National Museum of Health and Medicine

The museum is an element of the Armed Forces Institute of Pathology on the campus of Walter Reed Army Medical Center in Washington D.C.

Everything in these discovery sheets is on the exhibit floor. Locate the exhibits described below, and after you explore the cases, feel free to answer the question(s). The answers are available in the text or the object. Some questions you may have to think about, draw upon your own knowledge, or research upon return to your classroom. Please do not write on the exhibit or lean against the display cases. Borrow a writing board from the Information Desk and use only pencils. Have fun and enjoy you museum experience.

To Bind Up the Nation's Wounds: Medicine during the Civil War

The State of Civil War Medicine: *"The hurt and wounded I pacify with soothing hand"*

Examine the photos, gunshot wounds, and artifacts in this exhibit. List some of the sanitary conditions that existed during the war. What pain-killers were available? What anesthetics were available?

Trauma and Surgery: *"The smell of ether, the odor of blood"*

Despite the inadequate conditions that existed during the war, surgical procedures were sometimes the only way to save a soldier's life. Based on information in these cases, describe some surgical procedures used during the war. Would they be used today? What was the purpose of the Chisolm Inhaler? What types of wounds were considered nearly always fatal?

Disease and Hygiene: ***"The rapid march, the life of the camp"***
A silent killer lurked in all the camps. The discovery of diseases and the germ theory were years away. Name some of the diseases that killed many of the soldiers. Did more men die of disease or battle wounds? Explain the conditions of the time to support your answer. How did the acceptance of female nurses change medical care during the war?

Evacuation and Hospitalization: ***"Some on the bare ground, some on planks or stretchers"***
The Civil War is credited for making significant changes in evacuation and hospitalization. Describe some of the changes introduced in the processes of evacuation and hospitalization? Which are still in use today? Name the military physicians who were largely responsible for these changes. List some of the methods of evacuation displayed in the cases.

Abraham Lincoln: The Final Casualty of the War: ***"The dust was once the man"***
X-rays, which would be one of the technologies used to locate the bullet today, were not discovered until 1895. What instrument did Dr. Barnes use to locate the bullet lodged in Lincoln's brain? What type of equipment do you think doctors will use in the year 2010 to locate a bullet?

Notice the blood-stained cuff of the physician. Following the autopsy, the doctor may have operated on a living patient wearing the same shirt. What does this tell you about the sterile procedures of the time?

From Single Cells, Human Reproduction, Growth and Development

Viewing the Body: Male and Female
Why is the female pelvis generally broader than the male pelvis?

Childhood Skeletal Growth
The skull bones of babies are not fused when they are born. What purpose does this serve for the infant's development?

These skeletons from young humans have heads that are large in proportion to the rest of their bodies. What does the relatively large size of the head show about human development? How does this relate to the requirement of human infants for relatively more parental care than other animal babies? Compare to the development of another animal.

Do you believe that drugs, alcohol or excessive smoking could alter normal fetal development? Explain your answer.

Human Body Human Being

Skin

The skin is the largest organ of the body--1.7 square meters (18.3 square feet). How many layers is the skin composed of? Sketch a diagram and identify each layer.

How does burn damage interfere with the functions of the skin?

What process is happening during adolescence that may result in acne, a skin disorder caused by inflammation of the hair follicles and sebaceous glands?

If some sun is necessary for good health, why should you protect yourself from sun damage? What techniques provide effective protection from the sun?

Kidneys

An important function of the kidney is the regulation of the amount of water, salt, sugar, and protein by filtering the blood plasma and reabsorbing into the blood those substances the body needs. Approximately how much fluid (in liters) do you think healthy kidneys filter in a single day?

30 – 70 L
70 – 110 L
110 – 150 L
150 – 180 L
180 – 210 L

Why does a person suffer from poisoning if the kidneys fail to function? What is the poison?

Kidney stones are formed from crystals of calcium and other substances. Why do you think that drinking water helps prevent the formation of kidney stones?

Which of the following statements about the kidney are true? Correct false statements.

___ Regulates the amount of water, salt, sugar and proteins in our body.

___ Rids the blood stream of toxic nitrogen containing products like urea and renin.

___ Activates vitamin C for use in our bodies.

___ Synthesizes glucose (sugar) during prolonged periods of fasting.

___ Releases three important hormones which effect red blood cell production and blood pressure.

Lungs

Describe the lungs from each of the following people. Explain what accounts for the different colors.

iron miner

coal miner

city dweller

The incidences of iron lung and black lung have decreased over the years. What factors could have contributed to this decrease?

A baby's lungs are pink. Notice the lungs of a smoker. Describe the appearance of the smoker's lung? What is the hard, white tissue?

Heart: Heart Disease
Heart disease is this Nation's number one killer. Describe heart disease.

High blood pressure (hypertension) is an abnormally high measure of the pressure of the blood on the walls of the arteries. How does high blood pressure contribute to heart disease?

Atherosclerosis is an accumulation of fatty deposits in the arteries. How does this disease contribute to the risk of heart disease?

What can you do to help keep your heart healthy? Particularly address the two conditions listed above.

Cautery
Blood is very important to the function of the human body. If too much is lost, a person will die. Cautery is a method to control bleeding that is sometimes used today during an operation. Describe techniques a surgeon may use to temporarily halt bleeding, including cautery.

Medicinal Leeches
Leeches have been used in bloodletting for centuries. Today, leeches are used for reattaching tissues and in plastic surgery. Explain the biology of the leech that makes it useful for this purpose.

Do you think it is a good idea to use the same leech on more than one patient? Justify your answer.

One of the goals of this exhibition is to help visitors identify behaviors or activities that can impact their individual health. List at least three personal decisions that may result in staying healthy. Why do you think it is so difficult to follow recommendations for healthy living?

Exhibit Section	Personal Decision	Reason Difficult to Follow
Skin		
Lungs		
Heart		

Muscle and Bone
The human skeleton contains 206 bones. Where are the smallest bones of the body located? Name the four ways that bones serve the body.

Two Tubes
Osteoporosis is an abnormal loss of bone. What is the difference between the diseased bones and the healthy ones? What can we do to help prevent this disease?

Arthritis
Look at the seated skeleton of a man. What characteristics of the bones (the white ones) do you see that support the original diagnosis of arthritis?

Lymphatic System
Lymph is the excess fluid from the body's tissues. Elephantiasis involves the enlargement of a body part in which the lymph vessels have become blocked, in this case by a parasitic worm. Why does this blocking cause enlargement?

Stomach: The Gastrointestinal System
What is peristalsis? Why is it important along your digestive tract? What type of muscle is in the gastrointestinal system?

Explain what causes "heartburn." How do antacids provide relief?

Endocrine
The pancreas produces insulin, which regulates the level of sugar in the blood. What causes diabetes mellitus? What treatment strategies can be used to manage this disease?

The thyroid is unique among the endocrine glands in that it stores a large amount of hormone, thyroxin, which is necessary for normal growth and development. The production of this important hormone is dependent upon what chemical element? What is the major dietary source of this element?

Many athletes, both male and female, take synthetic hormones to increase muscle mass. Describe negative effects that may result from taking steroids?

Growth hormone controls our overall growth in height. What is the difference between a dwarf and a midget? Is achondroplasia as displayed by the skeleton of the elderly woman the only type of dwarfism?

Liver

The hepatic system involves the liver, the largest gland in the body. Which of the following statements are true about the liver? Correct false statements.

___ Removes toxic products from the bloodstream such as alcohol and drugs.

___ Stores fat soluble vitamins, iron and copper.

___ Normal liver tissue is yellow in color.

___ Regulates sugar levels in the blood stream.

___ Produces glycogen for the digestion of fat.

___ The liver and spleen recycle useable elements from red blood cells, proteins and hormones.

A major function of the liver is to filter toxic wastes from the blood. How does excess alcohol damage the liver? If evidence supports that alcohol causes damage to the body, why do individuals drink excessively?

The gall bladder is located under the liver. What is the function of the gall bladder? Once a person has had a gall bladder removed, what foods might they have to be careful eating?

Evolution of the Microscope

Butterfly wings, plant cells and the webbing of the frog's foot -- this was the fantasy world observed by the fortunate few with the invention of the microscope in the early 16th century. If the magnification lens is the heart of the instrument, what purpose is served by the mirror that tilts at different angles?

Galileo is famous for his contributions to astronomy. What was his connection with the microscope?

Comparison Microscope
Describe a unique feature of the comparison microscope. What special use do police make of this microscope?