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Background

- Insulin pump therapy leads to improved glycemic control, reduced hypoglycemia, alleviation of diabetes burden and enhanced quality of life
- International Society of Pediatric and Adolescent Diabetes and American Diabetes Association support need for structured technology education for children and youth with diabetes
- Insulin pump therapy is recommended as main mode of insulin delivery for those under age 7 years with type 1 diabetes mellitus (T1D)

Burning Platform

- Our diabetes care center noted decreased insulin pump utilization when compared to peer institutions
- Furthermore, general prescribing barriers were also deemed to be of concern
- Prior to implementation of this quality improvement project, a lack of standardized process for insulin pump initiation existed within our division
- As such, a multidisciplinary team of pediatric endocrinologists, advance nurse practitioners, diabetes educators and hospital leaders implemented QI initiatives aimed at increasing insulin pump use

Aims

- By end of summer 2022, increase insulin pump use in new onset T1D patients (less than 1 year from diagnosis) by 5% at Texas Children's Hospital, The Woodlands (community campus)
- The secondary objective of this project was to standardize the approach to insulin pump initiation

Standardizing insulin pump therapy initiation in children with type 1 diabetes

Methods/Materials

P: Educated providers and diabetes educators about the new onset pump initiation protocol, safe start criteria, pump action plan and pre and post pump visit checklist D: Jan 2021 S: Increase percent initially PDSA 1 A: Adopt P: Implemented the new process of early introduction of pump technology and education to patients/families D: Spring 2021 • S: Clinically better to wait until second follow up at 90 days post diagnosis PDSA 2 A: Adapt- instead of introducing at 30 days post diagnosis, to introduce at 90 day P: Scheduled and labeled post-pump follow up visit with provider and diabetes educator • D: Summer 2021 S: Initially increased percent PDSA 3: A: Adopt P: Greatly simplified the process, action plan, reminding providers, diabetes educators about process D: Fall 2021 S: Increased percent PDSA 4 A: Adopt **PUMP INITIATION ALGORITHM-** UPDATED 8/11/22 follow up* Safe start up criteria . Identify barriers Meets minimum insulin requirements / day Review therapy benefits / risks Patient/family Provide alternative solutions interested for insulir Administering rapid acting insulin at least 2x/day pump therapy? ionale) *diabedpumpreadine Intensive insulin management (ICR + CF) and/or 5. Re-visit at next visit using insulin dosing cheat shee Knows when to check ketones & diabetes helplir Parental supervision for at least 1 bolus per da Meets minimum Parental supervision for pump site chang safety criteria? No severe mental health concerns (i.e. active SI) Nay introduce pump technology at new onset or first 30 day L. Provider to assess pump readiness pllow up visit if family is interested and inquirin 2nd outpatient visit is tentatively 90 days from initial diagnosi CDE or MD/APP 1. Pump/CGM introduction - Give patient handout brochures/ action plan .et patient know to contact us if/when ready, follow up Patient/family woul like to submit for Yes CDE – When sending pump start settings orders: 90 day post pump follow up: 1) Send Rx insulin vials 1D: knowledge review, dose adjustmer 2) Check to make sure patient has post pump follow up 1. Provide action plan + parent guide on pump process iew sick day management, advance pun within 90 days, label as "Post Pump" expectation 3. Contact pump company & send paperwork Ensure action plan in place. settings, review device portals to upload Texas Children' My Diabetes Pump Action Plan Patient Name Back up Insulin regimen: Lantus/Basaglar/Tresiba (long acting): ____ units once daily Humalog/Novolog/Fiasp/Lyumjev (rapid acting): Insulin to carbohydrate ratio (ICR): 1 unit for ____ grams of carbs for breakfast 1 unit for ____ grams of carbs for lunch 1 unit for ____ grams of carbs for dinner orrection factor (CF): 1 unit for every ___ mg/dL above target BG ___ mg/dL Continue giving insulin via pump • Continue checking BG via CGM device OR meter per usual management If high BG >200 for >3 days, call clinic to review BG log as insulin doses may need adjustmer Drink plenty of sugar free fluid or wate Give correction bolus via pump Re-check blood glucose and ketones in **2-3 hours.** If BG is still >250 mg/dL commend give correction bolus via SYRINGE/PEN and CHANGE POD or INFUSION set, recheck BG in 2-3 hours If high BG >3 days, call clinic to review as insulin doses may need adjustment Give correction bolus (Novolog/Humalog) via SYRINGE/PEN DO NOT GIVE BOLUS VIA PUMP ANGE POD or INFUSION SE Continue to correct 2-3 hours via syringe/pen until ketones are trace or Drink sugar free fluid or water - If unable to tolerate fluids, go to Emergency Call Diabetes Emergency Line (832-822-3670, Option 0 Once ketones are cleared, wait 3-4 hours from last insulin injection to give correction bolus via pump, as the pump will not recognize IOB provided from insulin svringe/pen injection When to check for ketones? Vhat causes ketones What are symptoms of Diabetic Ketoacidosis (DKA)? Child is not getting enough Sickness BG >250 mg/dl for 2 insulin causing ketones to Nausea, vomitin form. This could be due to blood glucose checks (3 Abdominal pain of the following: hours apart) Difficulty breathing Pump occlusion at infusion Vomiting Confused / not acting like self Ketones not decreasing at Infusion site leaking next check Reservoir / pod is bad Lethargy/altered mental Missed insulin dose status Expired insulin, or compromised insulin (exposed to >86F or freezing temperatures) Infusing into scar

- Checking blood glucose at least 2 times /day and/or

- to additional TCH campuses



- Available upon request



Results

• In patients with T1D duration of <1 year, insulin pump use has increased from a baseline of 20% in January 2021 to \geq 30% in January 2022 and remains sustained

Given this improvement, we are spreading the initiative

Conclusion

• Early standardized pathway and multidisciplinary education facilitates a structured way to increase the uptake of insulin pumps in youth with recent T1D It may also help reduce healthcare disparity via elimination of unconscious provider prescriber biases

References

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