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Schedule for reducing diabetes medication in case of T2DM/insulin-resistance

This schedule has been produced by Harriet Verkoelen, for diabetes professionals for use in their practice in the reverse diabetes type 2 with carbohydrate restriction.

Harriet Verkoelen is a Dutch dietician with also 25 year's experience as a diabetes nurse. In her own practice 90% of T2DM with insulin can stop insulin therapy.

She wrote 4 books on the carbohydrate restricted lifestyle. The 4th is titled: 'Overcoming diabetes'.

Harriet is a leader in the Netherlands in the implementation of carbohydrate restriction dietary therapy and has been educating diabetes professionals in The Netherlands since 2014.

Restricting carbohydrates for reducing diabetes medication

The doctrine presented here is that overweight patients suffering from type 2 diabetes (T2DM) do not have an insulin shortage but are in fact insulin resistant, causing them to have an endogenous hyperinsulinemia (characterized by an increase in belly size out of proportion to their diet). Insulin is a growth hormone that drives anabolic metabolism. The increased blood sugar values are a symptom of overweight induced changes in the metabolic status (insulin resistance). Because of the Sulphonylureas (SU) and/or the insulin medication (SU-tablets and insulin injections), patients are overdosed which even further increases the hyperinsulinemia. This facilitates counter-regulation by adrenalin causing the high blood sugar values to persist. Characteristically the medication is significantly increased - in particular SU-tablets and insulin injections - to sometimes strikingly high levels and often with poor results. Losing weight seems to be impossible in this situation.

The result is a higher insulin resistance and even higher hyperinsulinemia which does not only maintain the overweight, but also negatively impacts the lipid profile. This is one of the mechanisms for hyperinsulinemia being a risk factor for cardiovascular diseases.

Following a low carb diet will lower the need for insulin, turning the metabolism from anabolic to catabolic and thereby allowing the patient to lose weight again. Losing weight will treat the cause of insulin resistance and high blood sugar levels, instead of treating the symptoms of overweight which will cause even more weight gain.

Common medical conditions and symptoms of insulin resistant patients are:

- Increased abdominal circumference
- A bloated feeling
- Not being able to lose weight, despite a normal or reduced die
- Feeling tired
- Sadness or depression

- Poor diabetes glucose regulation
- Feeling hungry, craving for sweets
- Symptoms of hypoglycemia, even without diabetes medication
- Stressed, restless feeling
- A red, round face, with a sad expression. Similar to Cushing syndrome
- Increasing or decreasing insulin injections seems to have no effect
- Increasing insulin shows promising values for two to three days, but the values will increase again after a few days

The dietitian is the ideal person to turn the tide through prescribing a carbohydrate-restricted diet and paving the road to a carbohydrate-restricted lifestyle. It is an absolute requirement to significantly lower medication before commencing the carbohydrate-restricted diet. This is the critical factor in the success of the treatment. Decreasing the medication is supervised by the doctor or diabetes nurse. A tailor-made treatment is very important. The recovery of normal and healthy metabolic function and losing weight takes a few months. In this period it is not the goal to get the most optimal blood sugar values, since getting optimal blood sugar values would only mean a treatment of the symptoms instead of the underlying causes.

SCHEDULE TO REDUCE DIABETES TYPE 2 MEDICATION AT THE COMMENCEMENT OF DIETARY CARBOHYDRATE RESTRICTION

During the reduction or tapering of the medication, the patient will have 1-2 days per week with blood glucose testing and making a glucose curve which are passed to the diabetes nurse every 1-2 weeks. The goal for diabetes type 2 patients is to reduce both insulin and SU's to zero. Both should be phased out. Below are the common guidelines for reduction of medication that should preferably be achieved in a few weeks. Blood glucose values as high as 15 mmol/l (270 mg/dl) are acceptable up until six months. If blood glucose values rise to 20 mmol/l (360 mg/dl) then the reduction in medication should be stopped, and short-acting insulin should be increased again. In this case there is a possibility of a LADA type of diabetes. Another cause could be compromised beta cell production of insulin due to *inter-alia* fatty degeneration of the pancreas in longer-standing T2DM.

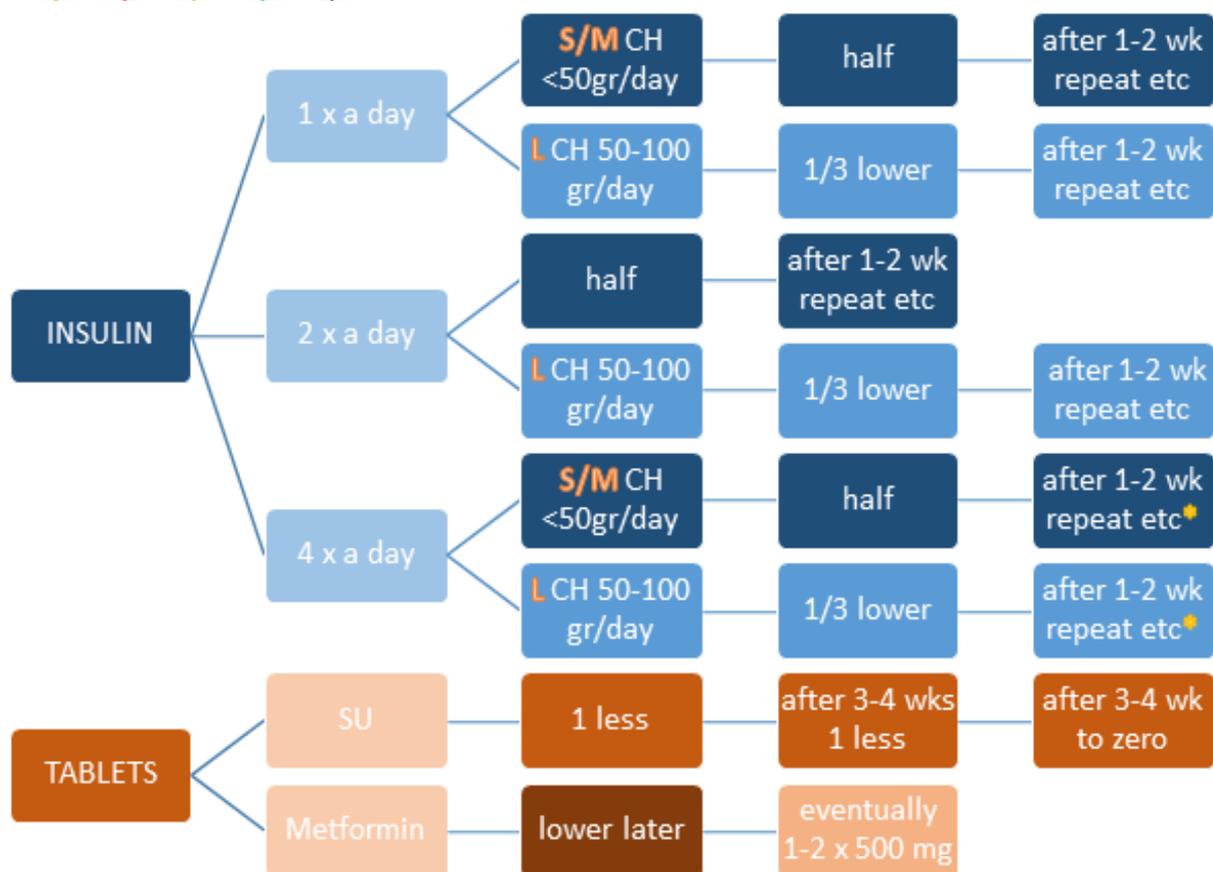
If the latter is the case than take care not to increase insulin for an extended time as this will make weight-loss impossible. The best is to wait a little while longer before tapering the insulin.

When both SU-tablets and insulin are being used, first start by reducing insulin and thereafter the tablets.

This schedule belongs to Harriet Verkoelen. You can download it following this link: <https://www.harrietverkoelen.nl/demedicaliseren/>

Lower carbs strict, moderate or light (S,M,L)

This schedule for reducing medication on diabetes should only be used when the training “Carbohydrate reduction S,M,L. Which size does your client have?” has been clarified by Harriet. Keep in mind that this schedule is not complete, as stated in the text below. It is to be used as a helpful tool.
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*In case of four times a day: reduce everything by half (S/M) or reduce by 1/3 (L). After that, phase out the longterm insulin, followed by the short lasting insulin. Only have 8 IU or less left? Then you should stop after 1-2 weeks. **The goal is to stop all SU medication and insulin.**

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INSULIN

Prior to starting the carbohydrate reduced therapy and if current insulin dose is above 150 IU, then it should be reduced, to no more than 150 IU (divided equally over all injections). After one week it should be reduced to 100 IU, again divided over all injections equally. If the starting values of insulin are between 100 and 150 IU, then it should be reduced to 100 IU prior to starting the carbohydrate reduction. When these recommended dosages are met, continue according to the schedule below:

Once per day injection of long-acting insulin

In case of strict or moderate CHO reduction (CHO < 50g/day) the amount of insulin should be halved. After 1-2 weeks the amount of insulin should be halved again, and so on. When the insulin reaches a value of 15 IU, insulin medication may be stopped completely. In case of a higher CHO intake (CHO 50-100 g/day) the amount of insulin has to be reduced by one third. After 1-2 weeks the amount of insulin has to be reduced again by one third, and so on. Again insulin medication may be stopped when it reaches a value of 15 IU.

Twice-a-day injections of mixed insulin or twice-a-day long-acting insulin

This can be approached exactly the same way as the above.

It is possible that both of the injections do not stop at the same time. In this case the schedule should be followed per injection.

Four times-per-day insulin injection

In case of strict or moderate CHO reduction (CHO < 50g/day) both the long-acting and short-acting insulin have to be halved. After this the long-acting insulin has to be totally reduced first (schedule once a day long-acting insulin). Lastly the short-acting insulin has to be reduced and stopped by weekly reducing one third of the insulin. When insulin reaches a value of 8 IU insulin treatment can be stopped.

In case of a higher CHO intake (CHO 50-100 g/day) the amount of insulin has to be reduced by one third. The amount of insulin has to be reduced again by one third every week. When insulin reaches a value of 8 IU insulin treatment can be stopped. It is possible that both of the injections do not stop at the same time. In this case the schedule for reducing insulin should be applied per injection.

Insulin pump

There is a high chance that the patient may stop using the insulin pump. The aim is to achieve a basal value below 1.0 IU/h, preferably 0.8 IU/h. Reduce by 0.1-0.3 IU/h every 1-2 weeks. During the last phase the pump may be turned off provisionally, at least during the day. You should make as few time blocks as possible. To keep a clear overview, a maximum of three time blocks is advised.

In proportion the basal mode has to be reduced faster, the meal bolus can remain the same but eventually attempts should be made to reduce this as well. In case the blood sugar values stay increased after reduction (10-15 mmol/L), the addition of SGLT2-inhibitors should be considered. SGLT-2-inhibitors should always be trialled for two weeks before using (see SGLT2-inhibitor).

TABLETS

SU-derivatives.

(Tolbutamide; Gliclazide; Glibenclamide; Glimepiride; Glipizide)

SU-derivatives have as a side effect, weight increase. This is why they have to be totally phased out, just like insulin. In the case of a carbohydrate reduction, SU medication should be reduced to a single tablet every morning. This has to be actively reduced further (for example to completely terminate by the time of next consultation).

Metformin

Metformin does not interfere with the process of losing weight. Metformin 3 x 850 mg is the maximum recommended dosage. It may be reduced to 2x 850 mg, and even further at a later stage. Depending on weight and rate of weight loss Metformin 2 x 500mg or 1x 500 mg may be seen as an end goal.

In case of diarrhoea, the Metformin should always be reduced until the Metformin response is acceptable.

Maintain the reduction in insulin dosing.

DPP 4-inhibitors

DPP 4-inhibitors do also not have an adverse effect on weight-loss. Their use may be continued in case of a light carbohydrate restriction. In case of a moderate or strict carbohydrate restriction the effect will be minimal and the patient may stop using them. In some cases the DPP4-inhibitors lead to a positive effect since it can suppress the alfa-cells in the pancreas leading to a low sober blood sugar value.

GLP1

Same as the DPP 4-inhibitors. GLP1 is expensive and during a moderate to strict carbohydrate restriction the effect is very small. May be stopped.

SGLT2-inhibitor

In case the HbA1c value stays above 58 (7.5 %) after reduction of medication (SU tablets and/or insulin), adding a SGLT2-inhibitor should be considered, (which, as mentioned before, should always be trialed for two weeks before ongoing use).

It shows great results in terms of blood glucose values. It supports the process of weight loss and has a protective function on micro-angiopathy. It is important that the patient also consumes 2-3 extra glasses of water every day. Do not use in case of a poor kidney function or together with loop-diuretics (Furosemide/Lasix/Bumetanide/Burinex).

Side effect of a yeast infection or a urinary infection appears to be no more common than without these tablets.

Thiazolidinedione (TZD)

In case the HbA1c value stays above 53 (7%) after reduction of medication (SU tablets and/or insulin), it may be considered to add pioglitazone to the metformin. A side effect can be fluid retention.

Points of interest and consideration:

-If T2DM forgets to use the long-acting insulin this usually has no effect on the blood sugar values. These values will not go sky high (different from T1DM).

-In case type 2 diabetes is treated with SU tablets or insulin, there is always overmedication.

-When the medication is reduced, so is the risk of a hypoglycemia.

-After reduction the blood glucose values may increase or even decrease, accordingly, it is important to wait a few days.

-Increased blood glucose values are not always caused by a shortage of insulin. In most cases the cause is a shortage of fluid or counteracting hormones.

-Increased blood sugar no higher than 15 mmol/L (270 mg/dl) should be accepted up until six months so as to facilitate weight loss.

-If blood sugar values suddenly rise to 20 mmol/L (360 mg/dl) there is a chance of LADA diabetes. In this case complete reduction might not be possible. It is preferred to reduce long-acting insulin, but to maintain short-acting insulin.

-Medication should be reduced as fast as possible. This may be achieved after a few days or one week. When symptoms prior to medication reduction appear, reduce medication even further. For example: If a patient is strictly following the diet, does not feel ill, but the blood sugar values are rising, the weight-loss comes to a halt (or weight increases again), the feeling of hunger returns, or when hypo's are coming back, reduce medication further!

-When blood sugar values are good, keep on reducing! This means reducing in an active way, not steered by blood sugar values. If blood sugar values are still increased after reducing SU tablets and/or insulin, start adding other medication. In case of a light carbohydrate restriction (CH 50-100 g/day) DPP4-inhibitors can be the solution. In case of a moderate or strict carbohydrate restriction (CH < 50 g/day) adding DPP4-inhibitors are less likely to have an effect, and in this case using a SGLT2-inhibitor can be the solution.

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ANNEXURE - DIAGNOSTICS

On-demand point-of-care Insulin testing to reduce demedication risks

Harriet Verkoelen's practice is a pioneer in reversing diabetes and demedication with the guidance of advanced technology that has recently become available to measure Insulin and C-Peptide in the practice or at home. By tracking these molecules quantitatively with a certified point-of-care device, we believe that we are able to taper medications more safely and effectively. We see that it is no longer necessary to treat metabolism in the dark or having to infer the subject's state of insulin regulation when we are able to measure it directly and in real-time.

This capability allows us to monitor the patient's own endogenous insulin production or response and the bioavailability of administered insulin - together with of course glucose levels - and all from capillary blood fingerstick samples. We administer a glucose challenge and analyse the response of Glucose, Insulin & C-Peptide to understand the progression of insulin-resistance in the subject and the relative contributions of their endogenous and administered insulin.

Our project involves analysing these glucose response curves and HOMA-IR measurements mathematically and representing the measurements and their analyses graphically. To assist other practitioners, that might be newer to the practice, we will include in that diagnostic system, demedication advice based on the various measured parameters. Such information is provided for academic and research purposes and is not medical advice

Another innovation available is a protocol for simulating Kraft Curves testing (Insulin OGTT response) with urine samples that are sent from the patient or client and are analysed for C-Peptide with the result available on the dashboard.

References:

https://www.trusfood.org/plotting_1906/auc.html

<http://ehalghdhpuma.cpeptide.trusfood.nl>

For dietitians and clinicians it would be ideal if they could use this simple test to measure insulin or C-peptide in insulin-resistant patients. Patients can do this at home from urine-samples.

This needs to become a tool to diagnose hyperinsulinemia and also at intervals, as a control tool to monitor the effect of their lifestyle and medication change. Such interaction with real-time diagnostics not only guides the clinician, but perhaps more importantly gives hope and positive reinforcement to the patient in their life-long journey of re-adaptation. We believe that only when such a quantitative approach becomes normalised, will we be able to turn back the diabetes epidemic.

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