

Looping with iAPS is so simple

compiled 2022-Oct-21 by Tom Elliott from a text & email exchange with Marc Fournier, BCDiabetes' volunteer online iAPS moderator
Note: as of 2023-Jan-05 iAPS is the new name for FreeAPS X Next Gen (previously abbreviated to FAXng).

When using iAPS ultimately only one adjustment is made on a day-to-day basis = AdjustmentFactor = AF. AF is the only value we ever tweak *after* the first 24h with iAPS users on our Slack support channel. There may be exceptions, but for the most part, for anyone that is running iAPS, if I were to get them to send me their settings and compare them to mine, the only differences should be the 'safeties' (5 of those, and generally set within the first 24h of operation) and AF: beyond that, we would be identical. *For the default iAPS settings used at BCDiabetes click [here](#) - parameters are shown in the same order they appear in the iAPS settings menu - hovering over a parameter explains its function. The 6 in red, including AdjustmentFactor, are the only ones routinely tweaked at BCDiabetes. *credit to Nabeel Khan*

Note that when we support a new iAPS user (on the BCDiabetes Slack channel) we recommend they read our [user guide](#) that lists all settings that need to be switched 'from the default', and that includes Insulin Fraction ... but those are just done on initial setup, never touched again afterwards. UAM / SMB / SMB Max Basal settings are individual settings that get tweaked again just after you start using it, but those are guardrails ... you don't "adjust" those, you just raise them until they match the individual. 99.9% of the time, those are set and never touched again within the first 24h, if not less

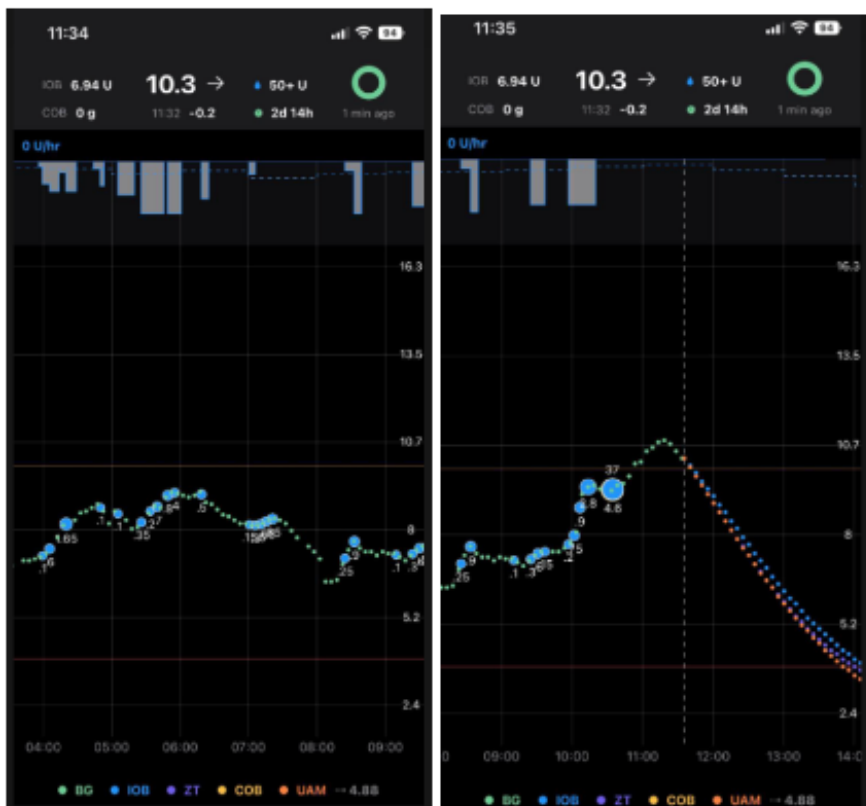
AF affects the aggressiveness of the Dynamic ISF Algorithm ... the idea is that as your BG rises, your ISF decreases, so your insulin requirement to reduce BG by 1 mmol/L will increase. The default formula used is logarithmic in nature, and the value of AF affects how fast the dosage multiplier rises in relation to BG levels.

I worked with a new user on getting her on the newest version of iAPS from an older version a few weeks ago: with AF adjustments she went from a 'long high plateau' on the old iAPS to a 'peak and drop' on the new in a matter of <24h because the system was able to be more aggressive as her sugars went up, bringing her back down to range faster.

My AF right now is 1.1 & my control is OK, until it's not.... Adjusting my AF up even by .1 will reduce highs. The left panel is with with AF = 1.1, & R, one minute later, with AF 1.2

The settings in iAPS *look* daunting and I wish that we could have a 'basic / advanced' mode for them, as about 90% of them are rarely used by *anyone*.*

The dash pods highlighted a problem with the old system ... basically, the way that iOS works with background processes is to put the app to sleep ... we have code to wake it up, but until dash came along, nobody realised that it wasn't being woken up



frequently enough so some loops were being skipped ... I think it was attributed back then to the rileylink, so nobody investigated it. With dash, the red loops weren't expected, causing folks to dive in to figure out why, since we couldn't blame the rileylink anymore 😊

Honestly, anyone on Loop, without realising it, is working *way* too hard to get the same results as we're getting with the newest iAPS ... "carb absorption values"? "Glycemic index"? There is a reason we don't have those in iAPS ... we don't need them, they serve no purpose.

I'd love to see a comparison of Loop to the current commercial offerings ... the only reason I switched from Medtronic -> Loop is that Loop was the only way I could get Dexcom CGM and a pump to be controlled *like* Medtronic did it ... but Loop didn't really offer any features that Medtronic didn't have in theirs ... and with the new Omnipod PDM / software, Loop users may as well just switch back to something Health Canada approved ... Loop isn't giving them anything extra (is it?) and I honestly suspect that within the next cycle, Loop will be behind what the commercial vendors are offering, as the commercial vendors have the money to sink into the whole FDA/Health Canada process

It's not the adjustment factor as much as the algorithm itself ... freeAPS and Loop both are based on the concept that ISF is static ... if your sugars are 5 or your sugars are 20, your ISF is the same ... the new iAPS has the dynamic ISF algorithm, which says that ISF at 5 is one value, and at 20 its at a totally different value, so give insulin accordingly ... the adjustment factor just changes the degree to which ISF changes from 5 -> 20 ... Loop == straight line, Dynamic ISF with an AF of 1 is a curve, Dynamic ISF with an AF of 1.1 is a steeper curve

So with Loop, you may need 2-3 bolus to deal with a high sugar, dynISF you may just need 1 .. that 1 will be similar to / equivalent to the 2-3 that Loop gives, but with Loop, it takes 15 minutes to get those 2-3 into you, which means that you sugar stays higher longer, which means out of range longer

As for hiding prediction graphs ... I don't see it ever happening ... once explained to most folks, its not as daunting ... any it only means something if you are constantly looking at the app, and if you are doing that, why are you on it? You obviously don't trust it to do what its supposed to be doing

question ... how do loop folks deal with their ISF and CR? for FAX, it auto recalculates it daily ... for loop, its a hard coded setting ... do you train the patients on how to recalculate it, or is it fixed until their next appointment?

Tom's answer - We teach them to do a test meal with a known number of carbs using ICR = 1:450/TDD assuming that the ICR is correct when the sugar is back to where it started 3 hours later.... Then we recommend a test correction from wherever to 5 using ISR (insulin sensitivity ratio not factor because it is a ratio.... where ISR = 1:100/TDD): if their sugar gets back to 5 at 3 hours their ISR is correct: if corrected sugar > 5.0 they needed more insulin (and a "higher" ISR); if sugar < 5.0 they needed less insulin (and a "lower" ISR).

Marc on the notion that "Loop is simpler, it has fewer variables to adjust"

This is a perception thing ... with iAPS, AF is one value that I ever recommend anyone to adjust, and even that one is very very rare ... every other setting is identical across everyone that I work with ... Even the more "paranoid" patients I work with, who may sit with their phones turned on watching what is happening, have the same settings as I do, other than AF....

Marc on the notion that "Custom override is better on Loop"

If iAPS is set up properly, you should never have to override anything (except change your temp target) ... if you are constantly overriding the system, why are you on it?

Marc on Loop having customizable glycemic index and absorption time

*... that's only because they are values that factor into the Loop app's algorithm (oref0) which is focused on *actual* numbers ... iAPS doesn't have a "bolus wizard" because we don't *have* to bolus ... the reason we pre-bolus isn't because we have to, its to compensate for slow insulin*

iAPS's oref1 algorithm is based on "do you actually need insulin?", not "do you think you will need insulin?" ... that's why there is no basal, there is nothing "natural" about basal insulin, our bodies don't have such a mechanism. Basal insulin was something that was introduced by doctors (rightly so at the time) to handle the fact that the insulin we were using was atrociously slow ...

Basal insulin is why patients go hypo more often than not ... a constant supply of insulin being injected into their body when they don't necessarily need it ...

Marc on Loop having a user-friendlier interface

Granted.... The only thing I hate about iAPS (understand it, just wish they could simplify it) is the prediction graphs ... it is information overload, wish there was a toggle to 'make it one' ... it's needed on the backend, but people don't necessarily need to see it ...

Marc on why people use Loop at all vs iAPS

*Loop uses the same methodology as the modern pumps are doing ... Tandem has been pretty much doing everything Loop is doing for the past year or so, I believe the new OmniPod PDM is now up the about the same standard, and the big issue I had with medtronic when I was on it wasn't their algorithm, but the CGM (it was wrong more often then right) ... Loop was relevant while the commercial vendors caught up, but they have done that *and* have Health Canada approval for it ... and at the rate of development that is happening with Loop (stalled), I expect that the next version(s) of each of their software will surpass Loop ... there is no innovation happening over there as their focus is on FDA approval, and they don't have the deep pockets that the commercial vendors have to achieve that ...*

oref1 was always a better algorithm, but due to the hardware required, wasn't widely adopted ... now that it's available on both Android and iOS, I suspect that Loop's market share is going to continue to drop as it falls behind everyone else ... its sad when Loop had dash support first and that we (iAPS) adopted their work and had it available first, while Loop has no roadmap to get it properly released other then to deploy "-dev code"