

Best Format

ORGANIZATION OF PATHOGEN CHARTS

VIRAL

NON-VIRAL

ENVELOPED NON-ENVELOPED

GRAM(+)

GRAM(-)

MODES OF TRANSMISSION

- *Transmission by vectors/infected animals
- *Transmission by contact with infected person or infected surfaces
- *Transmission mainly by sexual intercourse person
- *Transmission by inhalation
- *Transmission of disease to dogs only

MODES OF TRANSMISSION

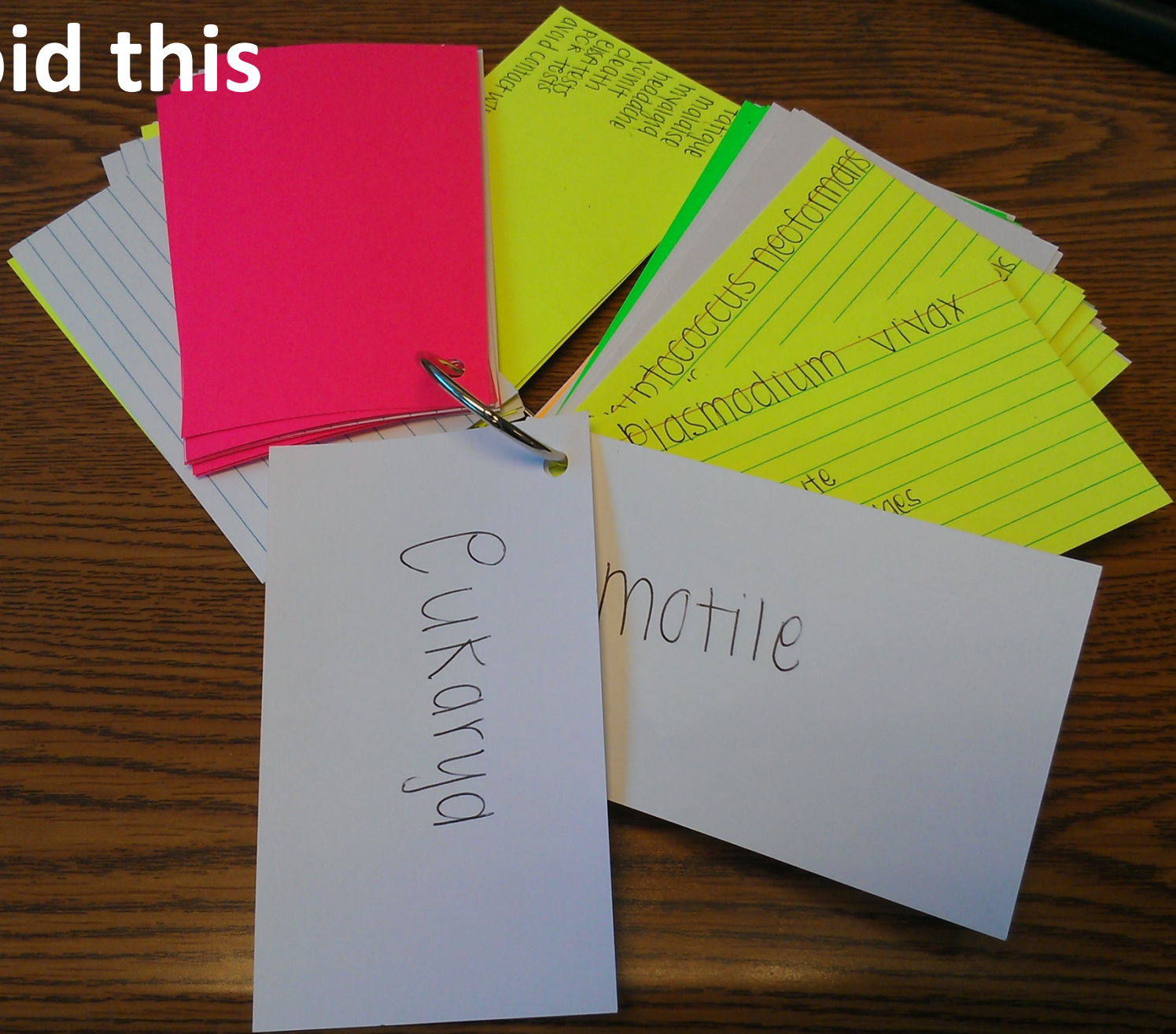
- *Transmission by ingestion of contaminated food
- *Transmission by direct contact with mucus secretions or person to contact/contaminated surfaces
- *Transmission by inhalation
- *Transmission by vectors/infected Animals
- *Nosocomial transmission

VIRAL

Non-enveloped

Enveloped

Avoid this



Avoid this

Non-enveloped

Disease Name(s) Cytomegalovirus

VIRAL PATHOGEN CHART

Name of virus:
 • Cytomegalovirus
 Common name, if any:
 • CMV HVV5
 Nucleic acid:
 •
 Envelope:
 •

pathmicro.med.sc.edu

Pathogenic Properties: (Hint: Refer to the *Pathogenic Properties (Virulence Factors) of Some common Pathogens* handout given in class):

- Cytomegalovirus causes no symptoms in children and at most mild disease in adults.
- The virus first infects the upper respiratory tract and then local lymphocytes. Circulating lymphocytes then spread the virus to other lymphocytes and monocytes in spleen and lymph nodes. The virus finally spreads to a variety of epithelial cells including those of salivary glands, kidney tubules, testes, epididymis and cervix

pathmicro.med.sc.edu

THE DISEASE:

Geographic occurrence:

- In third world countries with more crowded conditions, the virus is found in a much higher proportion of the population than in western countries.

High risk individuals:

- fetus in a pregnant woman and to the newborn via lactation

pathmicro.med.sc.edu

Reservoir:

- saliva glands
- genitals
- lactate glands
- humans/animals

NA
HNA1

anced
arch
nd offi-

ogram
g, and
statio-

which
ge.

g

ing
ental
ntive

g

PRO
EUK

NONVIRAL PATHOGEN CHART

Disease Name(s)

Scientific name of pathogen: *Brucella abortus*
 Domain classification: Bacteria
 Prokaryotic or eukaryotic? Eukaryotic

Pathogens handout given in class):

THE DISEASE: Brucellosis

Geographic occurrence: Worldwide
High risk individuals: People who have been previously exposed, people in contact with domesticated animals
Reservoir: Various wild, feral and domesticated animals. Frequently invade mammary glands of infected mammals
Part(s) of host body infected: Mainly the mammary glands and testicles
Method(s) of transmission: Zoonosis affecting domestic animals is caused by contact with milk, urine, and genital organs, unpasteurized milk, undercooked meat.
Portals of entry: Mouth, conjunctivae, respiratory tract, and abraded skin
Incubation period: 1-2 months
Period of illness: Few weeks, many months, maybe years
Contagious Period: 1-2 months

Signs/Symptoms: Muscular pain and sweating, high fevers.
Serious complications: In humans, brucellosis can be a serious, debilitating and sometimes chronic disease that may affect a variety of organs. Most cases are caused by occupational exposure to infected animals or the ingestion of unpasteurized dairy products. This disease remains a common and serious problem in some parts of the world. In

SCHOLARSHIP APPLICATION DEADLINES

these dates on your calendar:

- 5 — High school juniors can start applying online for an Air Force ROTC scholarship.
- ber 1 — Final day for submission of online applications.
- ry 13 — Postmark deadline for scholarship applicants to submit all required paperwork.

orce ROTC selection board evaluates your scholarship application for:

- l fitness assessment.
- of extracurricular activities.
- ic composite consisting of your GPA, SAT or ACT scores, class ranking, and number of honors or advance
- nt courses taken.

ip application details can be found at AFROTC.COM.



REWARDING LIFESTYLE

Air Force ROTC is a great way to complement your college lifestyle. You still have time for a job, to join a sorority or fraternity, and take part in other social activities.

For more information, talk to your high school counselor or an Air Force ROTC representative. Also, call 1-866-4AFROTC or visit our web site at AFROTC.COM.

Avoid this

Pathogens	Modes of transmission	Parts of host body infected	Portal of entry	Complications
Rhinovirus (common cold)	spread through droplets in air from human contact	Upper respiratory tract	mouth, eyes, or nose	Runny nose, sore throat, cough, sneezing, congestion, acute ear infection, wheezing, sinusitis
Poliomyelitis virus (polio)	Ingestion of contaminated water, person to person	feces, saliva	mouth	Stiffness in neck and limbs, fever, headache, nausea, 95% asymptomatic, respiratory muscle paralysis, permanent cripple limbs
Rubeola virus (measles, morbilli)	Person to person	face, neck, body	Respiratory tract	Full body rash, Koplik's spots, fever, red eye bronchopneumonia, laryngotracheobronchitis, diarrhea
Human papillomavirus (genital warts)	genital contact	Mouth, throat	Reproductive organs	Asymptomatic, cardiovascular, cervical cancer
Hepatitis A	close person-to-person contact, sexual contact w/an infected person, ingestion of contaminated food or drinks	liver, bloodstream	fecal-oral route	loss of appetite, nausea, vomiting, abdominal pain, gray-colored bowel movements, joint pain, jaundice
Rotavirus	fecal-oral route		Fecal-oral	severe watery diarrhea

Avoid this

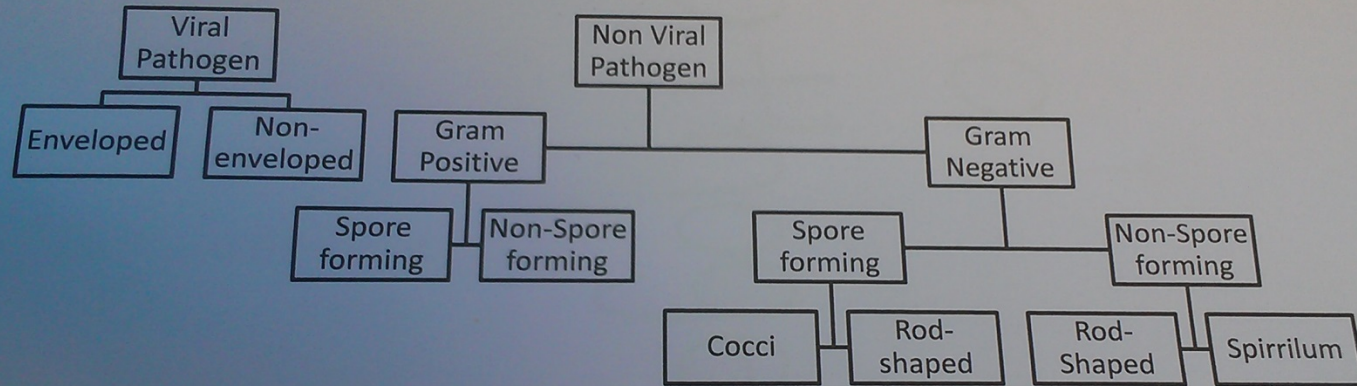
Pathogen Group 1 (Nonviral)

	<i>Clostridium botulinum</i>	<i>Clostridium perfringens</i>	<i>Clostridium tetani</i>	<i>Clostridium difficile</i>	<i>Corynebacterium diphtheria</i>	<i>Bordetella pertussis</i>
Disease Name	Botulism	a. Gas gangrene b. Food poisoning	Tetanus (lockjaw)	Antibiotic-associated diarrhea; pseudo-membranous colitis	Diphtheria	Whooping Cough
Domain	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria
Prokaryotic/Eukaryotic	Prokaryotic	Prokaryotic	Prokaryotic	Prokaryotic	Prokaryotic	Prokaryotic
Gram Stain & Morphology	+ Bacillus	+ Bacillus	+ Bacillus	+ Bacillus	+ Bacillus (club-shaped)	- Bacillus (rod-shaped)
Spores	Large, subterminal	Endospore	Terminal spores	Endospore	--	--
Motility	Peritrichous flagella	--	Peritrichous flagella	Peritrichous flagella	--	--
Oxygen Requirements	Obligately anaerobic	Obligately anaerobic	Obligately anaerobic	Obligately anaerobic	Aerobic	Aerobic
Distinguishing Features	Most dangerous foodborne poisoning in humans. One pint of pure toxin could kill everyone in world.	Most common cause of gas gangrene. Veg. cells are killed when cooked; however, spores may still remain. Will not grow at refrigeration or freezing temps.	Exotoxin is a potent neurotoxin. Once spasms start, cannot stop.	Most common cause of nosocomial diarrhea (up to 30%) although overall rare.	Pleomorphic, stains unevenly. Tough grayish membrane forms in back of infected throat. .001mg of toxin is enough to kill 91kg person.	3 stages: 1) catarrhal; 2) paroxysmal; 3) convalescence. Immunity following infection lessens severity of future attacks
Pathogenic Properties	Powerful exotoxin: neurotoxin that blocks nerve impulses from passing into muscle (can't contract), causes flaccid paralysis	(a) grows in dead & poorly O ₂ tissue, releases alpha-toxin that kills cells (b) toxin causes abdominal cramps & watery diarrhea	Exotoxin acts against nerve cells that normally inhibit muscle contraction, causing constant contraction of muscle (state of tetanus).	Toxins kill intestinal epithelial cells & cause small patches called pseudomembranes, composed of dead epith., inflammatory cells, & clotted blood to form on intestinal wall.	Infection is in upper respiratory tract (often throat); exotoxin absorbed into blood, kills heart, kidney & nerve cells by blocking protein synthesis.	Grows in upper respiratory tract, trachea, & bronchioles; ciliary action slowed; toxins released cause death of epithelial cells
Geographic Occurrence	Worldwide	Worldwide (except N. African desert)	Worldwide	Worldwide	Worldwide	Worldwide
High Risk Individuals	People who eat improperly	(a) People with exposed skin w/ reduced O ₂ supply. (b)	People exposed to soil or animal	People recently treated w/ broad-spectrum antibiotics; older adults	Anyone who has not been immunized. Children are most	Anyone not vaccinated, more common in children

A little better, but still avoid

Name	Type	Gram stain	Spores	Motility	Oxygen requirements	Shape	Part of Body Infected
<i>Haemophilus influenzae</i>	Bacteria	Gram-negative	Non-sporeforming	Non-motile	Facultative anaerobic	Rod	Nose, throat
<i>Klebsiella pneumoniae</i>	Bacteria	Gram-negative	Non-sporeforming	Non-motile	Facultative anaerobic	Rod	Urinary tract, respiratory tract
<i>Shigella sonnei</i>	Bacteria	Negative	Non-forming	Non-motile	Facultative Anaerobic	Rod-shaped	GI Tract, Large Intestine
<i>Yersinia pestis</i>	Bacteria	Negative	Non-forming	Non-motile	Facultative Anaerobic	Coccobacillus	chest, abdominal area, digits, lungs, lymph nodes, necl, groin
<i>Francisella tularensis</i>	Bacteria	Negative	Non-forming	Non-motile	Facultative Anaerobic	Coccobacillus	muscles, eyes, neck, joints, armpits, groin, organs
<i>Acinetobacter baumannii</i>	Bacteria	Gram-negative	Non-sporeforming	Non-motile	Obligate aerobic	Coccobacillus	Respiratory tract, blood, Urinary tract, skin, eyes
<i>Neisseria meningitidis</i>	Bacteria	Gram-negative	Non-sporeforming	Non-motile	Obligate aerobic	Circular	Nasopharynx
<i>Chlamydia trachomatis</i>	Bacteria	Negative	Non-forming	Non-motile	Aerobic	Coccoid, rod-shaped	Eyelid, eyelashes,
<i>Chlamydia genital virus</i>	Bacteria	Negative	Non-forming	Non-motile	Aerobic	Coccoid, Rod-shaped	(F)-Cervix, uterus, (M)-Urethra
<i>Bordatella pertussis</i>	bacteria	negative	non spore	non motile	aerotolerant	rod	immune system
<i>Neisseria gonorrhoeae</i>	Bacteria	Negative	Non-forming	Non-motile	Obligate Anaerobe	Coffee bean shaped, coccus	Upper/lower tract, pharynx, ophthalmic area, rectum, bloodstream
<i>Escherichia coli</i>	Bacteria	Gram-negative	Non-sporeforming	Flagella	Facultative anaerobic	Rod	Intestine, urinary tract, blood stream, CNS
<i>Salmonella enteritidis</i>	Bacteria	Gram-negative	Non-sporeforming	Flagella	Facultative anaerobic	Rod	GI Tract
<i>Salmonella typhi</i>	Bacteria	Gram-negative	Non-sporeforming	Flagella	Facultative anaerobic	Rod	GI Tract

Optional extra



Non-enveloped

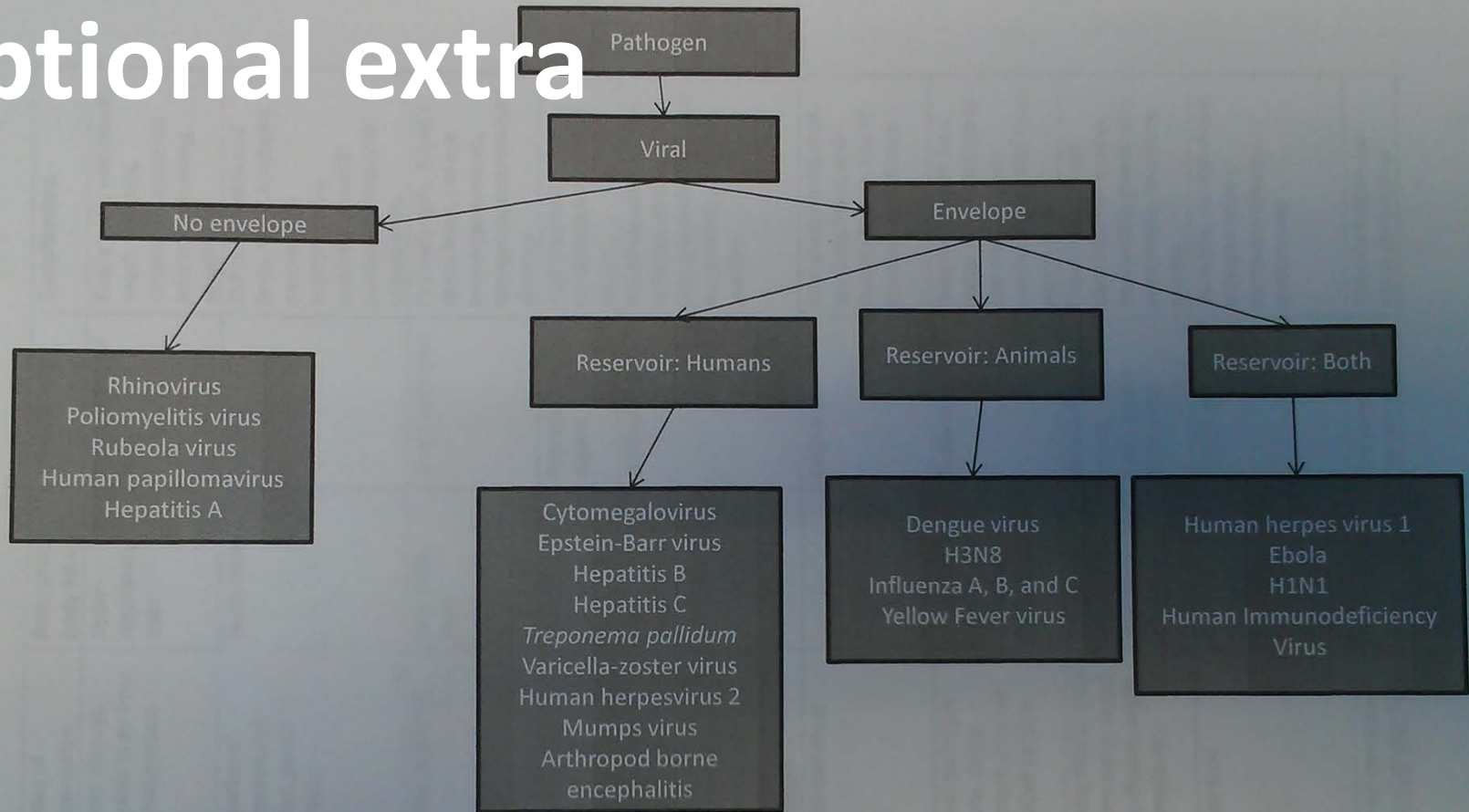
Viral

Non-Viral

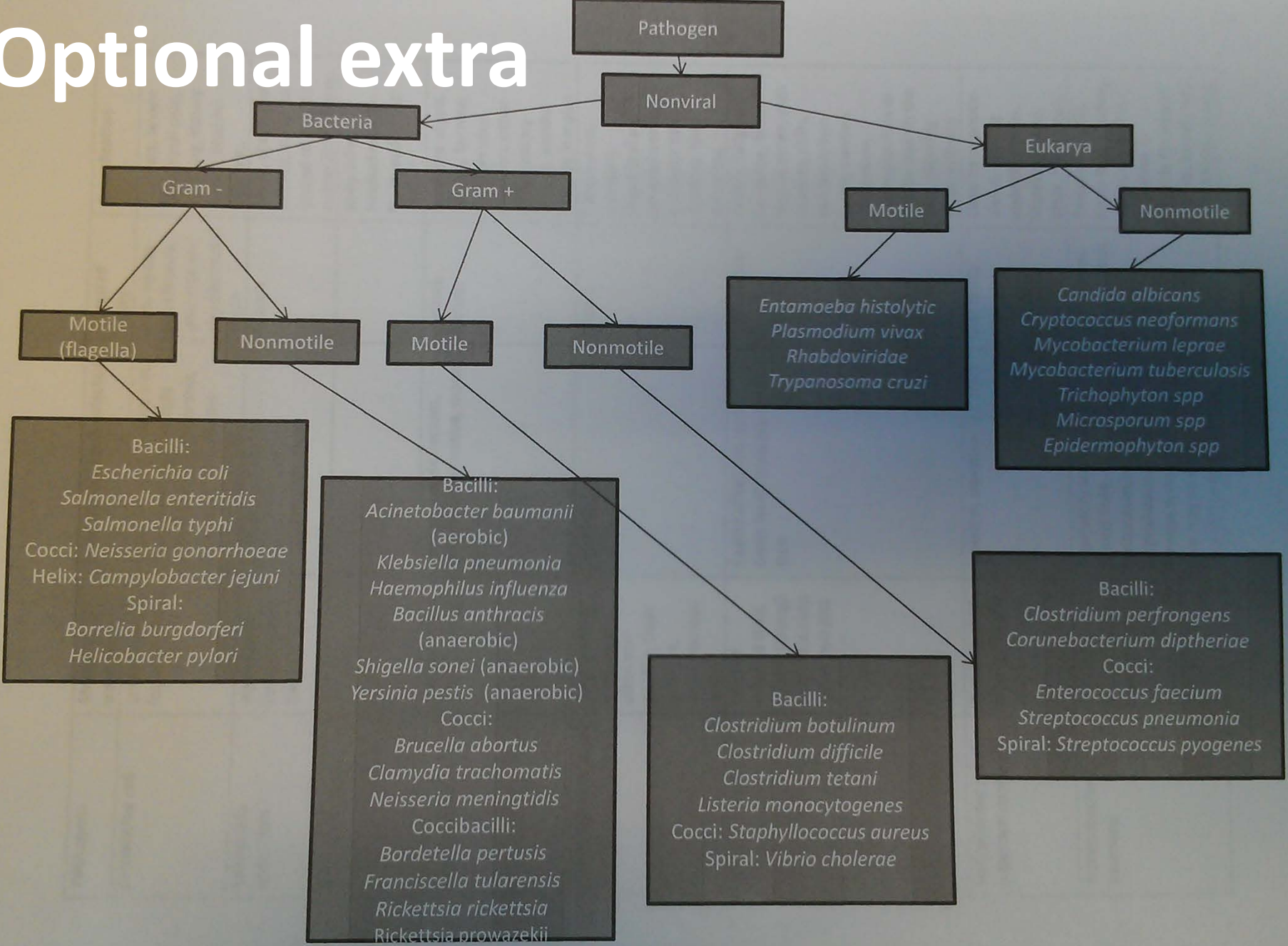
Spore forming

Gram+

Optional extra



Optional extra



Bacilli:
Escherichia coli
Salmonella enteritidis
Salmonella typhi
Cocci: *Neisseria gonorrhoeae*
 Helix: *Campylobacter jejuni*
Spiral:
Borrelia burgdorferi
Helicobacter pylori

Bacilli:
Acinetobacter baumannii (aerobic)
Klebsiella pneumonia
Haemophilus influenza
Bacillus anthracis (anaerobic)
Shigella sonnei (anaerobic)
Yersinia pestis (anaerobic)
Cocci:
Brucella abortus
Chlamydia trachomatis
Neisseria meningitidis
Coccibacilli:
Bordetella pertussis
Francisella tularensis
Rickettsia rickettsia
Rickettsia prowazekii

Bacilli:
Clostridium botulinum
Clostridium difficile
Clostridium tetani
Listeria monocytogenes
Cocci: *Staphylococcus aureus*
Spiral: *Vibrio cholerae*

Entamoeba histolytic
Plasmodium vivax
Rhabdoviridae
Trypanosoma cruzi

Candida albicans
Cryptococcus neoformans
Mycobacterium leprae
Mycobacterium tuberculosis
Trichophyton spp
Microsporium spp
Epidermophyton spp

Bacilli:
Clostridium perfringens
Cornebacterium diphtheriae
Cocci:
Enterococcus faecium
Streptococcus pneumoniae
Spiral: *Streptococcus pyogenes*

Optional extra

