NEONATAL Medication Monograph

LEVETIRACETAM

This document should be read in conjunction with this **DISCLAIMER**

Restricted: Requires Neonatologist or Neurologist review within 24 hours of initiation

Presentation	**Vial:** 500mg/5mL = 100mg/mL **Oral solution:** 100mg/mL
Description	Anticonvulsant with a broad spectrum of activity which can be used in conjunction with other anticonvulsants. The mechanism of action is unclear. It is thought to influence excitability by binding to the synaptic vesicle glycoprotein 2A receptor (SV2A) on neuronal cells and reducing presynaptic neurotransmitter release. This receptor appears to be involved in the generation of seizures.
Indications	Treatment of neonatal seizures
Contraindications	Hypersensitivity to levetiracetam or any of the ingredients
Precautions	Do not stop levetiracetam therapy abruptly in infants on prolonged therapy. Use with caution in renal impairment.
Dosage	**IV/Oral:** **Loading dose:** 20 mg/ kg Repeat this dose after 30 minutes if seizures persist. It is essential to give a loading dose. **Maintenance dose:** 10-15 mg/kg/dose **every 8 hours** The first maintenance dose is to be given **8 hours after the loading dose.** Dose can be increased every 2 to 3 days to a maximum of **60mg/kg/day** or after review by neurology
Dosage Adjustment	Dose frequency should be reviewed in patients with renal impairment (consider extending interval to daily and consulting paediatric neurologist) Adjust final concentration in fluid restricted infants *(see Preparation)*

Adverse Reactions	**Common:** sedation, irritability, increased diastolic blood pressure
	Serious: Steven Johnson syndrome, agranulocytosis, hepatic failure
Interactions	Clearance may be increased by 30% with co-administration of phenobarbitone, carbamazepine and phenytoin.
Compatible Fluids	Sodium chloride 0.9%, Glucose 5%
Preparation	**IV :** **5mg/mL Concentration** Take 1mL (100mg) and dilute to 20mL with compatible fluid. Concentration is 100mg/20mL Final concentration = 5mg/mL **15mg/mL Concentration** Fluid restricted infants – a maximum final concentration of 15mg/mL is to be used Take 1.5mL (150mg) and dilute to 10mL with compatible fluid. Concentration is 150mg/10mL Final concentration = 15mg/mL
Administration	**IV:** Administer over at least 15 minutes via a peripheral or central line **Oral:** May be given at any time with regards to feeds.
Monitoring	Renal function, blood pressure, full blood picture, seizure control
Storage	Store at room temperature, below 25°C
Notes	Although similar dosing has been used in premature infants, there is minimal pharmacokinetic data in this population. If ceasing therapy, the dose should be reduced gradually as abrupt withdrawal may lead to increasing seizures. A general weaning regimen is 20-25% reduction per week over 4-5 weeks. Changing from IV to oral therapy does not require any dosage conversion. It is NOT necessary to perform routine drug levels unless specified by a neurologist.

References	Nagarajan L. Neonatal Seizures: Current management and future challenges. International Review of Child Neurology Series 2016; page 130 Shin JW et al. Experience and pharmacokinetics of Levetiracetam in Korean neonates with neonatal seizures.Korean J Pediatr. 2017 Feb;60(2):50-54 Khan O et al. Role of intravenous levetiracetam for acute seizure management in preterm neonates. Pediatr Neurol. 2013 Nov;49(5):340-3 Sharpe CM, Capparelli EV, Mower A, Farrell MJ, Soldin SJ, Haas RH. A seven-day study of the pharmacokinetics of intravenous levetiracetam in neonates: marked changes in pharmacokinetics occur during the first week of life. *Pediatr Res*. 2012;72(1):43–49. doi:10.1038/pr.2012.51 Rakshasbhuvankar A, Rao S, Kohan R, Simmer K, Nagarajan L.Intravenous levetiracetam for treatment of neonatal seizures.J Clin Neurosci. 2013; 20:1165-7 Taketomo CK, Hodding JH, Kraus DM. Pediatric and neonatal dosage handbook. Hudson (OH): Lexi Comp; 2010. Truven Health Analytics. Levetiracetam. In: NeoFax [Internet]. Greenwood Village (CO): Truven Health Analytics; 2020 [cited 2020 Apr 02]. Available from: https://neofax.micromedexsolutions.com/ The Leeds Teaching Hospitals NHS Trust. Medicines Management and Pharmacy Services- LTHT Neonatal Unit Administration Guide. Levetiracetam [internet] 2016 [cited 2020 April 2]. Available from: Leeds NHS Neonatal Formulary (UK)

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