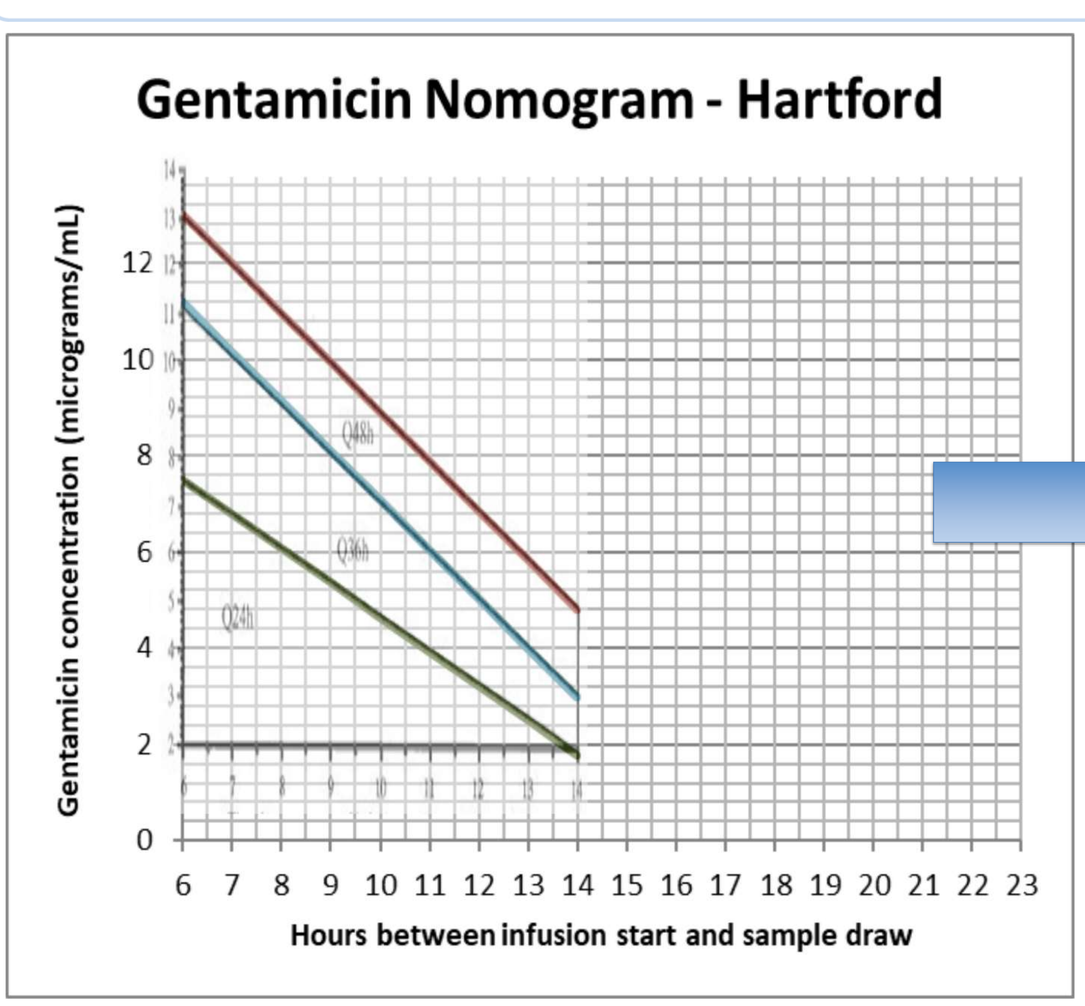
Validation of a 6 to 24-hour extended interval gentamicin nomogram

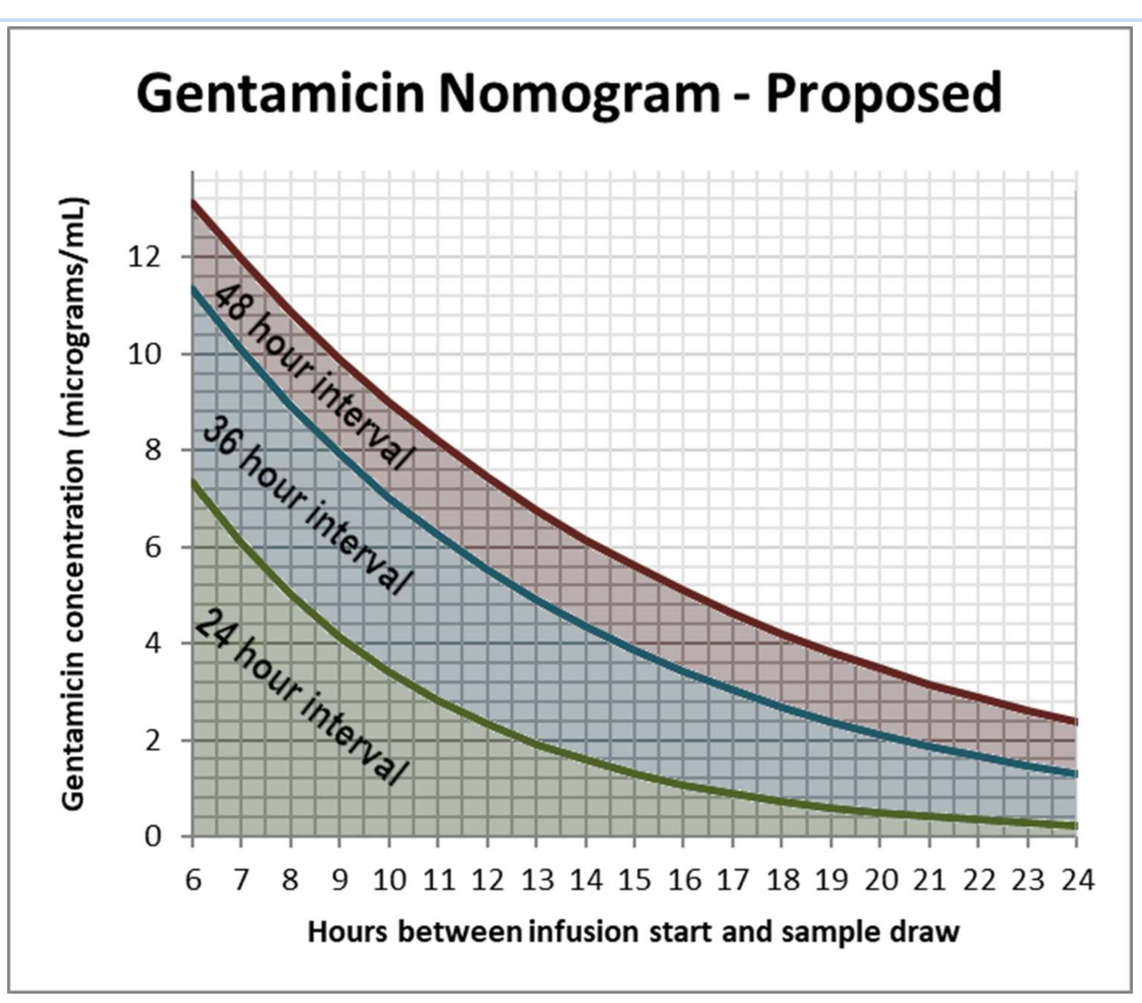
Kevin J Frost, Pharmacy Department, Airedale NHSFT
Keighley, West Yorkshire, BD20 6TD

Why take a patient's blood just for gentamicin levels?

Gentamicin remains an important antibiotic in the treatment of gram-negative infections, but the monitoring of levels for dosing can be challenging. An alternative nomogram was developed based upon the limits for gentamicin clearance using the pharmacokinetic calculation of Sawchuk and Zaske[1], This new nomogram was based on a patient clearing gentamicin to less than 0.5mg/L (for a minimum of 4 hours prior to the next dose, as per the original Hartford[2] nomogram) after a single bolus of 7mg/kg with a volume of distribution of 0.26L/kg. This alternative nomogram allows for levels to be taken between 6 and 24 hours, thus allowing the assay of gentamicin levels from the patient's daily U&Es sample rather than tasking another staff member to take it before or later.

Real world data on 107 patients seen in clinical practice were analysed. 14 patients (13%) would have been dosed on 36 rather than 24 hour dose interval, indicating that they would not have cleared gentamicin within 20 hours according to Sawchuk and Zaske calculations. All other dose interval recommendations remained the same. This would represent an improvement in patient safety.





This alternative nomogram reduces the need for the patient to be bled for more than 1 gold-top sample per day.

Acceptability measures to prescribers & further validation is required prior to clinical use

References

1. Nicolau DP, Freeman CD et al. Experience with a Once-daily Aminoglycoside Program Administered to 2,184 Adult Patients. Antimicrobial Agents and Chemotherapy 1995; 39: 650-655.
2. Winter ME. Basic Clinical Pharmacokinetics. 5th ed. Lippincott Williams & Wilkins; 2010.p.137, 144-145.

More Information

https://github.com/kevfrost/Gentamicin

@AntibioticPharm

kevin.frost@nhs.net