cases of VRE BSI early after HSCT—a period of neutropenia and mucositis resulting from a preparative regimen—likely resulted from gastrointestinal translocation. The findings from our study support the current National Healthcare Safety Network initiative to distinctly categorize high-risk patients with MBI and BSI due to gastrointestinal commensal organisms. Exclusion of this category when reporting CLABSI among high-risk patients will improve accuracy of reported rates to develop reliable benchmarks.

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Measuring Quality Metrics to Identify and Monitor Antimicrobial Stewardship Program Quality Improvement Efforts

To the Editor—In a previous issue of *Infection Control and Hospital Epidemiology*, Morris et al[1] defined a number of quality metrics for evaluating antimicrobial use (AU) in hospital settings. The authors suggested using quality metrics for ongoing evaluation of antimicrobial stewardship programs (ASPs) and to complement quality improvement (QI) efforts. Having read this article, we would like to share our experience with using these metrics to identify QI initiatives after reimplementing our ASP.

In March 2008, part of the ASP at the University of Florida Health Shands Hospital, an 852-bed academic medical center, was suspended because of pharmacist attrition. During the period that the ASP was inactive, there was no dedicated pharmacist support, postprescription review, or real-time prescriber feedback. The only aspect of the ASP that remained intact was a restricted antimicrobial policy, which was enforced by the Division of Infectious Diseases (ID). Successful recruitment of 2 ID pharmacists led to reimplementation of the ASP in September 2010. After reimplementation, we performed analysis of AU that revealed a large increase in consumption during the period the ASP was inactive, particularly in our medical intensive care unit (MICU). This increase in AU occurred despite a decrease in nosocomial infections and stable antimicrobial susceptibility patterns.[2] In light of these findings, we performed an analysis of antimicrobial quality metrics in the MICU during the period without ASP intervention. Data from this analysis would be used to identify gaps in antimicrobial prescribing and develop MICU-specific QI interventions.

This analysis was a retrospective review of patients who initiated antimicrobial therapy in our 24-bed MICU between June 1, 2010, and August 5, 2010. Four metrics from the 3 domains described by Morris et al[1] were evaluated: days of therapy (domain 1), rate of tailored antimicrobial use at days 3 and 5 of antimicrobial initiation (domain 2), all-cause mortality (domain 3), and conservable days of therapy (domain

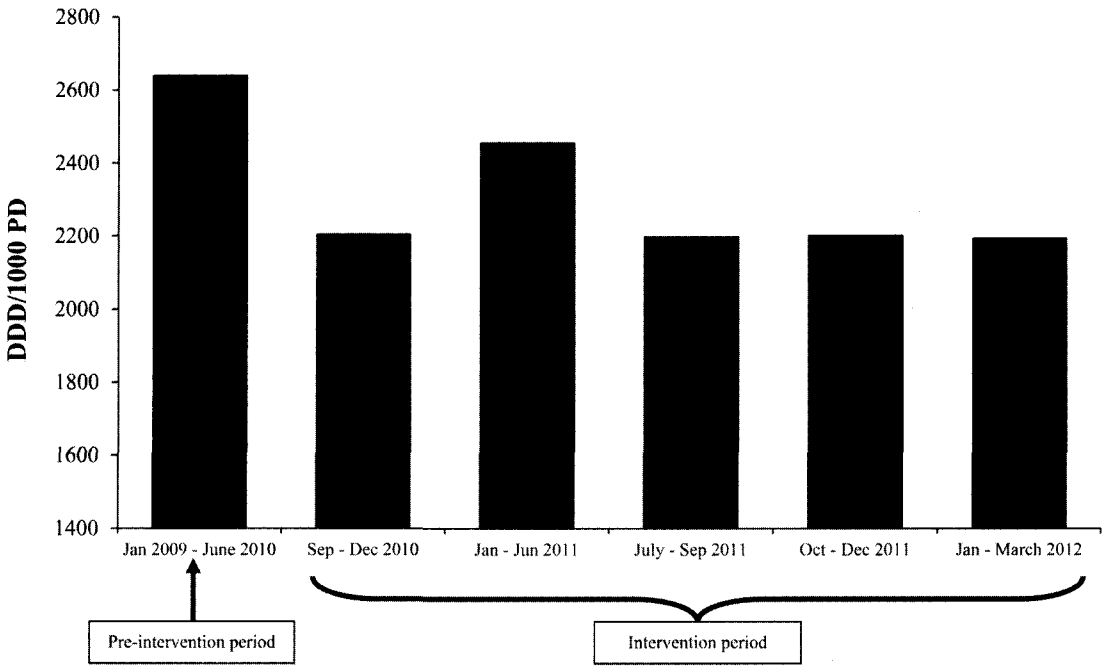

FIGURE 1. Antimicrobial use in the medical intensive care unit over a 39-month period, measured by defined daily doses (DDD) per 1,000 patient-days (PD), covering the periods before (January 2009–June 2010) and during (October 2010–March 2012) the antimicrobial stewardship program intervention.

3). Tailored antimicrobial use was defined as either discontinuation of at least 1 empirical agent, narrowing antimicrobial spectrum to culture and susceptibility results, or discontinuing antimicrobial therapy if no infection was established. We calculated total conservable days of therapy on the basis of indication and duration of therapy recommendations from current guidelines developed or endorsed by the Infectious Diseases Society of America.[2-8] Additionally, we compared patient characteristics and outcomes by separating eligible patients into 2 groups on the basis of whether therapy was tailored within 5 days. We evaluated the need for escalation (ie, change to a broader-spectrum antimicrobial or addition of 1 or more antimicrobials) or recommencement of therapy for the same or secondary infection within 28 days after the start of initial treatment. Descriptive analysis was performed for all quality indicators. Fisher exact test was used for comparisons between patients who received tailored antimicrobials and those who did not.

Data for 95 patients were collected during the analysis. The most frequent sites of infection were respiratory tract (n = 65; 57%), urinary tract (n = 16; 14%), primary bloodstream (n = 12; 11%), sepsis of unknown origin (n = 9; 8%), and intra-abdominal (n = 4; 4%). The rate of tailored antimicrobial use within 3 and 5 days after initial empirical therapy was 22% and 44%, respectively. The application of tailored antimicrobial use could not be evaluated for 14 patients because of initial directed therapy, justifiable continuation of empirical antimicrobials on the basis of culture results, or death within 3 days of therapy initiation. The median days of therapy were 12 days overall, 14 days for proven infections, and 8 days for nonproven infections. A total of 613 (33%) of 1,879 days of therapy were deemed to have been conservable. The in-hospital mortality rate was 17% (n = 16). In the analysis of outcomes for patients who received tailored therapy versus those who did not, the only difference observed was that failure to tailor AU resulted in increased escalation or recommencement of antimicrobial therapy after initial therapy (19.4% vs 42.2%; P = .03). Whether this is a genuine relationship or a reflection of patient characteristics among those for whom tailored antimicrobial therapy is chosen is unknown; however, Acute Physiology and Chronic Health Evaluation II scores were not statistically different between the 2 groups either at MICU admission (16 vs 17; P = .48) or 5 days after initiation of treatment (15 vs 18; P = .52), which suggests that differences in severity of illness may not account for this finding.

On the basis of these results, our ASP collaborated with the multidisciplinary MICU team to develop strategies aimed at improving antimicrobial delivery. Specifically, we added a drop-down menu in our computerized physician order entry system that required an indication for initiating intravenous antimicrobial therapy. Indications for therapy are now clearly documented, which has assisted in tailoring therapy and selecting optimal durations of therapy. Second, both critical care and ASP pharmacists began enforcing the 72-hour restriction policy for select antimicrobials. If a patient is re-

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ceiving an agent with a 72-hour restriction and criteria are not met within the window, prescribers receive direct feedback from our clinical pharmacists recommending discontinuation of the agent, tailoring of therapy, or obtaining ID approval for continuation. An initial postintervention analysis of AU, measured by defined daily doses per 1,000 patient-days, showed a 14.8% decrease in use from the preintervention period (Figure 1).

In summary, this analysis provides insight into the value of ASP activities. First, a quality analysis providing baseline information on antimicrobial prescribing practices reveals opportunities for improving antimicrobial therapy. We identified that 33% of antimicrobial-days were unnecessary, and 42% of patients required escalation of antimicrobial therapy when deescalation was not performed. Second, without direct provider feedback, healthcare providers are less likely to modify an antimicrobial plan. Support for this concept has been realized with other ASP initiatives, understanding that key clinicians and hospital management must be involved to implement targeted interventions.[9,10] Finally, these data will be used to develop additional ASP initiatives, and a follow-up analysis will be conducted to evaluate the effectiveness of the new initiatives. This report supports the application of the quality metrics defined by Morris et al[1] to evaluate AU. ASPs can use this information to develop and support QI initiatives, monitor program effectiveness, and benchmark performance with other healthcare facilities.

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Needlestick Injuries among Healthcare Workers of a Tertiary Care Hospital in South India

To the Editor—Globally, about 35 million healthcare workers (HCWs)—including doctors, nurses, laboratory staff, and housekeeping attenders—are at risk of sharps injury every year.[1] A sharps injury is a penetrating stab wound from a