

# Early initiation of subcutaneous long-acting insulin in the acute management of diabetic ketoacidosis

Chloe Kent, PharmD., Jeremy Walley, PharmD., BCPS, Neda Borhani, PharmD. BCPS, Andrew Beaty, PharmD., Michelle Holtgraewe, RN.

## Introduction

- Diabetic ketoacidosis (DKA) is a medical emergency resultant of metabolic acidosis, hyperglycemia, and electrolyte disturbances requiring continuous insulin infusion therapy (CIIT)
- CIIT requires frequent titration and close monitoring resulting in increased utilization of hospital resources
- Recent research suggests that the early addition of long-acting insulin may result in sustained anion gap closure and resolution of DKA

## Purpose

To implement a revised protocol for the management of DKA to improve resolution time resulting in decreased intensive care unit (ICU) length of stay (LOS) and/or avoidance

## Objective

To determine the efficacy and safety of the early addition (within three hours) of long-acting insulin to CIIT in patients presenting with DKA to a rural, community hospital

## References

1. Haas RM and Hoffman AR. Treatment of diabetic ketoacidosis: should mode of insulin administration dictate use of intensive care facilities? *Am J Med.* 2004; 117:357-358.
2. Hsia E, Seggelke S, Gibbs J, et al. Subcutaneous administration of glargine to diabetic patients receiving insulin infusion prevents rebound hyperglycemia. *J Clin Endocrinol Metab.* 2012 Sept.; 97(9):3132-3137.
3. Houshyar J, Bahrami A, Aliasgarzadeh A. Effectiveness of insulin glargine on recovery of patients with diabetic ketoacidosis: a randomized controlled trial. *J Clin Diagn Res.* 2015 May; 9(5):OC01-5.
4. Rappaport SH, Endicott JA, Gilbert MP, et al. A retrospective study of early vs delayed home dose basal insulin in the acute management of diabetic ketoacidosis. *J Endocr Soc.* 2019 Apr 11; 3(5):1079-1086.

## Methods

### Inclusion Criteria

- At least 18 years of age
- ICD-10 code for DKA
- Managed with CIIT
- Post-intervention long-acting dose

### Exclusion Criteria

- Left against medical advice prior to recovery from DKA
- Pregnant
- Active/history of traumatic brain injury
- Lack of data in patient chart

### Initiation of Therapy

- CIIT dose: 0.1 units/kg TBW/hr
- Long-acting insulin dose: 0.3 units/kg TBW
- Fluids, electrolyte repletion, and bicarbonate therapy at provider discretion

### Statistical Analysis

- Nominal data expressed as percentages
- Numerical data expressed as means
- Comparison to be performed pending post-intervention data collection

## Results

	Pre-Intervention (n=22)	Post-Intervention (n=TBD)
Age	36.9 years	TBD
Sex	54.5% male	TBD
Total Body Weight	73.9 kg	TBD
Body Mass Index	24.6 kg/m <sup>2</sup>	TBD
History of Diabetes	100%	TBD
Type of Diabetes	90.1% type 1	TBD

## Results (continued)

	Pre-Intervention (n=22)	Post-Intervention (n=TBD)
Total Time on CIIT	24.8 hours	TBD
Hypoglycemia	50%	TBD
Hypokalemia	54.5%	TBD
Rebound Hyperglycemia	81.8%	TBD
Rebound Elevated Anion Gap	27.3%	TBD
Anion Gap Closure	15.1 hours	TBD
DKA Resolution	18.4 hours	TBD
ICU Admission	95.5%	TBD
ICU LOS	43.8 hours	TBD
Non-DKA Indication Contributing to LOS	27.3%	TBD

## Discussion

To be determined

## Contact Information

Chloe Kent, PharmD  
PGY-1 Pharmacy Resident  
cckent@crmchealth.org  
Nothing to disclose