

CELLS & SYSTEMS

Topic 4 - Diseases

HISTORY

- How many of you have ever...
 - Broken a bone?
 - Cut yourself?
 - Puncture/stab wound?
 - Big scrapes?
- Luckily it is 2015 because in the mid 1800s you would have had a 50% chance of dying from those

THE 1ST VACCINATION

- Before the discovery of vaccinations medicine could not really do anything for you
- 1600s-1700s small pox was ruining Europe
 - Rash filled with pus (yum!)
 - Muscle aches
 - Nausea
- Up to 40% of people who got it died or went blind
- It was not a good time
 - Highly stressed and panicked

THE 1ST VACCINATION



THE 1ST VACCINATION CONT ...

- ◉ Enter Dr. Edward Jenner
 - He was an English doctor
- ◉ He noticed that milkmaids (working with cows) often got cowpox but...
- ◉ They rarely, if ever, got small pox!
- ◉ This made him think if I infect people with cowpox will it protect them from small pox?
- ◉ So he did and ...

- ◉ The world's first vaccine was invented! 😊

THE 1ST VACCINATION CONT ...

- ◉ Why is it known as a **vaccine**?
- ◉ **Cowpox** stopped small pox
- ◉ “**Vacca**” = “**cow**” in Latin
- ◉ “**ine**” = from a (loosely translated)

- ◉ Vaccine = from a cow!

You're
welcome
human
race!



BACTERIA

- Since the discovery of the 1st vaccine (cowpox) about 90 years went by without a new vaccine
- Why?!
- They did not know why people got sick!
- Enter Louis Pasteur!
 - He was the first to theorize, discover then prove that bacteria existed and were making us sick!



BACTERIA CONT ...

- ◉ How did he figure this out?
- ◉ Wine & beer would spoil & people did not know yeast was alive
- ◉ Did some thinking and thought wait a second it is not black magic spoiling the wine it must be something else ... BOOM!
- ◉ He discovers bacteria!

BACTERIA CONT ...

- So what did he do?
- Here is a hint ...
- Still nothing?

PASTURIZATION

- So what is that?



BACTERIA CONT ...

- ◉ Here is an educational video about the history of pasteurization ... it is very educational and extremely fun!
- ◉ [History of Pasturization!](#)



Woohoo!
Pasturization keeps me
safe!

BACTERIA ON THE RISE!

- ◉ Joseph Lister
 - English doctor, successful surgeon but high death rate ... what gives?
- ◉ He learns of Pasteur's research
- ◉ Assumes bacteria must be in the operating room
- ◉ Adopts the "Clean tools and Ourselves" practice
- ◉ Before that it was slob-city! Gross...



BALANCED NUTRITION



- Pirates & Sailors ... A Poem by Mr. Hebert
 - Tough and scary and often hairy
 - Love to eat dried meats and cheese
 - Long voyage at sea would lead to scurvy
 - And knock them down to the their knees
 - Enter Dr. James Lind who gave them some fruit
 - Some oranges and lemons and limes
 - No vitamin C, no veggies or fruit was clearly the root
 - So eat them everyday and be sure to rhyme
- Scurvy = no Vitamin C = not a problem we see today!

BACTERIA SPREADING

- The Bacteria Game!
- Can you identify the origin of a disease?

FACTORS AFFECTING HEALTH

- Classic Example ...
- Asthma
 - Airways become narrowed
 - Breathing becomes difficult and strained
 - Could be fatal
- Triggers
 - Colds / Cold Air
 - Allergies
 - Dust
 - Allergies
- Asthma demonstration

FACTORS AFFECTING HEALTH

○ Factors doctors examine to determine health risks:

1. Family history

2. Sensitivity to environmental stimuli

Smog, gases, allergens, etc ...

3. Your response(s) to different stressors

4. General body choices

Smoke, drugs, alcohol, sleeping habits, diet, exercise, etc ...

FACTORS AFFECTING RESPIRATORY SYSTEM

○ Smoking/Cigarettes

- Over 4000 chemicals in a cigarette

○ Tar

- Dark, sticky, substance that sticks to all organs of the system
- Villi exist in the respiratory system as well and they move mucus
- Tar can clump them together so no mucus is moved and your ability to breathe is affected



Example	Common Use
Carbon Monoxide	Gas in car exhausts
Copper	Electric wiring
Tar	Road surfaces
Nicotine	Pesticide
Acetone	Paint stripper
Ammonia	Cleaning agent
Arsenic	Rat poison
Benzene	Petrol fumes
Butane	Lighter fuel
Formaldehyde	Embalming fluid
Hydrogen cyanide	Poison in gas chamber
Methanol	Rocket fuel
Methane	Swamp gas
Toluene	Industrial solvent
DDT	Banned insecticide
Radon	Radioactive gas
Polonium	Radioactive fallout

MORE AWFUL CIGARETTE FACTS

- ◉ Cigarettes also contains ...
- ◉ Carbon Monoxide
 - During gas exchange CO takes the place of O
 - Your red blood cells then travel with CO instead of O
 - Heart has to beat faster and breathing is tougher
- ◉ Nicotine
 - Speed up heart & increases blood pressure
 - Highly addictive
 - This is what makes cigarettes hard to quit

CIGARETTES ARE AWFUL

- Of the 4000 chemicals ... science can confirm 40 are **carcinogens** (cause cancer)
- Bronchitis
 - Build up of mucus on the bronchi making it more narrow
 - Interrupts breathing making it harder
- Emphysema
 - Damage of lung tissue