

Breakthrough for children with serious epileptic seizures

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Emergency medicine doctors now have a better way to treat severe epileptic seizures in children, thanks to a New Zealand-Australian study.

Prolonged [epileptic seizures](#) are the most common neurological emergency in [children](#) seen by hospitals. The seizures are potentially fatal: up to five percent of affected children die, and a third suffer long-term complications from brain damage. Crucially, the longer the [seizure](#), the greater the chance of long-term complications.

The study—which will change management of this condition internationally—was published in the prestigious medical journal *The Lancet* this week (Thursday 18 April). It was led by Professor Stuart Dalziel from the Faculty of Medical and Health Sciences at the University of Auckland and Starship Children's Hospital, and the senior author was Professor Franz Babl at Melbourne's Murdoch Children's Research Institute.

In severe seizures, the first line of [treatment](#) (benzodiazepines) only stops the seizures in 40 to 60 percent of patients. Before this study, the second line treatment was the anti-convulsant drug phenytoin, but until now this practice had never been scrutinised in a robust major randomised controlled trial. Also, phenytoin was known to have a number of serious complications.

In this world-leading study, funded by the Health Research Council of New Zealand, researchers compared phenytoin with newer anti-convulsant levetiracetam for the second line treatment of seizures. Levetiracetam is used routinely as a daily medication to prevent seizures, but has not been properly tested against phenytoin for treatment of severe prolonged seizures.

The research, conducted by the PREDICT research network in 13 emergency departments at hospitals in Aotearoa New Zealand and Australia, involved 233 child patients aged between three

months and 16 years.

The researchers found that when given individually, the drugs are as good as each other: both had a moderate success rate (50-60 percent) at stopping a prolonged seizure.

But strikingly, treatment with one drug and then the other increased the success rate of stopping a seizure to approximately 75 percent.

Previously, children who continued seizing after phenytoin then needed to be intubated, sedated and placed on a ventilator in intensive care. By giving these two medications one after the other, researchers have potentially halved the number of children ventilated and sent to intensive care.

"This study has now given us robust evidence to manage children with prolonged seizures without reverting to intubation and [intensive care](#)," says Dr. Dalziel, who is Professor of Emergency Medicine and Paediatrics in the Departments of Surgery and Paediatrics, and a paediatric [emergency](#) medicine specialist at Auckland's Starship Children's Hospital.

"By controlling seizures in the [emergency department](#) we will increase the chance of these children recovering more quickly and returning back to their normal lives," he says. "This research has already changed practice and led to new guidelines in New Zealand and Australia."

"This study is going to profoundly improve treatment for children who are critically ill with epilepsy around the world," says Professor Franz Babl, who is also Professor of Paediatric Emergency Medicine at the University of Melbourne.

More information: Stuart R Dalziel et al, Levetiracetam versus phenytoin for second-line treatment of convulsive status epilepticus in

children (ConSEPT): an open-label, multicentre, randomised controlled trial, *The Lancet* (2019).
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