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| Dutch Paediatric Formulary: Gentamicin mock |

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Date literature search: mm-yyyy

Starting point (month-year): describe the reason why you are compiling this risk-benefit-analysis. Sometimes it’s a regular update or part of a project, sometimes an email of a user can be the reason to look deeper/better/again into the evidence of a monograph and many other reasons.

# National registration/guidelines

| **Source** | **Evidence** | **Effect** | **Remarks** |
| --- | --- | --- | --- |
| **Ref. 1a**  Speciality, dosage form  dd-mm-yy | SmPC | **4.2** what is the registered dose in children  **5.2** what is known about the kinetics in children (specifically the following PK parameters: Cmax, tmax, t1/2, Cl (preferably /kg) and Vd (preferably /kg).  Specific paediatric adverse events, warnings and precautions can also be mentioned here. | xxx |
| .. |  |  |  |

1. Kinetics - Neonates

| **Source** | **Evidence** | **Effect** | **Remarks** |
| --- | --- | --- | --- |
| **Ref. 2a**  J Clin Pharmacol. 2014 Jan;54(1):39-45 | Retrospective study, n=236 (2) | **Impact of small-for-gestational age (SGA) status on gentamicin pharmacokinetics in neonates**  Lulic‐Botica M et al.  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| **Ref. 2b**  Br J Clin Pharmacol. 2016 Jun;81(6):1067-77 | Prospective study, n=47 (2) | **Altered gentamicin pharmacokinetics in term neonates undergoing controlled hypothermia**  (Bijleveld et al. 2016)  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| … | … | … | … |

1. Kinetics - Children

| **Source** | **Evidence** | **Effect** | **Remarks** |
| --- | --- | --- | --- |
| **Ref. 3a**  Ther Drug Monit. 2014 Jun;36(3):288-94 | Retrospective study, n=140 (2) | **Dose derivation of once-daily dosing guidelines for gentamicin in critically ill pediatric patients**  Zakova M et al.  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| **Ref. 3b**  Antimicrob Agents Chemother. 2015 Jan;59(1):482-9 | Pop-PK study, n=263 (2) | **Population pharmacokinetics of gentamicin and dosing optimization for infants**  Medellín-Garibay SE et al.  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| … | … | … | … |

1. Febrile neutropenia

| **Source** | **Evidence** | **Effect** | **Remarks** |
| --- | --- | --- | --- |
| **Ref. 4a**  Ther Drug Monit. 2016 Dec;38(6):693-698 | Kinetic study,  n=69 (130 samples) (B) | **Gentamicin Pharmacokinetics and Monitoring in Pediatric Patients with Febrile Neutropenia**  Bialkowski et al. 2016  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| **Ref. 4b**  Antimicrob Agents Chemother. 2017 Jul 25;61(8) | Pop-PK study, n=423+52 (2422 samples) () | **A Population Pharmacokinetic Model of Gentamicin in Pediatric Oncology Patients To Facilitate Personalized Dosing**  (Llanos-Paez et al. 2017)  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| … | … | … | … |

1. Obesity

| **Source** | **Evidence** | **Effect** | **Remarks** |
| --- | --- | --- | --- |
| **Ref. 5a**  Pediatr Infect Dis J. 2011 Apr;30(4):347-9. | Retrospective cohort, n=50 (25 obese) (B) | **Altered gentamicin serum concentrations in obese pediatric patients**  (Choi et al. 2011)  Summary:  xxx | Indication: xxx  Age: xxx  Dosage: xxx  Administration: xxx  Duration: xxx  Proposal:  xxx |
| … | … | … | … |

Comments/discussion

Specific literature search on dosing strategies used for treatment of preterm and term neonates resulted in the following overview:

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| --- | --- | --- |
| **Study** | **Age** | **Dose** |
| Fullas 2011 [2] | 30-34 wk GA | 3,5 mg/kg/36u |
| ≥35 wk GA | 3,5 mg/kg/24u |
| Hansen 2003 [3] | <35 wk GA | 3 mg/kg/24u |
| >35 wk GA | 4 mg/kg/24u |
| … | … | … |

**References:**

(1) Bialkowski S et al. Gentamicin Pharmacokinetics and Monitoring in Pediatric Patients with Febrile Neutropenia. Ther Drug Monit. 2016 Dec;38(6):693-698

(2) Fullas F et al. Comparative evaluation of six extended-interval gentamicin dosing regimens in premature and full-term neonates. Am J Health Syst Pharm. 2011 Jan 1;68(1):52-6

(3) Hansen A et al. Once-daily gentamicin dosing for the preterm and term newborn: proposal for a simple regimen that achieves target levels. J Perinatol. 2003 Dec;23(8):635-9

Bijleveld, Y. A., T. R. de Haan, H. J. van der Lee, F. Groenendaal, P. H. Dijk, A. van Heijst, R. C. de Jonge, K. P. Dijkman, H. L. van Straaten, M. Rijken, I. A. Zonnenberg, F. Cools, A. Zecic, D. H. Nuytemans, A. H. van Kaam, R. A. Mathot, and group PharmaCool study. 2016. "Altered gentamicin pharmacokinetics in term neonates undergoing controlled hypothermia." *Br J Clin Pharmacol* 81 (6):1067-77. doi: 10.1111/bcp.12883.

Choi, J. J., B. S. Moffett, E. J. McDade, and D. L. Palazzi. 2011. "Altered gentamicin serum concentrations in obese pediatric patients." *Pediatr Infect Dis J* 30 (4):347-9. doi: 10.1097/INF.0b013e3181ff023e.

Llanos-Paez, C. C., C. E. Staatz, R. Lawson, and S. Hennig. 2017. "A Population Pharmacokinetic Model of Gentamicin in Pediatric Oncology Patients To Facilitate Personalized Dosing." *Antimicrob Agents Chemother* 61 (8). doi: 10.1128/aac.00205-17.