

COOPERATION

Week 5

Cooperation

Working well together.

Objectives

Cooperation Systems of the Body Week 5

- **General Objectives**

- To practice cooperation
- To learn about the digestive and excretory systems
- To see cooperation among systems of the human body
- To introduce the human anatomy
- To emphasize God's design in the human body
- To learn how to research about the body

- **Specific Objectives**

- To learn parts/functions of digestive/excretory sys.
- To conduct tests on enzymes breaking down food
- To research many digestive juices what they digest
- To test peristalsis and learn the Heimlich maneuver
- To draw digestive/excretory systems on body roll-out
- To research the problems of digestive/ excretory sys.
- To conduct experiments about large intestines
- To continue writing body adventure novel

Alert!

Cooperation Systems of the Body Week 4

- Tincture of iodine (Week 5)
- Pepsin and diluted hydrochloric acid (Week 5)
- Cheesecloth and chalk dust (Week 5)
- Urine dip sticks (Week 5)
- Locate source for pig or cow heart to dissect...Sheep's heart - Tobin's Lab (Week 6)
- Locate source for pig or cow lungs to investigate (Week 7)
- Microscope (Week 8)

Weekly Supplies

Cooperation Systems of the Body Week 5

- 30' yarn 6 (p.32)
- Gum 11 (p.32)
- Cracker 12 (p.32)
- Tincture of iodine 13 (p.32)
- Cornstarch, Styrofoam egg carton, iodine 14 (p.33)
- Apple 17 (p.33)
- Marble, tubing or long narrow balloon 20 (p.33)
- Candy, 2 jars with lids 21 (p.33)
- Applesauce, balloon, pepsin, dilute HCl 23 (p.34)
- Beef liver 25 (p.34)
- Cheesecloth, chalk 27 (p.34)
- Urine testers 31 (p.35)
- Straw 19 (p.33)

Bible Verse

Cooperation Systems of the Body Week 5

Do you not yet understand that whatever enters the mouth goes into the stomach and is eliminated?

Matthew 15:17

Because it does not enter his heart but his stomach, and is eliminated, [thus] purifying all foods?

Mark 7:19

Focus Books / Videos

Cooperation Systems of the Body Week 5

- A** *Blood and Guts: A Working Guide to Your Own Insides* by Linda Allison (A must!)
- *** *The Human Body* by Bruun and Bruun (excellent!)
- "**The Belly and Its Members" a fable by Aesop
- O** *Dr. Beaumont and the Man With the Hole in His Stomach* by S. Epstein and B. Epstein
- M** *Understanding Your Body* by Rebecca Treays and Christyan Fox
- Food and Digestion* by Brian R. Ward (Good information, vocabulary, and graphics)
- Y** *Your Body* by Stephanie Turnbull and Adam Larkum
- Flip-Flap Body Book* by Alastair Smith, Judy Tatchell, Maria Wheatley, and Ruth Russel
- Inspector Bodyguard: Patrols the Land of U* by Vicki Cobb
- What Happens to Hamburger* by Paul Showers
- What Happens When You Eat* by Joy Richardson
- Eating* by John Gaskin

Websites

Cooperation Systems of the Body Week 5

- <http://www.medtropolis.com/VBody.asp> (Virtual Body takes you through digestive system; games to master order of organs in digestion)
- <http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/> (Basic information on digestion)
- http://kidshealth.org/misc/movie/bodybasics/digestive_system.html (Interactive site for digestive organs)
- http://kidshealth.org/kid/htbw/digestive_system.html (Kid friendly information)
- http://kidshealth.org/kid/health_problems/stomach/food_poisoning.html (Basic info on food poisoning)
- <http://www.mc.maricopa.edu/~lauramay/Digestion/absorption.htm> (Great pictures of villi)
- http://www.mayoclinic.com/popupnowrap.cfm?objectid=0FDA895-E7FF-0DBD-16DA3582E5847EA1&method=display_full (Tooth decay)⁸

Music

Cooperation Systems of the Body Week 5

- **There Was an Old Lady Who Swallowed a Fly**
<http://www.youtube.com/watch?v=qgu-8CEkxhw&feature=related> (lyrics and music)

Writing Assignment

Cooperation Systems of the Body Week 5

Y-M-O 23 (p.9) Write and illustrate a book about traveling through the body.

- This week continue writing.
- Finish writing one or two adventurers.
- Illustrate what you have written.

Writing Tips

Cooperation Systems of the Body Week 5

- Share your 10 ideas on the e-loop.
- Game plan:
 - If you write 2 adventures per week, by Week 6 you will have six adventures and a closing, because Week 6 you will only write one adventure plus closing.
 - Option: Write only one adventure per week and end up with four adventures and a closing by Week 6.
 - Week 7 is for editing, cleaning up, re-drawing, designing the cover and title page, printing, binding.
 - Week 8 is for practicing reading the adventure novel like poetry reading in a coffee house to a large group. This will be our show-and-tell about body.

Writing Sample

Cooperation Systems of the Body Week 5

Once in the throat, the paratroopers began to check out the lymph nodes. All the lymph nodes behind the ears, under the armpits, behind the knees and in the groin area appeared to be normal size and not enlarged indicating that no enemies had affected the body yet. Had these lymph nodes been swollen due to the fast production of white blood cells to kill invading bacteria, the paratroopers would have known the enemy agents had established a toehold. The enemy had not; however, the situation was about to change drastically.

"We're at the spinal cord. We'll slide down it and find out what they detected on the RADAR," said Sgt. McClure.

"There they are!" whispered a private.

"Bob, do you have the bazooka in your backpack?"

"Sure do, sir."

"Blast them."

"You got it."

KA-BOOM!!!

"Direct hit! We got them good, now let's get out of here" shouted serge.

Timeline Characters

Cooperation Systems of the Body Week 5

St. Martin [1] (man with a hole in his stomach)

Dr. William Beaumont [1] (physician who worked on St. Martin)

Vocabulary

Cooperation Systems of the Body Week 5

Digestive Organs

Teeth

Tongue

Salivary gland

Pharynx

Epiglottis

Esophagus

Stomach

Pyloric valve

Pancreas

Liver

Gall bladder

Small intestine

Duodenum

Jejunum

Ileum

Villi

Digestive Enzymes (Juices)

Enzyme

Saliva

Chyme

Pepsin

Hydrochloric acid

Ptyalin

Bile

Digestive Actions

Peristalsis

Digestion

Absorption

Other

Trachea

Appendix

Heimlich maneuver

Vocabulary (cont'd 2)

Cooperation Systems of the Body Week 5

Digestive Problems

Stomach ach/Indigestion

Ulcer

Gastroenteritis

Vomiting

Heartburn

Food poisoning

Gall stones

Excretory Problems

Diarrhea

Constipation

Colitis

Dysentery

Urinalysis

Dehydrated

Solid Waste Organs

Rectum

Anus

Colon (large intestine)

Liquid Waste Organs

2 Kidney

1 Bladder

2 Ureter tubes

1 Urethra

Excretory Actions

Excretion

Filter

Urine

Dialysis

Discovery and Design Week

Cooperation Systems of the Body Week 5

- Focus on God's incredible design of the human body
- His greatest creation!!

Activities

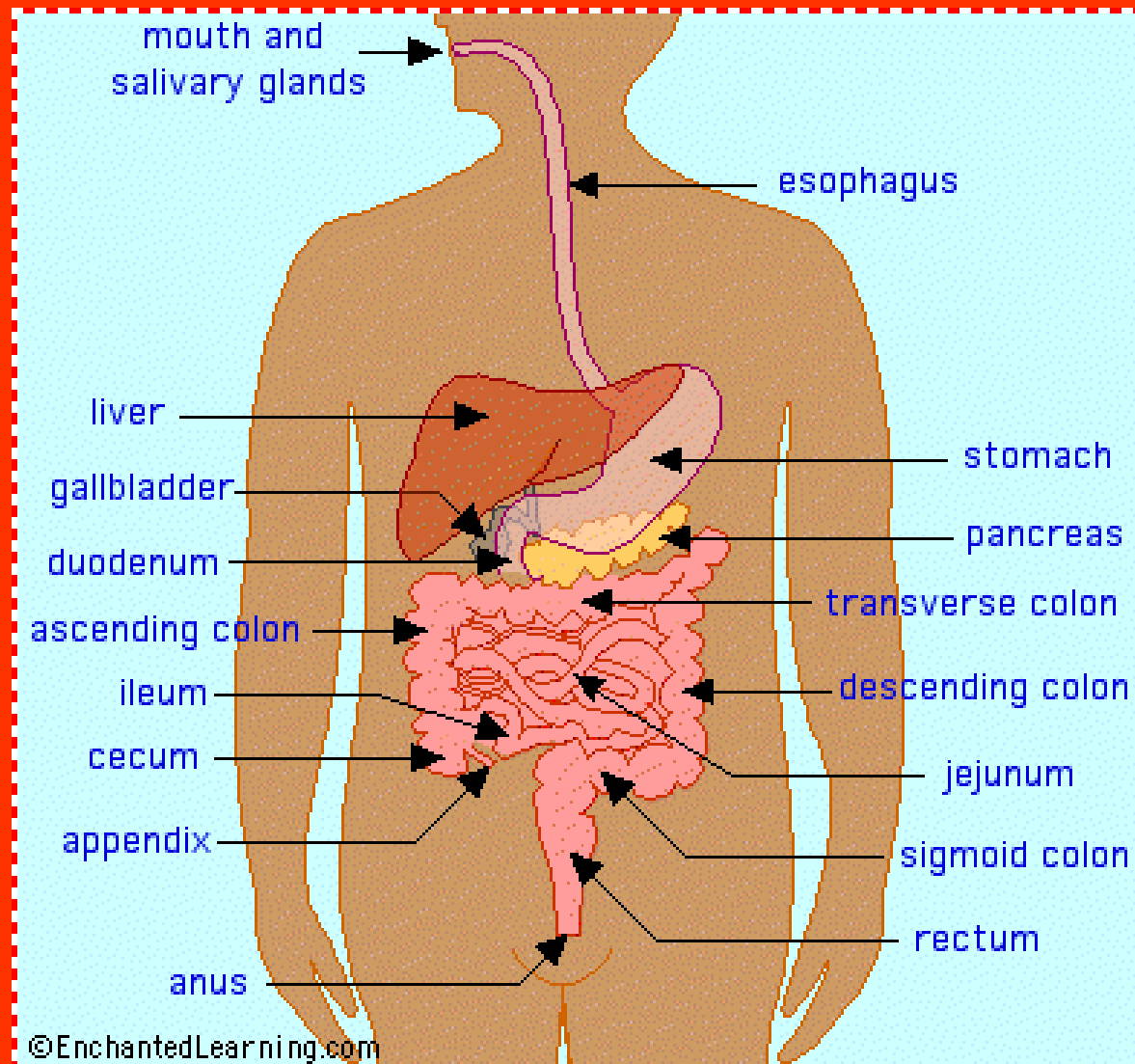
Cooperation Systems of the Body Week 5

Monday: Digestive System Organs

- 1 (p.30) Draw what you think your digestive track looks like.
- 2 (p.31) Learn the basic organs of the digestive system and each organs function.
- 7 (p.32) Research and make index cards of each step of digestion.
- 5 (p.32) Identify on your body where the major organs of the digestive system are.
Draw the digestive system on your body roll-out.

Digestive System

Cooperation Systems of the Body Week 5



Digestion by Organ

Cooperation Systems of the Body Week 5

1. Eat or chew food. (Mouth/Tongue)
2. Saliva breaks down starches. (Salivary glands)
3. Swallow. (Pharynx/Esophagus controlled by epiglottis)
4. Food is broken down further in stomach. (Stomach)
5. More break down in duodenum (Pancreas, liver, gall bladder, small intestines)
6. Food molecules absorbed into blood through villi. (Small intestine)
7. Nutrient-rich blood filtered through liver taking out harmful substances or wastes; liver directs how many nutrients will go to the rest of the body, and how many will stay behind stored in liver. (Liver)
8. Water is absorbed. (Large intestine)

Activities (cont'd 2)

Cooperation Systems of the Body Week 5

Tuesday: Process of Digestion

- 10 (p.32) Observe how your body reacts when you are hungry and smell food.
- 11 (p.32) Explain saliva and chew gum for a day.
- 12 (p.32) Test how long it takes saliva to break down a cracker in your mouth.
- 13 (p.32) Test for starch in different foods.
- 14 (p.33) Conduct an experiment to see enzymes in action.
- 16 (p.33) Get a piece of bread and simulate what teeth do.
- 17 (p.33) Eat an apple.
- 24 (p.34) Research digestive juices and what organs make them.

Enzymes

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Enzyme	Made	Destination	Breaks down
Amylase	Salivary glands Pancreas	Mouth Sm. intestines	Starch→sugar Starch→sugar
Pepsin	Stomach	Sm. intestine	Protein→peptide
Trypsin	Pancreas	Sm. intestine	Peptides→amino acids
Lipase	Pancreas	Sm. intestine	Fat→fatty acids
Pepti-dase	Sm. intestine	Sm. intestine	Polypeptides→peptides
Bile	Liver	Sm. intestine	Fat→fatty acids
Maltase	Sm. intestine	Sm. intestine	Double sugar→single sugar

Activities (cont'd 3)

Cooperation Systems of the Body Week 5

Wednesday : Digestion in Stomach and Intestines

- 19 (p.33) Stand on your head while drinking water through a straw.
- 20 (p.33) Show peristaltic motion by working a marble through rubber tubing.
- 21 (p.33) Test how stomach muscles help digest food.
- 23 (p.34) Make "apple soup".
- 26 (p.34) Experiment to see how bile acts like detergent in the intestine.

Peristalsis/Vomiting

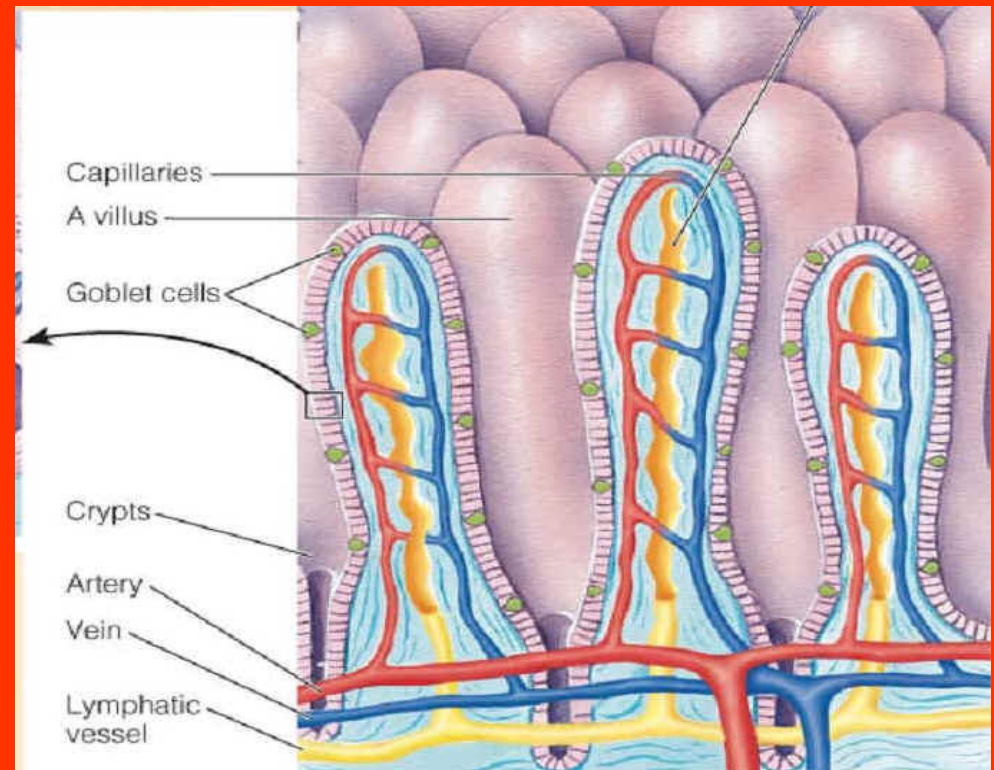
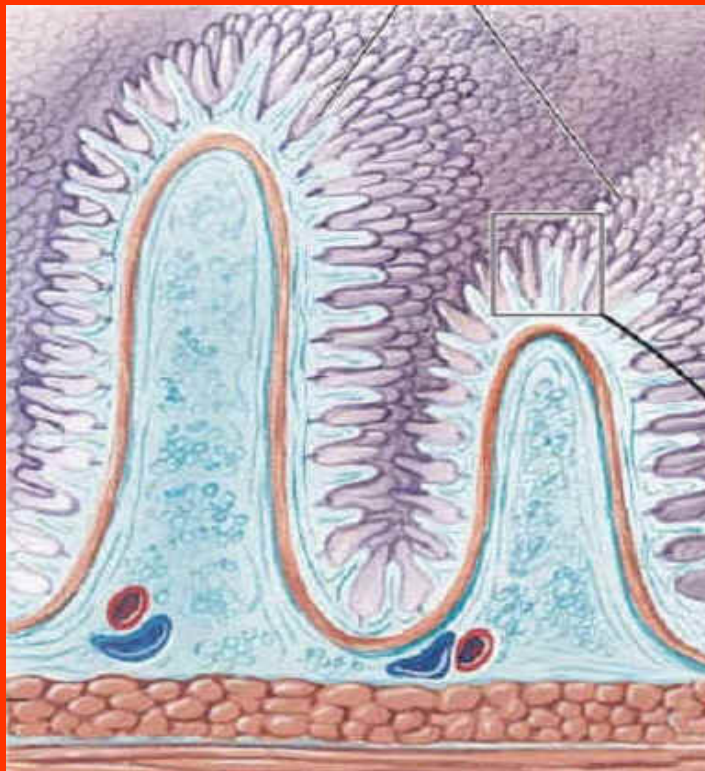
Cooperation Systems of the Body Week 5

Peristalsis - a series of organized muscle contractions that moves food through the digestive tract

- Automatic
- Can be reversed in vomiting
- Moves urine from the kidneys to the bladder
- Moves bile from the gallbladder to duodenum
- May be felt in the abdomen as gas moves
- Automatic contagion

Absorption

Cooperation Systems of the Body Week 5



Villi line the small intestines. They are like a tube 22 feet long in an adult lined with fuzzy shag carpet that absorbs the nutrients from the digested food.

Activities (cont'd 4)

Cooperation Systems of the Body Week 5

Thursday: Digestion Problems

6 (p.32) Guess how long your digestive tract would be if it were stretched out.

9 (p.32) Calculate amount of time to digest your last meal.

Research problems of the digestive system.

18 (p.33) Learn the Heimlich maneuver.

22 (p.33) Research why stomach growls.

Work cooperatively on your body novel.

Tooth Decay

Cooperation Systems of the Body Week 5

Cavities - decayed areas in teeth that develop into tiny holes.
Cavities, also called tooth decay

- **Process:**
 - Mouth naturally contains bacteria
 - Some bacteria grown sugars and cooked starches
 - When sugar/ starches aren't cleaned off your teeth, bacteria can convert them into acids in just 20 minutes
 - This forms plaque — a sticky film that coats your teeth
 - Acids in plaque attack the enamel forming holes — cavities
- **Cause:**
 - Not brushing teeth well
 - Frequent snacking and sipping sugary drinks.
 - If cavities are not filled, they get larger infection and toothache or tooth loss results
- **Prevention:**
 - Regular dental visits
 - Good brushing
 - Cheese may also help prevent cavities
 - Potato chips may be more harmful than a candy bar

Acid-reflux and Heartburn

Cooperation Systems of the Body Week 5

Heartburn - a burning sensation in the food pipe (esophagus), just below or behind the breastbone, usually after a big meal

- Constant heartburn is the most common symptom of acid reflux a disease in which stomach acid or, occasionally, bile flows up (refluxes) into your esophagus
- Can be managed with diet and over-the-counter medications

Ulcer

Cooperation Systems of the Body Week 5

- I. Peptic ulcers are open sores that develop on the inside lining of your stomach, upper small intestine or esophagus from bacterial infection or medications

Symptom of a peptic ulcer:

- Pain few minutes to many hours
- Worse when your stomach is empty or at night
- Stress and excessive alcohol can aggravate
- Often temporarily relieved by eating acid buffering food or by taking an acid-reducing medication
- Peptic ulcers are treated in just a few weeks

- II. Esophageal ulcers are sores in the esophagus from bacteria but can be aggravated by reflux of stomach acid

Food Poisoning

Cooperation Systems of the Body Week 5

Food Poisoning - inflammation of the intestines caused by bacterial infection from contaminated food

- Symptoms include fever, abdominal pain, diarrhea, nausea, and vomiting
- Types:
 - **Salmonella** - uncooked/undercooked chicken/ eggs; some seafood
 - **E. Coli** - from vegetables and meat contaminated by stools of animals
 - **Botulism** - home-canned foods not cooked long enough to kill bacteria; potatoes baked in aluminum foil; DEADLY
- Prevention
 - Wash Hands!
 - Wash fruits/ vegetables before eating/ cooking
 - Cook meat thoroughly
 - Keep hot food hot AND cold food cold
 - Refrigerate leftovers immediately

Gastroenteritis

Cooperation Systems of the Body Week 5

Gastroenteritis - inflammation of the stomach, small and large intestines; caused by a virus that causes vomiting/ diarrhea; also called the "stomach flu"

- Symptoms can include headache, fever, abdominal cramps
- Not serious illness, unless dehydration
- Very contagious
- Spread by contaminated food when food preparers do not wash their hands regularly after using the bathroom.
- Shellfish may be contaminated by sewage
- Drinking water can also be contaminated by sewage

Gallstones

Cooperation Systems of the Body Week 5

Gallstones - solid deposits of cholesterol that form stones in your gallbladder (may/ may not cause prob.)

- **Symptoms are chronic indigestion**
- **Causes and cures:**
 - Liver makes bile to digest fat and sends it to gall bladder for storage
 - People who eat too much fat get an imbalance in gall bladder and form stones as small as a pea or as big as golf ball
 - Gall bladders and stones can be removed by surgery
 - Without a gall bladder bile builds up in liver and flows into intestines slower
- **People at risk:**
 - Older, overweight, female
 - Rapid weight loss/ eating very low-cal diet

Cirrhosis of the Liver

Cooperation Systems of the Body Week 5

Cirrhosis - irreversible scarring of the liver; affects blood flow/function of liver

- **Symptoms include fatigue, nausea, weight loss, and swelling in legs and abdomen; jaundice and intense itching; bleeding from intestines**
- **Causes:**
 - Liver removes drugs, alcohol, and harmful waste from blood
 - Replaces/ repairs damaged cells quickly
 - Cirrhosis causes liver to make new cells too big, too fast
 - Forms scar tissue that slows liver function
 - Excessive use of alcohol
- **Treatment:**
 - Nutrition/ dietary changes
 - Liver transplant

Heimlich Maneuver

Cooperation Systems of the Body Week 5

Use when someone is
choking on a foreign object

Steps:

1. Place arms around waist
2. Make fist with one hand;
place free hand on fist
3. Put fist on abdomen/
above belly button
4. Thrust fist up and into
stomach 5 times

<http://www.personnelconcepts.com/product/heimlich-maneuver-poster/HCP-1-L/769/>



Activities (cont'd 5)

Cooperation Systems of the Body Week 5

Friday: Excretory

33 (p.35) Research parts of and how the kidneys work. Talk about filters.

27 (p.34) Use cheesecloth, chalk powder, and water to show how the intestinal wall filters out particles.

29 (p.34) Research excretory problems.
Draw excretory system on body roll-out.

35 (p.35) Design your own board game using the food canal. (Optional)

Work cooperatively on novel.

Silliness – Nip It Early

Cooperation Systems of the Body Week 5

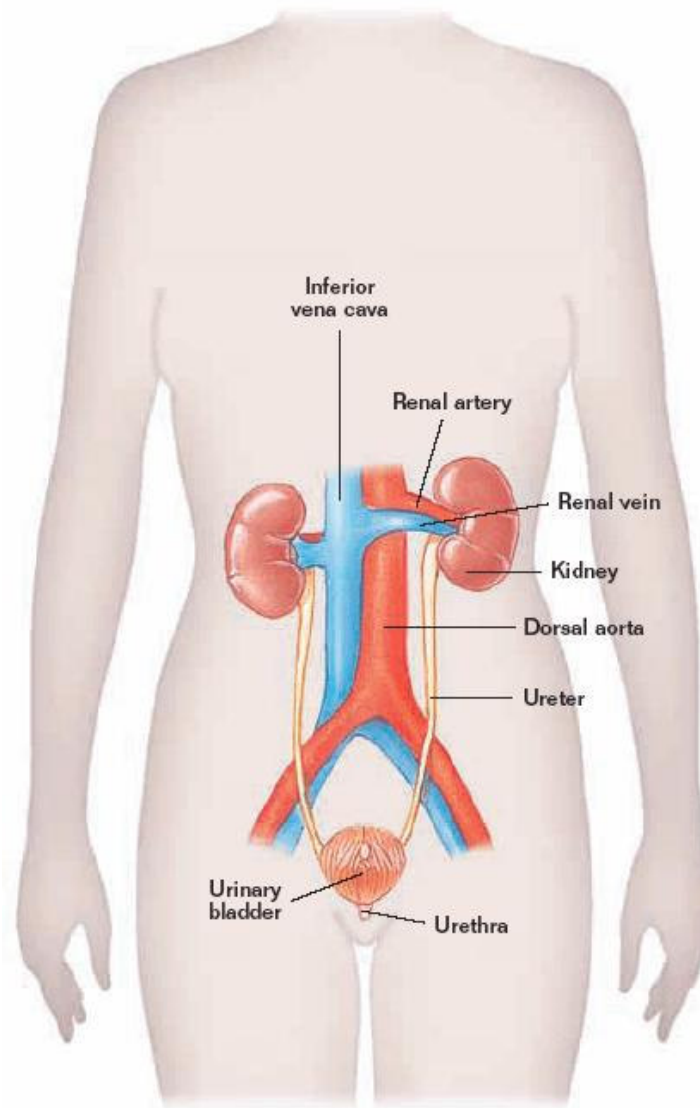
- Expect some laughter (We are talking about poop)

But ...

- Body wastes are **toxic**
- This is a **serious topic**

Excretory System

Cooperation Systems of the Body Week 5



Kidney Stones

Cooperation Systems of the Body Week 5

Kidney stones – small, hard deposits of minerals on the inner surfaces of kidneys

- Symptoms include pain in the side and back, pain when urinating, constant urge to urinate
- Causes:
 - Kidneys remove minerals and waste from blood in form of urine
 - Stones form if there are too many minerals for fluid to dilute; minerals crystallize and cause pain
- Treatment:
 - Dissolve stone with medication
 - Flush out with water
 - “Passing” stone out with urine; very painful
 - Removed with surgery

Nephrosis/ Nephritis

Cooperation Systems of the Body Week 5

Nephrosis - a kidney disorder where the kidneys fail to filter the blood properly allowing a massive leak of protein and excessive water into the urine

- In children, minimal change nephrosis occurs mostly in boys ages 2-6 yrs. possibly after a strep infection
- Puffiness and pitting of skin (edema)

Nephritis - a kidney disorder where kidneys fail to filter the blood properly allowing massive leaking of proteins, water and blood into the urine

Kidney Failure

Cooperation Systems of the Body Week 5

Kidney failure is the sudden loss of the kidneys' ability to filter waste from blood allowing dangerous levels of excess fluid and waste to stay in the blood

- **Common in people who are already hospitalized and weak:**
 - Poor heart
 - Severe dehydration
 - Atherosclerosis
 - Escherichia coli (E. coli) bacteria
 - Inflammation in the kidneys from allergic reaction to a drug
aspirin, ibuprofen, antibiotics, diuretics
 - Toxins such as alcohol or drugs
 - Extremely low blood pressure from severe bleeding or shock
after a traumatic injury
- **Kidney failure may be reversible, if in good health**
- **If not reversible people may need dialysis which is an artificial filtering machine people must be hooked up to 3 time per week for 2-4 hrs. or even kidney transplants** ³⁹

Urinalysis

Cooperation Systems of the Body Week 5

Urinalysis is a tool used by doctors to help detect substances in the urine

- Ordered routinely to detect any problems with kidneys or bladder
- Looking for too much sugar, protein, or blood in urine

Diarrhea/ Constipation

Cooperation Systems of the Body Week 5

- I. Diarrhea - food ingested passes too quickly/ in too large amt. through colon w/o absorbing water out of the waste and resulting in a watery bowel movement

The most common causes of diarrhea include:

- Viruses
- Bacteria
- Parasites
- Contaminated food or water
- Medications. Antibiotics destroy both good and bad bacteria

- II. Dysentery - gastrointestinal disorders of inflamed intestines/ colon; cramps, diarrhea, blood in stool caused by virus, bacteria, or worms

- III. Constipation - infrequent bowel movements, pass hard stools, or strain during bowel movements less than 3 times per week

End constipation by:

- Exercising more
- Eating high-fiber foods
- Drinking more water

Permission Slip

Permission Coupon

Free pass to skip one activity
or other assignment
(Feel free to copy as often as needed)

Permission Coupon

Free pass to skip one activity
or other assignment
(Feel free to copy as often as needed)

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Free pass to skip one activity
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Field Trips

Cooperation Systems of the Body Week 5

15 (p.33) Talk to a dietitian about how they prepare food for the elderly who have few or no teeth.

31 (p.35) Visit a medical laboratory or your doctor's office to observe urinalysis or purchase own urine dip sticks for urinalysis.

Go to the butcher shop and look at or buy a tongue.

Focus of the Week

Cooperation Systems of the Body Week 5

- Practicing cooperation
- Learning about the digestive and excretory systems
- Seeing cooperation among systems of the human body
- Introducing the human anatomy
- Emphasizing God's design in the human body
- Learning how to research about the body
- Learning parts/functions of digestive/excretory sys.
- Conducting tests on enzymes breaking down food
- Researching many digestive juices what they digest
- Testing peristalsis and learning the Heimlich maneuver
- Drawing digestive/excretory systems on body roll-out
- Researching the problems of digestive/ excretory sys.
- Conducting experiments about large intestines
- Continuing to write body adventure novel

Suggestions for Dad

Cooperation Systems of the Body Week 5

- Do a weekend project around the house that includes the kids. Talk about cooperation and see that they work together.
- Watch for language that is cooperative among the children, i.e. "Sure you can have one of my cookies," or "Would you like to play with this for a while?" or "No, you go first."
- Teach the family from Phil. 2:2-3

Do nothing from selfishness or empty conceit, but with humility of mind regard one another as more important than yourselves;

do not {merely} look out for your own personal interests, but also for the interests of others.

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Thanks,
Wade and Jessica Hulcy