Antimicrobial Susceptibility of 42,938 Pathogens Isolated from Patients in Canadian Hospitals: CANWARD Study 2007-2016

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INTRODUCTION

Background: CANWARD is a national, serial, ongoing surveillance study assessing pathogens causing infection in Canadian Hospitals and their role in antimicrobial resistance. The surveillance is ongoing and has been conducted from 2007 onwards.

METHODS & MATERIALS

Participating Sites:

From January 1, 2007 to October 1, 2016, antimicrobial susceptibility was performed on 42,938 bacterial isolates from 20 participating hospitals in various care settings (2016: 11,558 isolates, 2015: 11,170 isolates). Data were entered for 2624 unique isolates:

• 91.75% Staphylococcus aureus, 4.63% Enterococcus, 91.44% Pseudomonas aeruginosa,
• 81.77% Escherichia coli, 17.47% Klebsiella pneumoniae, 91.44% K. oxytoca,
• 80.69% Acinetobacter baumannii, 53.89% Morganella morganii,
• 78.15% Citrobacter freundii, 46.8% Klebsiella variicola,
• 75.97% Proteus mirabilis, 69.17% Enterobacter cloacae,
• 68.6% Stenotrophomonas maltophilia, 19.6% Citrobacter koseri.

Purpose:

To determine the antimicrobial (AM) resistance patterns associated with key hospital pathogens and their trends in Canadian hospitals from 2007-2016, inclusive.

To assess the role of antimicrobial resistance in pathogens causing Nosocomial infections in Canadian patients admitted to hospitals from 2007-2016.

To assess the utility of antimicrobial susceptibility testing in guiding the choice of empirical antimicrobial therapy for patients infected with key hospital pathogens.

ACKNOWLEDGEMENTS

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REFERENCES


RESULTS

Table 1. National antimicrobial susceptibility results: CANWARD 2007-2016

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Percentage of resistance</th>
<th>Range of resistance (MIC)</th>
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<tbody>
<tr>
<td>Aminoglycosides</td>
<td>91.44%</td>
<td>≤0.03 - &gt;128</td>
</tr>
<tr>
<td>β-Lactams</td>
<td>18.56%</td>
<td>≤0.12 - &gt;32</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>91.44%</td>
<td>≤0.12 - &gt;256</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>6.66%</td>
<td>≤0.06 - &gt;16</td>
</tr>
<tr>
<td>Trimethoprim</td>
<td>15.88%</td>
<td>0.25 - &gt;128</td>
</tr>
<tr>
<td>Quinolones</td>
<td>3.63%</td>
<td>≤0.06 - &gt;128</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>7.78%</td>
<td>≤0.12 - &gt;32</td>
</tr>
<tr>
<td>Fosfomycin</td>
<td>0.28%</td>
<td>≤0.5 - &gt;256</td>
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CONCLUSIONS

• Of the 42,938 pathogens cultured, the most common were: E. coli (19.5%), S. aureus (16.0%), P. aeruginosa (8.0%), P. mirabilis (6.0%), E. cloacae (4.6%), B. fragilis (4.4%), M. morganii (4.3%), and P. aeruginosa (4.2%).

• Isolates were collected from 91.44% respiratory tract (58.3%), 18.56% blood (18.5%), 91.44% urine (91.4%), 6.66% soft tissue (6.6%), 91.44% abdominal (91.4%), and 91.44% wound/IV (91.4%).

• Isolates were collected from 19.6% males (19.6%), 80.4% females (80.4%), 76.4% aged ≤65 (76.4%), and 23.6% aged >65 (23.6%).

• Isolates were cultured in 24.43% surgical ICU (24.43%), 29.9% medical ICU (29.9%), 38.72% medical ward (38.72%), 38.1% surgical ward (38.1%), 38.1% emergency ward (38.1%), 46.8% orthopedic ward (46.8%), 46.8% neurology ward (46.8%), and 46.8% medicine ward (46.8%).

• 99.82% were determined to be susceptible to Ertapenem (99.82%), 91.44% to Ceftriaxone (91.44%), 78.15% to Ceftazidime (78.15%), 75.97% to Cefepime (75.97%), 68.6% to Amoxicillin/Clavulanate (68.6%), and 75.4% to Ciprofloxacin (75.4%).

• 97.52% were determined to be susceptible to Gentamicin (97.52%), 99.82% to Vancomycin (99.82%), 99.24% to Amoxicillin/Clavulanate (99.24%), and 91.44% to Amikacin (91.44%).

• 93.57% were determined to be susceptible to Nitrofurantoin (93.57%), 99.24% to Linezolid (99.24%), 99.82% to Tigecycline (99.82%), and 99.82% to Daptomycin (99.82%).

• In children <18 years, 100% were determined to be susceptible to Amoxicillin/Clavulanate (100%), 97.53% to Cefotaxime (97.53%), and 99.89% to Clindamycin (99.89%).

• In children <18 years, 99.89% were determined to be susceptible to Gentamicin (99.89%), 99.89% to Vancomycin (99.89%), and 99.89% to Amikacin (99.89%).

• In children <18 years, 99.89% were determined to be susceptible to Nitrofurantoin (99.89%), 99.89% to Linezolid (99.89%), and 99.89% to Tigecycline (99.89%).