1. Staphylococci aureus:

→ Sketchy: Ancient Egypt

→ G +ve cocci + cluster + non-motile

→ Catalase +ve + Coagulase +ve

→ Nasal carriage flora - 20-50% + people in hospitals ↑ + eczema + on fomites

Sphynx nose

→ Golden yellow colonies

→ Can undergo variable hemolysis

→ Teichoic acid & peptidoglycan - antigenic. Activate immune response. Endotoxin-Like

→ MSCRAMM protein attachment

→ Protein A

Moses wand A

→ Clumping factor A (+ coagulase) note: strep. has kinase which does opposite of staph. aureus

Moses wand A

→ Penicillin Binding protein - antibiotic resistance

→ β-lactamase - antibiotic resistance

→ Skin infection! Skin infection! Skin infections! - 1st staph aureus. 2nd Strep. pyogens

Bakers sketchy

→ Skin infection - Abscess & Pus. (pimple).

→ Skin infection - Impetigo + Folliculitis + Furnucle/Boils + carbuncle

→ **Osteoarticular infections** - Bone & joint infections

Bandage on camel

→ **Infective / Acute endocarditis** - Acute = Staph. aureus. Subacute = Strep. mitis

Camel running fast with ♡. Fast acute endocarditis

→ **Bacteremia** - shock

→ **Pleuropulmonary**

Man coughing

→ **Scalded skin syndrome** - Toxin. Children

Burnt bald mane

→ **Toxic shock syndrome** - Superantigen exotoxin. Hypotension. + Streptococci pyogens

Superman cape - SPE

→ **Food poisoning** - Heat stable enterotoxin, vomiting + diarrhea ... etc + ACUTE short incubation period 1 - 8 hours until onset + Fast recovery / convalescence (cook rotten meat? STILL TOXIC!)

Poisoned women

→ **Penicillin => PRSA => Methicillin => MRSA => Vancomycin => VRSA !!**


S. aureus
colonizes near here
osteoarticular infection
Rapid
Acute endocarditis
protein A
+
Clumping factor A
Coagulase +ve
Scalded skin syndrome
Super cape
Super antigen exotoxin
Shock hypotension
food
poisoning
toxin
β-hemolytic
Catalase +ve
sketchymicro
www.sketchymicro.com

2. Staphylococci epidermis:

→ Sketchy: Plumber

→ G +ve cocci + cluster + not motile

→ Catalase +ve + Coagulase -ve

→ Novobiocin sensitive

Belly button showing

→ Normal flora - skin + respiratory + GI tract

Dirt on plumber

→ Greyish white colonies

→ Biofilms, sticks to objects

Gunk on valves

→ Infections due to Catheter (+ entercocci!) , Shunt , Prosthetics

Gunk. Biofilm. Sticky

Catheter → UTI

Plumbers tubing

Shunt → Chronic inflammation

Prosthetics → endocarditis in artificial valve

orthopedic prosthetics

Hardware box

3. Staphylococci saprophyticus:

→ Sketchy: Female

→ G +ve cocci + cluster + not motile

→ Catalase +ve + Coagulase -ve

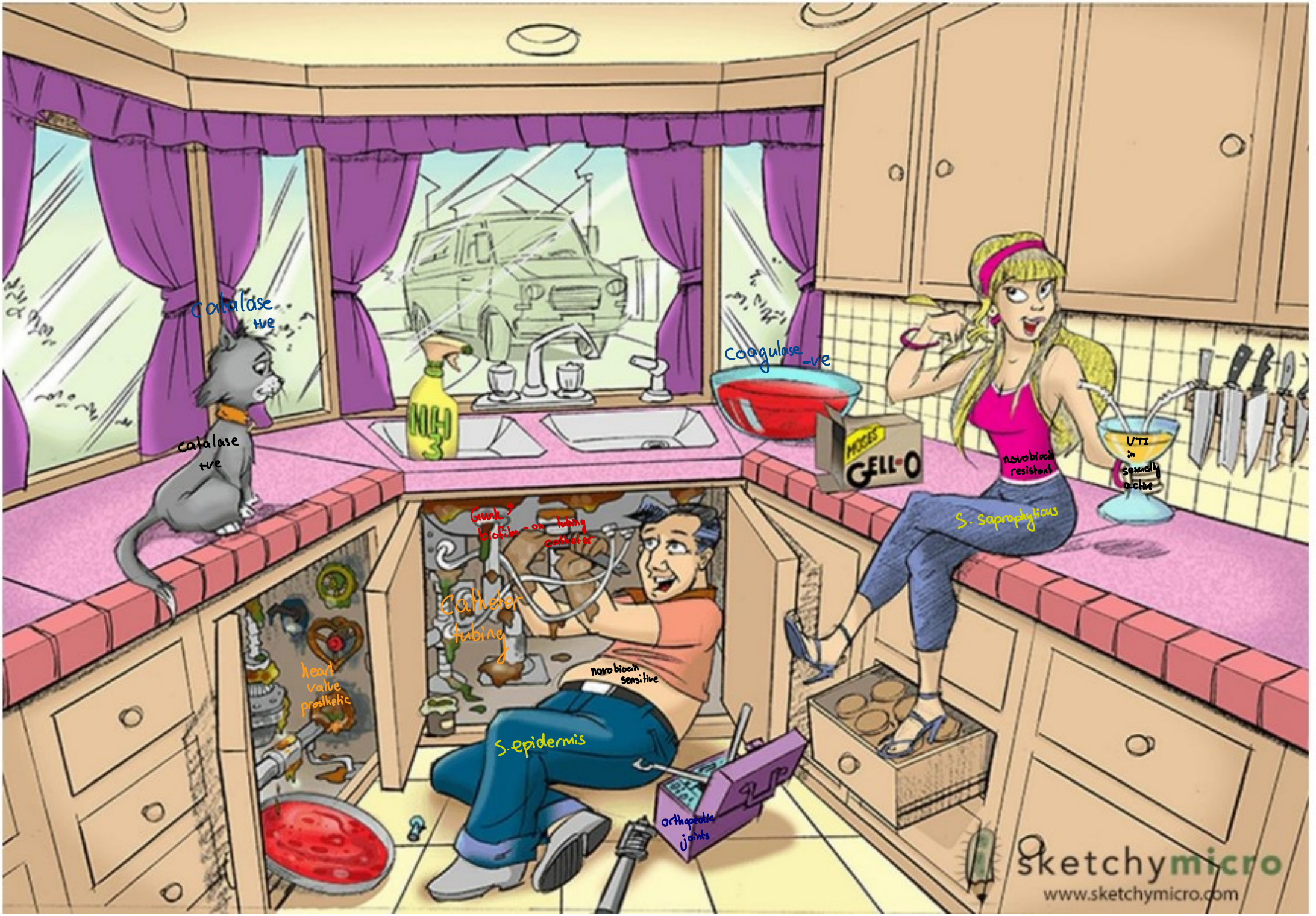
→ Novobiocin resistant

Belly button covered

→ Normal flora - skin + respiratory + GI tract

→ UTI in sexually active females

Bladder shaped cup


catalase +ve
catalase +ve
coagulase -ve
JELL-O
novobiocin resistant
S. saprophyticus
UTI in sexually active
Gunk / biofilm - on tubing catheter
Catheter tubing
novobiocin sensitive
S. epidermis
heart valve prosthetic
orthopedic joints
sketchymicro
www.sketchymicro.com

4. Streptococci pyogens:

→ Sketchy: Pyogens = Pie = Bakers

→ G +ve cocci + chain

→ Catalase -ve. complete β-hemolysis

→ Respiratory microbiota + common in urinary tract flora

→ Lancefield group A antigen

Hot Apple Pie

→ bacitracin sensitive

Dog. Basset hound EXPOSED. Sensitive

→ Has capsule. Made of hyaluronic acid. Prevents phagocytosis

Hot Apple Pie covered → capsule

→ M Protein - antiphagocytosis, blocks C3b + adhesion + invasion

Master chef. Swat away hand, antiphagocytosis

→ F Protein - invasion

→ C5a peptidase - serine protease that breaks down C5a

→ SPE - superantigen exotoxin + Hypotension & shock

Baker wearing cape

→ Streptolysin S - non immunogenic + oxygen stable + Hemolysin that lyses blood cells

→ Streptolysin O - immunogenic (except cutaneous infection ASO antibodies) + oxygen labile + Hemolysin that lyses blood cells

Donuts + Lady with ∧∧ tongs. ASO

→ Streptokinase - anti-coagulant, breaks blood clots

Pi cupcakes

→ DNAase - depolymerize DNA in pus, NETs

Cinammon twists

→ **Bacterial Pharyngitis** (imp!) - Bacterial tonsillitis with white pus. (no pus = viral)

Bakers wear Red handkerchief around neck

→ **Skin infections** - Pyoderma + Erysipelas (superficial) + Cellulitis (deep) (second common cause after staph. aureus)

Baker wearing red mittens

→ **Necrotizing faciatis** - flesh eating bacteria

Burnt ginger bread

→ **Scarlet fever** - Pharyngitis + Rash + Strawberry tongue

Red handkerchief + ginger bread red + eating strawberry

→ **Toxic shock syndrome** - Hypotension due to toxins. SPE

Superman cape. Shock due to toxin. SPE!

→ **Post streptococcal infections** - Rheumatic fever + post-streptococcal glomerulonephritis (phone cord) → immune related

Rheumatic fever: After pharyngitis ONLY

Red handkerchief ONLY

No red mittens

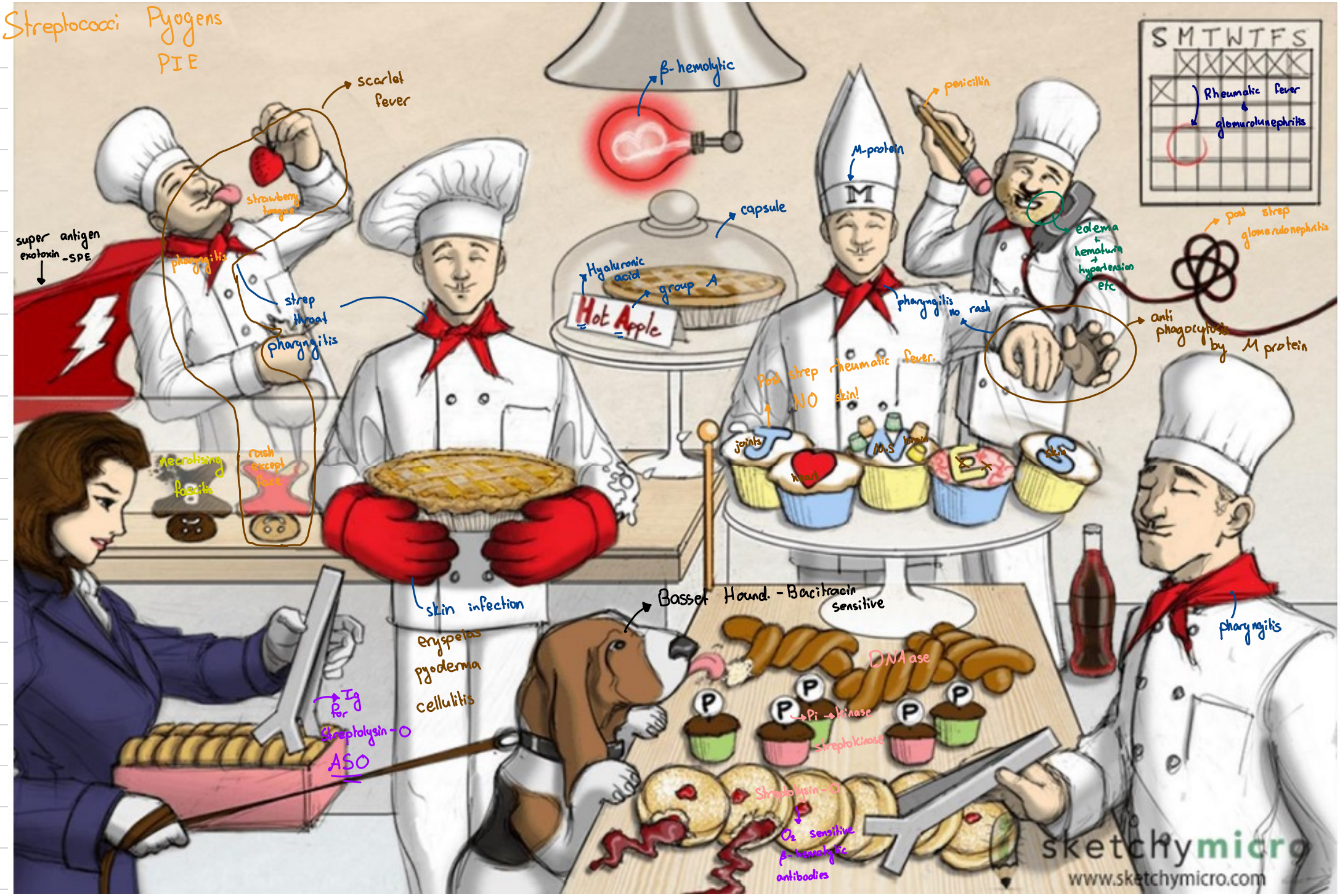
J ♡ N S

joint heart N.S brain skin

post-streptococcal glomerulonephritis: After pharyngitis OR skin infection

Streptococci Pyogens

PIE



Streptolysin - S

↳ O_2 - stable , no antibodies, β-hemolytic

5. Streptococci agalactiae

→ Sketchy: agalactiae = galactic = space

→ G +ve cocci + chain

→ Lancefield group A antigen

→ catalase -ve. Complete β-hemolytic

→ bacitracin resistant

Basset has helmet

→ Has capsule

Hippo helmet

→ Seen in vaginal flora, but its bad in pregnant women

Baby coming out of tunnel from spaceship

→ Affects older people - previous bacteremia + pneumonia + bone, joint, skin, tissue infections

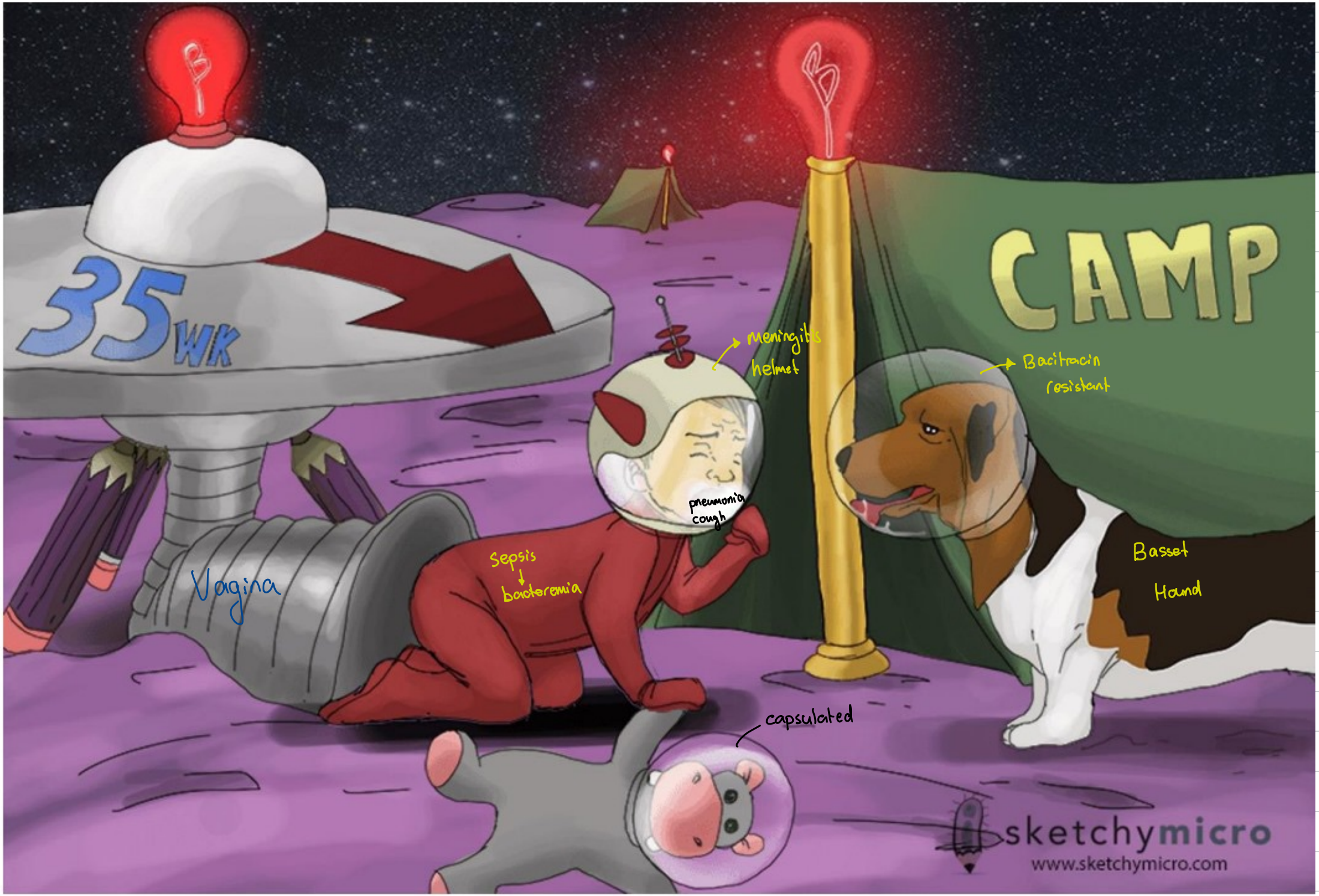
Red suit

Baby coughing

→ Neonatal infections - Bacteremia (sepsis) & meningitis

Meningitis helmet + Red suit (bacteremia) ON BABY

Baby coming out of tunnel


35 WK
CAMP
Meningitis helmet
Bacitracin resistant
pneumonia cough
Sepsis
bacteremia
Vagina
Basset Hound
capsulated
sketchymicro
www.sketchymicro.com

6. Streptococci pneumonia

→ Sketchy: pneumonia = knight

→ gram positive cocci + PAIR

Double sword = pairs only

→ Catalase -ve. Partial α- hemolytic - pneumolysis (green)

→ polysaccharide capsule (not hyaluronic acid) - used for polyvalent vaccine

Armor. This capsule so important.

→ non-encapsulated are avirulent. Encapsulated = pathogenic

Useless without capsule!

→ Optichin sensitive

Exposed chin

→ MOPS - meningitis + otitis media + pneumonia + sinusitis

Mopping floor

→ Colonize throat + nasopharynx, spread to other tissues causing M. O. P. S

→ IgA protease - prevents IgA from trapping it to mucin with Fc region

Cracked IgA shield

→ Amidase - Increase immune response by releasing techoic acid & peptidoglycan fragments

→ Phosphorylcholine - Imp. for amidase function. (+ Platelet factors + cell invasion)

→ 91 types due to differ sugar arrangements in capsule. (so important)

7. Streptococci viridans

→ Sketchy: Viridans = stupid weaker α-hemolytic = Joker & Donkey

→ gram positive cocci + chain

→ Catalase -ve. Partial α- hemolytic → green

→ No capsule

No armor

→ Optichin resistant

chin protected

→ Colonize oropharynx

→ S. mutans - Dental carries → tooth adhesion

Donkey teeth

glycocalyx. Strong adhesion - biofilms

→ S. mitis - Subacute endocarditis → heart adhesion

Heart on Hat ♡

Memo: mitis LIKE mitral valve


α KNIGHT TOURNAMENT
ADULT
MEZZANINE
CHILDREN
GROUND
capsule
Important
for
pathogenity
Cracked
IgA
shield
Exposed
chin.
Optochin
Sensitive
hemolysin
double
sword.
Diplococci
S. mitis
protected
chin.
Optochin
resistant
cavities
S. mutans
MOPS
from
S. pneumoniae
transfer from
nasopharynx
to produce
MOPS
sketchymicro
www.sketchymicro.com

8. Enterococci

→ Sketchy: caucus protest

→ G+ve cocci + pair or short chain

→ Catalase -ve. no γ-hemolytic - variable pattern

→ Entero = gut

→ E. faecalis - GI tract + UG tract

→ E. faecium - UG tract + GI tract

→ Broad temp. + pH range + NaCl & bile salts resistant

Resisting arrest

→ Nosocomial infection - from hospital

Ambulance

→ Biofilm

Many people

→ Antibiotic resistant!

Resisting arrest

→ UTI !! Worsened with catheter!

U ♡ trees? U ⇒ UTI

→ Bile - Esculin test - E. faecalis +ve & E. coli -ve
black colorless

↓
Bile resistance
AND
Esculin hydrolysis


CALIFORNIA CAUCUS
RESIST THE
6.5%
N. CA
resist 6.5% soil
!!
biofilm
STOP THE FEES!
DO U ♥ 🌲?
UTI
POLICE LINE
Resisting arrest.
Soooo Resistant.
So!! Sooo Resistant to antibiotics
biofilm
ambulance
→ nosocomial infection
ICE DEPT.
LINE
sketchymicro
www.sketchymicro.com

Diseases

1. Staphylococci aureus: Ancient egypt

→ Skin infections - Abscess & Pus. (pimple). Impetigo + Folliculitis + Furnucle/Boils + carbuncle

→ Osteoarticular infections - Bone & joint infections

→ Infective / Acute endocarditis - Acute = Staph. aureus. Subacute = Strep. mitis

→ Bacteremia -shock

→ Pleuropulmonary

→ Scalded skin syndrome - Toxin. Children

→ Toxic shock syndrome - Superantigen exotoxin. Hypotension. + Streptococci pyogens

→ Food poisoning - Heat stable enterotoxin, vomiting + diarrhea ... etc + ACUTE short incubation period 1 - 8 hours until onset + fast recovery / convalescence

2. Staphylococci epidermis: Plumber

→ Infections due to Catheter , Shunt , Prosthetics

↓ + entercocci!
UTI

↓
Chronic inflammation

↓
endocarditis in artificial valve
orthopedic prosthetics

3. Staphylococci saprophytics: Women

→ UTI in sexually active females

4. Streptococci Pyogens: Bakers

→ Pharyngitis

→ Scarlet fever

→ Skin infections

→ Necrotising facitis

→ Toxic shock Toxin. Super antigen

→ Post infection diseases Rheumatic fever / Glomerulonephritis
J ♡ NS

5. Streptococci agalactiae: Space baby

→ Vaginal.. neonatal infection

→ septic shock + pneumonia + meningitis

6. Streptococci pneumonia: knight ↓ vs Joker

→ MOPS

7. Streptococci viridians: knight vs Joker ↓

→ S. mutans - Dental cavities

→ S. mitis - subacute endocarditis

8. Enterococci: Protest

→ UTI

Dr. Alaa ALL + Dr. Anas ALL :

→ Mycoplasma

* Only bacteria with: No cell wall + sterols in cell membrane
* Polymorphic

→ Bacillus Anthracis

* Polypeptide capsule rather than polysaccharide

→ Streptococcus pneumonia

* 91 types due to different order of sugars in capsule

→ Streptococcus Mutans

* Glycocalyx that allows it to tightly adhere to surfaces like teeth & heart valves

→ Spirochetes

* Contain Endoflagella

→ Bacillus Anthracis

* Oval + central spore

→ Clostridium Perfringens

* Sub-terminal + oval spore

→ Clostridium Tetani

* Terminal + spherical pore

→ Bacillus & Clostridium

* Only species able to produce spores

→ Staphylococci aureus

* Two strains. MRSA & VRSA

→ Proteus

* An enterobacteriaceae G-ve bacilli
* Phenyl alanine deaminase +ve

→ Salmonella & Shigella

* G-ve bacilli
* Phenylalanine deaminase -ve

→ Pseodomonas Aeruginosa

* G -ve bacilli
* +ve oxidase test (purple)

→ Enterobacteriaceae

* G -ve bacilli
* -ve oxidase test (colorless)

→ Staphylococci

* G +ve cocci cluster
* Catalase +ve

→ Streptococci

* G+ve cocci chain
* Catalase -ve

→ Staphylococcus aureus

* G+ve cocci cluster
* Only staphylococci with +ve coagulase test.

→ Mycobacteria tuberculosis

* Present in unpasteurized milk

→ Salmonella

* Present in unpasteurized milk

→ Coxiella burnetti

* Present in unpasteurized milk

→ Brucilla abortus

* Present in unpasteurized milk

→ Vibrio cholera

* G -ve bacilli
* 13 minute division time

→ Myobacterium tuberculosis

* 24 hour division time

→ Staphylococci aureus

* G +ve cocci + cluster
* Can grow on simple agar plate media

→ Staphylococci aureus

* G +ve cocci cluster
* β complete hemolysis on blood agar

→ Streptococci pyogens

* G +ve cocci chain
* β complete hemolysis on blood agar

→ Streptococci viridans

* G +ve cocci chain
* α partial hemolysis on blood agar

→ Streptococci pneumoniae

* G +ve cocci chain
* α partial hemolysis on blood agar

→ Enterococci

* G +ve cocci chain
* γ no hemolysis on blood agar

→ Neisseria

* G -ve cocci pair
* Grows on chocolate agar

→ Haemophilus

* G -ve bacilli
* Grows on chocolate agar

→ Mycobacterium tuberculosis

* Only bacteria to grow on Lowenstein - Jensen medium. Malachite green resistant.

→ C. diphtheria

* G +ve bacilli + non-spore + aerobic
* Only bacteria to grow on blood tellulite agar. Potassium tellulite resistant.

→ Enterobacteria

* Resistant to bile. Mac Conkey's agar

→ Staphylococci aureus

* G +ve cocci + cluster
* Resistant to salt 7.5%
* Mannitol fermentor. Phenol red → yellow +ve

→ Staphylococci epidermis

* G +ve cocci + cluster
* Resistant to salt 7.5%
* No mannitol fermintation. Phenol red → Real -ve

→ Pseudomonas aeruginosa

* G -ve bacilli
* obligate aerobe. Must O_2. No O_2 die
* Oxidase +ve test

→ Bacteroid fragilis

* Obligate anaerobe. Must no O_2. O_2 die

→ Helicobacter

* G -ve bacilli
* micro-aerophilic. Must little O_2

→ Campylobacter

* G -ve bacilli
* micro-aerophilic. Must little O_2

→ Clostridium perfringens

* G +ve bacilli + spore forming + anaerobic
* aero-tolerant anaerobes. Prefer no O_2 but survive a bit in O_2.

→ Brucella

* Capnophilic

→ Neisseria

* G -ve cocci pair
* Capnophilic

→ Vibrio cholera

* G -ve bacilli
* pH 9, intestines

→ Lactobacilli

* G +ve bacilli + non-spore + anaerobic
* pH 4, produce acid waste product

→ Geobacillus stearothermophilus

* Spore forming
* Biological indicator (culture) used as test after moist heat autoclave.

→ Bacillus anthrax:

* Used by Robert Koch germ theory

→ Staphylococci epidermis:

* Skin microbiota

→ Corynebacterium:

* Skin microbiota

→ Propionibacterium:

* Skin microbiota

→ E. coli:

* Enterobacteriacea
* G.I microbiota

→ Lactobacilli & Clostridium:

* Anaerobic
* G.I microbiota

→ Staphylococci + Streptococci + Haemophilus + Moraxella:

* Respiratory microbiota
* Common in urinary tract microbiota

→ Aerobic lactobacilli only vaginal flora:

* After birth till several weeks

→ Aerobic + anaerobic lactobacilli vaginal flora::

* After puberty

→ Cocci & Bacilli vaginal flora:

* Several weeks after birth till puberty

→ Actinobacteria:

* Bacterial Vaginosis
* Lactobacilli die & this flourish

→ Bacteroidetes:

* Bacterial Vaginosis
* Lactobacilli die & this flourish

→ E. coli:

* Abnormal flora seen in health care workers

→ Staphylococci aureus:

* Abnormal flora seen in health care workers

→ Pseudomonas auriginosa:

* Abnormal flora seen in health care workers

→ Candida:

* Abnormal flora seen in health care workers

→ Klebsiella:

* Abnormal flora seen in health care workers

→ M. Morganii:

* Orthinine Decarboxylase +ve. Purple

→ P. rettgeri:

* Orthinine Decarboxylase -ve. Yellow

→ Clostridium:

* Results in clostridium difficile infection if it increases in number due to less competition

* Treat with fecal transplant (or vancomycin)

→ Enterococci:

* Grows in 6.5% salt agar