**Online Supplement 1 - Methods**

**Antimicrobial Stewardship Interventions**

**Feedback and Monitoring**

Quarterly performance reports were distributed to each ICU, as well as to hospital leadership. These reports included aggregate antibacterial and antifungal consumption and cost data, as well as balancing measures like those reported in this study (e.g., mortality, ICU length of stay, ventilator-associated pneumonia, etc.) The detail of these reports (posted to antimicrobialstewardship.com) improved over time, and included most commonly prescribed antimicrobials, *Pseudomonas aeruginosa* susceptibility and trends, and candidemia counts. (One unanticipated benefit of regular reporting was early recognition of unanticipated errors in data quality.)

**Coaching**

Coaching (or verbal persuasion) consisted of the AMS team meeting with the ICU clinical team to review all patients’ antimicrobial prescriptions, clinical status, and microbiologic cultures. Coaching was conducted face-to-face, weekdays at each site in the first year, four times weekly the following year, and thrice weekly thereafter at a scheduled, agreed upon time. Only on rare (i.e. less than 5%) of occasions would the coaching session be cancelled (due to unanticipated logistical barriers such as a patient acutely decompensating); on these occasions, coaching might be provided electronically. Prior to meeting with the ICU team, the AMS team reviewed data from the available electronic patient records and laboratory information system at each site. The total AMS team time investment was approximately 1 hour of preparatory review, and 15 minutes for each AMS coaching session per ICU team. No special software or antimicrobial stewardship computer applications were used until April 2014, when our program developed an intranet-based integrated database in-house with customized reporting for the AMS reviews.

Recommendations made by the AMS team were verbal and based on clinical information, microbiological data, and published evidence. There were no restrictive practices such as drug restriction, drug pre-authorization, or drugs requiring post-prescription authorization prior to continuing for more than 24 hours. Medicolegal advice confirmed that no additional documentation of the recommendations was required apart from the clinical teams’ progress notes addressing therapeutic changes. Common examples of AMS guidance include: de-escalating therapy; avoiding redundant combinations of antibiotics; tailoring therapy to local epidemiology; limiting the use of fluoroquinolones, antipseudomonal antibiotics, and antifungals; defining duration of therapy; and emphasizing the need for source control. The AMS teams had overlap of membership ensuring consistency of messaging. Starting in 2012, we began posting a variety of best practice documents and guidelines on our program’s website. These collated and formalized common recommendations, and facilitated education. The ICU clinical team retained autonomy regarding clinical management for each patient, and no antimicrobial agents were restricted or required pre-authorization for use. Formal infectious diseases consultation was readily available at all sites, and could be suggested by the AMS team, and increased infectious diseases consultation in at least 1 ICU.1

1. Katsios CM, Burry L, Nelson S, et al. An antimicrobial stewardship program improves antimicrobial treatment by culture site and the quality of antimicrobial prescribing in critically ill patients. *Crit Care.* 2012;16(6):R216.