



**OPTIMAL (HEALTHY) VS. CLINICAL REFERENCE RANGES
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**PREVENTATIVE AND PREDICTIVE STRATEGIES USING
LABORATORY INTERPRETATIVE TECHNOLOGY**

AVOIDING MISDIAGNOSES

There is an essential need in the health care industry to improve the health care providers' ability to make correct predictions and decisions regarding patient care.

According to Johns Hopkins patient safety experts, misdiagnosis accounts for 40,000 to 80,000 hospital deaths per year. Lawsuits for diagnostic errors (defined as a diagnosis that is missed, wrong or delayed) are nearly twice as common as claims for medication errors. While health experts have focused on drug-prescribing errors, wrong-site surgeries and hospital-acquired infections in their overall effort to reduce medical errors, in fact, diagnostic errors are probably more common and at least as dangerous. Research shows 14% of physician errors that caused adverse events were diagnostic versus 9% for those that were drug-related.

THE ROLE OF COMPUTER PROGRAMS TO IMPROVE PATIENT CARE

According to The Legal Examiner, "(medical errors)...could potentially be reduced with a variety of simple tools and strategies. Checklists can help physicians connect symptoms with particular conditions that are obscure and difficult to diagnose... computer programs can help calculate an individual's risk for a certain disease... X-rays and CT scans can be confirmed with "second looks" by a different physician to reduce errors of misinterpretation... and patients with unusual

symptoms can be rapidly directed to diagnostic experts.” This article goes on to say, “Technology holds the promise of alleviating some of these problems. “

To Err Is Human is the first of 2 reports produced by the Institute of Medicine (IOM) that brought attention to the extraordinary number of patients who die each year as a result of medical and health care management errors. According to Nursing Outlook,

“...TECHNOLOGICAL SOLUTIONS AT THE POINT-OF-PATIENT CARE CAN ASSIST HEALTH CARE ORGANIZATIONS IN MEETING THESE RECOMMENDATIONS (REFERRING TO REDUCING PREVENTABLE PATIENT DEATHS).”

BLOOD DETECTIVETM TECHNOLOGY TO ENHANCE CLINICAL DECISION MAKING

ADVERSE DRUG & NUTRIENT EFFECTS

Reducing adverse drug events, enhancing clinical decision-making, improving productivity, augmenting skills of clinical staff, promoting improved documentation, and providing better communication can positively impact and aid health care professionals and organizations in patient care strategies. Blood Detective computerized technology provides a simple-to-use first-line diagnostic and patient care guide for reducing diagnostic and treatment errors by busy health care professionals.

MAKING SENSE OF BLOOD TESTING RESULTS

Health care is in dire need of technology that can manage the task of providing accurate patient assessment of laboratory data. The Blood Detective computerized technology involves little computer knowledge to input laboratory data and only moments to print comprehensive patient interpretative and educational reports.

A comprehensive computerized software program, developed by Dr. Michael Wald, has the potential of reducing errors in health assessment and their potentially tragic results.

Nursing Outlook concludes,

“...HEALTH CARE ORGANIZATIONS MUST REPLACE OVERBURDENED MANUAL PROCESSES WITH TECHNOLOGICAL SOLUTIONS DESIGNED TO MEET PATIENT NEEDS WHILE SUPPORTING A NEW, “TECHNO-SAVVY” WORKFORCE THAT HAS GROWN UP WITH COMPUTERS AND TECHNOLOGICAL GADGETS.”
WHAT TECHNOLOGIES WILL BE NEEDED TO MEET THESE CHALLENGES?

The Blood Detective Professional Edition Software and the Nutritional Microscopic Edition Software programs make possible quick and accurate nutritional and health assessments that

improve patient outcomes. This paper will use the Blood Detective Professional Edition Software program as a model to demonstrate how sophisticated health technologies improve patient care; ease of health assessment by health professionals and reduce overall patient health care costs.

THE BLOOD DETECTIVETM ANSWER

How will we continue to develop computer technologies as our patients, the workforce, and the health care environment in which we operate change? How do we maintain the integrity of our solutions and protect them against obsolescence in the near term? How do we address the issue of cost? Blood Detective™ computer system answers these real-life clinical changes in these ways:

- Only a basic knowledge of data input is required to produce interpretative reports
- As a fully “open program” Blood Detective™ allows the end-user to add to or edit any of the content within the program whereby altering the final patient reports
- The Blood Detective™ computer system cost is a one-time fee eliminating future payments

FAILURE TO MAKE ACCURATE HEALTH CARE DECISIONS OFTEN RESULTS IN –

1. Incorrect patient assessment and diagnosis.
2. Delayed treatments and incorrect treatments including medications.
3. Improper testing and increased risk of injury from iatrogenic medical evaluations.
4. Significant pain and suffering.
5. Iatrogenic or “doctor induced” sickness, injury and death.
6. Financial hardship on the patient to pay for unnecessary medical tests.
7. Further burdening on the health care industry (i.e., hospitals, infrastructure, etc.) further increasing insurance premiums.

TREAT THE PERSON NOT THE DIAGNOSIS

“Numerous studies have shown that patients get the wrong diagnosis as much as 20% of the time and also receive the wrong treatment half of the time. 35% of doctors and 42% of patients report errors in their own care or that of a family member (s). Studies have shown that most errors happen because of a failure to analyze the patient’s problem correctly. The primary purpose of the Blood Detective™ technologies is to enhance the ability of the healthcare provider to reduce diagnostic and treatment errors.

The National Patient Safety Foundation stated that 42% of medical patients feel they have experienced a medical error or misdiagnosis, resulting in the cost of medical tests, drugs, and operations. Results from a separate survey of 2,201 in the United States, 35% of those experienced a medical mistake within the past 5 years. Of these, 35% resulted in permanent harm or death. It has also been shown that that at least 44,000 Americans die each year as a result of medical errors and misdiagnosis (that is more than motor vehicle accidents, breast cancer, or AIDS), resulting from patient safety problems. More Americans die each month of preventable medical injuries than died in the terrorist attacks of September 11, 2001. According to Dr. Michael Wald, "Computerized technologies like Blood Detective allow the practitioner to organize, analyze and improve upon patient treatment plans. Ultimately, the potential for improved patient outcomes is achievable."

MEDICAL MISDIAGNOSIS IS A SERIOUS RISK EVERY TIME YOU GO THE DOCTOR OR THE HOSPITAL

It does not come with the guarantee that everything will be handled at its full capacity. Out of the 2,201 adults surveyed in the United States, 55% listed their greatest concern as seeing a physician in an outpatient setting, while 23% listed concerns in a hospital setting. A physician could cause major financial hardship and exposure to tremendous health risks by not assigning the proper diagnosis code.

There are several signs to watch out for which may indicate misdiagnosis has occurred. If any of the following apply after undergoing any form of medical treatment, it should be investigated further:

- Treatment does not seem to be working.
- Symptoms that don't usually occur with the given diagnosis.
- The condition was diagnosed based solely on a lab test.
- The physician attributes symptoms that are common among other conditions.
- The physician references a test that was not performed as a factor in the diagnosis.

MISDIAGNOSIS IS ALSO A FORM OF MEDICAL MALPRACTICE

Diagnostic errors are typically the leading or the second-leading cause of malpractice claims in the United States and abroad. This type of error also has the potential to cost the patient thousands of dollars in needless expenses and treatments (and the doctor thousands of dollars in expenses in the process). This form of medical malpractice includes diagnosis errors of both physical and mental conditions" (<http://trishatorrey.com/guest-postings/how-a-wrong-diagnostic-code-may-affect-a-patient/>). Blood Detective™ computerized analysis provides evidenced-based interpretative reports that allow the clinician to consider several essential clinical areas that may ultimately reduce health care costs on the part of the insurance industry as well as promote a reduction of health care premiums incurred by the patient.

FINDING HIDDEN CAUSES OF DIS-EASE

Improved tools designed to find “hidden” or otherwise not obvious biochemical and nutritional issues that may promote and/or result in disease, have been blatantly missing from mainstream medicine. It seems that it is the job of the naturally-oriented, holistically-minded, proactive health care provider to lead the health care industry in reducing the need for disease care. The Professional Edition Blood Detective technology provides a tool that can be implemented in just a few hours of the practitioners’ time, potentially reducing the patients suffering in short order.

THE PROFESSIONAL EDITION BLOOD DETECTIVE TECHNOLOGY – THE POTENTIAL FOR PERSONALIZED PATIENT CARE...AND NATURAL SOLUTIONS!

The Professional Edition Blood Detective Program is an easy to use technology that, in the hands of a conscientious health care provider may:

1. Improve the accuracy and speed of determining a diagnosis – potentially lessening the often significant delay from time of health care genesis, subclinical disease (dis-ease) and outright clinical disease.
2. Provides the practitioner with an understanding and logic as to the underlying biochemical, physiologic and nutritional issues that may have caused and/or resulted in the patients current level of health and future health potential.
3. Creates a rapport between practitioner and patient focused on the underlying causes (i.e, diet, lifestyle, etc.) and solutions for disease and disability.
4. Dr. Wald’s computerized laboratory-nutritional interpretation system provides motivation for both practitioner and patient pointing the way towards proper diet, nutritional supplement and educational supports.
5. The Professional Edition Blood Detective technology provides the patient with the tools, skills and knowledge to build health and not merely maintain a victims position to disease and disability.
6. The Professional Edition Blood Detective technology allows the potential for quicker treatment strategies to begin, either medical and/or nutritional, focused on the patient’s biochemical individuality.
7. The Professional Edition Blood Detective technology reduces the overall cost to the health care system and patient in particular due to personalized (individualized) natural or medical treatment strategies; reducing the need for generalized patient care.

**ARE YOU THE HEALTH CARE PROVIDER YOU COULD BE?
LET BLOOD DETECTIVE’S EASY TO USE SOFTWARE HELP YOU**

Blood Logic, Inc. is an innovative company that has designed the most comprehensive, user-friendly software program for nutritionally interpreting patient diagnostic lab work – fast and accurately!

The Blood Detective Professional Edition software analyzes and produces comprehensive, individualized nutritional reports, nutritional supplementation protocols, dietary food plans, and follow-up preventive testing and recommendations. Blood Logic is the brain-child of Dr. Michael Wald, the original Blood Detective, and has been continually updated and improved for over ten years to provide a superior quality tool for health professionals to easily and accurately determine patient dietary and nutritional supplement needs.

SOME KEY FEATURES THAT BLOOD DETECTIVE OFFERS INCLUDE THE FOLLOWING:

1. Compares patient results to “average” and “healthy” ranges.
2. Provides nutritional and medical meaning of all abnormal tests.
3. Predicts disease problems that may exist or to which the patient is predisposed.
4. Alerts you to drug-nutrient interaction and possible disease considerations.
5. Generates personalized, 10-day breakfast, lunch, dinner and snack recommendations specific for the patient’s biochemistry.
6. Provides individualized nutritional supplement recommendations, both by compound and by nutritional product. Choose from any of 13 pre-programmed supplement companies and Blood Detective will provide complete supplement protocols with descriptions and dosages. Blood Detective also lets you add other nutrient companies, add or delete products, and even add your own product line!
7. Blood Detective is the only fully editable software program of its type on the market so that you can personalize it to your practice needs. Dr. Wald designed the software technology to be able to grow as your knowledge and experience does...without added or hidden costs.
8. Provides patient education essays and materials.
9. Includes a marketing feature that allows you to generate letters to individual or groups of patients within seconds (including inserting laboratory results and nutritional suggestions).
10. Sends patients their complete report, or a part of it, with a few clicks of a button – the report NEVER NEEDS TO BE PRINTED! Automatic feature allows patient reports to be zipped, encrypted and emailed to your patients while being fully HIPPA compliant.
11. Future updates coming soon will allow you to insert your own logo into Blood Detective, truly positioning YOU as the Blood Detective that your patients want and need.
12. Updates are free for two years!
13. Priced to maximize your earning potential with clinical excellence and integrity. Payment plans are offered and sample reports are available.

A NEW AND BETTER WAY OF THINKING ABOUT THE PERSON AND THEIR CURRENT AND FUTURE POTENTIAL FOR DISEASE, DISABILITY AND HEALTH

The studies below are a small representative sample that expose the fact that many of the so called “clinical reference ranges” used on blood test reports by virtually all doctors in the United States are overly broad (too wide); as they are often based on incorrect data collection; focused on disease detection (and not prediction and prevention). In short, many of the “reference or clinical ranges” are too wide creating many false negative test results (i.e., seemingly normal test results when the patient actually had a health problem).

For example, an individual with a TSH of 0.8 is considered “normal”, but an optimal TSH value is closer to 2.5. If the range of cholesterol or blood glucose, thyroid stimulating hormone or liver enzymes (or any test for that matter) are too wide then a person may not feel well or manifest outright disease while their blood testing appears “normal”. It should be kept in mind that the method used to establish the so called, “clinical reference ranges” place 95% of the age adjusted man or women within the bell curve within a distribution (standard deviation) of individuals to the right and to the left of this bell. “Optimal” or “functional blood ranges” (as they are defined within the Blood Detective™ Professional Edition Software, help define a more clinically-useful laboratory range that may be more predictive and detective for disease and dis-ease states.

STANDARD REFERENCE RANGES – WHO’S “STANDARD” OR “AVERAGE” ANYWAY?

A standard reference range denotes ranges determined by independent laboratories in seemingly healthy individuals (without any obvious condition) that might affect the ranges. However, so called “normal reference ranges” inevitably include individuals with health issues “under the surface” or hidden from the disease-oriented health care provider. Therefore, so called “normal ranges” are really “average ranges” representing seeming well people in a population who have donated or otherwise have been paid to provide laboratory tissue samples (i.e., blood).

Considering that most “average “ individuals suffer from seemingly ever-increasing acute and chronic causes of death it seems apparent that the criteria used (normal reference ranges) are simply not predictive enough for detection and/or prevention of the major causes of death. The table below lists causes of death experienced in high-income countries like the United States.

IN THE CLINICAL SETTING: HEALTHY OR FUNCTIONAL RANGES

It is not at all unusual in our office, or any clinical setting, to find individual patients with serious diseases such as cancer, autoimmune disease, chronic fatigue, pain, etc. who have been told that, “my blood work is normal”; according to normal or average reference ranges they are, but almost never according to optimal or healthy ranges (a.k.a functional ranges). It is important to also realize that the optimal ranges provided within Dr. Wald’s Blood Detective program also consider scientific data including, but not limited to, how reference ranges should be adjusted to

pick up individuals with smaller degrees of dis-ease as opposed to disease; the former often producing laboratory results either on the high or low end of the normal ranges, but appearing obviously outside of the optimal-functional-healthy ranges.

OPTIMAL BLOOD RANGES

Dr. Michael Wald is the originator of the Blood Detective technology that pioneered the concept of “optimal blood ranges” as opposed to “reference or clinical ranges”. These optimal ranges are more narrow having the potential to find “hidden” biochemical abnormalities that would otherwise be “lost” within the far wider “clinical or normal” blood reference ranges used by mainstream physicians. Dr. Wald uses both the optimal (aka healthy) and clinical (normal) laboratory ranges to develop preventative and novel treatment approaches for his patients who have not received adequate help elsewhere.

WHAT IS A BLOOD DETECTIVE?

Blood and other body tissues hold clues to one’s current and future health potential. Within these living streams may be the answers to a current medical crisis or the silent warning signs of a developing disease — if you know where and how to look.

Dr. Michael Wald, the *Original Blood Detective*, has created a user-friendly software technology that is capable of detecting obvious and subtle clues often overlooked by most practitioners who interpret lab results without computer-assisted technologies; especially if the computer-assisted software logic systems are not calibrated for health and preemptive (preventative) purposes.

“I’M JUST NOT FEELING WELL”– WHY DOES MY DOCTOR SAY, “I’M FINE”?

Patients often ask the question embodied in this section’s title, namely, “My labs look fine, but I do not feel fine.” A detailed laboratory report is produced from the patient’s laboratory results that compare the patient’s blood and other test results to both the clinical and optimal reference ranges. In this way, both disease presence and disease prevention can be appreciated. The clinician will often find that the patient’s symptoms can be explained by abnormalities that are revealed only when the patient’s blood results are compared to Blood Detective™ functional ranges; often, the standard “clinical” ranges demonstrate “normal” results.

From a practical and clinical perspective, if an individual is not feeling well, and there are medical tests whose clinical reference values are “normal” but on the low or high end of normal, it is reasonable for the practitioner to consider that such “normal” results may not be “optimal results”. Here are three examples of tests, the results of which may be normal, which we know are inaccurate to reflect actual deficiency of the nutrient, in question or disease prevalence:

- Ninety-percent of North Americans may actually suffer more or less from folate deficiency, but only 2.5% have the lowest levels that fall below the standard clinical reference range; therefore, the optimal level of folic acid is substantially higher than the standard clinical reference range. (Reference: [Folic Acid: Don’t Be Without It!](#) by Hans R. Larsen, MSc ChE, retrieved on July 7, 2009. In turn citing: Boushey, Carol J., et al. A

- quantitative assessment of plasma homocysteine as a risk factor for vascular disease. Journal of the American Medical Association, Vol. 274, October 4, 1995, pp. 1049- 57 and Morrison, Howard I., et al. Serum folate and risk of fatal coronary heart disease. Journal of the American Medical Association, Vol. 275, June 26, 1996, pp. 1893-96.
- Vitamin D has a similar tendency as compared to folic acid. The optimal serum level 25(OH) vitamin D for musculoskeletal and global health is > or = 30 ng/ml (75 nmol/l) for some experts and 20 ng/ml (50 nmol/l) for some others. [Rev Med Suisse](#). 2012 Oct 31;8(360):2066-8, 2070-1. [Therapeutic goal of vitamin D: optimal serum level and dose requirements]. [Lamy O](#), [Aubry-Rozier B](#), [Stoll D](#).
 - Regarding hemoglobin A1c: For people without diabetes, the normal range for the hemoglobin A1c test is between 4% and 5.6%. Hemoglobin A1c levels between 5.7% and 6.4% indicate increased risk of diabetes, and levels of 6.5% or higher indicate diabetes. WebMD, 2012.
 - Regarding TSH: “Recent laboratory guidelines from the National Academy of Clinical Biochemistry indicate that more than 95% of normal individuals have TSH levels below 2.5 mU/liter. TSH level of 1.18 mU/liter strongly suggest that this value is the true normal mean for a normal population. [J Clin Endocrinol Metab](#). 2005 Sep;90(9):5483-8. The evidence for a narrower thyrotropin reference range is compelling. [Wartofsky L](#), [Dickey RA](#).
 - Regarding uric acid: Altered serum uric acid concentrations, both above and below normal levels, have been linked to a number of disease states. An abnormally high uric acid level has been correlated with gout, hypertension, cardiovascular disease, and renal disease, whereas a reduced uric acid concentration has been linked to multiple sclerosis, Parkinson’s disease, Alzheimer’s disease, and optic neuritis. [J Pharmacol Exp Ther](#). 2008 Jan;324(1):1-7. Epub 2007 Sep 21. Altered uric acid levels and disease states. [Kutzing MK](#), [Firestein BL](#). Department of Cell Biology and Neuroscience, Rutgers University, Piscataway, NJ 08854-8082, USA.

It is essential to keep in mind that optimal/healthy/normal/functional ranges, by definition, are not based on a standard method for their calculation, as are clinical/normal ranges. The optimal / healthy / normal / functional ranges are based on scientific data oriented towards *Personalizing Health Care* and not simply identifying (and not particularly accurately) disease prevalence and early detection. The Blood Detective technology is fundamentally based on a “fix what the clinician finds” approach and not orienting healing methods solely towards the diagnoses.

SUMMARY

Information and communication technologies have clearly enhanced the success of many industries and professions that have dared to think outside of the box. Similar solutions can be applied to the health care environment to enhance patient safety and clinical efficiency, and do so at the point of care. The possibilities are infinite as we design our healthcare workplace of the future. As leaders in the field of clinical nutrition, it will be our collective energy and creativity that help us take the necessary steps to transition our overburdened manual processes into a technological foundation that supports the patient, the practitioner, and the multidisciplinary team at the point of care.

About Dr. Michael Wald

Dr. Michael B. Wald, Director of Longevity Services at Integrated Medicine of Mount Kisco, PC., and has a focus on helping athletes of all levels maximize their athletic performance, decrease injury propensity and recovery. As a Board Certified Nutritionist, Dietician, Fitness Nutrition Specialist and Certified Sports Nutritionist, Dr. Wald is expertly qualified to help athletes achieve a competitive edge. Dr. Wald earned an MD degree and is a licensed doctor of chiropractic.

Dr. Wald is a sought after natural health expert having appeared on ABC World News Tonight with Diane Sawyer, FOX Five News, Fox National News, Channel 11, The Food Network, PBS Channel 13 and many other television and radio programs providing expert advice in the area of wellness and natural treatments for disease.

Dr. Wald is the author of over ten books including *Frankenfoods – Controversy, Lies & Your Health.. The Dangers of Genetically Modified Organisms*. Dr. Wald is the author of the popular, *Anti-Aging Encyclopedia of Laboratory Tests*. As CEO of the technology company, Blood Logic, Dr. provides health care providers with medical software that aids in the interpretation of laboratory tests for their hidden medical and nutritional secrets. Dr. Wald's newest book, *Gluten-A-Holic: Hidden Dangers of Gluten & How to Live Well*, will be available in 2015. *Unleashing Your Healthy Athlete – For The Fit & The Fittest* will be available at booksellers early 2016.

REFERENCES

<http://www.ncbi.nlm.nih.gov/pubmed?term=optimal%20clinical%20blood%20ranges%20tsh>

- This paper marshals arguments in support of a narrower, optimal or true normal range for thyrotropin (TSH) .

<http://www.ncbi.nlm.nih.gov/pubmed/16148345> - Recognition and establishment of a more precise and true normal range for TSH have important implications for both screening and treatment of thyroid disease in general and subclinical thyroid disease in particular.

<http://www.ncbi.nlm.nih.gov/pubmed/16645008> – Is there a need to redefine the upper normal limit of TSH?

<http://www.ncbi.nlm.nih.gov/pubmed/14651790> – A consistently abnormal TSH probably indicates that T(4) and T(3) are not normal for the individual even when inside the laboratory reference range.

<http://www.ncbi.nlm.nih.gov/pubmed/14722150> – Subclinical thyroid disease: scientific review and guidelines for diagnosis and management.

<http://www.ncbi.nlm.nih.gov/pubmed/20418229> – Subclinical thyroid disorders: significance and clinical impact.

<http://www.ncbi.nlm.nih.gov/pubmed/21310313> – The cost-effectiveness of C-reactive protein testing and rosuvastatin treatment for patients with normal cholesterol levels.

<http://www.ncbi.nlm.nih.gov/pubmed/22040842> – Usefulness of the High Triglyceride-to-HDL Cholesterol Ratio to Identify Cardiometabolic Risk Factors and Preclinical Signs of Organ Damage in Outpatient Children.

<http://www.ncbi.nlm.nih.gov/pubmed/22011803> – Patients with severe forms of DR are at risk for the presence of coronary artery disease regardless of traditional cardiovascular risk factors.

<http://www.ncbi.nlm.nih.gov/pubmed/17890445> – Altered uric acid levels and disease states.

<http://www.ncbi.nlm.nih.gov/pubmed/8283191> – The anemia of infection and chronic disease confers protection from pathogen or neoplastic invasion.

<http://www.ncbi.nlm.nih.gov/pubmed?term=low%20alkaline%20phosphatase%20and%20zinc%20deficiency> – [Recalcitrant generalized eruption and low alkaline phosphatase: think zinc.](#)

<http://www.ncbi.nlm.nih.gov/pubmed/21724538> – Vitamin D deficiency in white, apparently healthy, free-living adults in a temperate region.

<http://www.ncbi.nlm.nih.gov/pubmed/22040839> – Vitamin D Levels and Asymptomatic Coronary Artery Disease in Type 2 Diabetic Patients with Elevated Urinary Albumin Excretion Rate.

Institute of Medicine Committee on Quality Health Care in America. To err is human: building a safer health system. Washington: National Academy of Sciences; 1999.

Institute of Medicine Committee on Quality Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington: National Academy Press; 2001.

American Hospital Association Commission of Workforce for Hospitals and Health Systems. In our hands: how hospital leaders can build a thriving workforce. Chicago: The Association; 2002.

Fox S, Rainie L, et al. Vital decisions: how internet users decide what information to trust when they or their loved ones are sick. Pew Internet and American Life Project. Washington, DC: 2002 May 22.