

MC 6.032 Beta-Hemolytic Streptococcus Susceptibility Reporting

Purpose This procedure provides instruction and guidance for routine testing and selective and cascade susceptibility reporting on Beta-Hemolytic Streptococcus species.

Principal and Clinical Significance The decisions for the most appropriate antimicrobial agents to test and report are made with input from Pharmacy, Infectious Disease and the Clinical Laboratory. The goal is to provide clinically relevant information that will decrease the chance of developing antibiotic resistance, harmful effects of inappropriate antimicrobial use and avoid reporting results that could adversely affect patient care using selective and cascade reporting rules.

Policy Statements This procedure applies to Microbiologists who perform susceptibility testing.

Special Safety Precautions Microbiologists are subject to occupational risks associated with specimen handling.

- [Biohazard Containment](#)
- [Biohazardous Spills](#)
- [Safety in the Microbiology Laboratory](#)

Procedure

1. List of organisms in the Beta-Hemolytic Streptococcus group include:
 - *Streptococcus pyogenes*
 - *Streptococcus agalactiae*
 - Beta Hemolytic Streptococcus, group G
 - Beta Hemolytic Streptococcus, group F
 - Beta Hemolytic Streptococcus, group C
 - *Streptococcus dysgalactiae* spp. *dysgalactiae*
 - *Streptococcus dysgalactiae* spp. *equisimilis*
 - *Streptococcus equi* spp. *equi*
 - *Streptococcus equi* spp. *zooepidemicus*
 - *Streptococcus equinus*
 - *Streptococcus equi/equisimilis* group C
2. Antibiotics appropriate for routine testing and reporting for Beta Hemolytic Streptococcus group include:
 - Erythromycin
 - Clindamycin
 - Penicillin
 - Ampicillin
 - Tetracycline
 - Ceftriaxone
 - Cefotaxime
 - Vancomycin
 - Cefepime
 - Daptomycin
 - Linezolid
 - Ceftaroline
 - Levofloxacin

3. Perform susceptibilities using Vitek cards AST-ST02 or Kirby Bauer Method.

- Vitek AST-ST02 will be the primary method of testing.
 - Kirby Bauer are back up if testing fails.
 - Do not perform testing on multiple methods to cover all the antibiotics. It is acceptable if cascaded antibiotics are not reported.
4. Vitek results will be accepted under the Online Results tab. Modifications will be under the **VITMIC** keyboard under the Susceptibility tab.
 5. Kirby Bauer results will be entered manually under the **KB** keyboards under the Susceptibility tab.
 6. ETEST or send out results will be entered manually under the **MMIC** keyboards under the Susceptibility tab.

Selective Reporting

1. Antibiotics will be reported in a specific order indicating the first and subsequent preferences of the Antimicrobial Stewardship Committee and Infectious Disease physicians
2. Antibiotics will be reported depending on the source, if the sample is a urine, non-urine or CSF source.
3. There will be exceptions based on the method used for testing.
4. For **urine sources**, 1 antibiotic will be reported routinely.
 1. Penicillin

Figure 1 -Only Pen is reported. All other antibiotics are in HIDE

Organism #1 - STREPTOCOCCUS AGALACTIAE, GROUP B		
- VITMIC -		
SS	P(0.06)	
HIDE	AM(0.06-SS), VA(1-SS), TE(2-SS), CAX(0.5-SS), LEVO(2-SS), LZD(2-SS)	

5. For **non-urine sources**, including blood, 2 antibiotics will be reported routinely, in this order.
 1. Penicillin
 2. Clindamycin

Figure 2-Only Pen and CD are reported. All other antibiotics are in HIDE.

Org #1. STREPTOCOCCUS AGALACTIAE, GROUP B		
- VITMIC -		
SS	P(0.12), CD(0.25)	
HIDE	E(0.25-SS), AM(0.12-SS), TE(2-SS), VA(1-SS), CAX(0.5-SS), LEVO(2-SS), LZD(2-SS), ICR(NEG)	

6. For **CSF sources**, only 1 antibiotic will be reported routinely.
 1. Penicillin

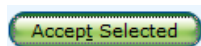
Figure 3-Only Pen is reported. All other antibiotics are in HIDE.

Organism #1 - STREPTOCOCCUS AGALACTIAE, GROUP B		
- VITMIC -		
SS	P(0.12)	
HIDE	AM(0.25-SS), VA(1-SS), CAX(0.5-SS), LZD(2-SS)	

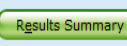
Cascade Reporting- Vitek Method

If resistance is encountered, additional antibiotics will automatically be released.

1. For Vitek method, hidden antibiotics will be released when Accept Selected is clicked.



The released results will be visible in Results Summary.



2. Results can be edited under the **VITMIC** keyboard but is not needed to report the cascaded antibiotics.

Method: **Vitek** -Non-Urine sources

- o If ICR is positive → report Clindamycin as R, remove the MIC result**

Figure 4- Example with ICR positive on a Blood culture

Org #1.	STREPTOCOCCUS AGALACTIAE, GROUP B	
- VITMIC -	SS	P(0.12)
	R	CD(R)
	HIDE	E(1-R), AM(0.12-SS), TE(2-SS), VA(1-SS), CAX(0.5-SS), LEVO(2-SS), LZD(2-SS), ICR(POS)

3. ** Exception: Clindamycin is not reported on CSF or urines.
4. All other antibiotics on the panel that are not part of the cascade are hidden. Do not release and report. Hidden antibiotics include:
 - o Erythromycin
 - o Ampicillin
 - o Tetracycline
 - o Vancomycin
 - o Ceftriaxone
 - o Levofloxacin
 - o Linezolid
 - o Inducible Clindamycin Resistance
5. Requested antibiotics may be released with a provider request

Cascade Reporting- MicroScan Method

If additional antibiotics are requested or ETEST performed, use the MMIC keyboard and release from HIDE.

1. Enter results manually under the **MMIC** keyboard.
2. Click the check mark under SUP to remove from HIDE.

Figure 5 MMIC keyboard

Figure 5 shows the MMIC keyboard interface. The keyboard is set to "MMIC - MICROSCAN MIC". The organism is "STREPTOCOCCUS AGALACTIAE, GROUP B". The table below shows the drug results:

Drug Code	Drug Name	SUP	Result	Interpretation	Comment	Description
<<DAP>>	DAPTOMYCIN	<input checked="" type="checkbox"/>	HIDE	SUSCEPTIBLE		
		<input type="checkbox"/>		<<DO NOT REPORT>>		


3. Click on File.  Result will be un-hidden.

Figure 6- Daptomycin requested

Organism #1 - STREPTOCOCCUS AGALACTIAE, GROUP B	
- MMIC -	
SS	DAP(1)

4. Requested antibiotics may be released with a provider request.

**Cascade
Reporting-
Kirby Bauer
Method**

If resistance is encountered, additional antibiotics will automatically be released.

1. Enter **all** listed results manually under the **KB** keyboard. Antibiotics will be released following the cascade rules.

Method: Kirby Bauer – non-urine source

- If ICR is positive → report Clindamycin as R*

Figure 7 Example with ICR positive, CD reported as R

Organism #2 - STREPTOCOCCUS AGALACTIAE, GROUP B (STRAIN 2)	
- KB -	
SS	P(24)
R	CD(R)
HIDE	E(15-R), AM(24-SS), VA(17-SS), ICR(POS)

2. *Exception: Clindamycin is not reported on CSF or urines.
3. All other antibiotics on the panel that are not part of the cascade are hidden. Do not release and report. Hidden antibiotics include:
 - Erythromycin
 - Ampicillin
 - Vancomycin
 - ICR
4. Requested antibiotics may be released with a provider request.

**Method
Performance
Specifications**

1. Usually, only the Vitek card AST-ST02 will be required for testing Beta-Hemolytic Streptococcus species.

Appendix Additional Tables and Flowcharts

Vitek

Beta Strep Urine	
Antibiotics that are reported- Urine	
Sunquest code	Drug Name
P	Penicillin
Hidden antibiotics	
AM	Ampicillin
VA	Vancomycin
TE	Tetracycline
CAX	Ceftriaxone
LEVO	Levofloxacin
LZD	Linezolid

Beta Strep Non-Urine	
Antibiotics that are reported- Non-urine	
Sunquest code	Drug Name
P	Penicillin
CD	Clindamycin
Hidden antibiotics	
E	Erythromycin
AM	Ampicillin
TE	Tetracycline
VA	Vancomycin
CAX	Ceftriaxone
LEVO	Levofloxacin
LZD	Linezolid
ICR	Inducible Clindamycin Resistance

If ICR is positive
Report Clindamycin
as R and remove
MIC value

Beta Strep CSF	
Antibiotics that are reported- CSF	
Sunquest code	Drug Name
P	Penicillin
Hidden antibiotics	
AM	Ampicillin
VA	Vancomycin
LZD	Linezolid
CAX	Ceftriaxone

Kirby-Bauer

Beta Strep Urine		
Antibiotics that are reported- Urine		
Disk (Abbrev.)	Sunquest code	Drug Name
P	P	Penicillin
Hidden antibiotics		
AM	AM	Ampicillin
VA	VA	Vancomycin

Beta Strep Non-Urine		
Antibiotics that are reported- Non-Urine		
Disk (Abbrev.)	Sunquest code	Drug Name
P	P	Penicillin
CD	CD	Clindamycin
Hidden antibiotics		
E	E	Erythromycin
AM	AM	Ampicillin
VA	VA	Vancomycin
	ICR	Inducible Clindamycin Resistance

If ICR is positive

Report
Clindamycin as R

Beta Strep CSF		
Antibiotics that are reported- CSF		
Disk (Abbrev.)	Sunquest code	Drug Name
P	P	Penicillin
Hidden antibiotics		
AM	AM	Ampicillin
VA	VA	Vancomycin

MicroScan

Beta Strep Non-Urine	
Hidden antibiotics	
Sunquest code	Drug Name
DAP	Daptomycin

References

1. bioMerieux Vitek 2 AST-ST02 Streptococcus Susceptibility Card 046685-02 2021-08
2. CLSI M100 edition 34 Performance Standards for Antimicrobial Susceptibility Testing 2024

Training Plan/ Competency Assessment

Training Plan	Initial Competency Assessment
<ol style="list-style-type: none"> 1. Employee must read the procedure. 2. Employee will observe trainer performing the procedure. 3. Employee will demonstrate the ability to perform procedure, record results and document corrective action after instruction by the trainer. 	<ol style="list-style-type: none"> 1. Direct observation.

Historical Record

Version	Written/Revised by:	Effective Date:	Summary of Revisions
1	Susan DeMeyere	3/19/2025	Initial version