NHS Grampian

Acute Sector

NHS Grampian Staff Guidance For The Use Of Once Daily Intravenous Gentamicin Dosing In Adults (Hartford Guidance)

Co-ordinators:	Reviewer:	Approver:
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Executive Sign-Off

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Purpose/description:	To provide guidance for medical, nursing and pharmacy staff about how to dose, monitor and administer intravenous once daily gentamicin safely and effectively in adults.
Responsibility:	Responsibility for the effective management of the Acute Sector's policy, protocol, procedure and process documentation ultimately lies with the General Manager for the Acute Sector. Delegation for formulating, disseminating and controlling these documents falls to either a named individual or a working group.
Policy statement:	It is the responsibility of supervisory staff at all levels to ensure that their staff are working to the most up to date and relevant policies, protocols procedures. By doing so, the quality of the services offered will be maintained, and the chances of staff making erroneous decisions which may affect patient, staff or visitor safety and comfort will be reduced.
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Revision Date	**Previous Revision Date**	**Summary of Changes (Descriptive summary of the changes made)**	**Changes Marked* (Identify page numbers and section heading)**
September 2020	August 2015	References and hyperlinks updated	Throughout
September 2020	August 2015	Link and reference to gentamicin calculator in Antimicrobial Companion app added.	Page 2
September 2020	August 2015	Link to NHS Grampian Guideline: Synergistic Gentamicin for Endocarditis in Adults added.	Page 2
September 2020	August 2015	Updated Prescription and administration Record (PAR) front page graphic	Page 4
September 2020	August 2015	Link to Medusa added	Page 4
September 2020	August 2015	*Aminoglycosides are inactivated by beta lactams due to an interaction with the beta lactam ring. These drugs (e.g. penicillins, cephalosporins and carbapenems) should be given at a different site* - text removed.	Page 4

September 2020	August 2015	Note added to Figure 1: Hartford Nomogram to 'Stop gentamicin therapy and re-check level' if above Q48h.	Page 5
September 2020	August 2015	'*or microbiological sensitivities'* added to 3rd bullet point under Step 3.	Page 6
September 2020	August 2015	Multiple courses of gentamicin added as a risk factor for ototoxicity and referral to ENT for assessment suggested if ototoxicity suspected.	Page 7
September 2020	August 2015	*'If obese refer to full guideline to calculate corrected dosing weight.'* added to Prescribing, administration and monitoring chart. Kardex changed to prescription and administration record (PAR).	Appendix 1: Prescribing, administration and monitoring chart.
September 2020	August 2015	Appendix 4 Removed. Information sheet will be republished as a standalone document only.	Appendix 4

* Changes marked should detail the section(s) of the document that have been amended, i.e. page number and section heading.

NHS Grampian Staff Guidance For The Use Of Once Daily Intravenous Gentamicin Dosing In Adults (Hartford Guidance)

Contents **Page No.**

NHS Grampian Guidance for the Use of Once Daily Gentamicin Dosing in Adults (Hartford guidance)

NHS Grampian
Acute Sector

Scope

This guidance applies to the treatment of infection only and covers dosing, monitoring and administration of intravenous gentamicin as a once daily regimen[1].

Details of dosing of gentamicin for surgical prophylaxis in adults can be found in the departmental NHS Grampian Surgical Antibiotic Prophylaxis Guidelines.

This guidance does not apply to the use of gentamicin for synergistic treatment of infection, e.g. endocarditis, use in Renal Unit patients, or those on haemodialysis or haemofiltration. For full list of exclusions, see below.

Introduction and Rationale

Gentamicin is an aminoglycoside antibiotic with bactericidal activity against many Gram negative and some Gram positive organisms. It must be given by the intravenous route due to poor absorption from the gut.

Aminoglycosides show concentration-dependent killing. The aim of aminoglycoside treatment is to achieve an initial high peak concentration to kill the bacteria, but allow the concentration to fall to a trough level between doses to prevent toxicity. Aminoglycoside antibiotics also exhibit a post-antibiotic effect, and once daily administration results in prolongation of this effect[2]. This is a phenomenon of continued bacterial killing even although the serum concentrations have fallen below the minimum inhibitory concentration (MIC).

Once daily administration is as effective as multiple daily dosing, is more convenient, cost-effective, leads to higher initial antibacterial concentrations at the site of infection and has less nephrotoxicity.

Vestibular and ototoxicity secondary to gentamicin is independent of drug concentration, being associated with prolonged aminoglycoside use (usually >10 days but may be >72 hours) and drug accumulation within the inner ear[1].

Patients can be asymptomatic but still have toxic gentamicin levels, and symptoms of toxicity can develop even in patients with normal gentamicin levels. The best way to avoid toxicity is to ensure that treatment duration is no more than 72 hours unless necessary on clinical grounds[1]. All prescriptions for gentamicin should therefore be reviewed after 72 hours in conjunction with microbiology results and treatment continued only on the advice of a microbiologist or infectious disease specialist.

Exclusions

This guidance is only for use in adults over 16 years of age.

Advice should be sought from Microbiology or an Infection Specialist on treatment options if the patient has any of the following exclusions:

Exclusions to once daily regimen[1]

- Synergistic treatment of endocarditis†
- Major burns (>20% total body surface area)
- Ascites
- Patients treated in renal units or receiving haemodialysis or haemofiltration
- Cystic Fibrosis (refer to local guidelines).

Contra-indications:

- Hypersensitivity to aminoglycosides
- Myasthenia gravis
- Documented and significant degree of auditory and/or vestibular hypofunction.

Cautions

- Pregnancy – local guidelines recommend a single 7mg/kg dose based on "booking weight" (not actual weight) and measurement of serum level at 6-14 hours post-dose. Agreement **must** be sought from senior obstetric staff before administration of further doses.
- Patients with decompensated liver disease – aminoglycosides are associated with an increased risk of renal failure.
- Concurrent administration of neurotoxic and/or nephrotoxic agents increases the risk of gentamicin toxicity. Review therapy and consider amending or withholding nephrotoxic drugs during gentamicin treatment. Avoid co-administration with the following:
  - Neuromuscular blockers
  - Other potentially nephrotoxic (e.g. NSAIDs and ACE inhibitors) or ototoxic drugs
  - Potent diuretics
  - Other aminoglycosides.
- Chronic Kidney Disease (CKD) stage 4 (eGFR 15-29mL/min) or known/suspected Acute Kidney Injury (AKI) in previous 48 hours (≥50% increase in baseline serum creatinine or oliguria‡ >6 hours) – if gentamicin is clinically indicated, give one dose as per guidance and check with microbiology or infection specialist before giving a second dose[1].

  This list is not exhaustive – consult the Summary of Product Characteristics (SmPC) for a full list (www.medicines.org.uk).

Step 1: Calculate, Prescribe And Administer The First Dose

- To reduce the risk of mortality, commence gentamicin administration **within 1 hour** of recognising sepsis.
- *If creatinine is known* – use the NHSG online calculator (preferred method) which is available via the Hospital Portal on the intranet and can be found under References. Print out the result, add patient details and file with the prescription. Alternatively access the calculator via the Antimicrobial Companion app (desktop or mobile).

Notes:

† see NHS Grampian Guideline: Synergistic Gentamicin for Endocarditis in Adults

‡ oliguria = urine output of <30mLs/hour

The guidelines in Box 2 (below) can be used (if the online or app calculator is not available). The dose amount is based on estimated creatinine clearance using the Cockcroft Gault equation (Box 1) and actual body weight (ABW), or a corrected dosing weight (CDW) if the patient is obese, i.e. above maximum body weight for their height (Box 2).

- *If creatinine is not known* – give 7mg/kg gentamicin (maximum 600mg) or, if Chronic Kidney Disease (CKD) 5, give 2.5mg/kg (maximum 180mg) only on advice of senior medical staff. Calculate the dose using actual body weight or corrected dosing weight if the patient is obese, i.e. above maximum body weight for their height (Box 2).

Box 1: Estimation of creatinine clearance (CrCl)

The following 'Cockcroft Gault' equation can be used to estimate creatinine clearance (CrCl):

$$\text{CrCl (mL/min)} = \frac{[140 - \text{age (years)}] \times \text{weight}^{*}\text{ (kg)}}{\text{serum creatinine}^{\Delta}\text{ (micromol / L)}} \times 1.23 \text{ (male) } \textit{or}\ 1.04 \text{ (female)}$$

Cautions:

- *****Use actual body weight or maximum body weight for patient's height, whichever is lower. For maximum body weight see Appendix 3 or: https://www.sapg.scot/media/4471/maximum-body-weight-table.pdf
- $^{\Delta}$ In patients with low creatinine (<60micromol/L), use 60 micromol/L to avoid overestimating creatinine clearance due to low muscle mass.
- Note: Use of estimated glomerular filtration rate (eGFR) from labs is **not** recommended for calculation of gentamicin doses.

Box 2: Initial GENTAMICIN dose

- *If creatinine clearance >20mL/min and the patient is **not obese***, calculate the dose by multiplying actual body weight (kg) by 7 (i.e. 7mg/kg) to a **maximum dose of 600mg**. Round this to the nearest 40mg for ease of administration (see Table 1).

- *If creatinine clearance >20mL/min and the patient is **obese*** (above maximum body weight for their height, i.e. >20% above ideal body weight) calculate the gentamicin dose by multiplying their **corrected dosing weight** (**CDW** (kg)) by 7 (i.e. 7mg/kg CDW) to a **maximum dose of 600mg**. Round this to the nearest 40mg for ease of administration (see Table 1).

CDW (kg) = ideal body weight + 0.4 (actual body weight – ideal body weight)

For ideal body weight see Appendix 2 or: https://www.sapg.scot/media/4470/ideal-body-weight-tables.pdf

- *If creatinine clearance ≤20 mL/min,* first confirm with a senior clinician that gentamicin is the most appropriate treatment. Calculate the initial dose by multiplying the patient's actual body weight (kg) (or corrected dosing weight (kg) if the patient is obese) by 2.5 (i.e. 2.5mg/kg) to a **maximum of 180mg**.

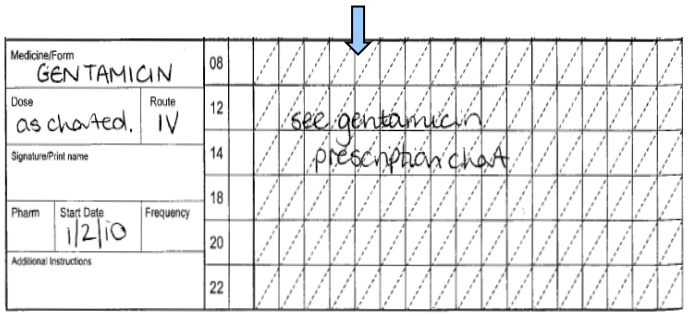
Table 1: Initial GENTAMICIN dose

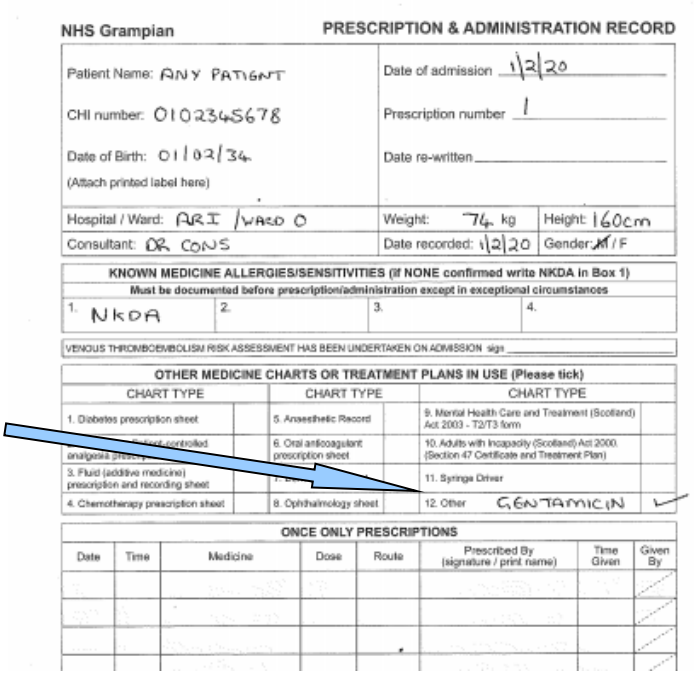
Creatinine Clearance (mL/min)	**Dosing weight** (either Actual body weight or Corrected if obese)								
	40-44 kg	45-49 kg	50-54 kg	55-59 kg	60-65 kg	66-71 kg	72-77 kg	78-82 kg	≥ 83 kg
≤ 20	**2.5mg/kg (max. 180mg)** then take a blood sample after 24 hours								
> 20	**280mg**	**320mg**	**360mg**	**400mg**	**440mg**	**480mg**	**520mg**	**560mg**	**600mg**

If actual **body** weight is < 40kg and creatinine clearance is > 20mL/min, still use a dose of 7mg/kg but round to the nearest 20mg.

Prescribing

Gentamicin should be prescribed on the Adult Parenteral Gentamicin (Hartford): Prescribing, Administration & Monitoring Chart (Appendix 1), and reference to this chart should be made on the patient's main prescription chart as shown below and opposite.





Administration (See monograph on Medusa, which is available via the Hospital Portal on the intranet and can be found under References)

The dose should be prepared in 100mLs of sodium chloride 0.9% or glucose 5% and given over 1 hour by intravenous infusion[3].

Ensure the time of administration (24 hour clock) is noted on the Adult Parenteral Gentamicin (Hartford): Prescribing, Administration & Monitoring Chart (see Appendix 1).

Gentamicin should not be mixed with other drugs in syringes or infusions nor given through the same IV line[4]. Check Medusa (which is available via the Hospital Portal on the intranet and can be found under References), contact your ward pharmacist or Medicines Information (ext 52316) for advice if there are restrictions on intravenous access.

IV lines should be flushed with sodium chloride 0.9% before and after gentamicin administration to ensure no interactions occur.

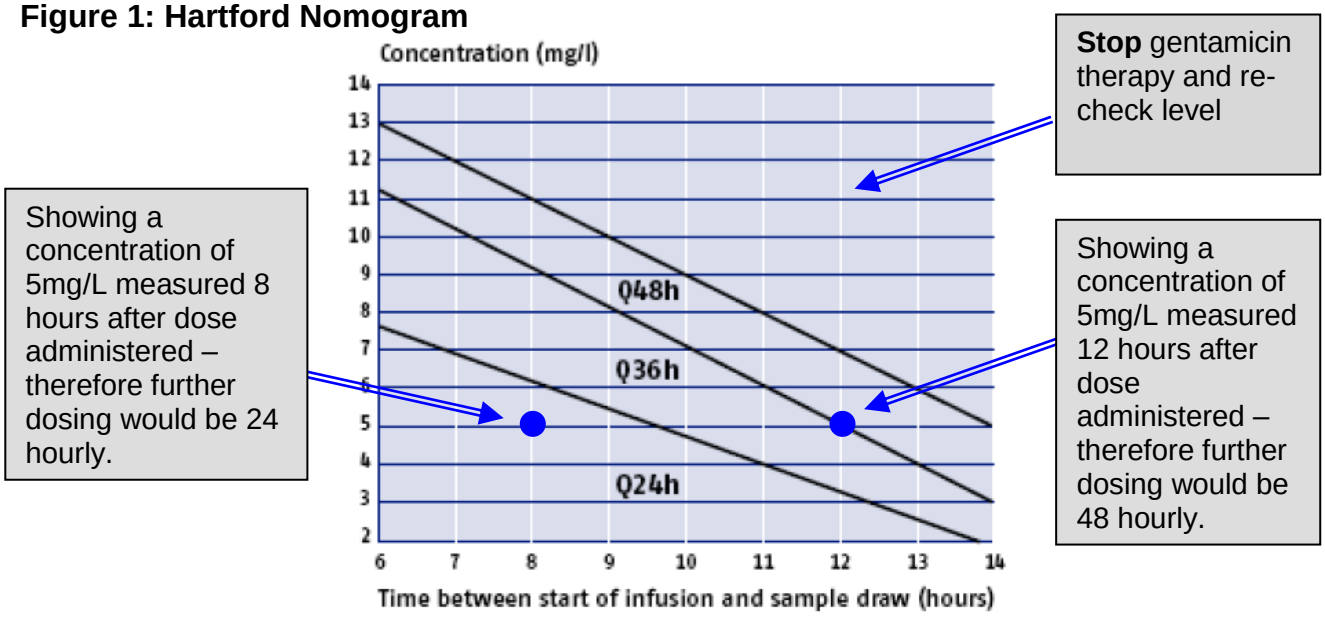
Step 2: Monitor Creatinine And Gentamicin Concentrations And Reassess The Dosage Regimen

Concentrations are meaningless unless the dose and sample times are recorded accurately.

If creatinine clearance is > 20mL/min:

- Take a blood sample 6-14 hours after the start of the first gentamicin infusion.
- Record the exact time of all gentamicin samples using the Adult Parenteral Gentamicin (Hartford): Prescription, Administration & Monitoring Chart AND on the sample request form along with the actual time of administration.
- Record the serum concentration on the Adult Parenteral Gentamicin (Hartford): Prescription, Administration & Monitoring Chart.
- Plot the gentamicin concentration on the Hartford nomogram on the Adult Parenteral Gentamicin (Hartford): Prescription, Administration & Monitoring Chart (see Figure 1 below) and reassess the dose/dosing interval as indicated.
- If the result lies on a diagonal line, choose the longer interval. If the level is above the 48 hourly line (Q48h), **stop** the gentamicin and reassess the requirement for ongoing therapy. If gentamicin remains the most appropriate antibiotic to use, do not give another dose until the concentration is <1mg/mL.
- Seek advice from pharmacy or microbiology if you are unsure how to interpret the result.

Figure 1: Hartford Nomogram



If creatinine clearance is ≤ 20mL/min:

- Take a blood sample 24 hours after the start of the gentamicin infusion.
- Record the exact time of all gentamicin samples using the Adult Parenteral Gentamicin (Hartford): Prescribing, Administration & Monitoring Chart **and** on the sample request form along with the time of administration.
- If therapy is to continue, give a further dose once the measured concentration is <1mg/mL.

General points

- Document the action taken in the medical notes and on the Adult Parenteral Gentamicin (Hartford): Prescribing, Administration & Monitoring Chart.
- Undertake pre-prescribing checks [see Box 3 & Box 4 (below)] to assess the risks of renal toxicity and ototoxicity.
- Prescribe the next dose as appropriate.
- If a blood sample is not taken, is lost or is taken at the wrong time ***and*** if the patient's creatinine clearance* is <60mL/min, take a sample 20-24 hours after the start of the gentamicin infusion and wait for the result. **Only** give the next dose if the concentration is < 1mg/mL. If > 1mg/mL, **withhold** the dose and recheck in 12-24 hours.

*** NB:** If creatinine clearance was >60mL/min and creatinine has remained stable, 24 hourly dosing may be expected and a second dose may be considered at 24 hours before a level is obtained. However, advice should be sought from pharmacy, microbiology or senior medical staff taking into consideration risk and benefit.

If the measured concentration is unexpectedly HIGH or LOW, consider the following:

- Were dose and sample times recorded accurately?
- Was the correct dose administered?
- Was the sample taken from the line used to administer the drug?
- Was the sample taken during drug administration?
- Has renal function declined or improved?
- Does the patient have oedema or ascites?

If in doubt, take another sample before re-prescribing and / or contact pharmacy for advice.

Step 3: Assess daily the ongoing need for gentamicin and for signs of toxicity

- Take a further sample 6-14 hours after the dose **at least every 2 days.** If the concentration is unexpectedly high, or if renal function alters, **daily** sampling may be necessary.
- If the patient is receiving 36 or 48 hourly dosing, a level should be checked after each infusion.
- To minimise the risk of toxicity, duration of therapy should normally be limited to 72 hours. All gentamicin prescriptions that continue beyond 3 - 4 days of treatment must be discussed with microbiology or an infection specialist to ensure clear clinical and microbiological need for prolonged therapy. Consider changing to an oral alternative – refer to the IV to Oral switch (IVOST) policy and the empirical antibiotic therapy guidelines, or microbiological sensitivities.

Box 3: Renal toxicity

- Monitor creatinine daily. Seek advice if renal function is unstable (e.g. change in creatinine of >15-20%).
- Signs of renal toxicity include increase in creatinine or decrease in urine output/oliguria.
- Consider an alternative agent if creatinine is rising or the patient becomes oliguric.

Box 4: Ototoxicity

- Ototoxicity secondary to gentamicin is independent of drug concentration. It is suggested by any of the following: new tinnitus, dizziness, poor balance, hearing loss or oscillating vision.
- Toxicity is associated with prolonged aminoglycoside use (usually >10 days but may be >72 hours) and is secondary to drug accumulation within the inner ear. Multiple courses of gentamicin are also a risk factor for ototoxicity.
- Stop the treatment if ototoxicity is suspected and refer to microbiology / infection specialist for advice on future therapy and refer to ENT for assessment.
- If gentamicin continues for >7 days, consider referral to audiology for assessment.

For further advice contact:
Antibiotic Pharmacists Bleep 3933. Ext: 51048/51363.
Ward Clinical Pharmacists - see ward information for contact details.
Medical Microbiology via switchboard.
Medicines Information Ext 52316.

References

1. Scottish Antimicrobial Prescribing Group. Intravenous Gentamicin Use in Adults (Hartford). January 2019. https://www.sapg.scot/media/4718/gentamicin-hartford.pdf
2. Nicolau et al. Experience with a Once-Daily Aminoglycoside program Administered to 2,184 Adult Patients. Antimicrobial Agents and Chemotherapy. Mar 1995. Vol 39, No3, p 650-655.
3. Medusa Injectable Medicines Guidance – gentamicin monograph updated: 12/06/2017
4. Martindale: The Complete Drug Reference [accessed via http://www.knowledge.scot.nhs.uk/home.aspx September 2020].

Review Consultation List (for 2020 update):
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Prof. Ian Gould	Consultant - Microbiology

Glossary of Abbreviations

ABW	Actual Body Weight
AKI	Acute Kidney Injury
CDW	Corrected Dosing Weight
CKD	Chronic Kidney Disease
CrCl	Creatinine Clearance
eGFR	Estimated Glomerular Filtration Rate
IBW	Ideal Body Weight
MBW	Maximum Body Weight
MIC	Minimum Inhibitory Concentration
PAR	Prescription and administration record

Appendix 1: Adult Parenteral Gentamicin (Hartford): Prescribing, Administration and Monitoring Chart

ADULT PARENTERAL GENTAMICIN (HARTFORD): PRESCRIBING, ADMINISTRATION & MONITORING CHART

NHS SCOTLAND

Use for patients prescribed intravenous gentamicin as per the HARTFORD guidance. Not for prophylactic indication or where synergistic doses (usually in endocarditis) are being used.
Refer to full guidance for information on EXCLUSIONS to policy and Cautions / Contra-indications to gentamicin.

Patient name: .....

Date of birth: .....

CHI no.: .....

Affix patient label

Age: ..... Sex: M / F

Weight: ..... Height: .....

Creatinine ..... on: ..... /..... /.....

Source of first dose:

Online calculator (preferred method) ❑

Manual calculation ❑

Weight based, creatinine not known ❑

Step 1: Calculate and prescribe the first dose of gentamicin (see overleaf for more details)

- If creatinine is known - use the online gentamicin dose calculator.
- If creatinine is unknown - give 7 mg/kg gentamicin (maximum 600 mg) or, if CKD 5, give 2.5 mg/kg (maximum 180 mg) on advice of senior medical staff. *If obese refer to full guideline to calculate corrected dosing weight.*
- Prescribe gentamicin 'as per chart' on the prescription and administration record (PAR). AVOID specifying dose or administration time on the main PAR.
- Prescribe individual doses in the prescription record section below, specifying the date and time the dose should be given.

Step 2: Monitor creatinine and gentamicin concentration and reassess the dosage regimen

- Check gentamicin concentration after the first dose and then at least every 2 days (see overleaf for more details).
- Monitor creatinine daily. Seek advice if renal function is unstable (e.g. a change in creatinine of >15-20%).

Step 3: Assess daily: the ongoing need for gentamicin signs of toxicity

- Consider an alternative agent if creatinine is increasing or the patient becomes oliguric.
- If gentamicin continues for >7 days, suggest referral to audiology for assessment.
- Refer to guidelines or clinical pharmacist for further advice on prescribing, monitoring and administration.

PROMPT ADMINISTRATION
within 1 hour of recognition of sepsis reduces mortality

SIGNS OF GENTAMICIN TOXICITY
RENAL: ↓ urine output/oliguria or ↑ creatinine

OTO/ VESTIBULAR: NEW tinnitus, dizziness, poor balance, hearing loss, oscillating vision

Toxicities may occur irrespective of gentamicin concentration

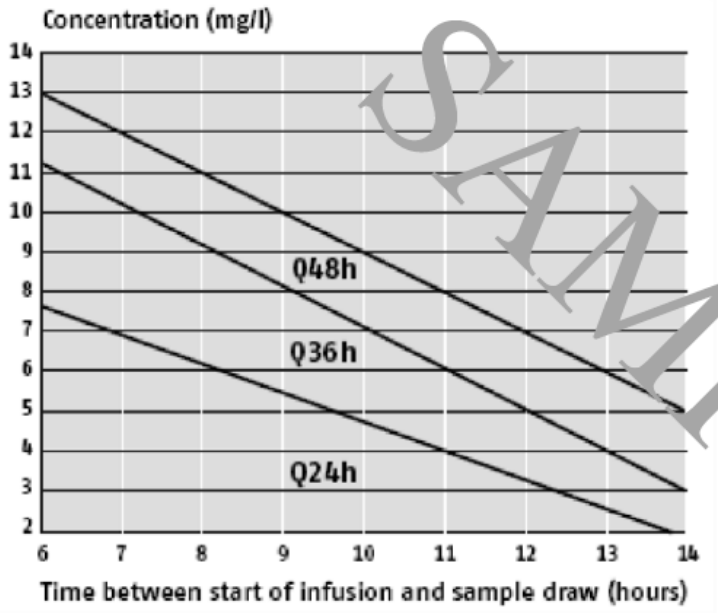
TOXICITY Before prescribing each dose check: **Renal & Oto-vestibular function**	Gentamicin Prescription Record Complete each time a dose is given (ensuring gentamicin is prescribed 'as per chart' on the main PAR)				Administration Record Complete each time gentamicin is administered			Monitoring Record Record ALL sample dates/times accurately below. See overleaf for monitoring advice.			
	Date to be given	Time to be given 24 h clock	Gentamicin Dose (mg)	Prescriber's signature, PRINTED name and STATUS	*Infuse over 60 mins* Date given	*Infuse over 60 mins* Time started 24 h clock	Given by	Date of sample	Time of sample 24 h clock	Gent level (mg/L)	Action/ Comments (please initial action to be taken)
Cr = micromol/L											24 hourly ❑ 36 hourly ❑ 48 hourly ❑ Stop ❑ Details/other :
Cr = micromol/L											24 hourly ❑ 36 hourly ❑ 48 hourly ❑ Stop ❑ Details/other :
***Discuss with an infection specialist or microbiology and document in the notes if treatment continues beyond 3 to 4 days * Risks of prolonged treatment must be considered and treatment options discussed with microbiology or infection specialist**											
Cr = micromol/L											24 hourly ❑ 36 hourly ❑ 48 hourly ❑ Stop ❑ Details/other :
Cr = micromol/L											24 hourly ❑ 36 hourly ❑ 48 hourly ❑ Stop ❑ Details/other :
Discuss with an infection specialist before continuing onto a second sheet											

Patient name: ..... CHI no.: .....

ADULT PARENTERAL GENTAMICIN (HARTFORD): PRESCRIBING, ADMINISTRATION & MONITORING CHART

Prescribing, monitoring, interpreting and re-prescribing advice

NHS SCOTLAND



If the measured concentration is unexpectedly HIGH or LOW

- Were dose and sample times recorded accurately?
- Was the correct dose administered?
- Was the sample taken from the line used to administer the drug?
- Was the sample taken during drug administration?
- Has renal function declined or improved?
- Does the patient have oedema or ascites?

If in doubt, take another sample before re-prescribing and/or contact pharmacy for advice.

Calculating the first dose of gentamicin

- If creatinine is known - use the online gentamicin dose calculator.
- If creatinine is not known - give 7 mg/kg gentamicin (maximum 600 mg) or, if CKD 5, give 2.5 mg/kg (maximum 180 mg) on advice of senior medical staff. If obese refer to full guideline to calculate corrected dosing weight.
- Re-calculate and assess the dose once creatinine is available.

Checking the patient's gentamicin concentration

- Take a blood sample 6-14 hours after the start of the first gentamicin infusion (or after 24 hours if CrCl ≤ 20 ml/min).
- Thereafter, sample at least every 2 days.
- Record the exact time of all gentamicin samples overleaf AND on the sample request form.

Interpreting gentamicin results and re-prescribing

- Record the measured concentration overleaf.
- If creatinine clearance is ≤ 20 ml/min and therapy is to continue, give a further dose once the measured concentration is <1 mg/L.
- If creatinine clearance is >20 ml/min and therapy is to continue, plot the gentamicin concentration on the graph opposite & reassess the dose/dosing interval as indicated.
- If the result is on the line, choose the longer interval. If the level is above the Q48h line, stop therapy and reassess the dosage regimen. Do not give a further dose until the concentration is <1 mg/L.
- Document the action taken in the medical notes and overleaf. Prescribe the next dose overleaf as appropriate.
- Contact pharmacy for further advice as necessary (e.g. if renal function is changing or the gentamicin concentration is unexpectedly high or low).
- Check microbiology sensitivities and refer to the IV to Oral switch

February 2021
Date of Review: February 2023

NHS Grampian Guidance for the Use of Once Daily Intravenous Gentamicin Dosing in Adults (Hartford guidance)

Appendix 2: Tables Of Ideal Body Weight

These tables can be used to estimate a patient's ideal body weight (IBW) and to calculate gentamicin dosing weight in patients classed as obese (>20% above Ideal body weight, i.e. > Maximum body weight) when using the Hartford guidance.

FEMALES
IBW = 45.5kg + 2.3kg for every 2.5cm above 152cm in height

Height (feet)	5'	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'	6'1"	6'2"	6'3"	6'4"
Height (Inches)	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
Height (cm)	152	155	157	160	163	165	168	170	173	175	178	180	183	185	188	190	193
IBW (kg)	45.5	47.8	50.1	52.4	54.7	57.0	59.3	61.6	63.9	66.2	68.5	70.8	73.1	75.4	77.7	80.0	82.3

MALES
IBW = 50kg + 2.3kg for every 2.5cm above 152cm in height

Height (feet)	5'	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'	6'1"	6'2"	6'3"	6'4"
Height (Inches)	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
Height (cm)	152	155	157	160	163	165	168	170	173	175	178	180	183	185	188	190	193
IBW (kg)	50	52.3	54.6	56.9	59.2	61.5	63.8	66.1	68.4	70.7	73.0	75.3	77.6	79.9	82.2	84.5	86.8

Appendix 3: Maximum Body Weight Table – For Creatinine Clearance Calculations

This table can be used to determine whether patients are classed as 'obese' (>20% over Ideal Body Weight) and to determine the Maximum Body Weight for use in the Cockcroft Gault equation (see Box 1)

Maximum Body Weight (MBW) table (= Ideal Body Weight + 20%)			
Height (ft inches)	**Height (cm)**	**MBW (kg) MALE**	**MBW (kg) FEMALE**
4' 8"	142	49	43
4' 9"	145	52	47
4' 10"	147	54	49
4' 11"	150	58	52
5' 0"	152	60	55
5' 1"	155	62	58
5' 2"	158	66	60
5' 3"	160	68	62
5' 4"	163	71	66
5' 5"	165	74	68
5' 6"	168	77	71
5' 7"	170	79	74
5' 8"	173	82	77
5' 9"	175	85	79
5' 10"	178	88	82
5' 11"	180	90	85
6' 0"	183	94	88
6' 1"	185	96	90
6' 2"	188	98	94
6' 3"	191	101	97
6' 4"	193	104	99
6' 5"	195	107	101
6'6"	198	109	105
6' 7"	201	113	108
6' 8"	203	115	110