



# How Basal Rate Change Affects BG

10.7 Total Units When You Change a Basal Rate When you change a basal rate, it helps to know how many total units the change brings.					
Change in Basal Rate	Total units over 6 hrs	Total units over 8 hrs	Total units over 24 hrs		
+/- 0.025 u/hr	+/- 0.15 u	+/- 0.2 u	+/- 0.6 u		
+/- 0.05 u/hr	0.3 u	0.4 u	1.2 u		
+/- 0.1 u/hr	0.6 u	0.8 u	2.4 u		
Basal adjustments of 0.025 and 0.1 u/hr egual 0.6 and 2.4 units					

Basal adjustments of 0.025 and 0.1 u/hr equal 0.6 and 2.4 units over the entire day. For a glucose that falls or rises slightly during a basal test, a basal change of 0.025 or 0.05 u/hr (or 0.2 and 0.4 units over 8 hours) may fix this. Avg. rise or fall in BG/hr = Change in Basal X CorrF

Example: +/- 0.05 x 40 mg/dL/unit = 2 mg/dL average rise or fall in BG per hour

Plus a small additive effect over longer time periods

C	Common BG Patterns & Fixes
300 250 200 150 100 80 50 0 BGs: mg/st.	F E B2 Cl A C A C A C A C A C A C A C A C A C
(A	most common nettern (raise afternoon & evening basal lower suppor
P)	CarbF),
B) C) D)	frequent lows (lower TDD by 5-10% & find new settings), high and flat most of the time (raise basal rates), frequent highs with post-meal rise (raise basal rates & lower CarbF/ICR),
B) C) D) E)	CarbF), frequent lows (lower TDD by 5-10% & find new settings), high and flat most of the time (raise basal rates), frequent highs with post-meal rise (raise basal rates), nate or CarbF in previous meal),
B) C) D) E) F) G)	frequent lows (lower TDD by 5-10% & find new settings), high and flat most of the time (raise basal rates), frequent highs with post-meal rise (raise basal rates & lower CarbF/ICR), highs or lows at particular times of the day (raise or lower prior basal rate or CarbF in previous meal), post-meal spiking (bolus earlier, lower CarbF), over-correction of highs (do not increase recommended bolus, raise the

## The Right Number of Carbs for a Low Treat lows with: Grams of carb = Wt(lbs)/10 + (BOB\* x CarbF) Market Amy's BG = 52 mg/dL with 2u of BOB (CarbF = 10 g/u) 4 t 120 lbs, she needs 12 grams for the low glucose 4 Jus 2u BOB x 10 gram/u = 20 grams to cover her BOB 4 mg needs 12 g + 20 g = 32 grams for this low \* DIA time must be accurate Don't shorten DIA to "fix" control problems!







# Steel: Steel: • No kinking • Fewer silent occlusions<sup>1</sup> • Manual insertion • Less failure • Better biocompatibility, less back pressure<sup>2</sup> • Easier to train • Easier t

- C Easier to train
- ⊘ 28-30 gauge

### <sup>1</sup> McVey E, Keith S, Herr J, Sutter D, Pettis R. *J Diabetes Sci Technol.* 2015. In press. <sup>2</sup> Høibierre L. Skov-Jensen C. Kaastrup P. et al. *Diabetes Technol Ther.* 2009:11:301-306.

FlowSmart: 28 gauge (30-

gauge introducer



### Steel sets have a flatter profile and can be secured as shown.

Alternate setup would be to place IV300 or Tegaderm adhesive over needle and line, and remove adhesive from connector to let it dangle.

# <figure><text><text><text><text><text>



### Will Hypoglycemia Soon Disappear?

- Hypo-Minimizer pumps (now available)
- CGMs can predict BG (hypo or hyper events) 30 min. ahead (but don't yet inform wearers)
- Soon-to-arrive insulins peak faster and don't stick around as long: FIAsp and Biochaperone<sup>®</sup> lispro
- Hypo-Manager software that recommends a bolus or the exact carbs needed for each glucose













# Connectivity – the Next Big Wave Pumps, smart insulin pens, meters, CGMs activity monitors (FitBit, JawBone, MotActv, BodyMedia) Bluetooth LE connects to: Pumps, smart insulin pens, meters, CGMs activity monitors (FitBit, JawBone, MotActv, BodyMedia) Cell phones Integrates data from different devices Tidepool, Glooko, MySugr DiaSend Telecommunication companies and the FDA are on board! BLE-4 range = 150 ft BLE-5 range = 500 ft











Case Study – Dec	cision Support Software
<b>JD is a 20 yo DM1 colle</b> Wt 180 lb (84 kg), TDD = 80	ege student referred to clinic. u, avg BG = 194 mg/dL (10.8 mmol/L).
⊘Basal rate:	1.8 u/hr
⊘CarbF	10 gr
<i>⊘</i> CorrF	45 mg/dL (2.5 mmol/L)
ØDIA	4 hrs
⊘A1c	8.4%



Results o Suggestic	f Decisior ons	i Suppoi	t
J	D's Pump Settings	s:	
	Original	New	
ØTDD	80 u	85 u	
⊘ Basal ı	rate: 1.8 u/hr	1.7 u/hr	
⊘CarbF	10	5.6	
Ø CorrF	45	24	
ØDIA	4 hrs	5 hrs	
⊘A1c	8.4%	6.9%	
wv	vw.opensourcediab	etes.org	





# HbA1c Treatment Group Differences









Implanted fluorescent CGM

Adhesive base for transmitter Bluetooth LE communication



Implanted dual-enzyme CGM Lasts 12 mos or more Implanted in surgeon's office Vibe alerts when low or high Proprietary receiver Rechargeable battery

glysens.com





## Steps to a Better Artificial Pancreas

- ⊘ More accurate CGM devices
- Ø More rapid insulins
- Further refinements in control algorithm (exercise, stress, illness, etc)
- Improved user interface and connectivity
- ⊘ More reliable longer-lasting infusion sets
- ⊘ Stable glucagon
- ⊘ Dual-hormone systems

# Early AP System Approved

- ⊘ Medtronic 670G
  - Available April or May 20
- Treat to target, proportional integral derivative
- Ø Enlite 3 MARD: 10.3%
- No Bluetooth
- Ø For meal boluse
- Ø Manually bolus well before ea
- Ø Eat mostly low-GI foods
- Or give larger meal bolus (risk reduced, essentially a Super Bolus)















