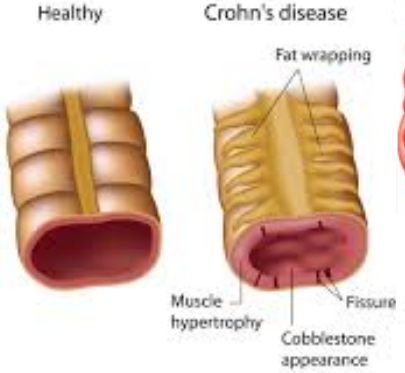
Organ Systems and Human Health

Common Diseases Associated with the Digestive System

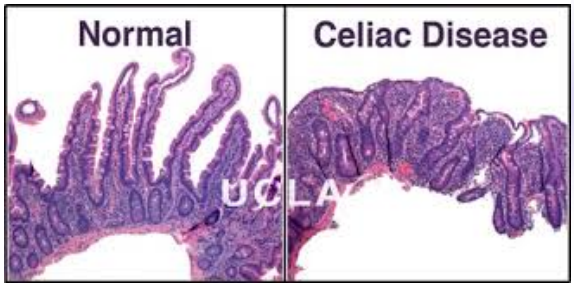
Crohn's Disease

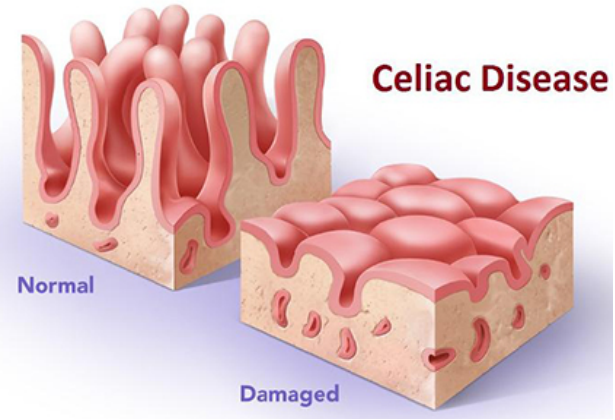
- chronic inflammation of the small intestine (ileum)
- symptoms include:
  - diarrhea and abdominal pain
  - rectal bleeding
  - fever
  - weight loss
  - arthritis
  - anemia



Celiac Disease

- an inherited autoimmune disease in which people cannot tolerate gluten
- symptoms include:
  - foul, pale-coloured stools
  - diarrhea
  - decreased appetite
  - weight loss
  - abdominal pain
  - skin rash





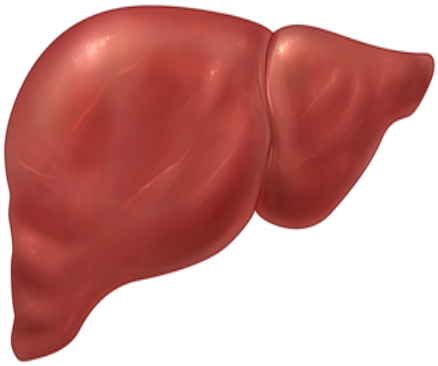
Jaundice

- excess accumulation of bile in the bloodstream and tissues
- most common cause is overproduction of bile by the liver
- results in a yellow to orange and sometimes greenish discolouration of the skin, the whites of the eyes, and the mucous membranes

Cirrhosis

- an irreversible change in normal liver tissue resulting in the degeneration of functioning liver cells
- primarily caused by excessive and chronic alcohol consumption
- other causes include
  - viral infection, particularly hepatitis B or C
  - cystic fibrosis
  - obesity
- Complications of cirrhosis include:
  - liver turns green from bile in the tissue
  - liver enlarges
  - hemorrhages in the esophagus and stomach
  - Imbalance of blood chemicals leading to coma
  - edema

Normal Liver



Liver with Cirrhosis

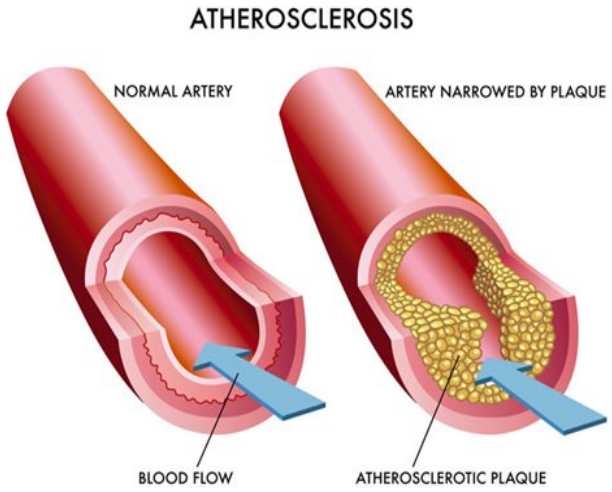
Other diseases include:

- Hepatitis (inflammation of the liver)
- Gallstones
- Inflammatory bowel disease (IBD)
- Irritable bowel syndrome (IBS)
- Hernia
- Appendicitis

Common Diseases Associated with the Circulatory System

Arteriosclerosis

- build up of fat and cholesterol on the walls of arteries
- can restrict or stop blood flow resulting in heart attack or stroke
- risk factors include
  - smoking
  - diabetes
  - high cholesterol diet



Hypertension (High Blood Pressure)

- causes the heart to work harder
- can lead to complications such as heart attack, stroke, or kidney failure

Stages of Hypertension

Category	Systolic		Diastolic
Normal	< 120	and	< 80
Prehypertension	120-139	or	80-89
High Blood Pressure/Hypertension			
Stage 1 Hypertension	140-159	or	90-99
Stage 2 Hypertension	≥ 160	or	≥ 100

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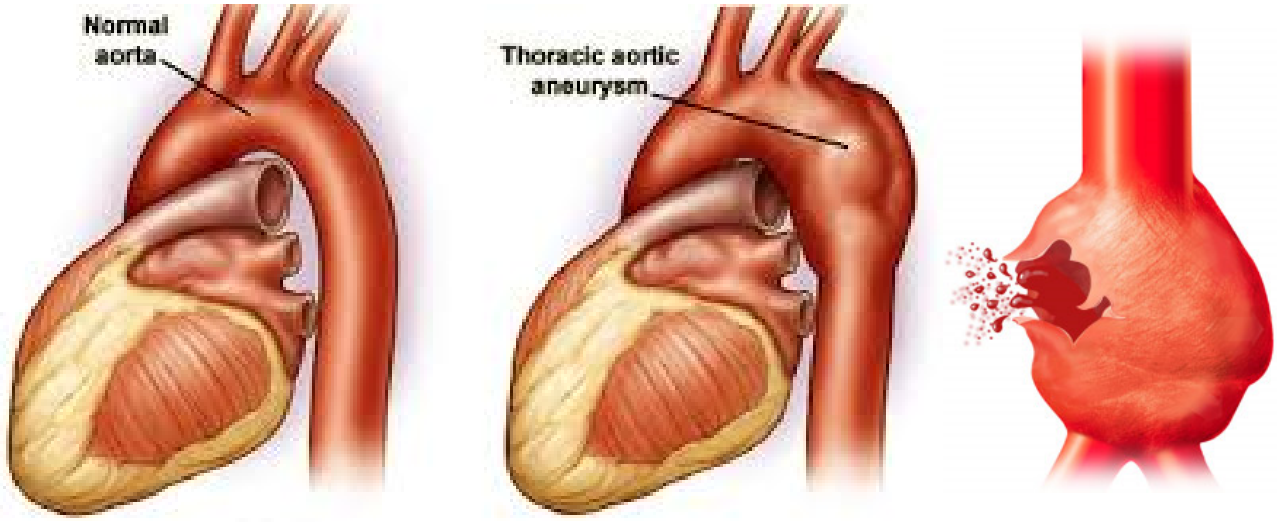
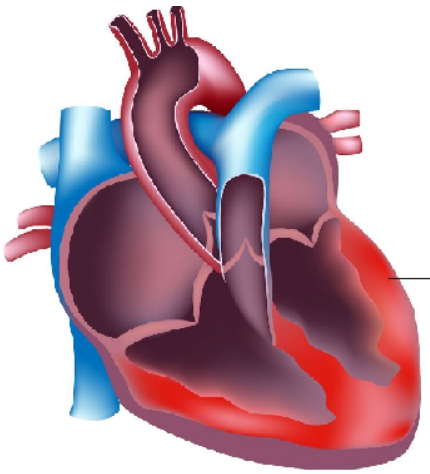
Aortic Aneurysm

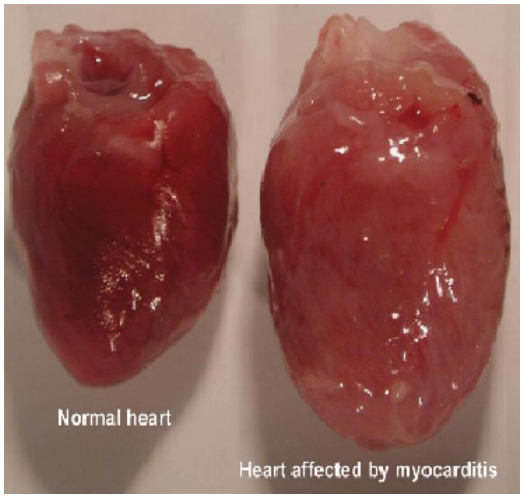
- Occurs when the aorta is damaged and starts to bulge or eventually tear
- Can cause severe internal bleeding
- This weakness can be present at birth, or caused by arteriosclerosis, obesity, and/or hypertension



Myocarditis

- inflammation of the heart muscle
- causes include:
  - many viruses, bacteria, parasites, and fungi
  - medication or illegal drugs that may cause an allergic or toxic reaction
  - certain chemicals, such as CO_2, and radiation





Common Diseases Associated with the Respiratory System

Tuberculosis (TB)

- infectious bacterial disease
- the bacteria cause the break down the respiratory tissues and form cavities in the lungs
- can also cause blood vessels to erode, leading to coughing up bright red blood

What are the differences between bacteria and viruses?

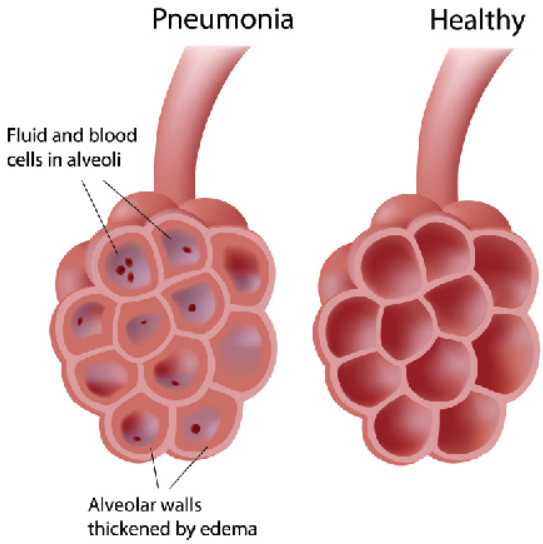
Video Link

Bacteria - alive, have cells, can reproduce on its own, can be both beneficial and harmful - you are full of bacteria

Virus - grey area, can't reproduce on its own, hijack other cells, can change over time, sorta living?

Pneumonia

- inflammation of the lung tissue as a result of infection, inhalation of foreign particles, or irradiation
- viruses and fungi can cause pneumonia, but the most common causes are bacteria



Influenza

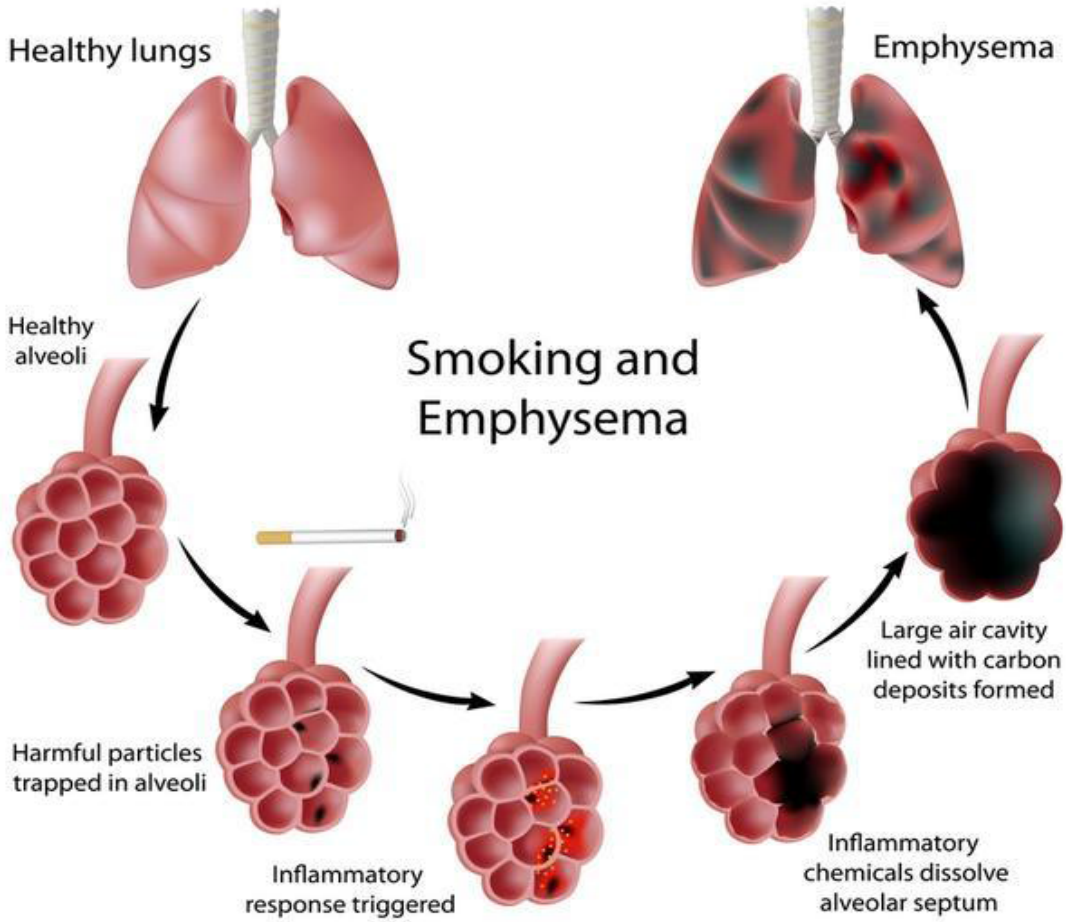
- An acute viral infection of the upper or lower respiratory tract
- signs and symptoms include:
  - fever and chills
  - weakness
  - muscle pain
  - varying degrees of soreness in head and abdomen

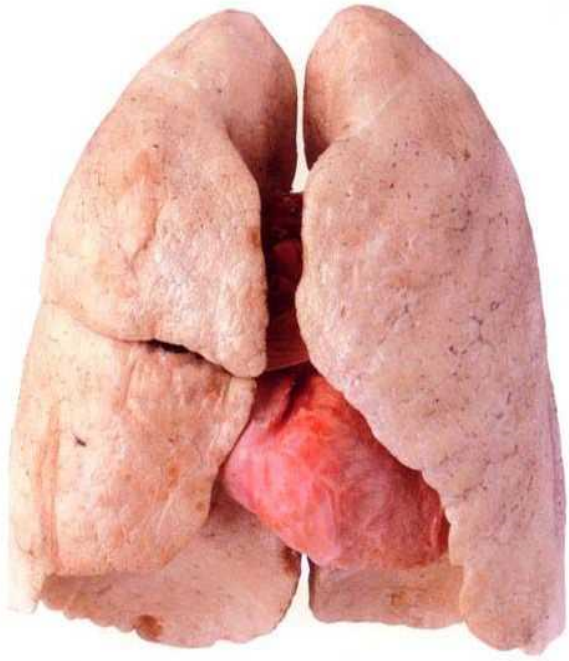
Asthma

- chronic disorder of the lungs in which inflamed airways are prone to constrict
- can cause:
  - episodes of wheezing
  - chest tightness
  - coughing
  - breathlessness
- range in severity from mild to life-threatening

Chronic Obstructive Pulmonary Disease (COPD)

- a progressive respiratory disease
- characterized by the signs and symptoms of
  - ***Emphysema***
    - destruction of lung tissue, which is replaced by large holes (air spaces)
    - gas exchange at the alveoli is reduced
  - ***Bronchitis***
    - excessive mucus production in the bronchi
- common cause of COPD is tobacco smoke


Healthy lungs
Emphysema
Healthy alveoli
Smoking and Emphysema
Large air cavity lined with carbon deposits formed
Harmful particles trapped in alveoli
Inflammatory response triggered
Inflammatory chemicals dissolve alveolar septum



Healthy Lung

Smoker's Lung

Advances in Medical Technologies (pg 93-95)

1) X-ray: transmits waves of electromagnetic radiation onto photographic film

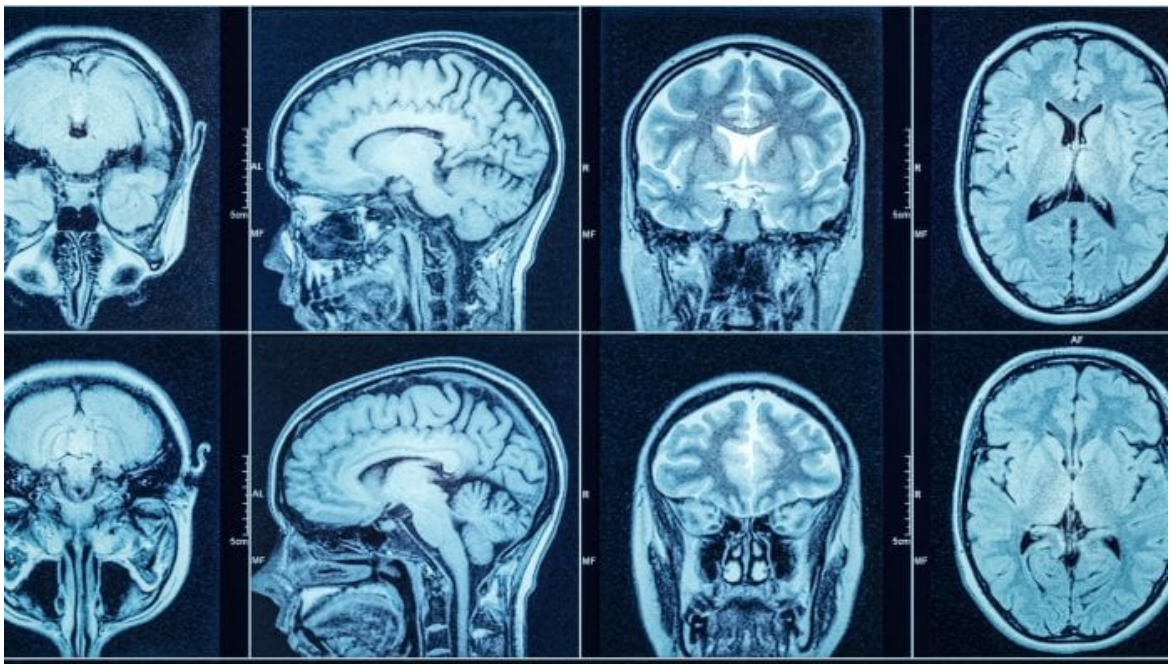
- goes through soft tissue.
- used to examine bone

2) **CT or CAT scan:**
Computerized Axial Tomography

- takes x-rays, thin slices of body parts
- reconstructed into a 3-D image by computer.
- used to diagnose heart disease, cancer

3) Ultrasound: high frequency sound waves directed at body part.
- shows real time movement of body parts (heart, fetus)

4) MRI scan: Magnetic Resonance Imaging
- produced using radio signals in a magnetic field to create images of body parts



- 5) **Endoscopy:** tiny camera with light on flexible tube, inserted into body
  - used to diagnose stomach ulcers & perform surgery without cutting body open
- 6) **Biophotonics:** procedures and devices that use light technologies i.e. lasers (for eye surgery)

Fighting Infectious Disease (pg 108-115)

- Caused by pathogens (viruses, bacteria and fungi)
- Immune system tries to attack and destroy foreign invader in the body
- White blood cells (phagocytes) and dissolved substances move through blood to the infection
- Causes inflammation (swelling and redness) to the area
- Foreign matter that stimulate the response is called an ***antigen***

Developing Antibodies

- Specialized proteins manufactured in bone marrow - fight disease
- Identify and attach to specific antigens
- prevents the invader from infecting the rest of the body
- signals immune system that invader needs to be destroyed

Preventive Health Care

Steps individuals can take to guard their own health:

- healthy eating

- regular exercise

- vaccinations

Video Links to Better Health

- Sugar on the Brain
- Didn't drink Water
- Sleeping Enough?
- Playlist

Homework

- ***Answer the following Questions using p. 112-114***

What are: SARS, AIDS, West Nile Virus?

Summary Task - Handout

Video Link - Amobea Sisters