

Epilepsies of Childhood: An Over-view of Treatment

2nd October 2018

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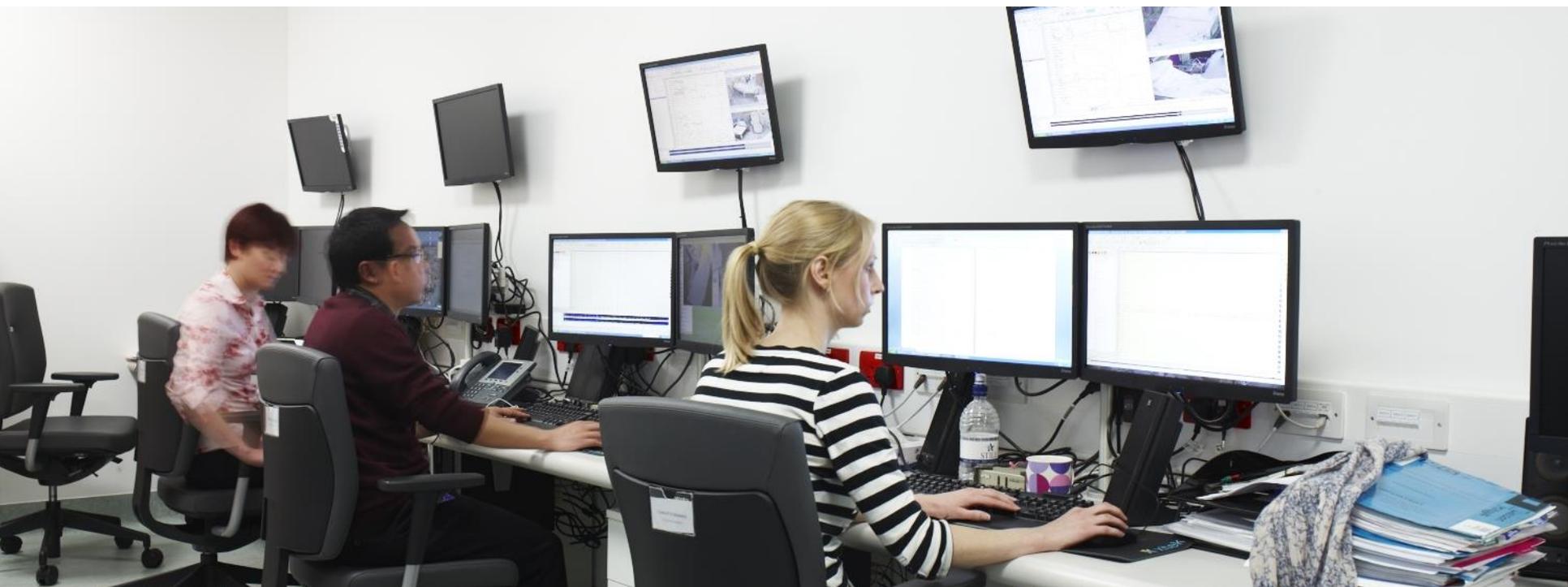
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Outline

1. General principles of treatment
2. When the first drugs don't work
3. Non-drug treatments
4. Other considerations

1. Introduction to GOSH Epilepsy Team



1. General principles of treatment



1. General principles of treatment

- i. Expectations of treatment
- ii. Decision to treat
- iii. Which first drugs

Decision to treat

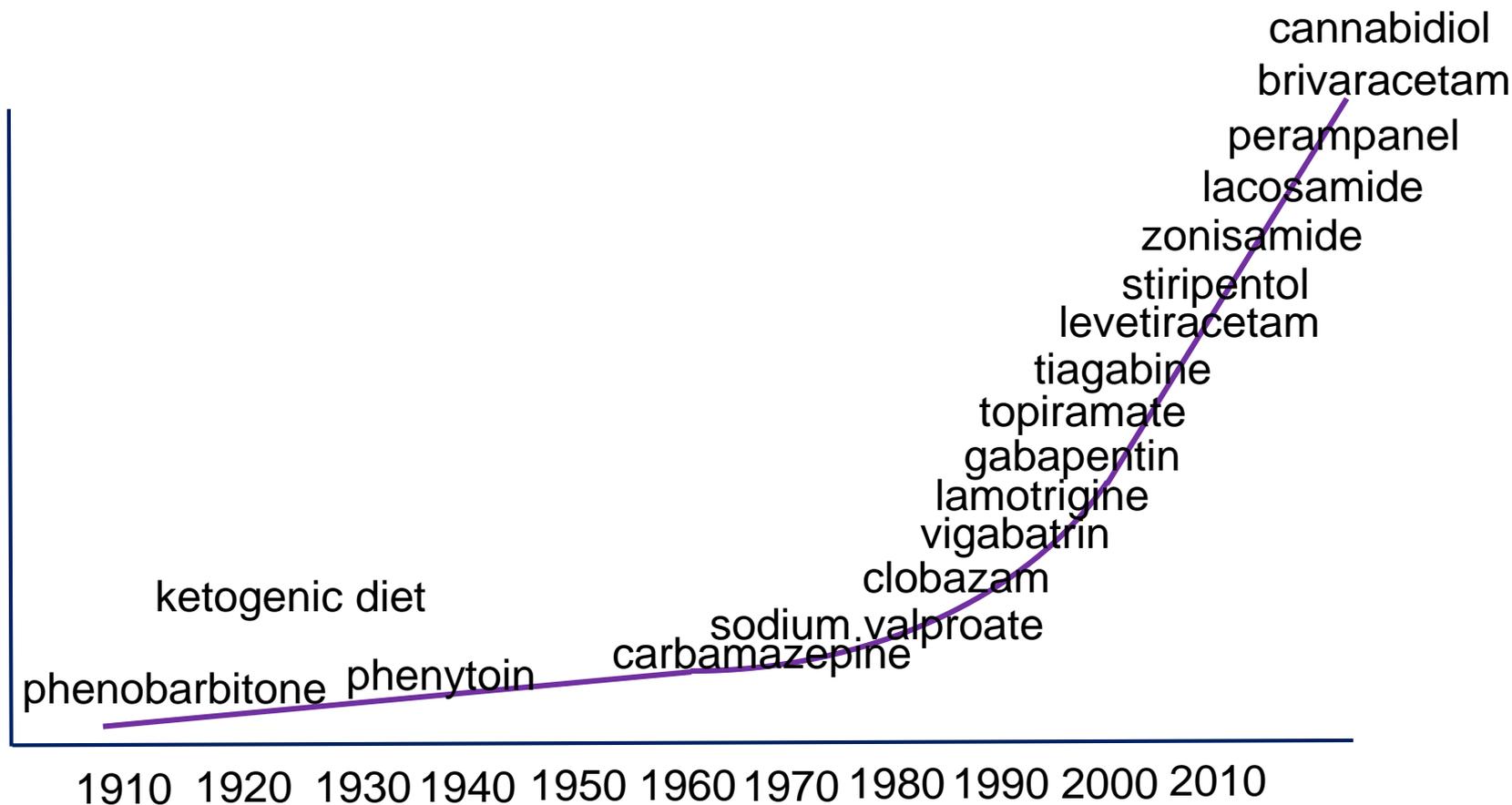
- Frequency of seizure
 - Don't always need to treat e.g. Childhood Epilepsy with Centro-Temporal Spikes (CECTS)
- Severity of seizures
 - Prolonged, injury sustained; more likely to treat
- Seizure syndrome
 - Infantile spasms (impact on development)
 - Juvenile myoclonic epilepsy (life-long)

Expectations of treatment and treatment response

Commonly

- Treatment aim is seizure freedom
- Achieved with:
 - first drug in 70%
 - second drug in a further 10-20%

Anti-epileptic drugs



Which drug to choose?

The ideal anticonvulsant!

- Effective on multiple seizure types
- No exacerbation of other seizure types
- No side effects
- Predictable pharmacokinetics
- No interaction with other AEDs

Which drug to choose?

- No 'ideal AED'
- What have we got?
- What do we know?
- Trade-offs: efficacy, safety and tolerability

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Epilepsies: diagnosis and management

Clinical guideline [CG137] Published date: January 2012 Last updated: February 2016 [Register as a stakeholder](#) [Uptake of this guidance](#)

Guidance

Tools and resources

Information for the public

Evidence

History

Overview

Introduction

Person-centred care

Key priorities for implementation

1 Guidance

2 Notes on the scope of the guidance

3 Implementation

4 Research recommendations

5 Other versions of this guideline

6 Related NICE guidance

7 Updating the guideline

Appendix A: The Guideline

Guidance

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NICE interactive flowchart - Epilepsy 2 Quality standards

The guideline covers diagnosing, treating and managing epilepsy and seizures in children, young people and adults in primary and secondary care. It offers best practice advice on managing epilepsy to improve health outcomes so that people with epilepsy can fully participate in daily life

MHRA advice on valproate: In February 2016, we updated this guideline to link to the Medicines and Healthcare products Regulatory Agency's (MHRA) [toolkit to ensure female patients are better informed about the risks of taking valproate during pregnancy](#).

Recommendations

This guideline includes recommendations on:

- [diagnosis of epilepsy](#) and [investigations to support a diagnosis](#)

Next >

‘Older’ drugs

- Phenobarbitone
- Phenytoin
- **Carbamazepine**
- **Sodium Valproate**
- Ethosuximide

‘Newer’ AEDs

- **Lamotrigine**
- Topiramate
- Oxcarbazepine
- Tiagabine
- **Levetiracetam**
- Stiripentol
- Zonisamide
- Rufinamide
- Lacosamide
- Eslicarbazepine
- (Retigabine)
- Perampanel

2. When the first drugs don't work



Drug Resistant Epilepsy

ILAE Consensus Proposal

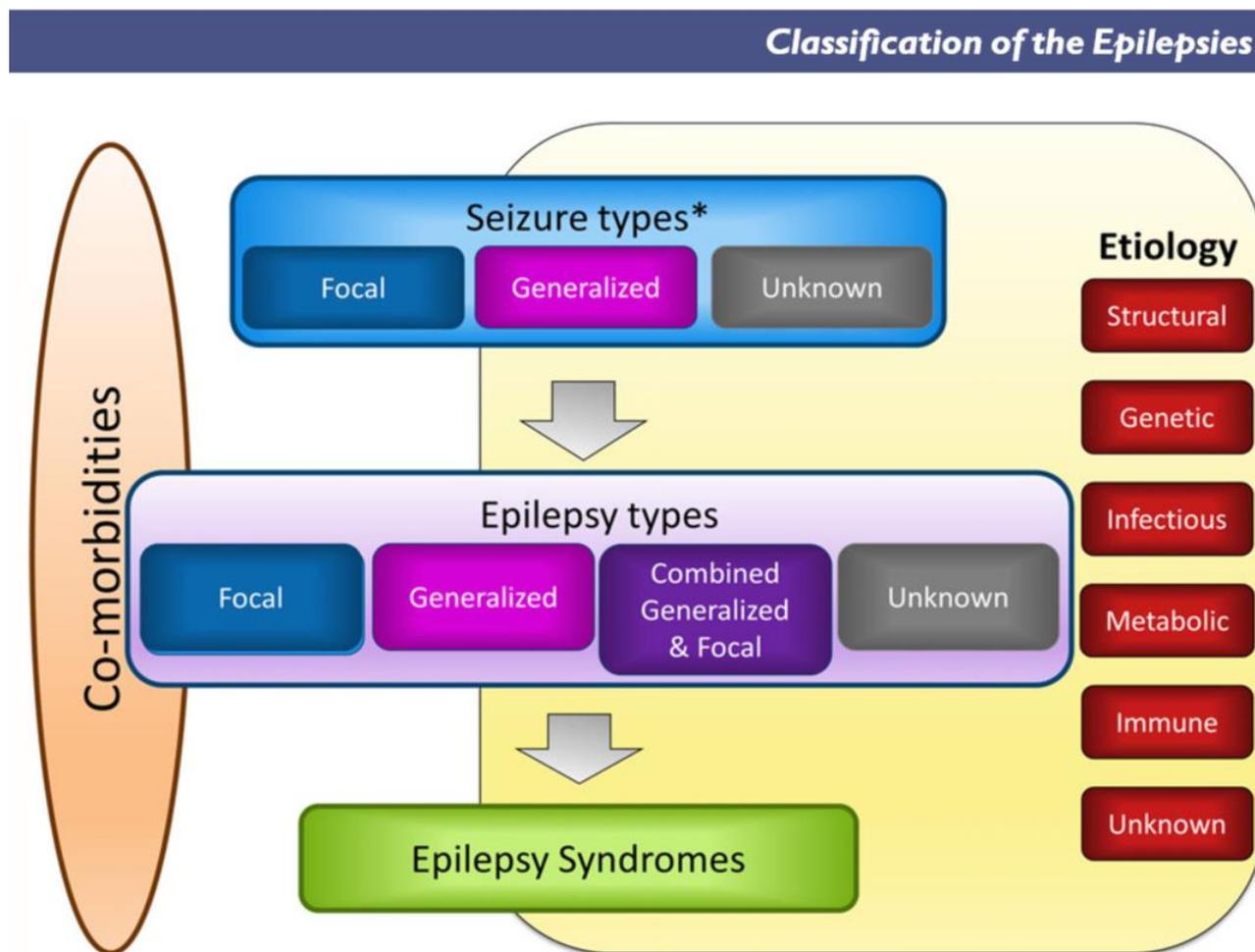
Failure of:

- adequate trials of
- two tolerated
- appropriately chosen
- and used AED schedules (monotherapy or combination)
- to achieve seizure freedom

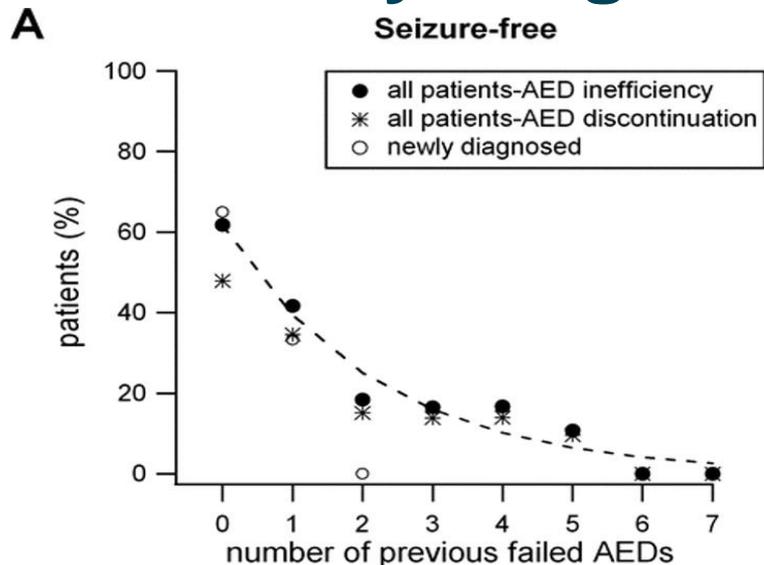
When the first drugs don't work - What else should we think about other than the drugs?

- Review the diagnosis
- Is the right drug being used for the seizure type and syndrome
- Compliance
- Consider the under-lying diagnosis
- Non-drug treatments

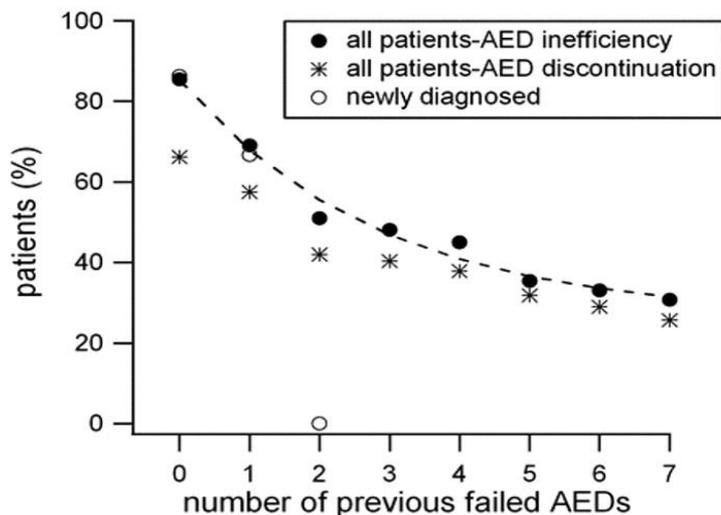
Different causes of epilepsy



How many drugs should you try?



B Greater than 50% reduction in seizure frequency



**Quantifying the response to AEDs:
Effect of past treatment history**
Schiller, Y. et al. Neurology 2008;70:54-65

Non-drug treatments

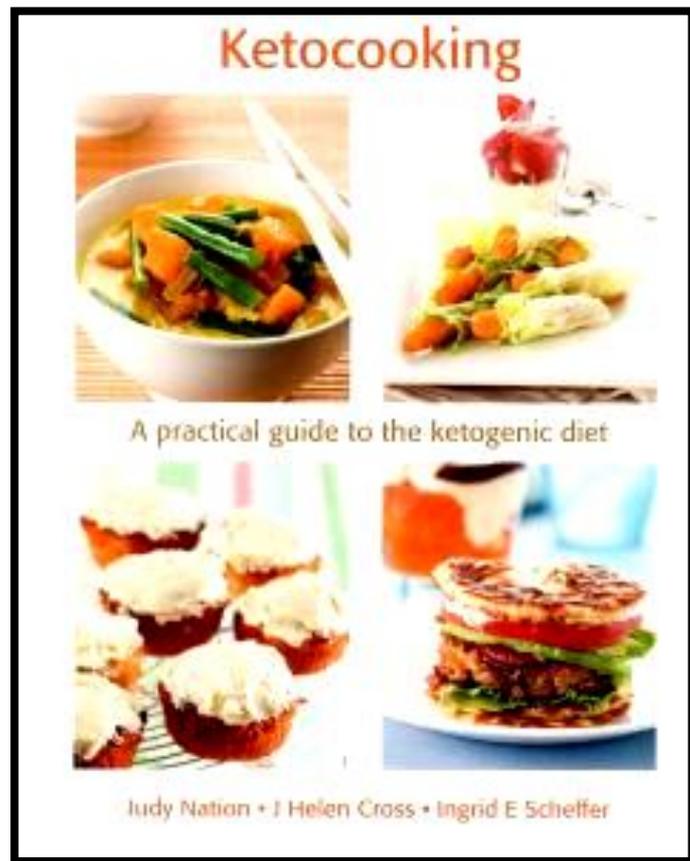
Promptly consider:

- Ketogenic diet
- Pre-surgical evaluation
- Vagus Nerve Stimulation
- (Novel therapies)

3. Non-drug treatments



Ketogenic diet



- High fat, low carbohydrate diet
- Modified Atkin's Diet for teenagers

Epilepsy surgery

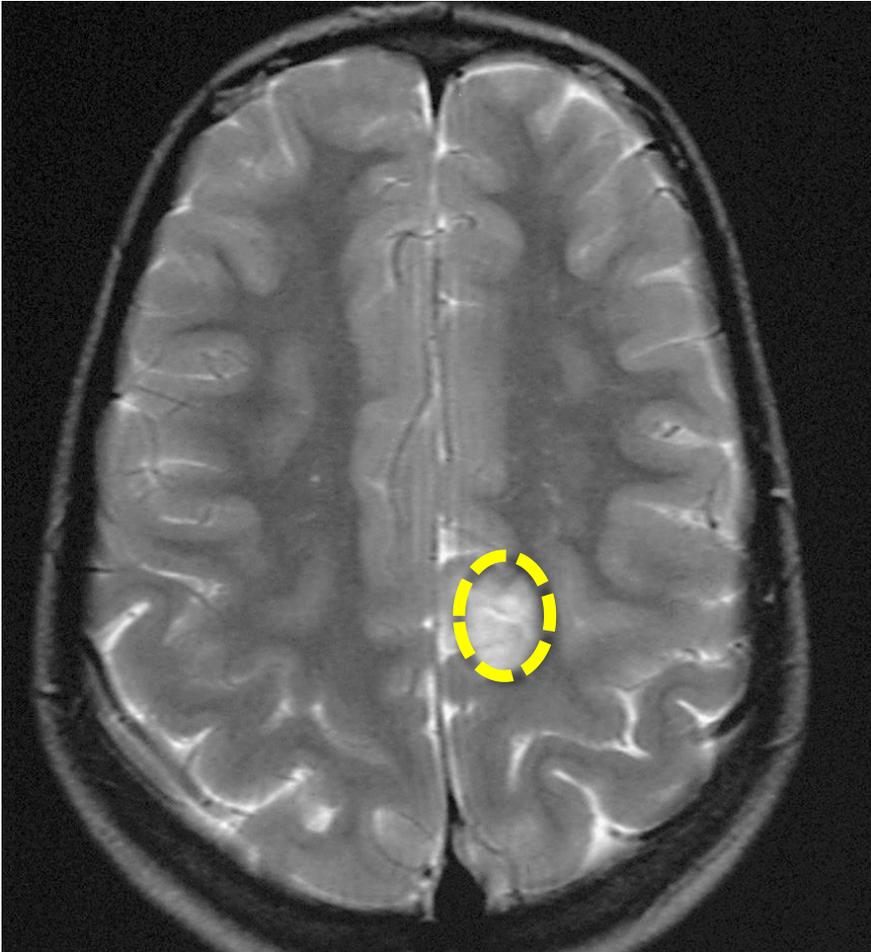
Definition

- Removal of an area of the brain with the aim of alleviating seizures

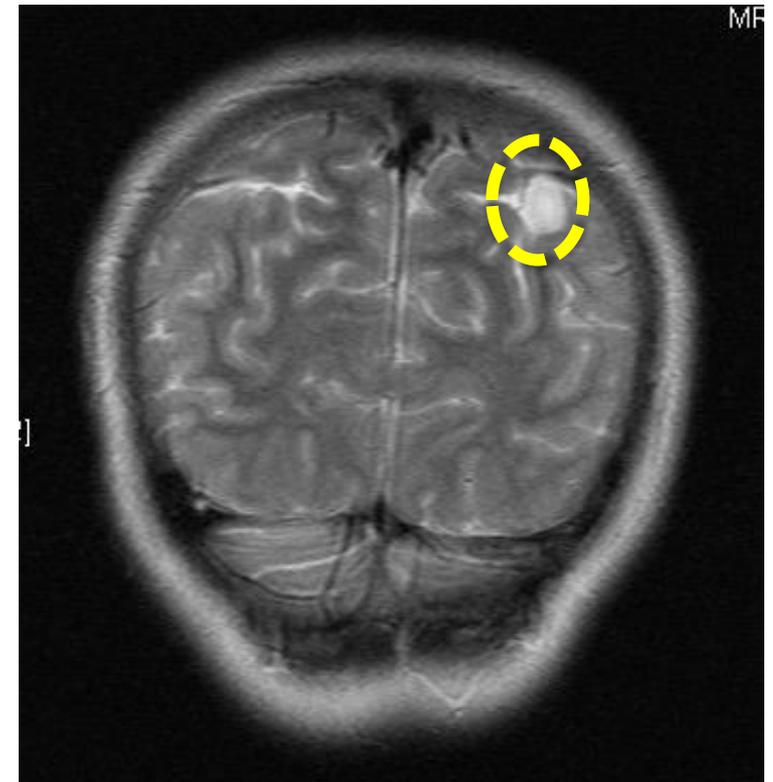
Aims

- Primary: seizure freedom/reduction
- Secondary:
 - neuro-developmental gains
 - behavioural improvement

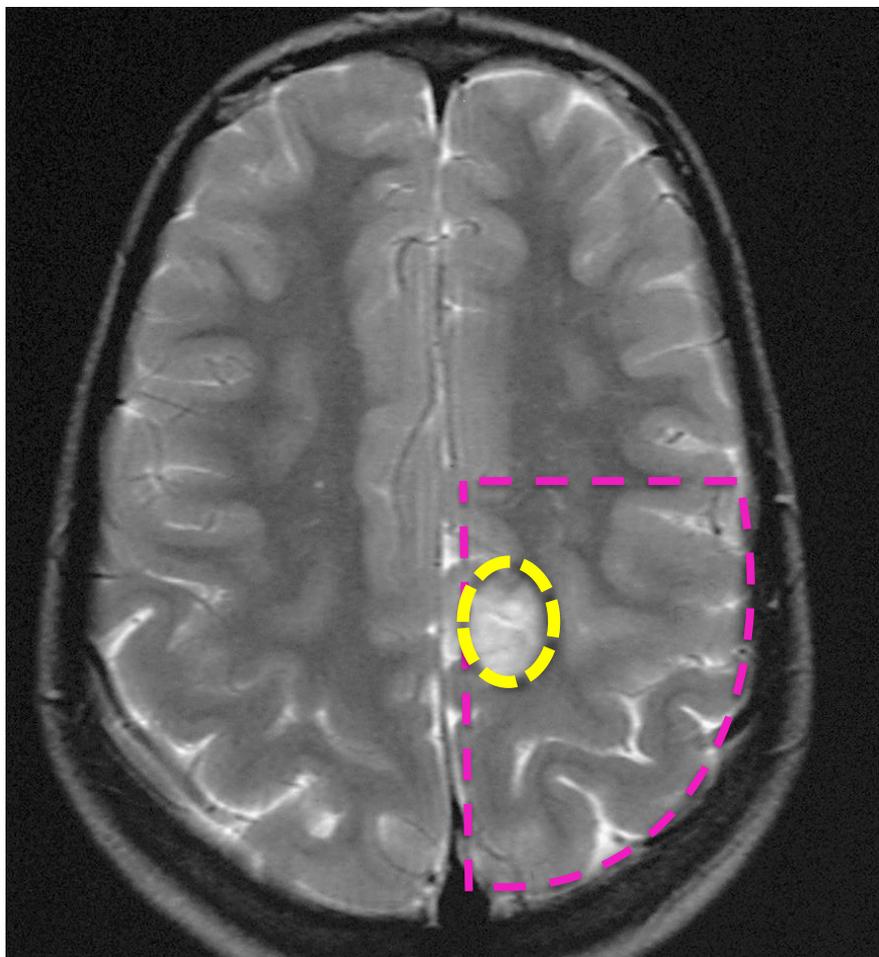
Types of surgery



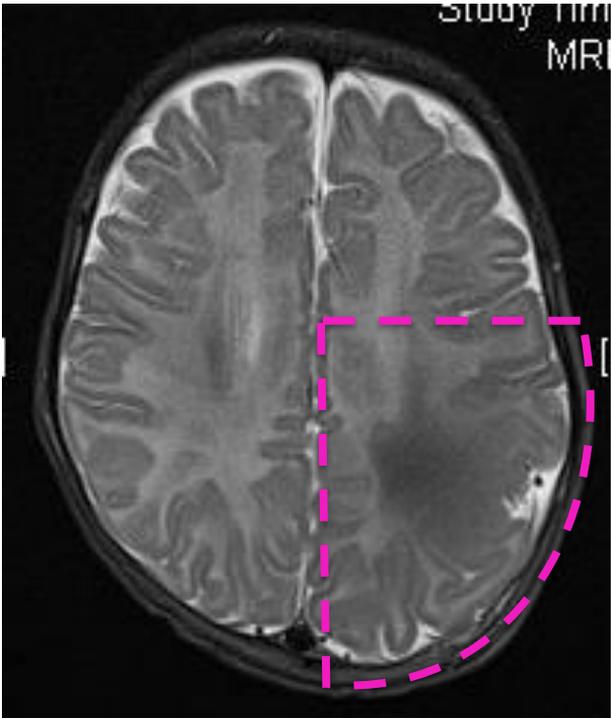
Lesionectomy



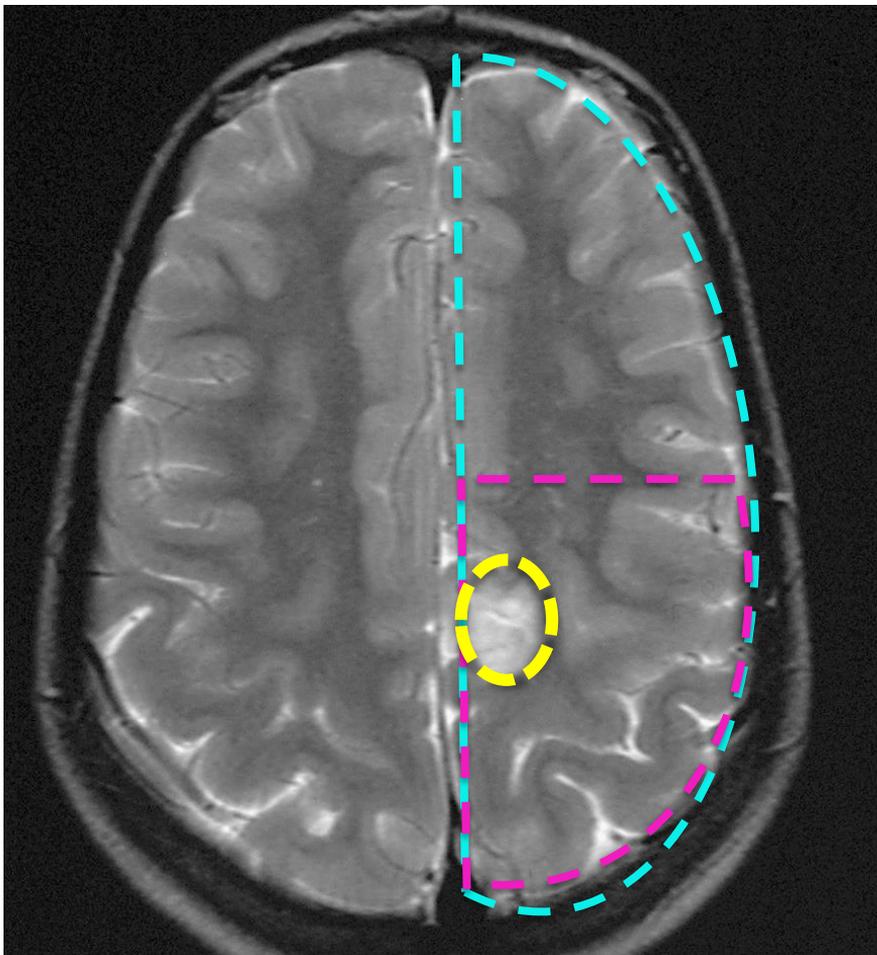
Types of surgery



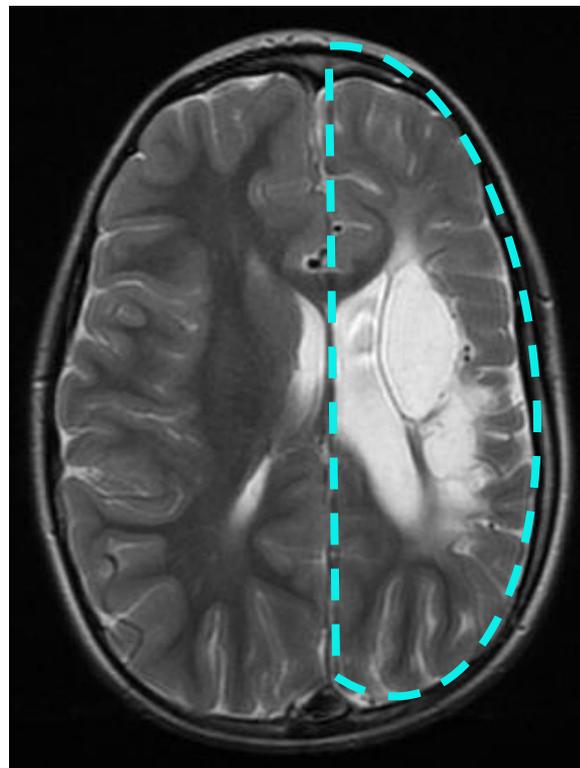
Lobectomy



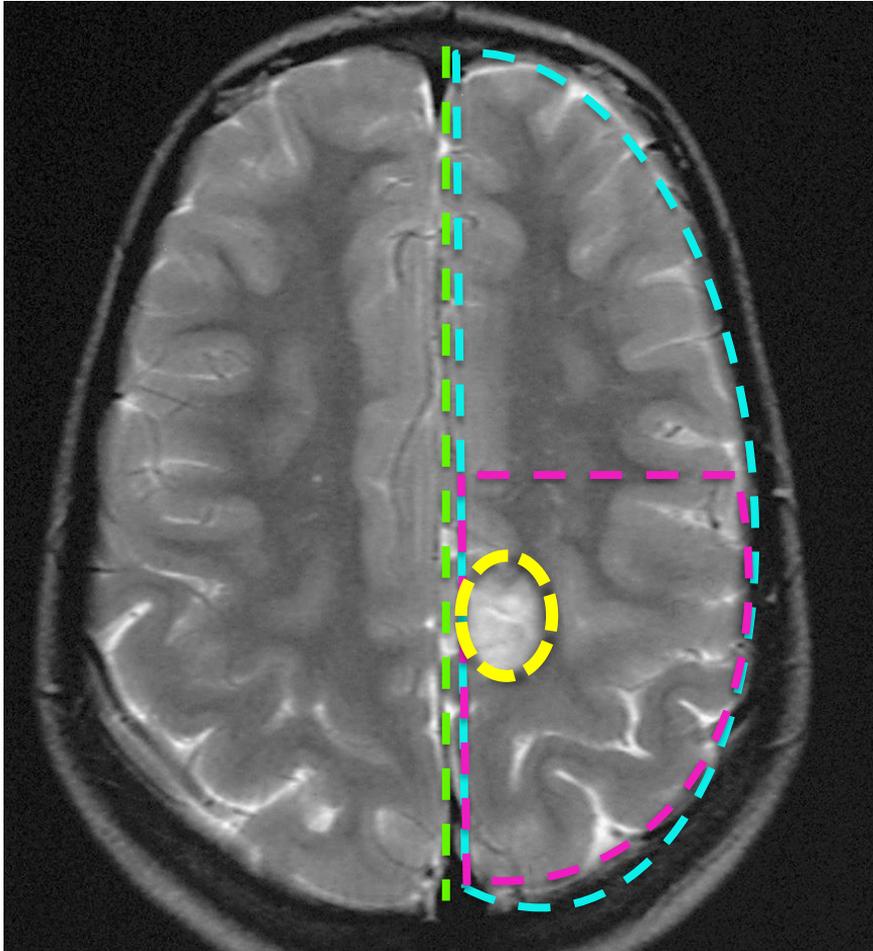
Types of surgery



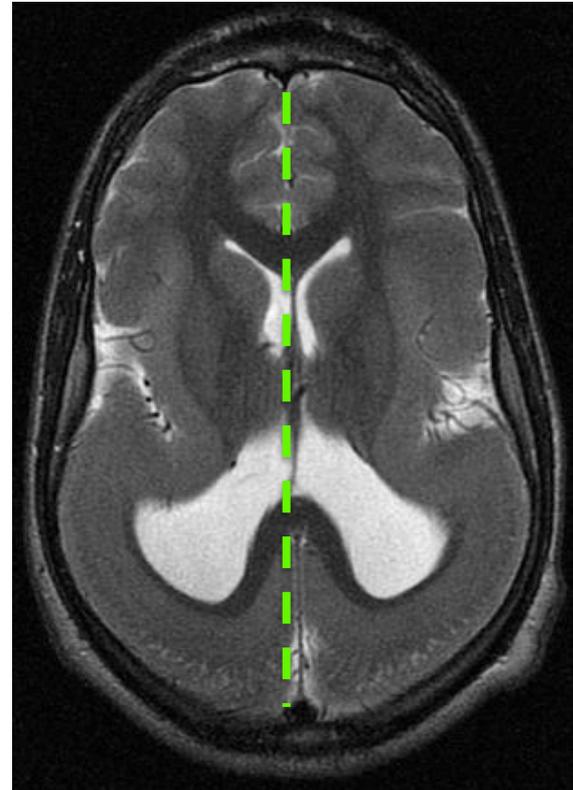
Hemispherotomy



Types of surgery



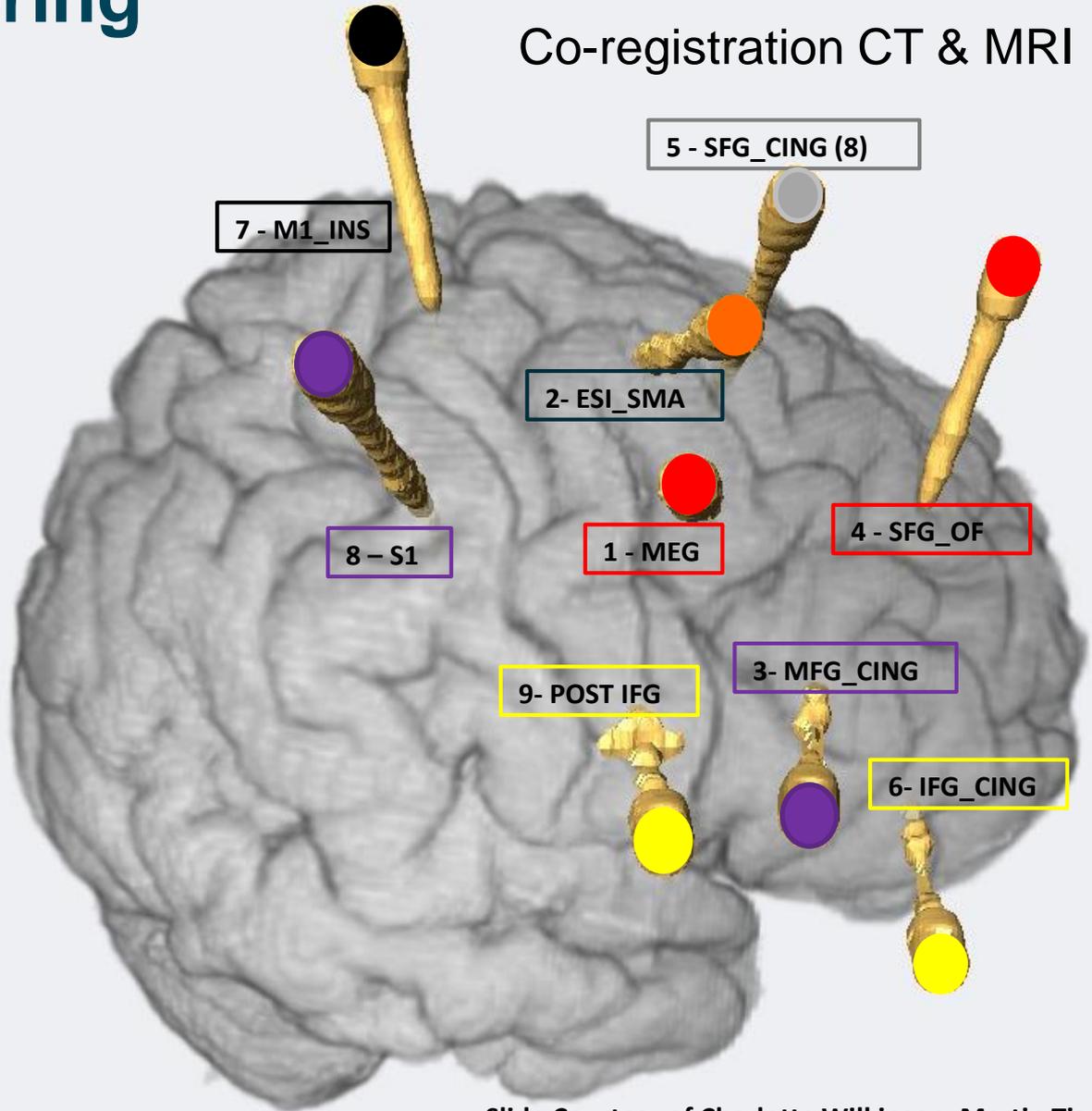
Corpus Callosotomy



Invasive monitoring



Co-registration CT & MRI

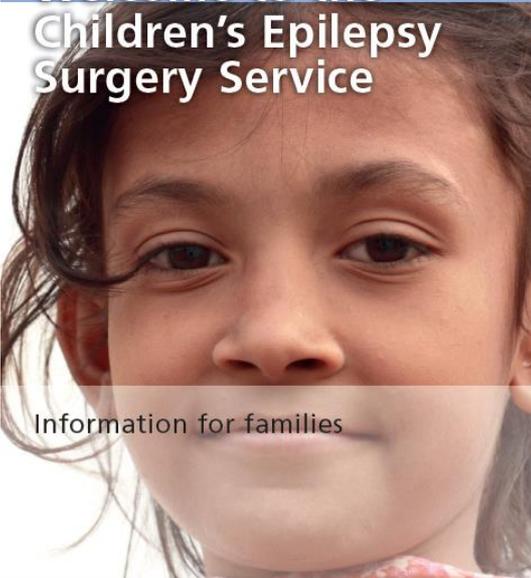


Why epilepsy surgery

- 70% chance overall for curing epilepsy
- No minimum age
- Consider the effect of epilepsy on early brain development
- Functional plasticity of the child's brain

Epilepsy Service at GOSH

Welcome to the Children's Epilepsy Surgery Service 



Information for families

Great Ormond Street Hospital for Children
NHS Foundation Trust



Pre-Surgical Evaluation Pathway

Identification of suitable candidates for Presurgical Evaluation
(All)

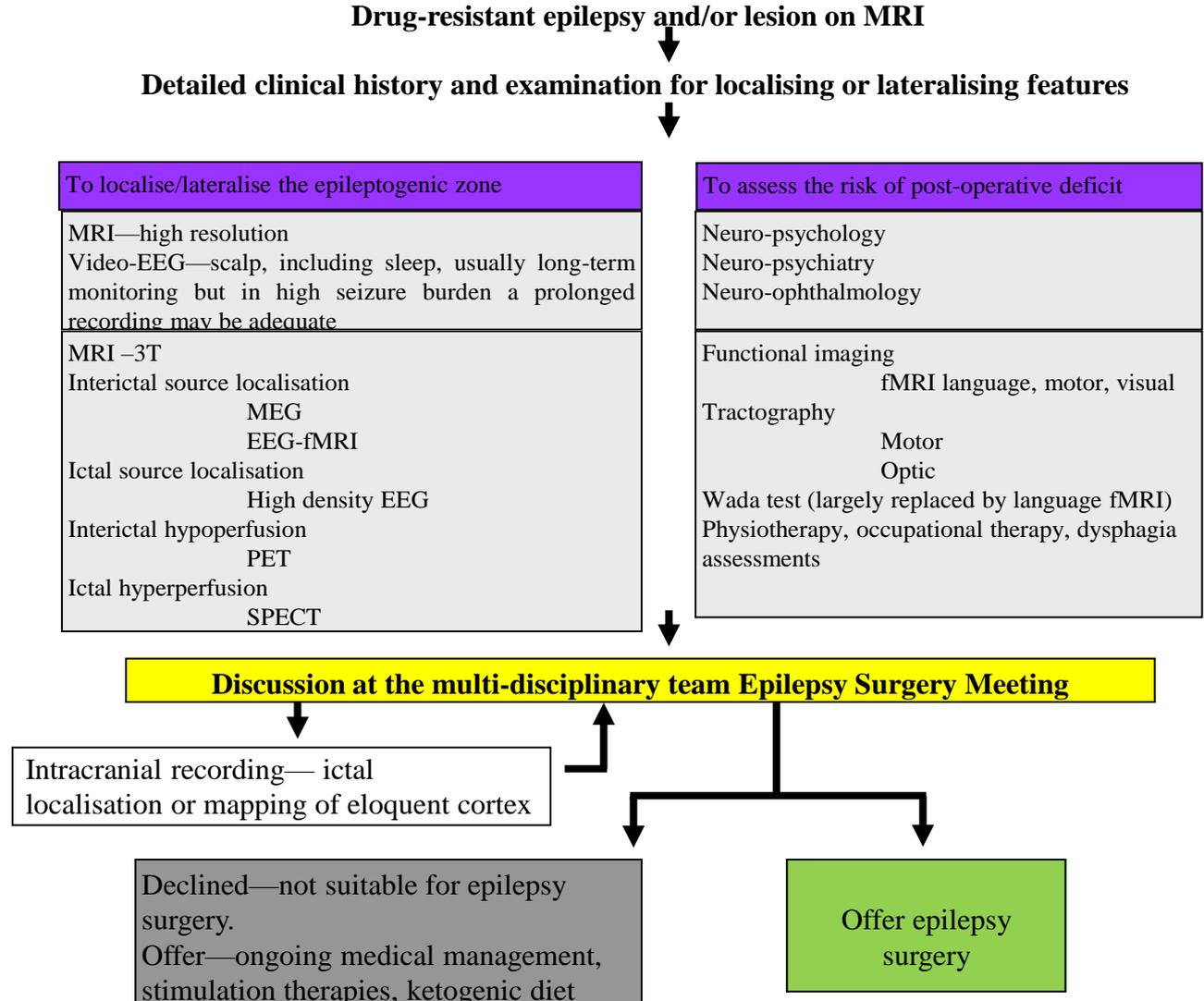
Phase 1 investigations
(All)

Phase 1 investigations—extended
(selected children)

(All)

Phase 2 investigations
(selected children)

Outcome of PSE
(All)

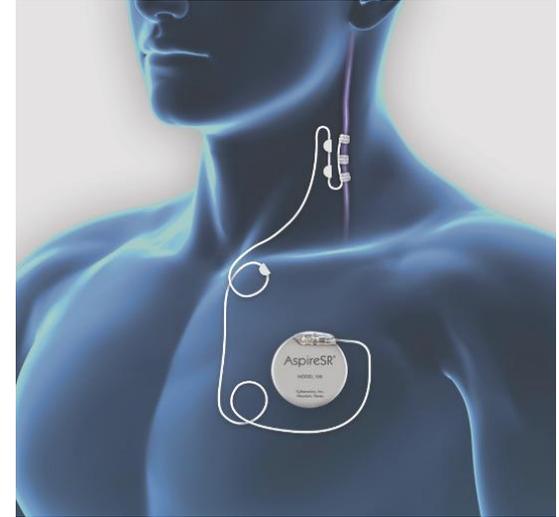


VNS Therapy



VNS Therapy

- Non-pharmacological therapy for epilepsy
- Repeated electrical stimulation of the left vagus nerve by a programmable pulse generator device
- Ramped up stepwise over months
- Magnet swipe may shorten of stop seizures



VNS is recommended in the UK

NICE National Institute for Health and Care Excellence

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 NICE interactive flowchart - Epilepsy  2 Quality standards *

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Clinical Commissioning Policy: Vagal Nerve Stimulation for Epilepsy

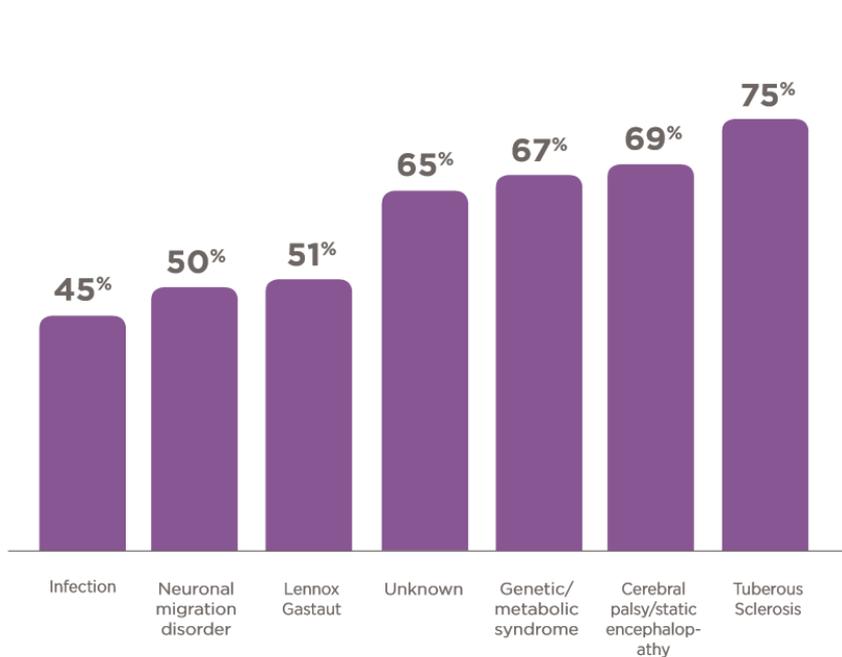
April 2013

Reference: NHSCB/D04/P/d

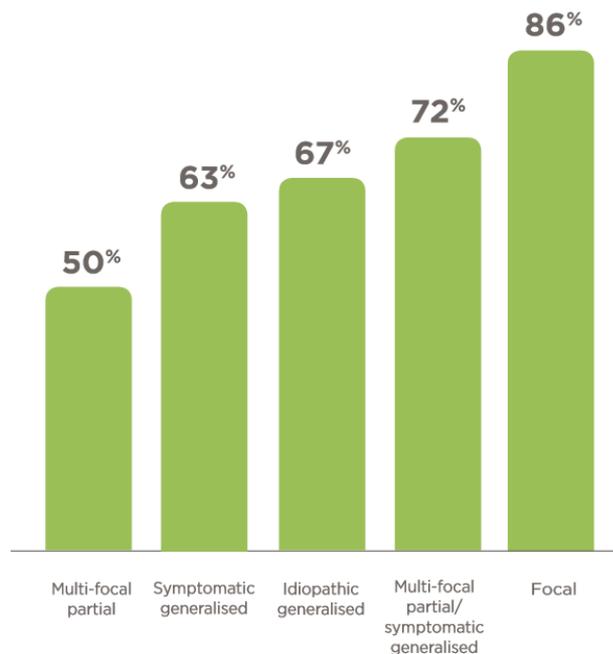


VNS effectiveness in different paediatric epilepsies?

VNS efficacy by etiology

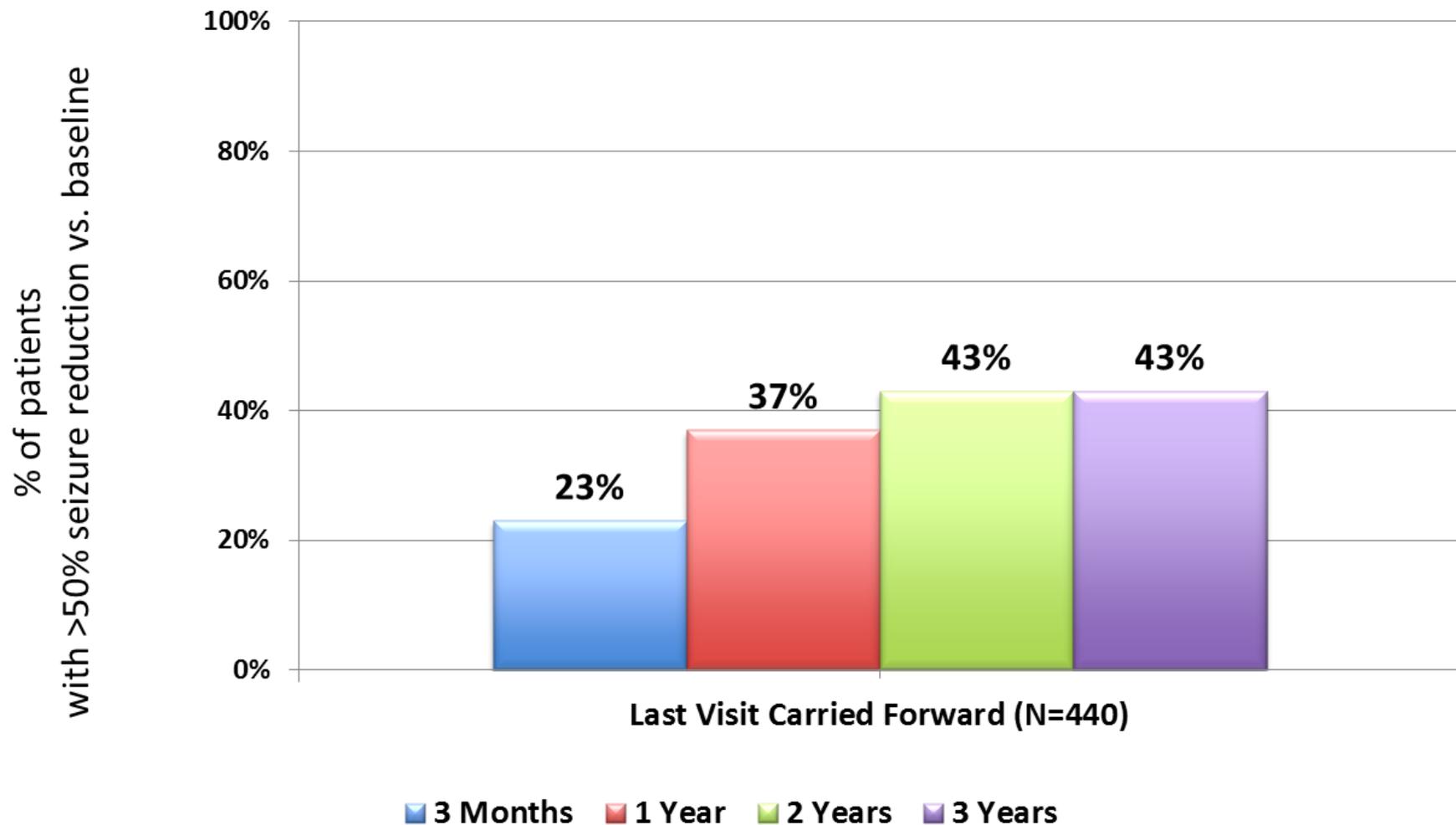


VNS efficacy by epilepsy classification



MEDIAN SEIZURE REDUCTION AT 12 MONTHS (N=141)⁸

VNS Effectiveness Over Time



New Generation VNS Therapy

AspireSR



What's new? Cardiac-based seizure detection

- (Standard VNS Therapy stimulation with on-demand magnet stimulation)
- Seizure detection algorithm based on ictal tachycardia
- Automatic stimulation upon seizure detection

Even Newer Generation VNS Therapy

SenTiva



Personalised features

- Guided programming
- Scheduled programming
- Day and night programming

New treatments

Drug

- Revisiting old drugs
- New drugs
- Drugs that have new targets
- Drugs that target new pathways

Non-drug

- Immune therapies
- New surgical approaches
- Neuro-modulation

4. Other considerations



4. Other considerations in treatment

Be a normal child/young person

Aim

- Develop and play
- Go to school and learn
- Interact and enjoy life with family and friends
- Grow in independence

Consider

- Sensible weighing up of risks

Be a normal child/young person

Encourage

- Assessment of development
- Assessment of education needs
- Activities including swimming

Think about

- Triggers
- Compliance with medication
- Medic-alert bracelets
- Keeping safe when out and about
- Plan for prolonged seizures

Co-morbidities of epilepsy in childhood

Commonly

- Motor disorder
- Learning difficulties
- Attention Deficit
Hyperactivity Disorder
(ADHD)
- Autism
- Mood disorder

Good news

- These do respond to
appropriate treatment

Summary

- There are many types of epilepsy in childhood
- The first AED will work for 70% of patients
- If it doesn't, consider the seizure type, syndrome, cause and compliance
- In children with drug-resistant epilepsy, non-drug options should be considered early and include ketogenic diet, epilepsy surgery and Vagus Nerve Stimulation therapy
- Lead a full life with epilepsy

Thank
you

