

### normal microbiota digestive system

not usually general microbes in esophagus, stomach and duodenum

microbes in teeth, tongue, sm. intestine, colon, rectum

microbiota feed, outcompete pathogens, produce vitamins

oral antimicrobials

mucous membranes prevent microbes entering blood

### bacterial diseases of the digestive system

dental erosion of teeth; can result in  
caries holes/pits in teeth/tooth loss

bacteria produce dextran (sticky sugar)

plaques metabolize dextran

bacteria invades dentin and pulp (eroding teeth)

decades enamel, then dentin, then pulp

period- inflammation of surrounding  
ontal tissues (gingiva= gums)  
disease

tartar trapped

anaerobic pockets- porphy-  
romonas gingivalis (acute necro-  
rizing ulcerative gingivitis)

teeth loosen and fall out

enzymes are produced causing  
pigmented, eroding and change  
of colour in gums

1 healthy gingivae 2 gingivitis 3  
periodontal pockets 4 period-  
ontitis

peptic abdominal pain - erosion of  
ulcers stomach or duodenum lining

### bacterial diseases of the digestive system (cont)

perforations- internal bleeding,  
bowel obstruction (could lead to  
shock)

1 bacteria invade mucus and  
attach to gastric epithelial cells

2 helicobacter, its toxins, and  
inflammation cause the layer of  
mucus to become thin

3 gastric acid destroys epithelial  
cells and underlying tissues

antibiotics and acid-inhibiting  
drugs, or acid reduced diet

bacterial diarrhea, nausea, vomiting,  
gastro- abdominal pain, cramps, kidney  
enteritis failure, anemia, **dysentery**-  
ulceration or bleeding of  
intestinal wall.

can be caused by: poorly  
prepared foods, contaminated  
water, poor sanitation conditions

treated by self-administered,  
electrolytes, antidiarrheal drugs  
<- not good choice keeps  
everything in body

cholera *vibrio cholerae*

loss of electrolytes

rice-water stool (contains  
mucus), dehydration, hypoka-  
lemia, hypovolemic shock

supportive care- replacing fluids

shigel- shigella  
losis

shigella enters epithelial cell  
lining intestinal tract

### bacterial diseases of the digestive system (cont)

shigella multiplies inside cell

shigella invades neighbouring  
epithelial cells thus avoiding  
immune defenses (shiga toxins  
released)

an abscess forms as epithelial  
cells are killed by the infection.  
The bacteria rarely spread in  
the blood stream

treated antibiotics if necessary

traveler's *escherichia coli*- a cloiform  
diarrhea

virulent genes:: fimbriae,  
adhesins, toxins

numerous antigens: O<- found  
on cell, K <- found on capsule,  
H<- found on flagella

dangerous strain: E. coli  
O157:H7 (binds to neutrophils)

loss of fluids + electrolytes

attachments to intestinal cells +  
rids good E. coli

treatment replace lost fluids..  
avoid antidiarrheal drugs

campyl- *campylobacter jejuni*  
obacter  
diarrhea

improper cooked poultry

colonizes jejunum, ileum, colon  
adhesins, cytotoxins, lipid A

antimi- *Clostridium difficile*  
crobial-  
asso-  
ciated  
diarrhea

5-10 bowel movements a day

### bacterial diseases of the digestive system (cont)

severe diarrhea + inflammation, colon lesions= pseudomembranous colitis

Toxin A: breaks junctions of mucous membranes

Toxin B: kills colon cells

treatments: metronidazole, vancomycin, eat probiotics fecal transplant

salmonellosis and typhoid fever

*Salmonella enterica*

salmonellosis- surface of egg shell

typhoid fever- blood stream infection spreads

1 salmonella attaches to epithelial cells lining the sm. intestine

2 salmonella triggers endocytosis

3 salmonella multiplies within food vesicle

4 salmonella kills host cell, inducing fever, cramps, and diarrhea

5 bacteremia: salmonella moves into bloodstream

treat with antibiotics

bacterial food poisoning

intoxication (enterotoxin)

symptoms depend on toxin (5 different toxins of *staphylococcus aureus*)

1-6 hours after food eaten intoxication occurs

### bacterial diseases of the digestive system (cont)

mumps mumps virus, *Rubulavirus genus*

inflammation, swollen glands, fever

parotitis- inflammation of parotid gland

treated w/ comfort care

viral gastro-enteritis consuming fo contaminated food

symptoms 24hrs after consumption

cramping, diarrhea, nausea, vomiting, complications rare

resolve after 1 week

fecal-oral route

common agents: calcivirus (norovirus). astrovirus, rotavirus <- most severe vaccine for it

viral inflammation of liver hepatitis

jaundice, abdominal pain, abnormal urine and stool

eventual coma

chronic infection = cirrhosis (scarring of liver), liver failure, liver cancer