



## Therapeutic ketosis and the broad field of applications for the ketogenic diet: Ketone ester applications & clinical updates

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### Abstract:

It has been recently shown that nutritional ketosis is effective against seizure disorders and various acute/chronic neurological disorders. Physiologically, glucose is the primary metabolic fuel for cells. However, many neurodegenerative disorders have been associated with impaired glucose transport/metabolism and with mitochondrial dysfunction, such as Alzheimer's/Parkinson's disease, general seizure disorders, and traumatic brain injury. Ketone bodies and tricarboxylic acid cycle intermediates represent alternative fuels for the brain and can bypass the ratelimiting steps associated with impaired neuronal glucose metabolism. Therefore, therapeutic ketosis can be considered as a metabolic therapy by providing alternative energy substrates. It has been estimated that the brain derives over 60% of its total energy from ketones when glucose availability is limited. In fact, after prolonged periods of fasting or ketogenic diet (KD), the body utilizes energy obtained from free fatty acids (FFAs) released from adipose tissue. Because the brain is unable to derive significant energy from FFAs, hepatic ketogenesis converts FFAs into ketone bodies-hydroxybutyrate (BHB) and acetoacetate (AcAc)-while a percentage of AcAc spontaneously decarboxylates to acetone. Large quantities of ketone bodies accumulate in the blood through this mechanism. This represents a state of normal physiological ketosis and can be therapeutic.

### Biography:

Raffaele Pilla, Pharm.D., Ph.D., Doctor Europaeus, received his Master's degree in Pharmacy at G. d'Annunzio University in Chieti-Pescara, Italy in 2005, where he



also served internships at the Cell Physiology Laboratory and Molecular Biology Laboratory. Prior, he was an Erasmus Student at Faculté de Pharmacie de Reims in Reims, France. He received his Doctor Europaeus in 2010 from Pitié-Salpêtrière Institute in Paris, France. Also in 2010, he received his Ph.D.

### Recent Publications:

1. D'Angelo G., Pilla R., Dean J.B. and Rampone S. Toward a soft computing-based correlation between oxygen toxicity seizures and hyperoxic hyperpnea Soft Computing: DOI 10.1007/s00500-017-2512-z (2017)
2. Pilla R. The ketogenic diet approach as metabolic treatment for a variety of diseases J. Epilepsy: 2:2 <http://dx.doi.org/10.4172/24720895.1000e010> (2016)
3. Viggiano A., Pilla R., Arnold P., Monda M., D'Agostino D.P., Zeppa P. and Coppola G. Different calorie restriction treatments have similar anti-seizure efficacy. Seizure: Feb; 35:45-9 (2015) 4

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