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## What treatments are beneficial in the prevention of post-traumatic epilepsy?

Source: Piccenna, L, Shears, G and O'Brien, T. Management of post-traumatic epilepsy: An evidence review over the last 5 years and future directions. *Epilepsia Open*. 2017. DOI: 10.1002/epi4.12049

### Plain language summary

Researchers from the Epilepsy Foundation and the Department of Medicine at the University of Melbourne recently published a detailed review looking at treatments for the prevention of post-traumatic epilepsy\*.

A search of the medical literature over the last 5 years found a total of 22 articles. The articles included studies of treatments in adults and children mostly with medications but also surgery and psychological therapies. The studies were completed in the USA (17 articles), Canada (2 articles), Australia (1 article), China (1 article) and the UK (1 article).

The researchers found that:

- The anti-epileptic drug *levetiracetam* showed a small benefit in the prevention of post-traumatic epilepsy in children.
- No effect was found for the use of any anti-epileptic drugs in the prevention or treatment of seizures in adults with post-traumatic epilepsy.
- There was promise shown for in the use of a psychologically directed education program for the improving understanding and management of post-traumatic epilepsy.

Currently, very little is known about how post-traumatic epilepsy is triggered at a molecular level. This could be why no effect was found for the use of anti-epileptic drugs in the prevention or treatment of seizures in adults with post-traumatic epilepsy and only a small effect found in children.

### \*What is post-traumatic epilepsy?

Post-traumatic epilepsy is a serious neurological condition that happens at least 6 months, and sometimes up to 20 years, following a traumatic brain injury. Traumatic brain injuries can include:

- Brain insults, e.g. due to violence (king punches), or sports (concussions),
- Trauma, e.g. accidents (motor vehicles or falls),
- Stroke,
- Tumours, and
- Infections.

While post-traumatic epilepsy accounts for 20% of acquired type epilepsies, it is not well understood or recognised and can be quite disabling. Acquired epilepsies are caused by physical changes in the structure of the brain, or metabolic changes due to age-related conditions, or changes as a result of immune-related conditions, or infections. Acquired epilepsies happen usually after we are born and affect the general function of the brain; they are not caused by genetic factors in our DNA.

Advancements in technology and medical treatment over the years mean that people often survive serious injuries. However, this increase in survival, particularly from severe traumatic brain injuries, means there is also an increase in the risk of developing other health conditions like epilepsy (post-traumatic epilepsy).

### **Why was the research done?**

This research was performed because health professionals and researchers:

- identified that increasing the awareness of the management of post-traumatic epilepsy was important, and
- there was an interest to understand what research studies should be done in the future to encourage progress of new and effective therapies.

It is useful to know what treatments are effective in preventing post-traumatic epilepsy so that a person is able to have the best outcome possible.

Future research studies should look at developing treatments that have more effectiveness in the prevention and treatment of post-traumatic epilepsy in adults and in children.

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