

# Personalized Nutrition Plan

Name: Leo Fischer \_\_\_\_\_

Case #: Maurice \_\_\_\_\_

## Overall Dietary Composition

### Current Total Energy Intake (TEI):

3733 kcal/day

Based on one day diet recall

### Total Daily Energy Expenditure (BMR x physical activity factor):

2392 kcal/day (based on the Mifflin St Jeor formula which has research to support being one of the most accurate formulas compared with indirect calorimetry)<sup>1</sup>

However, research has also shown that equations that calculate BMR are extremely inaccurate compared with indirect calorimetry, particularly with obese populations. Even the most accurate equations cannot even come within +/- 10% of actual TDEE 70% of the time. Other equations are sometimes off as much as 20% in obese populations.<sup>2</sup> Best to use indirect calorimetry when possible for most accurate results.

### Total Energy Intake Goal:

2392 kcal/day first 3 months

After 3 months, change to a 2100 kcal/day goal to start gradual weight loss assuming client does not increase exercise.

### Macronutrients

Discuss optimal and desired levels below

<sup>1</sup> Frankenfield D., Roth-Yousey L., Compher C. Comparison of predictive equations for resting metabolic rate in healthy nonobese and obese adults: A systematic review. J. Am. Diet. Assoc. 2005;105:775-789. doi: 10.1016/j.jada.2005.02.005.

<sup>2</sup> Wilms B., Schmid S.M., Ernst B., Thurnheer M., Mueller M.J., Schultes B. Poor prediction of resting energy expenditure in obese women by established equations. Metabolism. 2010;59:1181-1189. doi: 10.1016/j.metabol.2009.11.011.

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Name: Leo Fischer \_\_\_\_\_

Case #: Maurice DM \_\_\_\_\_ Date: 2/13/18 \_\_\_\_\_

<p style="text-align: center;"><b>Current CHO intake:</b> <b>%47 of TEI</b> 445 Grams/day</p> <p style="text-align: center;"><b>Optional CHO Intake:</b> &lt;10% Or 60g of CHO based on TEI goal.</p> <p style="text-align: center;"><b>*Should avoid added sugars and refined carbohydrates as much as possible.</b></p>	<p style="text-align: center;"><b>Current Protein Intake:</b> <b>%15 of TEI</b> 143 Grams/day</p> <p style="text-align: center;"><b>Optional Protein intake:</b>  ~%30</p>	<p style="text-align: center;"><b>Current Fat Intake:</b>  <b>%37 of TEI</b> 155 Grams/day</p> <p style="text-align: center;"><b>Optional Fat intake:</b>  ~%60</p>
<p>Special instructions and rationale:</p> <ul style="list-style-type: none"> <li>% macronutrient should be decided by the client. Strict eating lifestyle plans are usually not successful in the long run.</li> <li>Evidence suggest there is no optimal macronutrient composition for preventing or reducing symptoms of diabetes. Macronutrient distribution will be collaborative with client further.<sup>3</sup></li> <li>If client's single day food record is indicative of his usual eating habits he is eating above his TDEE requirement quite a lot. Therefore, suggesting to the client to eat below his TDEE to lose weight would not be recommended because his current TEI is much higher than the warranted TEI goal and It would be both unlikely the client could sustain such a large reduction for a long period and to do that without putting the body in some type of starvation reduced metabolic state would also be unlikely. Best to start with TEI goal.</li> <li>It is well established that weight loss can help reduce the symptoms of T2DM.<sup>4</sup></li> <li>Below are suggestions regarding very low carbohydrate diets/lifestyles which new research has great potential benefits for T2DM. Client needs to be aware of the potential risk of hypoglycemia and glucose levels needs to be closely monitored at the start of these diets.</li> </ul>		

<sup>3</sup> Koloverou E, Panagiotakos DB. Macronutrient Composition and Management of Non-Insulin-Dependent Diabetes Mellitus (NIDDM): A New Paradigm for Individualized Nutritional Therapy in Diabetes Patients. *The Review of Diabetic Studies : RDS*. 2016;13(1):6-16. doi:10.1900/RDS.2016.13.6.

<sup>4</sup> American Diabetes Association. Standards of medical care in diabetes 2013. *Diabetes Care* 2013;36(Suppl. 1):S11-S66

# Personalized Nutrition Plan

Name: Leo Fischer \_\_\_\_\_

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- Research has shown that very low carbohydrate lifestyles <10% even without calorie restriction or weight loss can help client reduce their fasting glucose and eliminate their T2DM medication from Metformin, Glyburide, and Januvia.<sup>5</sup>
- A very low carbohydrate diet (<10%) has been proven to be more effective than a low carbohydrate diet (<26%) in the reduction of Hba1c levels and fasting glucose levels after 24 wks.<sup>6</sup>
- An alternative of very low carbohydrate diets is the paleolithic-ketogenic lifestyle which has been promising for people with T2DM and T1DM and in some cases completely reverses the disease<sup>7 8 9</sup>. This lifestyle completely limits sources of wheat, dairy, and all carbohydrates (30g of CHO a day). It has been shown to normalize glucose levels and inflammation processes.
- Lower carbohydrate diets have been shown to be consistently more effective for weight loss in people with or without 2TDM, than a low-fat diet, or a “normal healthy diet”<sup>10</sup>
- Large anecdote evidence studies suggest that participants on a low carb diet report feeling more satiated and less hungry when trying to lose weight. Low carb diets contain more protein and fat consumption which can lead to more feelings of satiation.<sup>11</sup>

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<sup>5</sup> Saslow LR, Kim S, Daubenmier JJ, Moskowitz JT, Phinney SD, Goldman V, et al. A randomized pilot trial of a moderate carbohydrate diet compared with a very low carbohydrate diet in overweight or obese individuals with type 2 diabetes mellitus or prediabetes. PLoS One 2014;9:e91027.

<sup>6</sup> Hussain TA, Mathew TC, Dashti AA, Asfar S, Al-Zaid N, Dashti HM. Effect of low-calorie versus low-carbohydrate ketogenic diet in type 2 diabetes. Nutrition 2012;28:1016–21.

<sup>7</sup> McKenzie AL, Hallberg SJ, Creighton BC, Volk BM, Link TM, Abner MK, Glon RM, McCarter JP, Volek JS, Phinney SD A Novel Intervention Including Individualized Nutritional Recommendations Reduces Hemoglobin A1c Level, Medication Use, and Weight in Type 2 Diabetes JMIR Diabetes 2017;2(1):e5 DOI: [10.2196/diabetes.6981](https://doi.org/10.2196/diabetes.6981)

<sup>8</sup> Tóth C, Clemens Z. Type 1 diabetes mellitus successfully managed with the paleolithic ketogenic diet. Int J Case Rep Images 2014;5(10):699–703.

<sup>9</sup> Dressler, A., Reithofer, E., Trimmel-Schwahofer, P., Klebermasz, K., Prayer, D., Kasprian, G., Rami, B., Schober, E. and Feucht, M. (2010), Type 1 diabetes and epilepsy: Efficacy and safety of the ketogenic diet. Epilepsia, 51: 1086–1089. doi:10.1111/j.1528-1167.2010.02543.x

<sup>10</sup> Dyson PA, Beatty S, Matthews DR. A low-carbohydrate diet is more effective in reducing body weight than healthy eating in both diabetic and nondiabetic subjects. Diabet Med 2007;24:1430–5.

<sup>11</sup> Feinman RD, Vernon MC, Westman EC. Low carbohydrate diets in family practice: what can we learn from an internet-based support group. Nutr J 2006;5:26.

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- If client would like to try a very low carb diet based on their TEI goal, they would have to eat only 239 calories of carbs or 60g of CHO a day. Some examples of carbs in food are below. Refer to more extensive charts.
  - 1 medium apple has 25g of CHO
  - ½ cup of uncooked %100 whole grain oats have 51g of CHO
  - 1 large whole carrot has 7g of CHO
  - 1 large banana has 31g of carbohydrates
  - 2 table spoons of peanut butter have 8g of CHO
  - 1 cup of milk has 12g of carbohydrates
- Client should target most foods with a low glycemic index and avoid food with a high glycemic index as much as possible.
  - A website with a good glycemic index chart and explanation is <https://lowglycemic-foods.com/low-glycemic-index-foods/>

## Additional Information on the Optional Paleolithic Ketogenic Lifestyle

- Limiting diets can be hard to follow long term. Client needs to have a high level of motivation to follow. long-term viability of this lifestyle, because of difficulty to follow, might make it limited.
- Paleolithic Ketogenic lifestyle has the possibility of very positive results for people with T2DM. <sup>12</sup>
- Nutritional Ketosis will develop blood ketone body levels between .5 – 3.0 mmol/L of beta-hydroxybutyrate (BOHB). Some athletes in sports nutrition will try to obtain levels high than 3 mmol/L between 3-10mmol/L.
- Ketoacidosis signs include levels of ketone bodies of beta-hydroxybutyrate above 10 mmol/L, often 15-25. Which can contribute to a blood PH imbalance and profound metabolic disturbances including inducing a coma.
- Paleolithic Nutritional Ketosis seems to reduce oxidative stress in studies. <sup>13</sup>
- Paleolithic Nutritional Ketosis can improve insulin sensitivity. <sup>14</sup>
- Paleolithic Nutritional Ketosis does create clinically significant weight loss. <sup>15</sup>

<sup>12</sup> Amy L McKenzie, Sarah J Halberg. A Novel Intervention Including Individualized Nutritional Recommendations Reduces Hemoglobin A1c Levels, Medication Use, and Weight in T2DM. JMIR Diabetes 2017;2(1):e5 doi:10.2196/diabetes.6981

<sup>13</sup> Youm Y, Nguyen KY, Grant RW, Goldberg EL, Bodogai M, Kim D, et al. The ketone metabolite  $\beta$ -hydroxybutyrate blocks NLRP3 inflammasome-mediated inflammatory disease. Nat Med 2015 Mar;21(3):263-269

<sup>14</sup> Newman JC, Verdin E.  $\beta$ -hydroxybutyrate: much more than a metabolite. Diabetes Res Clin Pract 2014 Nov;106(2):173-181

<sup>15</sup> Cawley J, Meyerhoefer C, Biener A, Hammer M, Wintfeld N. Savings in medical expenditures associated with reductions in body mass index among US adults with obesity, by diabetes status. Pharmacoeconomics 2015 Jul;33(7):707-722

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- During a paleolithic ketogenic lifestyle client needs to make sure adequate hydration of 9 cups of liquids a day for client Maurice.
- On a ketogenic diet, it is beneficial to increase consumption of key electrolytes sodium, potassium and magnesium. Ketogenic diets often cause a loss of glycogen stores and as a consequence a loss of the ability to retain water.
- Increased urination is common in ketogenic diets at the start.
- Unlikely but symptoms of a ketogenic diet and acidosis include but are not limited to vomiting, drowsiness, deep breathing, upset stomach.<sup>16</sup>
- See table next page of typical foods on a ketogenic diet. Table was obtained from the website, lowcarbalpha.com

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<sup>16</sup> Gupta L, Khandelwal D, Kalra S, Gupta P, Dutta D, Aggarwal S. Ketogenic diet in endocrine disorders: Current perspectives. *Journal of Postgraduate Medicine*. 2017;63(4):242-251. doi:10.4103/jpgm.JPGM\_16\_17.

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Date: 2/13/18 \_\_\_\_\_

## Intro to a Keto Diet

<https://lowcarbalpha.com/introduction-to-ketogenic-diet/>

# WHAT CAN I EAT?

## YES

### MEAT

Eat Grass-fed, Wild Meat & Fish for Omega 3s

- Bacon
- Beef
- Beef Jerky
- Bison
- Chicken
- Duck
- Goat
- Lamb
- Organ Meats
- Pork
- Poultry
- Rabbit
- Steak
- Turkey
- Veal
- Venison

### FRUIT

- Avocado
- Berries (All Berries you can think of)
- Coconut
- Lime
- Lemon
- Olives
- Rhubarb

### FISH & SHELLFISH

Choose Oily Fish when possible and Fresh over Canned

- Cod
- Crab
- Halibut
- Lobster
- Mackerel
- Mussels
- Oysters
- Plaice
- Salmon
- Sardines
- Scallops
- Shrimp
- Trout
- Tuna

### NUTS & SEEDS

- Almonds
- Brazil Nuts
- Hazelnuts
- Macadamia Nuts
- Pecans
- Pine Nuts
- Walnuts
- Flaxseed
- Hemp Seeds
- Pumpkin Seeds
- Sesame Seeds
- Sunflower Seeds

### FLOUR

- Almond Flour
- Coconut Flour
- Psyllium Husk
- Other Nut Flours

### DRINKS

- Coffee
- All Teas (Without added sugar or milk)
- Broth
- Broth
- Lemon & Lime Juice
- Water

### FATS

- Avocado Oil
- Beef tallow
- Butter
- Cocoa Butter
- Coconut Butter
- Coconut Oil
- Duck Fat
- Extra Virgin Olive Oil
- Ghee
- Goose Fat
- Lard
- Macadamia Oil
- Mayonnaise
- MCT Oil
- Olive Oil

Non Starchy Vegetables above the ground is best especially Green Leafy Vegetables

- Aubergine
- Broccoli
- Brussel Sprouts
- Cabbage
- Cauliflower
- Celery
- Cucumber
- Garlic
- Green Beans
- Kale
- Kimchi
- Leeks
- Lettuce (All Varieties)
- Mushrooms
- Okra
- Onions
- Peppers
- Pumpkin
- Radishes
- Sauerkraut
- Spinach
- Sugar snap peas
- Tomatoes
- Zucchini

### GRAINS & STARCHES

- Barley
- Bread
- Breakfast Cereals
- Buckwheat
- Bulgur Wheat
- Chickpeas
- Corn
- Couscous
- Crackers
- Dried Beans
- Lentils
- Legumes
- Millet
- Muesli
- Oats
- Pasta
- Peas
- Pies
- Pizza
- Potatoes
- Quinoa
- Rice
- Rye
- Wheat Flour
- Whole
- Wheat Flour

### ALCOHOL

- Beer
- Cider
- Sweet Liqueurs

### FATS

- Canola Oil
- Cottonseed Oil
- Corn Oil
- Flaxseed Oil
- Hemp Oil
- Grapeseed Oil
- Margarine
- Safflower Oil
- Soybean Oil
- Sunflower Oil

### SWEETS & SNACKS

- Agave
- Artificial Sweeteners
- Biscuits
- Cakes
- Chocolate
- Cookies
- Crisps
- Donuts
- Dried Fruit
- Energy Drinks
- Fruit Juices
- Ice Cream
- Pancakes
- Pastries
- Syrups
- Sweet Puddings
- Sugary Soft Drinks
- Vegetable Juices

## LowCarbAlpha

If your weight loss has stalled then cut back on all sugars & increase your veggies & healthy fat intake

### VEGGIES

- Artichokes
- Asparagus

### DAIRY

Avoid all low-fat and fat-free products

- Butter
- Eggs (Anyhow you prefer, free-range is best)
- Ghee

## NO

### MEAT

Avoid Factory Farmed Meat & Fish High in Omega 6

- Lunch Meats

## OCCASIONALLY

### ALCOHOL

Ideally Avoid Alcohol Completely for a Healthy Lifestyle or Weight Loss

- Brandy
- Dry Red or White Wine
- Gin
- Rum
- Tequila
- Vodka
- Whiskey

### NUTS

- Chestnuts
- Cashew Nuts
- Peanuts
- Pistachios

### DAIRY

- Butter
- Heavy Cream
- Full-Fat Cheeses
- Ghee
- Sour Cream
- Unsweetened Greek & Plain Yogurt

### FRUIT

- All other fruits

### SWEETS & SNACKS

- Dark Chocolate
- Diet Sodas
- Erythritol
- Honey
- Sugar-Free Jello
- Stevia

### VEGGIES

- sweet potato

<https://lowcarbalpha.com>

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<b>Micronutrients</b>		
<b>Consider specific nutrients for disease or health conditions discuss below</b>		
<p><b>Nutrient: Magnesium</b></p> <p>unit/day:400-500mg</p> <p>300mg in supplement form. 100 mg from multivitamin and 200mg from additional supplementation.</p> <p>Current magnesium intake by client, based on one day food journal is 100 mg or 25% RDA based on 2000 calorie diet.</p>	<p><b>Nutrient: Vitamin D3</b></p> <p>unit/day: 400-600 IU a day with sun exposure.</p> <p>1000 IU a day without sun exposure.</p> <p>*interesting fact, did you know that your body with sun exposure makes around the equivalent of 20,000 IU of vitamin D in a day.</p>	
<p>Special instructions and rationale:</p> <p><b>Vitamin D:</b><sup>17</sup> is a cofactor for modulation of the innate and adaptive immune responses. Lack of vitamin D can lead to increased inflammation and greater autoimmune response. Supplement Vitamin D3 beyond multivitamin if necessary.</p> <p><b>Magnesium:</b><sup>18</sup> Taking a daily magnesium supplement around 400mg a day, has been proven to successfully reduce blood sugar levels in diabetics and increase insulin sensitivity. <sup>19</sup> More importantly, increase consumption of major food sources of magnesium, such as whole grains, nuts, and green leafy vegetables is most beneficial.</p>		

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<sup>17</sup> **Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis**  
[Michael F Holick](https://doi.org/10.1093/ajcn/79.3.362) *The American Journal of Clinical Nutrition*, Volume 79, Issue 3, 1 March 2004, Pages 362–371,  
<https://doi.org/10.1093/ajcn/79.3.362> Published:01 March 2004

<sup>18</sup> Hruby A, Guasch-Ferré M, Bhupathiraju SN, Manson JE, Willett WC, McKeown NM, Hu FB. [Magnesium Intake, Quality of Carbohydrates, and Risk of Type 2 Diabetes: Results From Three U.S. Cohorts](#). *Diabetes Care*. 2017 Dec;40(12):1695-1702. doi: 10.2337/dc17-1143. Epub 2017 Oct 4. PubMed PMID: 28978672; PubMed Central PMCID: PMC5711333.

<sup>19</sup> Magnesium Intake and Risk of Type 2 Diabetes in Men and Women, Ruy Lopez-Ridaura, Walter C. Willett, Eric B. Rimm, Simin Liu, Meir J. Stampfer, JoAnn E. Manson, Frank B. Hu, *Diabetes Care* Jan 2004, 27 (1) 134-140; DOI: 10.2337/diacare.27.1.134

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## Functional Foods to Target or Avoid

Food(s):	Servings: Specify – per day or week	Rationale:
Avoid meat unless unprocessed.	Feel free to eat	There is a strong correlation between processed meats a type 2 diabetes. <sup>20</sup> Just 50g of processed meats a day has been shown to increase risk and symptoms of type 2 diabetes by 51%. <sup>21</sup> Processed meats are those that are salted, sugared, cured, smoked, made with added chemicals like nitrates or nitrites. Almost all meats sold in the stores are processed unless otherwise specifically specified. Processed meats are also heavily linked to cancer. <sup>22</sup> The research is so strong that the World Health Organization has labeled processed meats as a carcinogen <sup>23</sup> on the same level as cigarettes. <sup>24</sup>
Reduce dairy, milk and cheese. Target dairy that is organic and made without antibiotics or added hormones.	Less than 3 servings a week.	Dairy can contain a high level of carbohydrates. Milk protein may promote autoimmune processes and create inflammation in the body for some people. Decreasing the function of the pancreas and decrease insulin production. <sup>25</sup>

<sup>20</sup> Ericson U, Sonestedt E, Gullberg B, Hellstrand S, Hindy G, Wirfält E, Orho-Melander M. [High intakes of protein and processed meat associate with increased incidence of type 2 diabetes](#). Br J Nutr. 2013 Mar 28;109(6):1143-53. doi: 10.1017/S0007114512003017. Epub 2012 Aug 1. PubMed PMID: 22850191.

<sup>21</sup> [Rohrmann, Sabine; Linseisen, Jakob](#) (2016). *Processed meat: the real villain?* Proceedings of the Comparative Nutrition Society, 75(3):233-241.

<sup>22</sup> James Gallagher (26 October 2015). ["Processed meats do cause cancer - WHO"](#). BBC.

<sup>23</sup> ["IARC Monographs evaluate consumption of red meat and processed meat"](#) (PDF). International Agency for Research on Cancer. 26 October 2015.

<sup>24</sup> Stacy Simon (October 26, 2015). ["World Health Organization Says Processed Meat Causes Cancer"](#). Cancer.org.

<sup>25</sup> Aguirre Castaneda RL, Mack KJ, Lteif A. Successful treatment of type 1 diabetes and seizures with combined ketogenic diet and insulin. Pediatrics 2012;129(2):e511-4.

# Personalized Nutrition Plan

Name: Leo Fischer \_\_\_\_\_

Case #: Maurice DM \_\_\_\_\_ Date: 2/13/18 \_\_\_\_\_

<p>Green leafy vegetables like cabbage, brussel sprout, broccoli, cauliflower, dark green lettuce, spinach, or kale.</p>	<p>6 servings of vegetables a day. Which is equivalent to about 4 cups of vegetables a day depending on the vegetable.</p>	<p>In people who do not eat enough vegetables, the intake of an extra 150grams of green leafy vegetables helps reduce the symptoms of T2DM and reduces additional diabetes risk up to 15% <sup>26</sup></p>
<p>Nuts, any type including almonds, brazil nuts, pistachios, pecans, walnuts etc</p>	<p>2-3 oz a day</p>	<p>Nuts help lower postprandial glycemia<sup>27</sup> and helps reduce LDL, and increase HDL. <sup>28</sup></p>
<p>Eat whole fruit, target non-tropical fruit like berries, apples etc.  Try to eliminate fruit juice.</p>	<p>4 servings a day. Equivalent of about 2 cups a day.</p>	<p>Whole fruit helps lower postprandial glucose levels, can help lower glycemic load and increases satiety from the fiber.  Research does not seem to support that eating fruit reduces the overall risk of diabetes relative to other healthy diets. Eating certain whole fruits like cantaloupe can pose a small but potentially greater risk of T2DM than other fruits like bananas.<sup>29</sup></p>

<sup>26</sup> Carter P, et al. Fruit and vegetable intake and incidence of type 2 diabetes mellitus: systematic review and meta-analysis. BMJ. 2010;341:c4229

<sup>27</sup> Josse, et al. Almonds and postprandial glycemia--a dose-response study. Metabolism. 2007 Mar;56(3):400-4

<sup>28</sup> Sheriden et al. 2007. J. Am. Coll. Nutr. 26(2).

<sup>29</sup> Muraki Isao, Imamura Fumiaki, Manson JoAnn E, Hu Frank B, Willett Walter C, van Dam Rob M et al. Fruit consumption and risk of type 2 diabetes: results from three prospective longitudinal cohort studies BMJ 2013; 347 :f5001

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## Dietary Supplements

Supplement:	Dose:	Rationale:
Multivitamin & a separate Coq10 supplement	Once a day	Based on client's single day dietary record, client was deficient in almost all micronutrients. Client is also on a few diabetic medications including Metformin and Glipidize. Metformin can cause deficiencies in b12, folic acid, and CoQ10. <sup>30</sup> Glipidize can also potentially cause other co-deficiencies like CoQ10.
Magnesium	Once a day, 200mg if multivitamin has 100mg or less of magnesium. If multivitamin has more than 200mg of magnesium, take a magnesium supplement of 100mg or less. Symptoms of too much magnesium can be diarrhea, cramps, stomach pain, or breathing problems.	<p>Taking a daily magnesium supplement around 200mg a day, has been proven to successfully reduce blood sugar levels in diabetics.</p> <p>*In the The Diabetes Educator, it states that it is possible to create a hypoglycemic effect with the combination of typical diabetes drugs like Metformin and Glipidize with very high supplementation of certain spices, herbs or magnesium. When using magnesium or other substances watch blood glucose levels more closely when first supplementing with magnesium. <sup>31</sup></p>

<sup>30</sup> Wulffele MG, Kooy A, Lehert P, et al. Effects of short-term treatment with metformin on serum concentrations of homocysteine, folate and vitamin B12 in type 2 diabetes mellitus: A randomized, placebo-controlled trial. *J Intern Med* 2003;254:455-463.

<sup>31</sup> May M, Schindler C. Clinically and pharmacologically relevant interactions of antidiabetic drugs. *Therapeutic Advances in Endocrinology and Metabolism*. 2016;7(2):69-83. doi:10.1177/2042018816638050.

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## Nourishing Behaviors

Practice(s):	Instructions:	Rationale:
Cooking practices that reduce AGE's (Advanced Glycation end-products) and ROS ( Reactive oxygen species)	Reduce cooking methods that cook with added sugars, barbecuing, smoked, fried, browning and caramelizing. Instead try cooking methods that include steaming, boiling, and water sautéing.	Using alternative cooking methods reduce AGEs and ROS. AGEs <sup>32</sup> and ROS <sup>33</sup> have considerable evidence that implicate them in T2DM.
Use the non-caloric sweetener Stevia	Instead of using added sugar or other sweeteners like honey or syrups to sweeten food or drinks, use .5 teaspoons of stevia.	Non-calorie sweeteners can help potentially reduce overall calories and reduce blood glucose. <sup>34</sup>
Incorporate cinnamon and turmeric in food prepared at home.	Add into food prepared at home for example, turmeric in curry or on chicken and cinnamon in oatmeal, smoothies etc	Evidence is contradictory but use of Cinnamon and Turmeric, along with other foods like Cocoa (very dark chocolate), Tea and among many other things have substances like polyphenols and other active ingredients that have been studied to help increase insulin sensitivity, reduce fasting blood glucose and reduce HbA1c levels.

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<sup>32</sup> Negrean M, Stirban A, Stratmann B, et al. Effects of low- and high-advanced glycation endproduct meals on macro- and microvascular endothelial function and oxidative stress in patients with type 2 diabetes mellitus. Am J Clin Nutr. 2007;85(5):1236-43.

<sup>33</sup> Evans J, et. al, Oxidative stress and stress-activated signaling pathways: a unifying hypothesis of type 2 diabetes. Endocr Rev. 2002 Oct;23(5):599-622.

<sup>34</sup> Evert et al. Nutrition Therapy Recommendations for the Management of Adults With Diabetes. 2013. Diabetes Care. 36: 3821-3842.

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## Physical Activity

Practice(s):	Time & Frequency:	kCals used:
Start up an active hobby. -Walking for 30m -Start Bowling Again -Anything fun that is also active!	At least 30m a day	N/A
Use standup desk at work instead of sitting down.	Get adjustable one so you can go back and fourth between sitting and standing. Try spending half your time at work standing.	Can burn around 50 extra calories an hour by standing instead of sitting. <sup>35</sup> Standing 4 extra hours a day at work can burn enough extra calories to lose 40lbs or more of fat a year. <sup>36</sup>
A meditation of your choice. You can find guided body scan meditation videos online. <sup>3</sup>	Once a week to reduce stress.	N/A

## Follow Up

**Client Goals:** Although this is subjective, use the case to identify what the client is coming in for

1. General diabetes management
2. To reducing fasting blood glucose levels, to avoid the need of insulin.
3. To reduce HgA1c levels

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<sup>35</sup> BBC Magazine. (2013). Calorie burner: How much better is standing up than sitting? BBC Magazine. Retrieved from <http://www.bbc.com/news/magazine-24532996>

<sup>36</sup> Gallagher, J. (2015). Office workers 'too sedentary.' BBC Magazine. Retrieved from <http://www.bbc.com/news/health-32069698>

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## Nutritionist Goals

1. Clients ideal body weight should be around 177 pounds according to BMI charts. Assessment will be objectively measured during client visits.
2. Blood pressure objective observations at client visits
  - a. Below 120 systolic / 80 diastolic is goal
  - b. 120-140 systolic and 80-90 diastolic is considered prehypertension.
3. Fasting blood sugar test.
  - a. Client can take these tests in office with finger prick equipment.
  - b. Target and normal fasting blood sugar test should be below 100mg/dl (5.6 mmol/L).
  - c. Fasting blood sugar levels between 100-125 mg/dl (5.6 – 6.9 mmol/L) is considered prediabetes.
  - d. Fasting blood sugar levels of 126 mg/dl (7mmol/L) or higher on **two separate tests** mean you are considered to have diabetes.
4. Reduce Glycated Hemoglobin A1c levels below 5.7%
  - a. Since clients A1c levels are at 7.4% short term targets are for below 6.5%.
  - b. Long term targets are to get client below the prediabetes range of A1c of 5.7%-6.4%.
5. Random Blood Sugar Test
  - a. Client can take these tests in office with finger prick equipment.
  - b. Random blood sugar tests, without fasting, should be below 200 mg/dl or 11.1 mmol/L. Any higher suggests diabetes.
6. Oral glucose tolerance test
  - a. Client can take these tests in office with finger prick equipment.
  - b. Client fasts overnight, and the fasting blood sugar level is measured before you drink a sugary liquid. After drinking the sugary liquid, blood sugar levels are tested periodically or after 2 hours.
  - c. Blood sugar levels less than 140mg/dl (7.8mmol/L) after two hours is considered normal
  - d. A blood sugar level more than 200mg/dl (11.1mmol/L) after two hours indicates diabetes.
  - e. Blood sugar levels between 140-199 mg/dl (7.8-11.0 mmol/L) after two hours indicates prediabetes.

## Personalized Nutrition Plan

Name: Leo Fischer \_\_\_\_\_

Case #: Maurice DM \_\_\_\_\_ Date: 2/13/18 \_\_\_\_\_

### When should client return?

Would like to see client 4-5 times with in 3-6 months. As stated by the America Diabetes Association, this seems to be an effective amount of MNT for someone with diabetes.<sup>37</sup>

After 6 months, visit with nutritionist once every 3 months Is appropriate.

### How will you monitor progress?

Blood tests and objective weight measurements, client personal reports.

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<sup>37</sup> Franz MJ, Powers MA, Leontos C, et al. The evidence for medical nutrition therapy for type 1 and type 2 diabetes in adults. J American Diabetes Association 2010;110:1852-1889