Monographs for Commonly Administered Intravenous Medications
in Home and Community Care

GENTAMICIN

Drug Class[1]	Antibiotic – Aminoglycoside	
Spectrum[1-3]	**Refer to product monograph for complete spectrum** Gram negative pathogens (e.g., *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Serratia marcescens*), synergistic effect when used with penicillins for treatment of select gram-positive infections	
Cross Sensitivities / Allergies[1]	Hypersensitivity to gentamicin or other aminoglycoside agents	
Indications[1,2]	• Pyelonephritis • Endocarditis • Bacteremia • Peritonitis	• Skin and tissue infection • Bone infection • Respiratory tract infections • Other conditions based on culture and sensitivity results
Outpatient Considerations[1-4]	**Once daily dosing is the preferred dosing regimen for eligible outpatients** **Once daily dosing can be considered in all patients EXCEPT:** • Renal dysfunction (i.e., eGFR less than 30 mL/min) or dialysis • Age greater than 75 years • Enterococcal endocarditis • Liver disease / ascites • Burns (greater than 20% of body) • Pregnancy or breastfeeding • Baseline serum creatinine must be available and assessed prior to ordering treatment. Need for concurrent ototoxic or nephrotoxic medications should be assessed. • Patient must be able to access laboratory monitoring at least twice a week (either at outpatient laboratory or by arranging in-home lab) for the duration of treatment. • The physician who is responsible for ongoing assessment and follow-up of the course of gentamicin has been contacted and has accepted the responsibility. Contact name and information has been provided to the homecare professionals. • *Frequently in the home and community setting, the entire daily dose of gentamicin is placed in a single bag or cassette with pre-programmed boluses administered for dosing every 8-12 hours. In this situation, the vein is kept open using a continuous infusion of gentamicin at a low rate between doses. This means the patient is exposed to low concentrations of gentamicin in between ordered doses.* ***The risk of toxicity or treatment failure from this administration method has not been evaluated***	

GENTAMICIN

	Example of infusion path for 80 mg IV q8h: 72 mg bolus followed by 8 mg over next 7.5 hrs followed by 72 mg bolus followed by 8 mg over next 7.5 hrs followed by 72 mg bolus followed by 8 mg over next 7.5 hrs. Disconnected and reconnected for next dose by visiting nurse. • Can be dispensed as individual doses and administered over 30-60 minutes every 8-12 hours via pole pump with each nursing visit.	
Prescribing Considerations and Dosage in Adults[1-3]	**At time of prescribing please provide the following to the infusion pharmacist:** • **Height, weight** • **Most recent serum creatinine with date obtained** • **Indication (type of infection being treated)** • **Intended duration of treatment** *For Adults:* • Typical once daily dosing regimen is 5-7 mg/kg every 24 hours • Traditional dosing schedule is 1-1.5 mg/kg every 8 hours (or every 12-24h based on renal function) ***Dosing intervals and/or dose must be adjusted for renal impairment***	
Administration[2,3]	• May be dispensed in an ambulatory cassette/multi-dose bag intended for an infusion pump, programmed to deliver total daily dose via preprogrammed boluses over 24 hours. • Prior to connecting the patient to therapy, double check pump programming against the order. Recheck after each order change. • Can also be dispensed as single doses and administered by pole pump over 30-60 minutes with each nursing visit. • Contact pharmacy infusion provider for specific questions pertaining to administration.	
Stability / Compatibilities[1-3]	Compatible with: • 0.9% Sodium Chloride (NS) • Dextrose 5% in Water (D5W) *Do not mix or piggyback with any other medications*	Follow the stability as specified by the infusion provider (as it is based on the dilution and temperature). Ensure appropriate storage conditions as specified are being met.
Monitoring parameters[1-5]	**Laboratory:** • Serum creatinine weekly at a minimum (preferably twice weekly) Nephrotoxicity prevalence increases when used for longer duration and in	**Clinical by Nurse:** • Assess vestibular function at each visit to identify ototoxicity at an early stage (i.e., ask about tinnitus, fullness in ears, presence of new vertigo, difficulty hearing – ask

GENTAMICIN

	those with impaired kidney function. See Potential Drug Interactions section below for additional monitoring as needed. • Complete blood count weekly • ***Gentamicin trough levels should be drawn and evaluated for all patients receiving more than 3 days of treatment.*** *Trough level s are to be drawn just prior to the next dose being administered and should be obtained via venous puncture.* ***A standardized process is required to share results with the care team.*** **For patients receiving once daily dosing (5-7 mg/kg):** • A random gentamicin level 6 to 14 hours after the first dose is infused may be ordered. • A gentamicin trough level must be drawn weekly for the duration of therapy. Trough levels are drawn just prior to the next dose being administered and should be obtained via venous puncture. • If trough levels are not possible, at minimum a biweekly-weekly creatinine level is required. **For patients receiving traditional dosing (1 to 1.5 mg/kg q8-12h):** • At initiation or after dosage changes, peak gentamicin levels should be drawn after the 3rd or 4th dose, 30 minutes after the dose has finished infusing. • The trough should be drawn 15-30	spouse or living partner) • Observe for and report clinical signs suggestive of changing kidney function (CHF, edema, nocturia) • Confirm with patient that laboratory follow-up is being done • Assess for signs of dehydration • Depending on the site of the infection, observe for signs of improvement or deterioration, fever, malaise etc. • Monitor for rare neurotoxicity– seizures, muscle twitching, numbness • Contact most appropriate prescriber after 2 weeks of therapy have been administered to have dose and duration reassessed. • Review home medications and compare against the selected drug interactions listed below. Report to prescriber if patient is using an interacting drug and obtain further orders. For more comprehensive drug interaction screening, contact the patient's community pharmacist(s).

GENTAMICIN

	minutes prior to the next dose (i.e., 4 or 5th dose). • Timing of blood draws is critical • For ongoing monitoring of a stable dose, a weekly gentamicin trough level must be obtained and assessed. **Auditory:** Patients anticipated to receive aminoglycosides for more than 2 weeks should be considered for audiometry.	
Selected Clinically Significant Drug Interactions[1]	**Furosemide , ethacrynic acid -** can increase the chance of ototoxicity or nephrotoxicity, monitor vigilantly if taking during gentamicin therapy **Vancomycin** – combination increases risk of nephrotoxicity **Tacrolimus**[6] - combination increases risk of nephrotoxicity **Tenofovir**[7] (found in HIV combination products) – combination increases risk of nephrotoxicity **Non-steroidal anti-inflammatory agents** - combination increases risk of nephrotoxicity	
Patient Education[1,4]	*Advise patient to report to their doctor or nurse if they have:* • Changes to hearing (e.g., tinnitus [ringing], feelings of fullness in ear(s), new onset vertigo, change in hearing volume) • New onset leg swelling or shortness of breath, change in urine colour or reduced volume *Advise patient to:* • Drink plenty of fluids (1500–2000 mL/ day), unless otherwise instructed by their doctor	
Other	For information on pregnancy and nursing please contact the Motherisk Helpline found at http://www.motherisk.org/women/contactUs.jsp	

References:

1. Gentamicin product monograph. Boucherville (QC): Sandoz Canada Inc.; 2015 Nov 16 [cited 2016 Feb 23]. Obtained through Health Canada Drug Product Database; search term "gentamicin" as active ingredient, available from: http://webprod5.hc-sc.gc.ca/dpd-bdpp/index-eng.jsp
2. Gentamicin [monograph]. In: Bedard M, Gergoure N, Massicotte A, Editors. Parenteral Drug Therapy Manual. Ottawa (ON); 2015.
3. Gentamicin [monograph]. Global Rph. [cited 2016 Feb 23]. Available from: http://www.globalrph.com/gentamicin_dilution.htm
4. Aminoglycoside therapy: Balancing risk versus benefit. Ottawa (ON): The Canadian Medical Protective Agency. 2008 Dec [cited 2016 Mar 27]. Available from: https://www.cmpa-acpm.ca/-/aminoglycoside-therapy-balancing-risk-versus-benefit
5. Aminoglycoside Dosing and Monitoring Recommendations. San Francisco (CA): University of California, San Francisco, Infectious disease management program. 2013 [cited 2016 mar 27]. Available from: http://idmp.ucsf.edu/aminoglycoside-dosing-and-monitoring-recommendations
6. Trofe-Clark J, Lemonovich TL, and the AST Infectious Diseases Community of Practice. Interactions between anti-infective agents and immunosuppressants in solid organ transplantation. American J Transplant. 2013;13:318–326.
7. Kenyon C, Wearne N, Burton R, Meintjes G. The risks of concurrent treatment with tenofovir and aminoglycosides in patients with HIV-associated tuberculosis. Southern Afr J HIV Med. 2011;12(1):43-45.

Disclaimer: This monograph is intended to be used as a reference to support healthcare professionals in the home and community setting. It supplements, but does not replace: clinical judgement, the information provided by the product manufacturers, and the need to consult with the prescriber.

All reasonable precautions have been taken by the Institute for Safe Medication Practices Canada (ISMP Canada) to verify the information contained in this document. However, ISMP Canada does not guarantee the quality, accuracy, completeness or timeliness of such information. Accordingly, the information is shared without warranty or representation of any kind (express, implied or statutory). The responsibility for the interpretation and use of the information provided hereby lies with the reader. In no event shall ISMP Canada be liable for damages arising from the use or misuse of such information.

Developed with support from Health Quality Ontario