Streptococcus spp - other (LTR70544)

Edit Approved By: Van der Walt, Peet (10/21/2022) **Revision: 4.00**

Organism

Streptococcus spp. (other)

- ***S. anginosus*** group -*S. anginosus, S. constellatus, S. intermedius*
- ***S. mitis*** group - *S. mitis, S. cristatus, S. oralis, S. peroris, S. infantis, S. australis, S. lactarius, S. oligofermentans, S. massiliensis, S. orisratti,* S. *sanguinis*, *S.parasanguinis, S. gordonii, S. sinensis, S. tigurinus*
- ***S. mutans*** group- *S. mutans, S. sobrinus, S. criteti, S. ratti, S. downei, S. devriesei*
- ***S. salivarius*** group- *S. salivarius, S. vestibularis, S. thermophilus*
- **Zoonotic species** - *S. acidominimus, S. hyointestinalis S. ovis, S. pluranimalium, S. suis, S. uberis*

Clinical

These organisms are part of the normal flora of the oropharynx, gastrointestinal tract, and the female genital tract. They have been associated with endocarditis, deep seated abscesses and septicemia in neutropenic patients.

- ***S. anginosus* group** – members of this group have been associated with deep seated and superficial abscesses, CNS infections, bacteremia, endocarditis, septic arthritis and rarely urinary tract infections. *S. intermedius* is the least common but often significant in CNS and liver infections especially in children. *S. constellatus* has been associated with pulmonary and intra-abdominal infections. *S. anginosus* is usually recovered in polymicrobial infections (sinusitis, wounds and intra-abdominal female genital infections), associated with anaerobes.
- ***S. mitis* group** – members of this group have been associated with endocarditis (prosthetic/native) as well as septicemia in neutropenic patients.
- ***S. mutans* group** – members of this group have been associated with dental caries as well as endocarditis (prosthetic/native)
- ***S. salivarius* group** – members of this group have been associated with septicemia in neutropenic patients.
- **Zoonotic species** - These species are primarily animal pathogens that are occasionally isolated from humans. *S. suis* is associated with meningitis and bacteremia following entry via the percutaneous or gastro-intestinal route.

Streptococcus spp. (other), Continued

Usual susceptibility pattern

Susceptibility to penicillin and cephalosporins varies within the different species of Streptococci.

S. mitis, S. sanguinis, S. oralis and *S. salivarius* tend to be more resistant to penicillin than the *Streptococcus anginosus* group. Previous administration of beta-lactam antibiotics is a risk factor for penicillin resistance. Penicillin tolerance has been documented in *Streptococcus spp*. In serious infections, synergistic combination therapy with gentamicin is recommended. Although most isolates are susceptible to cefotaxime/ceftriaxone, resistance is increasing. Ceftazidime, cefixime, cephalexin and cloxacillin have poor or no activity and are not recommended for infections with these organisms. Ampicillin, amox/clav, piperacillin +/- tazobactam and cefuroxime are less active than cefotaxime, ceftriaxone or cefepime against penicillin-resistant strains. There is considerable resistance to macrolides and clindamycin.

Susceptibility method

VITEK2. Additional tests (disc diffusion or Etest method) using Mueller-Hinton agar with 5% sheep blood incubated in 5% CO_2 at 35°C for 20-24 hours.

There are no disc diffusion breakpoint interpretations for penicillin or ampicillin. Perform Etest if manual testing is required.

Note: For Etest use 0.5 McFarland suspension in broth.

Susceptibility reporting

	CSF/ Brain	Blood	Sterile Body Site	Urine	Other	Comments
Amoxicillin				✓		Report same as ampicillin
Ampicillin	*	*	*	✓*	*	*If pen S and amp I/R **see Special Considerations**
Cefotaxime	*	*	*		2	*Report if patient ≤3 months 2nd line if pen I/R and patient ≤3 months **See Special Considerations**
Ceftriaxone	✓	✓	✓		2	Do not report if patient ≤1 month 2nd line if pen I/R **See Special Considerations**
Levofloxacin				✓		Do not report if patient < 18 y
Clindamycin			✓		✓	
Meropenem	2	2	2		3	Etest method 2nd or 3rd line if cefotaxime or ceftriaxone I/R If mero nonsusceptible **see Special Considerations**
Penicillin	✓*	✓*	✓*	*	✓*	*If pen S and amp I/R **see Special Considerations**
Vancomycin	✓	✓	✓		2	2nd line if pen and clinda I/R If vanco nonsusceptible **see Special Considerations**

Streptococcus spp. (other), Continued

Note

Susceptibility testing is recommended if organism is sole isolate from sterile body site. For other sites, or if isolated with other organisms, clinical correlation and correlation with Gram stain is required. Generally, susceptibility testing is not recommended if multiple organisms isolated.

<table>
<tr><td>Blood cultures</td><td>Add comment:
“If patient has an endovascular infection or is immunocompromised, combination therapy with gentamicin should be considered.” &A220</td></tr>
<tr><td>S. anginosus group - Deep wound specimens</td><td>• If history of penicillin or beta lactam allergy perform susceptibility testing
• For S. anginosus group isolated in mixed cultures from deep wounds/abscesses, consult microbiologist regarding the need for susceptibility testing or alternatively adding comment &Str1</td></tr>
<tr><td>S. anginosus group – Urine</td><td><table><tr><th>IF significant urine isolate and …</th><th>THEN …</th></tr><tr><td>• history of penicillin / β lactam allergy
• at physician request</td><td>Perform susceptibility testing according to reporting chart</td></tr><tr><td>None of the above</td><td>Add comments &2162</td></tr></table></td></tr>
<tr><td>S. anginosus group - Other specimen sources</td><td>Refer to specific bench protocols for susceptibility testing requirements.
• If indicated in bench protocol add comment &Str1
• If history of penicillin or beta lactam allergy perform susceptibility testing</td></tr>
</table>

LIS Code…	Translation…
&Str1	Antibiotic susceptibility testing is not routinely performed. This organism is predictably susceptible to penicillin and other beta-lactam antibiotics. Susceptibility to clindamycin is variable.
&2162	This organism is generally susceptible to beta lactam antibiotics.

Streptococcus spp. (other), Continued

Special considerations

Ampicillin/ Penicillin:	If penicillin S **and** ampicillin I/R, consult Supervisor on call. Confirmation of both by Etest may be required.
Cefotaxime/ Ceftriaxone:	If cefotaxime or ceftriaxone I/R **and** penicillin or ampicillin S, consult Supervisor . Confirmation by Etest may be required.
	Because of variable MICs, these agents should be tested and reported individually.
	If patient ≤1 month report cefotaxime only. If patient >1-3 months report cefotaxime and ceftriaxone. If patient >3 months report ceftriaxone only.
Meropenem:	These organisms are usually susceptible to these antibiotics. If MIC ≥1 ug/mL (non-susceptible), repeat Etest to confirm result. If confirmed as non-susceptible: • Consult Microbiologist • If meropenem 1-2 µg/mL, add comment: "This isolate is testing as non-susceptible based on the CLSI breakpoint, and susceptible based on the EUCAST breakpoint. Expert consultation is advised." **(23365)** • If meropenem ≥4 µg/mL, add comment: "This isolate is testing as non-susceptible based on the CLSI breakpoint, and resistant based on the EUCAST breakpoint." **(23360)**
Vancomycin:	These organisms should be susceptible to this antibiotic. Consult Supervisor if not susceptible. If 'nonsusceptible', the organism ID and susceptibility should be confirmed by repeat testing. If confirmed, consider submitting isolate to a reference laboratory.

Interpretation

For Etest, report actual MIC result. For interpretation (S, I, or R) report according to the nearest higher doubling dilution **(Appendix 1)**.

Use **CLSI** interpretive document for ***Streptococcus* spp. Viridans Group**