diagnosis:Diet

The Scientific and Clinical Rationale for the Use of Ketogenic Diets in Psychiatric Disorders

Thank you for the opportunity to share information about the use of ketogenic diets in the treatment of mental illness. Skepticism about this approach is understandable given the absence of randomized controlled clinical trials in this field to date, however the scientific arguments for applying ketogenic therapies to psychiatric conditions are strong. This 2020 review paper authored by researchers at Stanford, Oxford, and Harvard Universities offers more detail and perspective: "Ketogenic Diet as a Metabolic Treatment for Mental Illness."

While we await more rigorous clinical trial evidence, a small but growing number of psychiatric practitioners around the world, including myself, have found the ketogenic diet to be a welcome addition to conventional care, particularly for the many patients who do not fully respond to medication, do not tolerate medication, suffer metabolic side effects of medication, or hope to reduce medication burden.

The 2022 open access paper "The Ketogenic Diet for Refractory Mental Illness: A Retrospective Analysis of 31 Inpatients," which I co-authored with Dr. Albert Danan, Dr. Eric Westman, and Dr. Laura Saslow, documents unprecedented psychiatric and metabolic improvements among adult volunteers with chronic, treatment-resistant mood and psychotic disorders who were prescribed a ketogenic diet in a semi-controlled inpatient hospital setting in Toulouse, France. All 28 patients who adhered to the diet experienced substantial psychiatric and metabolic improvements: 96% lost weight, 43% achieved clinical remission from their primary psychiatric diagnosis, and 64% were discharged on less psychiatric medication.

In 2024, Dr. Shebani Sethi and colleagues at Stanford University published the results of a pilot study showing that 79% of participants with bipolar disorder or schizophrenia experienced clinically meaningful improvement in their symptoms in response to a ketogenic diet.

As with any intervention, the ketogenic diet does not help everyone, but the majority of the hundreds of patients I have worked with, regardless of psychiatric diagnosis, have experienced meaningful improvement in their mental health, often evident within six weeks. Some are able to reduce or even eliminate their use of psychiatric medications, and for those who continue medications, the well-established metabolic benefits afforded by the ketogenic diet (including reduction in blood glucose and triglycerides as well as improved appetite control and fat loss) greatly help to offset the metabolic side effects of those medications.

While there are important absolute and relative contraindications to be aware of, it is well established that the ketogenic diet is safe for most adults, provided it is healthfully constructed, that the practitioner has enough information and experience to properly supervise the intervention, and that medications are thoughtfully and skillfully managed, particularly during the first six to twelve weeks when keto-adaptation is taking place.

A brief summary of the rationale for using ketogenic diets in psychiatry is below, followed by a list of the clinical trials already under way in the field.

Scientific Rationale:

- The ketogenic diet was originally devised in 1921 to stabilize brain chemistry in children with intractable epilepsy, long before useful anticonvulsant medications were available. More than a dozen RCTs have since found that more than 50% of patients achieve more than a 50% reduction in seizure activity, demonstrating that ketogenic diets stabilize neuronal networks. Given significant overlapping pathophysiology between epilepsy and bipolar disorder, it has long been hypothesized that ketogenic diets may have mood stabilizing properties. The ketogenic diet also addresses many other common underlying features of neuropsychiatric conditions, including chronic inflammation, excessive oxidative stress, neurotransmitter imbalances, and mitochondrial dysfunction.
- Lifestyle-induced, chronic hyperinsulinemia (which now affects a growing majority of us) can lead to insulin resistance at the blood-brain barrier, restricting the brain's access to insulin. As optimal glucose processing within the brain requires insulin, insulin resistance impairs the brain's ability to utilize glucose. The resulting cerebral glucose hypometabolism is now understood to be an important driving force behind many cases of late-onset Alzheimer's disease. Abnormal brain glucose processing has also been detected in major depression, bipolar illness, schizophrenia, and other psychiatric conditions. Ketogenic diets have been shown to improve brain metabolic function by generating ketones—an adjunctive fuel source that crosses the blood-brain barrier easily and burns efficiently in a low-insulin environment, thereby helping to bridge the energy gap created by longstanding insulin resistance.

Clinical Trials Under Way:

- **Alzheimer's disease:** Dr. Russell Swerdlow, University of Kansas, US: Therapeutic Diets in Alzheimer's Disease (TDAD); Dr. Suzanne Craft, Wake Forest University, US: Brain Energy for Amyloid Transformation in Alzheimer's Disease Study (BEAT-AD); Dr. Matthieu Lilamand, Hôpitaux de Paris France:

The Ketogenic Diet for Alzheimer's Disease: a Randomized Controlled Feasibility Study

- **Anxiety:** Dr. Adrian Soto-Mota, Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico: The Effect of Two Dietary Interventions on the Symptomatic Control of People Living with Anxiety Disorders
- **Bipolar Disorder:** Dr. Virginie-Anne Chouinard, McLean Hospital (Harvard), US: Ketogenic and Nutritional Interventions for First Episode Bipolar Disorder; Dr. Gerrit. Keferstein, MOJO Institute for Regenerative Medicine, Germany: Ketogenic Diet as Metabolic Therapy for Bipolar Disorder
- **Psychosis:** Dr. Anu Ruusunun, Kuopio University Hospital, Finland: Ketogenic Diet for Psychotic Disorders (PsyDiet); Dr. Judith Ford, UC San Francisco, US: Can Neural Network Instability in Schizophrenia be Improved With a Very Low Carbohydrate Ketogenic Diet?; Dr. Deanna Kelly, University of Maryland, Baltimore, US: Single-Blind Randomized Ketogenic Diet vs. Control Diet in People With Schizophrenia
- **Major depressive disorder and bipolar disorder:** Dr. Elisa Brietzke, Queen's University, Canada: Effects and Mechanistic Aspects of Ketogenic Diet in Individuals With Major Depressive Disorder: A Pilot Study
- **Substance abuse:** Dr. Corinde Wiers, University of Pennsylvania, US. Relationship Between Brain and Heart Glucose Metabolism in Alcohol Use Disorder; Dr. Gene-Jack Wang, NIH, US: Ketogenic Diet in Alcoholism; Dr. Anders Fink-Jensen, Psychiatric Center Copenhagen, Denmark: Does a Ketogenic Dietary Supplement Reduce Alcohol Withdrawal Symptoms in Humans?
- **Weight-Restored Anorexia:** Dr. Guido Frank, UC San Diego, US: Ketogenic Diet in Weight Recovered Anorexia Nervosa

If this topic interests you, there are many resources available to support your learning and practice goals, including the following:

Metabolic Mind: a content-rich virtual home for educational and inspirational resources related to metabolic psychiatry, provided as a free public service by the non-profit Baszucki Brain Research Fund.

Change Your Diet, Change Your Mind, by Georgia Ede MD (Hachette, 2024): a comprehensive guide to nutritional and metabolic psychiatry that explores

the interplay between metabolic health, dietary quality, and mental health. Includes detailed practical information about metabolic evaluation and a variety of dietary interventions, including ketogenic diets.

Ketogenic Diets for Mental Health Clinician Training Program: live, online, interactive, small-group CME course for clinicians of all backgrounds interested in incorporating the cutting-edge principles of metabolic and nutritional psychiatry into their care of people with psychiatric conditions.

Clinical Guidelines for Therapeutic Carbohydrate Restriction: compiled by Adele Hite, PhD, MPH, RD. Multiple clinician expert authors contributed to this living document which is focused primarly on the treatment of metabolic disorders. This is a free downloadable resource available in nine languages.

Ketogenic Therapeutics Mastery Courses: self-directed CPE-accredited courses with live Q&A covering the implementation of ketogenic metabolic therapy for numerous health conditions including psychiatric and neurological conditions.

Treating Metabolic Syndrome, Type II Diabetes, and Obesity with Therapeutic Carbohydrate Restriction: a free, online, video CME course for physicians. This activity is intended for physicians, physician assistants, registered nurses, and dietitians. Continuing education credits are approved for all of these professions.

Use of a Low-Carbohydrate, Ketogenic Diet to Treat Obesity: a 2018 clinical monograph by Duke University obesity medicine physician and low-carbohydrate clinician and researcher Eric Westman MD, et al.

If you have further questions or need help with a clinical case, I offer consultation services as well, so please feel free to contact me directly by email. I hope you have found this information helpful.

Sincerely,
Georgia Ede MD
diagnosisdiet.com/contact

Dr. Georgia Ede is an internationally recognized expert in nutritional and metabolic psychiatry. She co-authored the first inpatient study of the ketogenic diet for mental illness, developed the first medically accredited course in ketogenic diets for mental health, and is a recipient of the Baszucki Brain Research Fund's Metabolic Mind Award. Her comprehensive new book about nutrition science and mental health, *Change Your Diet, Change Your Mind*, was published in 2024.

EVIDENCE BASE FOR THE USE OF KETOGENIC DIETS IN THE TREATMENT OF NEUROPSYCHIATRIC CONDITIONS

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