the eyes.
- It is not a disease in itself but a symptom of an underlying illness.
- Can initially be asymptomatic.

Jaundice

Congenital

- Meconium Ileus: bile duct obstruction from excessive viscosity of bile (cystic fibrosis).
- Biliary atresia: incomplete formation of bile ducts in liver.
- Rh blood incompatibility: baby's red blood cells are destroyed by maternal antibodies.

Jaundice

Multiple Causes

- Congenital anatomic or chemical anomalies
- Infection (bacterial or viral)
- Obstruction
- Trauma
- Reaction to toxins or drugs
- Others

Congenital Causes

- Gilbert's syndrome
- G6PD deficiency
- Cholestasis
- Biliary atresia

BRITISH YELLOW PLAGUE of 664

British “Yellow Plague” of 664

- First recorded epidemic in English history, affected Britain & Ireland during the 1st plague pandemic, and coincided with a solar eclipse and a very warm summer.

- Sources said it lasted for 20-25 years, caused widespread mortality, social disruption and abandonment of faith.

- Irish called it “Stubble-Yellow Plague”, because of the color of grain stubble in harvested fields and the jaundiced appearance of the sick.

Yellow Fever

Aedes aegypti
(Urban)

Aedes albopictus
(Urban and forest)

- Short viral illness, with fever, chills, loss of appetite, nausea, muscle pains and headaches which improve within 5 days.
- After improvement, in ~15% of cases, the fever comes back with abdominal pain & liver damage begins, causing yellow skin; death occurs in up to 50% of those with severe disease.
- Bleeding in the mouth, nose, eyes, and the GI tract causes blood-containing vomit: Spanish name for yellow fever is *vómito negro* ("black vomit").

Yelllow Fever

- Long history of plaguing USA:
  - Philadelphia epidemic, 1793
  - New Orleans, 1819 & 1853
  - Memphis & Lower Mississippi Valley, 1878
  - Spanish-American War Cuba), 1898
  - Panama Canal, 1905

- Currently, vector (mosquito) control is effective.

- Available vaccine highly protective.

Carotinemia

Lycopenemia

ORANGE

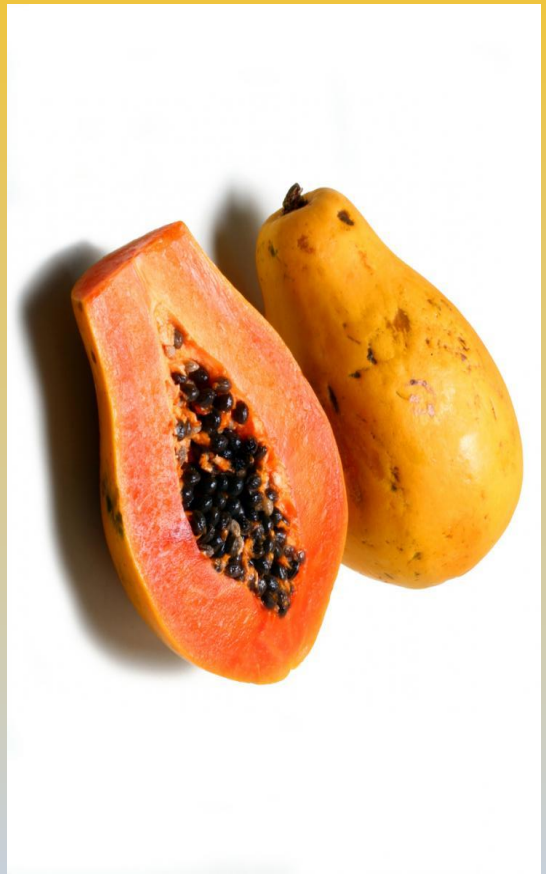
Carotinemia/Lycopenemia

- In some people with very large intakes of carotene-containing fruits and vegetables, the skin may get a yellow tint (carotinemia).
- Some people who consume large amounts of lycopene-containing tomatoes or tomato juice, get a red skin tint (lycopenemia).
- Persons who consume lots of both foods, or eat lots of papaya, will show a true orange tint:

(Yellow + Red = Orange)

Papaya

- The skin, pulp, and seeds contain benzyl isothiocyanates, glucosinates and beta *carotenoids.*
- Lutein and beta-carotene are prominent in the yellowish fruit skin, while lycopene is dominant in the red flesh.
- Chemicals increase during ripening.
- Papaya seeds contain the cyanogenic substance *prunasin*.



Lycopenemia

- *Lycopene*, a pigment present in tomatoes, when consumed in excess, can cause a deep, almost red discoloration of the skin.

- Like carotenemia, lycopenemia is harmless.

- Both resolve when the cause is removed, and require no treatment.

Erysipelas

Smallpox

Scarlet Fever

RED

Erysipelas

Fairly common bacterial infection of the epidermis and superficial lymphatics:

- Raised, well- defined, tender, bright red rash, on the face or legs.
- Usually caused by *Streptococcus pyogenes* (group A β- hemolytic streptococci), through a break in the skin such as scratches or insect bites.
- More superficial than cellulitis, and typically more raised & demarcated.

SMALLPOX

Smallpox

- Contagious, disfiguring and often deadly disease that has affected humans for 1,000's of years.
- Initial symptoms included fever and vomiting, followed by formation of ulcers in the mouth and a skin rash.
- In a few days, the rash turns into characteristic fluid-filled blisters with a dent in the center, which then scabbed over, fall off, leaving scars (pockmarks).
- Spreads between people or via contaminated objects

Smallpox

Exanthem

- Enanthem
- Macules
- Papules
- Vesicles
- Pustules
- Scab
- Scar

Smallpox

- Last naturally occurring case was in 1978.
- WHO declared disease eradicated in 1980.
- Only research strains in Russia and US.
- Related to monkeypox; same vaccine works.

SCARLET FEVER

Scarlet Fever
(Scarlatina)

- Onset with sore throat, fever, fatigue and “strawberry” tongue.
- In 1-2 days, diffuse red rash with small papules resembling goose bumps, itchy, but not painful.
- Rash has characteristic “sandpaper” texture, which blanches when pressure is applied to it.

Scarlet Fever

- Rash starts at the elbow crease, moves to the trunk and gradually spreads out to the arms and legs.
- Palms and soles are left uninvolved.
- The face is usually flushed, most prominently in the cheeks, with a ring of paleness around the mouth.
- Rash becomes more pronounced in skin folds of the inguinal and axillary regions.

Scarlet Fever

- Pastia's Lines may appear: petechiae arranged in a linear pattern.
- Within 1 week rash begins to fade followed by desquamation of outer layer of skin, which lasts for several weeks.
- Desquamation begins on the face and moves downward, leaving a sunburned appearance.

The Blue Plague

Methemoglobinemia

BLUE

BLUE

- Cholera called: “The Blue death”
- Bubonic Plague: “The Blue plague”
- Edinburgh: “Blue epidemic”
- The Blues, depression: “Blue Plague”

- Police killings of black men: “Blue plague”
- Methemoglobinemia: (“Blue people“)
  - Intentional
  - Accidental
  - Coincidental

The BLUE Plague

- Called also The Great Mortality, or the Great Pestilence.
- Called the bubonic plague because of the large dark buboes around the lymph nodes.
- The Pima Indians use the word oimmeddam (wandering sickness).

The Blue Plague

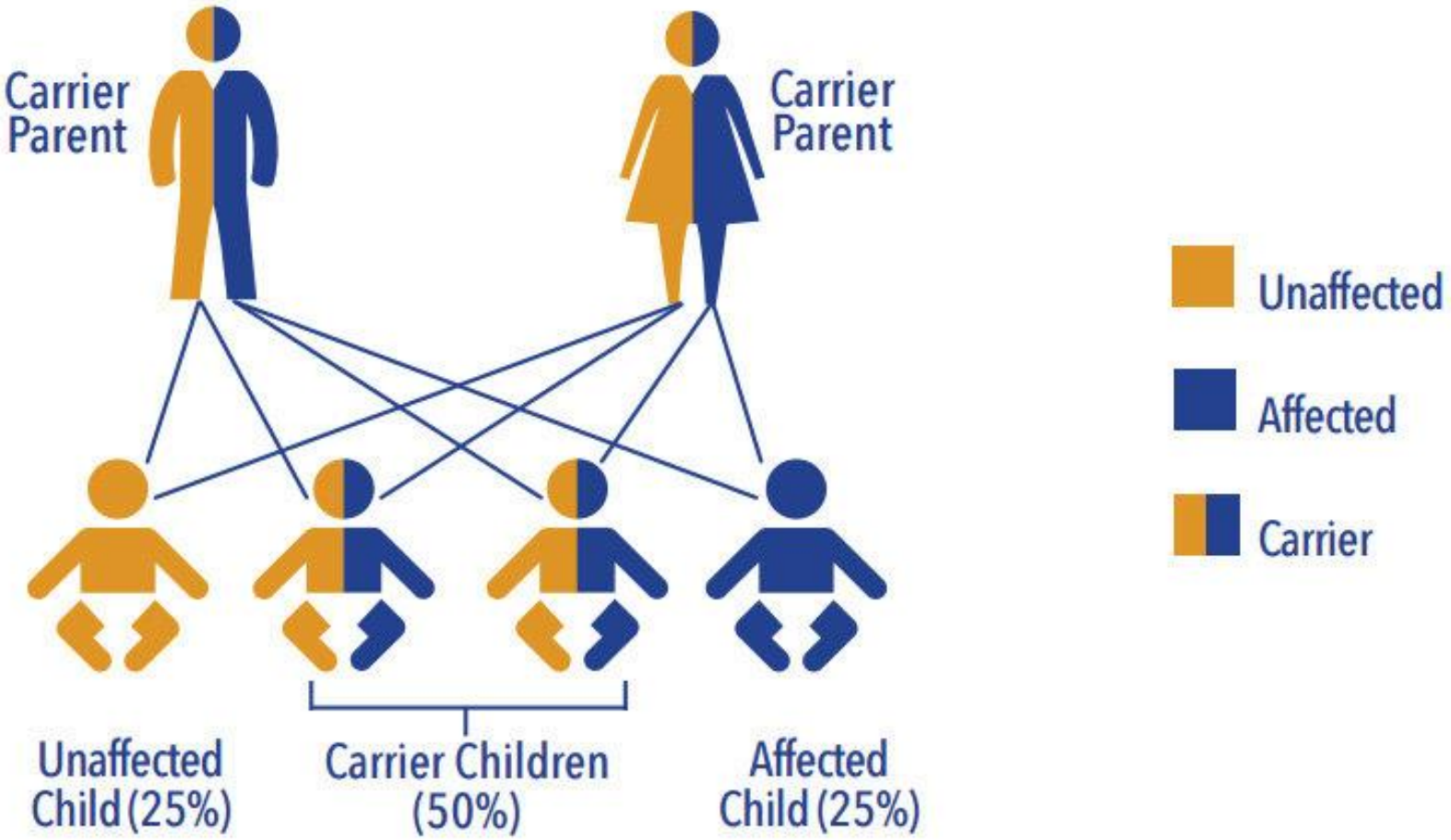
- The Plague was called the “Black Death” because that name suggests the horror of the epidemic as a dark, black, terrifying time.
- It does not refer to the color of the lesions, which were blue “buboes”.
- The Plague was not called the Black Death until centuries after it initially spread through Europe.

The Blue Plague

Edinburgh “Blue Epidemic”

- Tablets, known as 'blue plague', 'street valium' or 'blues', are churned out in backroom drug factories in Edinburgh.
- In 2018, the pills were linked to over 1,000 deaths.
- Their powerful component etizolam is confused by users for valium.
- Etizolam pushes opioid users over the edge.

Autosomal Recessive Inheritance Pattern



Methemoglobinemia
(Congenital)

- Described in native Alaskans by E.M. Scott,in 1960, who theorized that a deficiency of the enzyme *diaphorase* is the cause of RBC oxygen deficiency.

- This causes the blood to appear brown, and makes the skin of those affected appear blue.

- Dr. Madison Cawein III made a detailed study of the family's condition and ancestry and treated them with…

  Methylene blue!

Methemoglobinemia

Congenital (The Blue Fugates of Kentucky)

- Martin Fugate and Elizabeth Smith, settled near Hazard, Kentucky ca.1820, and were both carriers of the recessive *met-H* gene.

- Descendants with the gene continued to live in the areas around Troublesome Creek and Ball Creek into the 20th century.

- Benjamin Stacy, (1975), is the last known descendant of the Fugates born with the blue color showing only on his lips and fingertips if he was cold, or agitated.

The Blue Fugates of Kentucky

W. Spitzmiller 1982

Methemoglobinemia

Intentional/Accidental

- Ni**tra**tes are converted into ni**tri**tes (which cause toxicity) by bacteria in our saliva, stomach, and intestines.
- Ni**tri**tes oxidize the iron in hemoglobin making the red cells unable to carry oxygen.
- Causes *methemoglobinemia*, and the lack of oxygen produces the pale blue-gray color of the skin.

Methemoglobinemia

Intentional/Acidental

- Ni**tra**tes & ni**tri**tes can combine with other compounds like sodium and ammonium.

- Sodium ni**tra**te is commonly used as a preservative in curing meats and ammonium ni**tra**te is found in fertilizers, explosives and instant cold packets.

- Volatile ni**tri**tes ("poppers") are abused for recreational purposes or sexual enhancement.

Amyl Nitrite

- "Poppers" are labeled or packaged as room deodorizers, leather polish, nail polish remover, or videotape head cleaner to evade anti-drug laws.
- Supposed to be inhaled not ingested!

Methemoglobinemia

Accidental/Intentional

- Ingestion of Nit**ri**tes or of Nit**ra**tes that the body converts into Nit**r**ites.
- Accidental confusion of substances.
- Suicidal intentions:

Nitrite suicide kit from Amazon

Questions?

Argyria

PURPLE

Argyria

- Rare skin condition that can happen if silver builds up in the body over a long time.
- It can turn skin, eyes, internal organs, nails, and gums a purplish-blue-gray color, especially in areas of body exposed to sunlight.
- That change in skin color is permanent.

Argyria
Skin Color

Argyria
Skin Color

- Symptoms may start in the mouth with gums turning gray-brown.
- After a few months or years, skin may turn purplish blue-gray, depending on how much silver the person is exposed to.
- The discoloration may stand out most on the forehead, nose, hands, whites of the eyes, nail beds and other areas that are exposed to the sun.

Argyria
“Papa Smurf”

- Paul Karason, showed the definite coloration of Argyria.
- In 1998, he started to consume colloidal silver regularly for at least 15 years.
- This was his new-age treatment for dermatitis.

Argyria

"Papa Smurf"

- Argyria can also be caused by prolonged exposure to silver compounds or certain medications (rare).
- It can also be absorbed by skin application.
- Paul used a tanning bed to "fix" the silver on his skin.
- Paul died in 2013, at the age of 62.

Argyria

- Colloidal silver has been promoted by Doctor Internet and his followers as the miracle drug that can cure anything and everything.
- There is no scientific evidence that it is useful in the treatment of any disease (s).
- It may be used topically in combination with sulfadiazine in the treatment of burns (Silvadene cream, OTC).
- Homemade colloidal silver is not truly colloidal and may cause renal or hepatic harm.

FDA has banned all products containing silver for internal use and declared them **non-GRAS**!

The Black (Pneumonic) Plague

BLACK

Black (Pneumonic) Plague

The "Black Death" comes in 3 plague varieties:	Pneumonic plague does not need a vector	Pneumonic plague
Bubonic, in lymphatic system and lymph nodes	*Primary type* is acquired from another person by respiratory droplets.	Explains very quick spread in areas w/o rats & fleas
Pneumonic, in lungs and respiratory system	*Secondary* type can be acquired by pulmonary extension of septicemic plague	Can spread easily and rapidly person-to-person
Septicemic, systemic, in blood, throughout body	Untreated, within 24 hours, it's 100% lethal	Cough & sputum facilitate transmission

Symptoms

- Fever & headache
- Weakness & chest pain
- Pneumonia with shortness of breath
- Chest pain, Cough and bloody sputum

Infection with Yersinia pestis

- Onset 3 to 7 days
- Case fatality rate 100% if untreated
- Acquired by aerosolized plague bacteriae
- May get into lung tissue from septicemia

Melasma
Phytodermatitis
Pytyriasis alba (PA)
Post-inflammatory Hyperpigmentation (PIH)
Tinea versicolor

OTHER SKIN COLOR CHANGES

Melasma
(Chloasma)

- Often called "the mask of pregnancy”; some skin cells produce more pigment, usually appearing as brown or gray-brown patches on the face.

- Seems to have a hormonal component:
  - Pregnancy makes it worse.
  - Birth control makes it worse.
  - Sunlight makes it worse.

- Having the baby, stopping the birth control or protecting oneself from the sun can clear up the condition.

- It often recurs, and for many , it's a constant battle.

Phytodermatitis

- Mysterious dark marks on hands or around the mouth.
- Initial blisters/burning gets dismissed as sunburn or allergies, and this progresses to pigment changes which usually fade in a few months.
- If you just went on vacation, chances are the diagnosis is a skin reaction to sunlight and a chemical in limes and other citrus fruits.
- Common when mixing sunshine and lime juice, the condition is often nicknamed "Club Med Dermatitis", "Mexican Beer Dermatitis," or "Margarita Dermatitis".

Pytyriasis Alba (PA)

- Red, scaly patches that change leaving lighter patches on the skin.
- It’s a feature of eczema that's more apparent on tanned skin.
- It is benign, non-contagious.
- Treat eczema, PA goes away.

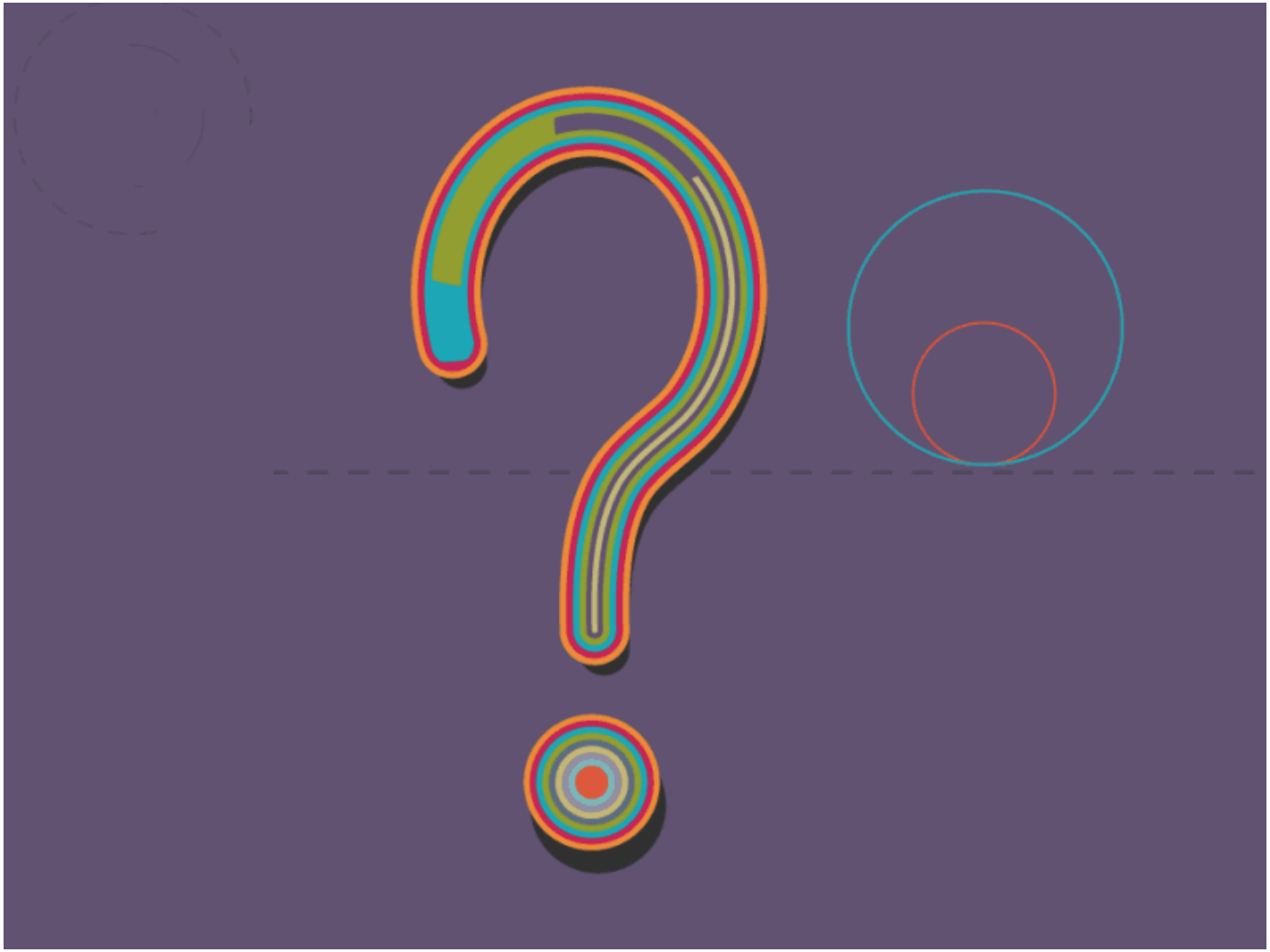
Post-inflammatory hyperpigmentation (PIH)

- Skin makes extra melanin after it has been irritated or injured.
- In places where person had acne, allergic reactions, injury, inflammation, or psoriasis.
- Epidermal or dermal.
- Temporary or long duration.

Tinea Versicolor

- Common yeast overgrowth.
- Brown, red or white spots in trunk, shoulders.
- Hypo or hyperpigmentation
- In summer or hot humid months.
- The solution? An anti-fungal treatment.

Final Questions/Comments?

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