MATATIKI
CHILD & YOUTH HEALTH
WAITAHA CANTERBURY
NEONATAL SERVICES

Neonatal
Amikacin Monitoring

NHI ..... WARD .....
SURNAME .....
FIRST NAME .....
GENDER ..... DOB ..... AGE .....
(or affix patient label)

Working weight: ..... Indication: ..... Prescriber's pager number: .....

Use a new sheet for each Amikacin course and keep in the notes **Accurate entry of drug infusion times is imperative for dose predictions**

PRESCRIBER/NURSE TO COMPLETE								PHARMACIST TO COMPLETE OR ADVISE BY PHONE AND NICU STAFF CAN COMPLETE					
DOSING				SAMPLING				PHARMACOKINETICS *see page 2 for calculations*				NEW DOSE	
Dose date	Dose and Interval	Amikacin Infusion Start Time	Amikacin Infusion Stop Time	Time of Peak Level	Peak Level (mg/L)	Time of Mid-interval Level	Mid-Interval Level (mg/L)	$t_{1/2}$ (hr)	C_{max} (mg/L)	C_{min} (mg/L)	AUC (mg.hr/L)	Recommendations *Dose and Interval*	Pharmacist Signature /Pager
	mg hrly												
	mg hrly												
	mg hrly												
	mg hrly												

Work hours

- The Neonatal Unit pharmacist (pager 5009) will provide help with Amikacin monitoring and dose predictions between 8.00am-4.30pm Mon-Fri

After hours

- Contact the on-call pharmacist via the Christchurch Hospital operator. Verbal predictions need to be "witnessed" by two staff members

Notes:

- This dosing strategy aims to maximise the effectiveness of Amikacin via concentration rather then time-dependent bacterial kill and to minimise toxicity and resistance
- **$t_{1/2}$** (half-life) – neonates with very long amikacin half-lives, ie. > 12 hr should not be given subsequent doses (D/W the Consultant as alternative antibiotics may not be available)
- **C_{max}** (true peak concentration) – needs to be 24 **mg/L. (aim for peak 24 – 35 mg/L. Amikacin works best with a high Cmax and a very low Cmin)**
- **C_{min}** (true trough concentration – at the end of the dosing interval) – needs to be as low as possible and ideally should be **< 5 mg/L**
- **AUC** (area under the concentration-time curve) – should **140 - 200 mg/L.hr for a 24 hr dosing interval, 210 -300 mg/L.hr for 36hr or 280- 400 mg/L.hr for 48 hr dosing**

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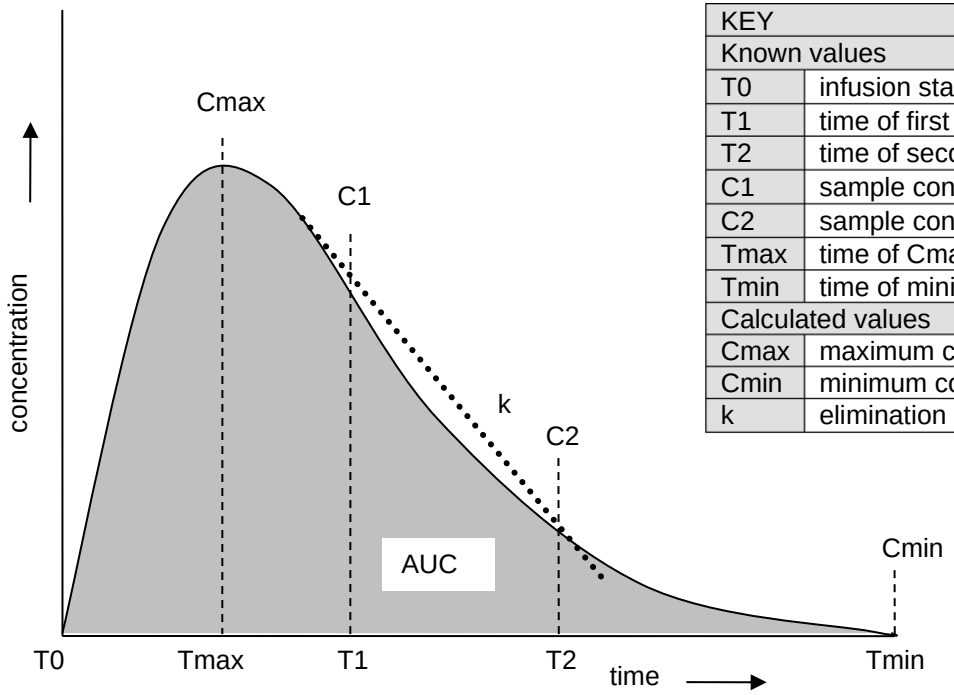
Neonatal Amikacin Monitoring



KEY	
Known values	
T0	infusion start time
T1	time of first sample
T2	time of second sample
C1	sample concentration at time 1 (T1)
C2	sample concentration at time 2 (T2)
Tmax	time of Cmax
Tmin	time of minimum concentration
Calculated values	
Cmax	maximum concentration
Cmin	minimum concentration
k	elimination constant

$$k = \frac{\ln C1 - \ln C2}{T2 - T1}$$

$$t½ = \frac{0.693}{k}$$

$$Cmax = C1 \times e^{k(T1 - Tmax)}$$

$$Cmin = C2 \times e^{-k(Tmin - T2)}$$

$$AUC = \frac{Cmax - Cmin}{k}$$