

**Note: Antibigram indicates percent susceptible to the antibiotic. Results are based on the first isolate per patient. Any duplicate isolates and surveillance isolates have been removed. Antibigram data should be considered in combination with patient's risk of resistant organisms, clinical syndrome and hospital epidemiology to guide empiric therapy.**

**NIAGARA HEALTH Antibigram 2016**

(St. Catharines Site, Greater Niagara General Site, Welland Site, Douglas Memorial Site, Port Colborne Site, Niagara-on-the-Lake Site)

| Organism   | GRAM POSITIVE ORGANISMS |             |             |                   |              |                                   |               |              |             |            | Number of Isolates |
|--|-------------------------|-------------|-------------|-------------------|--------------|-----------------------------------|---------------|--------------|-------------|------------|--------------------|
|  | Ampicillin              | Cloxacillin | Cefazolin   | Clindamycin       | Erythromycin | Trimethoprim/<br>Sulfamethoxazole | Ciprofloxacin | Tetracycline | Rifampin    | Vancomycin |                    |
| <i>Staphylococcus aureus</i><br>(includes MSSA and MRSA) |                         | 69          | 69          | See MSSA and MRSA |              |                                   |               |              |             |            | 1109               |
| Methicillin Sensitive <i>S. aureus</i><br>(MSSA)         |                         | 100         | 77<br>(773) | 72                | 99<br>(773)  | 86                                | 98            | 100<br>(773) | 100         | 774        |                    |
| Methicillin Resistant <i>S. aureus</i><br>(MRSA)*        |                         | 0           | 42          | 12                | 100          | 16                                | 92            | 100          | 100         | 357        |                    |
| <i>Enterococcus species</i> ^                            | 91                      |             |             |                   |              |                                   |               |              | 99<br>(960) | 965        |                    |

\* Methicillin Resistant *S. aureus* (MRSA) are resistant to all  $\beta$ -lactams (penicillins, cephalosporins,  $\beta$ -lactam/ $\beta$ -lactamase inhibitor combinations and carbapenems).

^ Clindamycin, Co-trimoxazole and all Cephalosporins are ineffective against *Enterococcus spp.*

| Organism  | <i>S. pneumoniae</i> |                           |             |              |           |            |                                   |   | Number of Isolates |
|---|----------------------|---------------------------|-------------|--------------|-----------|------------|-----------------------------------|---|--------------------|
|   | Penicillin V (oral)  | Penicillin G (parenteral) | Ceftriaxone | Levofloxacin | Meropenem | Vancomycin | Trimethoprim/<br>Sulfamethoxazole | Erythromycin<br>(predicts azithromycin) |                    |
| <b>Blood culture specimens:</b><br>(no positive spinal fluids)        | 84                   |                           |             | 100          | 96        | 96         |                                   |   | 25                 |
| meningeal interpretation  |                      | 84                        | 96          |              |           |            |                                   |   |                    |
| non-meningeal interpretation  |                      | 96                        | 96          |              |           |            |                                   |   |                    |
| <b>All specimens except blood cultures and spinal fluid specimens</b> | 88                   | 100                       | 100         | 100          |           |            | 75                                | 81                                      | #16                |

# Fewer than 30 isolates may not be reliable for guiding empiric treatment decisions and cannot be used to statistically compare results to other years.

| Organism                      | GRAM NEGATIVE ORGANISMS |           |             |            |                             |           |               |            |             |          |                                   |               |      | Number of Isolates |
|-------------------------------|-------------------------|-----------|-------------|------------|-----------------------------|-----------|---------------|------------|-------------|----------|-----------------------------------|---------------|------|--------------------|
|                               | Ampicillin              | Cefazolin | Ceftriaxone | Cefazidime | Piperacillin-<br>Tazobactam | Ertapenem | Meropenem     | Gentamicin | Tobramycin  | Amikacin | Trimethoprim/<br>Sulfamethoxazole | Ciprofloxacin |      |                    |
| <i>E. coli</i>                | 59                      | 90        | 93          |            | 96<br>(3061)                | 100       | 100<br>(3075) | 94         | 94          | 100      | 80                                | 82            | 3077 |                    |
| <i>Klebsiella pneumoniae</i>  | 0<br>(668)              | 93        | 96          |            | 96<br>(667)                 | 100       | 100           | 98         | 97          | 100      | 93                                | 96            | 669  |                    |
| <i>Pseudomonas aeruginosa</i> |                         |           |             | 88         | 92<br>(413)                 |           | 94<br>(411)   | 94         | 99          | 99       |                                   | 90            | 414  |                    |
| <i>Enterobacter spp</i> **    |                         |           |             |            |                             | 87        | 93            | 97         | 97          | 100      | 91                                | 96            | 274  |                    |
| <i>Proteus mirabilis</i>      | 80                      | 89        | 94          |            | 100<br>(284)                | 100       | 100           | 94         | 94<br>(285) | 100      | 83                                | 89            | 286  |                    |

##: *Enterobacter* and other SPICE organisms (*Serratia*, *Providencia*, *Morganella*, *P. vulgaris*, *Citrobacter freundii*) contain a chromosomal AmpC  $\beta$ -lactamase: treatment with penicillins, cephalosporins, broad spectrum penicillins and  $\beta$ -lactam/ $\beta$ -lactamase inhibitor combinations (eg. Piperacillin-tazobactam) is NOT recommended.

### Blood: % Susceptible

| Organism                                 | Ampicillin | Cloxacillin | Cefazolin | Ceftriaxone | Cefazidime | Ciprofloxacin | Trimethoprim/<br>Sulfamethoxazole | Gentamicin | Tobramycin | Amikacin | Ertapenem | Meropenem | Piperacillin-<br>Tazobactam | Vancomycin | Number of isolates |
|--|------------|-------------|-----------|-------------|------------|---------------|-----------------------------------|------------|------------|----------|-----------|-----------|-----------------------------|------------|--------------------|
| <i>Staphylococcus aureus</i>             |            | 69          | 69        |             |            |               |                                   |            |            |          |           |           |                             | 100        | 184                |
| <i>Coagulase negative Staphylococcus</i> |            | 42          | 42        |             |            |               |                                   |            |            |          |           |           |                             | 100        | 90                 |
| <i>Enterococcus faecalis</i>             | 100        |             |           |             |            |               | 72<br>(65)                        |            |            |          |           |           |                             | 100        | 66                 |
| <i>E. coli</i>                           | 58         |             | 71        | 91          |            | 77            | 77                                | 94         | 94         | 100      | 100       | 100       | 95<br>(248)                 |            | 250                |
| <i>Klebsiella pneumoniae</i>             | 0          |             | 82        | 95          |            | 94            | 97                                | 98         | 98         | 100      | 100       | 100       | 98                          |            | 88                 |
| <i>Enterobacter species</i>              |            |             |           |             |            | 95            |                                   | 95         | 95         | 100      | 90        | 100       |                             |            | 41                 |
| <i>Pseudomonas aeruginosa</i>            |            |             |           |             | 86         | 92            |                                   | 92         | 100        | 97       |           | 92        | 95                          |            | 37                 |

# Fewer than 30 isolates may not be reliable for guiding empiric treatment decisions and cannot be used to statistically compare results to other years.

^ High level gentamicin for use in combination with Ampicillin or Vancomycin for synergy.

### Urine: % Susceptible

| Organism   | Ampicillin | Cefazolin | Cefazolin/Cloxacillin | Ceftriaxone | Cefazidime | Ciprofloxacin | Nitrofurantoin<br>(for urine only) | Trimethoprim/<br>Sulfamethoxazole | Gentamicin | Tobramycin | Amikacin      | Ertapenem     | Meropenem | Tetracycline | Piperacillin-<br>Tazobactam | Rifampin    | Vancomycin  | Number of isolates |
|--|------------|-----------|-----------------------|-------------|------------|---------------|------------------------------------|-----------------------------------|------------|------------|---------------|---------------|-----------|--------------|-----------------------------|-------------|-------------|--------------------|
| <i>Staphylococcus aureus</i><br>(includes MSSA and MRSA) |            |           | 69                    |             |            | 54            | 98                                 | 100                               |            |            |               |               | 97        |              |                             | 99<br>(114) | 100         | 115                |
| <i>Enterococcus species</i>                              | 92         |           |                       |             | 71         | 93            |                                    |                                   |            |            |               |               | 35        |              |                             |             | 99<br>(822) | 826                |
| <i>E. coli</i>   | 58         | 91        |                       | 93          | 82         | 97            | 80                                 | 94                                | 94         | 100        | 100<br>(2900) | 100<br>(2901) |           | 96<br>(2890) |                             |             |             | 2903               |
| <i>Klebsiella pneumoniae</i>                             | 0<br>(592) | 95        |                       | 96          | 97         | 50            | 93                                 | 98                                | 97         | 100        | 100           | 100           |           | 96<br>(591)  |                             |             |             | 593                |
| <i>Enterobacter species</i>                              |            |           |                       |             | 95         | 49            | 90                                 | 96                                | 96         | 100        | 87            | 92            |           |              |                             |             |             | 192                |
| <i>Proteus mirabilis</i>                                 | 79         | 92        |                       | 94          | 90         | 0             | 83                                 | 94<br>(251)                       | 100        | 100        | 100           | 100           |           | 100<br>(249) |                             |             |             | 252                |
| <i>Pseudomonas aeruginosa</i>                            |            |           |                       | 90          | 92         |               |                                    | 93                                | 99         | 99         |               | 93<br>(266)   |           | 93           |                             |             |             | 268                |

### Intrinsic resistance for selected organisms

| Organism   | Antibiotics that are INEFFECTIVE (i.e. DO NOT USE)  |
|--|---|
| <i>Enterococcus</i>  | Cephalosporins, Cloxacillin, Clindamycin, TMP/SMX<br>Ciprofloxacin and Tetracycline should be used only for urinary source  |
| SPICE organisms ( <i>Serratia</i> , indole positive <i>Proteus</i> , <i>Providencia</i> , <i>Pantoeae</i> , <i>Morganella</i> , <i>Citrobacter freundii</i> complex, <i>Enterobacter spp</i> ) | Penicillins, cephalosporins, broad spectrum penicillins and $\beta$ -lactam/ $\beta$ -lactamase inhibitor combinations (eg. piperacillin-tazobactam) are not recommended as SPICE organisms contain an inducible chromosomal AmpC $\beta$ -lactamase. |
| <i>Salmonella spp</i>  | Aminoglycosides, 1st and 2nd generation cephalosporins  |
| Methicillin resistant <i>S. aureus</i> (MRSA)  | Penicillins, cephalosporins, broad spectrum penicillins and $\beta$ -lactam/ $\beta$ -lactamase inhibitor combinations, carbapenems (eg. meropenem)   |