Gram-positive Cocci Staphylococci ( non-motile/arranged in grapelike clusters/Some are normal microbiota of the skin and . . mucous membranes / 40 species /Antigenic Structure - polysaccharides and proteins (Piptidoglycan)/ . . . Elicits production of IL-1, Opsonic antibodies by monocytes /chemoattractant for PMN/endotoxin-like activity/ Activate . complement /Teichoic acids can be antigenic/Catalase,hyaluronidase- spreading factor, Staphylokinase-fibrinolysis, proteinases,

lipases,lactamase/Hemolysins(α-acts on eukaryotic cell membranes,β-degrades sphingomyelin(toxic for RBC),δ- disrupts . . membranes- diarrheal diseases, ϒ-leukocidin that lyses white blood cells)/Enterotoxins(superantigens, heat stable and resistant . . to gut enzymes, food poisoning(25 µg of enterotoxin B),acts on neural receptors in the gut(CNS stimulation)-vomiting center,

(1–8 hours) incubation period, no fever)/ lesion includes: furuncle or other localized abscess/ normal microbiota/

/ spread via the lymphatics and blood/ skin infections (acne, pyoderma, impetigo)/ DIAGNOSTIC TESTS(SPECIMENS swab pus or . . aspirate from an abscess or blood or tracheal aspirate or spinal fluid for culture,blood agar,Catalase test,coagulase test)

Aureus (coagulase positive-clots plasma, may deposit fibrin on staphylococci (altering phagocytosis)/major pathogen . . Protein A(adhesion) in cell wall, binds to the Fc portion of IgG except IgG3/have polysaccharide capsules-inhibit phagocytosis/

11 serotypes(5,8 –infections)/ Panton-Valentine Leukocidin(toxin kill white blood cells)/Exfoliative toxins(epidermolytic, toxin A . is encoded by eta, toxin B encoded by etb, desquamation of the staphylococcal scalded skin syndrome, superantigens ,dissolve . . mucopolysacccharide)/Toxic shock syndrome toxin-1(superantigen)- desquamative skin, rash,shock/ Nasal carriage(microbiota)/

in a hair follicle lead to tissue necrosis (dermonecrotic factor)/ Osteomyelitis- growth in terminal blood vessel of the long bone -- necrosis of bone and chronic suppuration/ pneumonia,meningitis,empyema,endocarditis,sepsis with suppuration in any organ

Epidermidis (coagulase negative/normal microbiota of skin and respiratory and gastrointestinal tracts)

Saprophyticus (coagulase negative /UTI in young women)

Streptococci (Facultative anaerobe/usually chains (sometimes pairs)/Catalase negative/Non motile/Hemolysins(β-Complete . disruption of erythrocytes with clearing of the blood around the bacteria,α -Incomplete lysis of erythrocytes with reduction of - . hemoglobin and the formation of green pigment, γ-nonhemolytic) / 18 antigens/ Lancefield Groups (C-carbohydrate in cell wall) / . some are microbiota/lancefield classification into lancefield groups a – h and k – u/ specificity of the capsular polysaccharides to . . classify *streptococcus pneumonia/*S.pyogens (lancefield A, HUMANS,pharyngitis)\*S.agalactiae(lancefield B,neonatal meningitis and . sepsis and infections,HUMAN\_CATTLE)\*E.faeclis and S.bovis(nonenterococcus)(lancefield D,HUMAN and ANIMAL gi tract and dairy . products and bacteremia,biliary or urinary tract infections and endocarditis)\*viridans”S.mitis,S.mutans”(non identified lancefield ,

HUMAN,Cariesand endocarditis)\*anaerobic or micro areophilic(non identified lancefield,HUMAN and ANIMAL,brain and polmunary

Abcess and gynecologic infctions)\*S.pneumoniae(non identified lancefield,HUMAN,lobar pneumonia)/Viridans and pneumonia are alpha hemolytic/virulence factors(M protein-fimbrae(major target/strain variation/re-infection occurs with different strains, ,carbohydrate antigen(c substance)-R and T proteins,lipoteichoic acid for attachment, Extracellular substances(streptolysins ,NADase,Hyaluronidase,streptokinases,streptodornases,streptolysins,pyrogenic exo toxin), Capsule-Anti-phagocytic activ).

Pharyngitis,rash(scarlet fever),pyoderma,impetigo,Erysipelas,Cellulitis,Necrotizing fasciitis,myositis,rheumatic fever,glumeronephritis

Virulence factors of S. pyogenes: Streptolysin (O & S), Antistreptolysin O (ASO)(Streptokinase-(Break down clots), Hyaluronidase,

Proteases), Toxins (Exotoxins) Pyrogenic toxin or erythrogenic toxin(A, B, C)- Streptococcal toxic shock syndrome and scarlet fever.

Streptococcus Diseases:\* *invasion by S. pyogenes (*Puerperal fever (sepsis), cellulitis, erysipelas, sepsis,and necrotizing fasciitis-streptococcal gangrene).

\*infection with *S. pyogenes* and their by products:( Streptococcal sore throat (tonsilitis), Streptococcal infection of skin( impetigo))

\*Toxin associated Streptococcal infections:(Streptococcal toxic shock syndrome, and scarlet fever (pyrogenic toxins))

\*Poststreptococcal diseases:( Rheumatic fever-1–4 weeks after, and Glomerulonephritis)

Streptococcus agalactiae (GBS)-( Group B Streptococci ,normal vaginal flora and lower GI tract) women(Puerperal sepsis) and their neonates

Specimens(throat swab, pus, or blood/blood agar/10% CO2 speed hemolysis/ASO, anti-DNase B and anti-hyaluronidase, anti-streptokinase; anti-M)

Bacitracin--inhibition of growth of streptococci A.

Viridans Streptococcus-normal microbiota of the URT.

principal cause of endocarditis on normal and abnormal heart valves.

*Streptococcus pneumonia(diplococcic)*

lancet shaped or arranged in chains /possessing a capsule of polysaccharide (91 type)/ normal inhabitants of the URT and can cause pneumonia, sinusitis, otitis, bronchitis, bacteremia, meningitis /pneumococci may reach the bloodstream via lymph flow

Pneumococcal infection causes an outpouring of edema fluid into the alveoli followed by RBCs, which results in consolidation of portions of the lung

Speciemen(CSF and sputum / blood agar and incubated in CO2/ Quellung Reaction(mixed with specific antipolysaccharide serum)