

**Streptococcus agalactiae (LTR70539)**

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

Revision: 6.00

**Organism****Streptococcus agalactiae**

- Streptococcus Group B
- 

**Clinical**

This organism is part of the normal flora of the gastrointestinal tract and the female genital tract. *S. agalactiae* are associated with serious neonatal infections (sepsis, meningitis, pneumonia), as well as with postpartum infections. In non-pregnant predisposed adults (diabetes, immunosuppression, malignancy) *S. agalactiae* have been associated with bacteremia, endocarditis, osteomyelitis, and skin/soft tissue infections.

---

**Usual  
susceptibility  
pattern**

These organisms are generally susceptible to penicillin/ampicillin, cephalosporins, vancomycin and linezolid. MIC to penicillin may be elevated and resistance (due to alteration of penicillin binding protein PBP2) has rarely been described. Resistance to tetracycline is common. Antimicrobial tolerance to penicillin has been described and in serious infections, synergistic combination therapy with gentamicin is recommended. Resistance to macrolides and clindamycin is significant.

---

**Susceptibility  
method**

VITEK2. Additional tests (Disc diffusion or Etest method) are performed using Mueller-Hinton agar with 5% sheep blood incubated in 5% CO<sub>2</sub> at 35°C for 20-24 hours.

**Note:** For Etest use 0.5 McFarland suspension in broth.  
For mucoid strains use 1.0 McFarland.

## Streptococcus agalactiae, Continued

### Susceptibility reporting

	CSF/ Brain	Blood +	Sterile Body Site +	Urine (Non- pregnant) +	Urine (pregnant) +	Vag/ Rectal +	Other +	Comments
Amoxicillin				✓	✓			Report same as penicillin
Ampicillin	✓	✓	✓	✓	✓		✓	If amp nonsusceptible <b>see Special Considerations</b>
Cefazolin		✓	✓				✓	Report same as penicillin
Cefotaxime	*	*	*					*Report if patient ≤3 months If cefotaxime non-susceptible <b>see Special Considerations</b>
Ceftriaxone	✓	✓	✓					Do not report if patient ≤1 month If ceftriaxone non-susceptible <b>see Special Considerations</b>
Cephalexin				✓	✓			Report same as penicillin
Clindamycin			✓*		+	✓*	✓*	<b>*See Special Considerations + See Note section</b>
Erythromycin			*		+	*	*	<b>See Special Considerations</b> *Test but do not report <b>+ See Note section</b>
Levofloxacin				✓				Do not report if patient <18 y
Nitrofurantoin				✓	✓			<b>Disc diffusion</b>
Penicillin	✓	✓	✓	*	*		✓	If pen nonsusceptible <b>see Special Considerations</b> If pen MIC 0.12 µg/mL <b>see interpretation</b> *Test but do not report
Vancomycin	✓	✓	✓		2*	2*	2**	*2nd line if clinda I/R **2nd line if co-isolated with MRSA If vanco nonsusceptible <b>see Special Considerations</b>

**+ See note section**

# Streptococcus agalactiae, Continued

## Note

<b>Blood cultures</b>	Perform susceptibility testing according to reporting chart:  <b>Additional Comments:</b> <ul style="list-style-type: none"> <li>• Add comment <b>&amp;A220</b>                      “If patient has an endovascular infection or is immunocompromised, combination therapy with gentamicin should be considered.”</li> <li>• If co-isolated with organisms where TMP-SMX is routinely reported, add comment <b>&amp;A373</b></li> </ul>											
<b>Sterile body sites</b>	Perform susceptibility testing according to reporting chart:  <b>Additional Comments:</b> <ul style="list-style-type: none"> <li>• If co-isolated with organisms where TMP-SMX is routinely reported, add comment <b>&amp;A373</b></li> </ul>											
<b>Deep wound specimens</b>	<table border="1"> <thead> <tr> <th>IF ...</th> <th colspan="2">THEN ...</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• cellulitis or fasciitis</li> <li>• isolate is pure</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• co-isolation of MRSA</li> <li>• failure of therapy</li> <li>• clindamycin therapy indicated</li> <li>• at physician request</li> </ul> </td> <td colspan="2">                     Perform susceptibility testing according to reporting chart                 </td> </tr> <tr> <td>                     None of the above                 </td> <td colspan="2">                     Add comment <b>&amp;Str1</b> </td> </tr> </tbody> </table> <p><b>Additional Comments:</b></p> <ul style="list-style-type: none"> <li>• If co-isolated with organisms where TMP-SMX is routinely reported, add comment <b>&amp;A373</b></li> </ul>			IF ...	THEN ...		<ul style="list-style-type: none"> <li>• cellulitis or fasciitis</li> <li>• isolate is pure</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• co-isolation of MRSA</li> <li>• failure of therapy</li> <li>• clindamycin therapy indicated</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart		None of the above	Add comment <b>&amp;Str1</b>	
IF ...	THEN ...											
<ul style="list-style-type: none"> <li>• cellulitis or fasciitis</li> <li>• isolate is pure</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• co-isolation of MRSA</li> <li>• failure of therapy</li> <li>• clindamycin therapy indicated</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart											
None of the above	Add comment <b>&amp;Str1</b>											
<b>Group B Strep screen swab: Vaginal/rectal or Vaginal</b>	<table border="1"> <thead> <tr> <th>IF ...</th> <th>THEN ...</th> <th>AND ...</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul> </td> <td>                     Perform susceptibility testing according to reporting chart                 </td> <td>                     Add comment <b>&amp;A336</b> </td> </tr> <tr> <td>                     None of the above                 </td> <td>                     Add comments <b>&amp;A336 &amp;IAPO</b> </td> <td></td> </tr> </tbody> </table>			IF ...	THEN ...	AND ...	<ul style="list-style-type: none"> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart	Add comment <b>&amp;A336</b>	None of the above	Add comments <b>&amp;A336 &amp;IAPO</b>	
IF ...	THEN ...	AND ...										
<ul style="list-style-type: none"> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart	Add comment <b>&amp;A336</b>										
None of the above	Add comments <b>&amp;A336 &amp;IAPO</b>											
<b>Urine (non-pregnant)</b>	<table border="1"> <thead> <tr> <th>IF ...</th> <th>THEN ...</th> <th>AND ...</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• neonate</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul> </td> <td>                     Perform susceptibility testing according to reporting chart                 </td> <td>                     Add comment <b>&amp;A373</b> </td> </tr> <tr> <td>                     None of the above                 </td> <td>                     Add comments <b>&amp;Str2 &amp;A37</b> </td> <td>                     If co-isolated with MRSA, add comment <b>&amp;van1</b> </td> </tr> </tbody> </table>			IF ...	THEN ...	AND ...	<ul style="list-style-type: none"> <li>• neonate</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart	Add comment <b>&amp;A373</b>	None of the above	Add comments <b>&amp;Str2 &amp;A37</b>	If co-isolated with MRSA, add comment <b>&amp;van1</b>
IF ...	THEN ...	AND ...										
<ul style="list-style-type: none"> <li>• neonate</li> <li>• history of penicillin / <math>\beta</math> lactam allergy</li> <li>• at physician request</li> </ul>	Perform susceptibility testing according to reporting chart	Add comment <b>&amp;A373</b>										
None of the above	Add comments <b>&amp;Str2 &amp;A37</b>	If co-isolated with MRSA, add comment <b>&amp;van1</b>										

# Streptococcus agalactiae, Continued

Note (continued)

<b>Urine, (Pregnant)</b>	<b>IF ...</b>	<b>THEN ...</b>	<b>AND ...</b>																				
	Significant urine isolate and: <ul style="list-style-type: none"> <li>history of penicillin / <math>\beta</math> lactam allergy indicated</li> <li>at physician request</li> </ul>	Perform susceptibility testing according to reporting chart	Add comment <b>&amp;A373</b>  Report clindamycin comments according to <b>Table 1</b>																				
	Significant urine isolate and above criteria not present	Add comments <b>&amp;GBPU</b>	If co-isolated with MRSA, add comment <b>&amp;van1</b>																				
<p><b>Table 1 Clindamycin Reporting for Urine (pregnant only):</b>            Report <b>comments only</b>            (Do NOT report erythromycin/clindamycin results as S / I / R)</p> <table border="1"> <thead> <tr> <th>Erythromycin</th> <th>Clindamycin</th> <th>ICR</th> <th>Add Comments</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>R</td> <td>N/A</td> <td><b>#A327</b> <b>#A331</b> <b>&amp;A336</b></td> </tr> <tr> <td>I or R</td> <td>S</td> <td>Positive</td> <td><b>#A328</b> <b>#A331</b> <b>&amp;A336</b></td> </tr> <tr> <td>I or R</td> <td>S</td> <td>Negative</td> <td><b>#A329</b> <b>#A331</b> <b>&amp;A336</b></td> </tr> <tr> <td>S</td> <td>S</td> <td>N/A</td> <td><b>#A329</b> <b>#A331</b> <b>&amp;A336</b></td> </tr> </tbody> </table>				Erythromycin	Clindamycin	ICR	Add Comments	R	R	N/A	<b>#A327</b> <b>#A331</b> <b>&amp;A336</b>	I or R	S	Positive	<b>#A328</b> <b>#A331</b> <b>&amp;A336</b>	I or R	S	Negative	<b>#A329</b> <b>#A331</b> <b>&amp;A336</b>	S	S	N/A	<b>#A329</b> <b>#A331</b> <b>&amp;A336</b>
Erythromycin	Clindamycin	ICR	Add Comments																				
R	R	N/A	<b>#A327</b> <b>#A331</b> <b>&amp;A336</b>																				
I or R	S	Positive	<b>#A328</b> <b>#A331</b> <b>&amp;A336</b>																				
I or R	S	Negative	<b>#A329</b> <b>#A331</b> <b>&amp;A336</b>																				
S	S	N/A	<b>#A329</b> <b>#A331</b> <b>&amp;A336</b>																				
<b>Other specimen sources</b>	Refer to specific bench protocols for susceptibility testing requirements. <ul style="list-style-type: none"> <li>If indicated in bench protocol add comment <b>&amp;Str1</b></li> <li>If co-isolated with organisms where TMP-SMX is routinely reported, add comment <b>&amp;A373</b></li> </ul>																						

## Streptococcus agalactiae, Continued

### LIS comments

LIS Code...	Translation...
&UTIO	If patient has severe allergy and susceptibility testing to nitrofurantoin is needed for the treatment of UTI, and to clindamycin for intrapartum antibiotic prophylaxis, contact the Microbiology laboratory.
&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.
&A336	Current guidelines suggest intrapartum GBS prophylaxis should be with penicillin (or ampicillin) IV, cefazolin if nonsevere penicillin allergy, clindamycin in severe beta-lactam allergy, or vancomycin in severe beta-lactam allergy where clindamycin tests resistant or susceptibility is unknown. A severe allergy is defined as anaphylaxis, angioedema, respiratory distress or urticaria following administration of a penicillin or a cephalosporin.
&Str2	This organism is generally susceptible to beta lactam antibiotics.
&A373	Trimethoprim-sulfamethoxazole has unpredictable activity against this organism.
#A327	This isolate is resistant to clindamycin.
#A328	This isolate demonstrates inducible resistance to clindamycin in vitro.
#A329	This isolate is susceptible to clindamycin.
#A331	Clindamycin results applicable for intrapartum prophylaxis, not for urinary tract infections.
&van1	This organism is predictably susceptible to vancomycin.
&IAPO	If susceptibility testing to clindamycin is needed for intrapartum antibiotic prophylaxis, contact the Microbiology laboratory.

### Special considerations

<u>Ampicillin/ Penicillin/ Vancomycin:</u>	<p>S. agalactiae should be susceptible to these antibiotics. Consult Supervisor if not susceptible.</p> <p>If 'nonsusceptible', the organism ID and susceptibility should be confirmed by repeat testing. If confirmed, consider submitting isolate to a reference laboratory.</p>
<u>Cefotaxime/ Ceftriaxone:</u>	<p>S. agalactiae should be susceptible to these antibiotics. Consult Supervisor if not susceptible.</p> <p>If 'nonsusceptible', the organism ID and susceptibility should be confirmed by repeat testing. If confirmed, consider submitting isolate to a reference laboratory.</p> <p>If patient ≤1 month report cefotaxime only. If patient &gt;1-3 months report cefotaxime and ceftriaxone. If patient &gt;3 months report ceftriaxone only.</p>

## Streptococcus agalactiae, Continued

### Special Considerations (continued)

Clindamycin/ Erythromycin:	If <b>clindamycin S/I</b> and <b>erythromycin I/R</b> this may indicate inducible resistance.	
	Check for inducible resistance with VITEK2 ICR.	
	<b>IF...</b>	<b>THEN....</b>
	VITEK2 ICR is positive	<ul style="list-style-type: none"> <li>• Report clindamycin R</li> <li>• Add comment: “This isolate is presumed to be resistant to clindamycin based on detection of inducible clindamycin resistance in vitro”. #A139</li> </ul>
VITEK2 ICR is negative	<ul style="list-style-type: none"> <li>• Report clindamycin as tested.</li> </ul>	
If <b>clindamycin I/R</b> and <b>erythromycin S</b> confirm results. This may represent a rare mechanism of resistance. <ul style="list-style-type: none"> <li>• Confirm clindamycin and erythromycin by disc diffusion and D test.</li> <li>• If VITEK2 results confirmed report as tested.</li> <li>• If discrepancy between VITEK2 and disc diffusion results consult Supervisor</li> </ul>		

### Interpretation

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

**Exception:** For penicillin - If MIC 0.12 µg/mL, report as S but add comment:  
“Although this isolate tests susceptible to penicillin, the MIC is elevated and higher doses of penicillin may be indicated.” #pen1

Use **CLSI** interpretive document for **Streptococcus spp. β-Hemolytic Group**

Urine: For nitrofurantoin – use **CLSI** interpretive document for **Enterococcus spp.**

Add comment:

“Susceptibility testing for this organism was performed by a non-reference method and/or required modifications to the standard test conditions. Results are probable but not definite.” &2130 &2338