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

PANTHER**TOOL**™ for

CONTROL-IQ

t:slim X2 insulin pump with Control-IQ technology

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

C | How it **CALCULATES**

- A hybrid closed-loop system that uses CGM glucose data to adjust the basal insulin delivery by increasing, decreasing or suspending programmed basal rates
- Algorithm targets glucose levels 112.5-160 mg/dL
- Automatic correction boluses up to once per hour, 60% of a calculated correction dose

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 doses overnight.

R | When to **REVERT** to open-loop

The system stays in hybrid closed-loop all the time except when CGM data is not available. Users must turn off Control-IQ if they want to use temporary basal rates.

E | How to **EDUCATE**

See PANTHER**POINTERS** below as well as EDUCATE-bullets found under STEP 3.

S | **SENSOR/SHARE** characteristics

- Dexcom G6 sensor and transmitter: 10 day sensor life, factory calibrated, can be used for diabetes management decisions without BG check.
- User can connect Dexcom transmitter to the Dexcom G6 app on a phone and share data with others using Dexcom Follow app.
- Sensor glucose levels auto-populate into bolus calculator

PANTHER**POINTERS**™ 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 user is bolusing before all meals and snacks.
4. When adjusting insulin pump settings, focus primarily on I:C ratios and correction factors.

NAME of Control-IQ user: _____

STEP 1 **BIG PICTURE** (PATTERNS)

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

- 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?**

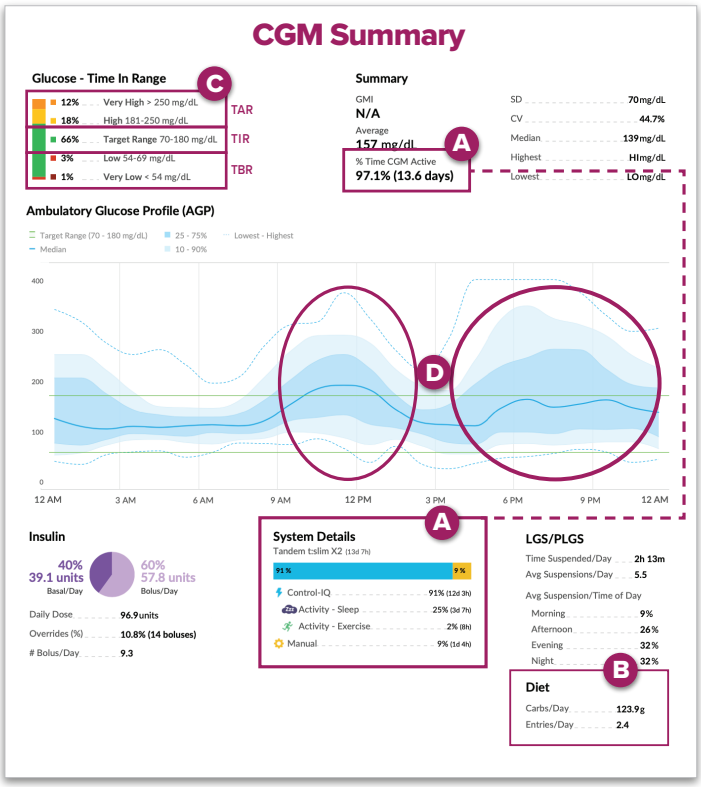
Number of Diet Entries/Day? _____
Is the user giving at least 3 "Diet Entries/Day" (boluses with CHO added)?

→If not, ASSESS for missed meal boluses

PANTHER**POINTERS**™ FOR CLINICIANS

1. The goal of this therapy review is to increase Time in Range (70-180 mg/dL) while minimizing Time Below Range (<70 mg/dL)

2. Is the Time Below Range **more** than 4%?
   If **YES**, focus on fixing patterns of **hypoglycemia**
   If **NO**, focus on fixing patterns of **hyperglycemia**



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?**

Hyperglycemia patterns: (eg: high glycemia at bedtime)

_____

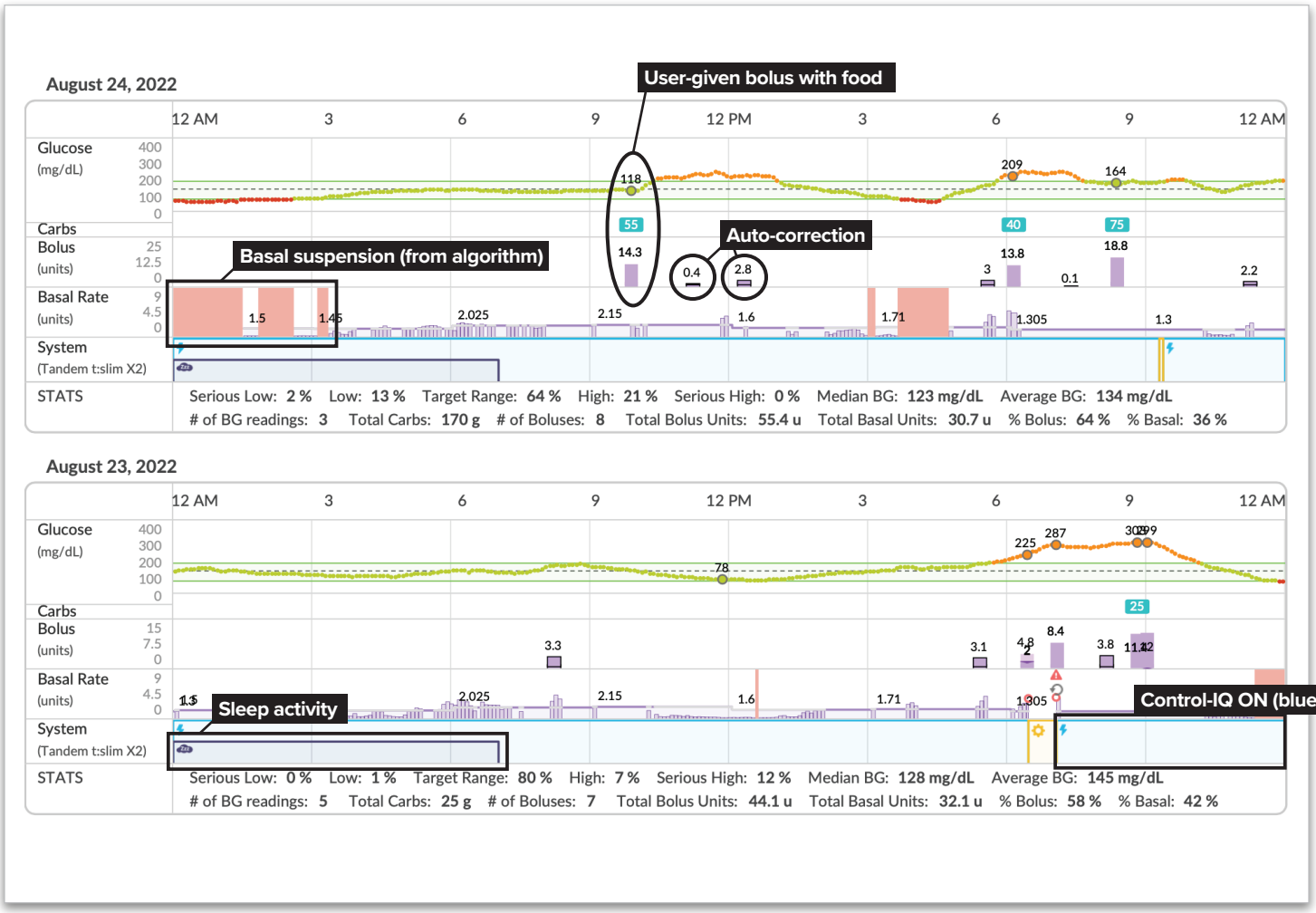
_____

Hypoglycemia patterns:

_____

_____

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)

Hypoglycemia		Hyperglycemia
SOLUTION	**PATTERN**	**SOLUTION**
Reduce basal rates 10-20% in 1-2 hours prior to hypoglycemia	**Fasting / Overnight**	Make sure Sleep Schedule is turned on every night Increase basal rates 10-20% in 1-2 hours prior to hyperglycemia
Assess carb counting accuracy, bolus timing, and meal composition. Weaken I:C Ratios by 10-20% (e.g. if 1:10, change to 1:12)	**Around mealtime** (1-3 hours after meals)	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 1:10 to 1:8)
If due to bolus calculator over-rides: 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. Weaken correction factor by 10-20% (e.g. if 50, change to 60) if hypos 2-3 hours after correction bolus. This will impact both user-given and auto-correction boluses.	**Where low glucose follows high glucose** **Where high glucose follows low glucose**	Educate to treat mild hypoglycemia with fewer grams of carbs (5-10g)
Use the Exercise Activity feature 1-2 hours before exercise begins. This will temporarily reduce insulin delivery aiming to reduce risk of hypoglycemia. To use Exercise Activity, go to: Main Menu → Activity → Exercise → start	**Around or after exercise**	
	After a correction bolus was given (1-3 hours after correction bolus)	Strengthen correction factor (e.g. from 50 to 40). This will impact both user-given and auto-correction boluses

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 doses given by the system
3. **Basal Rates** – Will affect fasting glucose levels

NOTE: Cannot change BG Target Range (fixed at 110 mg/dL) or Active Insulin time when Control-IQ is active

Options → My Pump → Personal Profiles

Basal Profile

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
Total	39.12 Units

Insulin : Carb Ratios

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)

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

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)

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
Cannula Prime Size	0.7 U
~~ess to display timeout~~	~~120 seconds~~
~~Pump~~	~~OFF~~
Pump Volume: Quick Bolus	
Pump Volume: Reminders	Vibrate

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

Bolus

Max Bolus	25 U
	OFF

Options → My Pump → Control-IQ

Hybrid Closed Loop

Closed Loop Enabled	ON
Total Daily Insulin	100 U
Weight	124.85 kgs / 275 lbs

HYBRID CLOSED LOOP

Update "Weight" and "Total Daily insulin" on their insulin pump at each visit (used to determine max and min delivery constraints.)

EDUCATE ON BOLUS BEHAVIOR

- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia due to automated insulin delivery).
- **Bolus before eating**. If bolusing after a meal, the user should reduce bolus 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 CHO** 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 calculates insulin-on-board accurately
- **Infusion set failure**: Change infusion set if unexplained persistent hyperglycemia. (i.e., >300 mg/dL for >90 min)

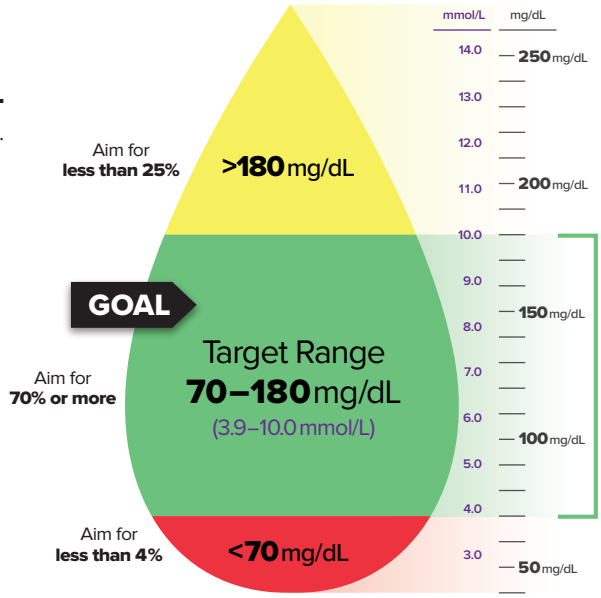
AFTER VISIT SUMMARY

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 1.5–2 hours?** Check ketones first! If ketones, give a syringe injection of insulin and turn off "Control-IQ" feature for 4 hours. Change infusion set.
- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia due to automated insulin delivery).
- **Bolus before eating**. If bolusing after a meal, the user should reduce bolus as system has already been increasing insulin for hyperglycemia.
- **Give correction boluses** for hypergylcemia.
- **Read bolus prompts carefully**. If it states "Your BG is Below Target. Reduce Bolus Calculation?", press "NO" (or R) to get full amount of insulin for carbohydrates. Press "Yes" (or A) to subtract insulin.
- **Try treating hypoglycemia with 5-10g CHO** 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.

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Diabetes Technology. Deciphered.™

SCAN TO VISIT
PANTHERprogram.org

Have questions about your insulin pump?

tandemdiabetes.com

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

Non-US customer support
1-858-255-6269

Have questions about your CGM?

dexcom.com

Dexcom customer support
1-888-738-3646

Dexcom technical support
1-844-607-8398