PROCEDURE: ANTIBIOTIC BATTERIES

The laboratory reviews CLSI M100 annually to update procedure for relevant organism/antimicrobial changes to ensure appropriateness of reporting. A Director actively participates with the Antimicrobial Stewardship Committee to address the needs of the patient population.

Non-standard susceptibility testing should not be performed. Always refer to CLSI M100 for standards.

*All providers requesting recommendations on antimicrobial therapy should be directed to the Antimicrobial Stewardship Pharmacist at: 350-2205.*

* *Haemophilus* species – perform cefinase only and report as the appropriate isolate comment: ***&HBLN*** *(Beta Lactamase Negative. Haemophilus isolates negative for beta-lactamase are likely to be susceptible to Amoxicillin, Macrolides and Cephalosporin antibiotics.)* or ***&HBLP*** *(Beta-Lactamase positive. Haemophilus Isolates producing beta lactamase are resistant to Amoxicillin.)*
* *Moraxella catarrhalis* - include isolate comment: ***&BCAT*** *(All isolates should be considered Beta-Lactamase positive.)*
* *Bacteroides fragilis* group – include isolate comment: ***&BCAT*** *(All isolates should be considered Beta-Lactamase positive.)*
* Antibiotics for MDR *Acinetobacter* screens are not routinely reported. The provider is looking for the presence or absence of the resistant organism. Refer to *Acinetobacter Screen Procedure* for guidance
* Additional antimicrobial requests – check CLSI standards for appropriateness (Table 1 & Table 2) & bring up on ROUNDS

 Quest Diagnostics (San Juan Capistrano location preferred) is the reference laboratory for send-out testing.

Document all requests in worksheet.

 (Reference laboratories require organisms to be submitted growing on an agar slant)

* Send isolate to RIDOH if reported result is: meropenem/imipenem resistant *E. coli, K. pneumoniae, K. oxytoca, Enterobacter*, non-mucoid *P. aeruginosa, Acinetobacter baumannii* complex; ertapenem resistant *E. coli, K. pneumoniae, K. oxytoca,* or *Enterobacter*; *Staphylococcus aureus;* vancomycin confirmed as non-susceptible (MIC is 4); pan-resistant organisms

**KIRBY BAUER: GRAM NEGATIVE RODS (Non-CSF SOURCES)**

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| *Routine Method* | *Back-up Method* |
| ***PSEUDOMONAS AERUGINOSA*** | **ENTEROBACTERIACEAE** | *SALMONELLA / SHIGELLA* |
| Amikacin (AN) | Amikacin (AN) | Ampicillin (AMP) |
| Aztreonam (ATM) | Ampicillin (AMP) | Ceftriaxone (CRO)d |
| Cefepime (FEP) | Ampicillin/Sulbactam (SAM) | Ciprofloxacin (CIP) |
| Ceftazidime (CAZ) | Cefazolin (CZ) | Trimeth/Sulfa (SXT) |
| Ciprofloxacin (CIP) | Cefuroxime (CXM) |  |
| Gentamicin (GM) | Ceftriaxone (CRO) |  |
| Levofloxacin (LV) | Cefepime (FEP) |  |
| Meropenem (MEM) | Ciprofloxacin (CIP) |  |
| Piperacillin/Tazobactam (TZP) | Gentamicin (GM) |  |
| Tobramycin (NN) | Meropenem (MEM) |  |
| Ampicillin/Sulbactam (SAM)e | Trimeth/Sulfa (SXT) |  |
| Trimeth/Sulfa (SXT)e | Nitrofurantoin (FD)a |  |
|  | Piperacillin/Tazobactam (TZP)b |  |

**a - Urines cultures only**

**b - Additional antibiotic reported for inpatients**

**c - ≤25mm – set up ESBL confirmatory disks**

**d – Only extra-intestinal isolates**

**e – *Acinetobacter baumannii* only**

**KIRBY BAUER: GRAM POSITIVE COCCI (Non-CSF SOURCES)**

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| **Routine Method** | ***Back-up Method*** |
| BETA-HEMOLYTIC STREPg,h | VIRIDANS STREPb,g | *ENTEROCOCCUS* | ***STAPHYLOCOCCUSe,h,i*** |
| URINESc | URINES | URINES | **URINES** |
| Ampicillin (AM) | Ceftriaxone (CRO) | Nitrofurantoin (FD) | Gentamicin (GM) |
| Levofloxacin (LV) | Penicillin (ETEST) | Penicillin (P) | Levofloxacin (LV) |
| Ceftriaxone (CRO) |  | Tetracycline (TE) | Trimeth/Sulfa (SXT) |
|  | **NON-URINE SOURCES** | Vancomycin (VA) | Cefoxitin (FOX for Oxacillin)e |
| **NON-URINE SOURCES** | Clindamycin (CC)b | Levofloxacin (LV) | Vancomycin (ETEST) |
| Ampicillin (AM) | Erythromycin (E)b |  |  |
| Clindamycin (CC)b | Ceftriaxone (CRO) | **NON-URINE SOURCES** | **NON-URINE SOURCES** |
| Erythromycin (E)b | Penicillin (ETEST) | Penicillin (P) | Clindamycin (CC)b |
| Levofloxacin (LV) | Vancomycin (VA) | Vancomycin (VA) | Erythromycin (E)b |
| Ceftriaxone (CRO) |  | Gent-500 (QUAD PLATE) | Gentamicin (GM) |
| Vancomycin (VA) |  | Strep-2000 (QUAD PLATE) | Levofloxacin (LV)d |
|  |  | Linezolid (ETEST)a | Trimeth/Sulfa (SXT) |
| **SCREENSc** |  |  | Cefoxitin (FOX for Oxacillin) |
| Clindamycin (CC) |  |  | Vancomycin (ETEST) |
| Dtest reported if positivef |  |  |  |

# a - Release if organism is resistant to all antibiotics reported from a sterile site

**b - DTEST performed only upon special request**

**c - When requested by provider, otherwise report isolate comment: *&GBS***

**d - Quinilones are not reported for *Staphylococcus aureus* in blood cultures**

**e - *Staphylococcus lugdunensis* and *Staphylococcus pseudointermedius* have special reporting criteria. Refer to CLSI Standards (Table 2C)**

**f - Ceftriaxone and Vancomycin can be released if DTEST is positive**

**g - *Streptococcus anginosus* group and Group D non-enterococcus are treated as viridans streptococcus**

**h – Daptomycin Etest is appropriate to add for non-respiratory sources**

**i – Ceftaroline is appropriate to skin/soft tissue/blood sources**

#### KIRBY BAUER: CSF ONLY

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| ***Routine Method*** | ***Back-up Method*** |
| ***VIRIDANS STREP.*** | ***PSEUDOMONAS AERUGINOSA*** | ***STAPHYLOCOCCUSb*** | **GRAM NEGATIVE RODS** | ***STREP. PNEUMONIAE***  |
| Ceftriaxone(CRO)a | Amikacin (AN) | Gentamicin (GM) | Amikacin (AN) | Ceftriaxone(CRO)a |
| Meropenem (MEM) | Aztreonam (ATM) | Vancomycin (ETEST) | Ampicillin (AMP) | Meropenem (MEM) |
| Penicillin (ETEST) | Cefepime (FEP) | Cefoxitin (FOX for Oxacillin)b | Amp/Sulbactam (SAM) | Penicillin (ETEST) |
| Vancomycin (VA) | Ceftazidime (CAZ) |  | Cefepime (FEP) | Vancomycin (VA) |
|  | Gentamicin (GM) |  | Ceftriaxone (CRO) |  |
|  | Meropenem (MEM) |  | Gentamicin (GM) |  |
|  | Pip/Tazobactam (TZP) |  | Meropenem (MEM) |  |
|  | Tobramycin (NN) |  | Pip/Tazobactam (TZP) |  |
|  |  |  | Tobramycin (NN) |  |
|  |  |  |  |  |

**a - Streptococcus pneumoniae that are resistant to ceftriaxone by disk diffusion need to have an MIC performed. If no MIC is available, the isolate must be sent to the RIDOH**

**b - *Staphylococcus lugdunensis* and *Staphylococcus pseudointermedius* have special reporting criteria. Refer to CLSI Standards (Table 2C).**

## VITEK PANELSl

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| ***Routine Method*** |
| **GN-84** | **GP-67** | **GP-67** |
| **GRAM NEGATIVE RODS** | ***STAPHYLOCOCCUSh, j*** | ***ENTEROCOCCUS*** |
| Amoxicillin/CA | Ciprofloxacinc | **NON-URINE SOURCES** |
| Ampicillin | Clindamycin | Penicillin |
| Aztreonam | Erythromycin | Vancomycin |
| Cefazolin | Gentamicin | Gentamicin High Level |
| Cefepime | Inducible Clindamycin Resistance | Streptomycin High Level |
| Ceftriaxone | Levofloxacinc | Linezolidf |
| Ciprofloxacin | Moxifloxacinc,d | Nitrofurantoina |
| Ertapenemk | (Cefoxitin) Oxacilling,h, i |  |
| Gentamicin | Tetracycline | **URINES** |
| Levofloxacin | Trimethoprim/Sulfamethoxazole | Nitrofurantoin |
| Meropenemk | Vancomycin e | Penicillin |
| Pip/Tazobactamb |  | Tetracycline |
| Tetracycline |  | Vancomycin |
| Trimethoprim/Sulfa |  |  |
| Nitrofurantoina |  |  |

**a – Urine cultures only**

**b – Add TZP disk if Vitek TZP is not performed (Inpatients)**

**c – Quinolones are not reported for *Staphylococcus aureus* in blood cultures or for MRSA isolates in wound cultures**

**d – Moxifloxacin only reported for MSSA**

**e – Vancomycin results of > 2µg/ml must be confirmed by GPN3F; >4µg/ml sent to CDC through RIDOH.**

**f – Release if organism is resistant to all antibiotics reported from a sterile site**

1. **1– If Cefoxitin screen is negative and switches oxacillin result of 0.5 µg/ml resistant setup a PBP2a test. If PBP2A is positive report out isolate as MRSA, if result is negative result just as SA. Bring up both cases on rounds.**

**2. If Cefoxitin screen is negative and oxacillin is 1µg/ml or 2µg/ml, perform a PBP2a test. If positive, report as MRSA and bring up on rounds. If result in negative, report out as just a SA.**

**h – When Staph lugdunensis and Staph pseudointermedius results for oxacillin and cefoxitin are discrepant repeat the vitek and perform a KB. Also perform a oxacillin screen for comparison. If the 2nd vitek result matches the KB, report the vitek result. If the vitek and the KB disagree, bring up on rounds.**

**I – *Staphylococcus lugdunensis* and *Staphylococcus pseudointermedius* have special reporting criteria. Refer to CLSI Standards (Table 2C).**

**j – Acceptable to release Rifampin for ID provider**

**k – Ertapenem and Meropenem results that are I or R need to be confirmed with the GNX2F Trek Sensititre panel.**

**l – Reported antimicrobials vary based on organism identification and product limitations**

**TREK SENSITITRE PANEL**

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| ***Routine Method*** | ***Supplemental Method*** |
| **GNX2Fa,g** | **GNX2Fa,g** | **STP6Fb** | **GPN3Fc** |
| **NLF GRAM NEGATIVE RODS** | ***BURKHOLDERIA CEPECIA*** | ***STREPTOCOCCUS PNEUMONIAEf*** | ***STAPHYLOCOCCUS AUREUS*** |
| Amikacin | Ceftazidime | Ceftriaxone (meningitis) | VANCOMYCINd |
| Aztreonam | Levofloxacin | Ceftriaxone (non-meningitis) |  |
| Cefepime | Meropenem | Chloramphenicol |  |
| Cefotaxime | Minocycline | Clindamycine |  |
| Ceftazidime | Trimeth/Sulfa | Erythromycin |  |
| Ciprofloxacin |  | Levofloxacin |  |
| Doxycycline | ***STENOTROPHOMONAS MALTOPHILIA*** | Meropenem |  |
| Gentamicin | Ceftazidime (R) | Penicillin(oral) |  |
| Levofloxacin | Levofloxacind | Penicillin(meningitis) |  |
| Meropenem | Minocycline | Penicillin(non-meningitis) |  |
| Minocycline | Trimeth/Sulfa | Vancomycin |  |
| Pip/Tazobactam |  |  |  |
| Tobramycin |  |  |  |
| Trimeth/Sulfa |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## a – Never release tigecycline from this panel

**b – Available upon request: amoxicillin/clav, azithromycin, cefepime, cefotaxime, cefuroxime, daptomycin, ertapenem, linezolid, moxifloxacin & trimeth/sulfa**

**c – For confirmation of possible VISA/VRSA isolates.**

**d – Suppressed if non-susceptible**

**e – Not reported if erythromycin is non-susceptible & clindamycin is susceptible**

**f – Only report: ceftriaxone, meropenem, penicillin & vancomycin for *Strep. pneumoniae* isolates from CSF sources.**

**g – Reported antimicrobials vary based on organism identification and product limitations**

**REVISIONS:**

 April 30, 2020 – Added Levofloxacin to PA and suppression of Quinolones for MRSA isolates in wound cultures