



Valley Metabolic Health SUGGESTIONS FOR PHARMACOLOGIC ADJUSTMENTS

Terms of Use

This document is intended for use by physicians and NPs who are associated with Valley Metabolic Health. They have had education in the use of therapeutic nutrition. These guidelines are intended mostly for the use of optimizing medications and de-prescribing when using carbohydrate restriction in the setting of type 2 diabetes. This is not a substitute for sound clinic judgement and should be used as always within the context of standards of medical care and guideline focused practice.

Recommendations in T2D:

- A1c < 7 in < 3 mos for most patients as per Diabetes Canada Guidelines. Suggest for those on insulin, sulfonylurea, multiple co-morbidities to aim for A1c of 7 to 8 (as per ACP guidelines).
- Statins for age >40 or any microvascular/macrovascular complications
- ACE/ARB for patients >55 or any microvascular/macrovascular complications as tolerated to goal (i.e. ramipril 10, perindopril 8, telmisartan 80).
- Eye Exam annually
- Monofilament annually
- Flu Vaccine annually
- Exercise – goal 150 min/week of moderate to vigorous activity.
- BP goal <130/80 for patients who can target this BP without numerous medications. Caution in the elderly, those prone to dehydration, or orthostasis.
- No smoking

Medication Adjustments Procedures:

- Typically split up combo pills if needing to stop one of the agents
- Metformin continued if possible (note, occasionally GI intolerance can develop on high fat diet.)
- GLP-1 agonists typically continued (can also be added if patient on insulin and has private insurance).
- DPP-4 inhibitor often discontinued at some point.
- SGLT-2 inhibitor discontinued 3 days prior to avoid drug induced keto-acidosis if going on a ketogenic diet.
- Sulfonylurea
 - All patients on a sulfonylurea should have a glucose monitor and check their sugars at a minimum of twice a day
 - discontinued day 1 if BG < 10 or A1c < 8
 - Reduced by 50% if BG is 10 to 16 or A1c of 8 to 10
 - Continue same dose if BG > 16 or A1c >10

- ❑ Dose reduction
 - ❑ Reduce dose by 50% when glucose <10
 - ❑ Discontinue when Glucose < 7
- ❑ Insulin week one insulin de-escalation EACH day successively:
 - ❑ Long acting insulin (whether NPH, Lantus, Basaglar, etc)
 - ❑ Baseline sugar > 16: continue current dose
 - ❑ Long acting insulin when baseline sugar 12 to 16: reduce by 25%
 - ❑ when baseline glucose less than 10: reduce by 50%
 - ❑ when glucose less than 7: reduce by 75%
 - ❑ when glucose less than 5: hold insulin until glucose goes above target of 7 to 10 and then adjust.
 - ❑ Short acting insulin will be discontinued with a correction factor offered for blood sugars >12
 - ❑ Determine ISF which is $100/TDD$
 - ❑ Example
 - ❑ You have decided the patients goal blood sugar is 7 to 10
 - ❑ Patient has a glucose of 15, so you want to correct it: $15 - 9 = 6$. How much insulin do you need to correct glucose by 6.
 - ❑ The patients total daily dose of insulin is 200
 - ❑ $ISF = 100/TDD =$ amount that 1 unit of insulin will correct sugar, so $100/200 = 0.5$. A unit of insulin will correct sugar by 0.5.
 - ❑ Therefor to correct glucose from 15 to 9 you would recommend 12 units of rapid insulin in this patient.
 - ❑ If the TDD was 80, the ISF would be $100/80 = 1.25$. Harder math! But 1 unit of insulin would drop sugar by 1.25, etc.
- ❑ Ongoing dose de-escalation can be modified over the next 3 moths.

Excellent resource also found here: <http://bjgp.org/lookup/doi/10.3399/bjgp19X704525>

Anti hypertensive therapy alteration need to be considered with particular focus on diuretics/ACE i/ARBs, particularly in older patients as there is a diuretic effect with a LCHF diet initially that could contribute to orthostatic changes in blood pressure, changes in renal function, and electrolyte changes.

- ❑ Loop diuretics may be reduced as well depending on clinical judgement.
- ❑ Beta-blockers should be highlighted due to risk of masking hypoglycemic symptoms and can often be weaned unless patient has ongoing angina/ischemia.
 - ❑ In patients with BP <130/80, consider stopping diuretic and be cautious with ongoing use of a thiazide.
 - ❑ Home BP monitoring ideal
- ❑ Lytes, Cr, Ca, Mg, Phos consider checking q 2 weeks in initial phases of program for patients with CKD, ACE inhibitors or diuretic therapy

- Downward adjustments in diuretics and anti-hypertensives if orthostatic symptoms or SBP <120 guided by physician and definitely reducing dose if < 110 systolic or 60 diastolic
- Other blood work will be considered and the frequency of blood work to be determined on a case by case scenario.
- For those without significant hypertension, ½ tsp of salt dissolved in warm water (or beef bouillon cube dissolved in water BID) can help prevent fatigue, lightheadedness, and other symptoms. It is recommended to increase salt intake to around 4 grams/day as the body needs increased salt intake when it is in a low insulin state
- Supplements:
 - Vitamin D 2,000 I.U. daily
 - Multivitamin such as Centrum
 - Omega 3 Fatty Acids can be considered or increased use of fish.
 - Magnesium Glycinate 200 mg 1 to 2 tablets daily (less GI side effects) which can be compounded at pharmacies (e.g Wolfville Pharmasave). Other options are Magnesium citrate and Magnesium oxide 500 mg daily (more prone to diarrhea)
 - Salt: ½ tsp of salt in water twice a day or a beef boillon cube (1 gram of salt) twice a daily unless advised to not take by your physician.

The relationship between A1C and eAG is described by the formula $28.7 \times A1C - 46.7 = eAG$.

A1C		eAG	
%	mg/dl	mmol/l	
6	126	7.0	
6.5	140	7.8	
7	154	8.6	
7.5	169	9.4	
8	183	10.1	
8.5	197	10.9	
9	212	11.8	
9.5	226	12.6	
10	240	13.4	



**VALLEY METABOLIC HEALTH
DIABETES MEDICATION LIST NAMES**

Biguanides

- Metformin (Glucophage)
- Metformin XR (Glumetza)

GLP-1 receptor agonist:

- Exenatide (Byetta)
- Liraglutide (Victoza)
- Dulaglutide (Trulicity)

DPP-4 inhibitors

- Sitagliptin (Januvia)
- Saxagliptin (Onglyz)
- Linagliptin (Trajenta)

SGLT-2 Inhibitors

- Dapagliflozin (Forxiga)
- Canagliflozin (Invokana)
- Empagliflozin (Jardiance)

Combination Pills:

- Janumet (metformin/sitagliptin)
- Jentadueto (metformin/linagliptin)
- Kazano (metformin/alogliptin)
- Komboglyze (metformin/saxagliptin)
- Xigduo (metformin/dapagliflozin)

Insulin Secretagogues

- Sulfonylureas
 - Gliclazide (Diamicon, Diamicon MR)
 - Glimeperide (Amaryl)
 - Glyburide (Diabeta)
- Meglitinides
 - Nateglinide (Starlix)
 - Repaglinide (Gluconorm)

Thiazolidinedione

- Pioglitazone (Actos)
- Rosiglitazone (Avandia)

Prandial Insulin

- Rapid Acting analogues
 - Aspart (NovoRapid)**
 - Glulisine (Apidra)**
 - Lispro (Humalog)
- Short Acting
 - Regular**
 - Humulin-R
 - Novolin ge Toronto

Basal Insulins

- Long acting basal analogues
 - Detemir (Levemir)
 - Glargine (Lantus, **Basaglar**)
 - Toujeo (Glargine)
- Intermediate Acting
 - NPH**
 - Humulin-N
 - Novolin GE NPH

Mixed Insulins

- Premixed Regular-NPH**
 - Humulin 30/70
 - Novolin 30/70
 - Novolin 40/60
 - Novolin 50/50
- Biphasic insulin aspart (NovoMix 30)
- Insulin lispro/lispro protamine suspension
 - Humalog Mix 25
 - Humalog Mix 50

Obesity Medications

- Liraglutide (Saxenda, Victoza)
- Semaglutide (Ozempic), needs T2D
- Bupropion/Natrexone (Contrave)