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## Welcome to Issue Four: A Focus on Diabetes

Diabetes is one of the most significant health conditions in the world and affects approximately 352,000 children and adolescents in the United States. Diabetes is a condition that occurs when the pancreas does not produce enough insulin or when the body cannot use the insulin it produces effectively. Insulin is a hormone that regulates blood glucose levels in the body. The inability to produce and/or use insulin results in high blood glucose levels that over time cause serious damage to organs, blood vessels, and nerves. The two most common types are type 1 and type 2 diabetes. Type 1 diabetes is characterized by the body's inability to produce insulin, and type 2 diabetes is characterized

by the body's inability to make insulin as well as the body's inability to use the insulin it produces effectively. Although type 1 diabetes is commonly associated with childhood, rates of new-onset type 2 diabetes are increasing among U.S. youth. A recent study found a 45% increase in type 1 diabetes and a 95% increase in type 2 diabetes from 2001 to 2017. There are many factors such as diet and activity level that are associated with diabetes risk and these are often targets of good management. Caring for a child with diabetes is a demanding task that involves regular monitoring, coordination of care with teachers while the child is at school, and regularly accessing health care services. These demands provide unique challenges in Appalachia and the articles below address these issues from both a researcher perspective and practitioner perspective.

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Elizabeth Beverly, Ph.D.

Professor, Ohio University Heritage College of Osteopathic Medicine



## Research Perspective

# Helping Children with Diabetes in Appalachian Ohio

**Elizabeth Beverly, Ph.D.**

Approximately 38.4 million people – or 11.6% of the United States (U.S.) population – have diabetes. Of these, 352,000 children and adolescents have

diagnosed diabetes. While type 1 diabetes is commonly associated with childhood, rates of new-onset type 2 diabetes are increasing among U.S. youth. The SEARCH for Diabetes in Youth (SEARCH) Study, a national multi-center study located across six regions of the U.S., documented a 45% increase in type 1 diabetes and a 95% increase in type 2 diabetes from 2001 to 2017. Environmental factors (e.g., viral infections, dietary factors) interacting with type 1 susceptibility genes likely account for the increases in type 1 diabetes, whereas changes in anthropomorphic risks and lifestyle behaviors likely drive the increasing rates of type 2 diabetes. Specifically, increases in body weight, body fat, consumption of high-calorie low-nutrient foods, and sedentary lifestyle play a significant role development of type 2 diabetes in childhood.

In Appalachian Ohio, prevalence rates for type 1 and type 2 diabetes in children and adolescents are unknown; however, high rates of child obesity and sedentary lifestyle suggest that many youth have type 2 diabetes. Moreover, widespread social drivers of health contribute to higher diabetes rates in the region. Children living in low-income families, with parents and/or guardians with unstable employment, lower levels of education, limited or uncertain access to nutritious food, lack of or inadequate health insurance, living in unsafe neighborhoods, and/or lack of access to healthcare have higher rates of prediabetes and type 2 diabetes. Living with type 1 and type 2 diabetes in childhood has wide-ranging impacts, including increased risk for microvascular (retinopathy, nephropathy, neuropathy) and macrovascular complications (cardiovascular disease), cognitive decline, diminished quality of life, and reduced life expectancy. Further, youth with type 1 and type 2 diabetes are more likely to experience psychosocial difficulties, including diabetes distress, depression, anxiety, and disordered eating. For this reason, early interventions in schools for children with diabetes can have profound and long-lasting effects on their physical, social, and emotional well-being.

Children spend a significant portion of their day at school for most of the calendar year. In school, children with diabetes, no matter the type, have to perform multiple self-care behaviors, including blood glucose monitoring, insulin administration and/or administration of other glucose-lowering medication, treatment of hypoglycemia (low blood glucose) and hyperglycemia (high blood glucose), checking for ketones if appropriate, and use of diabetes technology. The Ohio Revised Code Section 3313.7112 outlines the care that children with diabetes should receive in schools. According to Ohio law, school personnel are allowed to administer insulin, glucagon, and other medications, but they must be properly trained by a licensed healthcare professional. Children are also permitted to manage their own diabetes, but with authorization from a treating healthcare professional and guardian. However, prior research shows school personnel do not have adequate knowledge about diabetes and lack training in diabetes-related care. Thus, there is a need for diabetes education tailored for teachers and other school staff who interact with children with diabetes. Diabetes education should focus on glucose monitoring, medication administration, diabetes technology devices, signs and symptoms of hypoglycemia (low blood glucose), glucagon administration, and psychosocial concerns.

Federal law protects children with diabetes under Section 504 of the Rehabilitation Act of 1973,<sup>19</sup> the Individuals with Disabilities Education Act, and the Americans with Disabilities Act. Children with diabetes require accommodations that should be documented in a Section 504 Plan or Individualized Education Program (IEP) based on their Diabetes Medical Management Plan, which is written by their diabetes healthcare professional. The plan should identify school staff with responsibility for the student with diabetes throughout the school day, the location where the student will receive diabetes care, and other accommodations. Examples of other accommodations may include access to a cellular phone or Wi-Fi to support diabetes technology, breaks to monitor blood glucose levels, eat snacks, take medications, and go to

the bathroom, the ability to keep diabetes supplies and food nearby, and test-taking accommodations. For schools receiving federal funding, concerns about a lack of school resources or school nurses cannot be used to deny accommodations. Federal law prohibits discriminatory practices, such as denying students the support they need to monitor blood glucose levels and administer insulin, restricting students' ability to attend to their diabetes in the classroom, forcing students to transfer to different schools, and insisting that parents/guardians attend field trips and sporting events.

Care coordination with the child, family/guardian, school, and diabetes healthcare team is essential to optimize both diabetes management and educational outcomes. First steps include developing the Diabetes Medical Management Plan, which should include specific instructions for the frequency and circumstances for blood glucose monitoring and/or use of a continuous glucose monitoring (CGM) device. Second steps should outline insulin administration via injection or insulin pump and/or administration of other glucose-lowering medications. For students on insulin, instructions on dosing, timing, carbohydrate intake, and storage of insulin should be included in the plan. Next, the plan should include specific instructions for how to treat hypoglycemia (low blood glucose) and when to administer glucagon in an emergency. Relatedly, the plan should include instructions for hyperglycemia (high blood glucose) and checking for ketones when blood glucose levels are above a specified range. Finally, the Diabetes Medical Management Plan should include instructions for school-related activities, such as physical education classes, recess, field trips, and extracurricular activities.

In conclusion, rising incidence rates of type 1 and type 2 diabetes are affecting children and families across the country and in Appalachian Ohio. Both type 1 and type 2 diabetes impact the physical, social, and emotional health of children and adolescents. Effective diabetes management requires collaboration among the family/guardian, diabetes healthcare team, and school. Federal laws offer necessary protections for children in schools, but these must

be supplemented with additional training in diabetes education and a Diabetes Medical Management Plan. Fostering a supportive environment in the school can help children successfully manage this complex condition and improve their quality of life.

### **About the Author**

Elizabeth Beverly is a professor in the Heritage College of Osteopathic Medicine at Ohio University in Athens, OH. Her research focuses on understanding linkages among psychosocial issues, diabetes self-care, and health outcomes. She employs mixed methods to examine the culture and context of diabetes care in Appalachian Ohio. Elizabeth also implements evidence-based interventions (e.g., patient navigation, community health workers, peer support) to address health disparities.



## **Practice Perspective**

### **A Coordinated Approach for Support of Youth with Type 1 Diabetes**

**Karie Cook, BSN, RN & Hollie Goodell, RN, CDCES**

Diabetes is one of the most common chronic diseases in children. Type 1 diabetes, specifically, is often diagnosed in childhood or adolescence and is characterized by little to no insulin production by the pancreas. This results in high levels of glucose in the blood, or blood sugar, and can lead to serious

long-term complications such as damage to blood vessels, kidneys, eyes, and nerves. Without treatment, type 1 diabetes is fatal.

To help reduce, delay or even prevent complications, a comprehensive approach that helps manage blood glucose is essential. This includes blood sugar monitoring, administration of multiple doses of insulin daily, counting carbohydrate, fat and protein content in foods, regular physical activity, as well as patient and family education and support. The benefits of a comprehensive approach for children with type 1 diabetes include:

- Stable blood sugar levels requiring less time out of class during the school day to manage high or low blood sugar levels.
- Decreased need for medical intervention including hospitalizations, emergency room visits, and lower healthcare costs.
- Lower rate of medical complications including retinopathy, neuropathy and cardiovascular disease as well as less diabetes distress, depression and anxiety.

Multifaceted support is crucial for children and families living with type 1 diabetes, especially for families living in the Appalachian region. These families are often faced with access difficulties and service gaps in seeking medical treatment particularly when it comes to managing a chronic disease such as diabetes.

An ideal diabetes management approach for children with type 1 diabetes addresses the physical, social and emotional aspects of health with a goal to support the child and family as they transition toward independence in diabetes self-management. A team approach that involves the child, their family, school nurse, and healthcare providers is key. A diabetes navigator can offer support and guidance for all aspects of diabetes management in coordination with this team focusing on education and intervention strategies that help maintain

optimal diabetes management for the child with type 1 diabetes. Best practice approaches for the care team include the following:

- Helping children set SMART (Specific, Measurable, Achievable, Relevant, Time bound) goals targeting areas they want to focus on for self-management and supporting them to overcome barriers to meet their goals.
- Coaching self-management skills related to insulin administration, specifically, administering self-injections, the use of insulin pens, rotating injection sites, and calculating insulin doses based on carbohydrate intake.
- Reinforcing the use of Continuous Glucose Monitors (CGM) and/or glucometers to monitor blood glucose levels as directed by their provider. This includes teaching how to interpret CGM trend arrows that indicate rising, falling or steady blood sugar levels and appropriate interventions. Emphasizing careful monitoring to understand how blood sugar levels change in response to food, activity, illness, medications, stress, and hormonal changes.
- Teaching and practicing carbohydrate counting using real life examples with school lunch menus or packed lunches to increase confidence in these skills. Discussing how different foods impact blood sugar levels and reinforcing nutrient dense, low-fat, high fiber food options.

All interventions should be personalized to the child and their family and need to be ongoing to reinforce information learned and the diabetes management plan. In the school setting specifically, establishing a diabetes medical management plan helps ensure a safe learning environment. A diabetes navigator can support the school by providing supplies to help with monitoring and management of low blood sugars. Depending on the level of training, a



navigator may also be qualified to offer education for school staff specific to diabetes management and the treatment of diabetes emergencies. Navigation programs focusing on children with diabetes are not commonplace but are an invaluable addition to the care team.

Support is vital for children with type 1 diabetes and their families to help prevent diabetes distress. Managing type 1 diabetes requires attention 24 hours a day, 7 days a week. This demand can seem like too much and lead to worry, frustration, and anger known as diabetes distress. It is important to identify diabetes distress as it is associated with less engagement in diabetes self-management, higher A1C levels, and more severe hypoglycemia. Best practices for helping someone with diabetes distress include making an appointment with their diabetes care provider who can identify underlying issues and refer to other health professionals, if needed. Additionally, resources such as diabetes education, diabetes support groups (in-person or online), peer support, community/online forums and diabetes summer camps can create a support network for families to help manage and prevent diabetes distress.

Diabetes camps are held across the country and have been shown to decrease feelings of diabetes distress and increase self-management skills and confidence. Camp fosters self-responsibility, self-awarenesses and self-confidence while reinforcing physical activity, nutrition, stress management, and coping skills. Camp builds friendships, peer connections, and provides opportunities to develop positive life-long habits which can help decrease long-term complications of diabetes. There is a [diabetes camp](#) operated by the Diabetes Institute at Ohio University in Athens, Ohio. To locate other diabetes camps across the country, visit [www.diabetescamps.org](http://www.diabetescamps.org)

In conclusion, children living with type 1 diabetes need a specialized, comprehensive care plan for optimal diabetes management. Best practice approaches involve an integrated care team consisting of the child, their family,

healthcare providers, school nurses and a diabetes navigator, if possible. Coordinated care addressing blood sugar monitoring, insulin administration, nutrition, physical activity, education and support will establish a solid foundation for the child to grow in self-management skills, confidence and independence helping to prevent or delay complications.

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### **About the Authors**

**Karie Cook** BSN, RN: Karie has over 20 years of nursing experience in southeast Ohio in public health, community, hospital, and academic settings. She has experience developing and implementing targeted health education and outreach programs along with teaching in classroom and community settings, and partnership building. In her current position as director of operations at the Ohio University Diabetes Institute she is responsible for operations management, diabetes outreach program oversight, and execution of the Cat Camp, diabetes day camp for the institute.

**Hollie Goodell**, RN, CDCES: Hollie has been helping people with diabetes as a case manager and diabetes navigator in southeast Ohio for over 10 years. She is a Registered Nurse and Certified Diabetes Care and Education Specialist at the Ohio University Diabetes Institute with formal advocacy training and experience in personal, state, and national level advocacy. In her current position as a diabetes nurse navigator, she works closely with youth and adults with both type 1 and type 2 diabetes to help patients overcome barriers to get the care they need.

To learn more about the Diabetes Institute at the Ohio University Heritage College of Osteopathic Medicine, visit [www.ohio.edu/medicine/di](http://www.ohio.edu/medicine/di)

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**ACC Announces New Data Dashboard!**

As part of our commitment to providing access to the best health and well-being information related to Appalachian Ohio children, the Appalachian Children Coalition recently activated the Ohio Child & Family Health Data Dashboard. The dashboard, developed with funding from the Ohio Department of Mental Health and Addiction Services and in partnership with the Ohio University Voinovich School of Leadership and Public Service, is a one-stop source of Appalachian Ohio community health and wellbeing data. It includes over 200 child and adult health indicators with more to be added over time. The tools and data on this site are available to assist healthcare practitioners, health departments, ADAMH boards, school districts, social service agencies, policymakers, local leaders, researchers, and community members better understand and address root causes of inequities across Appalachian Ohio and improve the health and well-being of our region's children and families. The Dashboard can be accessed at [this link](#).

The Dashboard includes data for the entire 32-county Appalachian Ohio region as well as separate data summaries for each of those 32 counties. Over the coming weeks, we will continue to add indicators to the dashboard as those data are made available to us. We will also be regularly updating the dashboard so you will know you are accessing the most current data available.

## Appalachian Ohio Child & Family Health Data

The Appalachian Ohio Child & Family Health Data dashboard, made available by the Appalachian Children's Coalition (ACC), is a one-stop source of Appalachian Ohio community health and wellbeing data, consisting of over 200 community indicators. The tools and data on this site help healthcare practitioners, health departments, ADAMH boards, school districts, policymakers, local leaders, researchers, and community members better understand and address root causes of inequities across Appalachian Ohio and improve the health and well-being of our region's children.

Find data



Build a Custom Dashboard



Create a Custom Report



Promising Practices



FAQ

## Upcoming Professional Development

Check out these upcoming professional development opportunities

- **Mid-Ohio Psychological Services Public Trainings** ([MOPS](#))
  - All trainings are virtual with CE credits available
  - **SAB Series: Treatment of Sexual Abuse Youth Survivors** (12/2/24 from 8:45am-1pm)
  - **ADHD Assessment and Treatment Across the Lifespan** (12/9/24 from 8:45am-1pm)

- **Working with Individuals in Poverty** (1/20/25 from 8:45am-4pm)
  - **Montgomery County ADAMHS Board Trainings**
    - **Mental Health First Aid for Youth** (12/5/24 from 9am-3pm)
      - Virtual
      - Certification lasts for 3 years
      - \$20 enrollment fee
    - **PAX Tools** (12/17/24 from 9am-12:15pm)
      - PAX Tools is a collection of evidence-based, trauma-informed strategies to improve cooperation and self-regulation with youth.
      - Located at Montgomery County ADAMHS — Suite 201 (2nd floor), 409 E. Monument Ave, Dayton, OH 45402
      - No cost to attend
    - CEU credits available for all events
    - [Click here to learn more](#)
  - **Athens-Hocking-Vinton Alcohol Drug Addiction and Mental Health Services Monthly Board Meeting**
    - 11/25/24 6-7pm
    - Contact 740-593-3177 to obtain a Zoom link
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## About the Editors

The editor of this newsletter is Dr. Steven Evans who is a Distinguished Professor of Psychology at Ohio University ([SACeditor@appchildren.org](mailto:SACeditor@appchildren.org)). The assistant editor is Ms. Carolyn Campbell ([SACnews@appchildren.org](mailto:SACnews@appchildren.org)) who is a doctoral student in clinical psychology working with Dr. Evans.

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