

MC 6.033 Streptococcus Viridans Group Susceptibility Reporting

Purpose This procedure provides instruction and guidance for routine testing and selective and cascade susceptibility reporting on Streptococcus Viridans group.

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. Examples of organisms in the Streptococcus Viridans group include:
 - Alpha Hemolytic Streptococcus
 - Alpha Hemolytic Streptococcus, Viridans group
 - *Streptococcus anginosus*
 - *Streptococcus canis*
 - *Streptococcus constellatus*
 - *Streptococcus cristatus*
 - *Streptococcus gallolyticus*
 - *Streptococcus gordonii*
 - *Streptococcus intermedius*
 - *Streptococcus mitis/oralis*
 - *Streptococcus mutans*
 - *Streptococcus ovis*
 - *Streptococcus parasanguinis*
 - *Streptococcus sanguinis*
 - *Streptococcus salivarius*
2. Antibiotics appropriate for routine testing and reporting for Beta Hemolytic Streptococcus group include:
 - Penicillin
 - Ampicillin
 - Ceftriaxone
 - Cefotaxime
 - Vancomycin
 - Linezolid
 - Levofloxacin
 - Erythromycin
 - Clindamycin
 - Cefepime

- Ceftolozane-Tazobactam
3. Perform susceptibilities using Vitek cards AST-ST02, MicroScan MicroStrep or Kirby Bauer Method.
 - Vitek AST-ST02 will be the primary method of testing.
 - MicroScan MicroStrep and 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. MicroScan MicroStrep will be entered manually under the **MMIC** keyboards under the Susceptibility tab.
 6. Kirby Bauer results will be entered manually under the **KB** 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**, 2 antibiotics will be reported routinely, in this order.
 1. Ampicillin
 2. Penicillin

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

Organism #1 - STREPTOCOCCUS SPECIES, VIRIDANS GROUP	
- VITMIC -	
SS	AM(0.25), P(0.12)
HIDE	CAX(1-SS), VA(1-SS), LZD(2-SS), LEVO(2-SS)

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

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

Organism #1 - STREPTOCOCCUS ANGINOSUS GROUP	
- VITMIC -	
SS	AM(0.25), P(0.12)
HIDE	CAX(1-SS), VA(1-SS), LZD(2-SS), CD(1-R), E(1-R), LEVO(2-SS)

6. For **CSF** sources, 2 antibiotics will be reported routinely, in this order.
 1. Ampicillin
 2. Penicillin

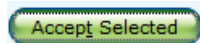
Figure 3-Only Am and Pen are reported. All other antibiotics are in HIDE.

Organism #5 - STREPTOCOCCUS ANGINOSUS GROUP	
- VITMIC -	
SS	AM(0.25), P(0.12)
HIDE	CAX(1-SS), VA(1-SS), LZD(2-SS)

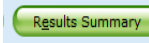
Cascade Reporting-Vitek Method

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 -all sources

- If Ampicillin or Penicillin is R → report Ceftriaxone
- If Ceftriaxone is R → report Vancomycin

Figure 4- Example with resistance on a urine culture

Organism #1 - STREPTOCOCCUS SPECIES, VIRIDANS GROUP		
- VITMIC -		
SS	VA(1)	
R	AM(8), P(4), CAX(4)	
HIDE	LZD(2-SS), LEVO(2-SS)	

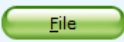

Figure 5-Example with resistance on a non-urine culture

Organism #2 - STREPTOCOCCUS INTERMEDIUS		
- VITMIC -		
SS	VA(1)	
R	AM(8), P(4), CAX(4)	
HIDE	LZD(2-SS), CD(0.25-SS), E(0.25-SS), LEVO(2-SS)	

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
 - Clindamycin
 - Levofloxacin
 - Linezolid
4. Requested antibiotics may be released with a provider request

Cascade Reporting-MicroScan Method

If resistance is encountered or ETEST performed, use the MMIC keyboard. Additional antibiotics will automatically be released.

1. Enter results manually under the **MMIC** keyboard.
2. Hidden antibiotics will be released when File  is clicked. Results will be visible in Results Summary. 

Method: MicroScan MicroStrep – all sources

- If Ampicillin or Penicillin is R → report Ceftriaxone
- If Ceftriaxone is R → report Vancomycin

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

Figure 6-Example of resistance on a urine culture

Organism #7 - STREPTOCOCCUS MUTANS	
- MMIC -	
SS	VA(1)
R	AM(8), P(4), CAX(4)
HIDE	CEFE(4-R), LEVO(2-SS)

Figure 7 Example of resistance on a non-urine culture

Organism #4 - STREPTOCOCCUS MITIS/STREPTOCOCCUS ORALIS (STRAIN 2)	
- MMIC -	
SS	VA(1)
R	AM(8), P(4), CAX(4)
HIDE	CEFE(1-SS), CD(0.25-SS), E(0.25-SS), LEVO(2-SS)

- All other antibiotics on the panel that are not part of the cascade are hidden. Do not release and report. Hidden antibiotics include:
 - Erythromycin
 - Clindamycin
 - Cefepime
 - Levofloxacin
- Requested antibiotics may be released with a provider request.


Cascade Reporting- Kirby Bauer Method

- Kirby Bauer method will not be very helpful, as Ampicillin and Penicillin do not have KB breakpoints.
- If Vitek or MicroScan MicroStrep do not yield results:
 - Set up Penicillin Etest and result under MMIC keyboard.
 - If Penicillin is resistant, set up Vancomycin Etest and result under MMIC keyboard.
- If KB method is used, enter all listed results manually under the **KB** keyboard.

Method: Kirby Bauer – all sources

- If Penicillin Etest is R → report Vancomycin
- Click the check mark under SUP to remove from HIDE

Figure 8 KB Keyboard

Keyboard KB - KIRBY BAUER 

S	H	O	B	Organism
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STREPTOCOCCUS MITIS
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STREPTOCOCCUS SANGUIS I

☒ Suppress all

Drug Code	Drug Name	SUP	Result	Interpretation
VA	VANCOMYCIN	<input checked="" type="checkbox"/>	17 HIDE	<<DO NOT REPORT>>
<<E>>	ERYTHROMYCIN	<input checked="" type="checkbox"/>	15 HIDE	RESISTANT <<DO NOT REPORT>>
<<CD>>	CLINDAMYCIN	<input checked="" type="checkbox"/>	15 HIDE	RESISTANT <<DO NOT REPORT>>

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

Figure 9 Example with Penicillin resistant by Etest, KB set up for Vancomycin

Organism #6 - STREPTOCOCCUS MITIS		
- KB -		
SS	VA (17)	
HIDE	E (15-R), CD (15-R)	
- MMIC -		
R	P (8)	

6. All other antibiotics on the panel that are not part of the cascade are hidden. Do not release and report. Hidden antibiotics include:
- Erythromycin
 - Clindamycin
7. Requested antibiotics may be released with a provider request.

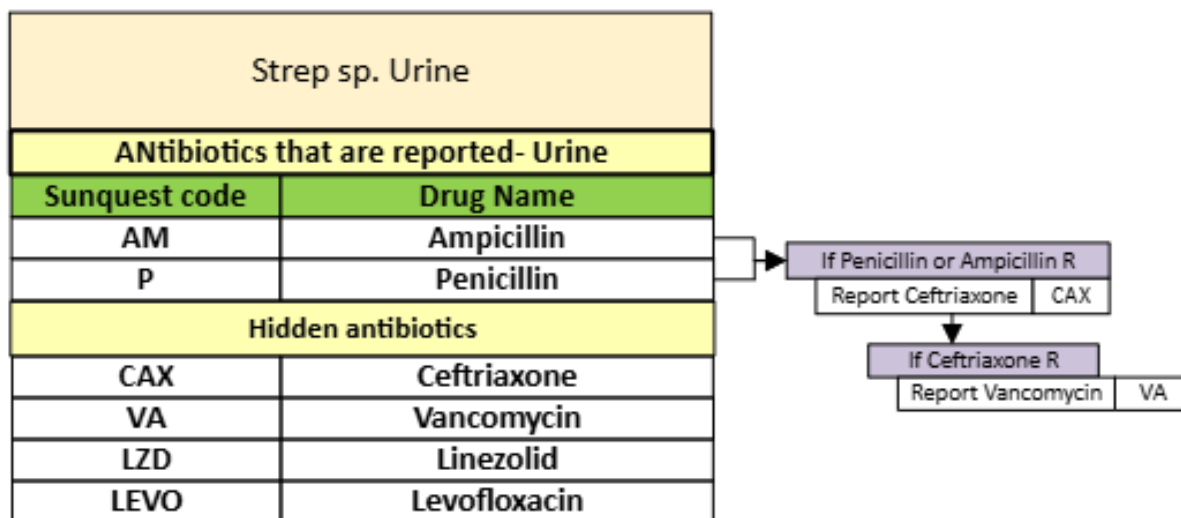
**Method
Performance
Specifications**

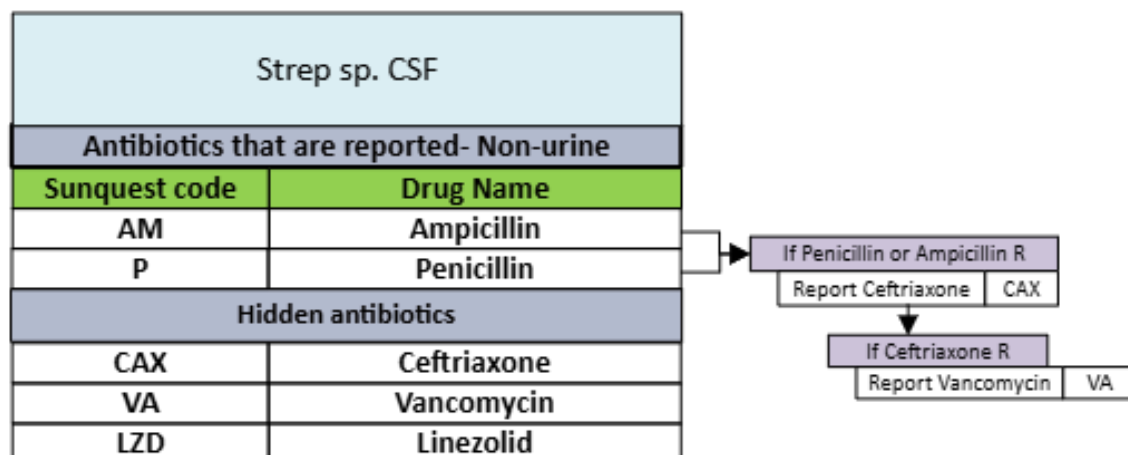
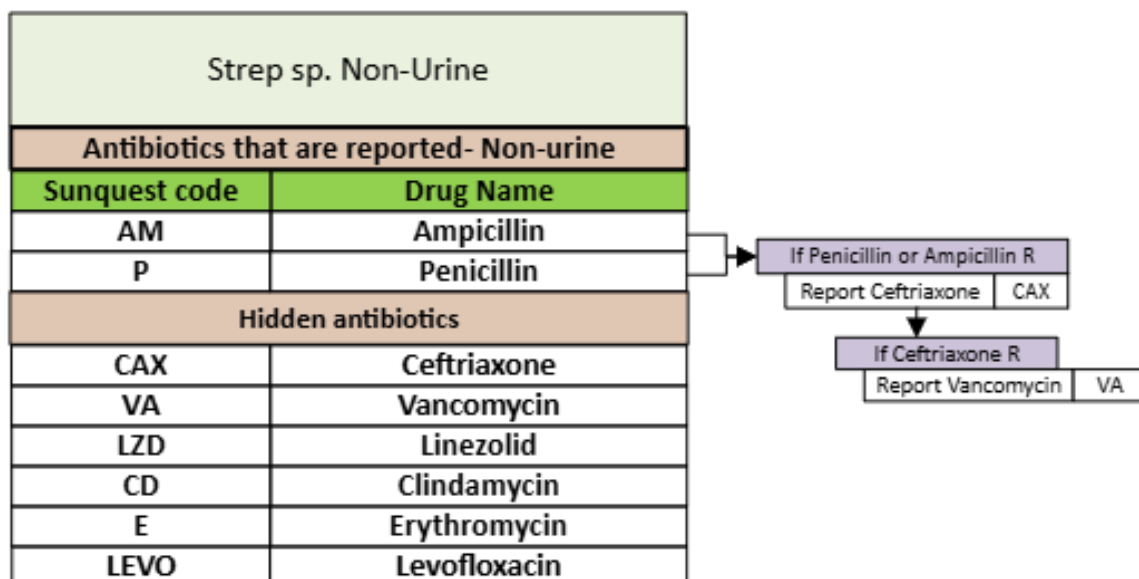
- Usually, only the Vitek card AST-ST02 will be required for testing Streptococcus Viridans Group.
- KB method with require Penicillin Etest. Set up penicillin Etest day of use QC.
- If Vancomycin Etest is performed, set up Vancomycin Etest day use QC.

Appendix

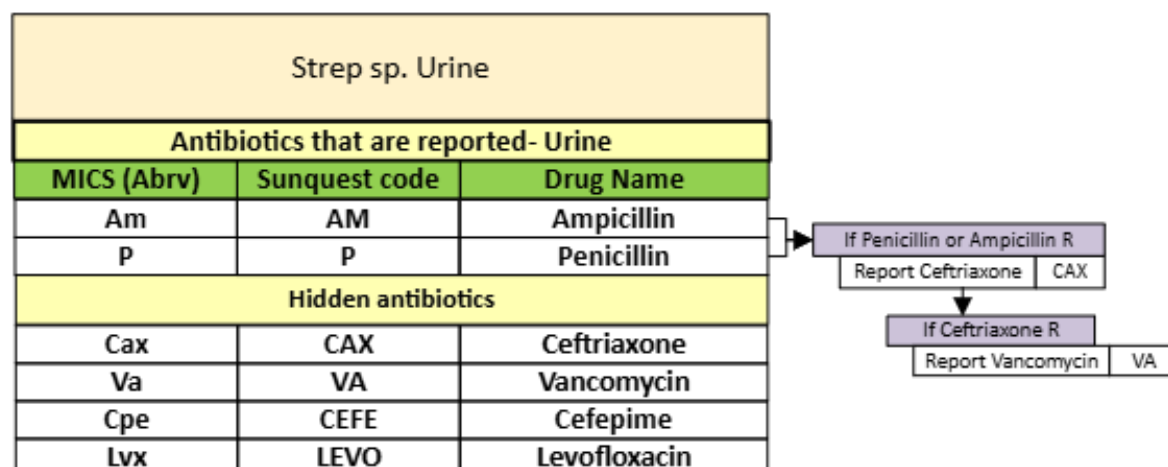
Additional Tables and Flowcharts

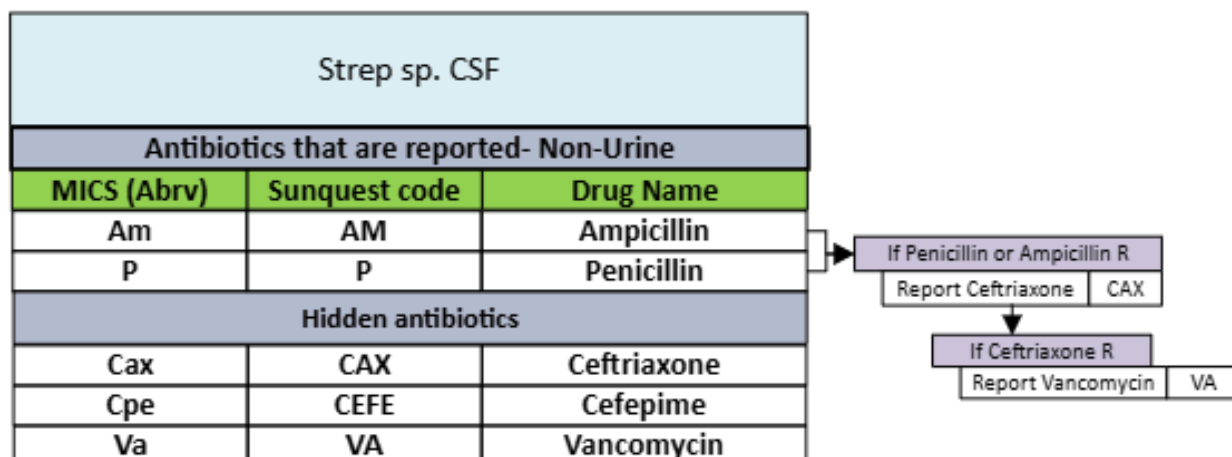
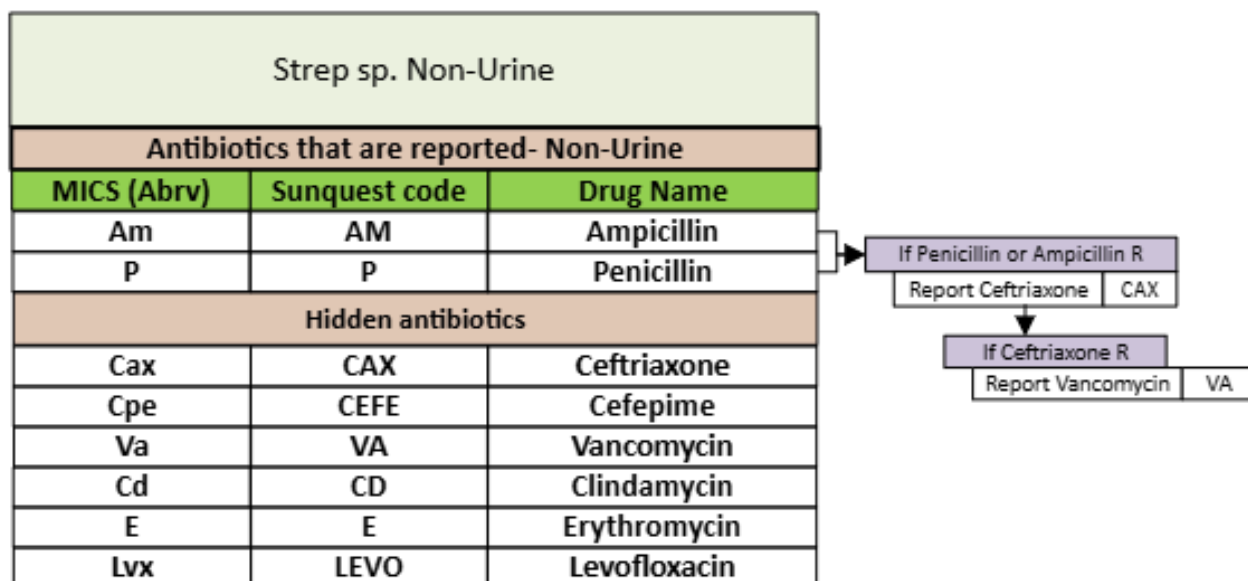
Vitek



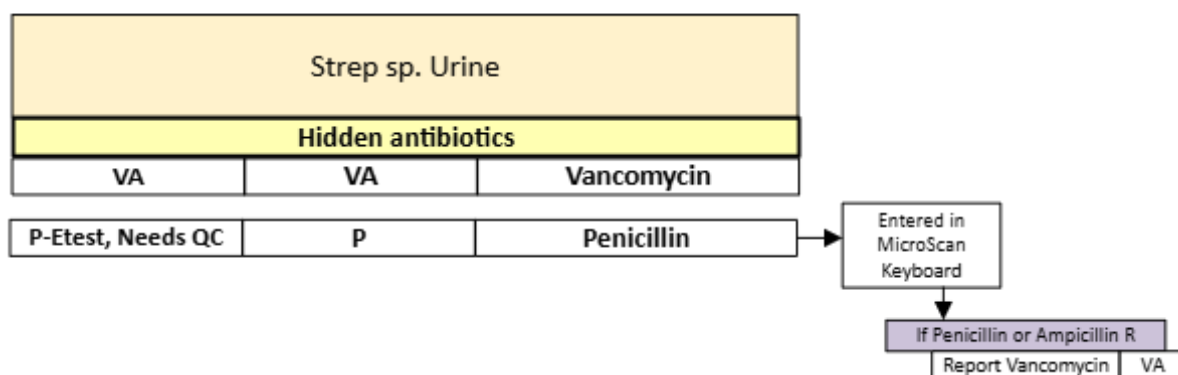


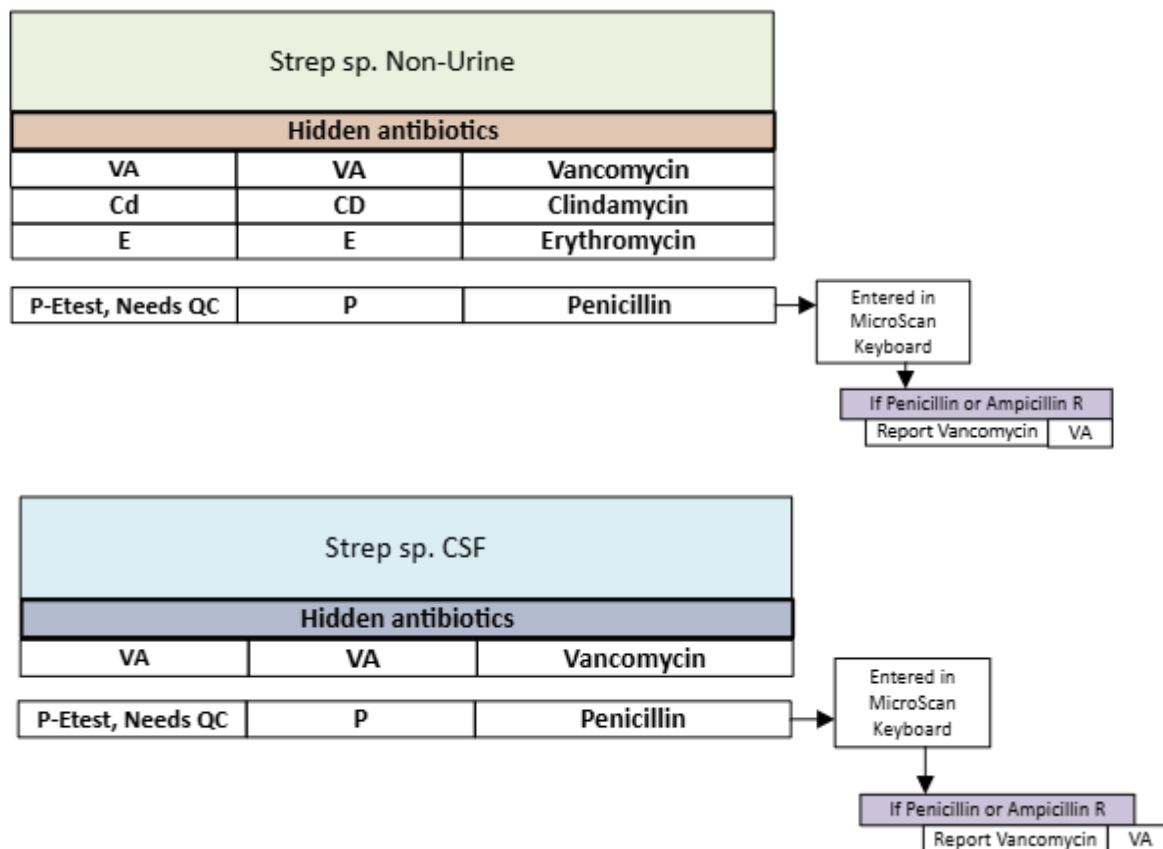
MicroScan





Kirby-Bauer





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
3. Beckman Coulter, Inc. MicroScan MicroStrep plus panel. August 2023. Brea, CA. www.beckmancoulter.com.

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