9.1 To Reach Glucose Goals, Start Where You Are:				
Data:		**Date:** ___/___/____	**Recommended Goal:**	**Where You Are:**
14-day CGM Average Glucose: (guide to finding your better TDD):			<154 mg/dL	_____ mg/dl(mmol/l)A
*** Average Glucose Goal: (where you want to go)**			Select from Table 9.2*	_____ mg/dl(mmol/l)
Glucose Elevation: (14-day avg. glucose – avg. glucose goal):			none	_____ mg/dl(mmol/l)C
Glucose Variability: (glucose stability, aka coeff. of variation)			<30%	_____ %A
14-day Average TDD: (controls your avg. glucose, guide to BC settings):			The optimal number of units	_____ u/dayB
Insulin Use as Percent of TDD	**Daily Basal Rates**		Close to half	_____ %B
	Carb/Meal Boluses		Close to half	_____ %B
	Manual Corrections		About 3%	_____ %B
	AID Auto-Corrections		About 3%	_____ %B
	Basal/Bolus Balance		About 46% each	Basal _____ % B Bolus _____ % B
Time in Range: (TIR)	**** <54 mg/dL (3 mmol/L):**		<1%**	_____ %A
	**** <70 mg/dL (3.9 mmol/l):**		<4%**	_____ %A
	***** 70-180 mg/dL (3.9-10 mmol/L):**		>70%	_____ %A
	>180 mg/dL (10 mmol/L):		<20%	_____ %A
	>250 mg/dL (14 mmol/L):		<5%	_____ %A

* Most people start with a glucose goal between 140 and 155 mg/dL (7.8 and 8.6 mmol/L, equivalent to an A1c of 6.5% to 7.0%). For pregnancy, the goal is 70% TIR between 63 and 140 mg/dL.

** If higher than these recommendations, start at Section B on pg. 88. *** Glucose goal range.

A) data from an AGP or CGM report B) data from pump history or AGP report.

9.2 Estimated Average Glucose from A1c

A1c	Approx. Avg. Glucose mg/dl	Approx. Avg. Glucose mmol/l
5.4%	108	6.0
5.6%	114	6.3
5.8%	120	6.6
6.0%	126	7.0
6.2%	131	7.3
6.4%	137	7.6
6.6%	143	7.9
6.8%	148	8.2
7.0%	154	8.6
7.2%	116	8.9

9.3 Hypo Symptoms Versus True Hypoglycemia

If your average glucose has been above 200 mg/dL for months and you feel low with a CGM reading of 100 or 120 mg/dL, this is not hypoglycemia. A long history of high readings can make a person feel low when the glucose is normal.

Here, multiply your average TDD by 1.06 (+ 6%) and select new settings from this larger TDD. Do this every 4 weeks to lower your average glucose by 20 to 30 mg/dL each time. Repeating this brings your average glucose down over a few weeks without feeling low when your glucose is normal.

9.4 For Frequent Lows, Reduce Your TDD

Reduce your TDD by 5% or 10% for frequent lows that are mild or more severe, respectively. Find your current average TDD in the left column and go across for a lower TDD from which to get new pump settings in Table 9.7. Multiply your current average TDD by 0.95 for a 5% reduction or by 0.90 for a 10% reduction, as shown in the table below.

$$\frac{\text{\_\_\_\_\_ u/day}}{\text{Current Avg TDD}} \times \frac{\text{0.95 (or 0.90)}}{\text{New Lower Avg TDD}} = \text{\_\_\_\_\_ u/day}$$

Current Avg. TDD	5% Lower TDD	10% Lower TDD	Current Avg. TDD	5% Lower TDD	10% Lower TDD
20.0 u	19.0 u	18.0 u	55.0 u	52.4u	50.5 u
25.0 u	23.8 u	22.5 u	60.0 u	57.1 u	54.0 u
30.0 u	28.5 u	27.0 u	65.0 u	61.9 u	58.5 u
35.0 u	33.3 u	31.5 u	70.0 u	66.7 u	63.5 u
40.0 u	38.1 u	36.0 u	80.0 u	76.2 u	72.0 u
45.0 u	42.9 u	40.5 u	90.0 u	85.7 u	81.0 u
50.0 u	47.6 u	45.0 u	100.0 u	95.0 u	90.0 u

My new betterTDD = _____ units/day.

Keep lowering your TDD every four to seven days until the lows largely disappear. Each time you lower your TDD, use the betterTDD to find more appropriate BC settings in Table 9.7.

9.5 Steps to Stop Frequent Lows

1. Lower your average TDD.
2. Consider when most lows happen: are your basal rates, carb boluses, or correction boluses causing them?
3. Check your basal/carb bolus balance. The larger one is usually the one to reduce.

9.6 Get a betterTDD to Lower an Elevated Average Glucose

Best use of this table: bolus BEFORE meals and DON'T have frequent lows and AREN'T over 3% TIR below 70 mg/dL. Late boluses falsely increase your average glucose and your TDD.

1. Determine your glucose elevation:

_____ mg/dL – _____ mg/dL = _____ mg/dL

14-day avg glucose — avg glucose goal = glucose elevation

A. Glucose Elevation	B. Multiply Avg TDD by	A. Glucose Elevation	B Multiply Avg TDD by
+5 mg/dL	**1.01**	**+50 mg/dL**	**1.08**
+10 mg/dL	**1.01**	**+55 mg/dL**	**1.09**
+15 mg/dL	**1.02**	**+60 mg/dL**	**1.10**
+20 mg/dL (1.1 mmol/L)	**1.03**	**+65 mg/dL**	**1.11**
+25 mg/dL	**1.04**	**+70 mg/dL**	**1.12**
+30 mg/dL	**1.05**	**+75 mg/dL**	**1.13**
+35 mg/dL	**1.05**	**+80 mg/dL**	**1.14**
+40 mg/dL	**1.06**	**+85 mg/dL**	**1.15**
+45 mg/dL	**1.07**	**+90 mg/dL**	**1.16**

2. Find a better TDD (betterTDD) by multiplying your current 14-day average TDD by the factor in column B next to your glucose elevation:

_____ u/day	x	_____ (B)	=	_____ u/day
Current avg TDD		**B Factor**		**Your better TDD**

Example: for a 14-day average CGM glucose of 200 mg/dL (11.1 mmol/L) and an average glucose goal of 145 mg/dL (8.0 mmol/L), the glucose elevation is 55 mg/dL (3.1 mmol/L). For a current average TDD of 40 units/day, 40 units would be multiplied by 1.09 to the right of +55 mg/dL. 40 units times 1.09 = 43.6 units as the betterTDD.

3. Then find appropriate basal and bolus settings from the betterTDD in Table 9.7 or 9.8.

For a glucose elevation greater than 30 mg/dL (1.7 mmol/L), you may want to multiply the current TDD by 1.06 to gradually lower your TDD. Then redo the calculation above in 2 to 4 weeks.

9.7 Appropriate Basal Rate, CarbF, & CorrF for an Insulin Pump and CGM or AID Start:												
betterTDD u/day	**Basal u/hr**	**CorrF[2] (mg/dL)/u (mmol/dL)/u**	**Carb Factor[3] in grams/u for these body weights:**									
			100 lbs 45.4 kg	110 lbs 49.9 kg	120 lbs 54.4 kg	130 lbs 59.0 kg	140 lbs 63.5 kg	150 lbs 68.0 kg	160 lbs 72.6 kg	170 lbs 77.1 kg	180 lbs 81.6 kg	190 lbs 86.1 kg	200 lbs 90.7 kg
16u	0.333	113 (6.3)	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0
20u	0.416	90 (5.0)	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0
24u	0.499	75 (4.2)	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
28u	0.582	64 (3.6)	8.6	9.4	10.3	11.1	12.0	12.9	13.7	14.6	15.4	16.3	17.1
32u	0.666	56 (3.1)	7.5	8.3	9.0	9.8	10.5	11.3	12.0	12.8	13.5	14.3	15.0
36u	0.749	50 (2.8)	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	12.7	13.3
40u	0.832	45 (2.5)	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
45u	0.936	40 (2.2)	5.3	5.9	6.4	6.9	7.5	8.0	8.5	9.1	9.6	10.1	10.7
50u	1.040	36 (2.0)	4.8	5.3	5.8	6.2	6.7	7.2	7.7	8.2	8.6	9.1	9.6
55u	1.144	33 (1.8)	4.4	4.8	5.2	5.7	6.1	6.5	7.0	7.4	7.9	8.3	8.7
60u	1.248	30 (1.7)	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0
65u	1.352	28 (1.6)	3.7	4.1	4.4	4.8	5.2	5.5	5.9	6.3	6.6	7.0	7.4
70u	1.456	26 (1.4)	3.4	3.8	4.1	4.5	4.8	5.1	5.5	5.8	6.2	6.5	6.9
80u	1.664	23 (1.3)	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0
90u	1.872	20 (1.1)	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3
100u	2.080	18 (1.0)	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8

[1] Basal Rate = betterTDD x 0.0208 u per hr 2Corr Factor = 1800 mg/dL / betterTDD 3Carb Factor = 2.4 x Wt (lbs) / betterTDD or 5.16 x Wt (kgs) / betterTDD

For exact calculations, use the Pump Setting Tool at diabetesnet.com/aid-system-settings/

9.8 Appropriate Basal Rate, CarbF, & CorrF for an AID System:

betterTDD u/day	Basal u/hr	CorrF[2] (mg/dL)/u (mmol/dL)/u	Carb Factor[3] in grams/u for these body weights:										
			100 lbs 45.4 kg	110 lbs 49.9 kg	120 lbs 54.4 kg	130 lbs 59.0 kg	140 lbs 63.5 kg	150 lbs 68.0 kg	160 lbs 72.6 kg	170 lbs 77.1 kg	180 lbs 81.6 kg	190 lbs 86.1 kg	200 lbs 90.7 kg
16u	0.352	107 (5.9)	13.9	15.3	16.7	18.1	19.5	20.9	22.3	23.7	25.1	26.5	27.9
20u	0.440	86 (4.8)	11.2	12.3	13.4	14.5	15.6	16.7	17.8	19.0	20.1	21.2	22.3
24u	0.528	71 (3.9)	9.3	10.2	11.2	12.1	13.0	13.9	14.9	15.8	16.7	17.7	18.6
28u	0.616	61 (3.4)	8.0	8.8	9.6	10.4	11.2	11.9	12.7	13.5	14.3	15.1	15.9
32u	0.704	53 (2.9)	7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.8	12.5	13.2	13.9
36u	0.792	48 (2.7)	6.2	6.8	7.4	8.1	8.7	9.3	9.9	10.5	11.2	11.8	12.4
40u	0.880	43 (2.4)	5.6	6.1	6.7	7.2	7.8	8.4	8.9	9.5	10.0	10.6	11.2
45u	0.990	38 (2.1)	5.0	5.5	5.9	6.4	6.9	7.4	7.9	8.4	8.9	9.4	9.9
50u	1.100	34 (1.9)	4.5	4.9	5.4	5.8	6.2	6.7	7.1	7.6	8.0	8.5	8.9
55u	1.210	31 (1.7)	4.1	4.5	4.9	5.3	5.7	6.1	6.5	6.9	7.3	7.7	8.1
60u	1.320	29 (1.6)	3.7	4.1	4.5	4.8	5.2	5.6	5.9	6.3	6.7	7.1	7.4
65u	1.430	26 (1.4)	3.4	3.8	4.1	4.5	4.8	5.1	5.5	5.8	6.2	6.5	6.9
70u	1.540	24 (1.3)	3.2	3.5	3.8	4.1	4.5	4.8	5.1	5.4	5.7	6.1	6.4
80u	1.760	21 (1.2)	2.8	3.1	3.3	3.6	3.9	4.2	4.5	4.7	5.0	5.3	5.6
90u	1.980	19 (1.1)	2.5	2.7	3.0	3.2	3.5	3.7	4.0	4.2	4.5	4.7	5.0
100u	2.200	17 (0.9)	2.2	2.5	2.7	2.9	3.1	3.3	3.6	3.8	4.0	4.2	4.5

[1] Basal Rate = betterTDD x 0.022 u per hr [2]Corr Factor = 1710 mg/dL / betterTDD [3]Carb Factor = 2.23 x Wt (lbs) / betterTDD or 4.92 x Wt (kgs) / betterTDD

For exact calculations, use the Pump Setting Tool at diabetesnet.com/aid-system-settings/

9.9 The One for Five Rule for a betterTDD

To quickly lower an elevated average glucose (with infrequent lows and no significant retinopathy), increase your current average TDD with the **One for Five Rule:**

Raise your TDD by 1% for every 5 mg/dL (0.3 mmol/L) of glucose elevation.

Example: for an average CGM glucose of 200 mg/dL (11.1 mmol/L) and an average glucose goal of 150 mg/dL (8.3 mmol/L), a 10% increase in the TDD to correct the 50 mg/dL elevation, or TDD times 1.08, will lower the average glucose by about 40 mg/dL (2.2 mmol/L), much closer to the average glucose goal. For someone with a TDD of 50 units, their new TDD would be 50 times 1.08 or 54 units,

9.10 Other Paths to a betterTDD

On an AID system, insulin delivery is continually increased to lower high readings and decreased to prevent lows. These actions rapidly produce a better 14-day average TDD if you bolus before and between meals with the CorrF from page 94. Use your AID system for one week, and then use this betterTDD to select appropriate BC settings in Table 9.8.

If not yet on an AID system with an elevated average glucose and no excess hypoglycemia, look at your CGM glucose five or six times daily and correct any elevation with the bolus your BC recommends, using the CorrF from page 94. After one week, the extra correction boluses provide a betterTDD and lower average glucose. Use this betterTDD in Table 9.7 to get a more appropriate basal rate, CarbF, and CorrF. Repeat if needed.

9.11 Reminders and Alerts (vary from pump to pump)		
Reminder or Alert	**What It Does**	**Range for Values**
Low Battery	Warns when battery needs changing.	24 hrs
Low Cartridge*	Alerts when a selected # of units are left in reservoir.	5 – 50u
Special Features	Alerts when an alternate bolus, temporary basal, or auto-off are active.	24 hrs
Delivery Limit	Warns when a maximum number of units of insulin are given per day or per meal.	1 – 150u
Glucose Reminder*	Reminder to test glucose at time selected after a bolus.	1 – 4 hr in 15 min increments
Low Glucose	Reminder to test glucose at selected time after a low glucose reading.	Time: 5 min – 1 hr BG: 50 – 100 mg/dl
High Glucose	Reminder to retest glucose at selected time following a high glucose reading.	Time: 30 min–2 hrs BG: 150–300 mg/dl
Automatic Off*	Turns pump off if no pump button is pushed during a selected time.	8 – 24 hrs
Site Reminder	Reminder to change infusion set.	Alerts at a certain time after 2–4 days.
Missed Meal Bolus	Alerts when a meal bolus was not given at a certain time of day.	Time range, such as 11:30 am to noon
* Alerts and reminders often have a default of "OFF" and must be set to "ON" with a personal value.		