UNDERSTANDING YOUR OWN BLOOD TEST RESULTS

IN RELATION TO YOUR NUTRITION & OTHER FUNDAMENTAL INFLUENCES ON YOUR HEALTH

- Although the results of a single blood test only provide a ‘snapshot’ of blood chemistry & blood cell values - those values can be very useful ‘tools’ when we are trying to determine if we are truly getting our nutrition right - or - when we are trying to figure out what we can do to improve our health through our nutrition.

- In addition to the nutrition (and unfortunately, the toxicity) that we take in from air, water & food, there are of course, other aspects of our self care that can influence our blood chemistry & blood cell values, such as: the quality & amount of sleep we get, how physically fit we are - or not, and of course, how much stress we have in our life.

- Our blood chemistry and blood cell values are determined, like ALL aspects of our health, by the dynamic interaction between our genes, and our environment - internal and external.

- The internal environment that we create for ourselves is the primary influence on our genes and of course, **the quality & quantity of food & drink that we are putting into our body each day is the primary influence on our internal environment!**

- With the **proper** reference ranges as our guides for interpretation - lab values on blood tests can offer us objective insights into the internal environment of our body and alert us to aspects of our biology where we are:
  - In balance
  - Out of balance
  - Strong
  - Weak

- When lab values indicate that we are in balance or strong - we can pat ourselves on the back for having good genes and good enough self care to support healthy gene expression.
- When lab values indicate that we are out of balance or weak - since we can not fundamentally improve our genes - this ultimately can be used as an objective indicator that we are in need of improving our self care to some extent. ?
- Practically speaking, improving our self care to support healthier gene expression requires us to identify the answers to the following 2 questions:

- *What is it that I need to add to my life?*
- *What is it that I need to subtract from my life?*

Interpreting Blood Test Results

- It is fundamentally important to know that there is NO universal medical standard for lab reference ranges*! Each individual lab determines their own reference ranges, and so, not surprisingly, reference ranges do vary from lab to lab to some extent. (*All labs however, are on board with the prevalent medical establishment dogma that the upper end of the reference range for total cholesterol should be 199 or 200.)

- Although reference ranges are supposed to be set by testing 'healthy' people together with consideration of peer reviewed research on lab values - in actual practice - **they are mostly determined by the sets of values that 95 percent of the lab's patient population falls within.**
- It is then important to ask the question: who are the people that comprise the vast majority of any lab's patient population? And of course the answer is: people with preexisting health problems (to say the least!)
- Because lab reference ranges are largely based on a population of people with preexisting health problems - they are almost always **too wide** to be representative of what is healthy. And here's why:

- It is part of the truth of our biology that all of our blood chemistry & blood cell values fluctuate to some degree. When we are healthy, the fluctuation occurs within a relatively narrow range because our body is really good at maintaining homeostasis, which is the medical term for BALANCE! Our experience of health is largely determined by how well our body is maintaining a relative balance in our biochemistry & physiology. We certainly do not want any of our basic blood chemistry & blood cell values to be too high or too low, because either is a problem.

- It is highly relevant to acknowledge that people with preexisting health problems have already lost some ability to maintain relative balance in their biochemistry & physiology - and so, they will have higher highs and lower lows in at least some of the measures of their chemistry & physiology. This ultimately influences the wideness of lab reference ranges which, to re-emphasize, are almost always **too wide** to be representative of what is healthy.

- So - lab reference ranges should NOT be thought of as being representative of what is healthy, but rather, as being representative of what is commonly found in the lab's generally unhealthy population of blood test subjects.

- The Healthier Reference Ranges that I offer in this presentation are the result of many years of my own clinical experience & research, along with helpful insights from other practitioners who have contributed to identifying healthier or optimal reference ranges, plus some ‘good ole fashioned’ rational thinking!

Chemistry Panel / Comprehensive Metabolic Panel / CMP

- **Glucose (Blood Sugar)**
- **Uric acid**
- **BUN (Blood Urea Nitrogen)**
- **Creatinine**
- **BUN/Creatinine Ratio**
- **EGFR (Est. Glomerular Filtration Rate)**
- **Sodium**
- **Potassium**
- **Chloride**
- **CO2 (Carbon Dioxide/ Bicarbonate)**
- **Anion Gap**
- **Calcium**
- **Phosphorus**
- **Total Protein**
- **Albumin**
- **Globulin**
- **Albumin/Globulin Ratio**
- **Bilirubin**
- **Alkaline Phosphatase**
- **LDH (Lactate Dehydrogenase)**
- **AST (SGOT)**
- **ALT (SGPT)**
- **Iron (Serum)**

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
GLUCOSE (Blood Sugar)	**(65 – 99 mg/dL)**	**(80 –90 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
***INSULIN**	**(2.6 - 24.9 uIU/mL)**	**(1 - 5 uIU/mL)**

*NOT PART OF THE CMP – NEEDS TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
HEMOGLOBIN A1c	**(< 5.7 %)**	**(4.7 - 5.2 %)**

*NOT PART OF THE CMP – NEEDS TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
URIC ACID	**F (2.5 – 7.1 mg/dL)** **M (3.7 – 8.6 mg/dL)**	**(2.8 – 5.8 mg/dL)** **(3.2 – 6.5 mg/dL)**

*NOT PART OF THE CMP FOR MANY LABS – WILL OFTEN NEED TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
BUN (Blood Urea Nitrogen)	**F (6 – 20 mg/dL)**	**(12 – 20 mg/dL)**
	M **(6 – 24 mg/dL)**	**(12 – 21 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
CREATININE	**F (.5 – 1.2 mg/dL)** **M (.6 – 1.4 mg/dL)**	**(.65 – 1.05 mg/dL)** **(.78 – 1.22 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
BUN/CREATININE RATIO	**(6 – 22)**	**(12 –21)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
EGFR (Estimated Glomerular Filtration Rate)	**(> 60)**	**(> 90)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
SODIUM (Na)	**(134 – 144 mmol/L)**	**(135 – 142 mmol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
POTASSIUM (K)	**(3.5 – 5.2 mmol/L)**	**(3.9 – 5.0 mmol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
CHLORIDE (Cl)	**(97 – 110 mmol/L)**	**(100 – 106 mmol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
CO2 (Carbon Dioxide/ Bicarbonate)	**(19 – 30 mmol/L)**	**(25 – 27 mmol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
ANION GAP	**(6 – 16 mmol/L)**	**(7 – 14 mmol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
CALCIUM	**(8.5 – 10.3 mg/dL)**	**(8.9 – 10.2 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
PHOSPHORUS	**(2.5 - 4.5 mg/dL)**	**(3.5 - 4.1 mg/dL)**

*NOT PART OF THE CMP FOR MANY LABS – WILL OFTEN NEED TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
ALBUMIN	**(3.5 – 5.5 g/dL)**	**(4.1 – 5.1 g/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
GLOBULIN	**(1.5 – 4.5 g/dL)**	**(2.3 – 3.2 g/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
TOTAL PROTEIN	**(6.0 – 8.5 g/dL)**	**(6.4 – 8.3 g/dL)**
ALBUMIN/GLOBULIN RATIO	**(1 – 2.1)**	**(1.5 – 2.1)**

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
TOTAL BILIRUBIN	**(0 – 1.2 mg/dL)**	**(.2 – 1 mg/dL)**
***INDIRECT BILIRUBIN**	**(.2 – 1.2 mg/dL)**	**(.2 – 1 mg/dL)**
***DIRECT BILIRUBIN**	**(0 – .4 mg/dL)**	**(0 – .2 mg/dL)**

*NOT PART OF THE CMP – NEEDS TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
ALK PHOS (Alkaline Phosphatase)	**(39 – 117 U/L)**	**(60 – 110 U/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
LDH (Lactate Dehydrogenase)	**F (0 - 214 IU/L)**	**(140 - 190 IU/L)**
	M (0 - 225 IU/L)	**(140 - 200 IU/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
AST (Aspartate Amino Transferase aka: SGOT)	F **(0 – 40 U/L)** M **(0 – 40 U/L)**	**(10 – 20 U/L)** **(12 – 25 U/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
ALT (Alanine Amino Transferase aka: SGPT)	F **(0 – 32 U/L)** M **(0 – 44 U/L)**	**(10 – 25 U/L)** **(12 – 28 U/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
***IRON, Serum**	**F (35 - 155 ug/dL)**	**+(50 - 100 ug/dL)**
		(40 - 80 ug/dL)
	M (40 - 155 ug/dL)	**(40 - 80 ug/dL)**

+ INDICATES THE HEALTHIER REFERENCE RANGE FOR MENSTRUATING WOMEN

*NOT PART OF THE CMP FOR MANY LABS – WILL OFTEN NEED TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
***FERRITIN**	**F (15 - 150 ug/dL)**	**+(50 - 100 ug/dL)**
		(40 - 80 ug/dL)
	M (15 - 150 ug/dL)	**(40 - 80 ug/dL)**

+ INDICATES THE HEALTHIER REFERENCE RANGE FOR MENSTRUATING WOMEN

*NOT PART OF THE CMP – NEEDS TO BE SPECIFICALLY REQUESTED

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Lipid Profile

- Triglycerides
- Total Cholesterol
- HDL Cholesterol
- LDL Cholesterol

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
TRIGLYCERIDES	**(0 - 149 mg/dL)**	**(60 - 95 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
CHOLESTEROL	**(100 - 199 mg/dL)**	**(160 - 240 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
HDL (High Density Lipoprotein)	**(> 39 mg/dL)**	**(50 - 80 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
LDL (Low Density Lipoprotein)	**(0 - 99 mg/dL)**	**(90 - 160 mg/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Complete Blood Count (CBC) with Differential

- **White blood cell count**
- **Red blood cell count**
- **Hemoglobin**
- **Hematocrit**
- **MCV (Mean Corpuscular Volume)**
- **MCH (Mean Corpuscular Hemoglobin)**
- **MCHC (Mean Corpuscular Hemoglobin Concentration)**
- **RDW (Red Blood Cell Distribution Width)**
- **Platelet count**
- **Neutrophils**
- **Lymphocytes**
- **Monocytes**
- **Eosinophils**
- **Basophils**

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
WBC (White Blood Cells)	**(3.4 – 10.8 K/uL)**	**(5 – 8 K/uL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
NEUTROPHILS	**(40 – 74%)**	**(50 –70%)**
LYMPHOCYTES	**(14 – 46%)**	**(20 – 40%)**
MONOCYTES	**(4 – 13%)**	**(3 – 7%)**
EOSINOPHILS	**(0 – 7%)**	**(.5 – 1.5%)**
BASOPHILS	**(0 – 3%)**	**(.1 – .5%)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
RBC (Red Blood Cells)	**F (3.77 – 5.28 x10E6/uL)** **M (4.14 – 5.80 x10E6/uL)**	**(4 – 5 x10E6/uL)** **(4.3 – 5.3 x10E6uL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
HEMOGLOBIN	**F (11.1 – 15.9 g/dL)** M **(12.6 – 17.7 g/dL)**	**(13.0 – 15.0 g/dL)** **(14.0 –16.0 g/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
HEMATOCRIT	**F (34.0 – 46.6 %)**	**(40.0 – 46.0 %)**
	M (37.5 – 51.0 %)	**(42.0 – 49.0 %)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
MCV (Mean Corpuscular Volume)	**(79.0 – 100.0 fL)**	**(80.0 – 90.0 fL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
MCH (Mean Corpuscular Hemoglobin)	**(26.6 – 33.0 pg)**	**(28.0 – 32.0 pg)**
MCHC (Mean Corpuscular Hemoglobin Concentration)	**(31.5 – 35.7 g/dL)**	**(32.0 – 35.0 g/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
RDW (Red Blood Cell Distribution Width)	**(12.3 – 15.4 %)**	**(11.0 – 13.0 %)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	‘Healthier’ Reference Range
PLATELETS	**(140 – 415 K/uL)**	**(150 – 300 K/uL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
HOMOCYSTEINE	**(0.0-15.0 umol/L)**	**(4.8 - 7.2 umol/L)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy:

Blood Test	Representative Lab Reference Range	'Healthier' Reference Range
TSH (Thyroid-Stimulating Hormone)	**(.45 - 4.50 µIU/mL)**	**(.75 - 2.5 µIU/mL)**
Total T4 (Thyroxine)	**(4.5 – 12.0 µg/dL)**	**(8.5 – 11 µg/dL)**
Free T4 (Thyroxine)	**(0.82 - 1.77 ng/dL)**	**(1.22 - 1.77 ng/dL)**
Free T3 (Tri-Iodothyronine)	**(2.0–4.4 pg/mL)**	**(3.4–4.2 pg/mL)**
Reverse T3	**(9.2 - 24.1 ng/dL)**	**(? - 16 ng/dL)**

The most basic things to consider when higher than healthy:

The most basic things to consider when lower than healthy: