Learning Objectives

• Discuss definitions and features of CGM and insulin pump reports
• Utilize a systematic approach to review CGM data
• Analyze CGM and insulin reports to make medication changes
Quick Review:
How a Pump Delivers Insulin
Available Pumps in U.S.

- Omnipod (Insulet)
- t:slim X2 with G6 CGM (Tandem/Dexcom)
- 670G with Guardian 3 (Medtronic)
- VGo
Continuous Glucose Monitoring

Dexcom G6

Medtronic Guardian Connect

Freestyle Libre Flash

Senseonics Eversense-Implantable
Insulin Pump Settings

**Basal**
- Maximum Basal Rate: 2.50 U/Hr

**Basal 1 (active)**
- 24-Hour Total: 28.100 U
- **Carbohydrate Ratio (g/U)**
  - Time: 00:00, Ratio: 1.00
  - Time: 02:30, Ratio: 1.10
  - Time: 08:00, Ratio: 1.15
  - Time: 13:00, Ratio: 1.30
  - Time: 22:00, Ratio: 1.05

- **Insulin Sensitivity (mg/dL per U)**
  - Time: 00:00, Sensitivity: 15.0

- **Blood Glucose Target (mg/dL)**
  - Time: 00:00, Low: 100, High: 120

- **Total daily dose (per day):** 49 units
- **Bolus amount (per day):** 21U (43%)
- **Auto Basal / Basal amount (per day):** 28U (57%)

- **Meal (per day):** 2.9
  - Carbs entered (per day): 190 ± 42 g
Pump Automation

• Suspend insulin on low

• Predictive suspend

• Auto adjust basal insulin

• Auto correction doses
Predictive Suspend
Control IQ
Control-IQ: How It Works

- Automatic basal attenuation (uses programmed rates)
  - Increases basals if predicted >160 mg/dL
  - Decreases basals if predicted <112.5 mg/dL
  - Suspends if predicted <70 mg/dL

- Automatic correction doses
  - Up to 1 every hour
  - Calculated at 60% of programmed correction factor (target of 110)

- User must still give boluses for CHO (and additional correction doses)

- Active insulin time 5 hours
Control-IQ: Sleep and Exercise

Sleep “Activity” schedule
- Target range to 112.5-120 mg/dL
- No automatic boluses

Exercise “Activity” schedule
- Temporary target range: 140-160 mg/dL
- Use like temp basal

Courtesy: Laurel H. Messer, RN, MPH, CDE, Barbara Davis Center for Diabetes University of Colorado School of Medicine.
## Control-IQ vs Medtronic 670G rtCGM

<table>
<thead>
<tr>
<th></th>
<th>MiniMed 670G</th>
<th>Control-IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calculate</strong></td>
<td>• Automatic basal delivery based on TDD</td>
<td>• Automated basal delivery based on basal rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Delivers auto-correction dose 1/h</td>
</tr>
<tr>
<td><strong>Adjust</strong></td>
<td>• Can modify:</td>
<td>• Can modify:</td>
</tr>
<tr>
<td></td>
<td>- I:C ratios, insulin action time</td>
<td>- Basal rates, I:C ratios, sensitivities</td>
</tr>
<tr>
<td><strong>Revert</strong></td>
<td>Will revert to OL:</td>
<td>Will revert to OL:</td>
</tr>
<tr>
<td></td>
<td>• Prolonged hyperglycemia, max/min insulin, no CGM data, sensor integrity</td>
<td>• if loss of CGM data</td>
</tr>
<tr>
<td><strong>Educate</strong></td>
<td>• Follow system prompts to stay in Auto mode (entering BGs)</td>
<td>• Set sleep schedule</td>
</tr>
<tr>
<td></td>
<td>• Increase I:C ratios to make more aggressive</td>
<td>• Do not override boluses: extra insulin present from auto-corrections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Read bolus prompts carefully</td>
</tr>
<tr>
<td><strong>Sensor/Share</strong></td>
<td>Guardian Sensor 3:</td>
<td>Dexcom G6 sensor:</td>
</tr>
<tr>
<td></td>
<td>• 2-4 calibrations/d</td>
<td>• Factory calibrated</td>
</tr>
<tr>
<td></td>
<td>• No remote monitoring</td>
<td>• Phone view and remote monitoring</td>
</tr>
</tbody>
</table>

Temp Basals

- Temporarily increase or decrease basal settings
- A great option for high stress, sick days, steroid bursts, exercise
- Start the temp basal 1-2 hours prior to exercise or activity requiring the change
- Depending on pump report view, you may not see the temp basals
- Hybrid-closed loop
  - Temp target option (Medtronic), 150mg/dL
  - Exercise mode (Tandem), 140-160mg/dL
Bolus Pattern Management

• Does glucose go low after a correction dose?
  - May need a higher sensitivity
  - Ex. 1:60 instead of 1:50

• Does glucose remain high after a correction dose?
  - May need a lower sensitivity
  - Ex. 1:50 instead of 1:60

• Does the person spike high after eating?
  - Is the person bolusing BEFORE the meal
  - Counting carbs correctly?
  - May need a more intensive carb ratio
  - Ex. 1:8 instead of 1:10

• Does the person go low after eating?
  - Counting carbs correctly?
  - May need a less intensive carb ratio
  - Ex. 1:10 instead of 1:8
# Data Management Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Website</th>
<th>What it Downloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloooko</td>
<td><a href="http://www.glooko.com">www.glooko.com</a></td>
<td>Omnipod, Dexcom, Libre, Eversense, many glucose meters, Inpen</td>
</tr>
<tr>
<td>Dexcom Clarity</td>
<td><a href="https://clarity.dexcom.com">https://clarity.dexcom.com</a></td>
<td>Dexcom, Inpen</td>
</tr>
<tr>
<td>LibreView</td>
<td><a href="http://www.libreview.com">www.libreview.com</a></td>
<td>Freestyle Libre</td>
</tr>
<tr>
<td>T:Connect</td>
<td><a href="https://tconnecthcp.tandemdiabetes.com/hcp_account">https://tconnecthcp.tandemdiabetes.com/hcp_account</a></td>
<td>Tandem insulin pumps with dexcom data</td>
</tr>
<tr>
<td>Carelink</td>
<td><a href="https://carelink.medtronic.com/">https://carelink.medtronic.com/</a></td>
<td>Medtronic insulin pumps, Guardian Connect</td>
</tr>
<tr>
<td>Tidepool</td>
<td><a href="https://tidepool.org/">https://tidepool.org/</a></td>
<td>All insulin pumps, Libre, Dexcom, Medtronic, many glucose meters, InPen</td>
</tr>
<tr>
<td>Eversense Data Management</td>
<td><a href="https://us.eversensedms.com/">https://us.eversensedms.com/</a></td>
<td>Eversense</td>
</tr>
</tbody>
</table>
Smart Pen Integration with CGM Data

https://www.companionmedical.com/InPen
Interpreting Reports
Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range

https://doi.org/10.2337/dc19-0028
Reviewing the Data: Key Metrics

<table>
<thead>
<tr>
<th>CGM Metric</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized visualization of data</td>
<td>Ambulatory glucose profile (AGP)</td>
</tr>
<tr>
<td>Mean glucose</td>
<td>Calculated</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>&lt;70mg/dL</td>
</tr>
<tr>
<td>Very low/clinically significant hypoglycemia</td>
<td>&lt;54mg/dL</td>
</tr>
<tr>
<td>Hyperglycemia</td>
<td>&gt;180mg/dL</td>
</tr>
<tr>
<td>Very high/clinical significant hyperglycemia</td>
<td>&gt;250mg/dL</td>
</tr>
<tr>
<td>Time in range</td>
<td>70-180mg/dL</td>
</tr>
<tr>
<td>Glycemic variability (coefficient of variation)</td>
<td>Standard deviation/mean, stable &lt;36%</td>
</tr>
<tr>
<td>Glucose management indicator (GMI)</td>
<td>CGM version of estimated A1C</td>
</tr>
<tr>
<td>Recommend data sufficiency</td>
<td>70% sensor use over 14 days</td>
</tr>
</tbody>
</table>

Problem Solving

What Does All That Data Mean?
Setting the Target Range

**Settings**

*Glucose Time/Target Range (mg/dL)*

Changes that you make here apply throughout Dexcom CLARITY, but they won’t affect any settings on your CGM device.

<table>
<thead>
<tr>
<th>Night</th>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>180</td>
<td>150</td>
</tr>
<tr>
<td>80</td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>

**Day**
- Start Time: 6:00 AM
- End Time: 10:00 PM
- Low Threshold: 70 mg/dL
- High Threshold: 180 mg/dL

**Night**
- Start Time: 10:00 PM
- End Time: 6:00 AM
- Low Threshold: 80 mg/dL
- High Threshold: 150 mg/dL
At least 42 factors affect glucose!

<table>
<thead>
<tr>
<th>Food</th>
<th>Biological</th>
<th>Behavioral &amp; Decision Making</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑↑ 3. Fat</td>
<td>↑ 22. Recent hypoglycemia</td>
<td>↑ 41. Decision-making biases</td>
</tr>
<tr>
<td>↑↑ 4. Protein</td>
<td>↑ 23. During-sleep blood sugars</td>
<td>↑ 42. Family relationships and social pressures</td>
</tr>
<tr>
<td>↑↑ 5. Caffeine</td>
<td>↑ 24. Dawn phenomenon</td>
<td></td>
</tr>
<tr>
<td>↓ 6. Alcohol</td>
<td>↑ 25. Infusion set issues</td>
<td></td>
</tr>
<tr>
<td>↑↑ 7. Meal timing</td>
<td>↑ 26. Scar tissue and lipodystrophy</td>
<td></td>
</tr>
<tr>
<td>↑↑ 8. Dehydration</td>
<td>↓ 27. Intramuscular insulin delivery</td>
<td></td>
</tr>
<tr>
<td>? 9. Personal microbiome</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication</th>
<th>Environmental</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>↓ 10. Medication dose</td>
<td>↑ 34. Expired insulin</td>
<td></td>
</tr>
<tr>
<td>↑↑ 11. Medication timing</td>
<td>↑ 35. Inaccurate BG reading</td>
<td></td>
</tr>
<tr>
<td>↓ 12. Medication interactions</td>
<td>↑ 36. Outside temperature</td>
<td></td>
</tr>
<tr>
<td>↑↑ 13. Steroid administration</td>
<td>↑ 37. Sunburn</td>
<td></td>
</tr>
<tr>
<td>↑↑ 14. Niacin (Vitamin B3)</td>
<td>↑ 38. Altitude</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>↓ 15. Light exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>↑↑ 16. High-intensity and moderate exercise</td>
<td>↑ 34. Expired insulin</td>
<td></td>
</tr>
<tr>
<td>↓ 17. Level of fitness/training</td>
<td>↑ 35. Inaccurate BG reading</td>
<td></td>
</tr>
<tr>
<td>↑↑ 18. Time of day</td>
<td>↑ 36. Outside temperature</td>
<td></td>
</tr>
<tr>
<td>↓ 19. Food and insulin timing</td>
<td>↑ 37. Sunburn</td>
<td></td>
</tr>
</tbody>
</table>
CGM: Guide to Data Interpretation

1) Gather Information
   • Key metrics, AGP, % time in range, % hypoglycemia, % hyperglycemia, coefficient of variation
   • DM medications, daily routine
   • Data gaps, data sufficiency?

2) Safety
   • Hypoglycemia-possible causes and solutions?

3) Focus on the positive
   • Highest day time in range
   • What worked well? (ex. Pre-bolusing, adequate sleep)

4) Focus on areas for improvement
   • Hyperglycemia-possible causes and solution?
It’s All About the AGP

Glucose Statistics:
- Avg Glucose: 189 mg/dL
- Glucose Exposure: 189

Glucose Ranges:
- Very Low: 0.0%, < 54 mg/dL
- Low: 0.8%, 54 - 70 mg/dL
- In Target Range: 50.1%, 70 - 180 mg/dL
- High: 49.0%, > 180 mg/dL
- Very High: 18.5%, > 250 mg/dL

Glucose Variability:
- Coefficient of Variation: 36.1%
- SD mg/dL: 68

Data Sufficiency:
- % Time CGM Active: 97.7%

Graph:
- Curves/peaks represent glucose frequency distributions by time regardless of date.

Time Periods:
- 12AM, 2AM, 4AM, 6AM, 8AM, 10AM, 12PM, 2PM, 4PM, 6PM, 8PM, 10PM, 12AM
### Snapshot: Hypoglycemia

#### Glucose
- **Average Glucose**: 259 mg/dL
- **% above target**: 74%
- **% in target**: 23%
- **% below target**: 3%

#### Low Glucose Events
- **Total**: 8 events
- **Average duration**: 64 minutes

#### Sensor Usage
- **Sensor data captured**: 50%
- **Daily scans**: 2

---

**Insulin**

- **Daily Carbs**:
- **Rapid-Acting Insulin**: 0 units/day
- **Long-Acting Insulin**: 0 units/day
- **Total Daily Insulin**: 0 units/day

**Comments**
- Gaps found in the insulin data. 21 days in this reporting period have no recorded insulin events.

---

*Additional comments or notes on the data.*
Caution with Data Gaps

Daily Log
February 19, 2019 - May 19, 2019 (90 Days)

TUE Feb 19

Glucose mg/dL

349 210 222 43 47

WED Feb 20

Glucose mg/dL

312 220 227

THU Feb 21

Glucose mg/dL

214 40 48 40 46
Comparing Different Days

Focus on the Positive-Best Day
Cases
Patient Case 1

- 55 year female with type 1 diabetes x 30 years
- Hypothyroid, Post-bariatric surgery, HTN
- BMI=29
- A1C=7.2%
- Wears Medtronic 670G
# Pump Settings/Statistics

## Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Mode (per week)</td>
<td>92% (6d 10h)</td>
</tr>
<tr>
<td>Manual Mode (per week)</td>
<td>8% (14h)</td>
</tr>
<tr>
<td>Sensor Wear (per week)</td>
<td>89% (6d 06h)</td>
</tr>
<tr>
<td>Average SG ± SD</td>
<td>156 ± 58 mg/dL</td>
</tr>
<tr>
<td>Average BG</td>
<td>171 ± 82 mg/dL</td>
</tr>
<tr>
<td>BG / Calibration (per day)</td>
<td>11.6 / 4.3</td>
</tr>
<tr>
<td>Total daily dose (per day)</td>
<td>31 units</td>
</tr>
<tr>
<td>Bolus amount (per day)</td>
<td>16U (52%)</td>
</tr>
<tr>
<td>Auto Basal / Basal amount (per day)</td>
<td>15U (48%)</td>
</tr>
<tr>
<td>Set Change</td>
<td>Every 3.3 days</td>
</tr>
<tr>
<td>Reservoir Change</td>
<td>Every 3.3 days</td>
</tr>
<tr>
<td>Meal (per day)</td>
<td>6.9</td>
</tr>
<tr>
<td>Carbs entered (per day)</td>
<td>110 ± 36 g</td>
</tr>
<tr>
<td>Active Insulin time</td>
<td>3:00 hrs</td>
</tr>
</tbody>
</table>

## Basal 1 (active)

- **24-Hour Total**: 19,800 U
- **Time** | **U/Hr**
  - 00:00 | 0.825

<table>
<thead>
<tr>
<th>Carbohydrate Ratio (g/U)</th>
<th>Insulin Sensitivity (mg/dL per U)</th>
<th>Blood Glucose Target (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Ratio</td>
<td>Time</td>
</tr>
<tr>
<td>0:00</td>
<td>8.0</td>
<td>0:00</td>
</tr>
</tbody>
</table>
# Auto Mode Exits

<table>
<thead>
<tr>
<th>Auto Mode Exits</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Calibration</td>
<td>0</td>
</tr>
<tr>
<td>High SG Auto Mode Exit</td>
<td>1</td>
</tr>
<tr>
<td>Auto Mode max delivery</td>
<td>1</td>
</tr>
<tr>
<td>Auto Mode min delivery</td>
<td>0</td>
</tr>
<tr>
<td>BG required for Auto Mode</td>
<td>2</td>
</tr>
<tr>
<td>Sensor Algorithm Underread</td>
<td>0</td>
</tr>
<tr>
<td>Sensor Updating</td>
<td>0</td>
</tr>
<tr>
<td>No SG values</td>
<td>1</td>
</tr>
<tr>
<td>Sensor Expired</td>
<td>0</td>
</tr>
<tr>
<td>Auto Mode disabled by user</td>
<td>0</td>
</tr>
<tr>
<td>Alarms</td>
<td>0</td>
</tr>
<tr>
<td>Pump Suspend by user</td>
<td>0</td>
</tr>
<tr>
<td>Auto Mode Warm Up</td>
<td>0</td>
</tr>
<tr>
<td>Unidentified</td>
<td>1</td>
</tr>
</tbody>
</table>
Hypoglycemic patterns (5)**
1. 1:20 AM - 2:15 AM (1 occurrences)
2. 4:23 AM - 4:48 AM (1 occurrences)
3. 10:45 AM - 11:10 AM (1 occurrences)

Hyperglycemic patterns (3)
4. 5:20 PM - 7:45 PM
5. 12:40 PM - 1:45 PM
6. 9:50 PM - 10:40 PM
Additional Cases

Full reports available online
Please fill out the worksheet
Jane is a 69yoF

- She has type 1 diabetes x 52 years
- Wears Dexcom G5
- A1C=8%, Wt=140lbs, BMI=23
- Current DM regimen:
  - Insulin glargine 14 units daily
  - Insulin aspart  ICR: 1:20
  - Correction: 1:50 over 150
Jane’s AGP

Glucose Statistics

<table>
<thead>
<tr>
<th>Glucose Exposure</th>
<th>Avg Glucose mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>189</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glucose Ranges</th>
<th>Very Low</th>
<th>Low</th>
<th>In Target Range</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>51 mg/dL</td>
<td>0.0%</td>
<td>0.8%</td>
<td>70 - 130 mg/dL</td>
<td>49.0%</td>
<td>18.5%</td>
</tr>
</tbody>
</table>

Coefficient of Variation | 36.1%  
SD mg/dL | 68  
% Time CGM Active | 97.7%  
Data Sufficiency | -    

CGM  
50% - Median  
25/75% - IQR  
10/90% - Target Range

Curves/peaks represent glucose frequency distributions by time regardless of date.
Top Patterns

1. Jane had a pattern of nighttime highs
   Jane had a pattern of significant highs between 12:00 AM and 12:15 AM.

2. Jane had a pattern of daytime highs
   Jane had a pattern of significant highs between 2:50 PM and 11:05 PM.

3. Jane's best glucose day was November 28, 2019
   Jane's glucose data was in the target range about 96% of the day.
Day by Day

- What would you like to ask Jane?
What to do for Jane?

• Intensify carb ratio, when?
• Change basal insulin?
• Insulin pump or smart pen?
• Referral to diabetes education?
• Referral to dietitian?
Matt is a 44yoM

- He has type 2 diabetes x 3 years
- Other comorbidities: HTN, hyperlipidemia
- A1C=8.4%, BMI=37kg/m²
- Wears Freestyle Libre
- Current DM regimen:
  - Insulin glargine 30 units qpm
  - Metformin 1000mg BID
  - Glimepiride 2g BID
Matt’s AGP

**Summary**

<table>
<thead>
<tr>
<th>Average Glucose</th>
<th>Time In Range</th>
<th>Coefficient of Variation (CV)</th>
<th>Standard Deviation (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 mg/dL</td>
<td>61%</td>
<td>29.4%</td>
<td>58.7 mg/dL</td>
</tr>
<tr>
<td>88-116*</td>
<td>39%</td>
<td>19-25*</td>
<td>10-26*</td>
</tr>
<tr>
<td>In Target Range</td>
<td>70-180 mg/dL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 70 mg/dL</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Reference ranges calculated from population without diabetes.*

**Ambulatory Glucose Profile**

Curves/plots represent glucose frequency distributions by time regardless of date.

- 90%
- 75%
- 50%
- 25%
- 10%
### Glucose

**Average Glucose**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average GLUCOSE</td>
<td>200 mg/dL</td>
</tr>
<tr>
<td>% above target</td>
<td>61 %</td>
</tr>
<tr>
<td>% in target</td>
<td>39 %</td>
</tr>
<tr>
<td>% below target</td>
<td>0 %</td>
</tr>
</tbody>
</table>

**Low Glucose Events**

- **Total**: 1
- **Average duration**: 60 Min

### Sensor Usage

**Sensor Data Captured**

- **82 %**

- Daily scans: 9
Day by Day

- What would you like to ask Matt?
What to do for Matt?

• Increase basal?
• Change metformin or glimepiride?
• Referral to diabetes education?
• Referral to dietitian?
• Add on new agents?
3 Pump Cases

• All people with type 1 DM, wearing insulin pumps and CGM
• T:Connect
• Glooko
• Carelink
Cleveland Clinic

Every life deserves world class care.
Extra Slides
Insulin Pump Terminology

• Basal rate - a continuous delivery of insulin, “background” insulin
• Bolus – used for carbohydrate and correction doses
• Insulin-to-carb ratio – how many grams of carbohydrates will be covered by 1 unit of insulin
• Insulin sensitivity factor (aka correction bolus or ISF) – how much 1 unit of insulin is expected to lower glucose
• Target – the goal glucose level used for corrections or reverse correction
• Insulin-on-board (aka active insulin time or IOB) – a pump feature that keeps track of a previous bolus
Common Pump Features

- Bolus calculator
- Temporary basal or temp target
- Insulin-on-board/active insulin feature
- Multiple basal patterns
- Small dose increments
- Integration with CGM
- Extended boluses
Insulin Pump Settings

• Use calculations as a starting point
  - Weight based insulin dosing or convert from current basal/bolus regimen with a 25% reduction
  - Rule of 1800 for sensitivity
  - Rule of 500 for carb ratio
  - Basal/bolus balance 50/50 (will vary based on carb intake)

• Fix fasting first
  - Begin with basal rate testing

• Once basals at goal, focus on bolus settings
Calculations

• Rule of 1800
  - Divide by 49 (TDD)
  - =36.73

• Rule of 500
  - Divide by 49
  - =10.2
Ambulatory Glucose Profile
# Time in Range Targets

Table 3—Guidance on targets for assessment of glycemic control for adults with type 1 or type 2 diabetes and older/high-risk individuals

<table>
<thead>
<tr>
<th>Diabetes group</th>
<th>TIR</th>
<th>Target range</th>
<th>% of readings; time per day</th>
<th>Target range</th>
<th>% of readings; time per day</th>
<th>TAR</th>
<th>Target range</th>
<th>% of readings; time per day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>% of readings; time per day</td>
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<td>% of readings; time per day</td>
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<td></td>
<td>% of readings; time per day</td>
</tr>
<tr>
<td>Type 1*/type 2</td>
<td>&gt;70%</td>
<td>70–180 mg/dL</td>
<td>&lt;4%; 16h, 48 min</td>
<td>&lt;70 mg/dL</td>
<td>&lt;4%</td>
<td>&lt;25%</td>
<td>&gt;180 mg/dL</td>
<td>&lt;25%</td>
</tr>
<tr>
<td></td>
<td>&lt;1%</td>
<td>(3.9–10.0 mmol/L)</td>
<td>&lt;1 h</td>
<td>(&lt;3.9 mmol/L)</td>
<td>&lt;6 h</td>
<td></td>
<td>(&gt;10.0 mmol/L)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;1%</td>
<td></td>
<td>&lt;1%</td>
<td>&lt;54 mg/dL</td>
<td>&lt;5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;15 min</td>
<td></td>
<td>(3.0 mmol/L)</td>
<td></td>
<td>&lt;1 h, 12 min</td>
<td></td>
<td>(&gt;13.9 mmol/L)</td>
<td></td>
</tr>
<tr>
<td>Older/high-risk#</td>
<td>&gt;50%</td>
<td>70–180 mg/dL (3.9–10 mmol/L)</td>
<td>&lt;1%; 12 h, 24 min</td>
<td>&lt;70 mg/dL</td>
<td>&lt;10%</td>
<td>&gt;250 mg/dL</td>
<td>(&gt;13.9 mmol/L)</td>
<td></td>
</tr>
<tr>
<td>type 1/type 2</td>
<td></td>
<td></td>
<td></td>
<td>(&lt;3.9 mmol/L)</td>
<td>&lt;2 h, 24 min</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each incremental 5% increase in TIR is associated with clinically significant benefits for individuals with type 1 or type 2 diabetes (26,27). *For age <25 years, if the A1C goal is 7.5%, set TIR target to approximately 60%. See the section CLINICAL APPLICATION OF TIME IN RANGES FOR ADDITIONAL INFORMATION REGARDING TARGET GOAL SETTING IN PEDIATRIC MANAGEMENT. #See the section OLDER AND/OR HIGH-RISK INDIVIDUALS WITH DIABETES FOR ADDITIONAL INFORMATION REGARDING TARGET GOAL SETTING.