

## Epilepsy apps – man and dog’s best friend



### WHO

## Global epilepsy

Epilepsy Society’s medical director Professor Ley Sander has welcomed a new World Health Assembly resolution urging countries around the world to strengthen their efforts to provide care for people with epilepsy.

Professor Sander works with the World Health Organization’s (WHO) global campaign against epilepsy to improve the way epilepsy is managed in resource-poor countries including China, Brazil, Ecuador, Georgia, Bulgaria, Kenya and Senegal.

He said: ‘It’s excellent news that delegates at the World Health Assembly, including those from the UK, have endorsed this resolution in support of improving epilepsy care and research for people across the globe. Now that the resolution is approved, epilepsy and the issues surrounding it will be firmly in the spotlight.’

The Royal Veterinary College has worked with Epilepsy Society to produce an app for the owners of dogs with seizures. Read about the parallels – and differences – between canine and human epilepsy and find out how research into one could benefit the other.

**An app for dogs? Page 8**  
**The latest apps, page 20**

### SEIZURE CONTROL

## Omega-3

A low dose of omega-3 fatty acids contained in fish oil capsules may help reduce seizure frequency by up to 33 per cent in those with uncontrolled epilepsy. This is according to a small study by researchers at UCLA School of Medicine, Los Angeles. The scientists caution however that the results are preliminary and a larger study is needed to confirm findings. Previous studies using high doses of omega-3 fatty acids showed no clear benefits.

## News in brief



In 2014 70% of 211 commissioning groups had no plans to assess needs of neurology patients. Page 4



Only 55% of first seizure patients in emergency departments referred to a neurologist.

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*This award is a great honour which I dedicate to all the children with epilepsy with whom I have had contact.*



Professor Helen Cross, Prince of Wales Chair of Childhood Epilepsy, on receiving an OBE



**\$137,000 awarded by Health Research Council in New Zealand to develop nose-to-brain epilepsy drug delivery.**



Professor Holger Volk and Dr Rowena Packer at the CT scanner with Betty, almost a staff member at the RVC. Tests for dogs with seizures include MRI scans, EEGs and CT scans. Dogs usually have to be mildly sedated for tests, although co-operative dogs can sometimes have an EEG without sedation.

## An app for dogs?

... well not quite, but certainly an app for dog owners. The Royal Veterinary College has worked with Epilepsy Society to develop the first ever app that allows dog owners to monitor their pets with epilepsy. The RVC Pet Epilepsy Tracker is based on the charity's epilepsy toolkit app. Canine epilepsy experts Professor Holger Volk and Dr Rowena Packer hope that not only will it bring a better understanding of seizures in dogs but it could also contribute to a wider understanding of the condition in humans. Here they talk about what epilepsy is like for our canine friends

### How common is epilepsy in dogs?

**Rowena** It is very common. In fact it is the most common long-term neurological condition in dogs. There are 9.4 million dogs in the UK and 50,000 of them have epilepsy. That is a prevalence of 0.6 per cent. Certain breeds seem to be more likely to develop epilepsy such as Border Collies, German shepherd dogs, Staffordshire bull terriers and Labrador retrievers. Studies show that male dogs are more prone to seizures than females.

### What sort of seizures do dogs generally have?

**Holger** We tend to see dogs that have focal seizures with secondary generalised seizures. If a dog is lying on the ground shaking, that is very easy to detect. It would be difficult to detect if a dog was experiencing lapses in consciousness, sight or vision. As in humans, there is often a genetic component to the epilepsy or it could be as a direct result of a stroke, brain tumour, cortical inflammation or hydrocephalus. We see a lot of dogs with seizures caused by head injuries from traffic accidents or from running into trees and other obstacles.

### Does epilepsy affect dogs in the same way that it affects humans?

**Holger** Very much so but there are differences. As with people, seizures in dogs are unpredictable and often uncontrollable. In humans, two thirds of people with

epilepsy will respond to anti-epileptic medication. In dogs only one third respond well to this treatment.

Dogs with recurrent seizures have an increased risk of experiencing fear, anxiety and depression. They are also more likely to develop behavioural changes, have learning difficulties, develop defensive aggression and to have a reduced quality of life. Even when the medication works, there can be side effects, just as in humans. Anti-epileptic drugs can make dogs sleep a lot, drink a lot and need to go to the toilet much more. This all impacts on their quality of life.

The stigma around epilepsy is very different for people and dogs. I notice on the internet that if someone posts a video of a person having a seizure there are often a lot of insensitive and negative comments. If someone posts a video of a dog having a seizure, there will be more sympathetic comments. People seem to be much nicer to dogs than they are to their own species.

### How does epilepsy impact on the dog's owners?

**Rowena** Studies have shown that when a dog has a seizure, not only does the dog's stress levels rise but so does the owner's. It can be very distressing to witness a dog having a seizure. Looking after a sick pet can present an emotional burden, as well as practical issues such as constantly medicating the dog, checking for side effects and coping with ongoing financial costs.

Many owners are reluctant to start AED treatment with their pets for fear of reduced quality of life. Side effects from AEDs were one of the top reasons cited by around one third of owners for a decreased quality of life in their dogs.

Epilepsy in dogs can present specific issues for dog owners who rely on dog sitters and dog walkers during the working week. Often they are unable to find someone who is willing to take on a dog that is likely to have a seizure and this can make life very difficult.

**Holger** We also see owners who totally change their lives around to look after their dog. The bond between owner and dog can be very strong, especially when they spend so much time with them.

Of course all dog owners hope that treatment will result in complete seizure freedom for their pet, although statistically there is only a 33 per cent chance of this happening. Many consider one seizure every three months to be tolerable for the dog. In some cases, where this is not achievable and the owner feels the dog is suffering, they may make the difficult decision to elect euthanasia.

As a vet it is very important to interact with the dogs we see in order to build up their trust. Stroking them and talking to them helps to build up a bond and of course, it is hard not to become attached to the dogs. This makes it very hard when it is bad news.

### Do dogs take the same anti-epileptic medication as people?

**Holger** Much of the time yes. Dogs can be prescribed levetiracetam, zonisamide, gabapentin, pregabalin and topiramate but the two most commonly prescribed anti-epileptic drugs for dogs are phenobarbital and potassium bromide.

Recently a new drug has been introduced - imepitoin. Some years ago this was prescribed in human epilepsy but it was not found to be suitable for people who smoked and so was withdrawn. However it is a very safe drug for dogs and may have the potential to help with fear and anxiety.

Interestingly, in the veterinary field we take a different approach to prescribing medication in dogs. In humans, the protocol is always to start low and go slow whenever a new or additional drug is introduced. With dogs we tend to start with the dose for optimum seizure control and tolerate a bit of initial wobbling or co-ordination problems while the dog is adjusting to the medication.

### Are there any other treatment options for dogs?

**Holger** We have carried out a small study into the use of a modified version of the ketogenic diet in 21 dogs. The ketogenic diet relies on inducing ketosis so that the body obtains its energy from fat rather than glucose. It is actually very hard to induce ketosis in dogs as they are descended from wolves and are biologically programmed to survive a degree of starvation. Feeding them regularly as we do is not natural for dogs.

We trialled a version of the ketogenic diet that allows for more carbohydrates and protein than the traditional high fat ketogenic diet. More than half of the dogs had more than 50 per cent reduction in seizure frequency when on the diet. Fourteen per cent became seizure free.

### Can we learn anything about epilepsy in humans by looking at epilepsy in dogs?

**Holger** Most definitely. Research at our canine epilepsy clinic showed that the more accurate indication of whether a dog will achieve seizure freedom is the closeness of its seizures rather than the number of seizures it is having. Similar results have been found in human epilepsy, highlighting the dog as a naturally occurring model of epilepsy. Our research into drug treatments for epilepsy in dogs could help to further our understanding of the condition in humans.

Our new app for dogs with epilepsy will allow owners to record patterns of seizure activity and medication diaries and send this directly to their vet. It will also give them the opportunity to share their records anonymously with the Royal Veterinary College. This could revolutionise our understanding of the way that epilepsy progresses in individual dogs and provide data for long-term studies of seizure activity in canine epilepsy.

In turn, this could advance our understanding of human epilepsy.

**Professor Holger Volk is professor of veterinary neurology and neurosurgery and clinical director of the RVC Queen Mother Hospital for Animals.**

**Dr Rowena Packer is clinical investigation research assistant at the RVC.**



## ◀ A dog called Casey

Casey is a beautiful three-year-old Border Collie. She had her first seizure at 11 months and is going through her first change of anti-epileptic medication. Her owner, Fran Agnew, talks about the impact of Casey's seizures

'The first time Casey had a seizure I thought she had been poisoned. She was sick and shaking. I put my hand in her mouth thinking I needed to remove something toxic and she bit me quite badly. I was mortified to see her like that and really panicked. The neighbours heard me screaming and came and took control. After that I went on to Google to find out everything I could about seizures.

I wanted to make sure that if it happened again, I would be prepared.

Casey's seizures are grand mal. She falls to the ground, starts paddling her legs, loses control of her bowels and starts snapping. It is very distressing to witness. The seizures often happen as she is falling asleep or coming out of a deep sleep. They always seem to be when she is resting. When she is busy and active they don't seem to bother her so much. That is one of the reasons why we got a second dog, Enzo, to play with her and help keep her occupied. She loves to compete in flyball, a four-dog relay race over jumps, and her epilepsy never bothers her then.

Casey's seizures usually last two to three minutes and tend to leave her very tired and hungry. She can also become extremely hot so we try to cool her down by placing ice on her back and between her shoulders.

When she comes out of a seizure she doesn't know where she is and starts sniffing everything as though she has only just arrived. She doesn't recognise Enzo or our cats. After about 40 minutes of stroking her and talking to her she usually falls into a very deep, hard sleep for a couple of hours. When she wakes up she is as right as rain. We take her out for a run and you wouldn't know anything has happened to her.

Casey didn't have her second seizure for nine months and then they started to come more frequently. Although the vet thought from the outset that it was likely she had epilepsy, we wanted to see if they could be controlled another way and have all the tests to rule out other causes. It was only after a few more months when she started having two in a week that she was put on imepitoin,

a relatively new drug thought to be the least invasive of the epileptic drugs.

For 18 months her epilepsy seemed to be well controlled and then she started having breakthrough seizures, sometimes two in a day. She is now slowly changing to phenobarbital. The side effects from the drugs mean she is a little overweight and can be quite sleepy. Since starting phenobarbital her back legs seem quite wobbly and uncoordinated. She also has a lot of head twitches which we hope will diminish as she adapts to the new drug.

Casey has to take her medication at 12-hourly intervals on the dot – 6am and 6pm so there are no lie-ins for us. She is very good at reminding us about her medication. Quarter of an hour before it is due, she will either whimper to wake us up or tap us on the arm. She is a very intelligent dog. Casey now has to have regular blood tests to check her therapeutic drug levels. This is very stressful for her.

I have given up work so that I can look after Casey full time. She is totally reliant on my husband Shane and myself. The emotional, physical and financial burden of looking after her can be quite difficult to cope with but we wouldn't want to be without her. She is our responsibility and we want her to have the best life possible.

When Shane and I got married two years ago, we left Casey with a neighbour while we went to Mauritius for our honeymoon. While we were away she had two seizures. Now we have bought a caravan so that we can holiday in the UK with Casey and, of course, Enzo. We are hoping that in time, Enzo might learn to recognise Casey's seizures and be able to warn us when they are going to happen.'

## Epilepsy app – man and dog's best friend



### Epilepsy toolkit app for people

Epilepsy Society

Available from: App store or Google Play (search: epilepsy toolkit)

#### Features include:

- seizure diary and medication reminder
- medication details, record and photograph your drugs
- video recording your seizures
- first aid and recovery position guide.



### RVC pet epilepsy tracker for dogs

Royal Veterinary College

Available from: App store or Google Play

#### Features include:

- seizure types, diagnosis and managing epilepsy
- seizure diary
- medication reminder
- option to share data for research purposes.