

# CANINE EPILEPSY OVERVIEW

Epilepsy is the #1 neurological condition in dogs<sup>10</sup>

Most idiopathic seizures commence between

1 and 3 years of age<sup>11</sup>

An estimated

1 in 111 dogs are affected by epilepsy<sup>10</sup>

Breeds with genetic predisposition to epilepsy<sup>12</sup>

- Labrador Retriever, Belgian Shepherd, Petit Basset Griffon Vendeen, Boxer, Irish Wolfhound, English Springer Spaniel, Vizsla, Bernese Mountain Dog, Standard Poodle, Border Collie, Australian Shepherd, Border Terrier
- While these are the most commonly affected breeds, any breed/dog can be affected

Goal of Epilepsy Management

## REDUCE OR ELIMINATE SEIZURE ACTIVITY



Reduction in seizure frequency of at least 50% is considered successful.<sup>13</sup>



66% of dogs continue to have seizures long-term<sup>14</sup>



20% of dogs remain poorly controlled despite appropriate medication<sup>15,16,17</sup>

# DIETARY SUPPLEMENTATION WITH MEDIUM CHAIN TRIGLYCERIDES (MCT) SHOWN TO REDUCE SEIZURE FREQUENCY IN EPILEPTIC DOGS

A recent clinical study investigated the effect of feeding a diet supplemented with medium chain triglycerides to dogs with idiopathic epilepsy receiving AEDs<sup>1</sup>.

Veterinary researchers are constantly searching for alternative or adjunctive efficacious treatments for idiopathic epilepsy. Approximately 1/3 of humans and dogs with epilepsy continue experiencing seizure, despite appropriate antiepileptic treatment.

Dietary manipulation has long been studied in humans as a way of improving seizure management.

A "classic" ketogenic diet (consisting of high fat, low protein, low carbohydrates typically with ratios up to 4:1 fats to proteins and carbohydrates) was first recommended for managing epilepsy in children in the 1920s<sup>2</sup>. As fasting was known to have anticonvulsant properties in children<sup>3</sup> the aim was to mimic the metabolic state and biochemical changes associated with fasting through dietary manipulation (still a recognised adjunct therapy for epileptic people).

Due to the antiepileptic effectiveness observed in "classic" ketogenic diets, other more palatable and better tolerated ketogenic diets have been tried in people- including diets containing MCTs<sup>4,5</sup>. MCTs are more efficiently digested and absorbed by the GI tract than long chain triglycerides (LCTs) and the resulting medium chain fatty acids (MCFAs) are more efficiently transported to the liver via the portal vein where they are converted to ketone bodies<sup>6,7</sup>. Consequently diets rich in MCTs are considered more ketogenic than LCT-rich diets<sup>8</sup>.

In a recent groundbreaking study<sup>1</sup>, a diet containing medium chain triglycerides MCTs was investigated for its anti-seizure effects in dogs. Diets containing MCTs are not only metabolically ketogenic in dogs but the MCT decanoic acid also appears to have anti-seizure effects due to its non-competitive AMPA receptor antagonist actions<sup>9</sup>.



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## STUDY OBJECTIVE

The primary aim of the study was to determine the antiseizure efficacy of the ketogenic MCT diet in antiepileptic drug-treated dogs with idiopathic epilepsy compared with a standardised placebo control diet.

## STUDY METHOD

- **Recruitment:** Dogs diagnosed with idiopathic epilepsy on anti-epileptic medication but still having seizures ( $\geq 3$  seizures in last 3 months)
- **Design:** 6-month prospective, randomised, placebo-controlled, double blinded, crossover design, 21 dogs fed test diet with MCT oil for 3 months then control diet for 3 months
- **Diets tested:** Test and control diets identical except test diet contained 5.5% MCT vs. 0% in control diet
- **Duration:** 6 months
- **Tests performed:** The following data was collected for each dog on days 2, 90 and 180 of the study:
  - Seizure frequency (generalised seizures)
  - Body weight
  - Serum phenobarbitone and/or potassium bromide concentrations as appropriate
  - Complete blood cell count, standard clinical chemistry and dynamic bile acids
  - Adverse events
  - Visual analogue score for ataxia, sedation and quality of life
  - Ketone bodies ( $\beta$ -hydroxybutyrate)

## OTHER RESULTS

- No significant differences in serum concentrations of phenobarbitone or potassium bromide between diet groups
- No significant effect serum concentration of glucose
- The test diet group had significantly higher levels of  $\beta$ -hydroxybutyrate than the control diet group

## CONCLUSION

The authors of the study made the following conclusion: This study provides evidence for the positive effects on reduction of both seizure frequency and seizure day frequency per month in dogs with idiopathic epilepsy when fed an MCT enriched diet as an adjunct to veterinary therapy.

## References

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## RESULTS

Most dogs with idiopathic epilepsy showed a reduction in seizure frequency in 90 days when fed a test diet with MCT oil, as an adjunct to veterinary therapy

 **71%** of dogs showed a reduction in seizure frequency

 **48%** of dogs showed a 50% or greater reduction in seizure frequency

 **14%** of dogs achieved complete seizure freedom

