

Team develops database to warn physicians of possible drug interactions for epilepsy patients on ketogenic diets

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A physician-scientist at the University of Arizona College of Medicine - Phoenix has developed a new database to ensure that individuals on ketogenic diets to help treat a certain kind of epilepsy are not prescribed potentially life-threatening medications that contain carbohydrates.

Working in partnership with Phoenix Children's Hospital, Andrew Muth, MD, a UA clinical informatics fellow, has developed a database to alert physicians about the carbohydrate count in medications so they do not prescribe high-carbohydrate medications to [patients](#) with epilepsy on ketogenic diets for health concerns. His primary focus is to improve treatment options for children with "refractory epilepsy," or seizures that have not been controlled with medications. The built-in clinical support tool is unique to Phoenix Children's Hospital, Dr. Muth said.

"I wanted to prevent patients with epilepsy on ketogenic diets from unintentionally being exposed to carbohydrates," Dr. Muth said. "There have been cases where such patients have accidentally been prescribed intravenous fluids that contain dextrose and had adverse outcomes, including breakthrough seizures and status epilepticus."

(In a breakthrough seizure, an individual who has been on a stable regimen of anti-epileptic drugs has a seizure; status epilepticus is a dangerous condition where seizures follow one another without recovery of consciousness between them.)

Dr. Muth worked with a multi-disciplinary team at Phoenix Children's Hospital, including: Mary Babico, PharmD; Lisa Vanatta, MS, RDN, CSP; and Melinda Loya, MSN, RN. The group worked under the supervision of Vinay Vaidya, MD, chief medical information officer at Phoenix Children's Hospital.

Out of a formulary of about 2,600 medications, the team identified 72 that never should be ordered for someone with epilepsy on a ketogenic diet.

About one-third of newly treated patients with [epilepsy](#) have the refractory type, which impacts all ages, but the initial diagnosis and treatment often occurs in childhood when seizures first appear.

Patients follow a [ketogenic diet](#) as one treatment option. The diet causes the body to make ketones, which are chemicals made from the breakdown of body fat. In many cases, higher ketone levels lead to improved [seizure](#) control, Dr. Muth said.

"Our team came up with the idea for the project after an adverse event involving a child going into status epilepticus after taking a prescribed medication containing sugar," Dr. Muth said. "We knew we could prevent events like this from happening with the right database in place."

Developing the database was Dr. Muth's "quality improvement project" at the UA College of Medicine - Phoenix, where he is a second-year clinical informatics fellow. Clinical informatics fellows work on multiple projects throughout their two-year fellowship. The program's goal is to develop experts adept at integrating people, processes and platforms to improve the quality, safety and efficiency of health care.

"With informatics, you can treat multiple patients at a time, versus just the patient in front of you," Dr. Muth said. "You can impact an entire

population of patients, plus you are able to impact and improve the workflow for clinicians."

"Using data and technology to protect and create better care scenarios for our patients is paramount and something we are very proud of here at Phoenix Children's Hospital," Dr. Vaidya said. "This effort also further solidifies our renowned Barrow Neurological Institute at Phoenix Children's Hospital Comprehensive Pediatric Epilepsy Program and our Level 4 National Association of Epilepsy Centers' accreditation."

Provided by University of Arizona

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