

1 Case Study 7.1:

zwackelfuss, loopercommunity. V.1.4.



2 Meal Announcement (Advanced HCL):

3 autoISF w/o carb inputs, but reduced bolus, for a 5y-old

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5 The following statements refer to the very personal experience of an individual case (boy, start
6 towards FCL in Oct. 2022 at the age of 4), and do not represent any recommendations for action!

7 Setup:

8 - AccuCheck Insight, Dexcom G6 (unfortunately no stable and reliable values with all other sensors),
9 Looperhandy Unihertz Jelly Star, insulin: Lyumjev

10 - xDrip and AAPS (dev variant +autoISF): each latest version.

11 - Signal path: G6 > xDrip > local broadcast to AAPS, upload to Nightscout

12 - Alarms: only in xDrip to all connected parent followers due to remote snoozing of alarms. Child cell
13 phone silent at night (except AAPS error messages e.g. "Pump not available"), BG alarms only for
14 parents.

15 !!! Important!!! Before all tests, it must be ensured that the **alarm management** works reliably! It will
16 certainly happen again and again that the system delivers (far) too much insulin - this must be
17 recognized in time to counteract with emergency carbs. Please follow the instructions for cautious
18 entry towards FCL/MA in the general section of the FCL e-book!

19 Differences when switching from the normal AAPS Loop to Advanced_HCL w/autoISF: none. All
20 values (IC, ISF, basal) exactly adopted. For iobTH% we used 58% (2.6 U, which is 75% of a typical HCL
21 meal bolus).

22

23 General assessment:

24 A "real" FCL without any pre-bolus or announcement did not work for us. The postprandial rises after
25 completely unannounced meals seem too intense, and inevitably lead to hyperglycaemia, which can
26 be prolonged. To investigate the causes, special diets would have to be tested (low carb, low glyx...).
27 For us, a conscious and balanced diet is essential (mixed diet, but lots of whole grains, lots of
28 vegetables, little sugar - but exceptions on special occasions), so we have given up the goal of a real
29 FCL (for the time being).

30 For us, the following approach leads to a total TIR of 85%:

31 - **Breakfast: complete meal bolus in classic form** (pre-delivery of insulin 18 minutes, calculation
32 100% via the bolus calculator)

33 - **Other meals: Pre-delivery of an estimated insulin value of 50%-80% of the bolus insulin as we**
34 **typically administered in the past** Hybrid Closed Loop. No carb inputs. Let AAPS (SMB+UAM,
35 w/autoISF) take care of keeping bg in range.

36

37 Manual corrections

38 - Some meals (like Pizza) come with longer bg plateaus. In this case, a **larger pre-bolus** is given

39 *Comment Bernie:* and for the late effects from the cheese, **dura_ISF** driven SMBs kick in.

40 - We cannot confirm the statements in the FCL e book (in the sense of “manual insulin
41 administration hinders the loop, and does more harm than good”)

42

43 **Typical problem scenarios and possible solutions:**

44 SMB is too low and cannot slow down the steep rise in BG at an early stage:

- 45 • Tightening the insulin profile or autoISF restrictions/parameters - more insulin

46 SMB comes too late:

- 47 • Increase in autoISF parameters (accel weight, but possibly also basic insulin profile)

48 SMB too high

- 49 • If insulin requirement is unusually low: this is recognized very well by the loop and regulated
50 early; reduction of the pre-bolus?

- 51 • If the insulin requirement is unusually high: longer plateaus and rises. We tried to manage
52 this via dura_ISF, and also with a couple of Automations, but too often it resulted in a hypo
53 later. For now, our (not perfect) solution is to increase the entire profile in 5% or 10% steps.

54 *Comment Bernie:* Many encounter this problem with duraISF.

55 My personal solution has been 1) to use aggressive bgAccel and pp-ISF to limit plateau development,
56 2) I reduced duraISF_weight, and 3) in instances where bg runs still too low (this happens mostly in
57 context of post-dinner dog walks), I take a small snack to prevent hypo.

58 Another potential solution was recently presented by Alex999 in Discord: A special Automation
59 produces short SMB pauses at certain plateau characteristics, see in [section 4.5.1](#) of FCL e-book (from
60 late April 2024 version on).

61

62 **Loop tuning:**

63 Frankly speaking, I have never yet gotten the emulator to the point of being able to recognize
64 meaningful conclusions from my own data

65 Instead: Observe BG curves. Make a note in Nightscout in case of abnormalities and emergency
66 carbs. In the case of “systematic” deviations, then identify situations in which a cause can be clearly
67 assigned

68

69 **Conclusion:**

70 We could not make a “real” FCL work for our child.

71 But with a flat-rate estimated **pre-bolus**, everyday life is very well possible **completely without**
72 weighing and **calculating carbohydrates**, at TIR between 80 and 90%.

73 **The “freedom” we have gained is a huge step forward** - many thanks to ... everyone involved!

74 *Comment Bernie:* That is nice to hear, and **it might be the best solution** for many kids.

75 See also conclusions in [section 7.3.3](#) and in [section 7.8](#) of the FCL e book

76

and edited