

## INSTRUCTIONS FOR USE

- 1 Download user's device to **Glooko.com**
- 2 Select "Create PDF" → 2 weeks → Select: a. Summary (CGM); b. Week View c. Devices
- 3 Follow this worksheet for step-by-step guidance on clinical assessment, user education and insulin dose adjustments.  
STEP 1 **BIG PICTURE** (PATTERNS) → STEP 2 **SMALL PICTURE** (REASONS) → STEP 3 **PLAN** (SOLUTIONS)
- 4 Give the After Visit Summary to the Control-IQ user after visit

PANTHERTOOL™ for

# CONTROL-IQ

t:slim X2 insulin pump with Control-IQ technology



## OVERVIEW using C|A|R|E|S Framework

### C | How it **CALCULATES**

- Uses CGM glucose data to adjust the basal insulin delivery by increasing, decreasing, or suspending programmed basal rates; aiming for a target glucose range of 112.5-160 mg/dL
- Delivers automated correction boluses up to once per hour if glucose is predicted to rise above 180 mg/dL; uses 60% of the programmed correction factor when calculating automated correction boluses

### A | What you can **ADJUST**

- Can change basal rates, I:C ratios, correction factors
- Cannot change active insulin time (5 hours) or correction bolus target (110 mg/dL)
- "Exercise Activity" targets glucose 140-160 mg/dL (to reduce insulin delivery)
- "Sleep Activity" narrows glucose target to 112.5-120 mg/dL and prevents automated correction boluses overnight

### R | When it **REVERTS** to manual mode

When the pump has not received CGM data for 20 minutes, it will revert to manual mode and deliver programmed basal rates without any adjustments to the doses. When CGM data resumes, Control-IQ will resume insulin automation automatically.

### E | How to **EDUCATE**

- Pre-bolus for all meals, ideally 10-15 minutes before eating
- Treat mild hypoglycemia with 5-10g carbs to avoid rebound hyperglycemia and WAIT 15 minutes before re-treating to give glucose time to rise
- Give correction boluses for hyperglycemia, following the dose recommended by the pump to avoid the risk of hypoglycemia
- Program the sleep schedule for each night

### S | **SENSOR/SHARE** characteristics

- Dexcom G6: 10-day sensor life, factory calibrated
- Can use Dexcom Share for remote monitoring of CGM data

## PANTHERPOINTERS™ FOR CLINICIANS

- 1 Focus on behavior: wearing the CGM consistently, giving all boluses, etc.
- 2 Set the Sleep Schedule for every night.
- 3 Make sure the user is bolusing before all meals and snacks.
- 4 When adjusting insulin pump settings, focus primarily on basal rates, I:C ratios and correction factors.

**A** Is the person using the **CGM and Control-IQ system?** The goal is to use Control-IQ as much as possible.

**CGM Active (Time using CGM):**   
 Aim for > 90%. If less, ASSESS why.

**Control-IQ (How often Control-IQ is in use):**   
 Aim for > 90%. If less, ASSESS why.

**Activity—Sleep (For tighter glucose targets overnight)**  
 Make sure this averages at least 25% (6 hours) or more per day

→If not, check pump settings to turn on “Sleep Schedule” and select all days

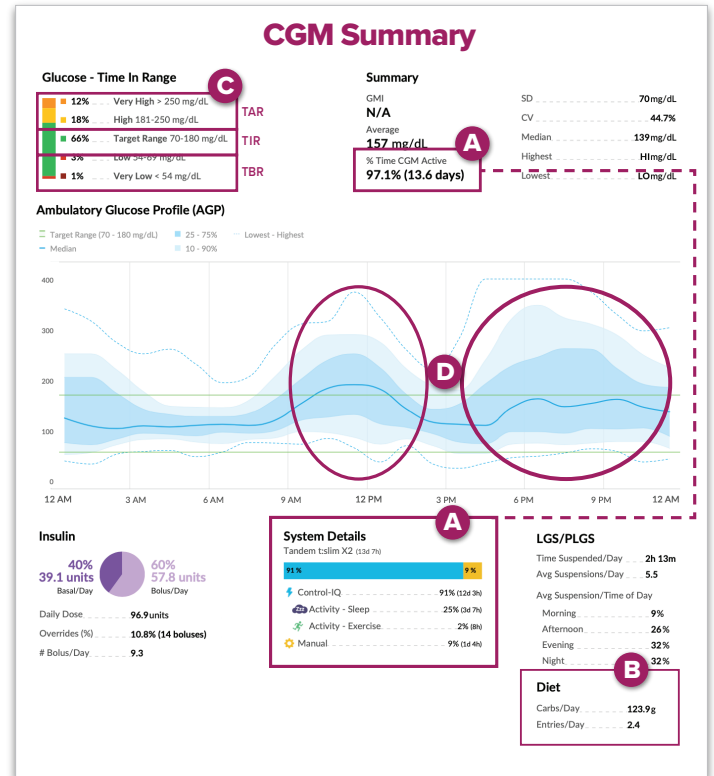
• Skin problems or difficulty wearing sensor on body?

- Rotate sensor insertion sites (arms, hips, buttocks, abdomen)
- Use barrier preps, tackifiers, overtapes, or adhesive remover wipes as necessary



SCAN TO VIEW:  
[pantherprogram.org/skin-solutions](http://pantherprogram.org/skin-solutions)

- Problems getting CGM data on pump?
  - Wear pump on same side of body as CGM transmitter (to improve line of sight of Bluetooth)
  - Carry pump with screen facing outward (away from body)



**B** Is the user giving meal boluses?

**Number of Diet Entries/Day:**

Is the user giving at least 3 “Diet Entries/Day” (boluses with carbs added)?

→If not, ASSESS for missed meal boluses

**C** Is the user meeting Glycemic Targets?

**Time in Range (TIR)**  **Goal is >70%**  
**70-180 mg/dL** (3.9-10.0 mmol/L) “Target Range”

**Time Below Range (TBR)**  **Goal is <4%**  
**<70 mg/dL** (< 3.9 mmol/L) “Low” + “Very Low”

**Time Above Range (TAR)**  **Goal is <25%**  
**>180 mg/dL** (>10.0 mmol/L) “High” + “Very High”

**D** What are their patterns of hyperglycemia and/or hypoglycemia?

Ambulatory Glucose Profile compiles all data from reporting period into one day; shows median glucose with the blue line, and variability around the median with the shaded ribbons. Wider ribbon = more glycemic variability. Identify the overall patterns by primarily focusing on the dark blue shaded area.

Hyperglycemia patterns: (eg: high glycemia at bedtime)

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Hypoglycemia patterns:

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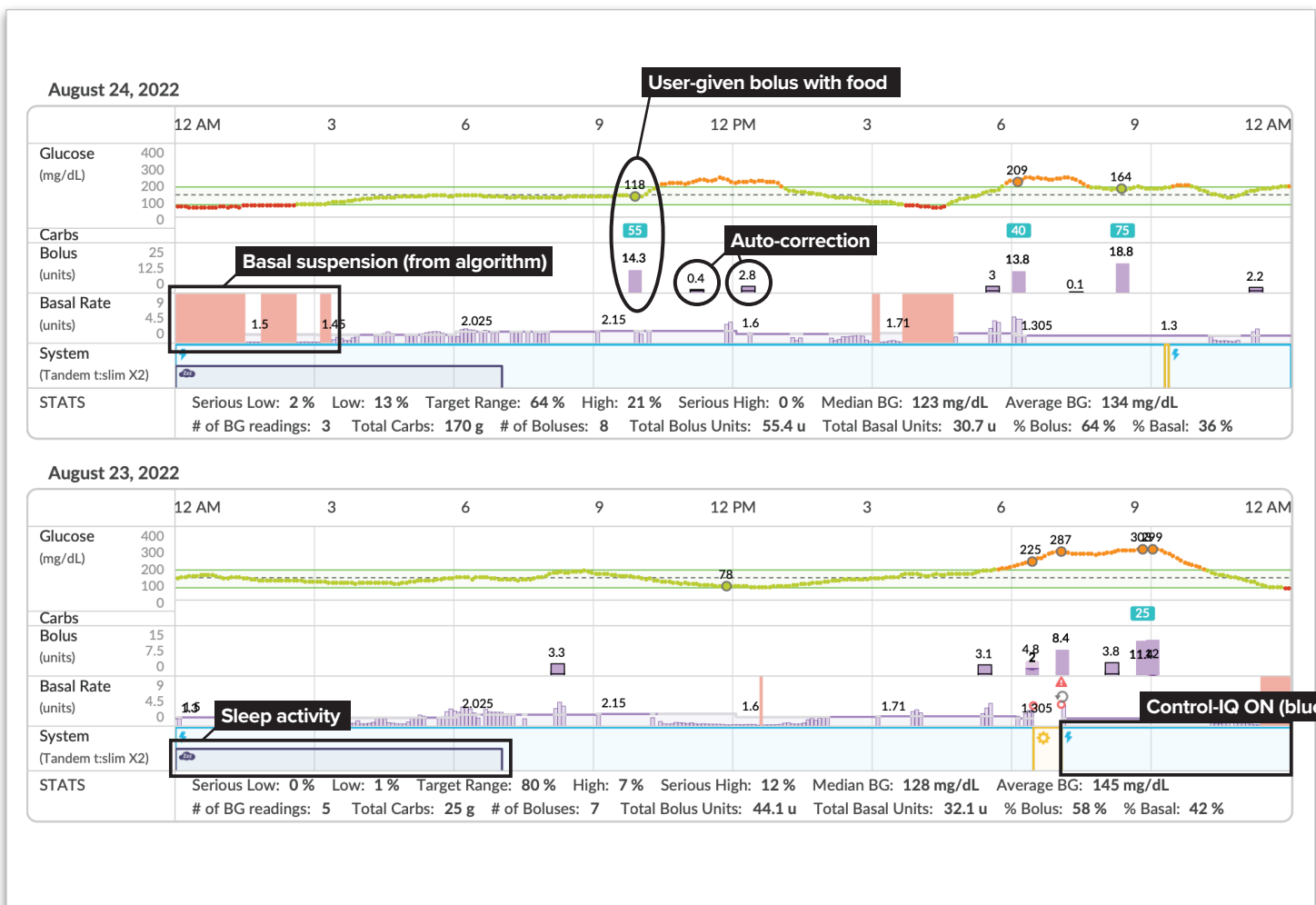


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- 1 The goal of this therapy review is to increase Time in Range (70-180 mg/dL; or 3.9–10.0 mmol/L) while minimizing Time Below Range (<70 mg/dL; <3.9 mmol/L)
- 2 Is the Time Below Range **more** than 4%?
  - If **YES**, focus on reducing patterns of **hypoglycemia**
  - If **NO**, focus on reducing patterns of **hyperglycemia**

## STEP 2 SMALL PICTURE (REASONS)

Use the **Week View** and discussion with the user to identify causes of the glycemic patterns identified in STEP 1 (hypoglycemia or hyperglycemia).








Identify the predominant 1-2 causes of the hypo- or hyperglycemia pattern.

Is the **hypoglycemia** pattern occurring:

- Fasting / Overnight?
- Around mealtime?  
(1-3 hours after meals)
- Where low glucose levels follow high glucose levels?
- Around or after exercise?

Is the **hyperglycemia** pattern occurring:

- Fasting / Overnight?
- Around mealtime?  
(1-3 hours after meals)
- Where high glucose levels follow low glucose levels?
- After a correction bolus was given?  
(1-3 hours after correction bolus)

<b>Hypoglycemia</b>	<b>PATTERN</b>	<b>Hyperglycemia</b>
<b>SOLUTION</b>	<b>PATTERN</b>	<b>SOLUTION</b>
<p>Reduce basal rates 10-20% in 1-2 hours prior to hypoglycemia</p>	<p><b>Fasting / Overnight</b></p> 	<p>Make sure Sleep Schedule is turned on every night</p> <p>Increase basal rates 10-20% in 1-2 hours prior to hyperglycemia</p>
<p>Assess carb counting accuracy, bolus timing, and meal composition. Weaken I:C Ratios by 10-20% (e.g. if 1:10g, change to 1:12g)</p>	<p><b>Around mealtime</b> (1-3 hours after meals)</p> 	<p>Assess if meal bolus was missed. If yes, educate to give all meal boluses prior to eating. Assess carb counting accuracy, bolus timing, and meal composition. Strengthen I:C Ratios by 10-20% (e.g. from 1:10g to 1:8g)</p>
<p>If due to bolus calculator overrides: Educate user to follow the bolus calculator and avoid overriding to give more than recommended. There may be a lot of IOB from AID that user is not aware of. Bolus calculator factors in IOB from increased AID when calculating correction bolus dose.</p> <p>Weaken correction factor by 10-20% (e.g. if 50 mg/dL, change to 60 mg/dL) if hypoglycemia occurs 2-3 hours after correction bolus. This will impact both user-given and auto-correction boluses.</p>	<p><b>Low glucose follows high glucose</b></p>  <p><b>High glucose follows low glucose</b></p> 	<p>Educate to treat mild hypoglycemia with fewer grams of carbs (5-10g) and wait 15 min to allow time for the glucose to rise before re-treating with more carbs</p>
<p>Use the Exercise Activity feature 1-2 hours before exercise begins. This will temporarily reduce insulin delivery aiming to reduce risk of hypoglycemia.</p> <p>To use Exercise Activity, go to: Main Menu → Activity → Exercise → start</p>	<p><b>Around or after exercise</b></p> 	
	<p><b>After a correction bolus was given</b> (1-3 hours after correction bolus)</p>	<p>Strengthen correction factor (e.g. from 50mg/dL to 40mg/dL). This will impact both user-given and auto-correction boluses</p>

**ADJUST insulin pump settings and EDUCATE.**

**Most impactful insulin dose settings to change:**

1. **I:C Ratios** – It is common to need stronger I:C Ratios with AID
2. **Correction Factor** – Will affect both user-given correction boluses and auto-correction boluses given by the system
3. **Basal Rates** – Will affect fasting glucose levels

**NOTE:** Cannot change the correction bolus target (fixed at 110 mg/dL) or Active Insulin time (fixed at 5 hrs) when Control-IQ is active

**Options → My Pump → Personal Profiles**

**Basal Profile**

Time	Rate
Active (Active)	
12:00 AM (3 hr)	1.5 Units/hr
3:00 AM (3 hr)	1.45 Units/hr
6:00 AM (3 hr)	2.025 Units/hr
9:00 AM (3 hr)	2.15 Units/hr
12:00 PM (3 hr)	1.6 Units/hr
3:00 PM (3 hr)	1.71 Units/hr
6:00 PM (3 hr)	1.305 Units/hr
9:00 PM (3 hr)	1.3 Units/hr
<b>Total</b>	<b>39.12 Units</b>

**Insulin : Carb Ratios**

Time	Ratio
Active (Active)	
12:00 AM (3 hr)	6 g/Unit
3:00 AM (3 hr)	5.5 g/Unit
6:00 AM (3 hr)	4 g/Unit
9:00 AM (3 hr)	4 g/Unit
12:00 PM (3 hr)	4.5 g/Unit
3:00 PM (3 hr)	4.5 g/Unit
6:00 PM (3 hr)	4 g/Unit
9:00 PM (3 hr)	5.5 g/Unit

**Sensitivity (ISF, Correction)**

Time	ISF
Active (Active)	
12:00 AM (3 hr)	17 mg/dL
3:00 AM (3 hr)	14 mg/dL
6:00 AM (3 hr)	14 mg/dL
9:00 AM (3 hr)	14 mg/dL
12:00 PM (3 hr)	14 mg/dL
3:00 PM (3 hr)	15 mg/dL
6:00 PM (3 hr)	15 mg/dL
9:00 PM (3 hr)	17 mg/dL

**BG Target Range**

Time	Target Range
Active (Active)	
12:00 AM (3 hr)	90 mg/dL (+0/-0)
3:00 AM (3 hr)	90 mg/dL (+0/-0)
6:00 AM (3 hr)	90 mg/dL (+0/-0)
9:00 AM (3 hr)	90 mg/dL (+0/-0)
12:00 PM (3 hr)	90 mg/dL (+0/-0)
3:00 PM (3 hr)	115 mg/dL (+0/-0)
6:00 PM (3 hr)	115 mg/dL (+0/-0)
9:00 PM (3 hr)	115 mg/dL (+0/-0)

Update **“Weight”** and **“Total Daily Insulin”** on their insulin pump at each visit (used primarily to determine max and min insulin delivery constraints when using Control-IQ.)

**AUTO-OFF**

Consider setting “Auto-Off” to “OFF”.  
If set to “ON”— pump will suspend all insulin delivery IF the user has not pressed any buttons in the programmed time duration (i.e., 12 hours default). This may cause unnecessary/dangerous suspensions of insulin.

**Tandem t:slim X2**

**General**

Active Insulin Time	3 hours
Auto Off Enabled	ON
Auto Off Timeout	24 hours

**Options → My Pump → Alerts/Reminders → Pump Alerts → Auto-off**

Cannula Prime Size	0.7 U
Pump Volume: Quick Bolus	OFF
Pump Volume: Reminders	Vibrate
<b>Bolus</b>	
Max Bolus	25 U
Auto Off Enabled	OFF

**Options → My Pump → Control-IQ**

<b>Hybrid Closed Loop</b>	
Closed Loop Enabled	ON
Total Daily Insulin	100 U
Weight	124.85 kgs / 275 lbs

**EDUCATE ON BOLUS BEHAVIOR**

- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia due to IOB from basal rate increases and/or auto-correction boluses).
- **Bolus before eating.** If bolusing after a meal, the user should reduce bolus by entering fewer carbs than they ate as system has already been increasing insulin for hyperglycemia.
- **Give correction boluses** for hyperglycemia if recommended by the bolus calculator.

**OTHER EDUCATION**

- **Treat hypoglycemia with 5-10 g carbs** since insulin may have been reduced/suspended for a period of time before hypoglycemia occurs.
- **Disconnecting:** If disconnected from the pump, SUSPEND insulin so Control-IQ can calculate insulin-on-board accurately.
- **Infusion set failure:** Change infusion set if unexplained persistent hyperglycemia. (i.e., >300mg/dL for >2 hours). Give an injection of insulin if ketones are elevated.

## AFTER VISIT SUMMARY

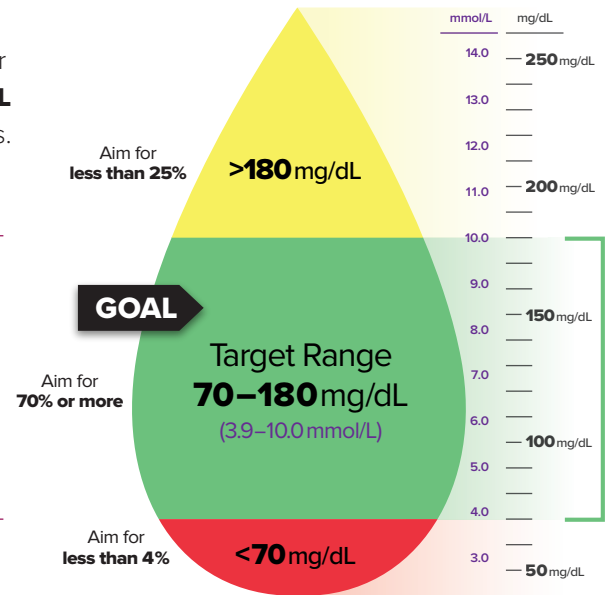
# Great job using **Control-IQ!**

Using systems like this can help you achieve better glucose control. Aim for more than **70%** of your CGM glucose levels to be between **70-180 mg/dL** (3.9–10.0 mmol/L). This is the goal for **MOST** people with type 1 diabetes. This is about the same as having an HbA1c level of 7%.



### REMEMBER...

- 1 Wear the CGM consistently.
- 2 Set the Sleep Schedule for every night.
- 3 Bolus before all meals and snacks.
- 4 Give correction bolus for hyperglycemia, if recommended by bolus calculator.



## TIPS for using **Control-IQ**

- **HYPERGLYCEMIA >300 mg/dL (or >16.7 mmol/L) for 2 hours or more?** Check ketones first! If ketones are >1.0 mmol/L (mod/large on urine strip), give a syringe injection of insulin and change your infusion set.
- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia if Control-IQ has been increasing insulin delivery).
- **Bolus before eating.** If bolusing after a meal, reduce the bolus dose by entering less carbs than you ate as Control-IQ will have already increased insulin delivery for hyperglycemia.
- **Give correction boluses** for hyperglycemia, following the bolus calculator suggested dose.
- **Try treating hypoglycemia with 5-10g carbs** since insulin may have been reduced/suspended for a while before hypoglycemia occurs. Treating hypoglycemia with more than 5-10g may result in rebound hyperglycemia.
- **If disconnected** from the pump, **SUSPEND** insulin so Control-IQ calculates insulin-on-board accurately.
- **Check “Auto-off” settings.** Turn off or extend to 16 hours or longer.
- **CHANGE INFUSION SET** every 2-3 days, or as needed for persistent hyperglycemia.

v.07.2023



◀ SCAN TO VISIT  
PANTHERprogram.org

Have questions about your  
insulin pump?

[tandemdiabetes.com](http://tandemdiabetes.com)

Tandem customer and  
technical support  
**1-877-801-6901**

Have questions about your  
CGM?

[dexcom.com](http://dexcom.com)

Dexcom customer support  
**1-888-738-3646**  
Dexcom technical support  
**1-844-607-8398**