Working Together to Define Antibiotic Appropriateness: Point Prevalence Survey in 47 Intensive Care Units from 12 US Hospitals, Partnership for Quality Care, March 2017

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ration policy planning. We developed a mathematical model to describe anti-
microbial use and demonstrate how it could be used in a model-driven decision
support system.

Methods. We developed a discrete-time Markov chain model to describe anti-
microbial use as a function of the following parameters: Choice decisions to start anti-
biotics on admission or after, Change decisions to step antibiotics, and Completion
decisions to discharge patients whether they were on or off antimicrobials. Partial
derivatives were used to predict the extent to which antimicrobial use would respond
to changes in each parameter. We used Veterans Affairs Bar Code Medication
Administration data from 2010 to estimate parameters, as well as antimicrobial use
using National Healthcare Safety Network (NHSN) definitions. Categories of anti-me-
thicillin-resistant Staphylococcus aureus (MRSA), broad community, broad hospital,
and surgical site infection prophylaxis (SSIP) from NHSN were also used. Because of
certain assumptions made when estimating parameters, we used non-linear regres-
sion to adjust them using data from year 2010. We then applied our model to predict
antimicrobial use from 2013 parameters and compared with actual use with Pearson's
correlation coefficient.

Results. Correlation of predicted and actual antimicrobial use was 0.97, 0.99,
0.95, and 0.92 (using NHSN category order above; Figure 1). As a conservative esti-
mate, the correlation of yearly changes between predicted and actual antimicrobial use
for all categories was 0.75. For > 99% of all combinations of medical center, antimicro-
bial category, and year, decreasing the probability of starting antimicrobials had the
most impact on measured antimicrobial use.

Conclusion. Our mathematical model is highly predictive of antimicrobial use
and can be used to anticipate how much changes in decision points might lead to
changes in antimicrobial use. Given the parameter space that most VA medical centers
occupy, not starting antimicrobials appears to have greatest impact on use.

Disclosures. All authors: No reported disclosures.

685. Working Together to Define Antibiotic Appropriateness: Point Prevalence
Survey in 47 Intensive Care Units from 12 US Hospitals, Partnership for Quality
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Session: 74. Stewardship: Data and Program Planning
Thursday, October 5, 2017: 12:30 PM


686. Broad-Spectrum Antibiotic Use at Choice, Change, and Completion
Throughout VA: Patterns of Initiation and De-escalation
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