**NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1. Which of the following best describes the arrangement of streptococci?**

 a) Clusters

 b) Pairs

 c) Chains

 d) Single cells

**2. What is the preferred agar for culturing streptococci, which serves as an indicator for patterns of hemolysis?**

 a) MacConkey agar

 b) Chocolate agar

 c) Sabouraud agar

 d) Sheep blood agar

**3. Which of the following statements about streptococci is true?**

a) They are catalase positive.

 b) They form spores.

 c) They are motile.

 d) Some strains form capsules.

**4. What is the main role of the M protein in group A streptococcal infections?**

 a) Lysing leukocytes

 b) Binding to fibronectin

 c) Stimulating cytokine release

 d) Providing serologic specificity

**5. Which toxin produced by streptococci inserts directly into the cell membrane of host cells?**

 a) Streptolysin O

 b) Streptokinase

 c) Hyaluronidase

 d) Streptococcal superantigen toxins

**6. Which post-streptococcal sequelae is characterized by an autoimmune response induced by molecular mimicry?**

 a) Acute Rheumatic Fever

 b) Acute Glomerulonephritis

 c) Scarlet Fever

 d) Streptococcal Toxic Shock Syndrome (STSS)

**7. How does acute glomerulonephritis cause renal injury?**

 a) By lysing leukocytes

 b) By causing complement activation and inflammation

 c) By inserting directly into the cell membrane of host cells

 d) By stimulating cytokine release

**8. Which of the following infections typically presents with a spreading area of erythema and edema, often occurring on the face?**

 a) Streptococcal Pharyngitis

 b) Impetigo

 c) Erysipelas

 d) Puerperal Infection

**9. Which poststreptococcal sequelae is characterized by nonsuppurative inflammatory disease involving fever, carditis, and migratory polyarthritis?**

 a) Acute Rheumatic Fever

 b) Acute Glomerulonephritis

 c) Peritonsillar abscess

 d) Otitis media

**10. How are β-hemolytic colonies identified on sheep blood agar plates?**

 a) By Lancefield grouping using immunofluorescence

 b) By PCR

 c) By their clear β-hemolysis zones

 d) By their Lancefield grouping using throat culture

**11. Which antibiotic is typically used to treat patients allergic to penicillin for group A streptococcal infections?**

 a) Imipenem

 b) Azithromycin

 c) Penicillin G

 d) Bacitracin

**12. What is a significant source of Group B streptococci transmission to newborns during childbirth?**

a) Maternal urine

b) Breast milk

c) Birth canal

d) Amniotic fluid

**13. Which virulence factor is produced by all pneumococci and is involved in disrupting the cilia of human respiratory epithelial cells?**

a) Pneumolysin

b) Neuraminidase

c) β-hemolysin

d) Capsule

**14. Which age groups are most affected by Streptococcus pneumoniae infections?**

a) Adolescents

b) Middle-aged adults

c) Very young (less than 2 years) and elderly (more than 60 years)

d) Children aged 5-10 years

**15. Which symptom is characteristic of pneumococcal pneumonia?**

a) Persistent headache

b) Watery diarrhea

c) Pink to rusty-colored sputum production

d) Nasal congestion

Q2. What are some GAS products that help with the pathogenesis of the bacteria?

**Bonus Question:**

CASE STUDY: SORE THROAT, MURMUR, AND PAINFUL SWOLLEN JOINTS

An 8-year-old boy presented with a 1-day history of fever (39°C), associated with painful swelling of the right wrist and left knee. The patient had a sore throat 2 weeks before the present illness, which was treated with salicylates. No cultures were obtained. The last medical history was essentially negative, and the boy had no history of drug allergy, weight loss, rash, dyspnea, or illness in siblings.

PHYSICAL EXAMINATION: Temperature (39°C), blood pressure 120/80 mm Hg, pulse 110/min, respirations 28/min. The patient was ill-appearing. He avoided movement of the right wrist and left knee, which were swollen, red, hot, and tender. He had a moderately injected oropharynx without exudate and an enlarged right cervical lymph node estimated to be 1 × 1 cm. The precordium was active and, a systolic thrill could be felt. Auscultation of the heart revealed a heart rate of 120/min, normal heart sounds, and a grade III/VI holosystolic murmur over the apex not transmitting toward the axilla. Lungs were clear. No rush or hepatosplenomegaly was present, and the neurologic examination was normal.

LABORATORY DATA:

Hemoglobin 12 g, Hct 37%, WBC 16 500/mm3

Sedimentation rate 90 mm/h

Urinalysis: Normal

Serology: Antistreptolysin 0 (ASO) titer 666Todd units (normal <200)

Chest X-ray: Normal (no cardiomegaly)

Throat culture: Negative for group A β-hemolytic streptococci

Blood culture: Negative

Electrocardiogram: Essentially normal except for mild ST depression and

nonspecific T-wave changes on V6

Aspirate from left knee: 3 mL of yellow and turbid fluid

WBCs: 3000/mm3 mainly polymorphonuclear leukocytes

Gram stain: Negative

Culture : No growth

QUESTIONS

**1. This patient’s condition is most probably a case of:**

A. Strep throat

B. Scarlet fever

C. Streptococcal toxic shock

D. Rheumatic fever

E. Poststreptococcal glomerulonephritis

**2. This boy’s joint and cardiac findings are due to:**

A. Circulating streptococcal pyrogenic exotoxin

B. Circulating streptolysin O

C. Antibody directed against M protein

D. Antibody directed against streptolysin O (ASO)

E. Circulating group A streptococci

**3. The illness could have been prevented by:**

A. Penicillin treatment of the sore throat

B. Penicillin treatment at the onset of joint pain

C. Aspirin at any point

D. Streptococcal vaccine in infancy

E. There is no prevention

**4. The etiology of the sore throat would have been best determined by:**

A. ASO titer

B. Throat culture

C. Throat antigen detection

D. Exudate on tonsils

E. Presence of cervical lymphadenopathy