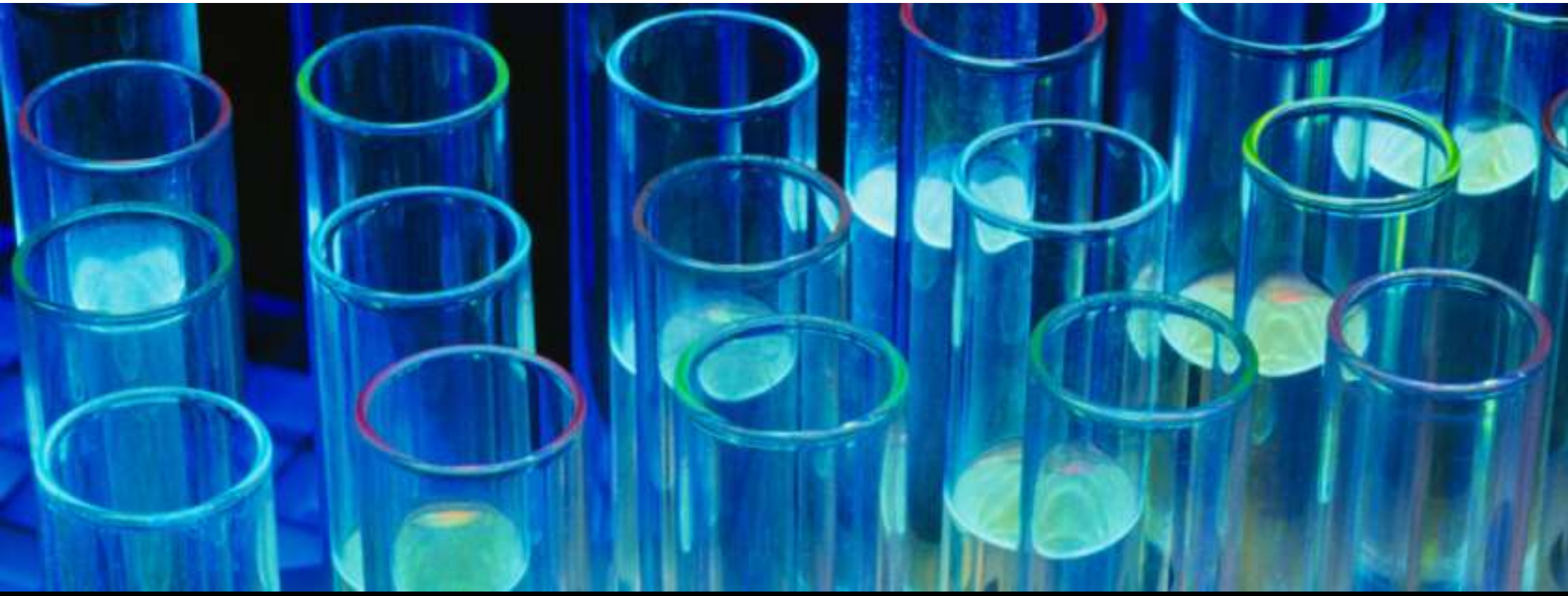

Tier 1 Laboratory Testing

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What is the Tier 1 Laboratory Testing Protocol

- Foundational Lab Testing and its Interpretation should be:
  - Actionable
  - Verifiable
  - In Context
  - Understandable
  - Easy-to-do
  - Using Multi-Variant Analysis
  - Has the Ability to Compare with Previous Tests

What are the Tier 1 Laboratory Tests

- Comprehensive Blood Chemistry
  - Chem 25
  - CBC
  - Thyroid Panel
  - hs-CRP
- Urinary Organic Acids/Environmental Pollutants
- Vitamin D
- Whole Blood Elements/Toxic Metals

What Does Actionable Mean?

- Testing urinary Methylmalonic Acid is actionable because when elevated, it is indicative of a vitamin B12 deficiency.
- Serum B12 is not actionable as recent evidence suggests is along with serum folate does not accurately represent bioavailable levels of these nutrients.
- Tests like Urinary Organic Acids are a very actionable test.
- Ones like a standard blood chemistry can, but only if properly interpreted.
- Whole Blood Elements/Toxic Metals can indicate need for supplementation of trace minerals and/or sequestration and excretion of toxic metals.
- Actionable similarities are an important consideration

Verifiability

- It is important to carefully select the lab that you choose to use.
- Split sample testing should be done.
- Or, find a reliable source to provide information on labs.
- Verify the tests that the lab is doing and has researchable references to back their claims.
- Arabinose versus D-Arabinitol
- Make sure the labs tell you when their tests are ***NOT*** appropriate.

In Context

- A 28-year-old female comes into your office.
- Her lab tests indicate elevated Cholesterol (285), high Uric Acid (6.3), elevated LDL (180) and high LDH (401).
- Furthermore, being progressive, you have even tested her carnitine level, it's low.
- She's in her third trimester and she is actually normal.
- Patient comes in to you office in June, you measure her cholesterol. You repeat it in February. What should you expect?

- Abbassi-Ghanavati M, Greer LG, Cunningham FG. Pregnancy and laboratory studies: a reference table for clinicians. Obstet Gynecol. 2009 Dec;114(6):1326-31. PMID:19935037

Context - Genetic Variability

- We know that African-Americans have a higher reference range for GFR (glomular filtration rate).
- In gluten sensitivity, someone with an Iranian heritage is about eight times less likely to have this than someone from the British Isles.
- If you run urinary hormone levels on men, there is a group in which the results will not accurately reflect their testosterone levels.
- Japanese men cannot conjugate testosterone.

Understandable

- The number one reason for practitioners to not run a urinary organic acid test.
- Inability to pronounce the test result names.
- 8-Hydroxy-2’-deoxyguanosine or 5-Hydroxyindolacetate
- The test results and the meaning of high, low and *normal* results are important.
- The actionability of the results must also be understandable.
- This is to fight off Skeptical Spouse Syndrome.

Easy-to-do

- The number one problem I have encountered in 30 years of working with laboratories is difficulty in acquiring a ***properly collected sample***.
- Requisition forms that resemble the operations manual of the Large Hadron Collider are commonplace.
- Sample instructions that might as well be written in Sanskrit are also an issue.
- In collecting urine samples for organic acid testing, it is essential that certain foods be avoided. Make sure the lab you are using makes that abundantly clear and easy-to-understand.

Multi-Variant Interpretation

- We all know that just looking at a Cholesterol level tells us very little in regard to the general health of an individual.
- Looking at the relationship between high, normal and low readings over an array of test results does.
- The difficulty is the inability of our brains to go beyond a 4 x 4 matrix and even that stretches most people's abilities.
- In the late 1990s, I was awarded two patents related to the use of multi-variant analysis in laboratory testing. In 1996 I received my first patent “Disease Indicator Analysis System”(#5,746,204) and in 1997 my second patent was awarded “Medical Diagnostic Analysis System” (#6,063,026).
- The field is known as metabolomics.

Ability to Compare

- Being able to compare test results over time using actionable, contextual, understandable, easy-to-do, and multi-variant analysis is foundational.
- Patients want to see if they are making progress in graphical and in a textual sense.
- Using this protocol dramatically increases patient compliance.
- You can give all of the best dietary suggestions, best quality supplements, and best lifestyle improvements, without compliance, nothing happens.
- The ability to compare compels patients to follow your direction.

How to Accomplish the Goals

- In 1986, I wrote this simple equation:
  - Test Result-Mean/Reference Range(High-Low)
- This allowed me to put all test results on a common ground.
- It also allowed me to compare improvements or regressions in test results.

Percent Status

- Example:
- Patient's Sodium Result is 141 mEq/dL
- Range is 135 – 145 mEq/dL
- Mean is 140 mEq/dL
- 141 - ((135+145)/2)/145-135 = 141-140/10 = .1 or 10% so the Percent Status is +10%

Percent Status

- Cholesterol = 155 mg/dL
- Range = 140 – 240 mg/dL
- Reference range according to most labs is 0-199 mg/dL
- This is a theoretical range, not based in reality because if the patient goes under 90 mg/dL, this may be considered life threatening.
- This is the same with a number of other reference ranges.
- The LabAssist™ Report uses scientifically based optimal reference ranges and population based ones when available.
- 155 – 190/240 - 140 = -45/100 = -45%

Clinical Correlations

- Young patient with a decreased T4, HGB, HCT, Globulin, Calcium and Albumin with an elevated Eosinophil
- The report showed a match for Psittacosis, a.k.a., Parrot Fever.
- The practitioner called me and told us that the patient was progressively getting sicker with no diagnosis until our report came up with this rare infection.
- The patient had a parrot that had just died. He had purchased it on the black market in San Francisco.
- He was treated with the right antibiotics and recovered fully. The disease, untreated or treated incorrectly could be fatal.

Lab Assist

- The reports my company Lab Interpretation LLC provides are known as Lab Assist.
- It can be used as a stand-alone report for one test, or a multitude of tests.
- A physician colleague and I have used a combination of blood chemistry, plasma amino acid, urine organic acid, environmental pollutants, and mineral/heavy metal panel.
- This is top-level testing.
- A combination of urinary organic acids with environmental pollutants is a foundational alternative.

Comprehensive Blood Chemistry

- Actionable
- Contextual
- Understandable
- Requires fasting blood draw
- Adding the Lab Assist report gives you both multi-variant analysis and the ability to compare.

Urinary Organic Acids

- Actionable
- Contextual
- Understandable
- Easy-to-do utilizing first morning urine collection
- Adding the Lab Assist report gives you both multi-variant analysis and the ability to compare.

Whole Blood Elements/Toxic Metals

- Actionable
- Contextual
- Understandable
- Requires fasting blood draw
- Adding the Lab Assist report gives you both multi-variant analysis and the ability to compare.

Environmental Pollutants Panel

- Can, and should be done with a urine organic acid test from US Biotek.
- Looks at exposure to phthalates, styrene, toluene, benzene, trimethylbenzene, xylene, and parabens.
- Let's look at phthalates.
- Recent studies show a decrease in the quantity and quality of male sperm
- It resembles steroidal compounds.
- At high levels, has been implicated in an increased risk for developing cancer.

Phthalates

- Damage DNA in male sperm
- Shorten pregnancies
- Depress testosterone
- Increase the risk of a child developing ADHD
  - The higher the levels of phthalates found in the urine of pregnant mothers, the higher the risk of the child developing ADHD – May 2018 Environmental Health Perspectives
- Erectile dysfunction in teenage boys
- Anatomical abnormalities in newborn babies.
- Should be implicated in the increased levels of autism.

Conclusion

- Lab Test must be the following:
  - Actionable
  - In Context
  - Understandable
  - Have an interpretive report that uses multi-variant analysis
  - Have the ability to compare

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