Metabolic Syndrome/ Diabetes Algorithm

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Definition: The full definition of **Metabolic Syndrome** includes *Waist Circumference* (> 40" men, >35" women), *Elevated Blood Pressure* (Home BP between 6-10PM >135/85, or anyone taking BP meds) *Dyslipidemia* (triglyceride/HDL ratio >2.0), and *Dysglycemia/Dysinsulinemia*. Solely Focusing on Glycation Criteria for simplicity:

1) *Hemoglobin A1C* (Also known as glycohemoglobin, A1C, "diabetes test") less than or equal to 5.2 is perfect, 5.3-5.6 is hyperglycemia, 5.7-6.0 is prediabetes, >6.0 is diabetes
2) *Fasting Insulin* less than or equal to 5 is perfect, 6-10 is mild dysinsulinemia, 11-15 is moderate dysinsulinemia, > 15 is severe dysinsulinemia

These labs do not pertain to Type 1 (autoimmune) diabetes. The primary disease is insulin resistance which usually precedes dysglycemia. Everyone should not only get an A1C but also a concurrent fasting insulin. Most everyone with elevated BP, waist circumference, and or dyslipidemia without an elevated A1C will have an elevated fasting insulin and should be treated aggressively as this is our primary disease. As time goes on you will find elevated A1C and abnormal pancreatic Beta Cell (insulin producing cell) function, which means we have allowed the disease to progress.

Treatment:

Lifestyle:

The entire MPM Foundations of Health is geared towards treating metabolic syndrome.

1) **Paleo Nutrition:** This is unequivocally the right template to start with, but is not meant to be a belief system. There is nothing controversial about "Eat like a human- an omnivore", as if you're reading this, probably a human. The most important macronutrient (macro) is eating *healthy fats* (nuts and seeds, organic extra virgin olive oil, avocados, organic and grass-fed and wild-caught animal proteins/fats), next most important is *healthy proteins* including organic, grass-fed dairy (if you have no known intolerance) free-range chicken eggs, hemp protein and finally eating a wide variety of healthy, primarily organic (go to EWG.org) fruits and vegetables. Avoiding grains and starchy legumes becomes necessary solely from a carb count perspective without having to get into the messy gluten, glutenoids, lectin discussion.

2) **Intermittent Fasting (IF):** Not a 'what' but a 'how' of eating. Grazing is flat out horrible for insulin resistant (IR) people. I like a system of Time Restricted Feeding (TRF) whereby "break-fast" becomes progressively later in the day. Goal is to shoot for a TRF window of 6-8 hours with a subsequent fasting period of 18-16 hours. In general, people without IR don't do as well with TRF. Be clear IF is a longevity enhancer, our bodies like having both prolonged time in keto metabolism as well as time in glycogen-repleted "fed" metabolism. Does not have to be done every day.

3) **Exercise:**

Yogic Fitness: Every day incorporate yoga or Tai Chi or good old stretching exercises. The basis for any fitness program as yoga works on flexibility, core strength, and balance. This level of fitness does more to promote health and well-being than any other. Treats muscle pain and stiffness while promoting body awareness and prevents injury.
Aerobic Fitness: The best form of aerobic exercise: the one you'll do. Although High Intensity Interval Training (HIIT) is useful, especially if you want to shorten your workout due to time constraints, the ½ hour walk covering 1.5 miles done most every day remains the best researched fitness exercise ever.
Resistance Fitness: Spending at least 20 minutes 3 days per week, where you exercise muscle groups "to failure" probably is more important in treating insulin resistance than improving aerobic fitness. Whether through Body Weight workouts, kettle bells, band training, circuit training please find a form of resistance training you can consistently perform. For those of you who need competition to motivate you, developing a skill-set/sport that you can do often helps provide the motivation necessary to add resistance. Maintaining lean body mass with age is one of the best predictors of survival and wellness.

4) **Sleep:**
I am separating this from stress management as it is its own subject. A minimum of seven hours per night of sleep is necessary to treat IR. Minimizing screen time, "the bed is for sleep and sex only", nightly routines, and if necessary, natural sleep aides.
Melatonin CR 5mg I recommend to all people over 50 as a well-aging hormone. An additional 5mg can be taken if more is needed to sustain sleep, 2-3 mg immediate release/sublingual can be added for initiation of sleep
5-HTP CR 100-300mg can be added at bedtime, promotes healthy serotonin levels and synergizes well with melatonin
Magnesium L-Threonate (OptiMag Neuro) 200-400mg Mg nightly can help promote restful sleep and is helpful as part of memory programs and for treating anxiety

5) Stress Management:
Please go to our stress management series (Available Here). Stress management should be #1 as most people who fail at 1-4 above do so because of unhealthy stress responses. Thusly stress, I believe, is the primary cause for the epidemic of IR we see in the world today.

As everyone knows, genetic predisposition does play a role. That is why if you test for signs of insulin resistance, the above is literally a playbook on how to play those genes into becoming *not* a risk factor for early mortality but how you can turn these genes into the most important well-aging and longevity enhancing factors known to humanity. If lifestyle does not adequately control the fasting insulin below or equal to 5 and the A1C below or equal to 5.2, then other Orthomolecular/Functional Medicine approaches are needed.

Treatment:

Supplements/Functional Medicine

1) **Basic Nutritional Protocol:** (Found Here) Always start first with the BNP, for targeted supplement strategies to work, they must be built on a strong foundation.
2) **Alpha Lipoic Acid (ALA):** For any A1C over 5.2, and/or fasting insulin over 5, consider starting with Jarrow ALA TR 300mg 2x/d. For more significant elevations of A1C >6.0 and fasting insulin >15 consider switching to ALA Max (Xymogen) 600mg once or twice per day, a well-researched formula but pricey.
3) **Berberine with InSea2:** Especially for A1C > 6.0, the combination of berberine with a patented brown seaweed extract 1 cap twice per day with 2 largest meals of the day provides a well-researched method of treating diabetes.
4) **CinnDrome X:** When adding this formula for persisting A1C elevations, it can be used at any level A1C, but is considered a must for > 6.0, one can stop extra ALA as it is part of the formula. Well composed with significant levels of ALA, chromium, American Ginseng, Green Tea, Gymnema Sylvestra and, of course, Cinnamon! The name refers to Metabolic Syndrome (sometimes called Syndrome X) and can be used for any of the subcategories of symptoms/signs of this syndrome. Dosage is 2 caps 2-3 times per day. Also limited by expense.

Treatment:

Medicines:
Integrative Medicine does very much incorporate Western medicines when lifestyle and orthomolecular approaches have not taken us to the finish line. These medicines can also be used temporarily as lifestyle and supplements are given a longer chance to work, then discontinued as diabetes becomes pre-diabetes. For those of you who are seeing other physicians, they might choose a different order in which to start medicines, or use a different medicine within the classes discussed. This will be based on their clinical experience. Avoid prescription insulin at all costs, except in the case of emergencies where insulin may be used acutely. Adding insulin to a condition of excess insulin will

dramatically shorten your life. Focus on strategies that lower glucose while lowering insulin!

- **Metformin (A biguanide medicine):** the first line therapy, can even be started in pre-diabetes, or predominantly hyper-insulinemic patients with obesity or dyslipidemia. Can cause significant gastrointestinal distress, start slowly and take with meals. So useful for decreasing insulin resistance some consider this an "anti-aging" medicine.
    - Strategies to successfully add metformin abound, and if you haven't tried them all, and have ongoing issues please try starting with metformin 500mg, ½ tab once per day with your largest meal and building up by ½ tab every week or so to allow your body to adapt. I usually try to get to 500mg twice daily and retest in 3-4 months. I usually peak at 100mg twice daily.
    - Alternative strategies include trying metformin ER 500mg tabs (can't be broken) if any dose of standard metformin can't be tolerated. Start with largest meal, build up slowly
    - Alternatively, one can find a metformin solution 500mg/5ml. Start slowly, like 1ml once per day and adjust up by 100mg/1ml every week or so as your body adapts
    - Lastly consider asking your doctor for an Rx of topical metformin taken to a compounding pharmacy usual dosage is 50mg/ 0.5ml applied twice per day. This eliminates the GI side effects and can work nearly as well as oral metformin
- **Pioglitazone (A thiazolidinedione medicine):** a medicine that has been underutilized due to misinformation and the promotion of more costly alternatives. The main concern is mild fluid retention that occurs in approximately 5% of patients, and is usually mild and can be regulated with a "flozin" medicine (upcoming). If someone already has congestive heart failure, this is not your drug, however this is possibly even more effective at preventing cardiovascular events than metformin, and far more proven than the costlier alternatives on your TV. Very synergistic with metformin and if you are on both, a generic combo med exists. Start at 15mg once daily, and with a max dosage of 30mg daily, it is our star second line therapy for diabetes. It is smart to monitor NT proBNP (as I always do anyways) and, in people with osteoporosis, continue to monitor UNTx. As with most medicines, we consider tapering off as A1C goes under 6.0.
- **Empagliflozin (Jardiance – A "flozin" medicine):** Flozins are a class of medicines known as Sodium-Glucose co-Transporter 2 (SGLT2) Inhibitors that work by increasing the urinary excretion of glucose. Also, a first line medicine if you have congestive heart failure, even if you are not diabetic. The main concern is maintaining adequate hydration and to be careful in those prone to urinary tract infections where this is definitely to be considered a drug to use with

caution. Can be started at 10mg every AM with or without food, and if necessary increased to 25mg daily (it only comes in 10 and 25 mg tablets)

- **Semaglutide (Ozempic a Glucagon-Like Peptide 1 Receptor Agonist – GLP1RA medicine):** This family has become famous as they can be used for weight loss only (Wegovy is the same medicine, slightly higher doses are used for maximal weight loss). Clearly, if weight loss is your primary concern this could be considered a first line medicine. It does increase after meal insulin secretion which fails as diabetes progresses. It also delays gastric emptying which keeps one "feeling full" which helps explain part of the weight loss. Given as a weekly subcutaneous injection, which is easy to learn. Start at 0.25 mg weekly for 4 weeks then increase to 0.5mg weekly and check labs in 3 months. Usually, we max out at 2mg weekly. I have been cautious with this family of meds as severe side-effects like pancreatitis and cholecystitis can occur but are, fortunately, rare.

Well, that is the overview of available approaches that I find useful, I hope you find it helpful, and understand that others will have widely and wildly different thoughts on this, and that is ok!

Your Journey to Health and Healing,
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