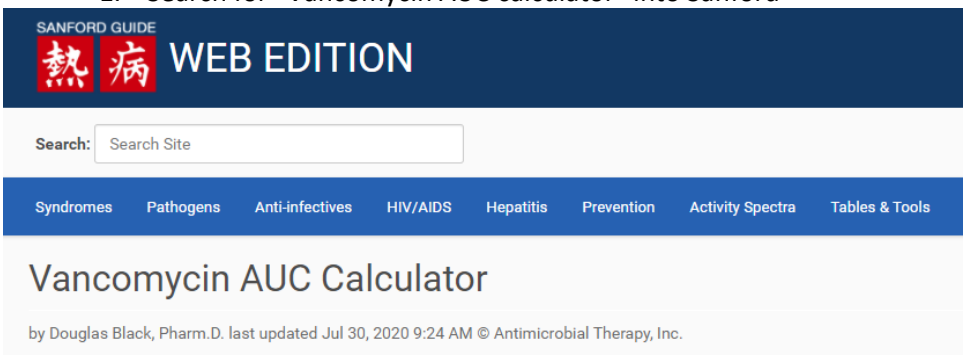
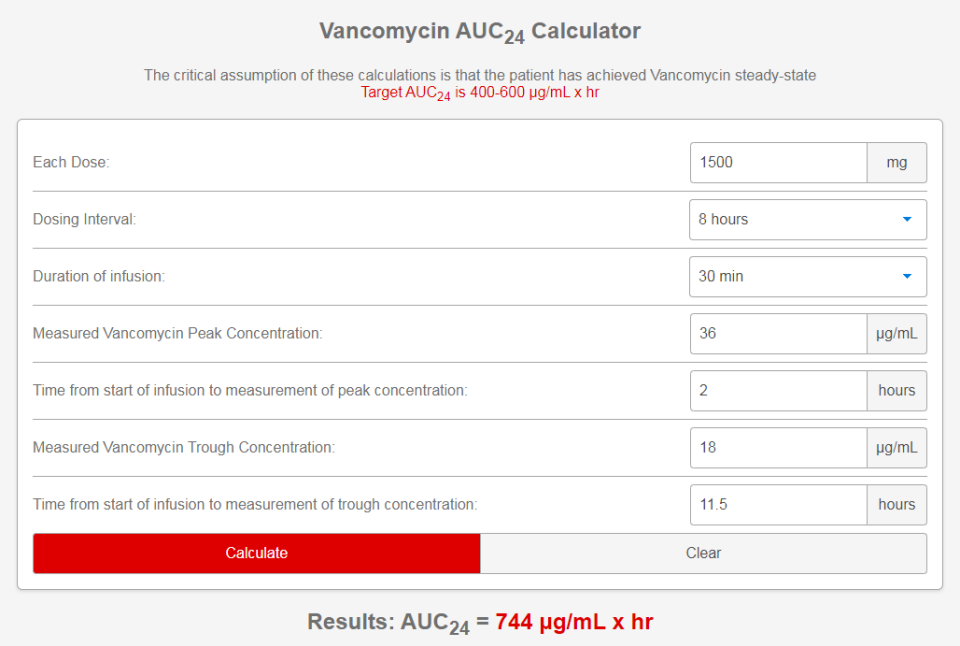
AUC calculations and procedure Job-aide

1. Does the patient have changing renal function? If yes, **do not calculate the AUC** and continue to use trough goal of 10-20 mcg/ml.
2. Does the patient meet the criteria for AUC measurement? **If yes to any of the following questions, proceed to Step 3.**
    i. Severe documented MRSA infection (including bacteremia, endocarditis, prosthetic joint infection, pneumonia, osteomyelitis, or meningitis).
    ii. Vancomycin dose greater than > 4g/day without achieving a minimum trough of 10 mcg/ml.
    iii. Long term vancomycin (i.e > 2 weeks) for any indication.
3. Schedule **two post-distribution levels** (i.e peak and trough) after the patient reaches a steady state. Levels do not need to be drawn around the same dose.
    i. Optimal timing is peak and trough but defer to clinical judgement for utilizing any two detectable levels, drawn at least 2 hours apart.
        a. Peak: 1-4 hours after the end of the infusion.
            1. There is not a preference but choosing the method that is least disruptive to the patient (i.e. adding on a vancomycin level with AM labs is ok).
            2. There must be at least 30 minutes between the end of the infusion and the measurement of the peak concentration to allow for adequate drug distribution.

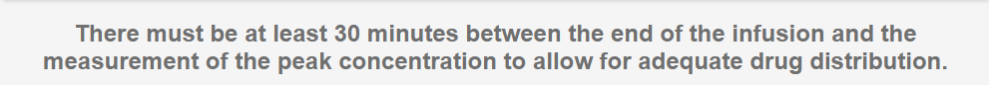
        b. Trough: 30 minutes prior to dose.
        c. Attempt to time levels and perform calculations during clinical day shift.
        d. To ensure proper handoff, please denote in "Documentation" in Vancomycin IVENT that patient is transitioning to "AUC-based dosing" and make sure denote the new trough goals.
4. Once the levels return, **write down all the levels and corresponding doses and times**.
    i. Use an AUC calculator to determine the vancomycin AUC. We prefer Sanford calculator due to ease of use and the ability to use levels from intervals. This can be accessed thru the health sciences library at hsl.uw.edu or pharmacy staff website. You may need your uwnetid to login.
        a. **https://webedition.sanfordguide.com/en/comparisons-1/calculators/sg-one-calculators-vancomycin**
        b. Sanford calculator is preferred since it allows for input of peak and trough levels and easier modifications to assess AUC and predicted peak and trough levels
            1. Search for "Vancomycin AUC calculator" into Sanford



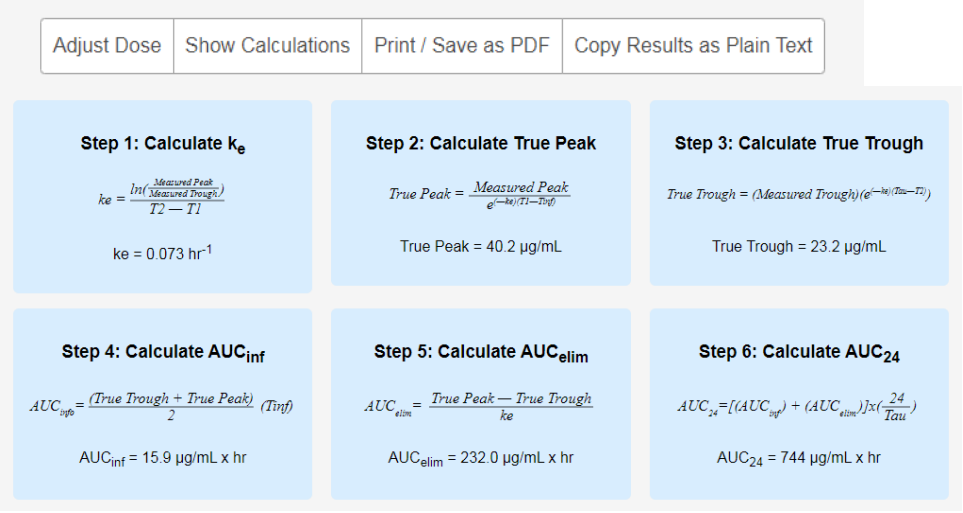
ii. Enter patient specific information; goal AUC is 400-600 µg/mL x hr.



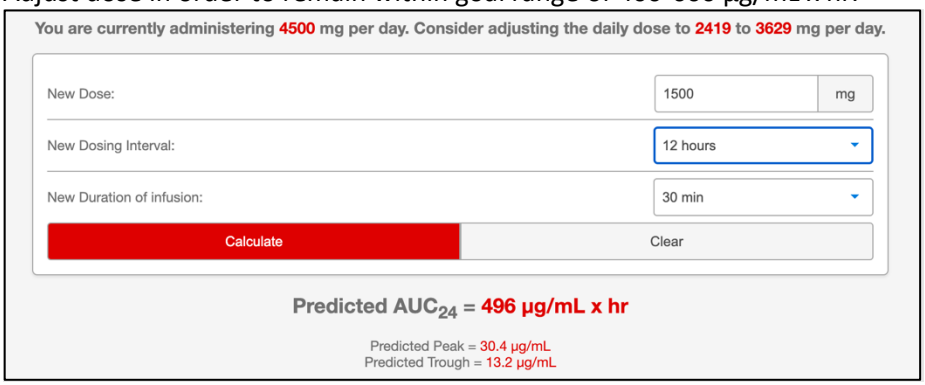
If the peak level is drawn too soon after the end of the infusion (< 30 mins), it will not calculate the AUC and show the notification below:



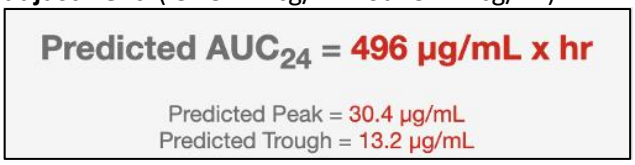
a. To note the Sanford AUC calculator can calculate true peak and trough, go to Show Calculations. You can also save



iii. Adjust dose in order to remain within goal range of 400-600 µg/mL x hr.



iv. From the calculator, determine the corresponding trough from the calculated AUC. If changing the dose or interval, **make sure to use the trough associated with the dose adjustment**. (ie 13.2 mcg/ml not 23.2 mcg/ml)



v. From the calculated AUC, create a direct proportion to determine the predicted trough goals that would correlate with AUC of 400 and 600 µg/mL x hr.
   a. 400/x=calculated AUC/predicted trough
      1. x=trough correlated with AUC of 400 µg/mL x hr
   b. 600/x=calculated AUC/predicted trough
      1. y=trough correlated with AUC of 600 µg/mL x hr
   c. The **new personalized trough goals (based on the daily dose)** for this patient to obtain an AUC of 400-600 µg/mL x hr are x to y

5. Recheck a trough level within 7 days if renal function is stable; check level sooner if renal functions worsen.
   i. Consider reassessment of AUC if volume status changes significantly or the vancomycin frequency is changed.
   ii. Upon rechecking trough, if the serum trough is higher than expected make a dose adjustment as you normally would using the previous trough goal values.
      a. **If there is significant clinical change (ie increase in SCr) requiring a change in the frequency, then recheck an AUC (i.e. after once SCr stabilizes) and calculate a new trough goal. You will need to use the previous trough goal of 10-20 mcg/ml until the SCr normalizes.**
   iii. Upon rechecking a trough, if serum trough is lower than expected and no clinical parameters have changed, increase the dose accordingly. If the dose adjustment requires a change in the frequency, then you will need to recalculate an AUC corresponding trough goal.
6. Please use available dotphrase **.AUCVANCO** in assessment and plan when writing a pharmacy Vancomycin Progress Note.

a. ASK antimicrobial stewardship pharmacist to share this with you.

AUC Verbiage (.dotphrase):
Vancomycin dosing may be optimized by AUC monitoring due to ****

Assessment:

1. We used two post-distribution levels of *** µg/mL (**date** and **time**) and *** µg/mL (**date** at **time**) to calculate a vancomycin AUC.
2. Based on the current dosing regimen, we calculated an AUC of *** µg/mL x hr (target AUC is 400-600 µg/mL x hr) utilizing the Sanford vancomycin AUC calculator.

Plan:

1. From this calculation, we can give *** g IVPB every *** hours, which will correlate with an AUC of *** µg/mL x hr and corresponding trough in the goal range of ***-***.
2. Plan to repeat level in *** days.