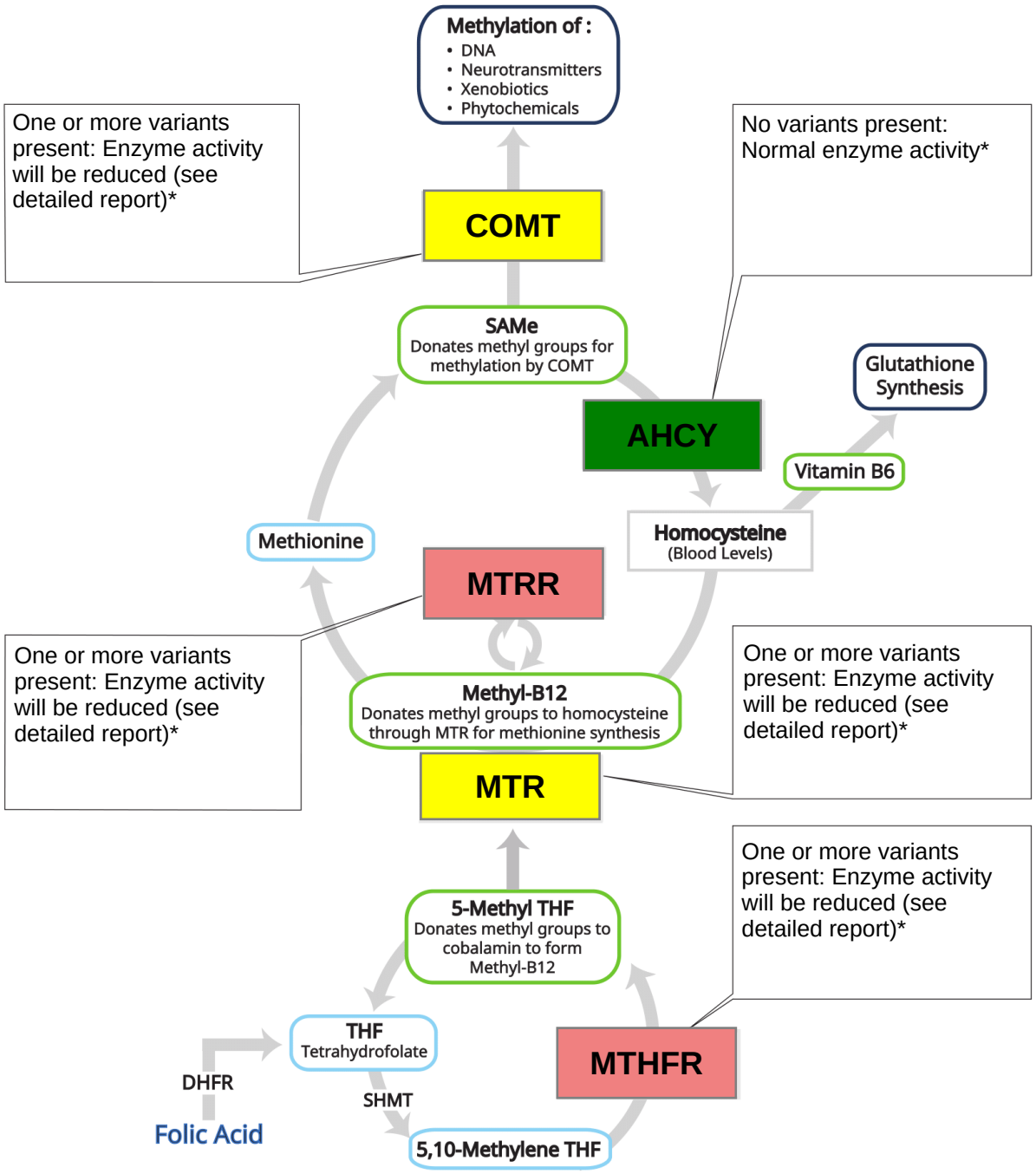
Patient Information	Name:	PATIENT II, PRETEND		
Date of Birth:	05/17/1962	Gender: F	Lab ID:	68220
Date Received:	03/02/2022	Date Collected: 03/01/2022	Date Reported:	03/07/2022
Physician:	Sample Physician		Clinic ID:	10804

Lab Director
Harold Alvarez, M.D.

Methylation Detoxification Cycle:



* *Note that variants other than those tested may contribute to the decrease in the enzyme activity. Proper nutrition can lead to balanced methylation, even when genetic variants exist.*

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Personalized Genomic Commentary:

MTHFR	C677T	Homozygous Positive	Genes inherited from both mother and father have variants. Enzyme activity tends to be reduced regarding the investigated variant site.
	A1298C	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.

Important: 1. If individual is being treated with antifolates and homocysteine levels are elevated, supporting literature strongly suggests supplementation with 5-MTHF. Examples of antifolates include:
Methotrexate (Rheumatrex, Trexall), Pyrimethanine (Daraprim) , Premetrezed (Alimta), Trimethoprim, Proguani.
2. Use caution with individuals previously diagnosed with serotonin syndrome.

MTR	A2756G (Asp856Gly)	Heterozygous	A gene inherited from one parent has a variant while the other gene is normal. Enzyme activity tends to be reduced regarding the investigated variant site.
	C3518T (Pro1173Leu)	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.

Summary: 1. Enzyme effectiveness tends to be reduced (see page 4 for genomic recommendations)
2. Mild tendency towards elevated homocysteine levels.

MTRR	A66G (Ile49Met)	Homozygous Positive	Genes inherited from both mother and father have variants. Enzyme activity tends to be reduced regarding the investigated variant site.

Summary: Enzyme effectiveness tends to be reduced (see page 4 for genomic recommendations)

Important: In combination with the C677T polymorphism in MTHFR, MTRR genotypes AG (heterozygous) and GG (homozygous positive) influence total plasma homocysteine levels. Additionally, the combination of the genetic polymorphisms in MTRR and MTHFR is linked to an increase in DNA damage as measured by micronucleus frequency (MN). Use caution with individuals previously diagnosed with serotonin syndrome.

AHCY	C112T (Arg10Trp)	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.
	G367A (Gly95Arg)	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.
	g.G32878481C	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.

Summary: Enzyme effectiveness tends to be normal.

Important: Relevant variants are associated with decreased enzyme presence and/or impaired function leading to elevated AdoHcy (s-adenosylhomocysteine) concentrations which may impair methylation potential. Studies show that association between variants resulting in poor methylation potential may lead to severe myopathies, developmental delays, and hypermethionemia.

COMT	G304A (Ala52/102Thr)	Homozygous Negative	Genes inherited from both parents have no variants. Enzyme activity tends to be normal regarding the investigated variant site.
	G472A(Val108/158Met)	Heterozygous	A gene inherited from one parent has a variant while the other gene is normal. Enzyme activity tends to be reduced regarding the investigated variant site.

Summary: 1. Enzyme effectiveness tends to be reduced (see page 4 for genomic recommendations)
2. Degradation of the following substances by methylation tends to be reduced:

Important: 1. Physician should be aware of this genetic test result should the patient be taking COMT inhibitors such as:
entacapone (Comtan) tolcapone (Tasmar) nitecapone
2. Use CAUTION when providing supplemental nutrients for those：
a. who have a history of serotonin syndrome
b. who take medication for Parkinson's disease
c. who take COMT inhibitors like Entacapone, Tolcapone in connection with L-Dopa (Dopamine).

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Genomic Recommendations:

Gene	Address Need For	Nutrient Applications FOOD FIRST	RDA (amount per day according to age)	Consider Supplementation With Practitioner Guidance IMPORTANT: The level of nutrient intake to optimize methylation status varies from individual to individual
COMT	Precursors for body to make SAMe (cofactor for COMT enzyme): L-methionine Cofactor:magnesium	Food sources of methionine:eggs, fish, turkey, cheese,legumes, nuts/seeds. High doses of bioactive food components, such as tea catechins (green and black tea, EGCG, green coffee bean extract) and quercetin may further inhibit COMT enzyme activty. Intake may need to be altered.	0-6 months-59 (AI) 6-12 months-43 1-3 years-28 4-8 years-22 9-13 years, boys-22 9-13 years, girls-21 14-18 years, boys-21 14-18 years, girls-19 19+ years-19 Pregnancy-25 Lactation-26	Clinical experience suggests an oral dose of 500mg methionine 1-2 times per day**
MTHFR	5-MTHF (5-methyltetrahydrofolate) Cofactors: riboflavin, niacin, magnesium, zinc	Encourage intake of green leafy vegetables, legumes, citrus fruit, beets, whole grains.	folate: 1-3 years-150ug 4-8 years-200ug 9-13 years-300ug 14+ years-400ug	A daily dose of 100-1000ug (.1- 1 mg) is typically used in research studies to achieve clinical benefit.** Additional support using vitamin B2, B6, B12, and betaine may also need to be addressed.** Avoid folic acid in supplements and fortified foods.
MTR	Vitamin B12 (hydroxycobalamin, adenosylcobalamin or methylcobalamin) Cofactors: zinc	Vitamin B12 is naturally found in animal products. Bound to protein in food, it is released by HCl and protease in the stomach. Many medications, including antacids and acid blockers, can deplete vitamin B12.	B12: 1-3 years-0.9ug 4-8 years-1.2ug 9-13 years-1.8ug 14+ years-2.4ug	1000ug typically suggested ** (Note: Homozygous positive COMT-consider hydroxycobalamin and/or adenosylcobalamin, Homozygous negative COMT-consider methylcobalamin Heterozygous positive COMT-methylocobalamin may or may not be tolerated)
MTRR	Vitamin B12 (hydroxycobalamin, adenosylcobalamin or methylcobalamin) Cofactors: riboflavin,niacin	Vitamin B12 is naturally found in animal products. Bound to protein in food, it is released by HCl and protease in the stomach. Many medications, including antacids and acid blockers, can deplete vitamin B12.	B12: 1-3 years-0.9ug 4-8 years-1.2ug 9-13 years-1.8ug 14+ years-2.4ug	1000ug typically suggested ** (Note: Homozygous positive COMT-consider hydroxycobalamin and/or adenosylcobalamin, Homozygous negative COMT-consider methylcobalamin Heterozygous positive COMT-methylocobalamin may or may not be tolerated)

***Limitations of the Recommended Dietary Allowances** The RDA is defined by The Food and Nutrition Board of the Institute of Medicine as "the average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group." This does not mean that additional nutrients provided via supplementation would not be beneficial.
The RDAs are not meant to apply to those managing inherited metabolic disorders, medical conditions, or those using nutrient depleting medications. It is generally well accepted by nutrition professionals, that higher levels of nutrient intake can help prevent chronic disease and promote optimal health.

****Consult with ordering health care practitioner to assess need for supplementation and proper dosage. Therapeutic dose to be determined by ordering health care provider. (the level of nutrient intake to optimize methylation status varies from individual to individual)**

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FOOD and LIFESTYLE FIRST

An individual's nutrient status depends on many factors. Digestion, absorption, and assimilation impacts the availability of nutrients supporting methylation, so issues potentially interfering with that availability need to be addressed. Further laboratory assessment may be indicated.

For food and lifestyle based support of methylation:

- Address GI function, intestinal permeability, dysbiosis, and food sensitivities. Avoid offending foods and ingredients.
- Consume a variety of organic, whole, colorful plant foods providing fiber, anti-inflammatory and anti-oxidant benefit. Include omega 3 fatty acids.
- Consume enough protein from lean- antibiotic/hormone free animal sources and/or plant sources- legumes, nuts/seeds.
- Manage weight and regulate blood glucose.
- Hydrate well with filtered water. Overall fluid need = 1 ounce/kg body weight (~½ body weight in fluid ounces, unless fluid restriction prescribed by physician)
- Avoid sugar, refined/fortified grains, conventionally raised animal products, trans fats, charbroiled foods (avoid grilling and deep frying)
- Avoid air pollutants, pesticides, bisphenol A, phthalates, automobile fumes, jet fuel, benzene, heavy metals, plastic food/beverage containers. Avoid high mercury fish- tuna, shark, swordfish, King mackerel.
- Avoid excessive alcohol consumption.
- Don't smoke.
- Work with a nutrition expert who can tailor the eating pattern to meet individual requirements.
- Lead an active lifestyle. Adopt a moderate exercise routine. Consult an exercise specialist to individualize routine. Avoid over-training.
- Reduce and manage stress. Consider meditation, yoga, prayer, positive thinking, acupuncture, social interaction, journaling. Get adequate sleep.

Dietary sources of key methylation nutrients

Folate - leafy greens- spinach, turnip greens, mustard greens, collard greens, legumes- mung beans, chickpeas, pinto beans, great northern beans, lentils, black beans, fava beans, kidney beans, soybeans, navy beans, pinto beans, black eye peas, split peas, peanuts, leeks, asparagus, broccoli, Brussels sprouts, avocado, citrus fruit, beets, spearmint, rosemary, daikon radishes, basil, cilantro (coriander leaf), marjoram, oregano, sage, tarragon, thyme, peanuts, sunflower seeds, wakame seaweed, quinoa, kelp seaweed, bay leaf, parsley, shitake mushrooms, dill, okra, egg, artichokes

Riboflavin - spirulina, egg, paprika, chives, cilantro, spearmint, tarragon, shiitake mushrooms, parsley, almonds, fish roe, cayenne pepper, chili powder, soybeans, game meat, daikon radish, chervil, goat cheese, mackerel, brie cheese, sesame, liver-lamb, beef, chicken, duck, goose

Niacin - peanuts, sunflower seeds, chicken, shiitake mushrooms, sesame seeds, salmon, spirulina, pork cilantro, mackerel, parsley, beef, game meats, sun-dried tomatoes, tarragon, trout, lamb, chili powder, mustard seed, duck, cod, anchovy, liver- beef, lamb, chicken

Magnesium - agar seaweed, herbs, spices, bran, pumpkin seeds, cocoa, flaxseed, Brazil nuts, sunflower seeds, sesame seeds, poppy seeds, almonds, cashews, buckwheat, amaranth, rye, molasses, walnuts, quinoa, great northern beans, mung beans, teff, tofu, chickpeas, oats, daikon radish, bulgur, lamb's quarters, hazelnuts, leeks, black beans, kidney beans, horseradish

Vitamin B12 - meat- beef, chicken, goose, pork, lamb, game meat, fish- mackerel, whitefish, salmon, cod, herring, snapper, trout, crab, clams, lobster, oysters, mussels, eggs, liver (lamb, beef, turkey, duck, goose, chicken) milk and milk products

Zinc - oysters, pumpkin seeds, sesame seeds, chervil, beef, game meats, lamb, poppy seed, shiitake mushroom, cardamom, celery seed, crab, bison, turkey, pork, peanuts, pine nuts, cocoa, thyme, parsley, rice bran, basil, agar seaweed, cashews, lobster, mustard seed, dark rye

Methionine - egg, cod, whitefish, sesame seeds, spirulina, Parmesan cheese, sunflower seeds, Brazil nuts, chicken, beef, lamb, salmon, buffalo, turkey, halibut, anchovy, Romano cheese, game meats, gruyere cheese, goat cheese, goose, duck, snapper, tilapia, mackerel, haddock, lobster, pumpkin seeds, sardine, herring, bison

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