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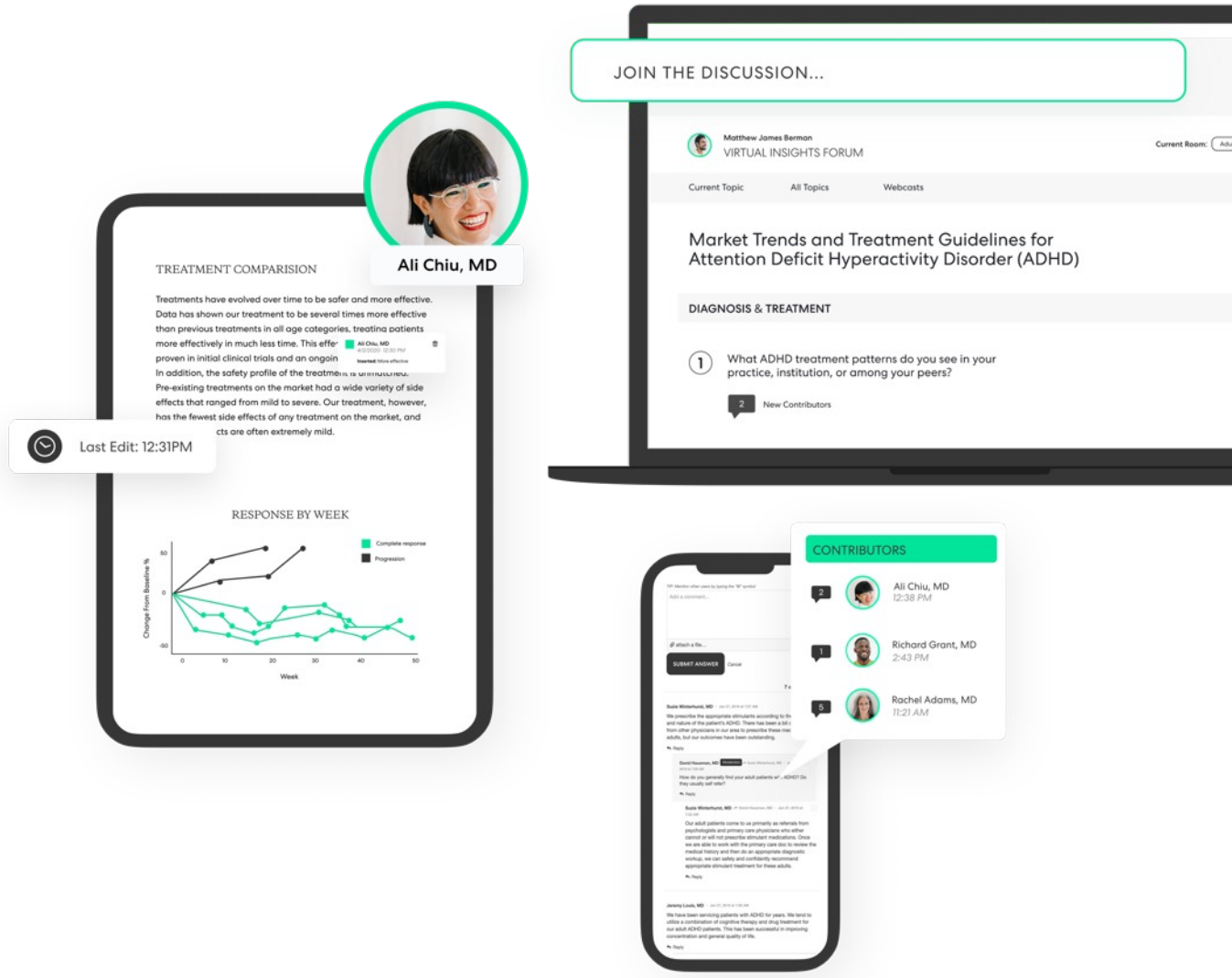
Executive Summary

CGM Data in the Inpatient Setting



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Session Overview

COMMUNITY NAME

Dexcom Virtual Advisor Forum

SESSION TITLE

CGM Data in the Inpatient Setting

SESSION OBJECTIVES

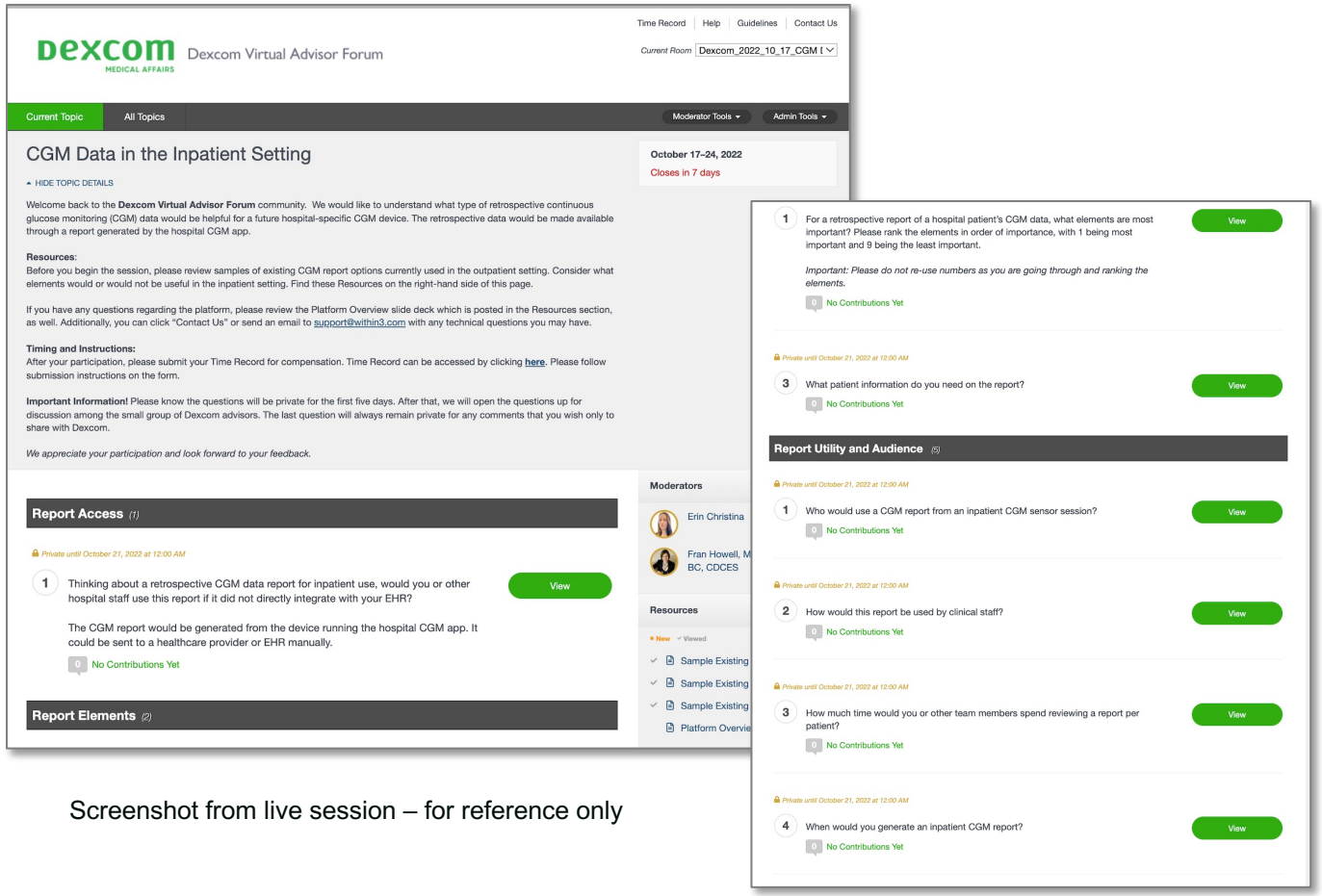
To understand what type of retrospective continuous glucose monitoring (CGM) data would be helpful for a future hospital-specific CGM device. The retrospective data would be made available through a report generated by the hospital CGM app.

SESSION START

October 17, 2022

SESSION END

November 1, 2022

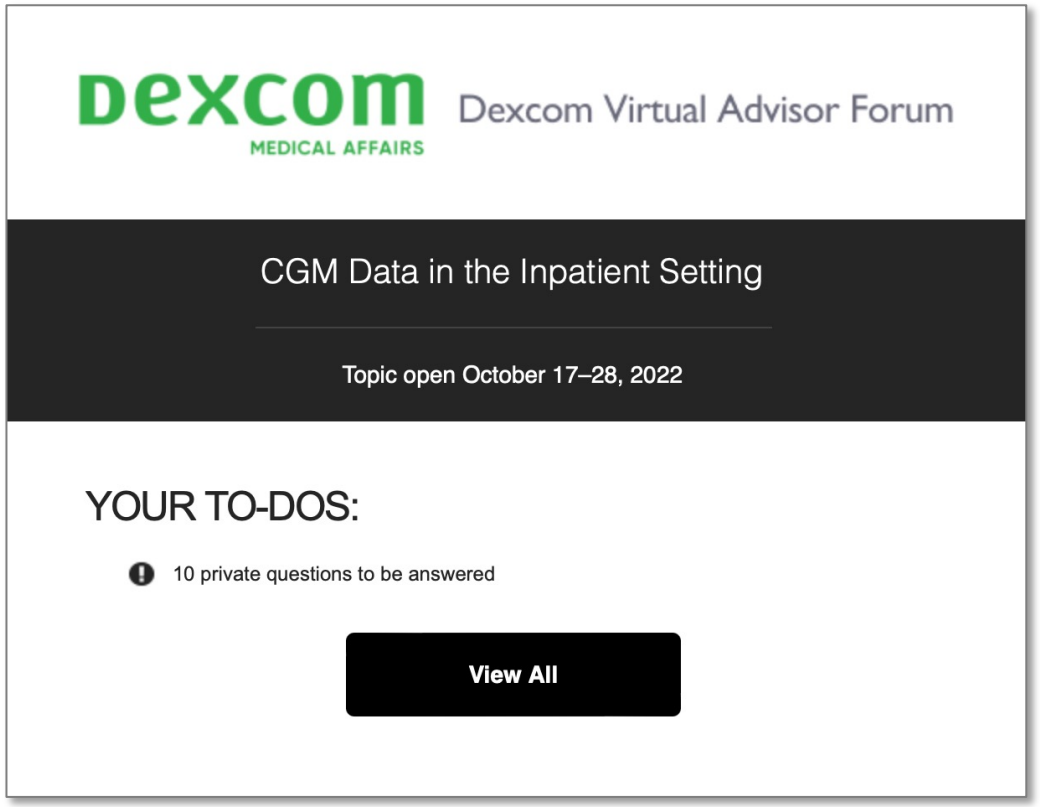


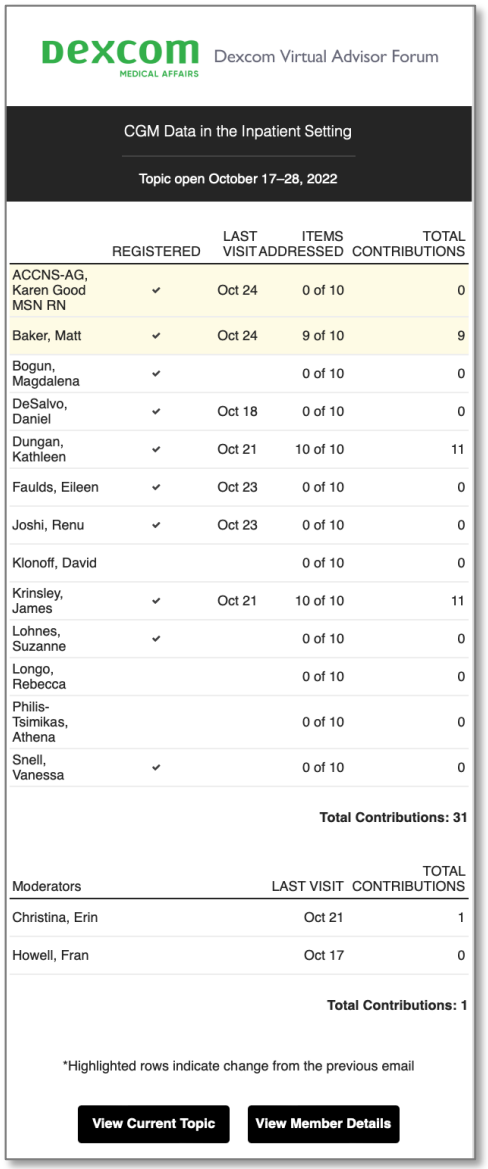
Screenshot from live session – for reference only

Session Overview *(cont.)*

ITEMS OF INTEREST

- All 10 questions were set up as private. Initially going to open-up questions for discussion after a few days but decided against due to advisor participation
- A mix of digest emails, personal emails, group messages were sent
- Three sample CGM reports were provided as resources
- Session was extended from October 28th to November 1st to receive additional advisor contributions
- 10/13 advisors participated





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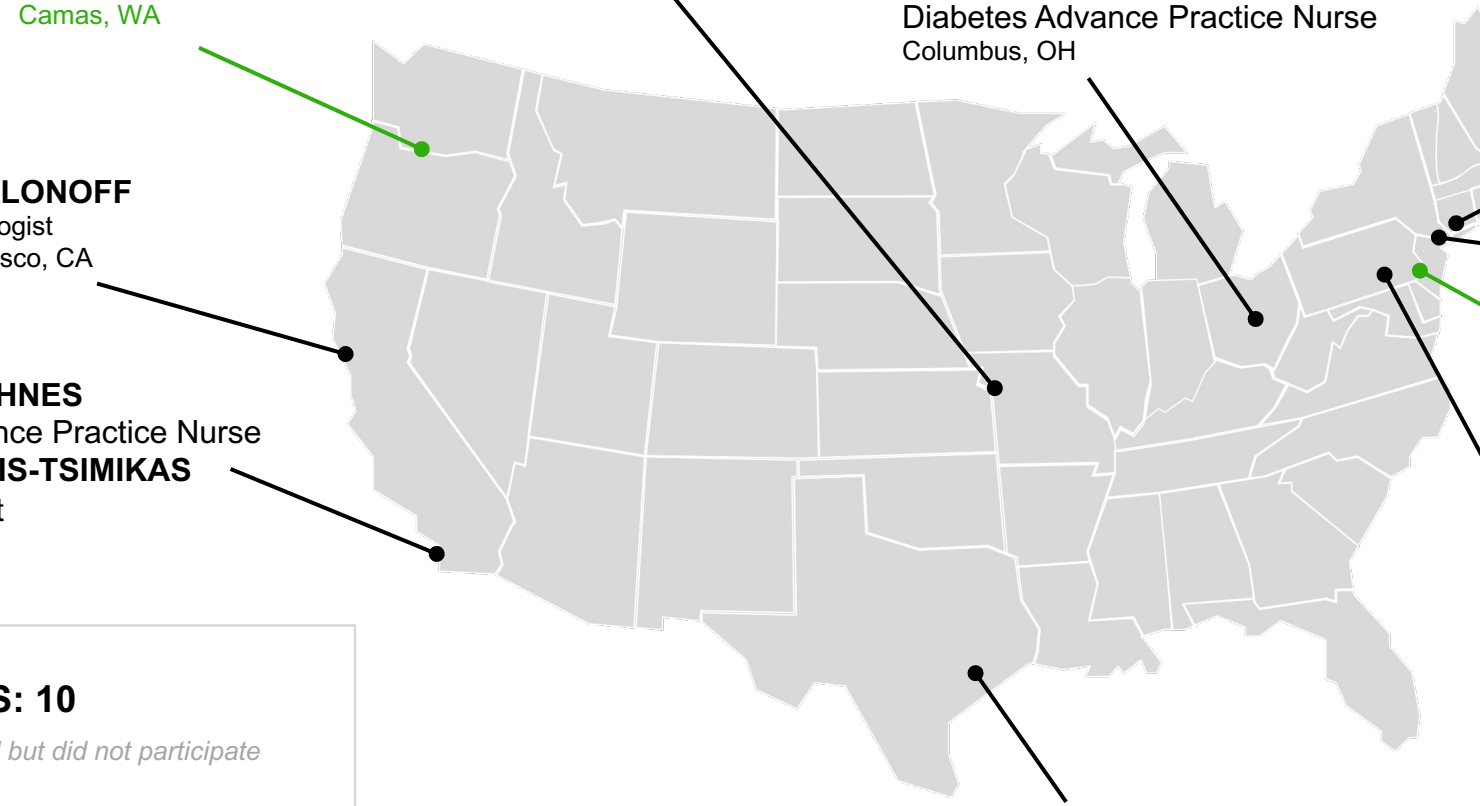
Participant Names & Locations



ERIN CHRISTINA
Camas, WA

MATT BAKER
Pharmacist
Kansas City, MO

KATHLEEN DUNGAN
Endocrinologist
EILEEN FAULDS
Diabetes Advance Practice Nurse
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Endocrinologist
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SUZANNE LOHNES
Diabetes Advance Practice Nurse
ATHENA PHILIS-TSIMIKAS
Endocrinologist
San Diego, CA

FRAN HOWELL
Chester Springs, PA

KAREN GOOD
ICU Nurse Manager
RENU JOSHI*
VANESSA SNELL*
Harrisburg, PA

DANIEL DESALVO
Pediatric Endocrinologist
Houston, TX

ADVISORS: 10

**Advisor invited but did not participate*

MODERATORS: 2

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Key Findings

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Report Access

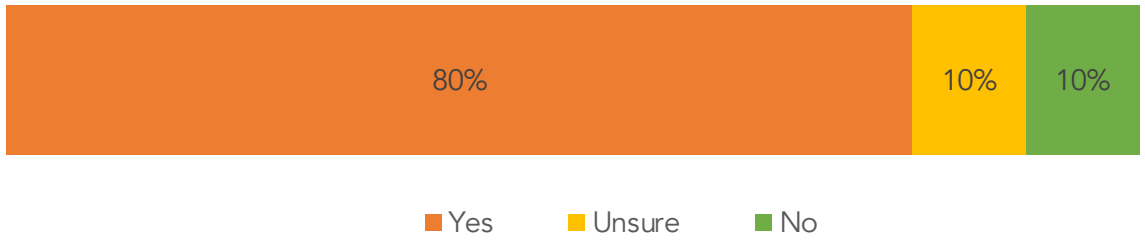
- Majority of the respondents (8 out of 10) agreed that retrospective CGM reports for inpatients would be useful.
- The retrospective CGM report is useful in insulin dosage adjustment and for monitoring safety and quality of treatment.
- Most of the respondents noted their preference of direct integration integration with the EHR versus generating from an app.

Usage of Retrospective CGM Data Report for Inpatients

(N=10)

Q: Thinking about a retrospective CGM data report for inpatient use, would you or other hospital staff use this report if it did not directly integrate with your EHR?

The CGM report would be generated from the device running the hospital CGM app. It could be sent to a healthcare provider or EHR manually.



If/when CGM will be used in the inpatient setting, it would be used on a large scale, meaning non-endocrinology teams would be using it. Most of the communication related to patient care happens via EHR and it would be very difficult to have a system which does not integrate with the EHR.

*- **Magdalena Bogun, endocrinologist***

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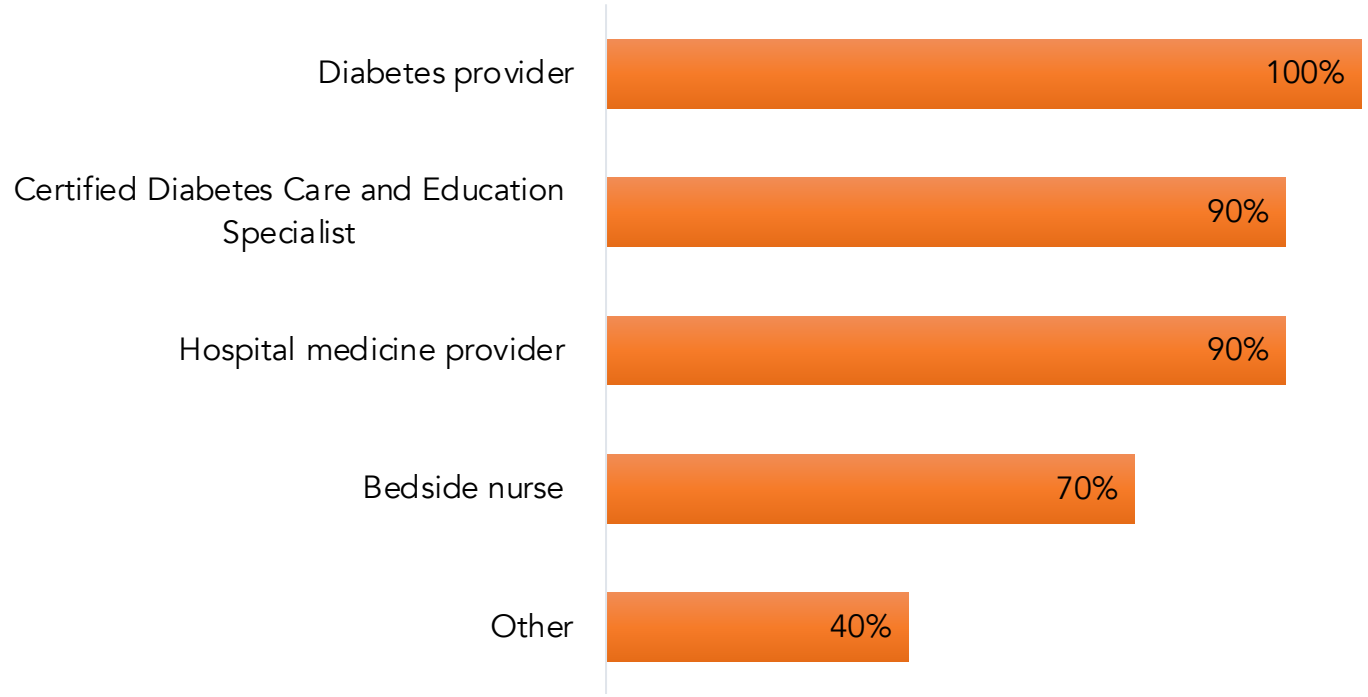
Report Audience

Who would use A CGM report from an inpatient CGM sensor session?

(N=10)



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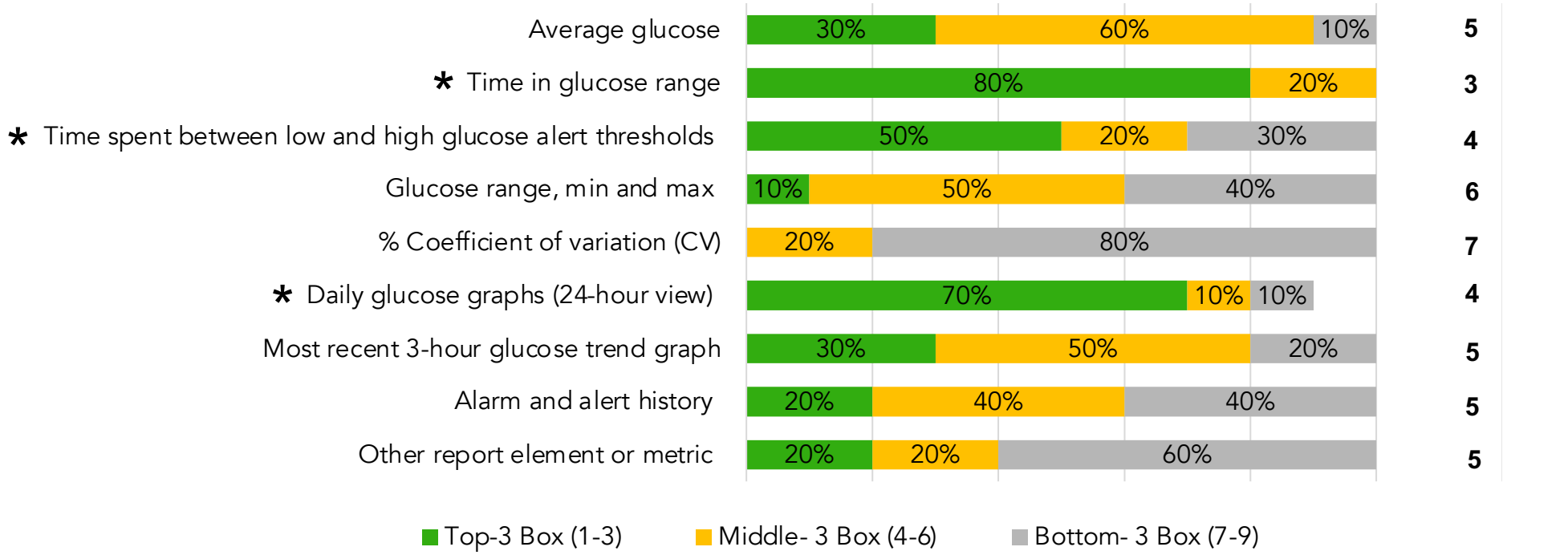
Report Elements

Elements of A Retrospective Report of a Hospital Patient's CGM Data

9-pt scale (1- Most important, 9- Least important)

(N=10)



Daily glucose graphs (24-hour view), most recent 3-hour glucose trend graph, time spent between low and high glucose alert thresholds, and time in glucose range are the key items used to manage a patient's glucose. Average glucose and glucose range (min/max) just give me an idea of a patient's overall management. Alert/alarm history and %CV I really don't use. -Suzanne Lohnes, diabetes APN

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Report Elements Comments

Inpatient context:

"In the inpatient setting, insulin adjustments are made on a daily (or more often basis), so the daily glucose graphs are most important."
Daniel DeSalvo, endocrinologist

In the hospital setting, most patients who have high glucose levels are admitted for other conditions. Therefore, often providers spend more time for management of other conditions than managing glucose levels. For that reason, the CGM report should be less detailed, easy to use. The most important information is time in range, frequency of hyper- and hypo-glycemic events.
– Magda Bogun, endocrinologist

TIR comments:

Ranges and goals for various hospital settings will need to be defined.

Suggestions:

- Target range should be relevant for inpatient use, such as 100-180 mg/dL or 140-180 mg/dl.
- Provide the ability to individualize by patient and/or unit.
- Break out time in hypoglycemia to <100 mg/dL and <70 mg/dL or "clinician-generated limits"

"I'd like to rank TIR higher but not certain how that translates to hospital outcomes yet". Matt Baker, pharmacist

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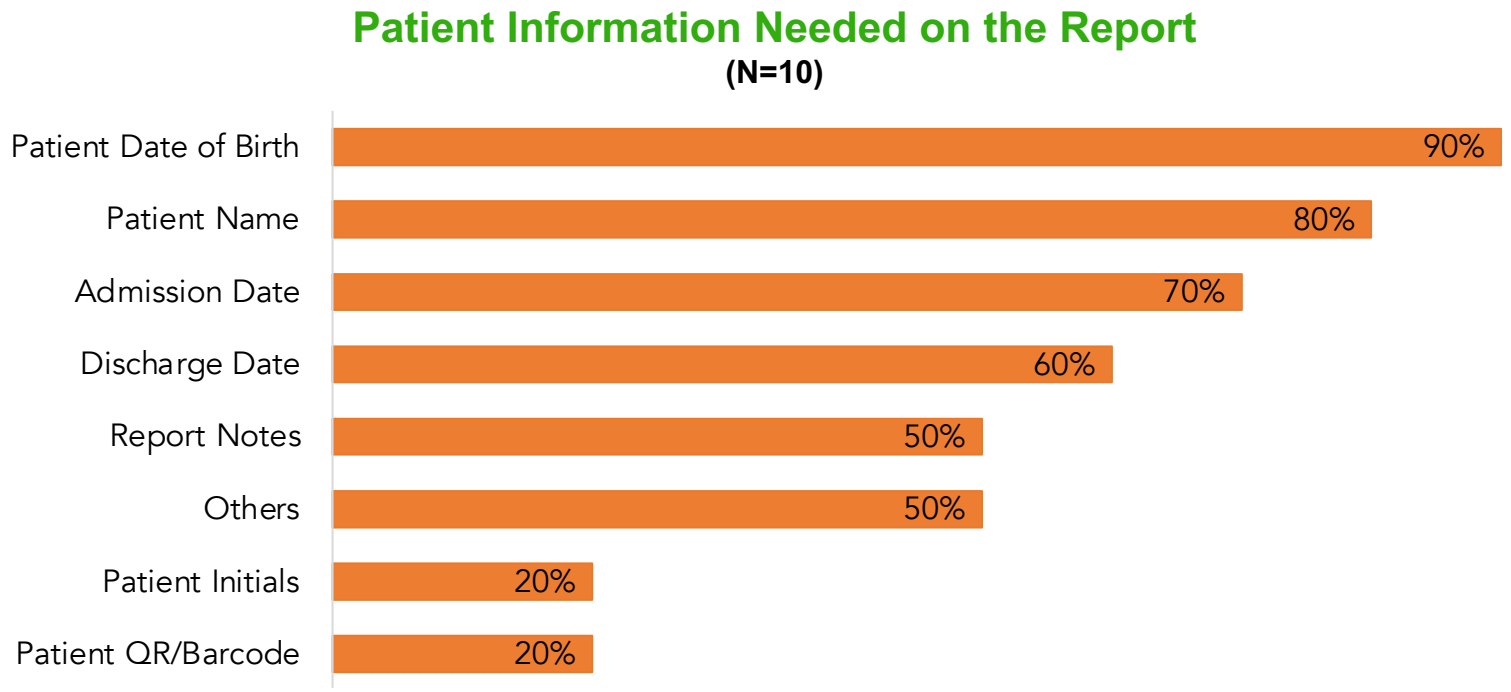
Report Elements



- Other included Medical Record Number, insulin dosing & nutrition, hospital unit, and patient room number.

Report Utility and Audience

- According to the respondents the CGM report from an inpatient CGM sensor session would be used to identify clinical trends needed for treatment decisions (e.g. insulin dose adjustments). The report can also be used for study and research to identify which treatment are best for the overall glycemic picture.
  - The hospital can use the report to promote a culture of safe and effective glucose control. The report can be a resource for patient awareness on good glucose control practice once they are discharged.
- Majority of the respondents (8 out 10) would review a report per patient within 1–15 minutes, dependent on patient's status, purpose of review, and on what is needed from the report. Generally, a daily review of patient's report would take 1–5 minutes.
- Majority of the respondents (8 out of 10) would usually generate an inpatient CGM report daily especially if patients have severe hypoglycemia or hyperglycemia. The generation of data is also dependent on the degree of integration within other workflows and the need for a problem or a solution to be explained.
- Most of the respondents would need the ability to export the raw CGM glucose data for research, QC/QA/QI, the calculation of multiple patient-level glucose meters, analysis of specific patient cohorts, and for audits. The raw data would not be necessary for clinical purposes.

"As an endocrinologist I am used to interpreting the current CGM reports and I don't need raw data. However, hospital providers are used to looking at the raw data, and it would probably be helpful to have the raw numbers." - Magdalena Bogun, endocrinologist

Actionable Recommendations

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Actionable Recommendations

- CGM report should be less detailed and easy to use by different hospital staff.
- Option to generate a report of the last 24 hours as well as whole sensor session. Report must include daily graph and time in range.
- Time in range target and goals for various settings should be defined by hospital but also give the ability to individualize. Time in range for past 24 hours and over whole sensor session.
- Ability to send report directly to the provider making the clinical decisions. CGM report must be easily accessible for daily use by responsible hospital staff or as needed by HCPs to guide the necessary therapy adjustments like insulin dosing, nutrition, and fluids.
- CGM data must provide relevant information for clinical needs, research, QA/QI, and patient cohort analysis. Since these activities are important for inpatients as well as for the improvement of the hospital setting.
- Future consideration: unit-level reports that aggregate glucose data to evaluate patient population and staff

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Thank You

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Report Elements Comments

- We currently use time in hypo and time in hyper to determine changes in the insulin dosing. It would help if the default ranges were changed to 100-180 as these are the more common target ranges in the hospital. Also, if time below 100 and time below 70 were broken out, to assist in calculating how much time is spent in these ranges to allow direction to adjusting the insulin to prevent time below 100. - Athena Philis-Tsimikas, endocrinologist

- Items 1-4 are the key items I use to manage a patient's glucose. Items 5-6 just give me an idea of the patient's overall management. Items 7-9 I really don't use. Suzanne Lohnes, diabetes advance practice nurse

- Time spent in hypo and hyper ranges would be useful.
  It would also be useful to have clinician-generated hypo and hyper limits. Recent literature has documented the importance of relative hypoglycaemia - for some patients there is signal of increased mortality risk at BG levels above the threshold typically defined as hypo (< 70 mg/dL). This would also be important for clinical units that had more than one BG target range.
  Of the 3 sample reports, I like the first best. It would be good to be able to expand the time interval beyond 24 hours - either graphically, or by generating a table that reports daily metrics - mean, time in range, CV, time in hyper range, time in hypo range, for example. - James Krinsley, intensivist

- The Glycemia Risk Factor presents a single number assessment of glycemia as a composite metric which weights times in severe hypoglycemia and severe hyperglycemia as more significant than time in mild hypogycemia and mild hyperglycemia. This metric more closely reflects clincan opinon and more closely tracks with glycemic variability than any other metric, such as TIR. Most people say TIR is the most important single metric, but these peole are simply not familar with GRI and I question the value of the opinion of someone who is not familiar with this metric. TIR is good for this purpose, but GRI is better. For predicting long term outcomes, the article by Benhamou shows that GRI can be more sensitive and more dynamic than TIR. – David Klonoff, endocrinologist

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Report Elements Comments

- Isolating glucose range from MN-6am would guide prescribers on basal insulin adjustments which are often made daily in the inpatient setting. So 24 hour overnight (MN-6am) time in range – Eileen Faulds, diabetes advance practice nurse
- [Would add the following elements] % time in hypoglycemia <70 mg/dl (priority 4); % time in hypoglycemia <54 mg/dl (priority 5). Time in range and goals for various settings will need to be defined. the current standard is 140-180 mg/dl for most patients but this should be individualized. – Kathleen Dungan, endocrinologist
- In the inpatient setting, insulin adjustments are made on a daily (or more often basis), so the daily glucose graphs are most important (as with Existing Reports 1&2). - Daniel DeSalvo, pediatric endocrinologist
- In the hospital setting , most patients who have high glucose levels are admitted for other conditions. Therefore, often providers spend more time for management of other conditions than managing glucose levels. For that reason, the CGM report should be less detailed, easy to use. The most important information is time in range, frequently of hyper and hypo-glycemic events. Alarms would be very useful but mostly for hypoglycemia. If alarms are included for hyperglycemia, they should be for severe hyperglycemia. Otherwise providers can develop "alarm fatigue" and respond less to alarms. – Magda Bogun, endocrinologist
- Looking at what has happened during inpatient stay would be more significant to make dosing adjustments under relevant circumstances. Would like to rank time in range higher but not certain how that translates to hospital outcomes yet. – Matt Baker, pharmacist
- Correlation with POCT glucose – Karen Goode, ICU Nurse Manager