

# How Well is the Target Concentration of Vancomycin Achieved in Intensive Care Unit Patients?



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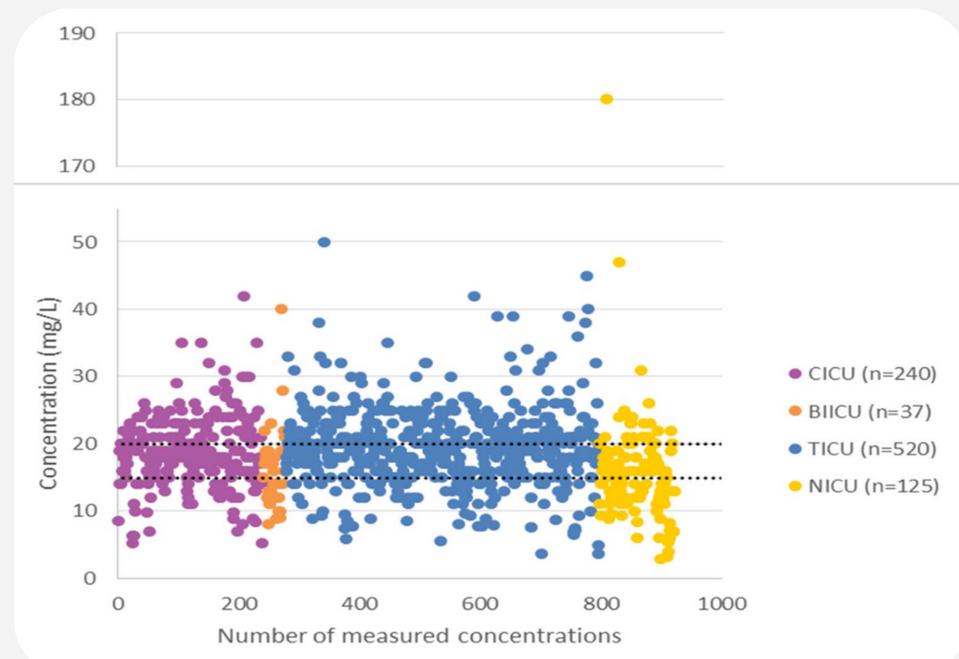
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## Background

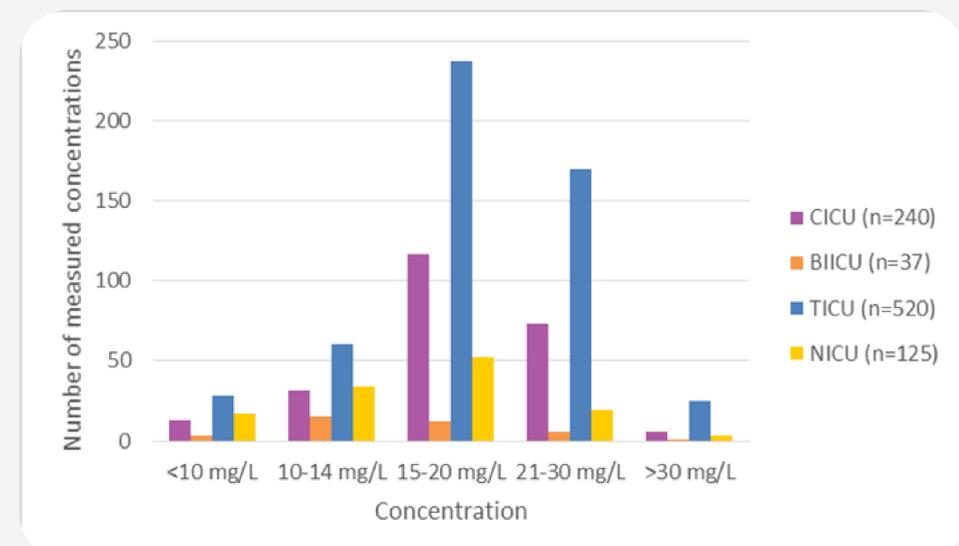
The recommended serum trough concentration of vancomycin is 15-20 mg/L. Concentrations outside this interval increase the risk of adverse effects, therapeutic failure and resistance development. In critically ill patients it is recommended to start with a loading dose of 25-30 mg/kg.

## Methods

A retrospective observational study was performed at Uppsala University Hospital, Sweden. Data was extracted from two electronic medical record systems. One hundred sixty-four patients treated with intravenous vancomycin at any of the four ICUs; Central Intensive Care Unit (CICU), Thorax Intensive Care Unit (TICU), Burn Injury Intensive Care Unit (BIICU), Neurologic Intensive Care Unit (NICU) were included.



**Figure 1.** Distribution of the measured concentrations, with a marked interval of the recommended trough serum concentration of 15-20 mg/L. Broken y-axis was used to be able to see the extreme outlier.



**Figure 2.** Descriptive figure of the number of concentrations per interval, for the different ICUs.

## Objective

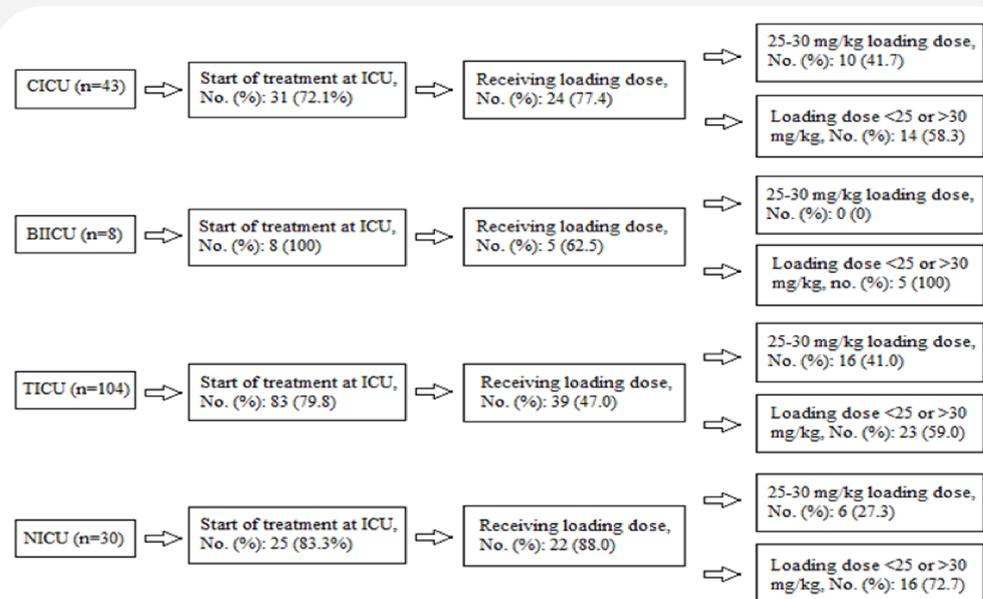
To determine to what extent trough concentrations of vancomycin are within the recommended range, in patients in intensive care units (ICUs).

## Results

In total, 922 vancomycin concentrations were registered in 185 treatment episodes in 164 patients. More than half (54.7%) of all the trough concentrations were outside the target range, 21.8% were subtherapeutic and 32.9% supratherapeutic (figure 1 and 2).

Out of the 185 treatment episodes, 147 were initiated at an ICU and 61.2% of these started with a loading dose, see figure 3.

A majority of cases (74%) had >1 trough concentration outside of target range and 55% of these non-therapeutic concentrations led to a change in dose regimen.



**Figure 3.** Schematic figure of cases with initiated treatment at any of the four ICUs and if they received a loading dose. The percentage of patients that received a loading dose corresponding to the recommendations of 25-30 mg/kg is seen.

## Conclusions

More than half of the measured vancomycin concentrations were outside of recommended target range. Dosing and monitoring of vancomycin in patients treated in an ICU should be improved.

