

# **The Science of Ketosis:**Significant Research Publications



# Discover the Cutting-Edge Science Behind Ketogenic Therapy

Among the hundreds of studies published, we've highlighted the most impactful papers across various disease states. These include research demonstrating ketogenic nutrition's potential to put type 2 diabetes into remission, improve symptoms and quality of life in Parkinson's disease patients, and provide significant metabolic and psychiatric benefits for individuals with severe mental illnesses. These studies represent just a glimpse of the expanding body of research, which is opening new doors for transformative advancements in chronic disease management.

#### Spotlight on Keto Research: Key Publications

#### **Psychiatry and Neurology**





#### ★ Cambbell and Campbell. The metabolic overdrive hypothesis: hyperglycolysis and glutaminolysis in bipolar mania

https://pubmed.ncbi.nlm.nih.gov/38273108/

This paper suggests that energy dysregulation in the brain plays a key role in bipolar disorder, particularly during episodes of mania. Researchers propose that mania may result from the brain shifting to alternative energy sources, like glucose and glutamate, leading to heightened brain metabolism and excitatory activity. While this process can be helpful for short-term energy demands, it may become harmful over time, contributing to the symptoms of mania; the authors highlight this as a new direction for understanding its biological causes.

## ★ Sethi et al. Ketogenic Diet Intervention on Metabolic and Psychiatric Health in Bipolar and Schizophrenia: A Pilot Trial

https://pubmed.ncbi.nlm.nih.gov/38547601/

A ketogenic diet (KD) may improve both metabolic and psychiatric health in individuals with bipolar disorder or schizophrenia. In this 4-month pilot trial, participants experienced significant metabolic improvements, including reduced BMI, visceral fat, and insulin resistance. Additionally, psychiatric symptoms improved, with reduced severity of psychotic symptoms and enhanced life satisfaction and sleep quality. These findings highlight the potential of KD as an adjunctive therapy for serious mental illnesses.

#### ★ Olivito et al. Mediterranean ketogenic diet accounts for reduced pain frequency and intensity in patients with chronic migraine: A pilot study

https://www.clinicalnutritionjournal.com/article/S0261-5 614(24)00207-3/fulltext

A pilot trial investigated the effects of a Mediterranean ketogenic diet on chronic migraine patients over 8 weeks. Participants experienced a significant reduction in migraine frequency (from 17.5 to 3 attacks per month) and intensity (from 8.4/10 to 3.6/10). The intervention also enhanced metabolic health, leading to weight loss and lowering insulin levels and HOMA-IR, suggesting that the Mediterranean ketogenic diet may help manage migraines by reducing oxidative stress and neuroinflammation. However, larger controlled studies are needed to confirm these findings.

#### ★ Allen et al. Ketogenic Diet Induced Shifts in the Gut Microbiome Associate with Changes to Inflammatory Cytokines and Brain-Related miRNAs in Children with Autism Spectrum Disorder

https://pubmed.ncbi.nlm.nih.gov/38794639/

A pilot study looked at how a modified ketogenic diet (KD) affected children with autism spectrum disorder (ASD) over four months. The diet led to clear changes in the gut microbiome, including increased microbial diversity and higher levels of butyrate kinase gene expression. It also lowered certain inflammatory markers in the blood (IL-1 $\beta$  and IL-12p70) and changed levels of brain-related microRNAs that are involved in inflammation and brain function. These findings suggest the KD may help improve ASD-related behaviors by supporting a healthier gut–brain connection and reducing inflammation.



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#### **Neurodegeneration**



★ Tidman et al. Impact of a keto diet on symptoms of Parkinson's disease, biomarkers, depression, anxiety and quality of life: a longitudinal study

https://pmc.ncbi.nlm.nih.gov/articles/PMC11457624/

This study investigated the effects of a 24-week ketogenic diet on seven adults with Parkinson's disease. The results showed significant improvements in weight, BMI, inflammation markers, mood, anxiety, and motor symptoms, as well as enhanced quality of life and cognitive clarity. The findings suggest that a ketogenic diet is a safe and potentially effective intervention for improving both physical and mental health outcomes in Parkinson's disease.

★ Schweickart et al. Serum and CSF metabolomics analysis shows Mediterranean Ketogenic Diet mitigates risk factors of Alzheimer's disease

https://www.nature.com/articles/s44324-024-00016-3

A Mediterranean Ketogenic Diet (MKD) may help address metabolic issues linked to Alzheimer's disease. This randomized trial compared the effects of a modified MKD and the American Heart Association Diet (AHAD) on Alzheimer's disease risk factors in older adults. Over six weeks, the MKD improved metabolic profiles by increasing ketone levels, reducing inflammation, enhancing lipid profiles, and increasing amino acid levels in cerebrospinal fluid, while the AHAD had little impact.

★ Phillips and Picard. Neurodegenerative disorders, metabolic icebergs, and mitohormesis

https://pubmed.ncbi.nlm.nih.gov/39242576/

This insightful review introduces a fresh perspective on neurodegenerative diseases, focusing on their shared hallmark: impaired mitochondrial function. Over time, chronic exposure to environmental and genetic factors leads to impaired mitochondrial biology, eventually surfacing as hallmark neurological symptoms. The authors suggest that repairing mitochondrial function through mitohormesis—a balance of mitochondrial stress and recovery—could be a promising strategy for preventing and treating neurodegenerative disorders.

Madhavan et al. β-hydroxybutyrate is a metabolic regulator of proteostasis in the aged and Alzheimer disease brain

https://pubmed.ncbi.nlm.nih.gov/39626664/

This study found that the ketone body  $\beta$ -hydroxybutyrate ( $\beta HB$ ) directly alters the solubility of misfolded proteins, including those linked to neurodegenerative diseases like Alzheimer's.  $\beta HB$  selectively targets unstable or misfolded proteins, reducing their toxicity by promoting their insolubilization and clearance. These effects were confirmed across multiple models — including cell cultures, aged mice, and C. elegans — and were especially effective against amyloid-beta. The findings suggest a novel, non-energetic role for  $\beta HB$  in supporting brain health through improved protein homeostasis.



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#### Type 2 Diabetes



★ McKenzie et al. 5-Year effects of a novel continuous remote care model with carbohydrate-restricted nutrition therapy including nutritional ketosis in type 2 diabetes: An extension study

https://pubmed.ncbi.nlm.nih.gov/39433217/

A long-term ketogenic diet, combined with continuous remote support, showed promise for both improving and achieving remission of type 2 diabetes. In a 5-year study, 20% of participants on a very-low-carbohydrate, telemedicine-supported intervention achieved diabetes remission, while many others experienced significant improvements in glycemic control, cardiovascular risk factors, and reduced reliance on medication. This approach opens up exciting possibilities for long-term diabetes management.

★ Ghasemi et al. Impact of very low carbohydrate ketogenic diets on cardiovascular risk factors among patients with type 2 diabetes; GRADE-assessed systematic review and meta-analysis of clinical trials

https://pubmed.ncbi.nlm.nih.gov/39030553/

A systematic review and meta-analysis of 29 clinical trials revealed that very low-carbohydrate ketogenic diets (VLCKDs) significantly improved glycemic control — including reductions in HbA1c, fasting glucose, and HOMA-IR — in individuals with type 2 diabetes. Additionally, VLCKDs were associated with lower triglyceride levels and reduced systolic blood pressure, suggesting a potential to improve cardiovascular risk factors in people with diabetes I think that how old is description for me yesterday for and I just wanted to see if that would be available to pick up this week thank you Friday night.

★ Unwin et al. What predicts drug-free type 2 diabetes remission? Insights from an 8-year general practice service evaluation of a lower carbohydrate diet with weight loss

https://nutrition.bmj.com/content/6/1/46

An 8-year real-world study by David Unwin and his team demonstrated that a low-carbohydrate diet can lead to drug-free remission of type 2 diabetes (T2D) and significant health improvements. Among 186 patients, weight dropped by an average of 22 lbs (10 kg), blood glucose levels improved, and remission was achieved in 77% of those diagnosed within a year and 20% of those with T2D for over 15 years. The findings highlight a critical "window of opportunity" for newly diagnosed patients to reverse diabetes, while others still experienced notable benefits, including reduced cholesterol, blood pressure, and medication costs.



#### **Type 1 Diabetes**



## ★ Watso et al. Advanced cardiovascular physiology in an individual with type 1 diabetes after 10-year ketogenic diet

https://pubmed.ncbi.nlm.nih.gov/38912731/

A recent case study of an adult with type 1 diabetes on a ketogenic diet for 10 years found HbA1c, triglycerides, and other cardiometabolic biomarkers within target ranges, with no signs of cardiac dysfunction and below-average CVD risk compared to typical type 1 diabetes norms. While further research is needed, these findings suggest that a ketogenic diet may improve glycemic control and reduce long-term cardiovascular risks in type 1 diabetes.

### ★ Koutnik et al. Efficacy and Safety of Long-term Ketogenic Diet Therapy in a Patient With Type 1 Diabetes

https://pubmed.ncbi.nlm.nih.gov/38989268/

This case report highlights a patient with type 1 diabetes who successfully maintained glycemic control on a long-term ketogenic diet, achieving an HbA1c of 5.5% and 90% glucose time-in-range while reducing daily insulin requirements by 43%. No adverse effects on thyroid function, kidney function, or bone health were observed, suggesting significant therapeutic benefits of a ketogenic diet in type 1 diabetes management.

## → Ozoran et al. Prolonged remission followed by low insulin requirements in a patient with type 1 diabetes on a very low-carbohydrate diet

https://pmc.ncbi.nlm.nih.gov/articles/PMC10895325/

A case report of a man newly diagnosed with T1D found that adopting a very-low-carb diet improved HbA1c from 11.6% to 6.2% within 11 months, reduced glycemic variability, and minimized insulin use. The patient achieved temporary insulin-free remission and maintained stable blood glucose levels with low insulin requirements six years following diagnosis, demonstrating potential benefits of low-carb diets for managing T1D.



#### Spotlight on Keto Research: Key Publications

#### **Obesity and Overweight**



## **★** Volek et al. Nutritional Considerations During Major Weight Loss Therapy: Focus on Optimal Protein and a Low-Carbohydrate Dietary Pattern

https://pubmed.ncbi.nlm.nih.gov/38814519/

This review examines the role of optimal nutrition during significant weight loss, emphasizing adequate protein intake to preserve lean mass and the benefits of low-carbohydrate and ketogenic diets. Achieving euketonemia (circulating ketones of 0.5–5.0 mM) is highlighted as a key metabolic state that promotes fat loss while maintaining lean body mass, with additional potential benefits for metabolic health. The authors also discuss the synergistic role of resistance training and proper mineral intake, which can enhance body composition and long-term weight management outcomes.

## ★ Erta et al. Impact of a 12-Week Dietary Intervention on Adipose Tissue Metabolic Markers in Overweight Women of Reproductive Age

https://pubmed.ncbi.nlm.nih.gov/39126081/

In a 12-week trial, both calorie restriction and low-starch diets improved adipose tissue metabolism in overweight women of reproductive age. Calorie restriction enhanced insulin sensitivity, while the low-starch diet reduced glucose variability. The authors suggest that salivary amylase activity could serve as a biomarker for tailoring dietary recommendations, offering the potential for personalized nutrition strategies in this population.

## ★ Li et al. Ketogenic diet-induced bile acids protect against obesity through reduced calorie absorption

https://www.nature.com/articles/s42255-024-01072-1

This study explores how a ketogenic diet can help with weight loss and glucose control by influencing gut bacteria and specific bile acids. The researchers found that a ketogenic diet increases levels of the bile acids TDCA and TUDCA in mice, which in turn reduces body weight and fasting glucose by limiting energy absorption in the gut.





★ Dynka et al. Beneficial Effects of the Ketogenic Diet on Nonalcoholic Fatty Liver Disease

https://pubmed.ncbi.nlm.nih.gov/39200999/

This review highlights the potential of a well-formulated ketogenic diet as a treatment for metabolic dysfunction-associated steatotic liver disease (MASLD), formerly known as non-alcoholic fatty liver disease (NAFLD), and emphasizes its positive effects on insulin resistance, body weight, and inflammation. The authors also encourage patients to take an active role in their health through self-education and self-monitoring.

★ Pinsawas et al. Asian Low-Carbohydrate Diet with Increased Whole Egg Consumption Improves
Metabolic Outcomes in Metabolic Syndrome: A 52-Week Intervention Study

https://pubmed.ncbi.nlm.nih.gov/39245182/

A 52-week study found that an Asian ketogenic diet significantly improved metabolic outcomes in individuals with metabolic syndrome. The diet enhanced weight loss, improved insulin sensitivity, and positively impacted lipid profiles. Notably, whole egg consumption provided additional benefits in reducing inflammation compared to egg whites alone, offering a promising strategy for managing metabolic syndrome.

**★** Cooper et al. Ketosis Suppression and Ageing (KetoSAge) Part 2: The Effect of Suppressing Ketosis on Biomarkers Associated with Ageing, HOMA-IR, Leptin, Osteocalcin, and GLP-1, in Healthy Females

https://pubmed.ncbi.nlm.nih.gov/39062126/

Part 2 of the KetoSAge study showed that suppressing ketosis in healthy women following a long-term ketogenic lifestyle worsened biomarkers associated with ageing. These biomarkers returned to baseline when ketosis was re-established, emphasizing the metabolic flexibility of these individuals. These data highlight the potential benefits of sustained nutritional ketosis in prolonging healthspan.



#### Women's Health



## ★ Tsushima et al. Ketogenic Diet Improves Fertility in Patients with Polycystic Ovary Syndrome: A Brief Report

https://pubmed.ncbi.nlm.nih.gov/39328462/

Researchers showed that following a ketogenic diet can improve fertility outcomes in women with polycystic ovary syndrome (PCOS). This retrospective study found that all participants restored regular menstrual cycles after at least three months on a ketogenic diet, with more than half of those seeking pregnancy successfully conceiving. These findings suggest that dietary interventions could play a key role in managing PCOS-related fertility challenges.

Lundanes et al. Gastrointestinal hormones and subjective ratings of appetite after low-carbohydrate vs low-fat low-energy diets in females with lipedema - a randomized controlled trial

https://pubmed.ncbi.nlm.nih.gov/39566600/

Low-carbohydrate diets may offer advantages in appetite regulation for women with lipedema compared to low-fat diets. This randomized controlled trial found that while both diets led to weight loss, the low-carbohydrate diet reduced postprandial ghrelin levels and increased feelings of fullness — changes not observed with the low-fat diet. These findings suggest that low-carbohydrate diets may support sustainable weight loss in women with lipedema.

\* Kackley et al. Self-reported menses physiology is positively modulated by a well-formulated, energy-controlled ketogenic diet vs. low fat diet in women of reproductive age with overweight/obesity

https://pubmed.ncbi.nlm.nih.gov/39150916/

In a randomized trial, a well-formulated ketogenic diet significantly improved menstrual frequency and intensity in women of reproductive age with overweight or obesity., while a low-fat diet did not have these effects. These findings suggest that nutritional ketosis may positively modulate female physiology, offering unique benefits for menstrual health beyond weight loss and metabolic improvements.



#### Cancer

#### ★ Duraj et al. Clinical research framework proposal for ketogenic metabolic therapy in glioblastoma

https://pubmed.ncbi.nlm.nih.gov/39639257

This consensus treatment protocol endorses ketogenic metabolic therapy as a treatment in glioblastoma, targeting the tumor's reliance on glucose and glutamine for energy and growth. By combining glucose-ketone index (GKI)-adjusted ketogenic diets, calorie restriction, fasting, and metabolic inhibitors, ketogenic metabolic therapy aims to disrupt tumor energy supply and improve treatment outcomes. The proposed best practices offer an evidence-based foundation for future clinical research in metabolic oncology.

★ Buga et al. Feasibility and metabolic outcomes of a well-formulated ketogenic diet as an adjuvant therapeutic intervention for women with stage IV metastatic breast cancer: The Keto-CARE trial

https://pmc.ncbi.nlm.nih.gov/articles/PMC10760925/

The Keto-CARE trial investigated the effects of a well-formulated ketogenic diet in women with stage IV metastatic breast cancer. Participants followed the diet for six months, showing adherence through consistent blood ketone levels, significant reductions in blood glucose and insulin, a 10% average weight loss (mainly from fat), and reduced inflammation. These findings suggest that the ketogenic diet is feasible, well-tolerated, and may offer metabolic benefits, potentially improving outcomes and quality of life for cancer patients, though more research is needed to assess its impact on cancer progression and survival.

#### ★ Qin et al. Ketogenic diet reshapes cancer metabolism through lysine β-hydroxybutyrylation

https://pubmed.ncbi.nlm.nih.gov/39134903/

Lysine  $\beta$ -hydroxybutyrylation (Kbhb) is a modification to proteins induced by the ketogenic diet. This study found that the ketogenic diet affects Kbhb in the liver, particularly on the protein aldolase B, which plays a key role in cancer cell metabolism. By mimicking this protein modification, the study suggests that it can inhibit cancer cell growth by disrupting their metabolism, offering new insights into how the ketogenic diet may regulate disease processes.



## ★ Nandi et al. Targeting fatty acid oxidation enhances response to HER2-targeted therapy

https://pubmed.ncbi.nlm.nih.gov/39097623/

In this mouse study, combining Cpt1a inhibition with a ketogenic diet or targeted therapy significantly reduced tumor growth and metastasis, offering a potential strategy to improve treatments for HER2-positive breast cancer by targeting both fatty acid metabolism and cancer cell resistance. This offers a promising new approach to overcoming treatment resistance in HER2+ breast cancer.

## → Phillips et al. Ketogenic metabolic therapy in conjunction with standard treatment for glioblastoma: a case report

https://pmc.ncbi.nlm.nih.gov/articles/PMC10996027/

This case report details a 64-year-old woman with glioblastoma (GBM) who combined standard treatments with ketogenic metabolic therapy (KMT) for 3 years. KMT, involving prolonged fasting and a time-restricted ketogenic diet, led to clinical improvement, stable imaging, and high quality of life for two years. Tumor progression occurred in the third year with reduced adherence, highlighting the feasibility and potential benefits of combining KMT with standard GBM treatments, especially when maintaining a low glucose ketone index (GKI).



#### ★ Kramer et al. The impact of time-restricted eating on beta-cell function in adults with type 2 diabetes: a randomized cross-over trial

https://pubmed.ncbi.nlm.nih.gov/39193706/

In this randomized crossover trial, time-restricted eating (TRE) with a 4-hour eating window improved pancreatic  $\beta$ -cell function and insulin resistance in overweight adults with type 2 diabetes. TRE also led to significant reductions in HbA1c, body weight, and waist circumference. These results support TRE as an effective non-pharmacological strategy for enhancing metabolic health and managing diabetes.

#### ★ Manoogian et al. Time-Restricted Eating in Adults With Metabolic Syndrome: A Randomized Controlled Trial

https://pubmed.ncbi.nlm.nih.gov/39348690/

A personalized time-restricted eating (TRE) window of 8 to 10 hours may help improve glycemic control in adults with metabolic syndrome. This randomized controlled trial found that combining TRE with standard care, including nutritional counseling and pharmacotherapy, led to a reduction in HbA1c after 3 months. These findings form the basis for further long-term studies to evaluate the effects of TRE on cardiometabolic health.

## **★** Yang et al. **Remodelling of the translatome controls diet and its impact on tumorigenesis**

https://pubmed.ncbi.nlm.nih.gov/39143206/

This innovative study reveals how fasting and ketogenic diets activate a unique signaling pathway that influences ketone production by remodeling protein translation. Researchers discovered that a molecule called P-eIF4E plays a key role in this process by controlling the translation of genes that help produce ketones during fasting or a ketogenic diet. The study also found that blocking P-eIF4E can impair ketone production and even slow the growth of pancreatic tumors, suggesting that this pathway could be targeted for cancer treatment.



#### ★ Grundler et al. Long-Term Fasting-Induced Ketosis in 1610 Subjects: Metabolic Regulation and Safety

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11206495/

This study evaluated ketosis dynamics during long-term fasting (4 to 21 days) in 1,610 individuals. Ketosis levels remained within a safe range and were influenced by age, gender, physiological status, physical activity, and minimal carbohydrate intake. These findings lay the groundwork for personalized long-term fasting strategies.

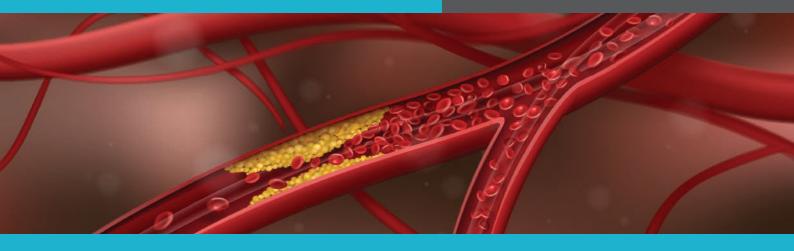
★ Guevara-Cruz et al. Intermittent fasting, calorie restriction, and a ketogenic diet improve mitochondrial function by reducing lipopolysaccharide signaling in monocytes during obesity: A randomized clinical trial

https://www.sciencedirect.com/science/article/pii/S026156 1424002280

In this randomized controlled trial, intermittent fasting, calorie restriction, and a ketogenic diet modulated the gut microbiota and significantly improved the metabolic profile of monocytes in obese individuals. The authors proposed that mitochondrial function in monocytes could be an indicator of metabolic and inflammatory status. The findings from this study suggest that dietary interventions can improve metabolic health and inflammation through mitochondrial bioenergetic regulation and gut microbiota modulation.



#### Lipidology



**★** Soto-Mota et al. Increased low-density lipoprotein cholesterol on a low-carbohydrate diet in adults with normal but not high body weight: A meta-analysis

https://pubmed.ncbi.nlm.nih.gov/38237807/

Body-mass index may play a key role in how LDL cholesterol responds to low-carbohydrate diets (LCDs). This meta-analysis of 41 randomized controlled trials found that individuals with a lower BMI experienced a significant increase in LDL cholesterol, while those with higher BMIs saw a decrease, and those with intermediate BMIs showed little to no change. These findings provide insights for personalized dietary recommendations to manage cardiovascular disease risk.

→ Norwitz and Cromwell. Oreo Cookie Treatment Lowers LDL Cholesterol More Than
High-Intensity Statin therapy in a Lean Mass Hyper-Responder on a Ketogenic Diet: A Curious
Crossover Experiment

https://pubmed.ncbi.nlm.nih.gov/38276308/

Recent research identified a population of "Lean Mass Hyper-Responders" (LMHR) who experience significant increases in LDL cholesterol in response to ketogenic diets, accompanied by high HDL and low triglycerides. A case study showed that adding 100 grams of carbohydrates in the form of Oreo cookies to a ketogenic diet led to a greater reduction in LDL cholesterol compared to 6 weeks of high-intensity statin therapy, supporting the lipid energy model hypothesis. This finding suggests that carbohydrate intake may significantly influence LDL cholesterol levels in LMHR individuals, although further research is needed to understand the implications.

★ Grundler et al. HDL cholesterol efflux capacity and cholesterol loading capacity in long-term fasting: evidence from a prospective, single-arm interventional study in healthy individuals

https://www.sciencedirect.com/science/article/abs/pii/S002191502401116X

This study examined the effects of long-term fasting (LF) on lipoprotein functionality and cholesterol homeostasis in healthy individuals. LF reduced triglycerides, total cholesterol, LDL cholesterol, and HDL cholesterol, while improving the functional properties of HDL, even after food reintroduction. The findings suggest that LF can positively influence lipoprotein function and shift the atherogenic risk profile, highlighting the importance of HDL functionality in cardiovascular health, beyond traditional lipid measurements.



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#### **Emerging Fields**



## Norwitz and Soto-Mota. Case report: Carnivore–ketogenic diet for the treatment of inflammatory bowel disease: a case series of 10 patients

https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2024.1467475/full

A case series explored the effects of animal-based ketogenic and carnivore diets in 10 patients with Crohn's disease or ulcerative colitis, who had not achieved remission with conventional treatments. After following these diets for five months to five years, all patients reported significant symptom relief, achieved clinical remission, and had improvements in biomarkers, including reduced intestinal inflammation. The authors emphasize the need for further research to confirm the long-term safety and efficacy of these diets for managing inflammatory bowel disease.

### Rahmel et al. An open-label, randomized controlled trial to assess a ketogenic diet in critically ill patients with sepsis

https://www.science.org/doi/epdf/10.1126/scitranslmed.adn9285

This study tested the effects of ketogenic enteral feeding in critically ill sepsis patients, comparing it to standard high-carbohydrate feeding. The results showed that the ketogenic diet safely induced stable ketosis, reduced immune dysregulation, and improved clinical outcomes, such as fewer days on ventilation and a shorter ICU stay, without major adverse effects. While there was no difference in 30-day survival, these findings suggest the ketogenic diet could offer immunological and clinical benefits for sepsis patients, warranting further research.

### Cukoski et al. Ketosis moderates the effect on kidney volume in dietary interventions for ADPKD - more insights on the KETO ADPKD trial

https://academic.oup.com/ndt/article/39/Supplement\_1/gfae069-0738-2160/7677337

The KETO-ADPKD study explored the effects of ketogenic therapy on autosomal-dominant polycystic kidney disease (ADPKD) and found that patients on the ketogenic diet showed improvements in kidney function and a reduction in kidney size, unlike those in the fasting or control groups. A post-hoc analysis revealed that higher ketosis levels (measured by  $\beta$ -hydroxybutyrate and breath acetone) were associated with a greater reduction in total kidney volume, suggesting that achieving higher ketosis may be key to slowing disease progression.



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#### **Brain & Mental Health**



#### ★ MacDonald & Palmer. Case report: Ketogenic diet as a therapeutic intervention for obsessive-compulsive disorder: a case series of three patients

https://www.frontiersin.org/journals/nutrition/articles/10.33 89/fnut.2025.1568076/abstract

The ketogenic diet may offer a promising non-pharmacological approach for obsessive-compulsive disorder (OCD). This case series reports three individuals with longstanding OCD who achieved symptom remission after adopting a ketogenic diet, with Y-BOCS scores dropping from moderate-severe to minimal or zero. Symptoms consistently returned with high-carb intake and resolved upon resuming the diet.

## ★ Shelp et al. Perspectives on the Ketogenic Diet as a Non-pharmacological Intervention For Major Depressive Disorder

https://pubmed.ncbi.nlm.nih.gov/40117502/

Preclinical and early clinical findings point to the ketogenic diet as a promising candidate for improving mood and cognitive function in major depressive disorder (MDD). This narrative review outlines current evidence on its potential antidepressant effects, identifies key gaps in knowledge, and discusses proposed mechanisms, including the modulation of inflammation, neurotransmitter balance, and mitochondrial function. While early evidence is encouraging, larger and more rigorous clinical trials are needed to establish efficacy and guide clinical use.

#### ★ Luong et al. A three-week Ketogenic Diet increases Global Cerebral Blood Flow and Brain-Derived Neurotrophic Factor

https://pubmed.ncbi.nlm.nih.gov/40172923/

A ketogenic diet may support brain health by increasing both cerebral blood flow (CBF) and brain-derived neurotrophic factor (BDNF). In this randomized crossover study, 11 healthy adults experienced a 22% increase in CBF and a 47% rise in BDNF after three weeks on a ketogenic diet compared to a standard diet. These findings point to the potential of ketogenic interventions in conditions marked by reduced CBF.

## Ruskin et al. Ketogenic diet, adenosine, and dopamine in addiction and psychiatry

https://pubmed.ncbi.nlm.nih.gov/40129664/

The ketogenic diet may influence brain function by modulating adenosine and dopamine signaling. This review highlights how ketosis enhances adenosine activity, which helps regulate dopamine, and may reduce symptoms in conditions like depression, schizophrenia, and addiction, suggesting a therapeutic potential for psychiatric and neurological disorders.

