

# Implementation of 2020 ADA Recommendations for the Initial Management of Overweight and Obese Pediatric Patients with New Onset Diabetes



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## Introduction:

Historically, ECU Pediatric Endocrinology admitted most patients with new onset diabetes to the hospital and initiated full basal-bolus (intensive) insulin regardless of age, weight and likelihood of Type 2 diabetes (T2D). While the 2020 ADA guidelines recommend that initial therapy for overweight and obese patients with new onset diabetes should address hyperglycemia and metabolic derangements, the guidelines also suggest that less intensive treatment regimens initiated in the outpatient setting may achieve target HgbA1c in patients with presumed T2D. Thus, our previous management strategies may have led to unnecessary hospitalizations with overly intensive insulin regimens.

## Project Design:

- Developed a standardized protocol for initial management of overweight/obese patients 10 to 17 years of age with new onset diabetes based on initial labs at presentation.
- Retrospectively applied the protocol to patients with T2D managed in our clinic to determine the expected change in hospital admission rates and use of intensive insulin.
- Utilized PDSA cycles to implement the protocol on 145 patients (123 ultimately diagnosed with Type 2 Diabetes), monitoring the following quarterly:
  - Admission rates at the time of diagnosis.
  - Percentage of patients initially managed by one of five treatment regimens defined by escalation of insulin therapy.
  - Rates of adherence to the protocol.

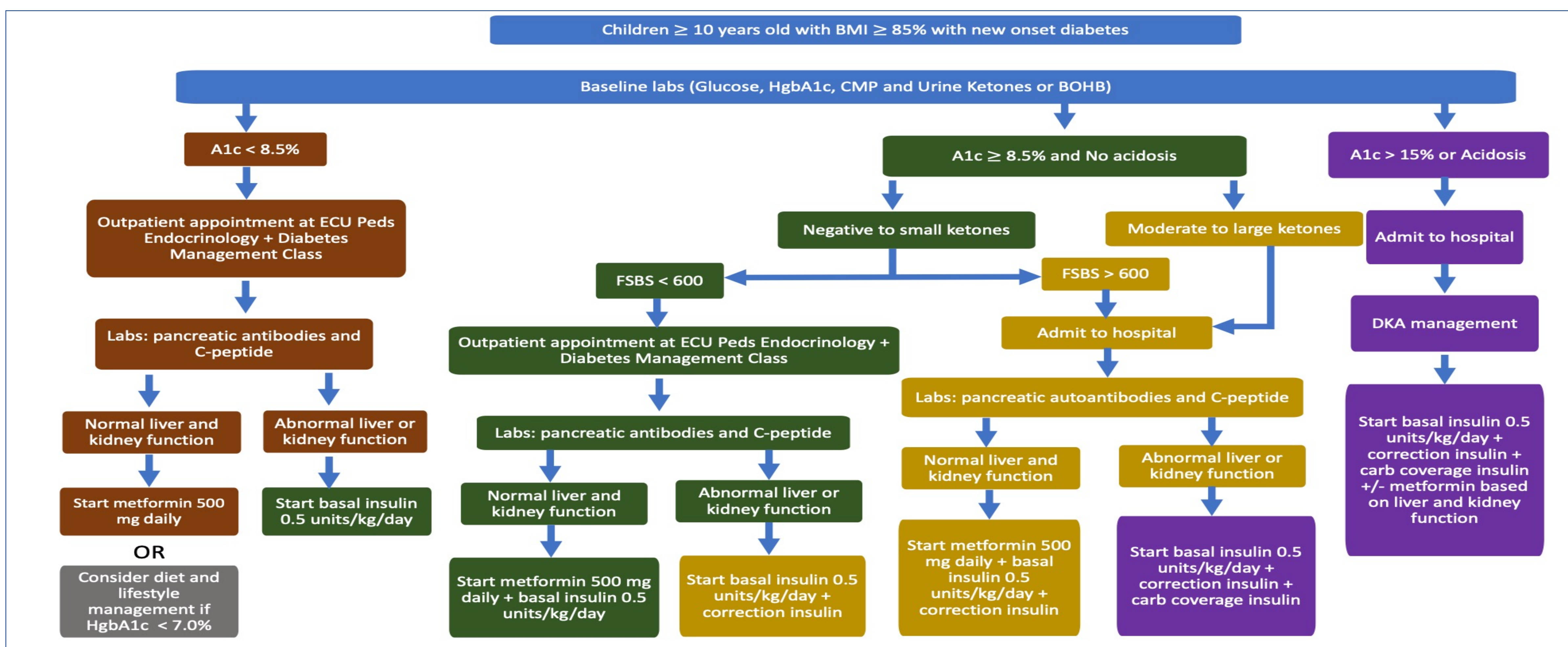
## PDSA Cycles:

- PDSA 1: Baseline data obtained from retrospective chart review
- PDSA 2: Informal discussion & development of protocol (6/23/20 - 9/8/20)
- PDSA 3: Formal implementation of protocol (9/11/20 - 12/31/20)
- PDSA 4: Protocol & Process Refinement (1/1/21-3/31/21)
- PDSA 5: Regroup and Re-education (4/1/21-6/30/21)
- PDSA 6 to 8: Sustainability (7/1/21-3/31/22)

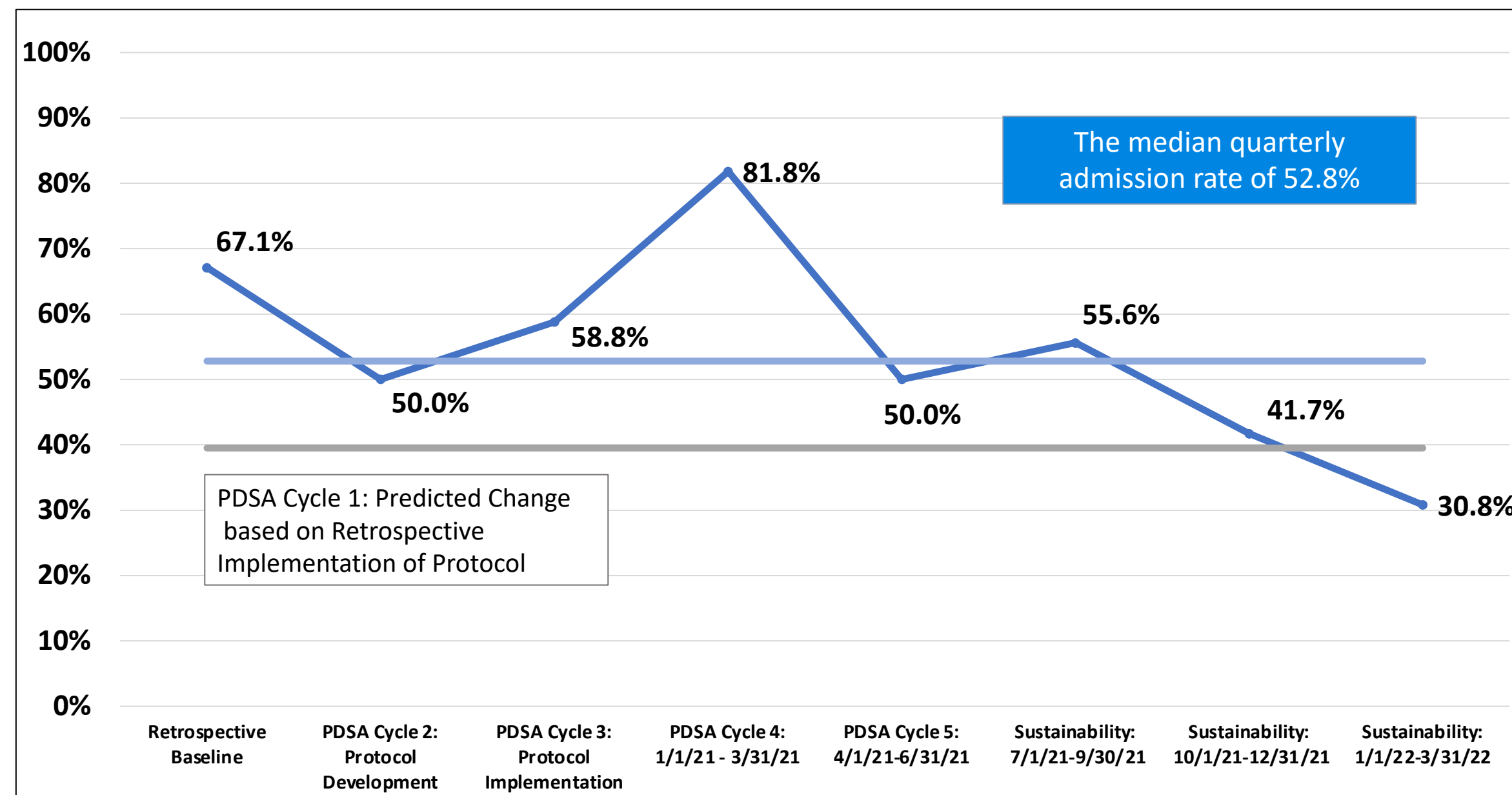
**Project Aim:** We aimed to standardize the initial management of overweight/obese patients 10 to 17 years of age with new onset diabetes cared for by ECU Pediatric Endocrinology over an 18-month period such that our practice aligned with the 2020 ADA recommendations with the goal to:

- Decrease hospital admission rates at the time of diagnosis from 67% as determined by retrospective review to 40%.
- Decrease percentage of patients receiving intensive insulin at diagnosis from 66% as determined by retrospective review to 20%.

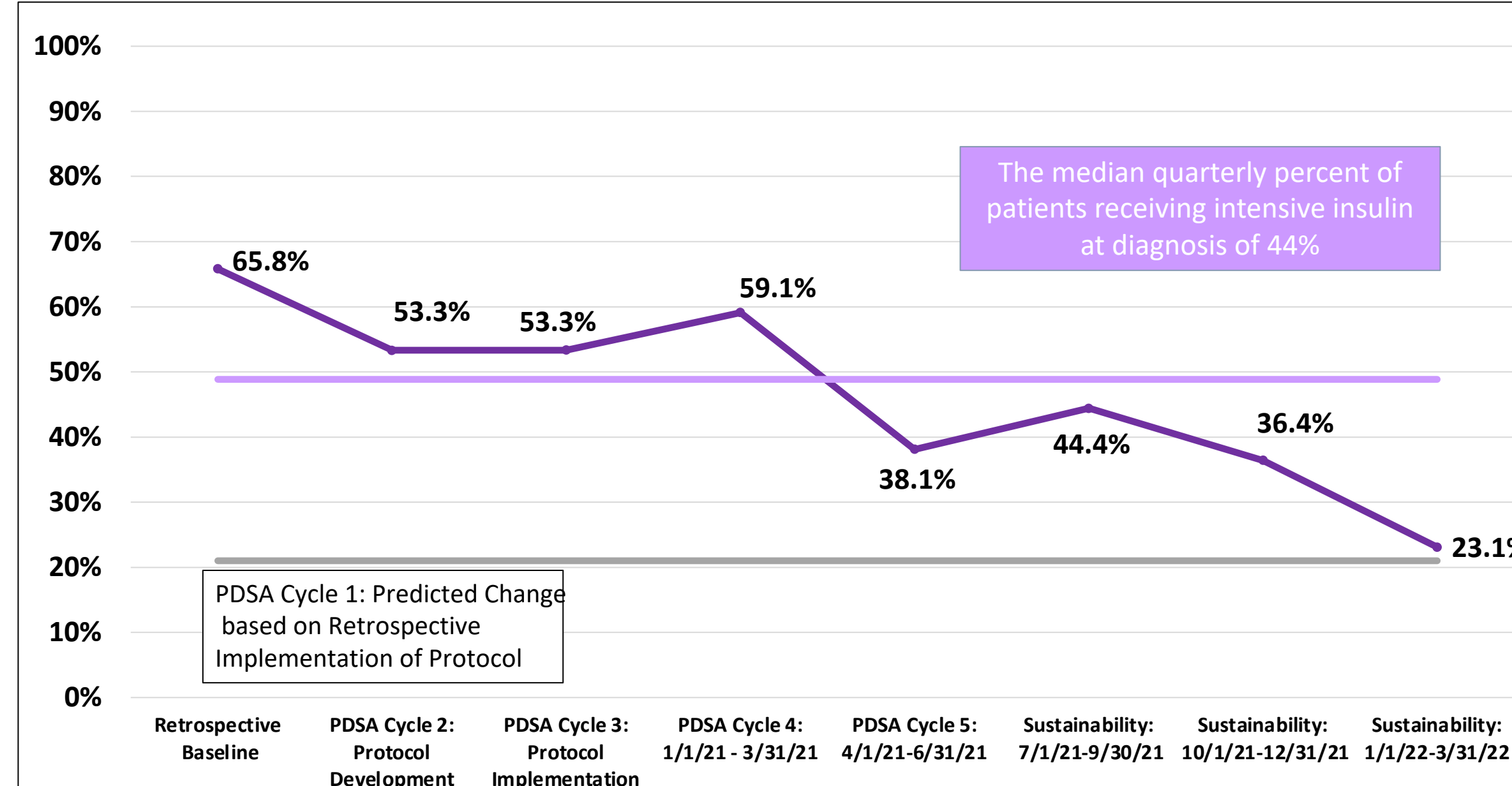
## Standardized Protocol



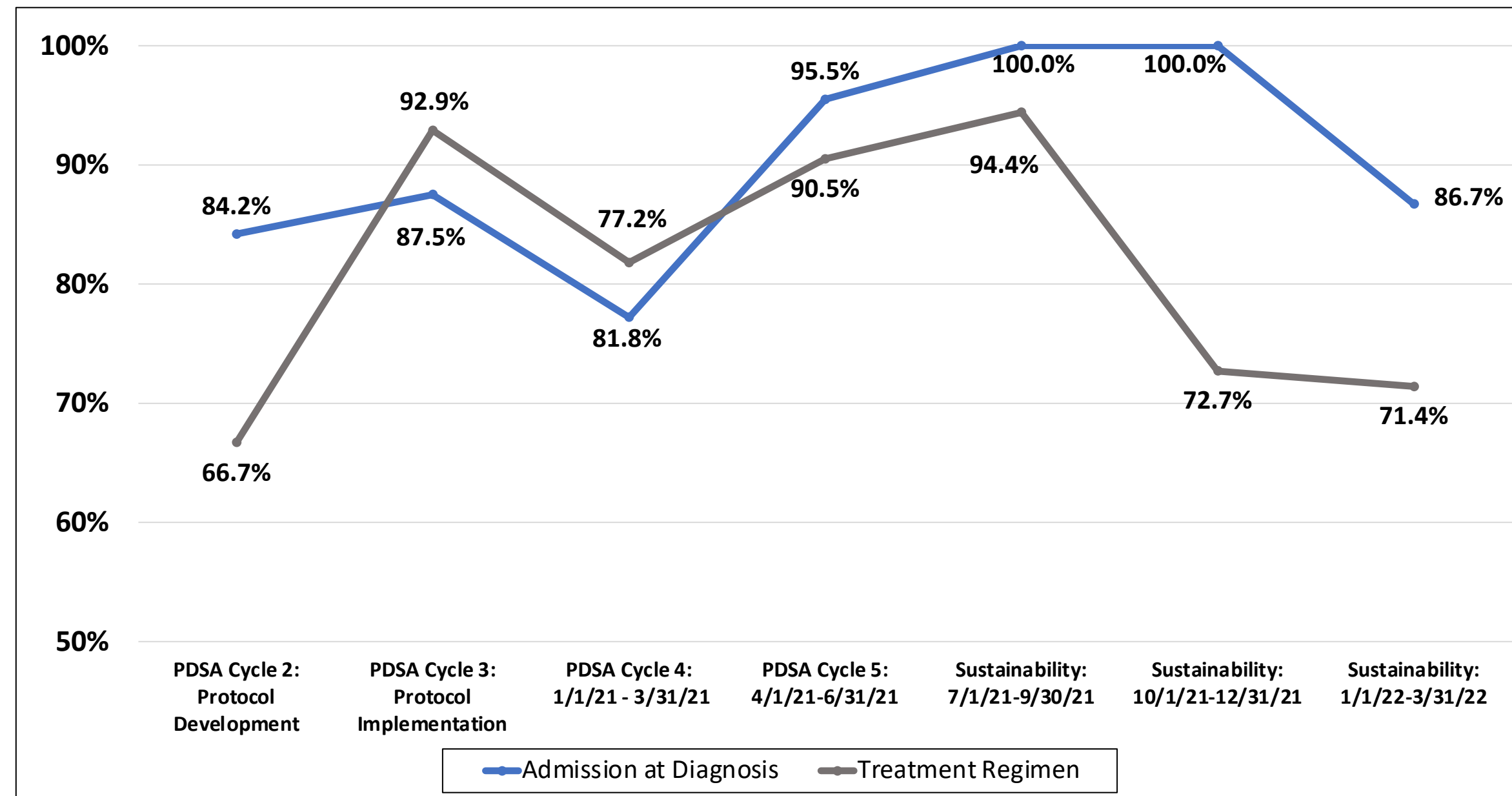
## Results: Admission Rates at Diagnosis



## Results: Intensive Insulin at Diagnosis



## Results: Adherence to Protocol



## Results: Unanticipated Factors

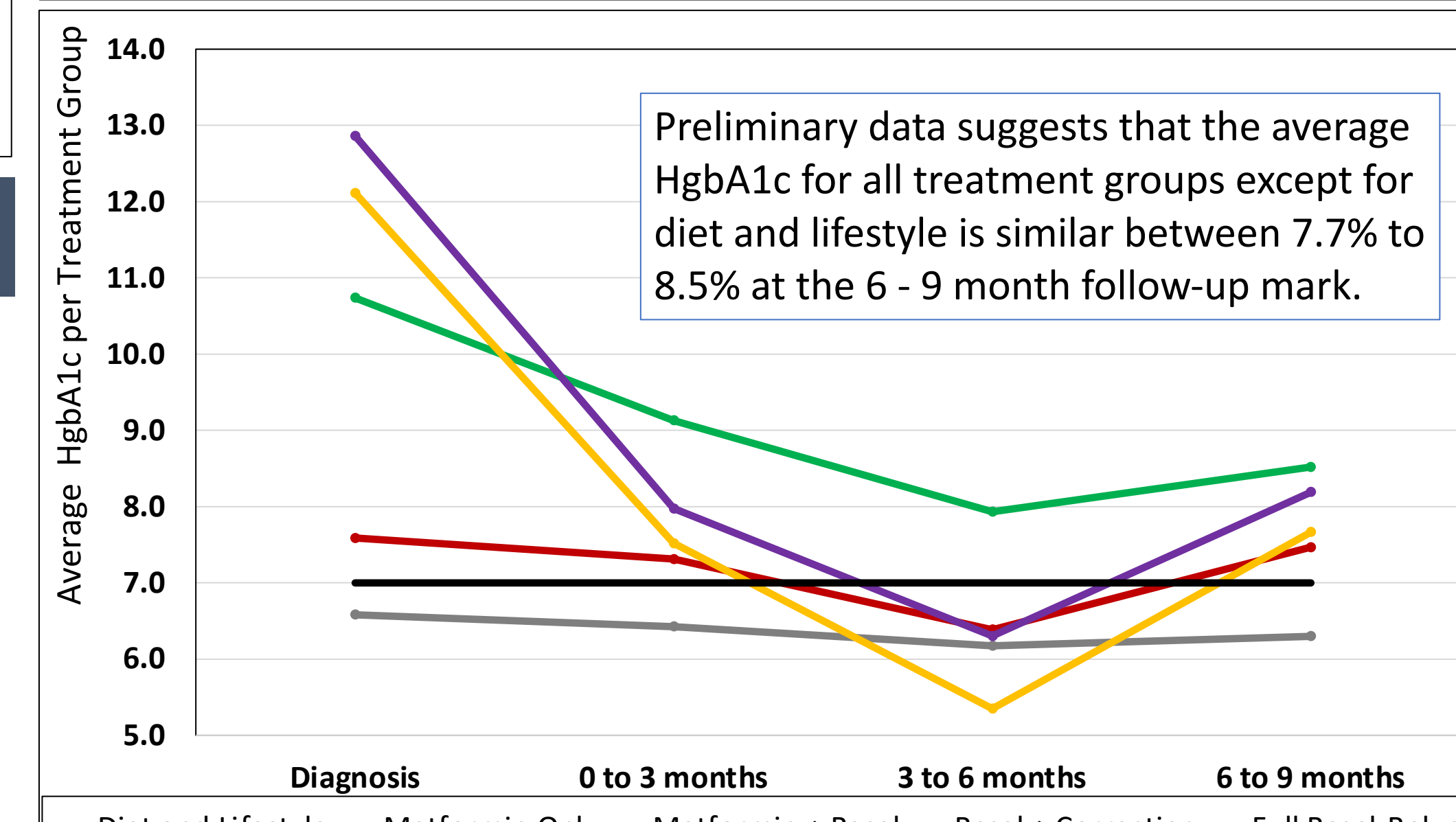
	PDSA 2:	PDSA 3:	PDSA 4:	PDSA 5:	Sustainability		
<b>DKA Rate (10.5% at baseline)</b>	25%	23.5%	31.8%	27.3%	5.6%	16.7%	
<b>Ketones or Severe Hyperglycemia (19% at baseline)</b>	6.3%	23.5%	27.3%	18.2%	38.9%	25%	
<b>Type 1 DM (Number)</b>	10% (2)	14% (3)	12% (3)	21% (6)	10% (2)	14% (2)	
<b>Unanticipated Outcomes</b>	Patient admitted from first outpatient appointment with escalation of treatment.	1. Patient presented to another ER the next day and admitted. 2. Admitted in DKA following initial outpatient management by another provider.	Patient admitted after conversation between PCP and admitting service.	5/12 patients with T1DM were not admitted at diagnosis requiring second outpatient visit within 1 week to complete education - no metabolic decompensation noted.	1 patient was admitted because of high suspicion of T1DM due to sibling's prior diagnosis with T1DM		

## Discussion:

- In the first 6 months following protocol implementation, admission rates and use of intensive insulin remained high peaking in the first quarter of 2021. This was likely due to higher metabolic acuity at presentation (DKA rates of 23% to 32% compared to 10% at baseline) and decreased adherence to the protocol in the setting of increased workload during the COVID-19 peak. Initial care provided by clinicians other than the endocrinology team also impacted the admission rates.
- With improved education of both internal and external providers and a decrease in metabolic acuity at presentation, adherence to the protocol for admission at diagnosis has steadily increased. Overall, this had led to a decrease in admission rates to 30% and use of intensive insulin to 23% in the past quarter, approaching our aims.
- The protocol appears safe with only one episode of metabolic deterioration requiring admission to the hospital noted among patients with Type 2 Diabetes who were not initially admitted (1/56). There were no episodes of metabolic deterioration noted in patients ultimately diagnosed with Type 1 Diabetes.

## Next Steps:

We plan to follow patients for 2 years post diagnosis documenting factors that impact achievement of target A1c, changes to treatment regimens and changes to other metabolic parameters such as BMI. Our global aim is to improve diabetes control and decrease complication rates for children and adolescents with T2DM in Eastern North Carolina.



## Acknowledgements:

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