SEIZURES – STATUS EPILEPTICUS

- Most seizures stop spontaneously within 5 mins. Treatment is indicated if a seizure lasts longer than 5 min in an otherwise healthy child. Treatment may be given earlier in any child with an acute brain injury.
- Status epilepticus is recurrent seizures without recovery of consciousness between attacks or continuous seizure activity lasting for more than 30 mins.
- There is increasing evidence that earlier treatment is associated with less refractory status epilepticus and possibly better outcome.

Treatment

1. Give oxygen. Support ABC.
2. Measure blood glucose. Give 2ml/kg 10% dextrose if blood glucose <3mmol/L
3. Check FBC, ABG/VBG, electrolytes, Ca, Mg, urea, creatinine, LFT
4. Consider blood cultures, anticonvulsant levels, toxicology screen, metabolic screen, ammonia, insulin and cortisol levels if hypoglycaemic.
5. Consider cefotaxime, acyclovir and CT scan. Do not do an LP.
6. First line agents are either:
   a. Lorazepam 0.1mg/kg IV (max 5mg). Preferred agent as longer duration of action and possibly more effective and less respiratory depression.
   b. Diazepam 0.25mg/kg IV (max 10mg)
   c. Midazolam 0.15mg/kg IV (max 10mg)
   d. If there is no venous access, options are intramuscular midazolam (0.2mg/kg), buccal or intranasal midazolam (0.5mg/kg), rectal diazepam (0.5mg/kg) or paraldehyde (see below)
7. Second line agents are indicated if seizures are continuing 5 min after two doses of a first line agent:
   a. Phenytoin 20-30mg/kg IV (max 1G) over 20-30 min OR
   b. Phenobarbinate 20-30mg/kg IV over 10-15 min in neonates
8. Third line agents, if seizures continue 10 min after second line agent, are:
   a. Phenytoin 20-30mg/kg IV (max 1G) over 10-15 min
   b. Sodium valproate 40mg/kg IV over 10 min. Contraindicated if hyperammonaemia, liver disease, thrombocytopenia or possible metabolic disease
   c. Levetiracetam 40mg/kg IV over 10 min. Consider if possible metabolic/liver disease.
9. For children in CED, PICU should be notified if still seizing after one third line agent or at any time if the airway is compromised. Children still fitting after a third line agent will usually need to be admitted to PICU.
10. If seizures persist 5 min after a third line anticonvulsant, then either administer a second third line agent or move to pharmacological coma induction.
11. **Pharmacological coma.**
   
a. Intubation and ventilation will very likely be required, along with arterial and central venous access. Respiratory depression, hypoxia and poor airway control are at least as dangerous as the seizures.

b. Continuous EEG monitoring should be performed, ideally until at least 24hr after infusions stopped. EEG goal is burst suppression.

c. The preferred first agent is a midazolam infusion. Give 0.15mg/kg bolus followed by 2 mcg/kg/min. If seizures persist, repeat the bolus and increase midazolam by 2 mcg/kg/min every 5 min to max 24 mcg/kg/min. If no seizures for 24 hours, reduce midazolam by 1 mcg/kg/min every 15 min.

d. Additional phenobarbitone doses of 10mg/kg may be given to a maximum of 40-60mg/kg.

e. If seizures persist despite midazolam infusion, change to thiopentone infusion – bolus 2-4mg/kg followed by infusion 2mg/kg/hr. If seizures continue, give additional boluses of 2mg/kg and increase infusion by 1mg/kg/hr every 30min to maximum 6mg/kg/hr. Vasopressor support is very likely to be required. Monitor thiopentone levels.

f. Additional anticonvulsants (e.g. sodium valproate, topirimate, levetiracetam) should be added prior to weaning infusions. Where appropriate ensure that "background" anticonvulsant levels are therapeutic.

12. **Other agents.**
   
a. Consider pyridoxine 100mg IV to children < 18 months old with recurrent or refractory seizures. Pyridoxime dependent seizures should respond in 10-60 minutes.

b. **Paraldehyde**
   
i. Can be administered from plastic syringes if used quickly.
   
ii. Use only freshly opened ampoules. Paraldehyde must not be used if the container has been opened as it decomposes. The administration of partly decomposed paraldehyde is dangerous as it may cause metabolic acidosis and be fatal.
   
iii. PR 0.3 ml/kg (max 10 ml) q 2-4 hours as required. Diluted 2-10 fold with saline or olive oil. Recommended administration in 20ml syringe attached to 10F feeding tube, inserted 10cm rectally. Hold buttock cheeks together for 2-3min (PR paraldehyde is a powerful GI stimulant).

c. Clonazepam. Neonate 0.25 mg (if ventilated). Child 0.5 mg. Adult 1 mg. May be repeated.