

Pharmacist utilization and target attainment with an integrated electronic medical record vancomycin calculator

Brianne Venrick, PharmD, Charles Jensen, PharmD, BCPS, BCIDP, Dallin Poulsen, PharmD, MBA/HSA, Steven Ward, PharmD, Logan Campbell, PharmD



Background

Vancomycin is an antibiotic that is frequently used and commonly dosed by pharmacy. In the past, pharmacists would target a specific trough level to monitor and dose vancomycin. Recently, new guidelines have emerged recommending moving away from targeting trough levels and instead, targeting an AUC/MIC range of 400-600.¹

In the spring of 2020, a vancomycin calculator embedded into St. Luke's Health System's electronic medical record, Epic, was released. This calculator assists pharmacists by estimating a dose that would produce an AUC/MIC of 400-600. It also allows pharmacists to test different doses and frequencies to target an estimated AUC/MIC within range. Once levels return, the actual AUC/MIC can be calculated. This calculator also saves the entered data, allowing pharmacists to review what was previously entered for any particular patient. The purpose of this evaluation was to assess usage of the calculator and determine if return levels produced an AUC/MIC in the target range.

Methods

Patient charts were identified for data collection through using a retrospective chart review of all adult patients within the health system that had a vancomycin consult initiated between August 1st, 2021, and August 14, 2021. All pediatric patients less than 18 years of age were excluded from the data collection.

The saved data in the integrated calculator was reviewed to determine if it had been used for initial vancomycin dosing. If there were returning levels, they were reviewed to determine if they produced an AUC/MIC in the target range.

Use of the integrated vancomycin calculator

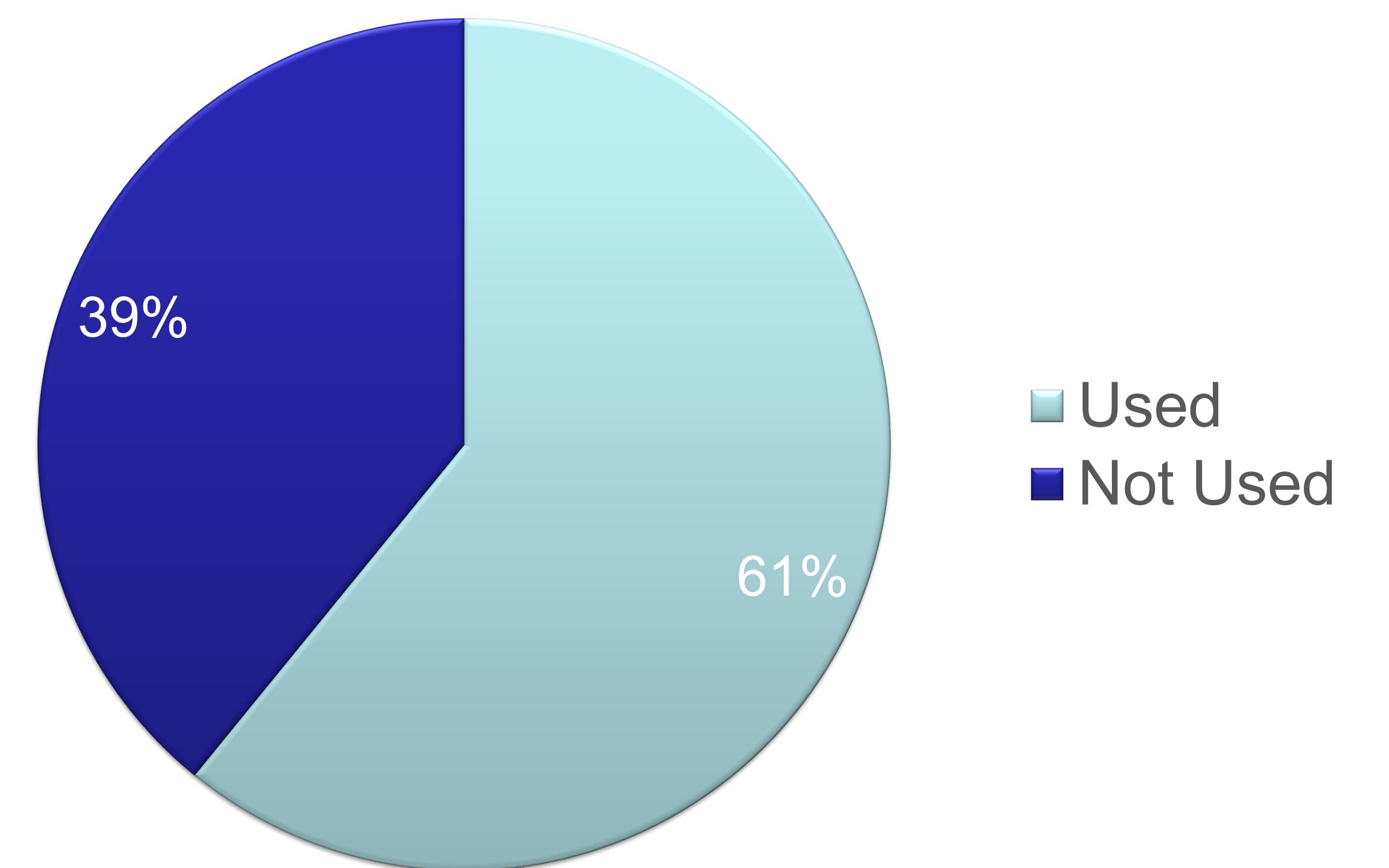


Figure 1: Illustrates the total usage of the vancomycin calculator within a 2-week time period

Assessment of levels after calculator use

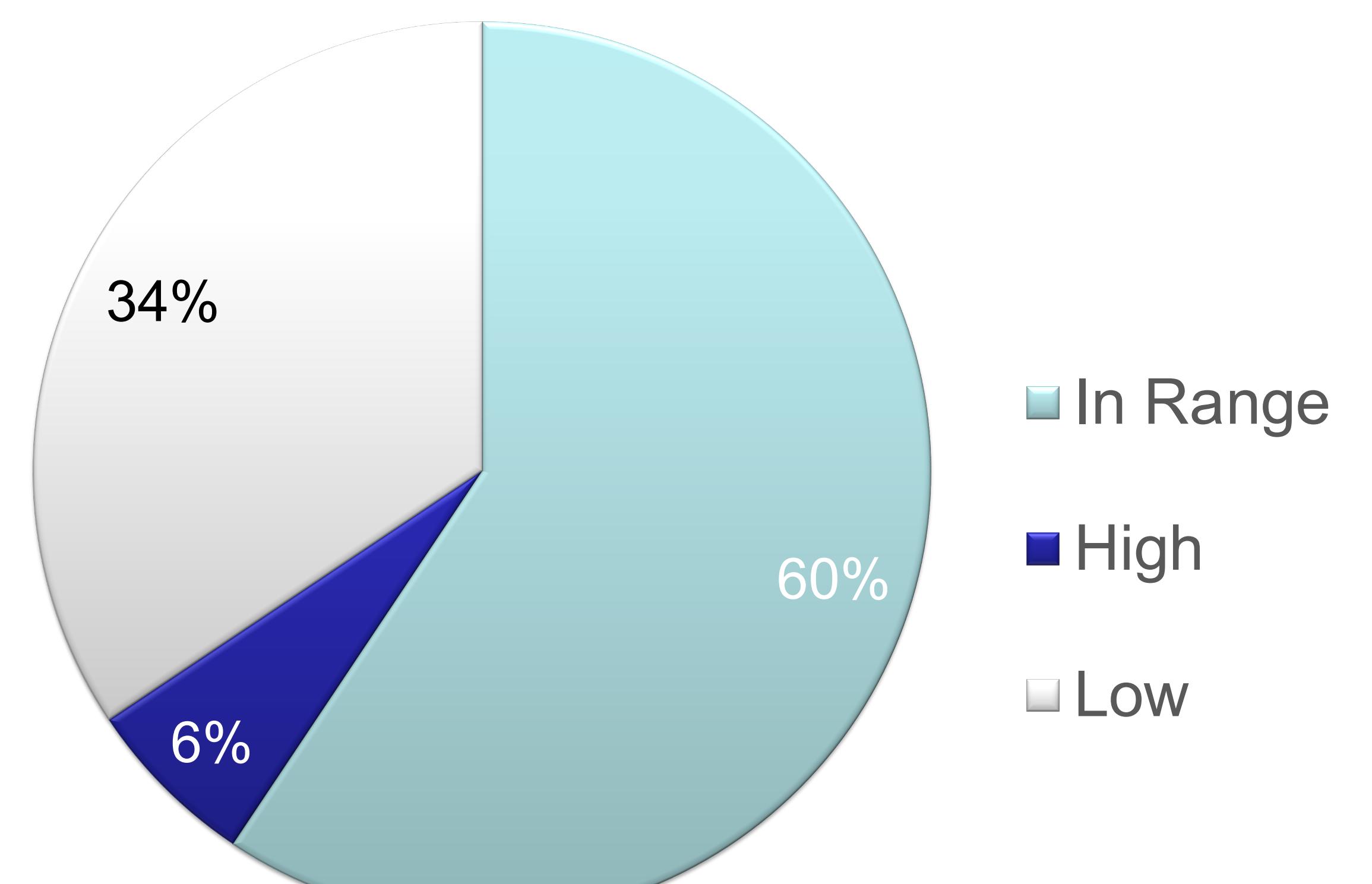


Figure 2: Illustrates how well the calculator provides dosing that is in range or not in range.

Calculator

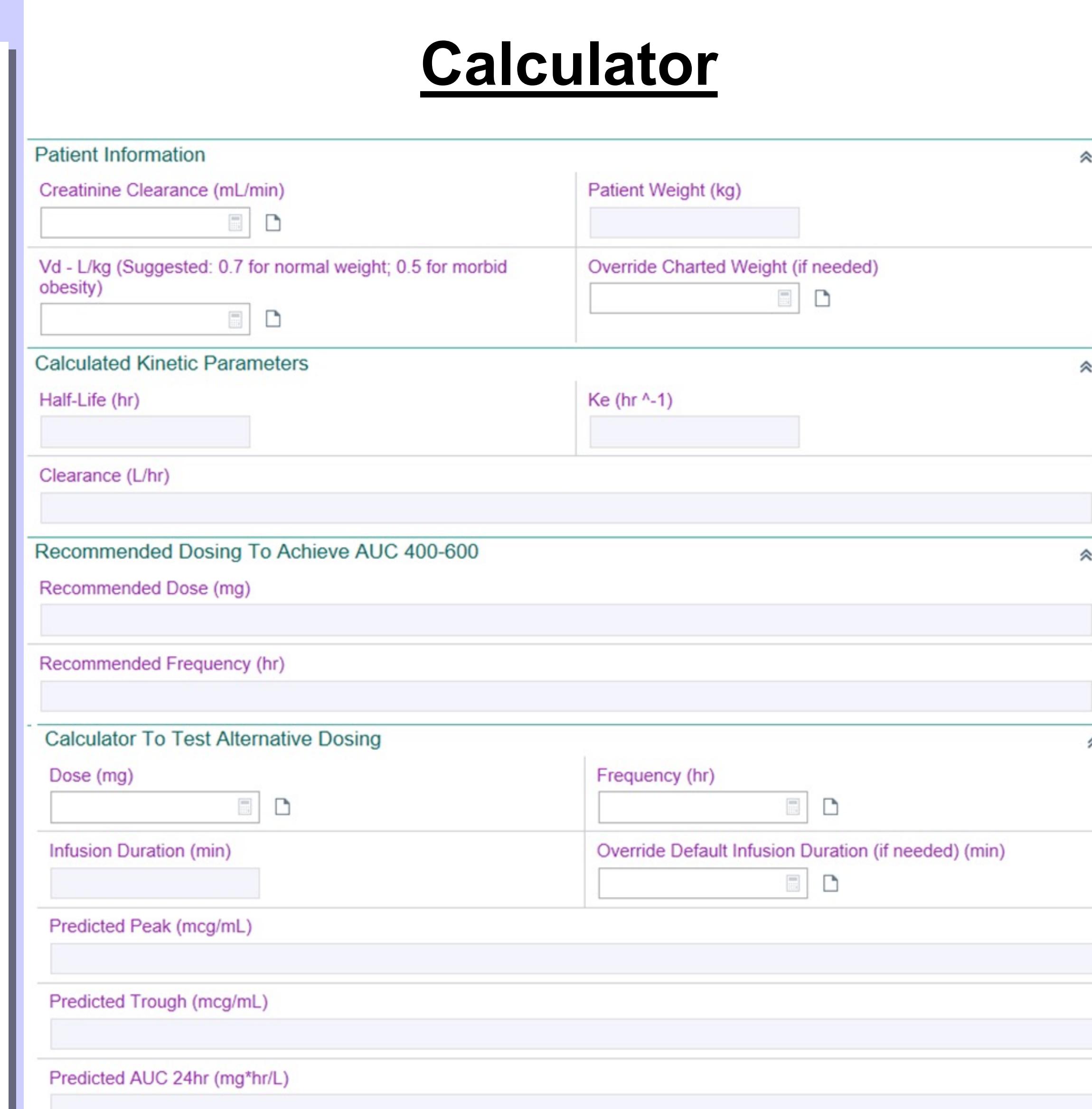


Figure 3: Integrated calculator data fields

Vancomycin Consults

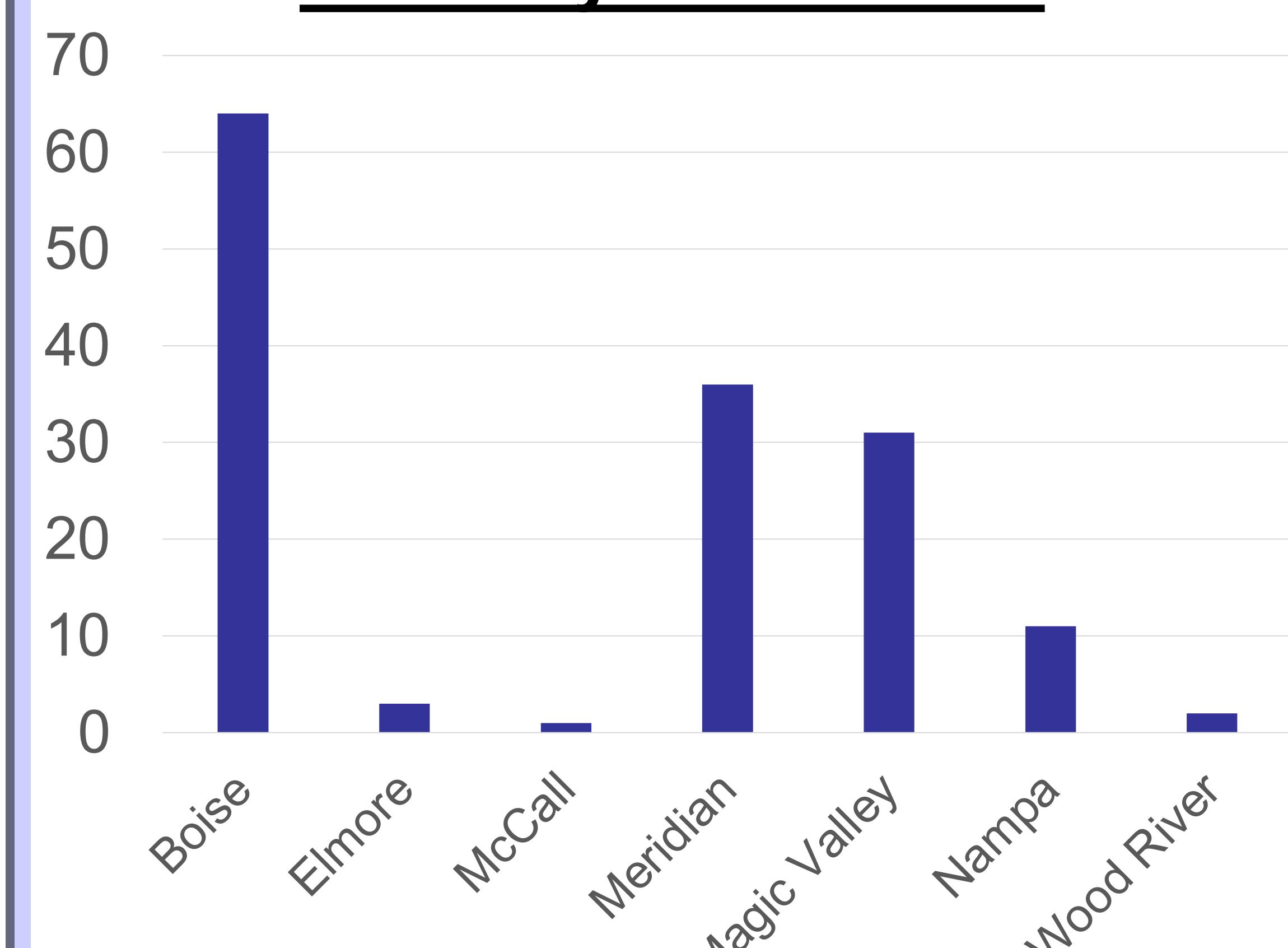


Figure 4: Distribution of vancomycin consults throughout the health system

Results

In the span of two weeks, there were 179 total consults with 61% using the calculator. When removing patients with acute kidney injury, on hemodialysis, or another factor preventing them from using AUC/MIC dosing, it was found that the use of the calculator was 67%. While these patients were not excluded from the overall evaluation, this result may show a more appropriate representation of calculator usage. Because vancomycin is sometimes discontinued before levels return, it is impossible to assess the calculator accuracy in those instances.

From patients where the calculator was used, 32 had levels return with 60% of them in target AUC/MIC range 400-600. The AUC/MIC values were lower than the range 34% of the time and higher 6% of the time.

Conclusions

Adoption of the integrated vancomycin calculator is incomplete. In instances where vancomycin levels were obtained, the majority of patients had AUC/MIC in the goal range. Additional staff education is warranted to further promote the calculator and its appropriate use.

Reference

- Rybak MJ, Le J, Lodise TP, et al. Therapeutic monitoring of vancomycin for serious methicillin-resistant *Staphylococcus aureus* infections: A revised consensus guideline and review by the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, the Pediatric Infectious Diseases Society, and the Society of Infectious Diseases Pharmacists. *Am J Health Syst Pharm*. 2020;77(11):835-864.