

## Diabetes Management, Screen Time in Pediatrics

# Special Edition



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*Welcome to a very special edition of **psi's** Paradigm! Read on for important information on diabetes management in schools and screen time and pediatrics.*

### The Complexities of Diabetes Management

Diabetes in school-aged children is not an uncommon finding. It is estimated that **over 200,000 Americans under the age of 20** carry this diagnosis. In healthy individuals, the pancreas automatically produces insulin in response to the ingestion of carbohydrates (also known as sugars) in the diet. In diabetics, the pancreas fails to meet this demand, so these patients must not only limit their sugar intake but also use injectable insulin to help the body metabolize dietary carbohydrates.

Ideally, carbohydrates in food provide an energy source for cell function. However, if the sugars in the diet don't get properly metabolized, these molecules build up in the blood causing hyperglycemia, or high blood sugar. Clinical symptoms of hyperglycemia include headaches, blurry vision, frequent urination, excessive thirst, or even coma. Chronically high blood glucose levels can cause irreversible damage to the nervous system, eyes, heart, and kidneys.

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### IN THIS SPECIAL EDITION: *Diabetes Management & Screen Time*

GENERAL INFORMATION

MONITORING AND DEVICES

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CHANGES OVER THE PANDEMIC

BRAIN CHEMISTRY & SOCIAL INTERACTION



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In order to dose the correct amount of insulin, diabetic patients must first prick a finger and extract some blood, and test that blood on a glucose monitor. Most diabetes patients have a baseline amount of long-acting insulin that they use every morning and night, and they adjust the daytime short-acting doses on a sliding scale in direct response to blood glucose readings. Insulin is then delivered using a syringe and injecting into the fatty layer just under the skin.



Diabetes requires vigilant tracking of diet, blood glucose levels, and insulin delivery. It also demands awareness of subtle cues that signal the onset of an episode of poor glucose control. These expectations may be unrealistic in younger children, and so the burden of responsibility falls on the staff and administrators at school to help keep diabetic children safe throughout the school day. But [there is no one-size-fits-all approach to a diabetic's care](#), and individualized disease management can be confusing. In addition, while technological advancements have created more enhanced supervision possible, the constantly-changing

landscape of available devices, and the platforms on which they function, have added extra layers of complexity to the management of school-aged children with diabetes.

To avoid multiple finger pricks and needle sticks throughout the day, devices like a [Continuous Glucose Monitor \(CGM\)](#) and an [Insulin Pump](#) can be helpful. Instead of spot-checking blood glucose levels before and after meals, a CGM uses a sensor that is attached to the body to monitor and track blood glucose levels every few minutes, around the clock, allowing for more comprehensive overview of the patient's glycemic control. Using a wireless hand-held device, the patient can enter the glucose reading obtained from the CGM into the bolus calculator of an Insulin Pump and the device automatically computes and dispenses the necessary insulin dose. Used together, a Continuous Glucose Monitor and Insulin Infusion Pump take a lot of the guesswork out of diabetes management. Some pump devices can even receive wireless transmission directly from a CGM, saving the user the step of entering the blood glucose level. [However, nothing is error-free, and the patient and those adults in the school building tasked with their safety must be prepared to recognize the symptoms of hyperglycemia or hypoglycemia and manage these swiftly and effectively.](#)



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Because carbohydrates are the body's main energy source, symptoms of low blood sugar (or hypoglycemia) include **shakiness, dizziness, poor concentration, sweating, irritability, rapid heart rate, and irritated mood**. With younger patients, or new-onset diabetics, their familiarity with these symptoms may be less than optimal, and indicators may be ignored or go unrecognized. Someone inexperienced with caring for diabetics may too easily dismiss a diabetic teenager's low energy or bad mood as age-appropriate, and dangerously abnormal blood glucose levels could go unchecked, causing immediate and lasting damage.

Diabetes care plans can be very confusing. By nature, they must be detailed and inclusive, planning for every possibility, from hypoglycemia to hyperglycemia, in addition to all the incremental responses to normal glucose levels. Diabetics have to watch their diet and avoid excessive carbohydrate intake. This is difficult in 3rd grade when every child's birthday comes with cupcakes for the class. This is still difficult in 7th grade when kids swap lunch items. This is even difficult in 12th grade when the vending machine is a constant temptation.

Diabetic Ketoacidosis (DKA) is a serious complication that can land a diabetic in the hospital, and likely in the Intensive Care Unit (ICU). Typically patients in DKA will have a blood sugar >300 and will show signs of metabolic distress (high levels of ketones in the urine). While there are predictive factors, like smoking, stress, young age, drug use, and infectious illness, sometimes we don't know what triggers a patient's DKA episode. Complications of DKA include kidney or brain damage, shock, and even death. What might be a mild stomach flu in an otherwise-healthy student can be very dangerous in a diabetic one. Stressing one's system with recreational drugs or even sleep deprivation can have serious consequences for diabetic students. It's vital that all personnel involved with overseeing diabetic patients feel comfortable with that role.



**Diabetes care in the pediatric population can be a challenge.** Even when all the instructions are followed, a young patient's hypoglycemic unawareness or an older patient's all-nighter for a school project can alter the way their body's metabolism functions. Experience helps practitioners gain some comfort level with treating diabetes in children and adolescents, and along with newer technology that offers hands-free digital communication, perhaps the future holds some hope for a safer environment for diabetic kids.

[Click here](#) for more information on Pediatric Endocrinology.

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### Screen Time and Pediatrics

As the COVID-19 pandemic unfolded, many schools and workplaces shifted to an online platform. This necessarily increased the amount of time we all spent using electronic devices to communicate, learn, and connect. While the American Academy of Pediatrics recommended fewer than two hours per day of total screen time prior to the move to remote learning, these guidelines have been updated to reflect the realistic demands of our current digital age.

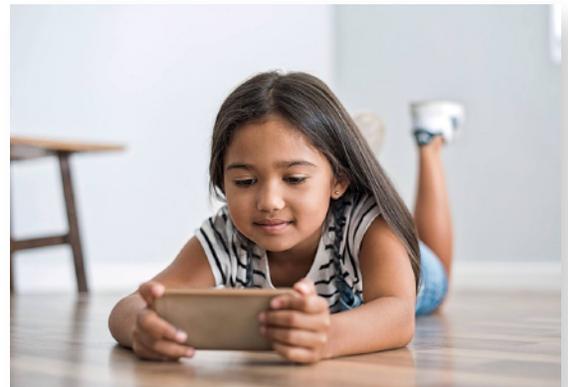
Not all screen time is bad. The effect it has on the mind and body varies with age, content, timing, and other important factors.

#### AGE -

Screen time for children under two years old is still not encouraged, however during the COVID lockdown, experts modified this recommendation to allow for real-time video chatting so that loved ones could stay in touch. For toddlers, it is advised that only high-quality educational programming be selected, and that parents or caregivers watch alongside younger children so that the experience can be shared and reflected upon together. Solo use of a phone or tablet for viewing in toddlers is not endorsed. For school-aged children, parents must establish clear rules and boundaries, including reviewing internet safety and avoidance of dangerous engagement in social media. For pre-teens and adolescents, this point bears repeating: it is easy for kids at this developmental stage to get swept away in a fad or a scam. They must be told in clear terms that their privacy (ranging from social security number, to home address, to intimate photos) must be prioritized and they are never to engage in behavior that is harmful to themselves (i.e. trending challenges) or others (bullying, trolling).

#### CONTENT -

Given the “frictionless interface” purposely designed to effortlessly slide the user’s attention from one screen to the next, it is too easy to fall into what’s called an internet rabbit hole. This reference, from *Alice in Wonderland*, is a metaphor for a method of transporting someone into a surreal and disturbing situation. Clicking on a link located on an age-appropriate site can lead down a road to something unsuitable and traumatizing for younger children. Teenagers and adults can also get caught up in the “gamification” of apps and social media sites, where designers intentionally set up competitive elements to encourage in-app purchases and promote online marketing. This is all to say where you start isn’t always where you land online. (Continued on pg. 5)





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### BRAIN CHEMISTRY -

Research continues to delve into the effect that screens have on children at a young age. Even in moderation, there are biologic consequences for exposure to the blue light wavelength that screened devices emit. It is surmised that extended exposure can cause long-term damage to the eyes, including macular degeneration, early development of cataracts, retinal toxicity, eye strain, and dry eyes. While an iPad can serve as a great babysitter for a busy parent trying to get dinner ready, inert observation does nothing to further a child's imagination, encourage creative problem-solving, or develop self-comfort mechanisms. It can serve as a welcome distraction for a hyperactive child, but doesn't teach them to channel their energy into a productive outcome. Videos of unboxing toys or watching others play video games does not stimulate the imagination. For older children, they should consider whether their screen contact makes them feel better or worse afterward, if it was overall a positive or negative experience. Learning to play guitar or draw calligraphy online and coming away with a new self-taught skill is an entirely different endeavor than passively watching Ninja play Fortnite on Twitch. At nighttime, the effect of the blue light wavelength is magnified. Scientists have discovered that exposure to screens, regardless of the filter applied, suppresses the secretion of melatonin, the body's naturally-occurring hormone that makes us sleepy. That means that having a TV or phone in the bedroom impedes the circadian nature of the sleep-wake cycle.

### SOCIAL INTERACTION -

Some screen use encourages social communication, connection, or useful contact, and other screen use does not. Real-time video calls with friends and family, or even judicious use of online gaming with other known players is beneficial. Video chatting throughout the COVID pandemic may have been the only way some grandparents could "visit" with family. It has value when it is used to promote family togetherness, and to prevent social isolation. On the flip side, when screens are prohibited during family dinnertime and bedtime, it encourages in-person intimacy and communication, and protects certain shared encounters that foster emotional closeness and healthy attachment.

Not all screen time is created equal. Using a device to attend classes, learn a new skill, connect with friends and family, or distract an antsy child for a moment is a testament to the ways we put technology to work to improve our lives. But too much screen time can cost us in terms of eye strain, social media addiction, exposure to inappropriate content, disruption of innate sleep chemistry, and exposure to the kind of stressors that contribute to trial-and-error skills-building. Screen time has its role, but it should not replace the need for eating, sleeping, studying, playing, exercising, or interacting with real people. As teachers, parents, and caregivers, we must remain vigilant to these hazards, and set a good example at the dinner table, during bedtime, and any other opportunity when we can to demonstrate good impulse control, put down our screens, and look at each other.

[Click here](#) for more on Screen Time from the CDC.

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