

Rising TIDE Report PedsGuide



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Children's Mercy
KANSAS CITY



RISING T1DE

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Rising T1DE Report:

PedsGuide

Children's Mercy Kansas City Diabetes Center - 2022

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In urgent situations, having pediatric-specific guidelines and best care practices is essential.

PedsGuide is a mobile app created by clinicians FOR clinicians. Originally developed to offer in-the-moment guidance in pediatric resuscitation, the platform quickly grew to include several other disease states.

PEDSGUIDE MISSION

- Improve frontline care of children through quick access to evidence-based clinical decision support on a national level.
- Improve collaboration in translating the most up-to-date research into clinical practice.
- Expand knowledge on the impact of mobile-app-delivered, just-in-time clinical decision support.





Ryan McDonough, DO, FAAP

Through collaboration with the Innovation Center at Children’s Mercy Kansas City, the Rising TIDE Alliance (RTA) took this platform and created a novel module for the acute care of diabetic ketoacidosis (DKA) and routine pediatric diabetes management. The application, which also contains other modules for other childhood conditions, already had 60,000 downloads from across the United States and beyond. This existing structure offered the RTA a unique opportunity to quickly disseminate this critical diabetes-related knowledge to clinicians across the globe.

Led by Dr. Ryan McDonough, Clinician Champion - Rising TIDE Alliance, the team began working in June 2020 to develop the app’s content for diabetes. While we initially focused on DKA management, conversations and testing with potential users showed there was a demand for more than just DKA. Conversations with community pediatricians, EMS providers, school nurses and other non-pediatric hospital-based clinicians revealed a significant need for guidance in routine diabetes management, as well. In response, we designed the app to aid caregivers at all levels of training and in diverse venues of care, ranging from the pre-hospital/EMS setting to inpatient critical care and everything in between.

Clinicians from all points on the care continuum participated in the development, testing and validation of the module. Pediatric endocrinologists, pediatric endocrinology fellows, advanced practice RNs, certified diabetes care and education specialists, and EMS providers played integral roles in the design of each component of the app. Human factors scientists reviewed it for usability and applied design heuristics to the flows throughout the module. They also conducted thorough testing throughout the design process, testing and validating more than 2,200 unique case scenarios before we released the module.

The scientific content of the module comes from a literature review, including peer-reviewed clinical practice guidelines, published recommendations/guidelines from the American Diabetes Association annual Standards of Care and treatment guidelines from the International Society of Pediatric and Adolescent Diabetes.

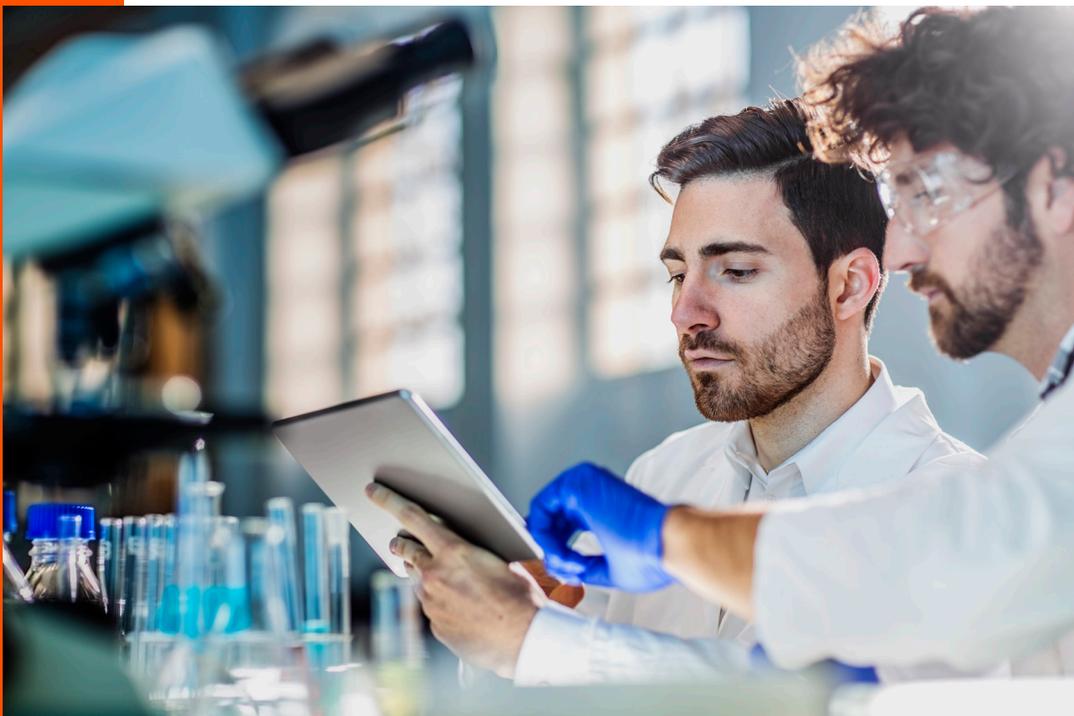
Inside the Pediatric Diabetes module, users will find step-by-step guidance in three key areas of diabetes management:

1. Diabetes Diagnosis
2. Diabetes Treatment
3. Technology Malfunction

DIABETES DIAGNOSIS

Children and adolescents presenting with new-onset diabetes are often misdiagnosed, particularly those with early signs/symptoms or those who present with mild biochemical derangements. The PedsGuide App helps guide clinicians through the routine diagnostic evaluation of new-onset diabetes. In addition, the app's decision support technology helps the clinician identify whether DKA is present and, if so, aids in the identification of one of the most worrisome complications of DKA, cerebral edema.

All of the individual decision support tools (diagnosis of diabetes, DKA identification, cerebral edema criteria), are available in a single linear flow through the app, capturing the typical process a clinician would use to come to these diagnoses. In addition to the single linear workflow, each of the tools is available as a stand-alone module for on-demand use in situations where only a specific component of the diagnosis is in question.





DIABETES TREATMENT

Kids are not little adults. This mantra has always been true in pediatrics and is similarly important in pediatric diabetes care. Critical access hospitals, EMS staff and those working away from a tertiary pediatric care center lack the specialized training required for pediatric diabetes care. Enabling these providers to provide evidenced based care quickly and safely is the primary goal of PedsGuide.

Similar to the diagnostic modules, the treatment sections follow the typical process a clinician would work through in real time. In a single session, a clinician can quickly move from the diagnosis section right into treatment for DKA, cerebral edema, hypoglycemia and routine diabetes care/insulin administration. Each subsection is also available independently for on-demand use.

Routine diabetes care is complex, and while many clinicians may be familiar with acute management of diabetes complications (DKA,

hypoglycemia), they may have limited familiarity with the day-to-day management of type 1 diabetes (T1D). This type of knowledge gap may result in children living with T1D who present with non-diabetes-related health concerns needing an escalation in their level of care strictly due to their diabetes. Providing clinicians with a clinical decision support tool that aids in dosing calculations and routine care management guidelines may allow these types of patients to remain closer to home for care, saving costs and burden to the patient, their family and the health care system as a whole.

The routine diabetes care and routine insulin delivery modules have been designed to allow clinicians to use established/known carb ratios, correction factors, basal doses, etc., or provide weight/age-based recommendations for new-onset diabetes cases, or assist in other situations where clinicians may not be aware of which dose to choose.



TECHNOLOGY MALFUNCTIONS

Pump mishaps happen! While variable across the country, data from the T1D Exchange show that about two-thirds of youth living with T1D use insulin pumps to manage their disease. While these devices are well-known to the patient and their family, clinicians who do not routinely interact with these technologies are often not comfortable with their operation. As a result, they are often relying on the patient/family's experience to guide their understanding of the devices. These technologies, particularly continuous glucose monitoring (CGM) systems, are becoming increasingly common in routine care.

They also change quickly and new/updated software is developed regularly. To provide some additional insight into first-line troubleshooting for these devices, the app includes links to each of the major insulin pump manufacturers. Future updates could continue to expand on the technologies that support diabetes self-management. While the app is not intended to replace clinicians and trained health care professionals in the education/utilization of the devices, general concepts surrounding the functionality of pumps/CGMs in general could aid clinicians at all levels of the care continuum.

COMMUNICATION

Embedded in the app is a quick access icon that can connect the user directly to the Transfer Center at Children's Mercy Kansas City, which can facilitate communication with a pediatric endocrinologist or arrange medical transport (by air or ground) to Children's Mercy. Future development will also allow geo-coded direct connections to pediatric tertiary care centers closest to the app user.



IMPACT

The diabetes module was released to version 1.29 of PedsGuide on Jan. 26, 2022. As of Aug. 30, 2022, the module has been accessed 2,617 times. Users have interacted with 45 unique screens on the module, totaling more than 17,000 unique page visits. The most-accessed workflow paths relate to DKA treatment (specifically insulin and IVF therapy) and routine diabetes management. Advanced analytics, including geo-location of users, and classification of user demographics/professional roles will come with future updates to the app.

PedsGuide is free for download in the Apple App Store and Google Play.





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