to the pediatric intensive care unit (PICU) at Women and Children's Hospital in Charleston, WV, from January 2007 to December 2010 in comparison with our general Type 1 diabetes population. The data collection tool included multiple sociodemographic factors, HbA1c, and markers of the degree of DKA.

Results: We reviewed a total of 167 patients with an admitting diagnosis of DKA; 63 charts were excluded because they did not meet either DKA criteria and age criteria, had new-onset diabetes, or lived outside of West Virginia; 57% were female, 43% male. Average age was 13.6 years (SD = 2.81 years); 56% were covered by Medicaid or CHIPS insurance and 44% by commercial payers; 11.5% were African American and 88.5% were Caucasian. The average HbA1c was 10.85% (SD = 2.364). Average length of stay in the PICU was 17.8 hours (SD = 11.13). We identified peak DKA admissions during April to October, with the lowest admissions being December through March.

Conclusions: Salient findings include higher HbA1c and higher rates in African American patients and in those covered by Medicaid/CHIPS.

Clinical Implications: This study identifies sociodemographic factors associated with children admitted for DKA in West Virginia. Patients indentified to be at higher risk for DKA include those with elevated HbA1c, of African American race, and covered by Medicaid/CHIPS. Nurses can utilize these findings to develop strategies to educate these high-risk groups on the prevention of DKA.

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Dance for Health: Implementation of a Dance Program to Improve Physical Activity of Children

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Background: Sedentary lifestyle, decreased physical activity, and poor diet contribute to the increasing problem of childhood obesity and risk for Type 2 diabetes. Children living in urban areas often have limited access to physical activity.

Aims: The purpose of this study was compare the effect of dance, with unstructured playtime, on the physical activity level of an underserved, urban population of children. Activity, via pedometer readings (PR), effect on heart rate (HR), and body mass index (BMI), were assessed.

Methods: In this longitudinal study, height and weight were measured and BMI was calculated during the first week of the 4-week program. Every week, heart rates were measured, as well as the PR. Preactivity heart rates were obtained, and a hip-hop dance class was taught for 30 minutes, once a week, by a dance team. Resting HR and PR were measured after the dancing. During the nondancing days, PR were taken to gauge physical activity during usual activity.

Results: Thirty-eight children (16 were female, and 22 were male; 4.7–12.9 years) participated in the study. Average BMI was 18.3 (±5.5); 20% were above the 85th percentile for age and gender. Overall, the average PR measurement for dancing days was 1,760 (±945) versus 851 (±619) on nondancing days. The number of steps in dancing days was approximately double those in the nondancing weeks ($p < .001$). The number of steps significantly increased in the later weeks in comparison with the first week ($p < .001$). Children 8–10 years had more steps than younger and older age groups. Age had a quadratic association with PR ($p < .001$). Males had 37.2% more steps than females ($p = .026$), and BMI was found to not be associated. Resting HR was significantly higher than baseline ($p < .001$).

Conclusions/Clinical Implications: Children in this population were not physically fit as evidenced by their elevated resting heart rates after exercise. Implementing dancing increased steps and activity of the children. Dance is a culturally relevant, enjoyable, free, and easily accessible method of activity. It is crucial for nurses in pediatric endocrinology to address the obesity epidemic with culturally appropriate interventions and to partner with the community to tackle this public health crisis.

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Improving the Efficiency and Safety of Managing Children With Diabetic Ketoacidosis

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Background: Typically, managing diabetic ketoacidosis (DKA) in children is labor intensive and includes collection and monitoring of hourly subcutaneous blood glucose, vital signs, neurological assessment, and other laboratory values every 2 to 4 hours by nurses. Intravenous (IV) hydration is imperative and requires frequent fluid changes based on laboratory results. Managing IV fluids is problematic because of delays in physician return calls, pharmacy response to physician orders, and delivery of IV fluids to patient areas.

Aims: The purpose of this pilot study was to investigate whether a streamlined process using a three-bag system for treating children with DKA would improve efficiency for nurses, length of hospitalization, cost, and blood glucose levels.

Methods: Pediatric hospitalists developed an order set to treat children with DKA using a three-bag system: Bag 1—3/4 normal saline (NSS) with 20 mEq/L potassium chloride (KCL) and 20 mEq/L K-Phosphate. Bag 2—dextrose (D) 10% 3/4 NSS with 20 mEq KCL/L and 20 mEq/L K-Phosphate. If the serum potassium is greater than 6.0 mmol/L, IV bags without potassium supplements would be used until serum potassium is less than 5.5 mmol/L. Bag 3—1 U regular insulin/1 mL NSS (usually 250 mL IV bag). Pharmacy delivers the bags prepared to the physician's specifications to the unit, and nurses manage administration based on the order set with minimal need to contact the physician. A comparative nonexperimental design was used to evaluate the outcomes of children hospitalized with DKA before and after initiation of the three-bag system. Thirty medical records were reviewed with 16 patients not using the three-bag system (control group) and 14 patients using the three-bag system (study group).

Results: Independent samples *t* test and chi-square were used to determine significance. There was no difference between the groups for change in glucose. Length of stay, number of IV bags, and cost were reduced in the study group; however, this change was not significant. Verbal orders significantly decreased from the control group (68%) to the study group (14%; $p < .008$).

Conclusions: By using the three-bag system, there is no indication for reduction in number of IV bags, cost, and length of stay; however, the sample size was too small to demonstrate significance. The reduction in verbal orders may create efficiency by saving nursing time and decreasing medication errors.

Clinical Implications: Using a three-bag system within a DKA order set creates a streamlined process that reduces frequency of verbal orders and creates efficiency for nurses. Further study with a larger sample size is warranted to verify additional benefits of using a three-bag system.

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A Case of Type 1 Diabetes in a Toddler With a Family History of Neonatal Diabetes

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Patient Demographics: The patient is a 33-month-old Caucasian female diagnosed with Type 1 diabetes mellitus (T1D).
Clinical Presentation: L. K. presented with 9-day history of polydipsia and polyuria. At home, the urine revealed positive ketones, and a blood glucose checked on home glucometer was 542 mg/dL. L. K. was transferred to a children's hospital and admitted with hyperglycemia and ketonuria without acidosis. Glucose management in the hospital was difficult because of hyperglycemia during the day and hypoglycemia at night without the initiation of insulin.
Past History: L. K. was born to a mother who was treated with insulin since the newborn period and said she was "born without a pancreas." L. K.'s mother is one of six children born to parents without diabetes. Two of L. K.'s mother's siblings have T1D, and two other siblings without diabetes have children with T1D. L. K. has a 4-year-old sibling without diabetes.
Evaluation: A HgbA1C was 9.1%, and a diabetes autoimmune panel revealed positive insulin antibodies of 24 uU/mL and positive ICA512 antibodies of 3.6 U/mL. Mutational analysis for PDX1 (encodes IPF1/associated with MODY Type 4) was performed and was negative.
Interventions: L. K.'s ketosis resolved, and she was initially treated with 2 U of lantus in the morning. She was discharged on 2 U of Lantus in the morning and 0.5 U of Humalog for blood glucose levels greater than 350 mg/dL.
Discussion/Recommendations: It is unclear whether L. K.'s mother had neonatal diabetes or a defect in PDX1, a very rare condition that results in pancreatic agenesis when homozygous for the mutation. Heterozygous mutations result in MODY Type 4. There are little data regarding the risk of T1D in children of mothers with neonatal diabetes, whereas children of mothers with MODY 4 are at risk for Type 2 diabetes. Family history is vital in newly diagnosed patients with T1D, and although neonatal diabetes and pancreatic agenesis are rare conditions, when it is present in a family member, those patients should be observed to see if there is transmission of a monogenic form of diabetes.

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Congenital Hyperinsulinism Associated With Beckwith Wiedemann Syndrome

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Patient Demographics: J. D. is a 9-month-old Caucasian male with hyperinsulinism (HI).
Clinical Presentation: J. D. reportedly had hypoglycemia at birth (exact data unavailable). He was discharged day of life (DOL) 3, when blood glucose (BG) levels "stabilized." On DOL 4, he had a seizure, was taken to the emergency room, and had a dangerously low BG level of 6 mg/dL (70–110). His medical evaluation was consistent with HI, but he failed medication therapy. He was discharged home on continuous feeds, but over the next several months had persistent hypoglycemia with BGs less than 50 mg/dL. Therefore, he was readmitted to his local hospital. Without additional treatment options, he was transferred to a hyperinsulinism center for further evaluation.
Past History: J. D. was the product of a pregnancy complicated by maternal lupus. He was full term and weighed 4.6 kg (large for gestational age).
Evaluation: HI was confirmed when laboratory values revealed a detectable insulin level, suppressed serum beta-hydroxybutyrate, and an inappropriate glycemic response to glucagon at the time of hypoglycemia. HI genetic testing was negative. An 18 F-DOPA PET scan of the pancreas suggested a possible focal lesion in the pancreatic head causing HI. During exploratory surgery, there was no evidence of focal or diffuse HI. The pathology of J. D.'s pancreatic biopsies indicated diffuse islet cell hyperplasia. J. D. had hemihypertrophy, raising the suspicion of Beckwith Wiedemann syndrome (BWS). Mosaic BWS was diagnosed, with a mutation on chromosome 11 (11p15.5p11.11).
Interventions: A gastrostomy tube was placed for continuous enteral administration of dextrose. J. D. maintained BGs greater than 70 mg/dL for 12 hours on a glucose infusion rate of 5 mg/kg per minute. He was discharged home on this regimen.
Discussion/Recommendations: BWS is frequently associated with HI. The clinical course and response to treatment have been variable, and medical therapy may not be successful. Further research is needed to analyze this association and treatment modalities. The genetic mutations in both HI and BWS are on chromosome 11, raising the question of a genetic link. Alternatively, because BWS is an overgrowth syndrome, perhaps the HI is simply an effect of islet cell hyperplasia.

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Unexplained Weight Loss in Two Growth Hormone-Deficient Adolescent Males

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Patient Demographics: Patient A is a 15 ½-year-old Caucasian male. Patient B is a 17-year-old Caucasian male.
Clinical Presentation: Patient A has been followed in an endocrine clinic since the age of 18 months with growth hormone (GH) and thyroid deficiencies. GH was discontinued 4 months prior because of growth completion (bone age 16y 6 m @ 15y 1 m). He had an appendectomy 1 month ago and reported diminished energy level and a 15-lb weight loss despite adequate oral intake and absence of gastrointestinal symptoms. No acute illness was noted. Patient B has been followed in endocrine clinic since age 7 years with growth hormone deficiency (GHD). GH was discontinued 6 months prior because of poor compliance (bone age 14y @ 15y 5 m). He reported a 20-lb weight loss and diminished energy levels. No changes had occurred in his medical regimen, and no other acute illness was present.