Paediatric Epilepsy Update 2018

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Epilepsy Service CUH

- ~550 children
- New diagnosis-education, support, clinic follow up
- Epilepsy phoneline service

Aims of Paediatric Neurology service

- Accurate diagnosis
- As well controlled epilepsy as possible
- No side effects
- Well managed co-morbidities
- Good quality of life for the child and family
- Reach maximum developmental potential
- Become well adjusted adults

What is epilepsy

- A chronic condition in which a person has a tendency to have recurrent, unprovoked seizures; normally diagnosed after 2 or more seizures >24 hours apart
- An epileptic seizure is an intermittent, stereotyped disturbance of behaviour, emotion, motor function or sensation resulting from abnormal cortical neuronal discharges
- Epilepsy is the tendency to have recurrent epileptic seizures

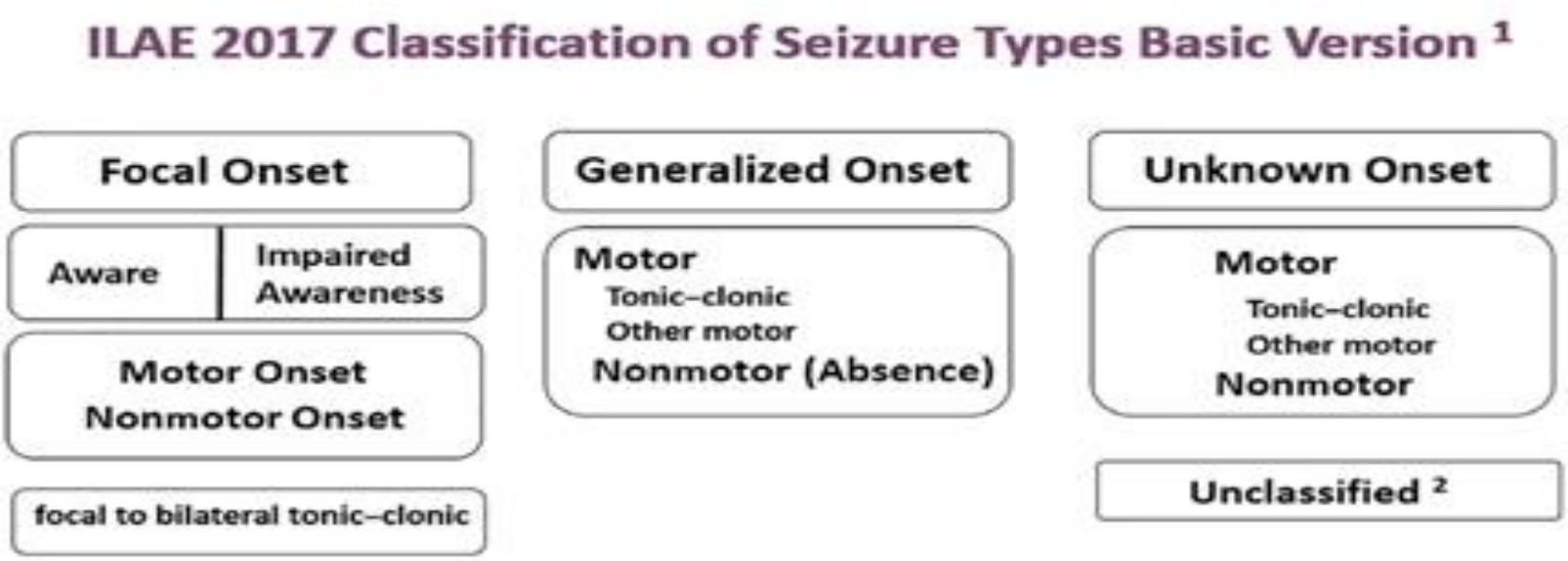
Seizure type

- Two patterns of epileptic discharges recognised:
  - **Generalised epilepsy** – discharges arising simultaneously from both hemispheres
  - **Focal epilepsy** – discharges arising from a focal cortical disturbance- these can evolve to generalised seizure

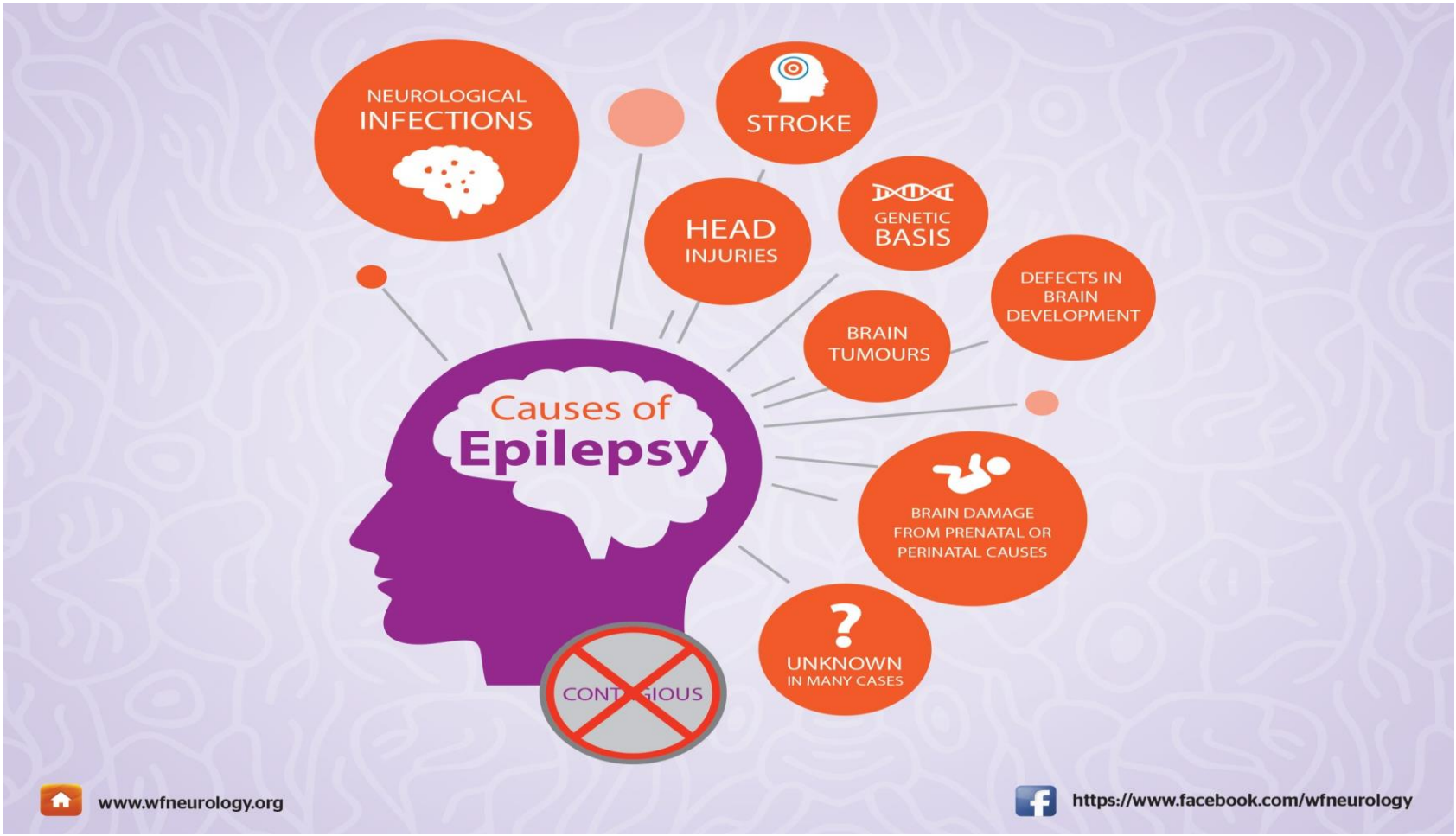
Terms no longer in use

- Grand Mal, Petit Mal
- Complex partial
- Simple partial
- Partial
- Dyscognitive
- Secondarily generalized tonic-clonic

ILAE classification



Causes ?


NEUROLOGICAL INFECTIONS
STROKE
HEAD INJURIES
GENETIC BASIS
DEFECTS IN BRAIN DEVELOPMENT
BRAIN TUMOURS
Causes of Epilepsy
BRAIN DAMAGE FROM PRENATAL OR PERINATAL CAUSES
?
UNKNOWN IN MANY CASES
CONTAGIOUS
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Diagnosis

- Clinical history.. Eyewitness account

  An incorrect diagnosis of epilepsy is made in 20-30% of cases; & up to 40% of children referred to a tertiary clinic do not have epilepsy (JEC, 2011).
- NICE Guidelines 2014
- video
- EEG
- ECG
- MRI
- Bloods

Diagnostic difficulties

- Children are prone to non epileptic paroxysmal events causing diagnostic confusion
- Every epileptic seizure type has a non epileptic differential
- 30% of individuals referred to a specialist clinic did not have epilepsy
- Concordance among neurologists for epileptic events is high but there is a tendency to overcall as epileptic non epileptic events

Why treat epilepsy?

- Improve Quality of Life
- Reduce morbidity/mortality
- To maximise academic potential

Status epilepticus

- One of the most common neurological emergencies affecting children worldwide
- Regarded as medical emergencies requiring immediate seizure control measures
- Untreated seizures can progress to status epilepticus (SE)
- SE carries increased risk of morbidity and mortality (case fatality in children, 2.7–8%)
- Early treatment is imperative

Treatment options

- Antiepileptic Medication
- Ketogenic Diet
- VNS therapy
- Resective surgery

Antiepileptic Drugs-

- Focal versus generalised specific medication
- Goal of treatment- no seizures with no/least side effects possible.
- Up to 70% of people with epilepsy respond to 1st or 2nd AED.
- 15-35% of all children will have medically intractable epilepsy.
- Monotherapy preferred; side effects.
- Practical issues.

Traditional versus new antiepileptic medication

- New generation vigabatrin, lamotrigine, pregabalin,
- Side effect profile improving with newer AED
- Genetic epilepsies- drug specific AED therapy

Tradional AEDs	New AEDs
phenytoin	Lacosamide
phenobarb	Zonisamide
Sodium Valproate	Lamotrigine
Benzodiapines	Levetiracetam

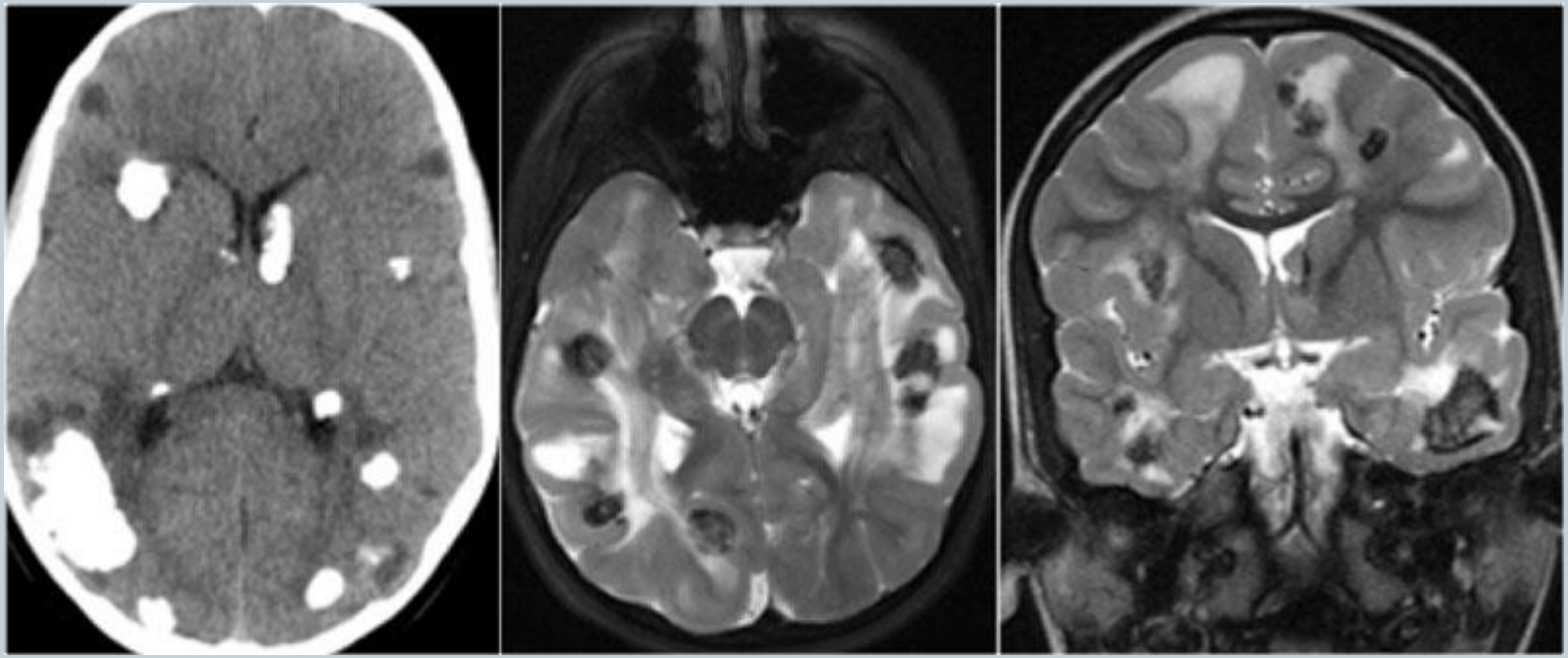
Ketogenic Diet

- Ketogenic diet-high fat, low carbohydrate; considered in those where AEDs fail.
- GLUT-1 deficiency- first line treatment
- Changes the metabolism in the body from burning glucose for energy to burning fat.
- Dietician/expert led, requires monitoring blood ketones and sugars

Case study

- Patient CO'B- 6 year old girl, hx infantile spasms & tuberous sclerosis, refractory epilepsy, 10 AEDs,
- Encephalopathic EEG 2014
- Commenced Ketogenic Diet jan '17, 2 provoked seizures since c/o diet.
- Making developmental progress
- EEG June 2017-much improved background, still focal discharges.
- No hospital admissions since c/o diet

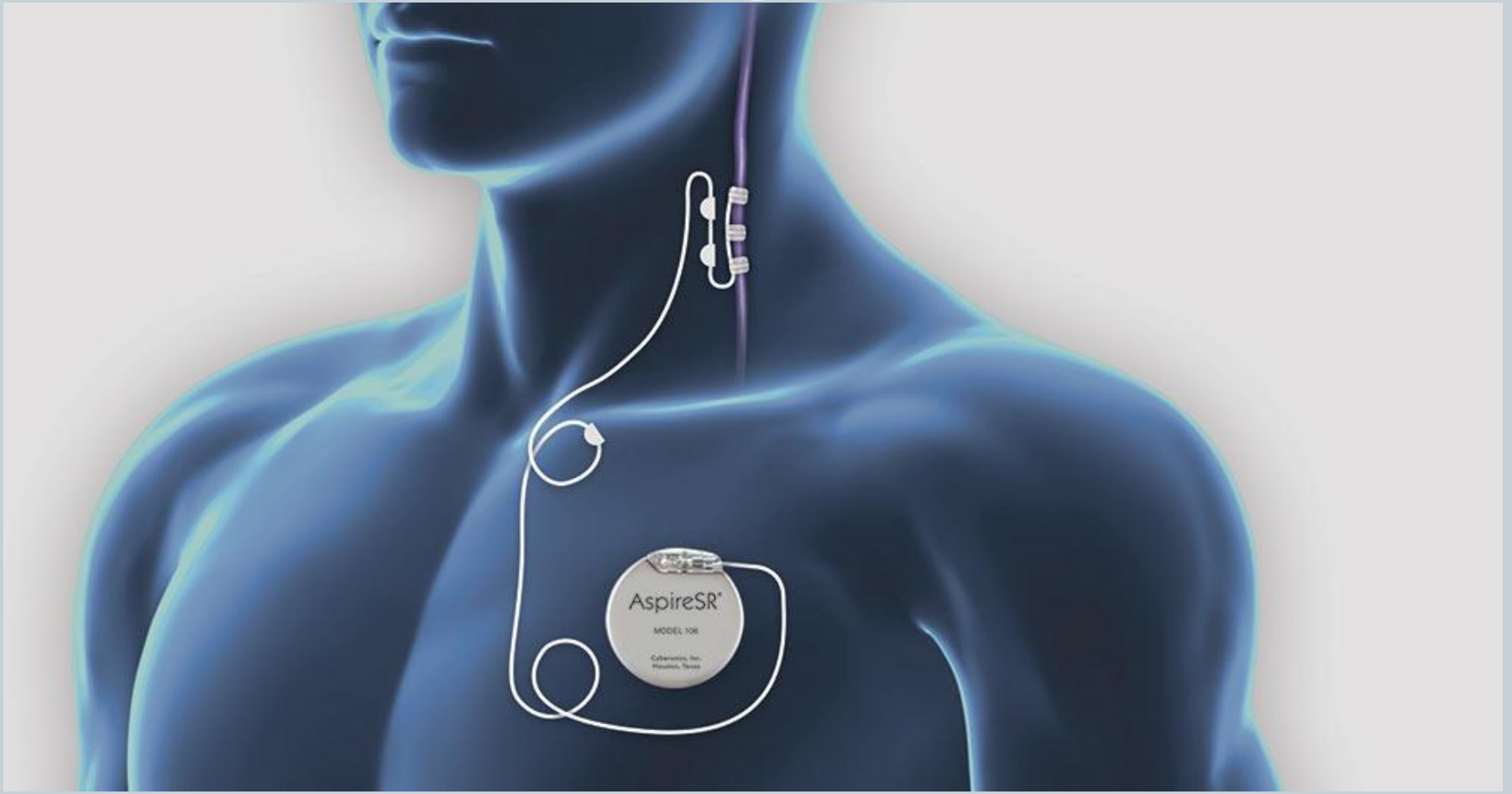
Tuberous sclerosis



Vagal Nerve Stimulator

- **Vagal Nerve Stimulator-** used in those resistant to AEDs, for whom surgery is not an option.
- Device implanted below collar bone; connected to vagus nerve, sends inhibitory impulses to desynchronise seizure activity in the brain.
- Devices are externally programmed- dedicated VNS clinic- patients seen every 3 months
- VNS therapy takes time, may take up to 2 years to see the full benefits

VNS



Case Study

- TR -17 year old boy, seizures since 8/12 old; developmental regression, tried ketogenic diet with little response; 9 AEDs, profound intellectual disability, multiple seizure types
- VNS 2005, battery replaced 2009, 2014,
- Parents report reduction in drop attacks, GTCs, improvement in behaviour, seizures persist but improved

Advances in VNS therapy

- *AspireSR* detects seizures by detecting pre-ictal tachycardia and provides automatic stimulation to stop or shorten a seizure and improve post-ictal recovery time
- Earlier activation reduces seizure duration and seizure severity
- Detects seizures in sleep

Resective Surgery

- **Surgery-** if AEDs fail; & focus of seizure can be localised, consideration for surgery. Extensive work up for surgery, need to be sure that removal of the offending area will not cause further problems; quality of life will improve for the child, acceptable risk: benefit ratio.

Case Study

- MD 15 yr old boy
- Hx infantile spasm @ 7/12 old, TLE 2007;
- Video telemetry 03/12-sharp waves left temporal lobe
- MRI confirmed temporal lobe gliosis
- Refractory epilepsy
- Resection of left temporal ganglioma march 2015
- Seizure free since 2015

references

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