

Epilepsy in the Primary School Aged Child

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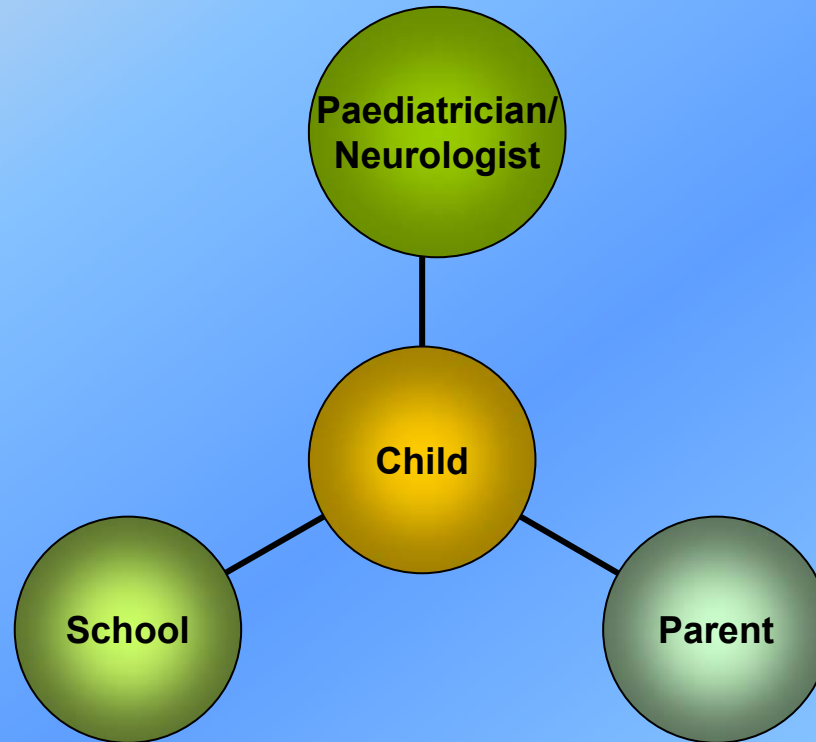
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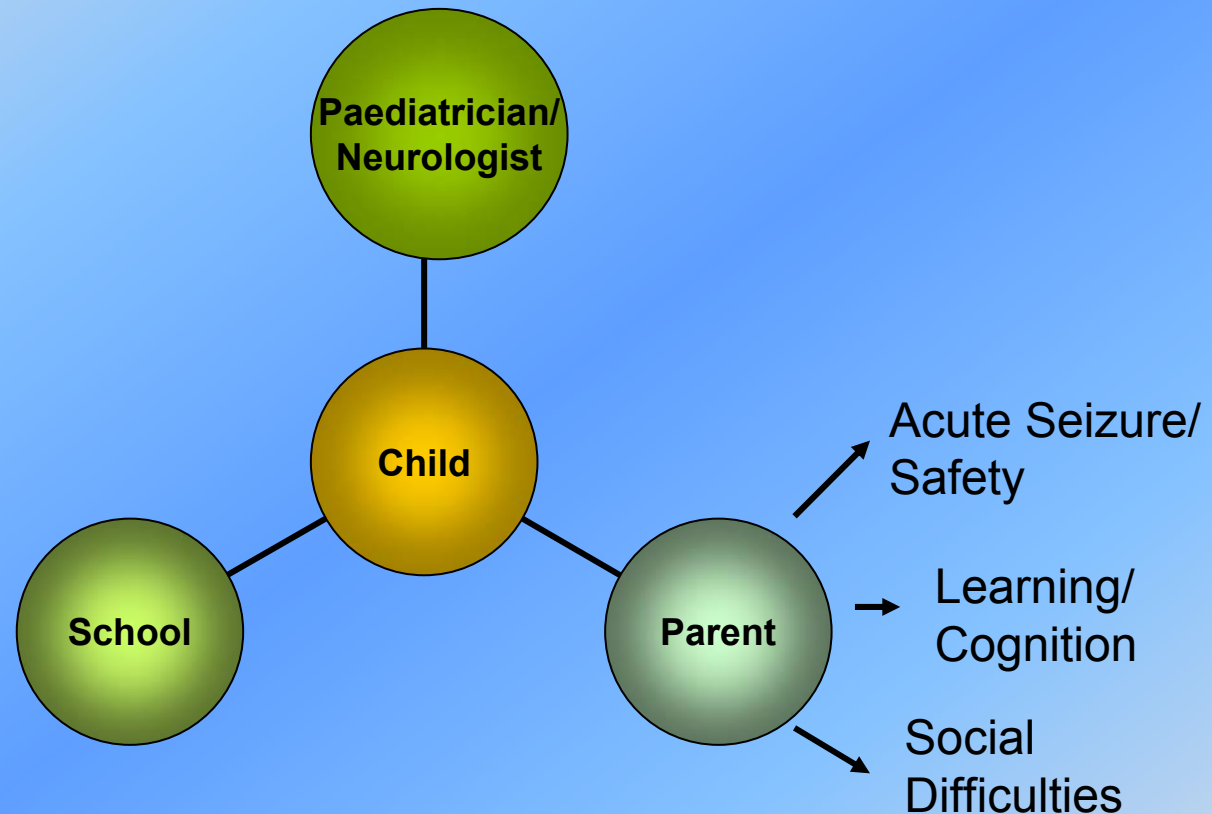
Overview

- **The School Age Child and Epilepsy**
- **Diagnosis of Epilepsy**
- **Identification of Epilepsy ‘Syndrome’**
- **Rational Treatment Options**
- **Side-Effects of Anti-epileptic medications**

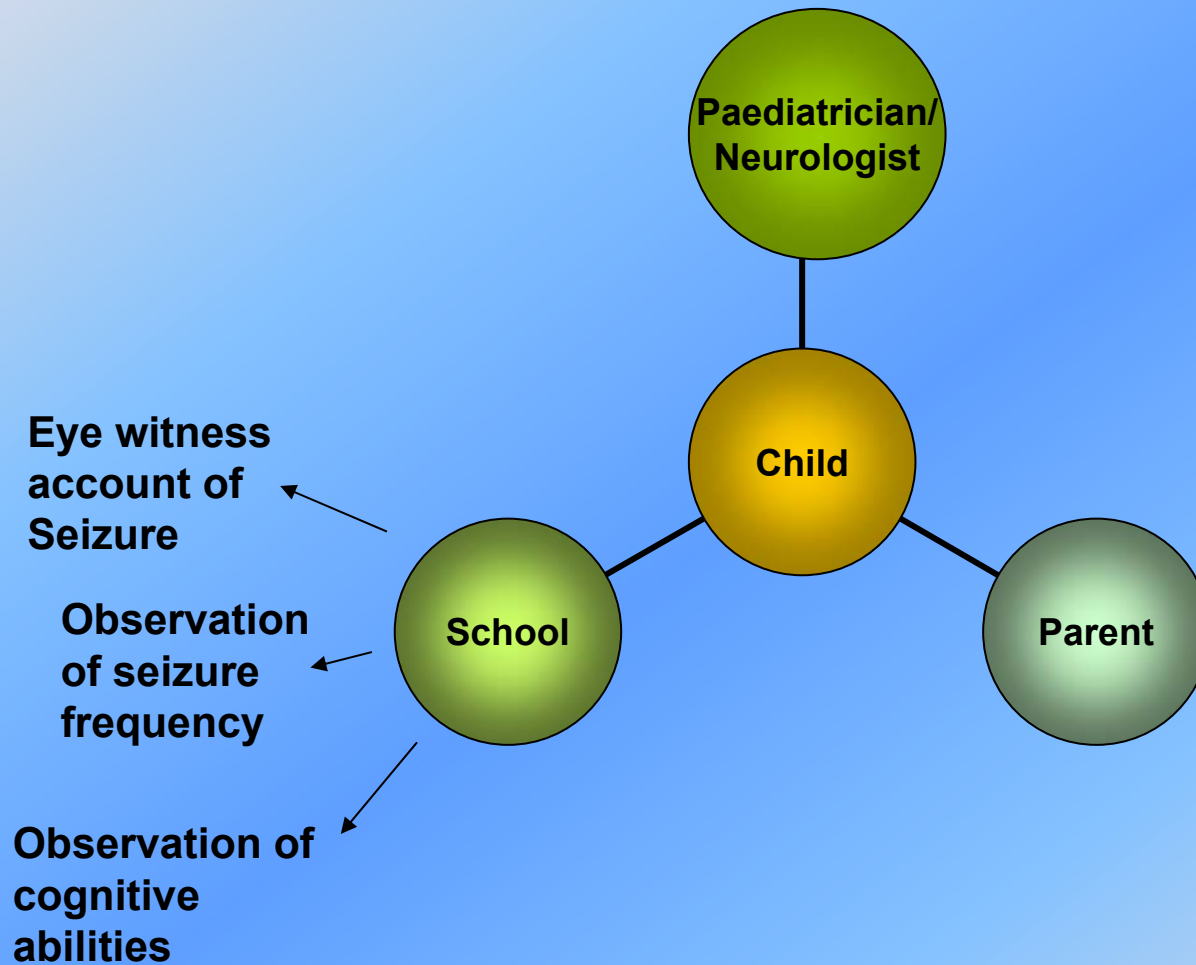
The Child at The Centre of Epilepsy Care



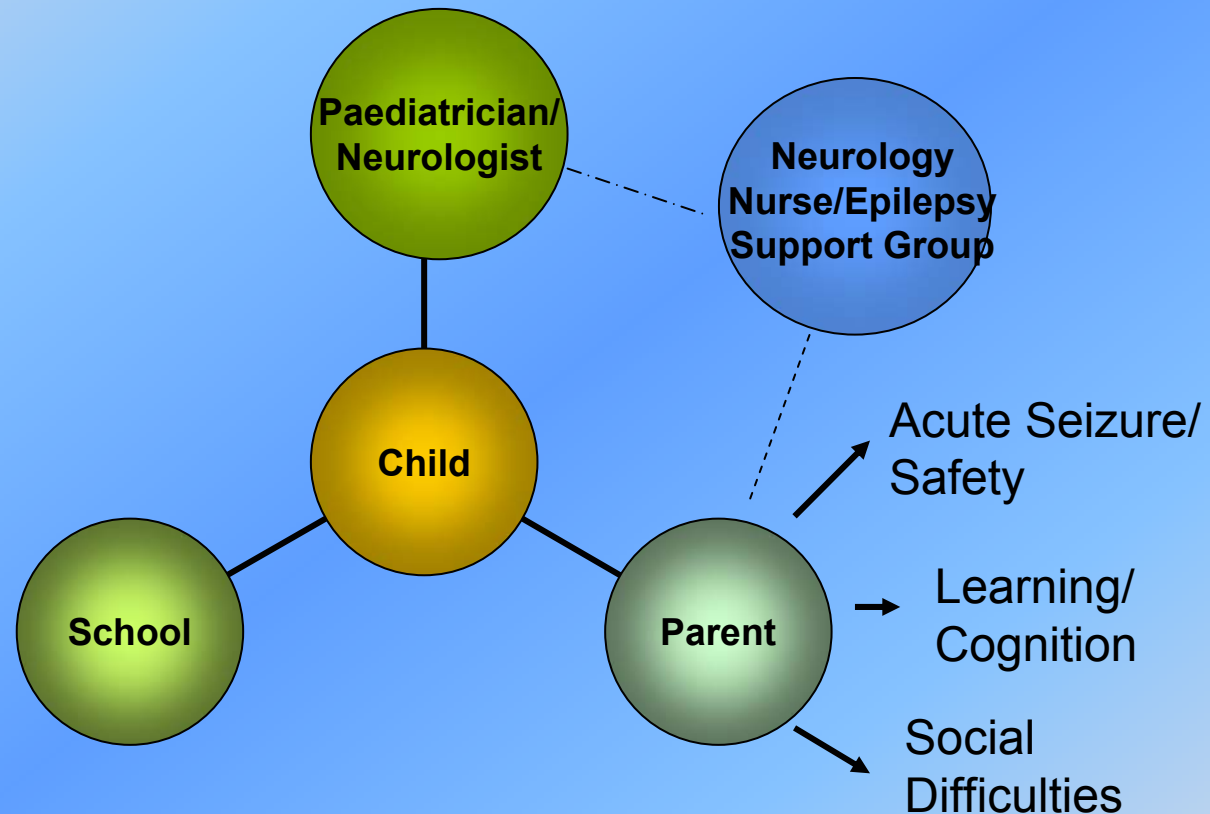
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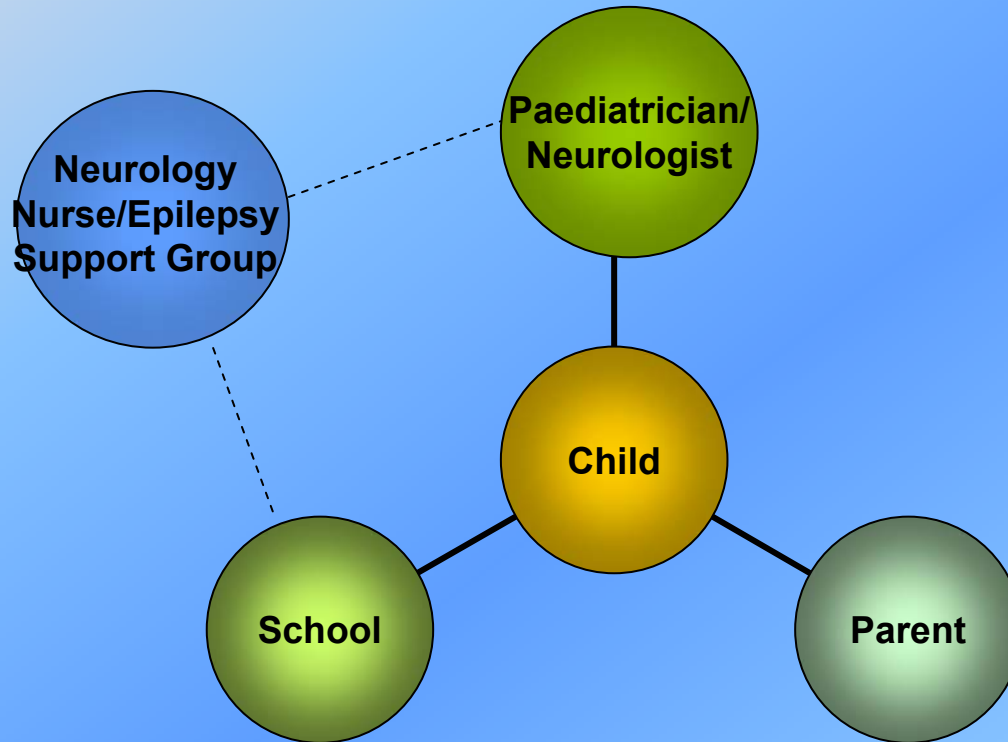
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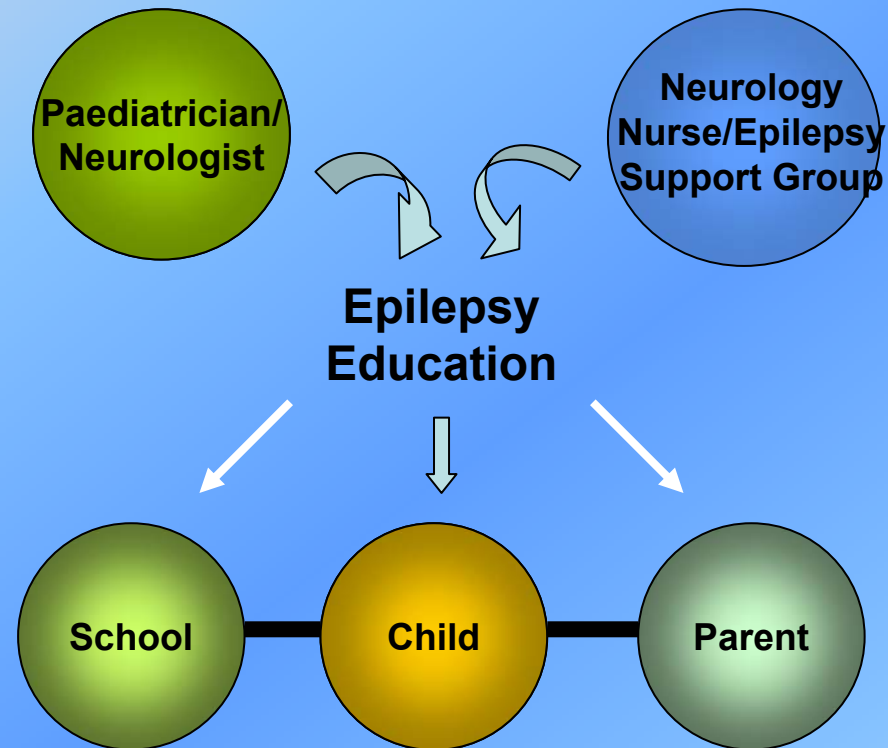
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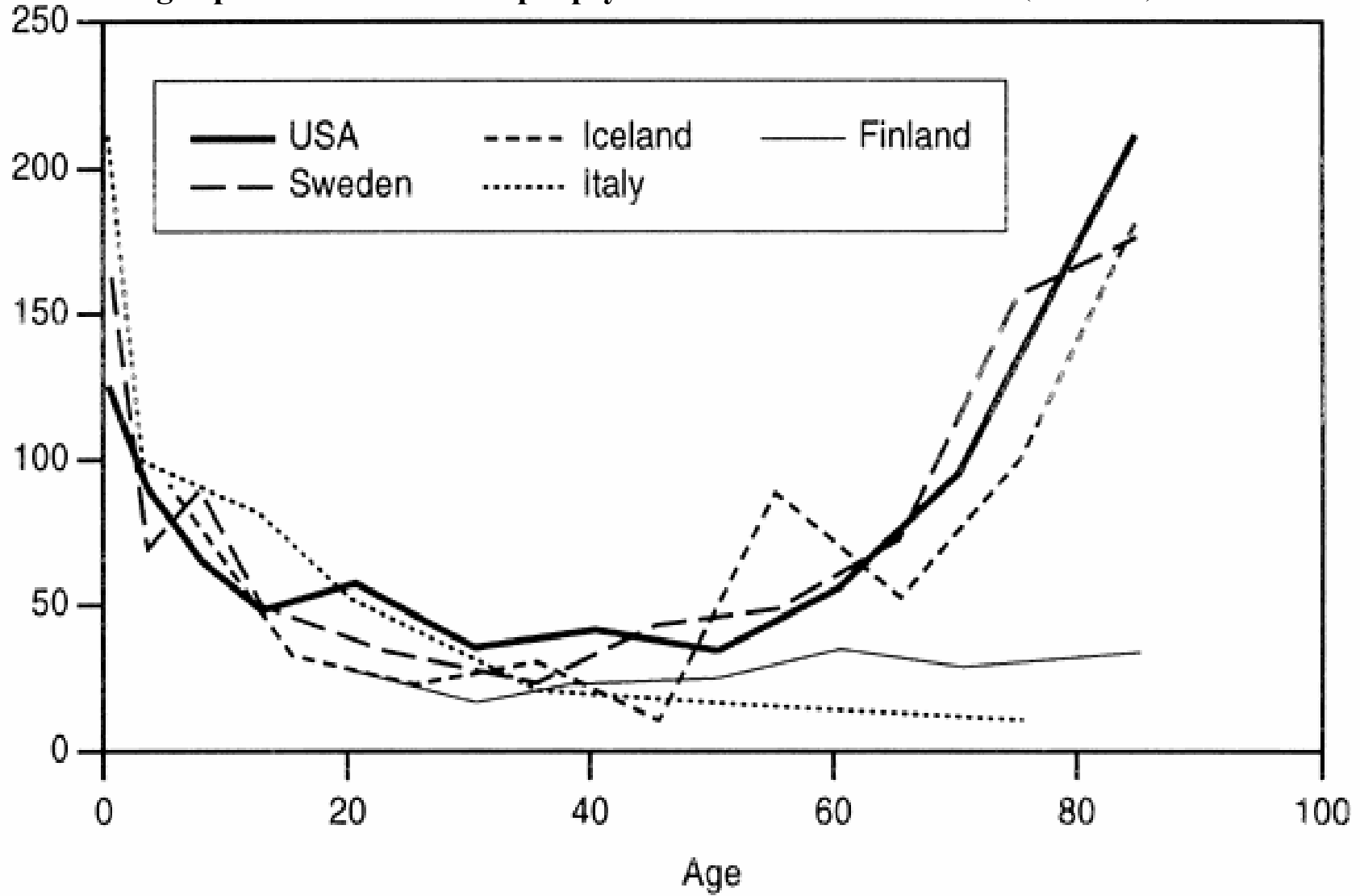
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Definitions

- Seizure – An Episode of transient alteration of cerebral function
- ‘Epileptic’ Seizure- onset is electrochemical (*cf* anoxic, traumatic etc)
- Epilepsy – Recurrent Epileptic Seizures
- Epileptic disorders are similar in that seizures predominate the clinical picture; however the symptom of a seizure may be due to very diverse aetiologies

Age-specific incidence of epilepsy in industrialized countries (Hauser 1998)



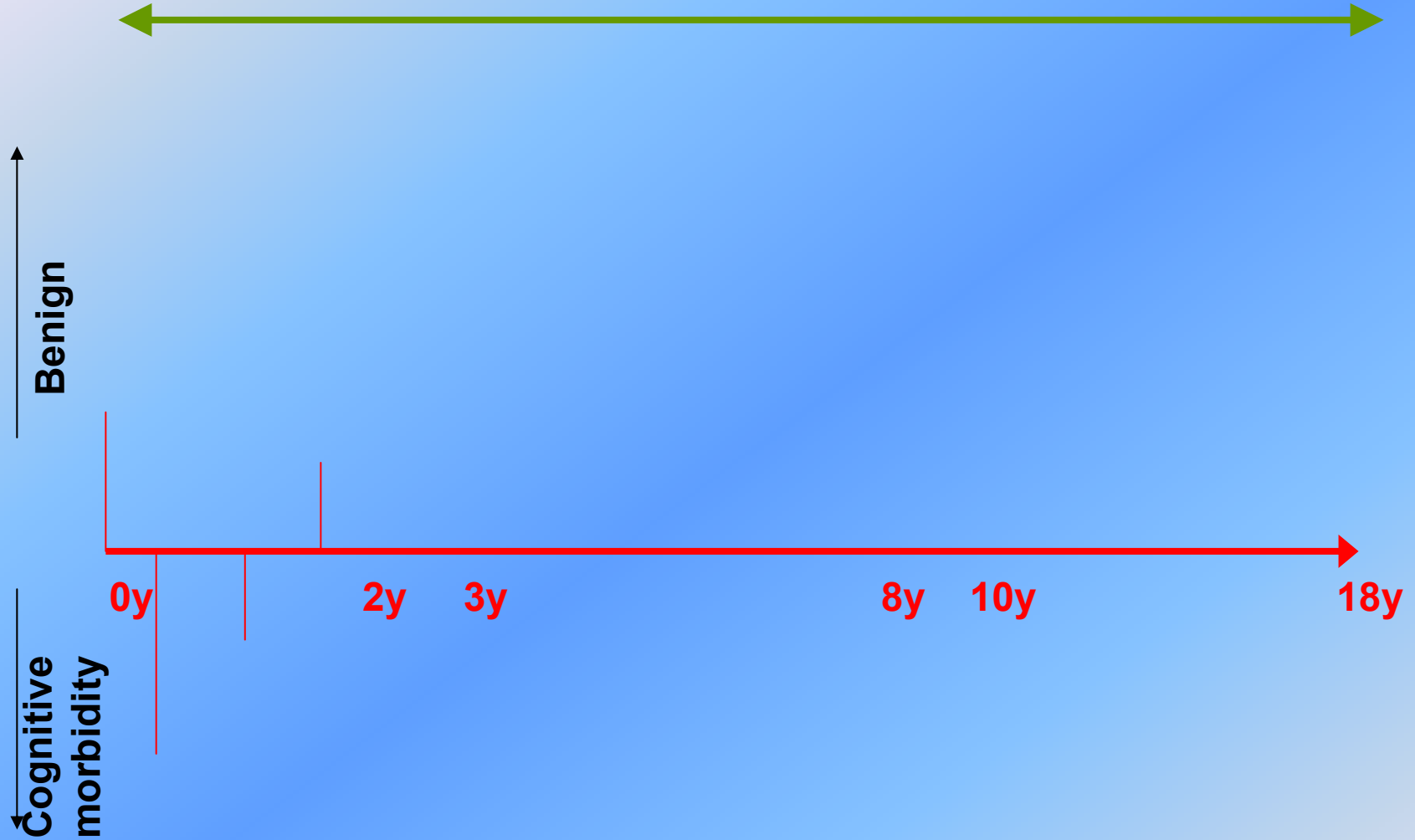
The Diagnosis of Epilepsy

- Epilepsy is a clinical diagnosis
 - Partial (focal) v Generalised
 - Idiopathic v Symptomatic
- Prevalence 0.5-1%
- 70% Well controlled or no medication
- 30 % Difficult to Control epilepsy

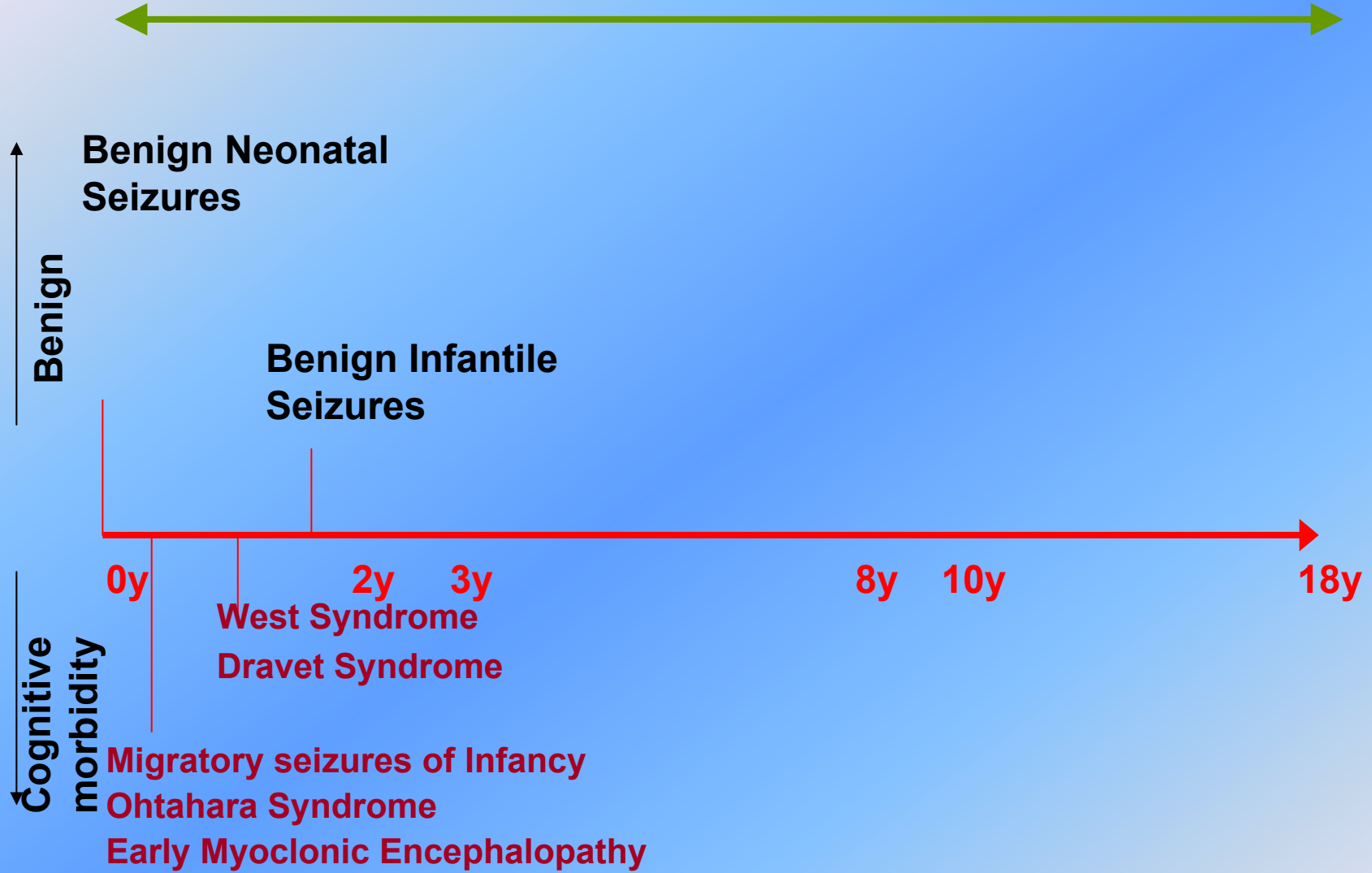
Concept of Epilepsy Syndromes

- Clusters of Signs and Symptoms customarily occurring together. A syndrome may have several causes and different outcomes (!)
- Level of specificity and precision uneven
- To serve as a basis of classification , a syndrome should be well-characterised, sufficiently agreed upon and defined in a sufficient number of patients

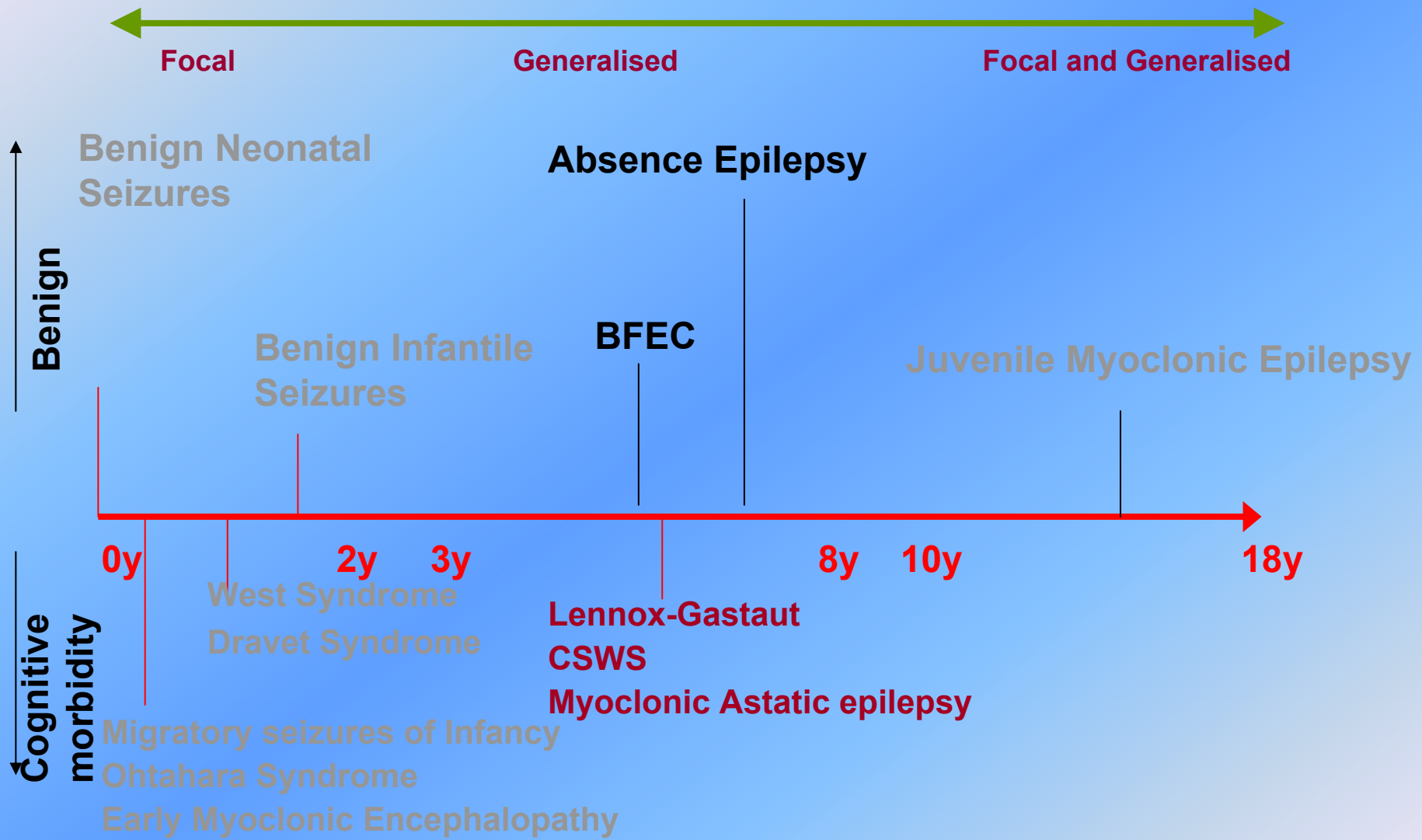
Paediatric Epilepsy syndromes



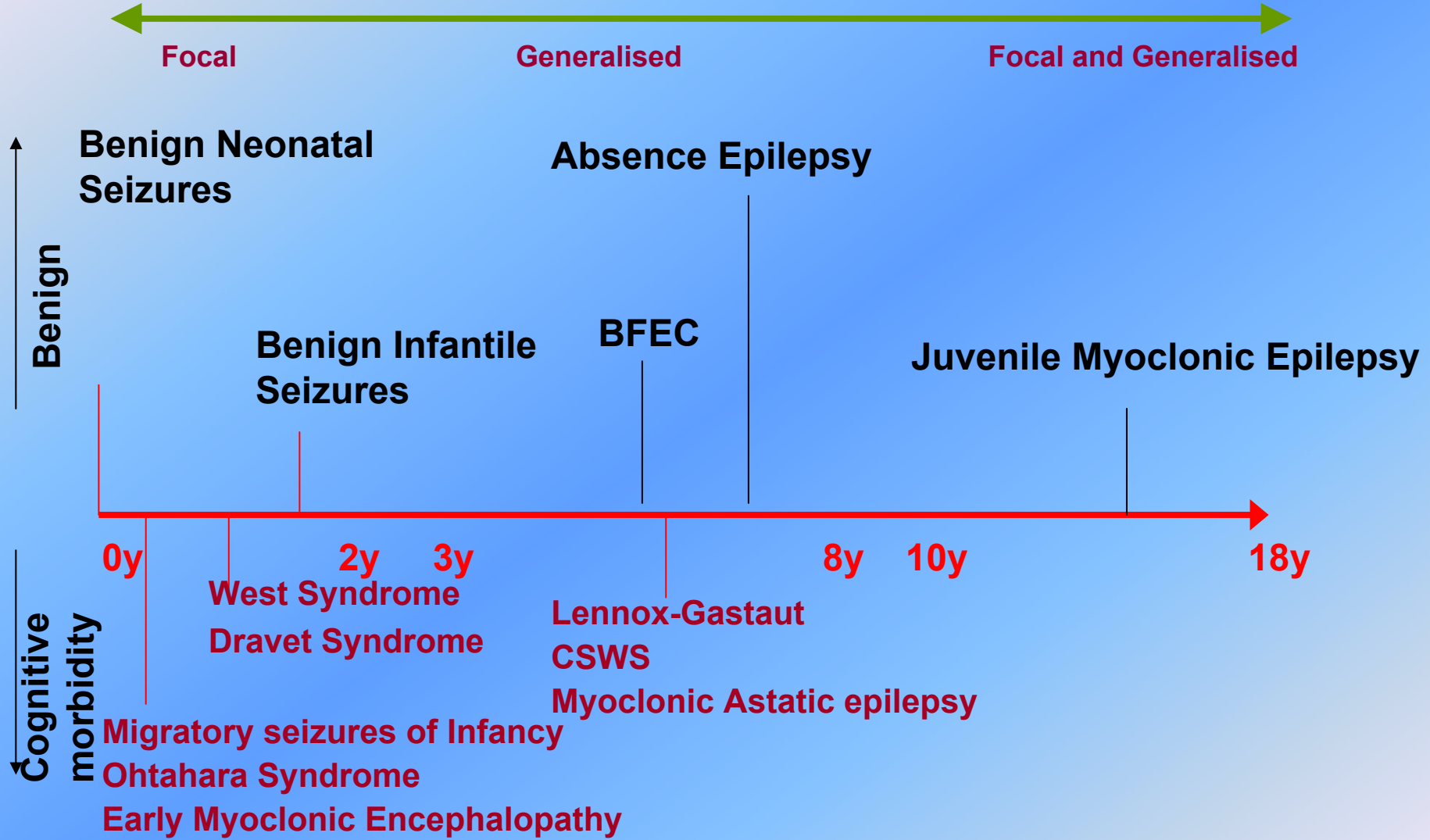
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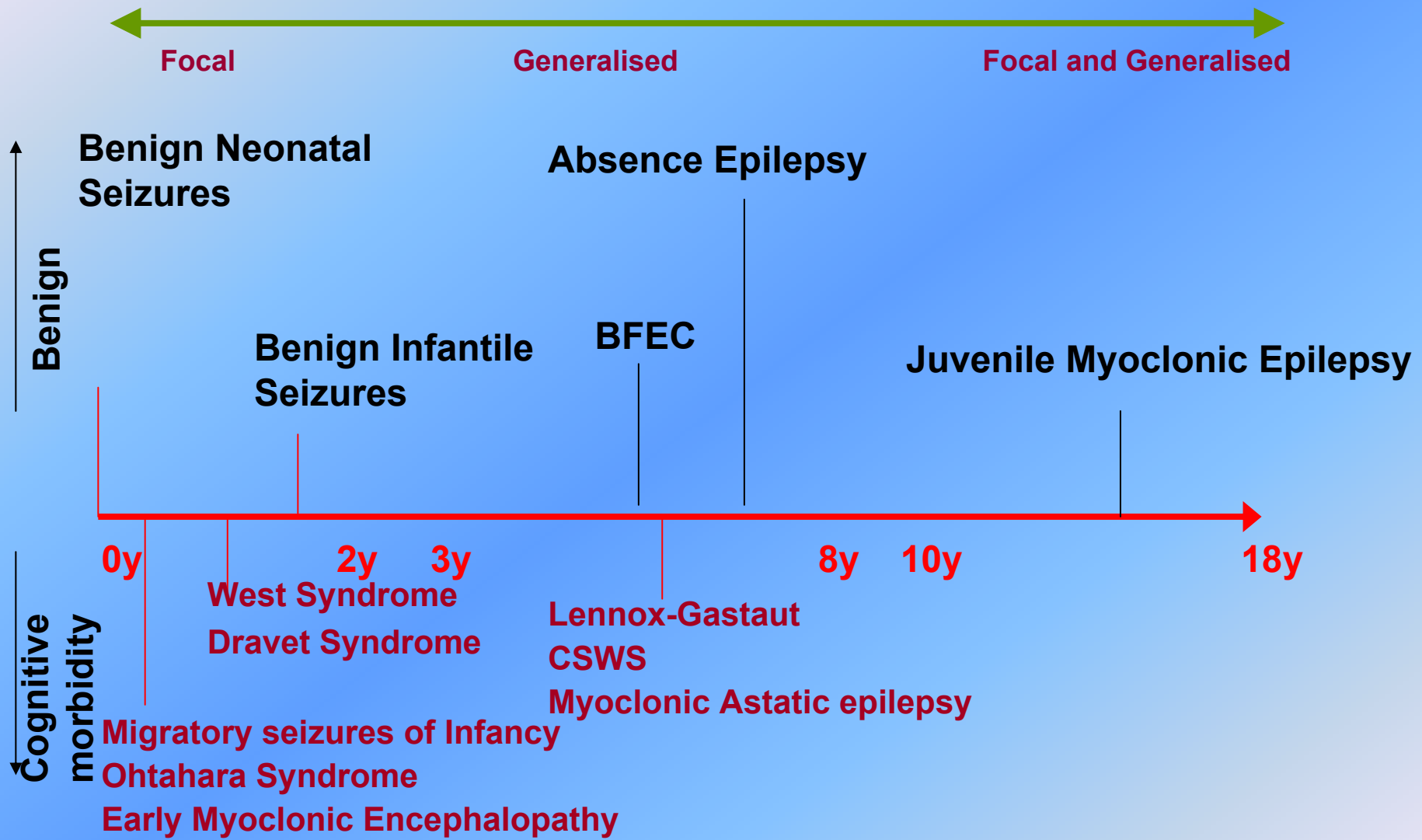
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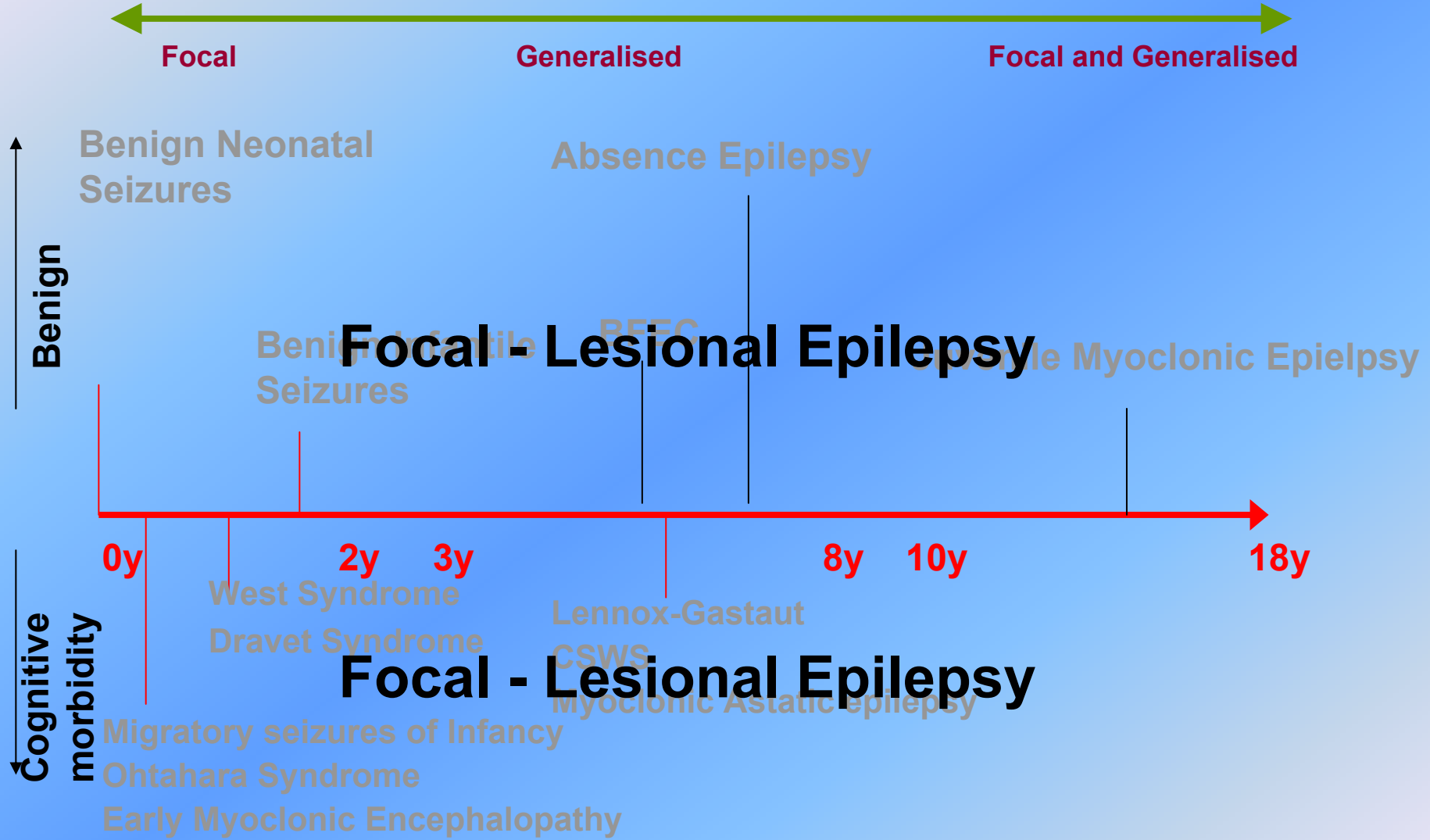
Epilepsy Syndromes and the EEG

- EEG may be 'encephalopathic' in the severe disorders
- Abnormal EEG may be seen in the 'benign' disorders. ?Correlation with cognition
- Some severe disorders eg Dravet syndrome (severe myoclonic epilepsy of infancy) may have normal EEG

Paediatric Epilepsy syndromes



Paediatric Epilepsy syndromes

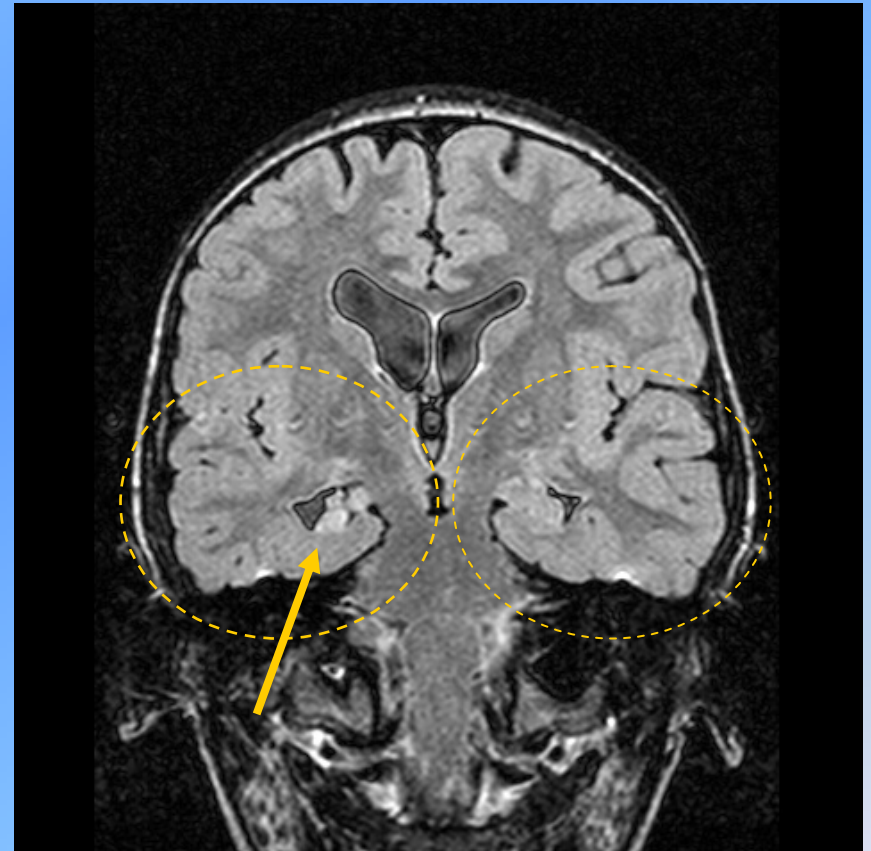


Focal Epilepsies- Epilepsy Syndromes and MRI

- The site of lesion may be predictive of cognitive impairment
 - Mesial temporal lobe epilepsy
 - Occipital Lobe Epilepsy
 - Frontal lobe epilepsy

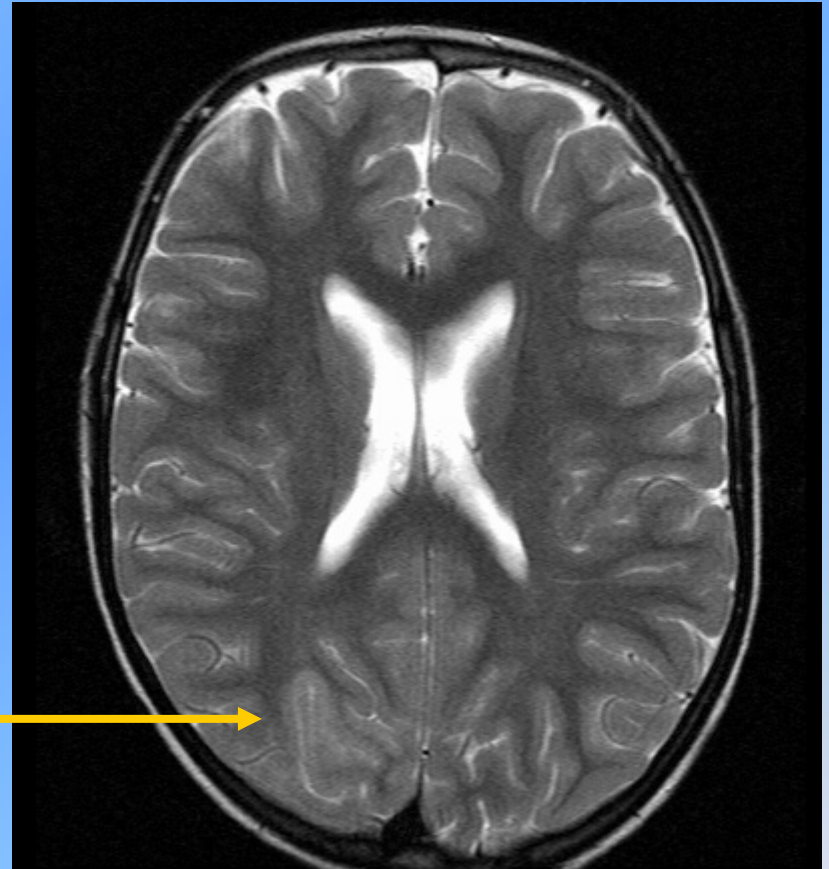
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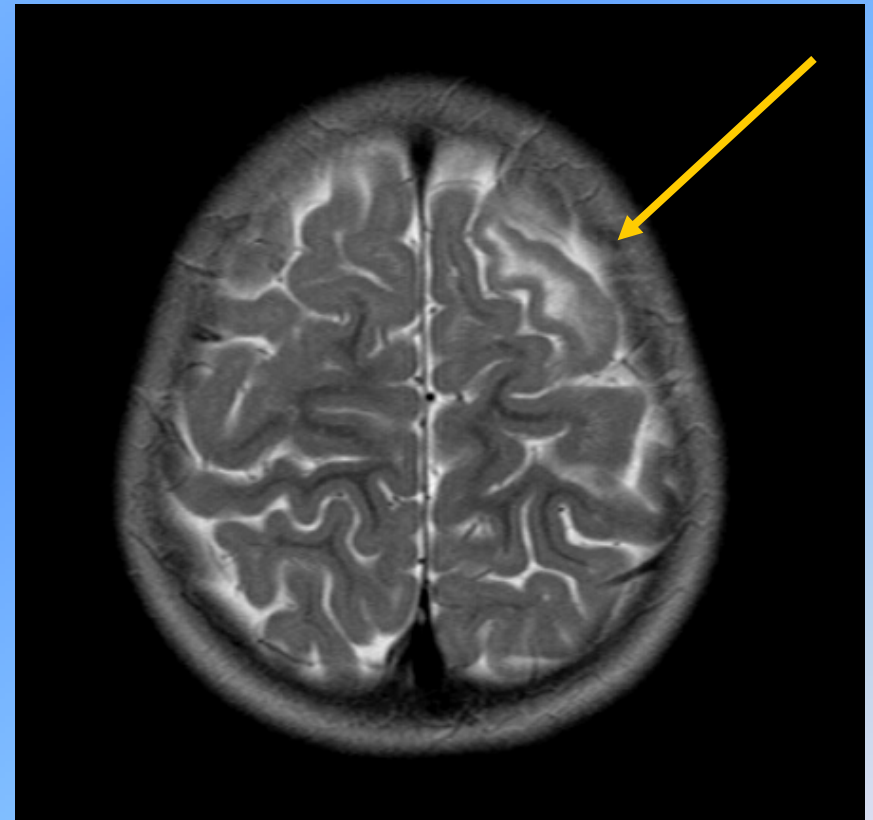
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Cognition and Focal (Lesional) Epilepsy

- Site of Lesion
- Nature of lesion
 - Localised or diffuse
 - Bilateral or Unilateral
 - Chronicity of epilepsy
- Chronic focal epilepsy → generalised epilepsy
 - EEG may become ‘encephalopathic’
 - High risk of cognitive impairment

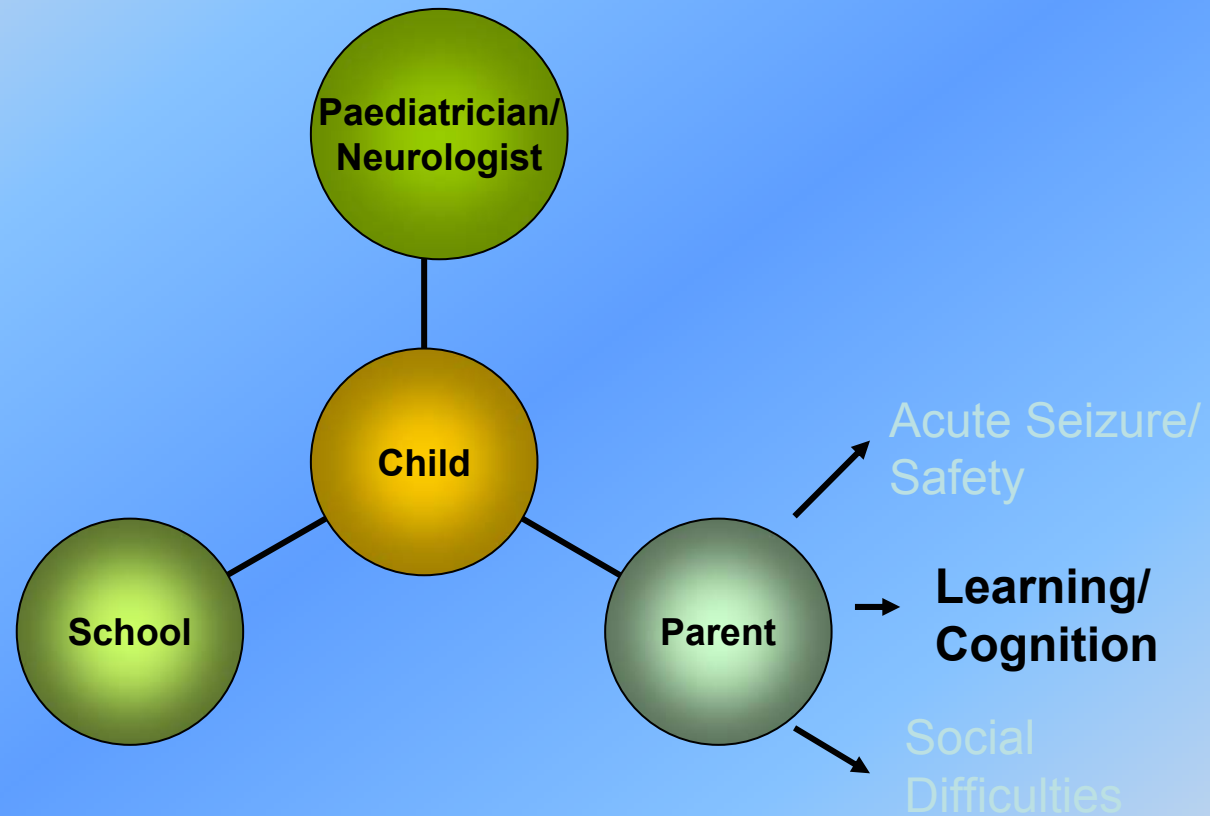
Role of Early Surgical Intervention in Focal Epilepsies?

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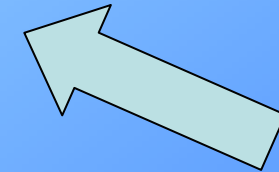


Cognition and Behaviour

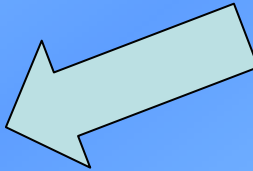
- Complex and multifactorial
- Epilepsy more frequent in intellectually disabled (ID) children
- Not all children with epilepsy have cognitive deficits
- Good data is scarce
 - Many studies have high rates of ID
 - ID related to severity of epilepsy
 - Short seizures no effect on gross development

Cognitive Impairments

- Attention
- Memory
- Mental Speed
- Language
- Executive
- Social



**Exacerbated by
Increased Seizure
frequency**



**Multiple anti-epileptic
medication**

Behavioural Impairments

- Fatigue
- Depression
- Anxiety
- Psychosis

Cognition and Behaviour

- *Idiopathic Epilepsies* - most children normal or superior intelligence
 - 98 with non-lesional epilepsy did less well than 96 asthma pts in all domains¹
 - 51 children v 48 controls, 48h after dx, 3m, 12 m; no persistent attention deficits, no detrimental effect of AED; related to prior school or behav diffic, maladaptive reaction from parents
- *Complex Partial Seizures* inferior to controls in seven cognitive domains ²
 - Early age onset-- related to cognitive deficit
 - Seizure frequency -- related to behavioural difficulties

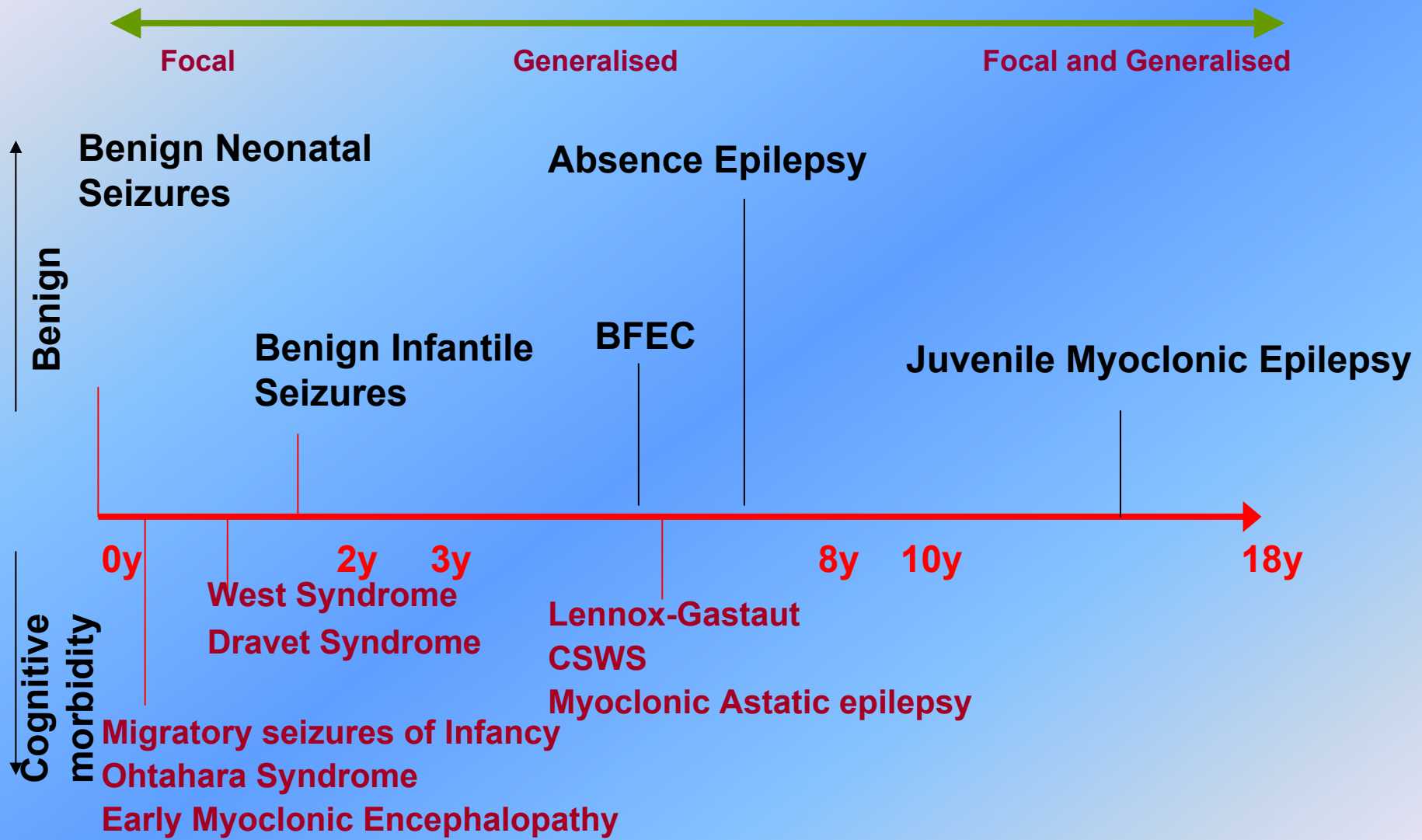
Cognition and Behaviour Decline – Risk factors

- Multiple short seizures - transient cognitive impairment (TCI).
 - Untreated absence epilepsy, atypical absences
- Syndromes of early childhood
 - West Syndrome
 - Lennox-Gastaut syndrome
 - SMEI / Dravet Syndrome
- Continuous Discharges on EEG
 - Landau-Kleffner, ESES, Frontal ESES
 - ?BFEC

Cognition and Behaviour Anti-Epileptic Drugs (AED's)

- Few good studies
 - Combination therapy, retrospective, controls, small sample size, Global IQ (insensitive for subtle changes)
- Many inconclusive
- Not all behavioural disturbances are due to AED's
- Older AED;- Phenobarbitone, older benzodiazepines greatest risk
- No consistent difference between carbamazepine, phenytoin, valproate

Paediatric Epilepsy syndromes

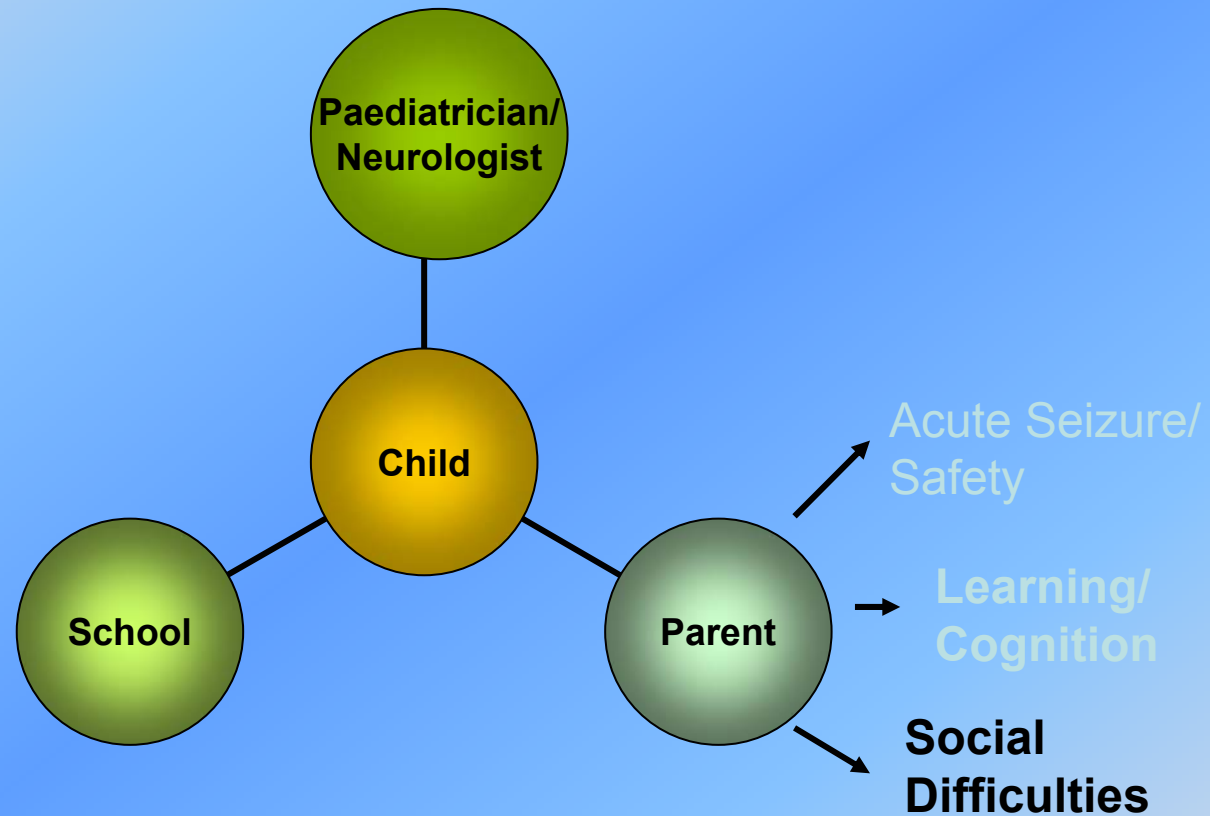


Newer Anti-Epileptic Drugs (AED's)

- Clobazam
- Lamotrigine - increased alertness, aggression
- Topiramate - emotional lability, fatigue, word-finding, despite improved seizure control ¹.
- Levetiracetam - Numbers too few
Aggression, agitation, sedation

1 Elterman RD, Neurology 1999

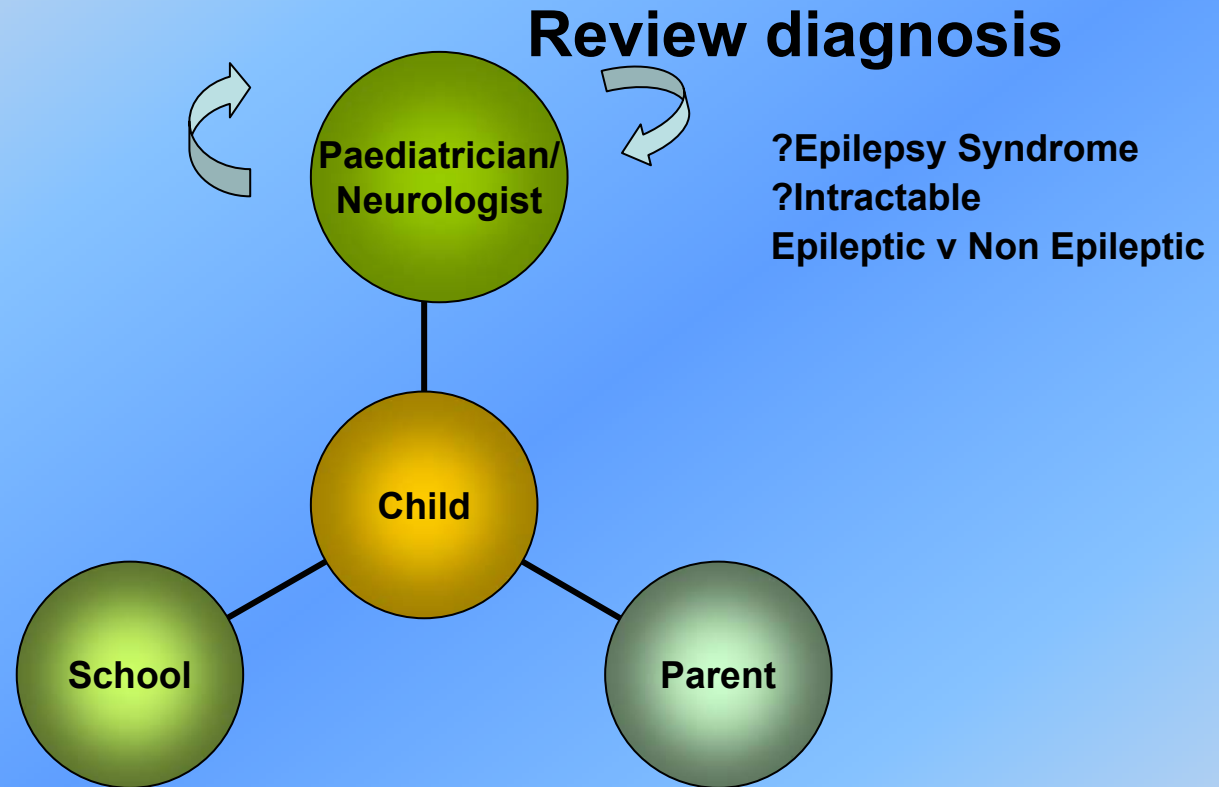
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Social Difficulties

- Over-protection
- Low Self-esteem
- Peer-peer relationships
- Exclusion
- Neurological disorder
- Poor non-verbal ability

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Conclusions

- Epilepsy is associated with co morbidities of cognitive and behavioral difficulties
- Epileptic syndromes group together children with similar clinical (?and cognitive) characteristics
- Rational drug therapy based on epilepsy syndromes may reduce cognitive morbidity
- Early intervention with surgery may be beneficial in early childhood in children with discrete lesions
- Further studies are needed to assess cognitive effects of AED's in children