

Chapter 12:

The health of the body depends on the health of its interdependent systems.

How Body Systems are Connected

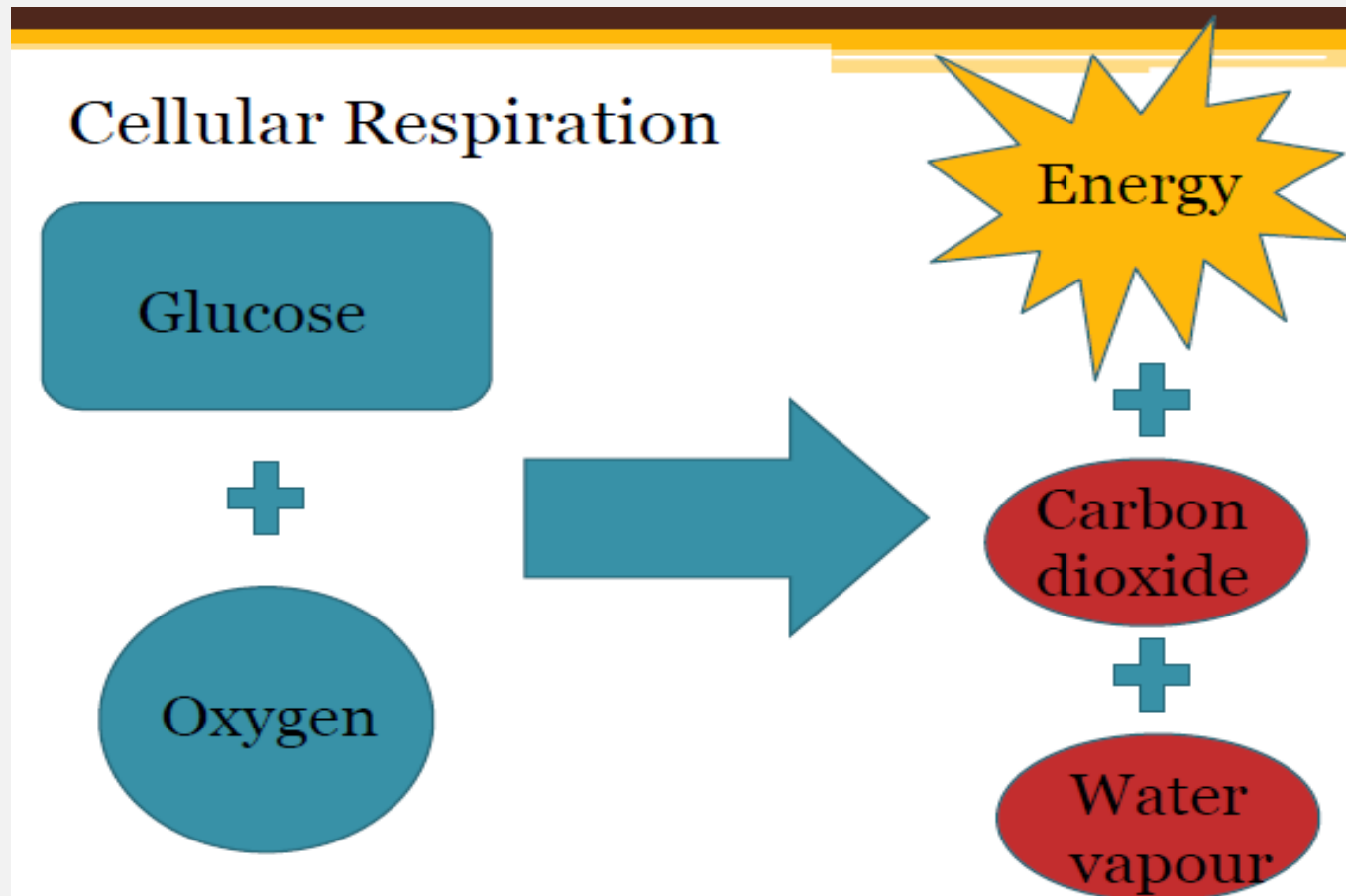
All the cells of the body have the same basic needs:

1. Energy
2. Nutrients
3. Oxygen
4. Removal of wastes

Body systems work together to provide cells with what they need.

Example: Cellular Respiration

A chemical process that releases energy that is stored in glucose.



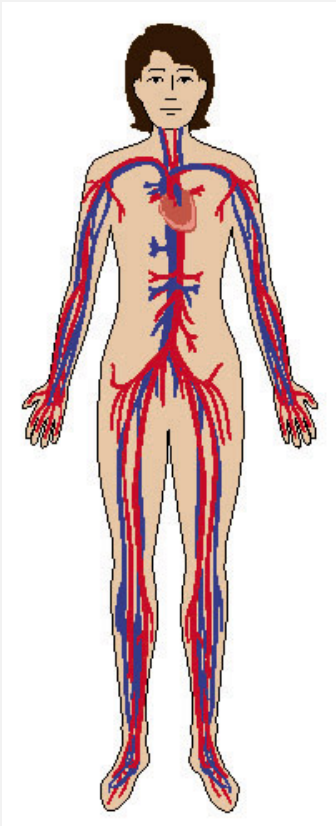
Organ systems that are directly involved with cellular respiration include:

- Respiratory system
- Digestive system
- Circulatory system
- Excretory system

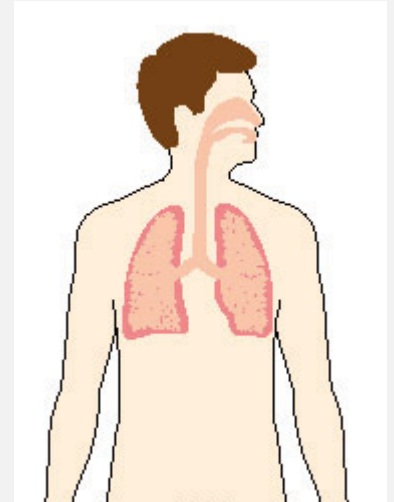
Connections Between Systems:

1. Circulatory & Respiratory
2. Circulatory & Digestive
3. Nervous & Muscular

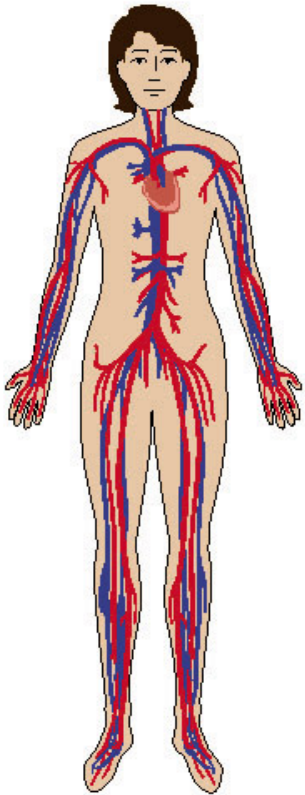
1. Circulatory & Respiratory



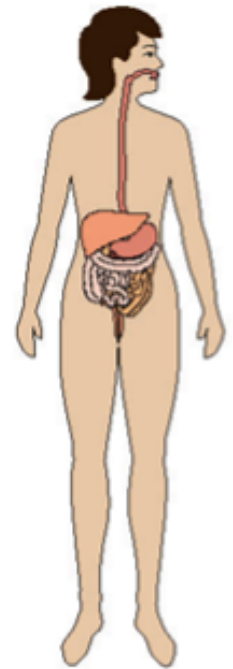
- The blood picks up oxygen from the lungs and delivers it to the body cells.
- The blood picks up carbon dioxide and delivers it to the lungs to be exhaled.



2. Circulatory & Digestive

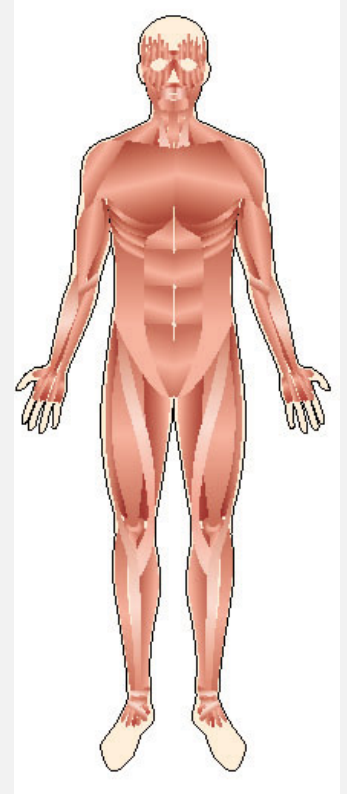
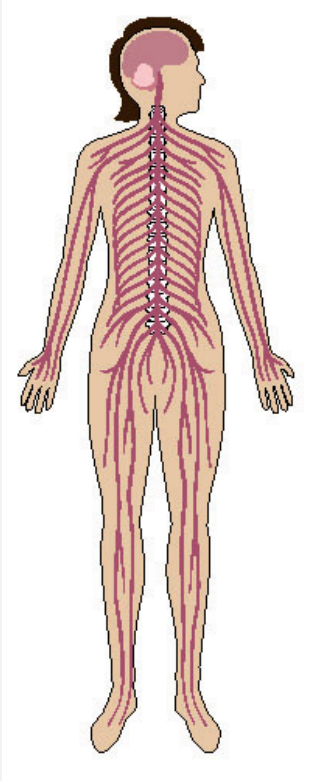


- The digestive system breaks down food into **glucose** and other nutrients.
- **Nutrients** enter the blood from the small intestine.
- The **blood** carries the nutrients to the body cells.



3. Nervous & Muscular

- Helps keep your body temperature stable.
- The nervous system monitors conditions outside the body through temperature-sensing cells in the skin.
- The information that is sent to the brain causes the brain to send nerve signals to different parts of the body, including the muscles.
- Ex. If cold, the muscles will relax and contract rapidly i.e. Shiver.



Textbook Questions

Page 445:

#s 1-7 and Pause & Reflect

Body Systems & Health

- Maintaining the health of each body system keeps the network of systems, and the whole body healthy.
- Factors that affect system health include:

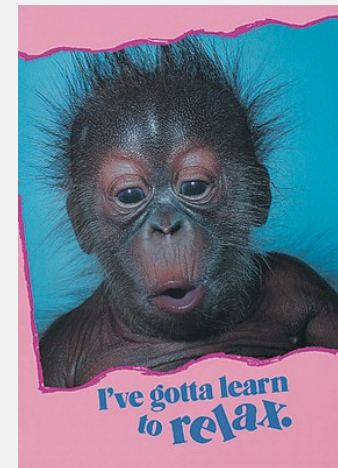
1. Diet



2. Exercise



3. Stress



The Balance of Body Systems

Can be affected
by both:

- Genetic factors
- Lifestyle factors



Genetic Factors

- Out of your control
- Things you inherit from one or both birth parents.



Lifestyle Factors (*page 449*)

- Within your control
Include:



- Diet
- Smoking



- Drugs and alcohol
- Lack of exercise



1) Diets that are high in fats and cholesterol

- Fats are harder to digest than other nutrients.
- Fatty deposits clog blood vessels.
- Fatty deposits in the arteries make your heart work harder.
- Cholesterol can crystallize in the gall bladder to form gallstones.

2) Overweight/Obesity

(20% above their desirable weight):

- Added weight strains heart functions, increased risk of heart disease.
- Associated with high cholesterol, high blood pressure, or diabetes.

3) Lack of Exercise:

- Digested food stays in the large intestine too long; coating of feces on walls of the large intestine results in poor absorption of water and nutrients.
- Constricts blood vessels.
- Increased risk of heart disease.
- Risk of becoming overweight.
- Increased risk of joint disorders, such as arthritis.
- Poor digestion leading to constipation

4) Smoking:

- Causes an increase in blood pressure, making your heart work harder.
- Decreases the amount of oxygen for body cells.
- Doubles the risk of sudden heart attack and death.
- Can cause indigestion.
- Linked to respiratory problems and lung cancer.



NON SMOKER



SMOKER

Healthy Lungs

In healthy people who live in a clean environment, the lungs are light pink

- A BREATH OF FRESH AIR
- KEEP THEM HEALTHY!



Smoker's Lungs

In smokers, the lungs appear dark and mottled owing accumulation of inhaled tar and impurities from cigarettes.

- SMOKING DAMAGE
- SMOKE AND THE LUNGS
- CANCER FACTS
- NEED HELP QUITTING SMOKING?



slide

Breath of Fresh Air

The average human inhales 388 cubic feet of air a day, enough to fill the total volume of 3 mid-sized sedans. About 19 cubic feet of that is pure oxygen, or enough to fill one sedan's trunk. A smoker's lungs have a reduced capacity to absorb oxygen, so the person may not get the oxygen they need.



Slide the above tabs on either side to see a comparison.

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STOP SMOKING START REPAIRING

In 1 week
your sense of taste
and smell improves

In 1 month
skin appearance is
likely to improve

In 3 months
your lung function
begins to improve

In 5 days
most nicotine is
out of your body

In 8 hours
excess carbon
monoxide is out
of your blood

In 12 months
your risk of heart
disease has halved

In 1 year
a pack-a-day
smoker will save
over \$4,000

Today
quit before
getting pregnant
and your risk of
having a pre-term
baby is reduced
to that of a
non-smoker

**EVERY CIGARETTE YOU DON'T SMOKE
IS DOING YOU GOOD**

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STOP SMOKING START REPAIRING

In 1 week
your sense of taste
and smell improves

In 5 years
your risk of a stroke has
dramatically decreased

In 3 months
your lung function
begins to improve

In 12 weeks
your lungs regain the
ability to clean themselves

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excess carbon
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It is Never TOO Late to Stop!

The Healing Time Line

A realistic look at how long it takes for your body to recover after your last puff



● Twenty minutes after quitting, your blood pressure decreases.

● Eight hours: The amount of carbon monoxide in your blood drops back to normal while oxygen increases to normal.

● Forty-eight hours: Your nerve endings start to regenerate, and you can smell and taste things better.

● One to nine months: Coughing, sinus congestion, fatigue, and shortness of breath decrease.

● One year: The added risk of heart disease declines to half of that of a smoker.

● Five years: Your stroke risk may be reduced to that of someone who never smoked.

● Ten years: Your risk of all smoking-related cancers such as lung, mouth, and throat decreases by up to 50 percent.

● Fifteen years: Your risk of heart disease and smoking-related death is now similar to that of someone who never smoked.

5) Drugs and Alcohol

Stimulants

- Temporarily increases rate of life functions.
- Speeds up heart rate.
- May cause diarrhea, stomach pain, changes in sleep patterns, anxiety, loss of appetite, vomiting.
- Can lead to dehydration, which can lead to constipation.

Depressants

- Decrease rate of life functions.
- Slow down heart rate.
- May cause nausea, increased acid production, vomiting, and diarrhea or constipation (depending on other factors such as if the person is dehydrated or not, or if the person is taking other drugs or has pre-existing medical conditions).

6) Stress

Nervous System

- The body suddenly shifts its energy resources to fighting off the perceived threat.
- Adrenal glands release adrenaline and cortisol.
- Fast heart beat, raised blood pressure, digestive issues.

Musculoskeletal system

- Tense muscles
- Tension headaches

Respiratory System

- Breathe harder/rapid breathing
- Hyperventilation
- Panic attacks

Cardiovascular System

- Inflammation in the coronary arteries, thought to lead to heart attack.

Endocrine System

- Liver produces more glucose, a blood sugar that would give you the energy for “fight or flight” in an emergency.

Gastrointestinal System

- Eat more/less
- Heartburn or acid reflux
- Nausea or pain
- Vomiting
- Can affect digestion and which nutrients your intestines absorb.
- Diarrhea or constipation.

For healthy organs & body systems, we all have the same basic needs:



- Clean air and water
- A nutritious and well-balanced diet



- Exercise
- Restful sleep

Scientific Technologies

1. Insulin pump: a device that can be programmed to deliver a specific dose of insulin at specific times during the day. Worn at all times (Diabetes) – used to help out the pancreas



2. Artificial Heart: used when a donor heart is unavailable. It is difficult for humans to stay alive for any length of time using hearts from other species.



Artificial Hearts



**STSE: Artificial
Organs**

Examples of Careers in Health

- Lab technician
- X-ray technician
- Physiotherapist
- Nutritionist
- Coaches
- Doctor
- Public health nurse



Making Informed Decisions:

Ideas for research...

- Insurance companies
- Fitness equipment
- Use of sunscreen
- Food additives
- Steroids
- Other?

Textbook Questions

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#s 1-9

“The Effect of Activity on Heart Rate and Breathing Rate”