

### **Paediatric Seizures and ConSEPT:**

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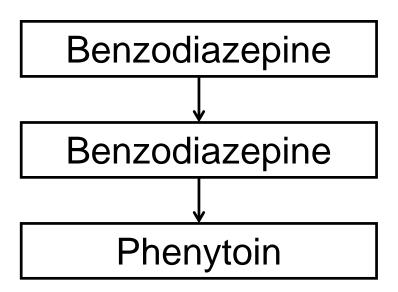
## CSE convulsive Status Epilepticus

### **CSE**

- Most common life threatening neurological emergency in children
  - ~20/100,000 in children
  - ~50/100,000 in <1 year olds
- Common PICU admission in Aust/NZ
- ½ previously normal
- Mortality ~3-5%

## CSE Acute management seizures

### CSE management guidelines:



## CSE Evidence for benzodiazepines

Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children (Review)



McTague A, Martland T, Appleton R

- 18 RCTs, 2,199 children
- IV/IM first line
- Buccal midazolam
- Midazolam = lorazepam ≥ diazepam

## CSE Evidence for phenytoin



Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children (Review)



McTague A, Martland T, Appleton R



Scottish Intercollegiate Guidelines Network







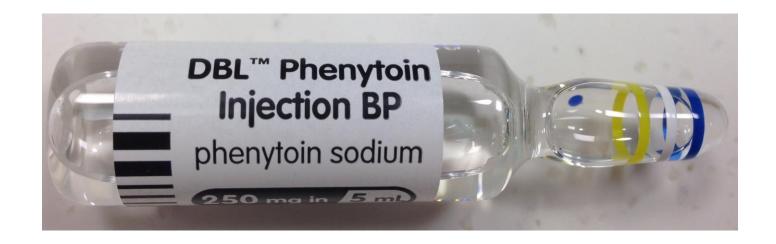
Diagnosis and management of epilepsies in chadren and young people

na onal clinical guideline



Advanced Paediatric Life Support

### CSE How ideal is phenytoin?



Efficacy = 60% (n=312 Lewena et al.)

# CSE How ideal is phenytoin?

- Purple glove syndrome
- Soft tissue injury from extravasation
- Cardiac arrhythmias
- Hypotension

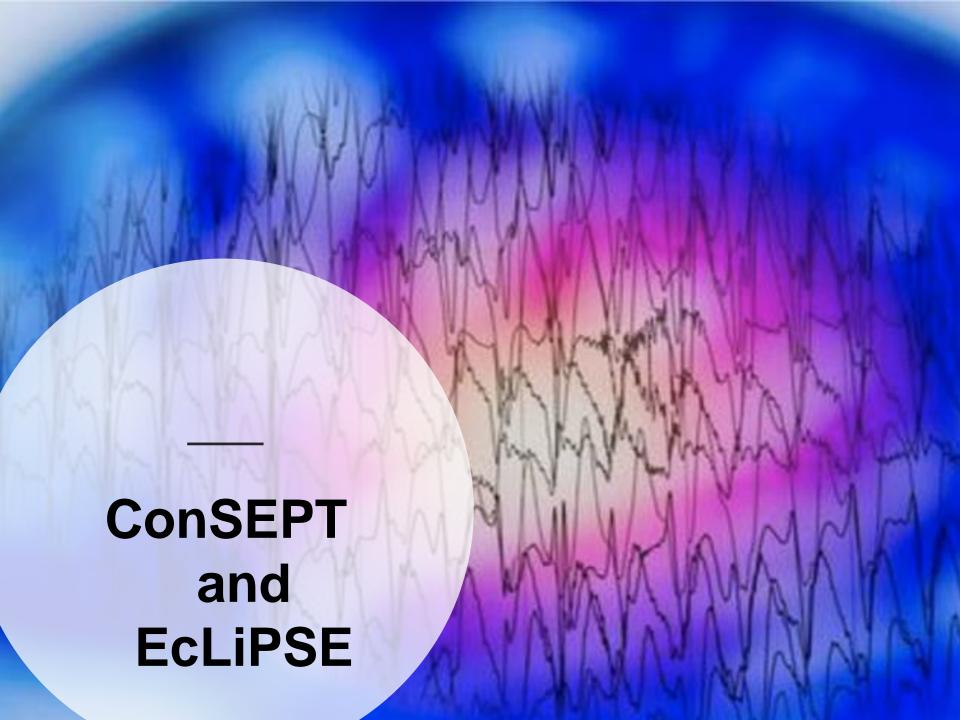


## CSE Levetiracetam an alternative to phenytoin?



Broad spectrum AED Rapid - 5 min infusion Safe

Efficacy = 80% small cohort studies



## ConSEPT convulsive Status Epilepticus Paediatric Trial

# PREDICT Paediatric Research in Emergency Departments International Collaborative

### Aim

 To determine whether IV levetiracetam (40mg/kg, max 3g) or IV phenytoin (20mg/kg, max 1g) is the better second line treatment for CSE in children

### Design

 An open label randomised controlled trial in children presenting to EDs with CSE who were still seizing after 2 doses of benzodiazepines

### ConSEPT 13 sites

Townsville Hospital (QLD)

Lady Cilento Children's Hospital (QLD)

Gold Coast University Hospital (QLD)

John Hunter Hospital (NSW)

Children's Hospital Westmead (NSW)

Sydney Children's Hospital (NSW)

Royal Children's Hospital (VIC)

Monash Medical Centre (VIC)

Women's and Children's Hospital (SA)

Princess Margaret Hospital (WA)

Starship Children's Hospital (NZ)

Kidzfirst Hospital (NZ)

Waikato Hospital (NZ)





### ConSEPT Inclusion/exclusion

Inclusion criteria

- 1. Children aged between 3 months and 16 years
- 2. CSE having failed benzodiazepines





### ConSEPT Outcome

Primary outcome

 Clinical cessation of seizure activity; termination of seizure activity such that the treating physician considers the participant is no longer demonstrating abnormality of movement or tone

Videos used for robustness







-15 min

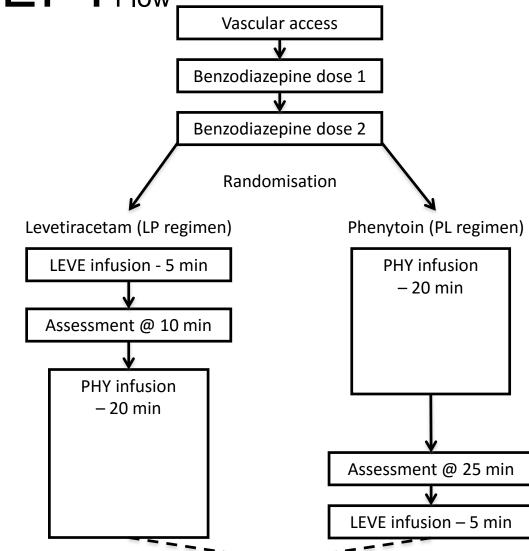
-10 min

-5 min

0 min

+10 min
Primary
outcome
assessment for
levetiracetam

+25 min
Primary
outcome
assessment for
Phenytoin





Usual care following failed 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> line CSE treatment as per treating physician

## Presented CSE n=639

Enrolled n=233

Missed n=127

### Excluded n=278

On phenytoin or levet. 136Mgt plan no phenytoin 58

•Prior randomization 41

•2<sup>nd</sup> line drug 24h 21

•Allergic phenytoin or leve.12

Major head injury

•Other 5

Refused n=1

Phenytoin n=114

Levetiracetam n=119



### History of current status epilepticus presentation

 Febrile - no. (%)
 82 (71.9)
 87 (73.1)

 Focal onset - no. (%)
 14 (12.3)
 14 (11.8)

Length of seizure prior to 1st study med – median (95% CI), h 1.2 (1.1-1.4) 1.2 (1.1-1.4)





Table. Primary efficacy outcome.	Phenytoin	Levetiracetam	Relative risk	
Outcome	(n=114)	(n=119)	(95% CI) 0.84	P value
Clinical cessation of seizure activity @ 5 min (ITT) - no. (%)	68 (59.6)	60 (50.4)	(0.66 to 1.07)	0.16



#### Clinical management prior to starting first study medication - no. (%) Midazolam used as first line anti-convulsant 105 (92.1) 112 (94.1) Manual airway repositioning 75 (65.8) 87 (73.1) Oral or nasal airway placement 13 (11.4) 18 (15.1) Positive pressure ventilation 37 (32.5) 40 (33.6) Tracheal intubation 3 (2.6) 2 (1.7) Fluid bolus 21 (18.4) 28 (23.5) Cardiac compression/defibrillation



<b>Table.</b> Secondary efficacy outcomes.	Table.	Secondary	/ efficacy	outcomes.
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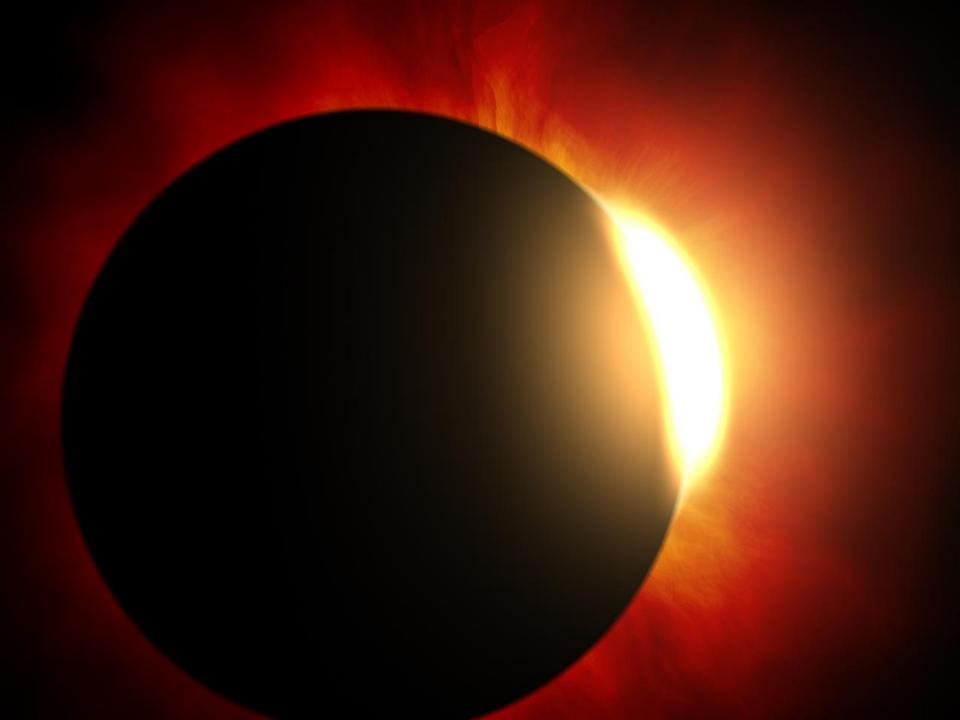
Outcome	Phenytoin (n=114)	Levetiracetam (n=119)
Intubation - n (%)		
Prior to first study medication	3 (2.6)	2 (1.7)
Within first 2 h	13 (11.4)	21 (17.6)
Subsequently during admission	5 (4.3)	8 (6.7)
Total	21(18.4)	31 (26.1)
Intensive care admission - no. (%)	34 (29.8)	39 (32.8)
Length of intensive care admission† - median (95% CI), h	20 (15.1-26.5	) 32 (22.7-53.4)
Length of hospital admission‡ - median (95% CI), h	47 (43.6-58.9	) 50 (45.7-53.8)

P > 0.05



Outcome		Phenytoin (n=114)	Levetiracetar (n=119)
Adverse events in first 2 h	- no. (%)		, ,
Death	• •	0 (0.0)	0 (0.0)
Manual airway reposition	oning	42 (36.8)	45 (37.8)
Oral or nasal airway pla	cement	4 (3.5)	9 (7.6)
Positive pressure ventil	ation	19 (16.7)	30 (25.2)
Tracheal intubation		13 (11.4)	21 (17.6)
Fluid bolus		33 (28.9)	41 (34.5)
Cardiac chest compres	sions	1 (0.9)	0 (0.0)
Cardiac defibrillation		0 (0.0)	0 (0.0)
Allergic reaction		4 (3.5)	0 (0.0)
	nous or intraoseous infusions	3 (2.6)	1 (0.8)
Purple glove syndrome		1 (0.9)	0 (0.0)
Other		6 (5.3)	2 (1.7)
Serious adverse events in	the first 2 h - no. (%)	42 (36.8)	55 (46.2)



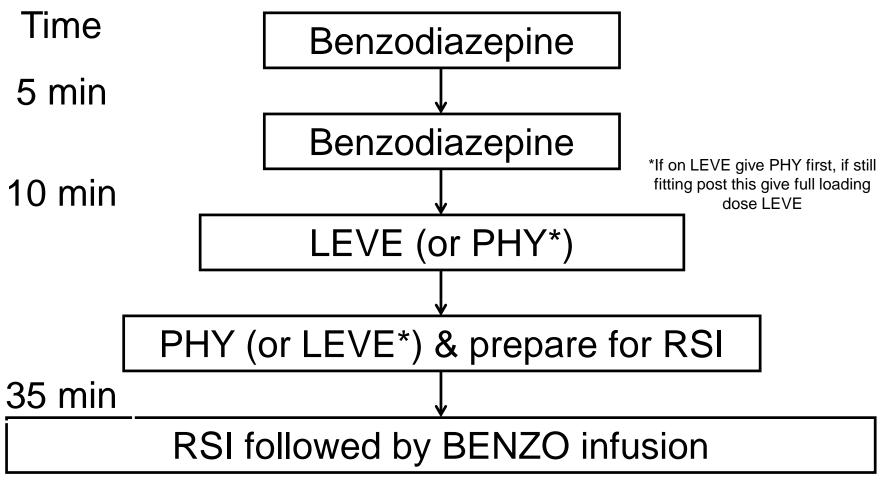




## Starship 2019 guidelines starship













### **SEIZING THE TRUTH?**

**LANCET APRIL 2019** 

#### ConSEPT PREDICT

### **EcLiPSE** PERUKI

WHAT SHOULD THE SECOND LINE TREATMENT FOR STATUS EPILEPTICUS BE?

#### PHENYTOIN

20mg/kg over 20 minutes



#### LEVETIRACETAM

40mg/kg over 5 minutes





6 mo - 18 yrs

30 EDs UK



3 mo - 16 yrs

n = 119

PHENYTOIN

**LEVETIRACETAM** 

n = 134

n = 152



**SEIZURE CESSATION 5 MINUTES AFTER** INFUSION END



TIME FROM **RANDOMISATION TO END OF CONVULSIONS** 

IF THERE WAS ONGOING SEIZURE POST, 37-40% THE OTHER DRUG WAS GIVEN AS THIRD LINE

#### **RESULTS**

#### **SEIZURE CESSATION 5 MIN POST**

PHENYTOIN 60%

**LEVETIRACETAM 50%** 

#### **MEDIAN TIME TO SEIZURE STOP**

PHENYTOIN 45 MIN **LEVETIRACETAM 35 MIN** 

#### CONCLUSION

**LEVETIRACETAM NOT SUPERIOR** 

#### NO SIGNIFICANT DIFFERENCE

READ THE FULL DETB POST ABOUT THIS AT HTTP://DOI.ORG/10.31440/DETB.18696 DONTFORGETTHEBUBBLES.COM @GRACIE\_LEO

