**Supplementary Table 1: Baseline demographics of ICU patients with AMS recommendations during the ward round**

|  |  |
| --- | --- |
| **Demographics** (n = 916) | n (%) |
| **Age**, median (IQR) | 62 (50.0 -73.0) |
| **Sex** (male: female) | 550 (60.0) : 366(40.0) |
| **ICU length-of-stay (first admission)** (days), median (IQR) | 5 (3.0 – 9.0) |
| **ICU length-of-stay (all admissions)** (days), median (IQR) | 7 (4.0 - 13.0) |
| **ICU mortality** | 91 (9.9) |
| **Antibiotic allergies** | Penicillin allergies | 104 (11.4) |
| Any antibiotic allergy | 170 (18.6) |
| **Admitting unit** | Medical  | 571 (62.3) |
|  | Surgical | 345 (37.7) |
| **Immunocompromised host admitting unit** | Liver transplant  | 101 (11.0) |
|  | Haematology/Oncology | 60 (6.6) |

**Supplementary Table 2: MRSA, VRE and MDR-GN colonization rates pre and post intervention**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pre-intervention***n tested (% positive)* | **Post-intervention***n tested (% positive)* | ***p* value** |
| **MRSA screening** | 4709 (0.06) | 6080 (2.29) | < 0.0001 |
| **MDR-GN screening** | 3660 (8.42) | 5348 (9.42) | 0.1086 |
| **VRE screening** | **vanB** | 4862 (5.00) | 5193 (4.20) | 0.0668 |
| **vanA** | 4862 (0.88) | 5193 (0.33) | 0.0005 |

*(Methicillin-resistant Staphylococcus aureus [MRSA], Vancomycin-resistant enterococci [VRE] and multi resistant gram-negative [MDR-GN])*

**Supplementary Table 3: Recommendations and acceptance rates:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Recommendation**  | **Aug 2017 –** **Jan 2018** | **Feb 2018 –** **July 2018** | **Aug 2018 –** **Jan 2019** | **Feb 2019 –** **July 2019** |
| Moment 1 [Escalation], n (% accepted) | 69 (92.75) | 65 (96.92) | 58 (98.28) | 58 (94.83) |
| Moment 2 [De-escalation],n (% accepted) | 71 (88.73) | 80 (90.00) | 68 (86.76) | 74 (83.78) |
| Moment 3 [Discontinuation], n (% accepted) | 223 (83.41) | 227 (88.55) | 228 (84.65) | 264 (89.77) |
| Moment 4 [Switch], n (% accepted) | 48 (85.42) | 59 (79.66) | 50 (88.00) | 60 (91.67) |
| Moment 5 [Optimize],  n (% accepted) | 78 (85.90) | 80 (90.00) | 82 (95.12) | 50 (92.00) |

**Supplementary Table 4: Demographic Data for additional sensitivity analysis (over a 9 week period)**

|  |  |
| --- | --- |
| **Demographics and clinical characteristics** (n = 184) | n (%) |
| **Age**, median (IQR) | 65 (54.6-75.4) |
| **Sex** (male: female) | 119(64.7) : 65(35.3) |
| **ICU length-of-stay (first admission)** (days), median (IQR) | 4 (2.0-6.0) |
| **ICU length-of-stay (all admissions)** (days), median (IQR) | 4 (1.5-7.5) |
| **Hospital LOS (first admission)** (days) median (IQR) | 14 (4.5-23.5) |
| **Charleston comorbidity index** median (IQR) | 4 (2-6) |
| **ICU mortality** | 13 (7.1) |
| **Antibiotic allergies** | 25 (13.6) |
| **Admitting unit** | Medical  | 88 (47.8) |
| Surgical | 96 (52.2) |
| **Immunocompromised host admitting unit** | Liver transplant  | 23 (12.5) |
| Haematology/Oncology | 17 (9.2) |
| **Immunocompromised** | 68 (37.0) |
| **Screening swabs** during first admission | VRE (vanA or vanB) colonised | 15 (8.2) |
| MRSA colonized  | 9 (4.9) |
| MDR-GN colonized  | 17 (9.2) |
| **Screening swabs** during all admissions | VRE (vanA or vanB) colonised | 19 (9.1) |
| MRSA colonized  | 11 (5.3) |
| MDR-GN colonized | 18 (8.6) |

VRE, Vancomycin-resistant enterococci; MRSA, Methicillin-resistant *Staphylococcus aureus*; MDR-GN, Multi-drug resistant gram negative

**Supplementary table 5: Factors associated with AMS recommendations made**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Recommendation n = 112 (%)** | **Nil recommendation n = 326 (%)** | **Adjusted odds ratio (95% CI)** |
| Admitting unit | Surgical | 55 (49.1) | 189 (58.0) | 1.48 (0.81-2.74) |
| Medical | 57 (50.9) | 137 (42.0) |
| IV therapy | 104 (92.9) | 278 (85.3) | 2.64 (1.03-6.79) |
| Continuous renal replacement therapy | 13 (11.6) | 71 (21.8) | 0.45 (0.19-1.07 |
| Intubation | 58 (51.8) | 163 (50.0) | 1.12 (0.62-2.02) |
| Vasopressor use | 69 (61.6) | 178 (54.6) | 1.80 (0.97-3.31) |
| Restricted antimicrobial | 72 (64.3) | 223 (68.4) | 0.96 (0.55-1.69) |
| Narrow spectrum penicillin | 11(9.8) | 19 (5.8) | 1.23 (0.40-3.77) |
| Macrolide | 10 (8.9) | 10 (3.1) | 3.24 (0.91-11.53) |
| Cephalosporin | 28 (25.0) | 95 (29.1) | 0.55 (0.25-1.17) |
| Glycopeptide | 8 (7.1) | 39 (12.0) | 0.58 (0.20-1.64) |
| Fluroquinolone | 4 (3.6) | 3 (0.92) | 7.17 (0.92-56.01) |
| Carbapenem | 3 (2.7) | 18 (5.5) | 0.43(0.12-0.70) |
| Other antimicrobial | 20 (17.9) | 77 (23.6) | 0.50 (0.22-1.16) |
| Bacteraemia | 4 (3.6) | 24 (7.3) | 1.39 (0.25-7.83) |
| CNS infection | 7 (6.3) | 6 (1.8) | 15.32 (1.86-125.92) |
| Intra-abdominal infection | 9 (8.0) | 41 (12.6) | 2.34 (0.51-10.70) |
| Other infection | 28 (25.0) | 62 (19.0) | 4.33 (1.13-16.54) |
| Pneumonia | 46 (41.1) | 80 (24.5) | 6.85 (1.83-25.63) |
| Surgical prophylaxis | 5 (4.5) | 55 (16.8) | 0.73 (0.16-3.39) |
| Urogenital infection | 8 (7.1) | 21 (6.4) | 4.45 (0.84-23.62) |

**Supplementary definitions:**

**ICU Screening program:** All ICU patients at Austin Health undergo regular multidrug resistant organism (Methicillin-resistant Staphylococcus aureus [MRSA], Vancomycin-resistant enterococci [VRE] and multi resistant gram-negative [MDR-GN]) screening. Screening is undertaken on admission to ICU and weekly (whilst in ICU). Pre and post intervention, colonization data of all ICU patients was also collected and analysed.

**NAUSP**: National Antimicrobial Utilisation Surveillance Program (NAUSP) conducts volume-based antimicrobial surveillance to monitor trends in antimicrobial usage. Australian hospitals can benchmark usage rates against other hospitals. Data is collection as Defined Daily Dose (DDD) data/1000 Occupied Bed Day (OBD).

**NAPS**: The National Antimicrobial Prescribing Survey (NAPS) is a standardized electronic auditing tool developed in 2013 to assist Australian healthcare facilities monitor antimicrobial prescribing by assessing antimicrobial appropriateness. Using the NAPS an assessment of the overall ‘appropriateness’ of each prescription was made and each antimicrobial was given a score. Prescriptions were classified as ‘appropriate’ (score of 1 or 2), ‘inappropriate’ (score of 3 or 4), or ‘not assessable’ (score of 5). The methodology of the NAPS has been previously described by James *et al.*1

**1.** James R, Upjohn L, Cotta M, et al. Measuring antimicrobial prescribing quality in Australian hospitals: development and evaluation of a national antimicrobial prescribing survey tool. *J Antimicrob Chemother* 2015;70:1912-1918.