PATHOLOGIES

HEART DISEASE

MALARIANUMBER ONE CAUSE OF DEATH IN THE WORLD

MAL=BAD ARIA=AIR

ASSOCIATED WITH SWAMPS-WHY?

MOSQUITO VECTOR BREEDS IN STANDING WATER

PROTISTS INSIDE RBC’S
RESPIRATORY SYSTEM

FUNCTIONS

THE RESPIRATORY SYSTEM WORKS IN DIRECT COOPERATION WITH THE CIRCULATORY SYSTEM

STRUCTURES
PATHOLOGIES

MYCOBACTERIUM TUBERCULOSIS
DIGESTIVE SYSTEM

FUNCTIONS

1. Ingestion
2. Digestion
3. Absorption
4. Elimination

Food (polymers) → Food in mouth → Monomers → Undigested materials

STRUCTURES

ACCESSORY ORGANS

SMALL INTESTINE

- Duodenum ~10"
- Jejunum 4-8ft
- Ileum 6-12ft
- Total ~11-21ft!!
LARGE INTESTINE

PATHOLOGIES

HEPATITIS

GALLSTONES

VITAMIN DEFICIENCIES

PARASITES
INTEGUMENT

KEEPS THE INSIDE IN AND THE OUTSIDE OUT…

FUNCTIONS

Figure 4.8 Human skin anatomy. The epidermis, or the outermost layer, and the dermis. A subcutaneous layer lies below the dermis.
**PATHOLOGIES**

- Dermatitis
- Rickets
- Cancers

**LYMPHATIC SYSTEM**

- Removes excess fluid from tissues
- Carries immune system molecules
- Destroys pathogens
- Absorbs fats?
STRUCTURES

Removes excess water from tissues

Macrophages inside nodes engulf pathogens

SPLEEN - Macrophages engulf red blood cells
RED BONE MARROW - Origin of many immune system cells (WBC's)
THYMUS GLAND - Origin of T-lymphocytes and hormones

Metastatic Cancer

A tumor grows from a single cancer cell. Cancer cells invade neighboring tissue. Cancer cells spread through lymph and blood vessels to other parts of the body.

Cancer Treatments

Chemotherapy uses drugs that disrupt cell division
Radiation therapy disrupts cell division
Two basic uses for **NUTRIENTS**:

- Energy
- Use in structure/body processes
## MACROMOLECULES

<table>
<thead>
<tr>
<th>Carbohydrates</th>
<th>Proteins</th>
<th>Lipids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Complete</td>
<td>Essential Fatty Acid</td>
</tr>
<tr>
<td>Complex</td>
<td>Incomplete</td>
<td>Cholesterol</td>
</tr>
<tr>
<td>Fiber</td>
<td></td>
<td>Saturated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unsaturated</td>
</tr>
</tbody>
</table>

## CARBOHYDRATES

Simple carbohydrates are found in foods such as fruits, milk, and vegetables.

Complex carbohydrates are found in foods such as breads, legumes, rice, pasta, and many vegetables.

### Complete Carbohydrates
- Provide vitamins, minerals, and fiber.
- Example: Whole grains, legumes, and vegetables.

### Incomplete Carbohydrates
- Lack vitamins, minerals, and fiber.
- Example: Refined sugars, white flour, and white rice.

## PROTEINS

### Complete vs. Incomplete

Complete proteins contain all essential amino acids.

Incomplete proteins lack one or more essential amino acids.

Example: Soy protein is incomplete; it lacks the amino acid methionine.

Example: Corn protein is incomplete; it lacks the amino acid lysine.

Example: Bean protein is incomplete; it lacks the amino acid lysine.

Example: Eggs are complete proteins.
**LIPIDS**

- Saturated
- Unsaturated
- Cholesterol
- Linoleic & Linolenic Acids

**MICRONUTRIENTS**

- **Vitamins**
  - Lipid Soluble: A, D, E, K
  - Water Soluble: B’s, C, Biotin, Pantothenic Acid, Folic Acid

- **Minerals**
  - Macrominerals: Ca, P, Na, K, Cl, Mg, S
  - Trace Minerals: Fe, Zn, I, Fli, Se, Mn

**Redesigning the Food Pyramid**

- Early Exercise and Weight Control
- Heart Rate
- Blood Pressure
- Cholesterol
- Salt
- Fluid
- Fat
- Calories
- Sugar
ENERGY BALANCE

Energy Intake = (BMR + Activity) + Heat + Storage

Energy Intake:
- Fats = 9 kcal/g
- Carbs & proteins = 4 kcal/g

BMR:
- Women = 0.9 kcal/kg/hr
- Men = 1.0 kcal/kg/hr

Heat:
- Thermogenesis

Storage:
- Weight

Activity:
- Various depending on intensity

MUSCULOSKELETAL SYSTEM

Axial Skeleton:
- Skull & Spinal Cord

Appendicular Skeleton:
- Rib Cages, Shoulders, Arms, Pelvis, Legs

Three basic types of joints
Find and Inspect the Following on a Neighbor or on Yourself

• **Bones:**
  – Nasal, mandible, patella, zygomatic, tarsals, scapula, clavicle, vertebra

• **Muscles:**
  – Triceps, biceps, trapezius, flexor carpi group, rectus abdominus, gastrocnemius
PATHOLOGIES

Osteoporosis

Trichinella spiralis

EXCRETORY SYSTEM

Kidney
Ureter
Bladder
Urethra

Pathology: Osteoporosis

Pathology: Trichinella spiralis

Excretory System: Kidney, Ureter, Bladder, Urethra
FILTRATE

- WATER
- UREA
- GLUCOSE
- SALTS
- AMINO ACIDS
- VITAMINS

REABSORPTION

URINE FORMATION
URINE COMPOSITION

- WATER
- UREA
- SALTS
- VITAMINS

PATHOLOGIES

URINARY TRACT INFECTIONS - USUALLY E. COLI

CACULI - KIDNEY STONES

SCHISTOSOMA HEAMATOBIUM (PHAROAH'S CURSE) - BLADDER FLUKE

Schistosoma haematobium