

STAPH AND STREP

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See also Jensen & Wright, pp 202-228

STAPH AND STREP ARE GRAM-POSITIVE COCCI:

STAPHYLOCOCCUS: spread by direct contact, **fomites**, etc

Staphylococcus aureus (yellow colonies) is the most problematic of Staph

Common 20% people's skin, 30% nares, in rectum, **opportunistic**

Very strong cell walls resistant to high salt, can survive in cured meats, drying

Invasive because of toxins and enzymes:

necrotizing toxin dissolves tissue

enterotoxin grows in cream products, heat resistant, triggers nausea, violent vomiting, diarrhea 1-6 hrs. lasts 24 hrs
(**intoxication**, not **infection**).

Diseases: **pimple to boil to carbuncle** cavity from **necrosis**,
suppuration

Abscesses should be drained to break up niche, remove dormant bacteria
sty when follicle of eyelash infected

Impetigo *mixed infection* of Strep and Staph

Toxic shock syndrome: fever, vomiting, sunburn-like rash, shock

burn infections 1° care of burn patients: prevent infection, dehydration

scalded skin syndrome in newborns

Develops resistance to drugs faster than any other bacterium (misuse of antibiotics.)

10 % sens to penicillin now (penicillinase) (**MRSA**: methicillin-resistant *Staph aureus*)

Serious problem in hospitals (**nosocomial**). Determine antibiotic sensitivity first.

STREPTOCOCCUS: *cause more disease than any other single group of bacteria.*

Not all strep are pathogens (for instance, lactic acid fermenters in milk)

Pathogenic Strep are carried in the population: 5% in summer, 10% in winter

Airborne: Spread by aerosol (a problem esp in elem. schools)

Distinguish among Strep by two techniques:

1) Lancefield Serology of **M protein in cell wall**, mediates attachment, retards phagocytosis

Groups A through O, **most pathogens are in group A.**

2) Hemolysis: alpha: partial clearing, green cast
beta: **complete clearing, yellow cast**
gamma: no clearing

Streptococcus pyogenes: most common **Group A beta hemolytic strep.**

Extracellular agents of pathogenicity produced, esp. enzymes:

leukocidin alters permeability of neutrophils and macrophages, causing lysis

erythrogenic toxin fever and rash (vasodilation)

hyaluronidase spreading factor (digests connective tissue)

streptokinase a fibrolysin, digest fibrin in inflammatory barrier (used after heart attack)

Diseases:

Strep throat **Pharyngitis and tonsillitis:** beefy red pharynx, fever, SORE throat (but 80% Strep infections are asymptomatic) children under 15 avg 1 infect'n/yr.

Scarlet fever erythrogenic factor diffuses into blood

Puerperal fever infection of uterus following childbirth

Rheumatic fever in 3% of untreated children, appears 1-5 wks later, arthritis, heart murmur

glomerulonephritis filtering basement membrane scarred

"Flesh eating bacteria" invasive Strep, exotoxin A, hyperantigen, causes autoimmune damage

tooth decay *S. mutans* (cariogenic) make dextran fr sugar, lactic H⁺ decays teeth

