Objective: To explore the relationship between diabetes mellitus (DM), hyperglycemia, and adverse outcomes in critically ill patients with coronavirus disease 2019 (COVID-19).

Research Design and Methods: The study population comprised 133 patients with COVID-19 admitted to an intensive care unit (ICU) at an academic, urban, quaternary-care center between March 10th and April 8th, 2020. Patients were categorized based on the presence of DM and early-onset hyperglycemia (EHG), defined as a blood glucose >180 mg/dL during the first two days of ICU admission. The primary outcome was 14-day in-hospital mortality; also examined were 60-day in-hospital mortality and the levels of C-reactive protein (CRP), interleukin 6, procalcitonin, and lactate. **Results:** Compared to non-DM patients without EHG, non-DM patients with EHG exhibited higher adjusted hazard ratios (HR) for in-hospital mortality at 14 days (HR 5.76, p=0.008) and 60 days (HR 7.28, p=0.004). Non-DM patients with EHG also featured higher levels of mean CRP (322.3±177.7 mg/L, p=0.036), procalcitonin (34.75±69.33 ng/mL, p=0.028), and lactate (2.7±2.1 mmol/L, p=0.023). **Conclusions:** In patients with critical illness from COVID-19, those without DM with EHG were at greatest risk of 14-day and 60-day in-hospital mortality. The limitations of our study include its retrospective design, and relatively small cohort. However, our results raise the possibility that the combination of elevated glucose and lactate may identify a specific cohort of individuals at high mortality risk from COVID-19, and suggest that glucose testing and control are important in individuals with COVID-19, even in those without pre-existing diabetes.

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Impact of COVID 19 National Lockdown on Glycaemic Control in Children and Adolescents With Type 1 Diabetes (T1DM): A Retrospective Review at a Large UK Teaching Hospital

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Introduction: The coronavirus disease global pandemic led to national lockdown in the United Kingdom on 23rd March 2020. We compared the glycaemic control of children and adolescents with Type 1 diabetes (T1DM) at Doncaster & Bassetlaw Teaching Hospitals in the 12 weeks prior to the lockdown, to the 12 weeks following lockdown. **Methods:** HbA1c result 3 months following lockdown was compared to the last HbA1C prior to lockdown. Data from Continuous Glucose Monitors (CGMs), Flash Glucose Systems (FGS) and those performing Self-Monitoring of Blood Glucose (SMBG) were compared alongside changes to patient contact that occurred. **Results:** In 264 patients under 20 years of age across both hospitals in the Trust, face-to-face consultations decreased (245 vs 151, 39%), and remote consultations increased (1751 vs 2269, 30%) (χ^2 p<0.001). Excluding those within a year of diagnosis, 122 had paired HbA1c results, and 80 had more than 70% of glucose monitoring data available. HbA1c levels decreased (67.4 mmol/mol vs 61.3 mmol/mol, p<0.001) and glucose monitoring data showed lower mean glucose after lockdown (9.7mmol/L vs 9.5mmol/L, *p*=0.034) with lower standard deviation (4.4mmol/L vs 4.2mmol/L, *p*<0.001). Proportion of time in range (3.9mmol/L to 10mmol/L) increased (n=47, 55.2% vs 58.0%, p=0.017), with no change to time below range (4.8% vs 5.0%, *p*=0.495). **Conclusion:** Glycaemic control improved in the 12 weeks following national lockdown. This demonstrates the difficulties faced by patients and carers managing T1DM around school pressures, meals away from home, social life and peer pressure. Increased remote contact with patients with T1DM has not been detrimental to glycaemic control.

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Impact of Covid-19 Lockdown Measures on Lifestyle Behavior in Children and Adolescents With Severe Obesity

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Introduction: During the COVID-19 pandemic, lockdown measures were implemented with large impact on lifestyle behaviors and well-being of children (including adolescents). The impact on children with severe obesity, who plausibly are at even larger risk, has not yet been described. Aim of this study was to investigate the impact of COVID-19 lockdown on eating behaviors, physical activity, screen time and quality of life (QoL) of children with severe obesity. **Methods:** In this mixed-methods study, questionnaires and semi-structured telephone interviews were used to investigate impact of COVID-19 during the first wave in the Netherlands (April 2020) on children with severe obesity (adult BMI-equivalent ≥35kg/m^2) treated at our obesity center. The Dutch Eating Behavior Questionnaire - Child, Pediatric Quality of Life Inventory, and Dutch Physical Activity Questionnaire were filled out by their families pre-pandemic and during lockdown. Changes over time in percentile scores, weekly physical activity and screen time were assessed. Qualitative analyses were performed according to the Grounded Theory. **Results:** We included 83 families, of which 75 participated in the interviews. Their children's characteristics were mean age 11.5 years (SD 4.6), 52% female, mean BMI SD score 3.8 (SD 1.0), indicating severe obesity. On group level, no changes in scores for emotional, restrained, external eating, and QoL nor in screen time were observed (Δ scores +9.2, +3.9, +0.3; and +3.0, respectively; -0.3 hr/wk; all p>0.05). Weekly

physical activity decreased (Δ -1.9 hr/wk, p=0.02). Age, pre-existent psychosocial problems and pre-pandemic questionnaire scores were associated with improved or deteriorated questionnaire scores in specific subgroups. For example, children who did not fulfill WHO physical activity criteria pre-pandemic showed a further decline from 2.8 to 0.7 h/wk (p=0.001). Children with high emotional and external eating during lockdown had the lowest QoL scores (p-values <0.01). Qualitative data showed that an increased demand for food was frequently observed (n=21), mostly in children aged <10 years (19/21). This was attributed to loss of daily structure, increased stress, or emotional eating. Families who reported no changes (n=15) or improved eating behaviors (n=11) attributed this to already existing strict eating schemes that they kept adhering to.

Conclusion: This study shows differential response profiles to COVID-19 lockdown in children with severe obesity. Although on group level lifestyle scores averaged out, a substantial part of families reported deterioration in physical activity and eating behaviors. Children with pre-existent psychosocial problems, high external or emotional eating scores were most at risk. Health care professionals should target these vulnerable children to minimize short- and long-term negative physical and mental health consequences.

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Impact of Covid19 Lockdown on Glycemic Control

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Evidence shows that people with poor glycemic control are at greater risk of mortality due to Covid19. It is important to achieve and maintain good glycemic control to prevent negative outcomes during this pandemic (1). To study the effect of lockdown on glucose control we conducted an observational, retrospective cohort study involving 98 patients followed at endocrine clinic at an inner city, community hospital in Brooklyn, NY in the period February to May 2020. Of the cohort, 60% were women, mean age was 54.1 + 15.3 years, 70% was Hispanic, 24% was African American with a predominance of type 2 diabetes (86%). Mean HbA1c of prelockdown and lockdown phase was 9.77 ± 2.26% and 9.49 ± 2.17 % respectively and the difference was statistically significant (p < 0.001) both in patients with Type 1 and Type 2 diabetes. Mean BMI of prelockdown and lockdown phase was 30.5 ± 6.8% and 30.1 ± 6.05% respectively and the difference was not statistically significant (p = 0.33). Despite no significant change in BMI, the factors responsible for improvement in HbA1c might be a result of refined eating patterns (increased consumption of home-made food), increased adherence to medication and time to cope with the daily challenges of diabetes management (1).

Reference: Maddaloni E, Coraggio L, Pieralice S, Carlone A, Pozzilli P, Buzzetti R. Effects of COVID-19 Lockdown on Glucose Control: Continuous Glucose Monitoring Data From People With Diabetes on Intensive Insulin Therapy. Diabetes Care Aug 2020, 43 (8) e86-e87; DOI: 10.2337/dc20-0954

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Implementation of a Continuous Glucose Monitoring Program at a Safety Net Hospital During Covid 19 Pandemic

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Background: COVID 19 disproportionately impacts individuals with diabetes leading to increased morbidity and mortality. Hyperglycemia is common in hospitalized patients with COVID requiring intensive monitoring and management. Close monitoring of glucoses requires increased use of personal protective equipment (PPE), which has been in limited supply since the beginning of the pandemic. The FDA granted conditional allowance for use of continuous glucose monitors (CGM) in hospital settings during the COVID pandemic to allow for preservation of PPE. We present the process of implementing a continuous glucose monitoring program in an urban safety net hospital.

Methods: The program was implemented at a county urban safety net hospital. Patients were eligible to be started on Dexcom G6 CGM if they had hyperglycemia requiring multiple insulin injections daily, were in contact isolation, and were located in 1 of 3 units of the hospital (medical intensive care unit [MICU], surgical intensive care unit, COVID 19 floor unit). Initial program was started in the MICU and subsequently expanded. Nurses and staff underwent training using videos, in-person demonstrations, and written guides. Informational Technology modified the electronic medical system to allow for ordering and documentation of CGM values by nurses. Supplies were stored both on unit and in central supply allowing for primary team to initiate monitoring independent of diabetes team. Records of patients participating in program were maintained by the diabetes team. Amount of PPE saved was estimated to be 10 instances/day while on insulin drip and 3/day when using subcutaneous insulin.

Results: A total of 69 patients used a CGM during their hospital course. Average age was 56 years old, 69 % were male, average BMI 31, and 84% had known diabetes prior to admission. The majority of patients were critically ill with 68% intubated, 48% on vasopressors, 6% requiring dialysis, 38% on insulin drip, 46% were on tube feeds, and 74% received steroids. The racial demographics of the patients were 72% White, 3% Black, 4% Native American, 4% Asian, and 14% other. For ethnicity, 73% identified as Hispanic and half spoke Spanish as their primary language. An estimated 2600 instances of PPE were saved. Challenges that were faced in implementing the program included consistent training of large numbers of staff, maintaining