

What's the Evidence? Cannabis-based products to treat childhood epilepsy

Key findings

- Cannabidiol (CBD) and tetrahydrocannabinol (THC) are two drugs which can be extracted from the cannabis plant and have been shown in experiments to have anti-epileptic properties.
- There is evidence that THC can have harmful effects on the developing brain, research has therefore concentrated on the use of CBD as a treatment for epilepsy in children.
- In July 2018 UK law was changed to allow medical practitioners to prescribe cannabis-based products to patients with exceptional clinical need. However, there is currently no agreement in the UK as to how 'medicinal cannabis' is defined.
- Research evidence suggests some children with rare forms of childhood epilepsy (Lennox-Gastaut Syndrome and Dravet Syndrome) or epilepsy which does not respond to standard medication, may benefit from the use of cannabis-based products.
- Grown cannabis or 'artisanal' cannabis cannot be safely used in place of prescribed cannabis-based products.
- Any use of cannabis-based products should be under expert medical supervision.

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What were we asked?

We were asked whether there was any research evaluating the effectiveness of cannabidiol (CBD) for controlling epileptic seizures in children.

What did we do?

We first performed a general internet search for cannabidiol (CBD) and epilepsy. After familiarising with the literature we undertook a systematic search of NHS Evidence, Cochrane, TRIP, NICE, and PubMed databases. We used the search terms 'Cannabis' and 'Epilepsy' in order to

ensure we identified all relevant studies and reports.

What did we find?

What are cannabis, CBD and THC?

Cannabis is a controlled drug. CBD and tetrahydrocannabinol (THC) can both be extracted from cannabis. Both CBD and THC have been shown in experiments to have anti-epileptic properties. However, there is also evidence that THC can have harmful effects on the developing brain, including damage to brain structure and mental

health. Research has therefore concentrated on the use of CBD as a treatment for epilepsy in children.^{1,2}

What are the laws around CBD oil?

CBD oil is legal as long as it contains a maximum of 0.2% THC. CBD oil with no more than 0.2% THC can therefore be sold in the UK. However, if CBD products are to be advertised for medical purposes they need to be licensed. So far no CBD products have a medical license.

What was the oil in the news recently?

The oil which has been in the news recently because of its use in children with epilepsy is cannabis oil, not CBD oil. This oil has higher concentrations of THC and is therefore not usually allowed in the UK.

What's the difference between cannabis based products for medicinal purposes and grown cannabis or cannabis obtained from health food shops or online?

Cannabis-based products used for medical purposes have different concentrations of the drugs which naturally occur in cannabis. This is why grown or 'artisanal' cannabis cannot be safely used in place of prescribed cannabis-based products.¹

The British Paediatric Neurology Association (BPNA) warn that there are cannabis-based products in other countries which have not been tested to the same rigorous standards as used in the UK. There are also a wide range of cannabis-based products available online. Any product containing more than 0.2% THC is currently not legal in the UK. Products with higher concentrations of THC can damage the developing brain. Therefore the BPNA does not recommend their use with children and

young people.² These 'artisanal' cannabis-based products cannot be guaranteed to be pure and there is no scientific evidence for their effectiveness.

There is also debate around the use of the term 'medicinal cannabis'. In the UK there is no agreement as to how 'medicinal cannabis' is defined. Current discussion is focussed on incorporating measures of safety and quality into the definition of 'medicinal cannabis'.

What is the evidence for cannabis-based products to help control epilepsy in children?

In June 2018 the UK Government announced that it would be reviewing the legal classification of cannabis-based products. The Government asked for reviews from the chief Medical Advisor to the UK Government and the UK Government's official drug advisors, the Advisory Council on the Misuse of Drugs (ACMD).

The Chief Medical Advisor to the UK Government published their review of recent evidence on the therapeutic and medicinal benefits of cannabis-based products in June 2018. The key findings in relation to epilepsy were¹:

- The US National Academies of Sciences, Engineering and Medicines (NASEM) report in 2017 found no or insufficient evidence that drugs derived from cannabis are an effective treatment for epilepsy.
- The Health Products Regulatory Authority (HPRA) of the Republic of Ireland 2017 report advised cannabis-based products may be an appropriate treatment for people with severe,

epilepsy that has failed to respond to standard medication.

- The World Health Organisation Expert Committee on Drug Dependence met in June 2018 to discuss a review of CBD (cannabidiol). Their review found one CBD product to be in an advanced stage of clinical trial and multiple other smaller clinical studies showing CBD to be effective at controlling seizures.
- The Australian Government Department of Health review in 2018 concluded there was limited but high quality evidence for the use of cannabis-based products in epilepsy.
- Other regulators have recognised a shift in the evidence for cannabis-based products. In June 2018 the US Food and Drug Administration (FDA) licensed purified CBD (which has the trade name Epidiolex) to treat Lennox-Gastaut syndrome and Dravet syndrome, two rare forms of childhood epilepsy.¹

In July 2018 the Advisory Council on the Misuse of Drugs (ACMD) published their review of the evidence for cannabis-based products. They state *'that there is now evidence of medicinal benefit for some Cannabis-derived products in certain medical conditions for some patients'*.³ They reference studies of cannabis-based products showing positive results in people with Lennox Gastaut Syndrome, Dravet Syndrome, and drug resistant or refractory epilepsy.⁴⁻⁷

What are the recent changes in law relating to cannabis-based products?

Prior to these reviews, cannabis-based products were controlled as Schedule 1

drugs, meaning they had been classed as having no medicinal properties and therefore could not be legally prescribed by a medical practitioner. The key recommendation from both the Chief Medical Advisors report and the ACMD report was that cannabis-based medicinal products be moved out of Schedule 1. In July 2018 it was announced that cannabis-based products would be moved into Schedule 2, meaning they can be legally prescribed. Raw cannabis and THC remain in Schedule 1. Schedule 2 drugs are still controlled and have certain requirements attached. For example, proof of identity is required when collecting a Schedule 2 drug from the pharmacist.

The purified CBD product, known as Epidiolex, is, as the time of publication, going through the European Medicines Agency and will likely be licensed and available in the UK within the next 12 months. Because it contains almost entirely CBD, it is exempt from the scheduling regulations.

What do we conclude?

There is agreement that some cannabis-based products can benefit some children with certain conditions. Specifically, the evidence suggests purified CBD (Epidiolex) can be effective in helping to control seizures for some children with Lennox-Gastaut Syndrome, Dravet Syndrome, and epilepsy which does not respond to standard medication. This drug should be available in the UK within the next 12 month.

The recent change in law means that as well as purified CBD (Epidiolex), other cannabis-based products may now be prescribed for patients with *'exceptional clinical need'*. Any use of cannabis-based products should be

under expert medical supervision. For doctors to be able to prescribe a cannabis-based product to a patient, it would need to be medicinal grade cannabis. However, there is still no agreement in the UK as to how 'medicinal cannabis' is defined.⁸

Epidiolex is soon to be licensed and will therefore be medicinal grade cannabis. However, 'artisanal' cannabis-based products obtained over the internet cannot be guaranteed to be pure. They are therefore unlikely to fulfil a definition of 'medicinal cannabis', meaning doctors will be unable to prescribe them.

If you think your child might benefit from a cannabis-based medicinal product we

We would like to hear your feedback on this summary – please email us at pencru@exeter.ac.uk if you have any comments or questions.

References

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3. Advisory Council on the Misuse of Drugs (July 2018) Scheduling of cannabis-derived medicinal products: ACMD response (Online) Available at: <https://www.gov.uk/government/publications/advice-on-scheduling-of-cannabis-based-medicinal-products>
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6. Devinsky O, et al. (2017) Trial of cannabidiol for drug resistant seizures in the Dravet syndrome. *New Eng J Med*.
7. Tzadok M, et al. (2016). CBD-enriched medical Cannabis for intractable pediatric epilepsy: The current Israeli experience. *Seizure*.
8. Advisory Council on the Misuse of Drugs. (2018) Re: Consultation on Cannabis-derived medicinal products. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739636/Consultation_on_Cannabis-derived_medicinal_products.pdf

strongly recommend you discuss this with your child's doctor.

Signposts to other information

- www.epilepsy.org.uk
Epilepsy Action provide helpful information and resources
- www.epilepsysociety.org.uk
Epilepsy Society also provide information and resources which may be helpful.
- www.youngepilepsy.org.uk
Young Epilepsy focusses on better futures for young lives with epilepsy and associated conditions.

Note: the views expressed here are those of the Peninsula Cerebra Research Unit (PenCRU) at the University of Exeter Medical School and do not represent the views of the Cerebra charity, or any other parties mentioned. We strongly recommend seeking medical advice before undertaking any treatments/therapies not prescribed within the NHS