

Primidone p. 224 is largely converted to phenobarbital and this is probably responsible for its antiepileptic action. It is used rarely in children. A low initial dose of primidone is essential.

#### Phenytoin

Phenytoin p. 211 is licensed for tonic-clonic and focal seizures but may exacerbate absence or myoclonic seizures and should be avoided if these seizures are present. It has a narrow therapeutic index and the relationship between dose and plasma-drug concentration is non-linear; small dosage increases in some patients may produce large increases in plasma concentration with acute toxic side-effects. Similarly, a few missed doses or a small change in drug absorption may result in a marked change in plasma-drug concentration. Monitoring of plasma-drug concentration improves dosage adjustment.

When only parenteral administration is possible, fosphenytoin sodium p. 204, a pro-drug of phenytoin, may be convenient to give. Whereas phenytoin should be given intravenously only, fosphenytoin sodium may also be given by intramuscular injection.

#### Rufinamide

Rufinamide p. 212 is licensed for the adjunctive treatment of seizures in Lennox-Gastaut syndrome. It may be considered by a tertiary specialist for the treatment of refractory tonic atonic seizures [unlicensed].

#### Topiramate

Topiramate p. 218 can be given alone or as adjunctive treatment in generalised tonic-clonic seizures or focal seizures. It can also be used for absence, tonic and atonic seizures under specialist supervision and as an option in myoclonic seizures [all unlicensed]. Female patients should be fully informed of the risks related to the use of topiramate during pregnancy and the need to use effective contraception—for further information, see *Conception and contraception* and *Pregnancy* in the topiramate drug monograph.

#### Valproate

**Valproate** (as either sodium valproate p. 213 or valproic acid p. 219) is effective in controlling tonic-clonic seizures, particularly in primary generalised epilepsy. It is a drug of choice in primary generalised tonic-clonic seizures, focal seizures, generalised absences and myoclonic seizures, and can be tried in atypical absence seizures. It is recommended as a first-line option in atonic and tonic seizures. Valproate should generally be avoided in children under 2 years especially with other antiepileptics, but it may be required in infants with continuing epileptic tendency. Sodium valproate has widespread metabolic effects, and monitoring of liver function tests and full blood count is essential. Because of its high teratogenic potential, valproate must not be used in females of childbearing potential unless the conditions of the Pregnancy Prevention Programme are met and alternative treatments are ineffective or not tolerated. During pregnancy, it must not be used for epilepsy unless it is the only possible treatment. For further information see *Important safety information*, *Conception and contraception*, and *Pregnancy* in the sodium valproate and valproic acid drug monographs. Plasma-valproate concentrations are not a useful index of efficacy, therefore routine monitoring is unhelpful.

#### Zonisamide

Zonisamide p. 222 can be used as an adjunctive treatment for refractory focal seizures with or without secondary generalisation in children and adolescents aged 6 years and above. It can also be used under the supervision of a specialist for refractory absence and myoclonic seizures [unlicensed indications].

#### Benzodiazepines

Clobazam p. 225 may be used as adjunctive therapy in the treatment of generalised tonic-clonic and refractory focal seizures. It may be prescribed under the care of a specialist for refractory absence and myoclonic seizures. Clonazepam p. 226 may be prescribed by a specialist for refractory absence and myoclonic seizures, but its sedative side-effects may be prominent.

#### Other drugs

Acetazolamide p. 707, a carbonic anhydrase inhibitor, has a specific role in treating epilepsy associated with menstruation. Piracetam is used as adjunctive treatment for cortical myoclonus.

#### Status epilepticus

##### Convulsive status epilepticus

Immediate measures to manage status epilepticus include positioning the child to avoid injury, supporting respiration including the provision of oxygen, maintaining blood pressure, and the correction of any hypoglycaemia. Pyridoxine hydrochloride p. 650 should be administered if the status epilepticus is caused by pyridoxine deficiency.

Seizures lasting 5 minutes should be treated urgently with buccal midazolam p. 229 or intravenous lorazepam p. 228 (repeated once after 10 minutes if seizures recur or fail to respond). Intravenous diazepam p. 226 is effective but it carries a high risk of venous thrombophlebitis (reduced by using an emulsion formulation of diazepam injection). Patients should be monitored for respiratory depression and hypotension.

##### Important

If, after initial treatment with benzodiazepines, seizures recur or fail to respond 25 minutes after onset, phenytoin sodium should be used, or if the child is on regular phenytoin p. 211, give phenobarbital sodium intravenously over 5 minutes; the paediatric intensive care unit should be contacted. Paraldehyde p. 228 can be given after starting phenytoin infusion.

If these measures fail to control seizures 45 minutes after onset, anaesthesia with thiopental sodium p. 228 should be instituted with full intensive care support.

**Phenytoin sodium** can be given by intravenous infusion over 20 minutes, followed by the maintenance dosage if appropriate.

Paraldehyde given rectally causes little respiratory depression and is therefore useful where facilities for resuscitation are poor.

##### Non-convulsive status epilepticus

The urgency to treat non-convulsive status epilepticus depends on the severity of the child's condition. If there is incomplete loss of awareness, oral antiepileptic therapy should be continued or restarted. Children who fail to respond to oral antiepileptic therapy or have complete lack of awareness can be treated in the same way as for convulsive status epilepticus, although anaesthesia is rarely needed.

#### Febrile convulsions

*Brief febrile convulsions* need no specific treatment; antipyretic medication (e.g. paracetamol p. 278), is commonly used to reduce fever and prevent further convulsions but evidence to support this practice is lacking. *Prolonged febrile convulsions* (those lasting 5 minutes or longer), or *recurrent febrile convulsions* without recovery must be treated actively (as for convulsive status epilepticus).

Long-term anticonvulsant prophylaxis for febrile convulsions is rarely indicated.