Practical application of Functional & Integrated Practice in Psychology & Psychiatry

(With particular consideration to conditions related to infections by Mold (Mycotoxins), Long COVID and Mitochondrial Dysfunction).

Dr Rajendra Sharma

MB BCh BAO LRCP&S(Ire)

www.drsharmadiagnostics.com

Common Presentations

- Depression and Bipolar Disorder
- Anxiety
- Attention, processing and cognitive deficit disorders
- Addiction
- Eating Disorders
- Mood disturbance
- Obsesive Compulsive Disorder
- Alzheimer's and other dementias
- Many others…

- Less common: Psychosis, Schizophrenia, Mania etc

Causes of Psychiatric Conditions:

(for Dummies!)

Psychological – Reactive ("My cat has died…")

Can develop into

Physical – Endogenous (Brain dysfunction)

- Any cause of neuroinflammation
- Nutritional deficiencies
- Brain Trauma

Can be both….

Neuroinflammation (inc. Oxidative stress) as a cause of psychiatric issues

Condition	No. of papers found in Google Scholar
Depression	142,000
Anxiety	77,000
Mood disorder	52,000
Addiction	22,400
Eating disorders	22,600
OCD	9,040
ADHD	11,700
Alzheimer's	307,000
Psychosis	28,6000

Areas & Systems Affected

As examples:

Limbic-cortical dysregulation - **Depression**

Prefrontal cortex, hippocampus, anterior cingulate, amygdala – **Mania**

Frontal-subcortical, right caudate – **OCD**

Atypical *serotonin* system, right frontal and right caudate dysfunction, mesolimbic *dopamine* pathways – **Eating disorders**

Sympathetic and Parasympathetic ANS, *adrenalin, noradrenalin, GABA etc* - **all conditions**

Psychology of Home, Work and School Environs

Poverty

High stress in your specific role

Imbalance of effort vs. rewards

Low social support in the workplace

Not having control over your job

Feeling connected and safe

Lack of access to instruction

Unclear or unfocused objectives

Experiencing bullying

Low relational and procedural justice

Not feeling valued or respected

Not having a sense of belonging

Absence of a support system

Bosses and peers not understanding

Environmental Factors Affecting Mental Health

- **Climate** – warmth, sunlight, cloud & rain, length of daylight, increased frequency of disasters contributing to the development of depression, adjustment disorder, and post-traumatic stress disorder.
- **Crime levels**. - affecting females more strongly, increasing their risk of depression and anxiety.
- **Stigma -** racism, sexism, sexual orientation**, supporting Spurs** etc.
- **Pollution** - increased rates of depression and anxiety in more polluted areas.

Environmental Toxins

- Sleep deprivation
- Smoking
- Substance abuse
- Pollution
- Exposure to toxins through off-gassing (glues, sealants, pesticides, fire retardant, VOC from computers, cleaning products, mold etc.
- Hazardous conditions at work

References

(EXCLUDING EVIDENCE OF SUPPORTING THE WRONG FOOTBALL TEAM)

Home Environment

- Padhy SK, Sarkar S, Panigrahi M, Paul S. Mental health effects of climate change. *Indian J Occup Environ Med*. 2015;19(1):3-7. doi:10.4103/0019-5278.156997
- Dustmann C, Fasani F. The effect of local area crime on mental health. *Econom J*. 2014;126(593):978-1017. doi:10.1111/ecoj.12205
- Washington HA. *A terrible thing to waste: Environmental racism and its assault on the American mind*.
- Braithwaite I, et al Air pollution (particulate matter) exposure and associations with depression, anxiety, bipolar, psychosis and suicide risk: A systematic review and meta-analysis. *Environ Health Perspect*. 2019;127(12):126002. doi:10.1289/EHP4595
- Bornschein et al Psychological Medicine , Volume 32 , Issue 8 , November 2002 , pp. 1387 - 1394
- DOI: https://doi.org/10.1017/S0033291702006554

Work and School |Environs

- Knifton L, Inglis G. Poverty and mental health: policy, practice and research implications. *BJPsych Bulletin*. 2020;44(5):193-196. doi:10.1192/bjb.2020.78
- Harvey SB, Modini M, Joyce S, et al. Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems. *Occup Environ Med*. 2017;74(4):301-310. doi:10.1136/oemed-2016-104015
- Schulte-Körne G. Mental health problems in a school setting in children and adolescents. *Dtsch Arztebl Int*. 2016;113(11):183-190. doi:10.3238/arztebl.2016.0183

Overall causes of neuroinflammation

- Infection
- Toxicity
- Autoimmune disease.
- Inflammation from peripheral organs.
- Directly from mental stress
- Metabolic disorders
- Poor lifestyle.

Sun Y, Koyama Y, Shimada S. Inflammation From Peripheral Organs to the Brain: How Does Systemic Inflammation Cause Neuroinflammation? Front Aging Neurosci. 2022 Jun 16;14:903455. doi: 10.3389/fnagi.2022.903455. PMID: 35783147; PMCID: PMC9244793.

Infective causes of neuroinflammation
1. Viral

- Chronic viral (HIV, EBV, CMV, Coxasckie, various Herpes viruses, SARS CoV-2 and no doubt many others)

"Chronic Viral Neuroinflammation: Speculation on Underlying Mechanisms"

- Foci of cytotoxic inflammation.
- Human immunodeficiency virus (HIV)-associated neurocognitive disorders.
- Macrophages in the CNS spur development of encephalitis (HIVE).
- Continual activation of astrocytes drive neurocognitive disorders/subclinical disease, and *neuroinflammation.*
- Activation of glial cells.
- *CNS **innate immune system** is distinct from the rest of the body, there could be a number of activation profiles not observed elsewhere.*

Delery EC, MacLean AG. Chronic Viral Neuroinflammation: Speculation on Underlying Mechanisms. Viral Immunol. 2019 Jan/Feb;32(1):55-62. doi: 10.1089/vim.2018.0093. Epub 2018 Sep 27. PMID: 30260764; PMCID: PMC6350055.

The causes of neuroinflammation
2. Mold & mycotoxins

Google scholar – 4,730 papers

Here's one regarding Mycotoxins & Psychiatry with Mold as a cause :

"Brain inflammation in the hippocampus, the area of the brain that governs memory, learning, and the sleep-wake cycle.

Decreased neurogenesis, or the formation of new brain cells. Impaired memory. Increased sensitivity to pain. Increased anxiety"

Cheryl F. Harding, et al Mold inhalation causes innate immune activation, neural, cognitive and emotional dysfunction. Brain, Behavior, and Immunity, Volume 87, 2020, Pages 218-228, ISSN 0889-1591, https://doi.org/10.1016/j.bbi.2019.11.006

The causes of neuroinflammation – 3. Bacterial or Parasitic

Rarely presents except in A&E as much more aggressive requiring acute, emergency treatment

Inflammation from Peripheral Organs. - The Gut

Google Scholar – 15,700 papers Neuroinflammation + microbiome + psychiatry

Google Scholar – 61,100 papers Microbiome + psychiatry

1. *"Stress-induced **enteric dysbiosis and intestinal permeability** [leaky gut] confer risk for negative mental health outcomes through immunoregulatory, endocrinal, and neural pathways."*

Liu, R. T. (2017). The microbiome as a novel paradigm in studying stress and mental health. *American Psychologist, 72*(7), 655–667. https://doi.org/10.1037/amp0000058

Common conventional view:

2. *"There is **interest** among both the research and lay communities in understanding the effects of the microbiome on the brain."*

G. MacQueen has received honoraria from Allergan, Pfizer, Lundbeck and Janssen. P. Moayyedi has accepted speaker fees from Allergan Inc. and Abbvie Pharmaceuticals

MacQueen G, Surette M, Moayyedi P. The gut microbiota and psychiatric illness. J Psychiatry Neurosci. 2017 Mar;42(2):75-77. doi: 10.1503/jpn.170028. PMID: 28245172; PMCID: PMC5373703. been on the advisory boards of Allergan Inc, Shire and Salix Pharmaceuticals.

Mitochondria in Psychiatry

- "Patients with mitochondrial disorders can present with primary psychiatric symptomatology, including mood disorder, cognitive impairment, psychosis, and anxiety."

The Psychiatric Manifestations of Mitochondrial Disorders: A Case and Review of the Literature. Rebecca E. Anglin, MD, FRCP(C); et al J Clin Psychiatry 2012;73(4):506-512

Google scholar 205,000 papers Mitochondria + Psychiatry

- Mitochondrial *disease* differs from *disorder* and *dysfunction*
- 4000-5000 Mito per cell.
- Catecholamines and cortisol directly affect Mitochondria as do infections, toxins and nutritional deficiencies

Therapeutic Approaches - Psychological

Meditation

Breathing – Yoga, Tai Chi, Qi Gong

Sleep training

Exercise

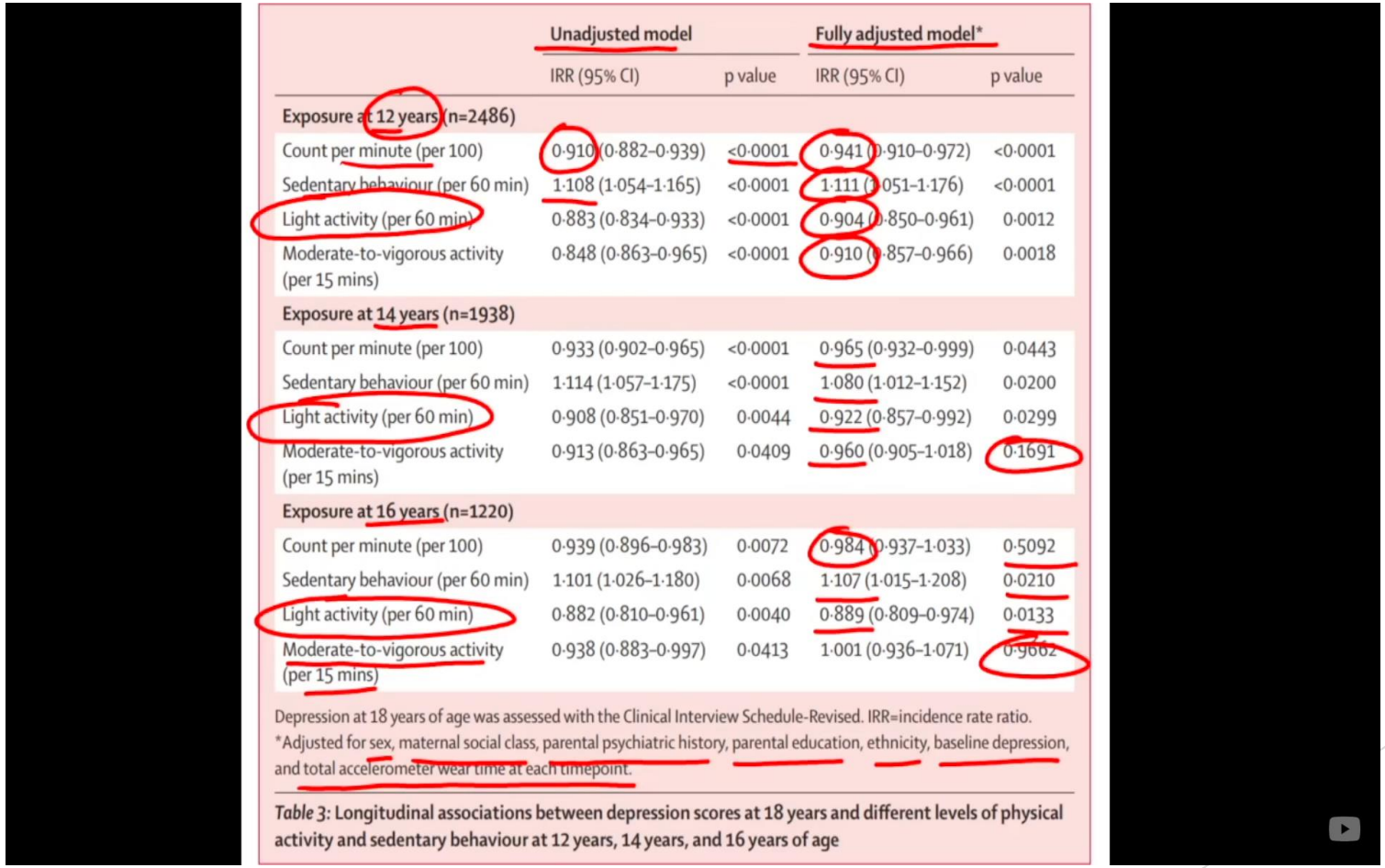
On line options such as ‘The ThinQ Fitt training - a method of developing awareness of your thinking habits.” https://www.get-fitt.com/thinq-fitt-training/

Refer for Counselling

Exercise Rx in Psychiatry (2.7 million papers on Google Scholar).

Roger Seheult, MD of MedCram - https://www.youtube.com/watch?v=QevFo8wsXZ4

In depression ….



	Unadjusted model		Fully adjusted model*	
	IRR (95% CI)	p value	IRR (95% CI)	p value
Exposure at 12 years (n=2486)				
Count per minute (per 100)	0·910 (0·882–0·939)	<0·0001	0·941 (0·910–0·972)	<0·0001
Sedentary behaviour (per 60 min)	1·108 (1·054–1·165)	<0·0001	1·111 (1·051–1·176)	<0·0001
Light activity (per 60 min)	0·883 (0·834–0·933)	<0·0001	0·904 (0·850–0·961)	0·0012
Moderate-to-vigorous activity (per 15 mins)	0·848 (0·863–0·965)	<0·0001	0·910 (0·857–0·966)	0·0018
Exposure at 14 years (n=1938)				
Count per minute (per 100)	0·933 (0·902–0·965)	<0·0001	0·965 (0·932–0·999)	0·0443
Sedentary behaviour (per 60 min)	1·114 (1·057–1·175)	<0·0001	1·080 (1·012–1·152)	0·0200
Light activity (per 60 min)	0·908 (0·851–0·970)	0·0044	0·922 (0·857–0·992)	0·0299
Moderate-to-vigorous activity (per 15 mins)	0·913 (0·863–0·965)	0·0409	0·960 (0·905–1·018)	0·1691
Exposure at 16 years (n=1220)				
Count per minute (per 100)	0·939 (0·896–0·983)	0·0072	0·984 (0·937–1·033)	0·5092
Sedentary behaviour (per 60 min)	1·101 (1·026–1·180)	0·0068	1·107 (1·015–1·208)	0·0210
Light activity (per 60 min)	0·882 (0·810–0·961)	0·0040	0·889 (0·809–0·974)	0·0133
Moderate-to-vigorous activity (per 15 mins)	0·938 (0·883–0·997)	0·0413	1·001 (0·936–1·071)	0·9662

Depression at 18 years of age was assessed with the Clinical Interview Schedule-Revised. IRR=incidence rate ratio.
*Adjusted for sex, maternal social class, parental psychiatric history, parental education, ethnicity, baseline depression, and total accelerometer wear time at each timepoint.

Table 3: **Longitudinal associations between depression scores at 18 years and different levels of physical activity and sedentary behaviour at 12 years, 14 years, and 16 years of age**

Gizmos and Gadgets

The Sensate - a sound wave instrument that interplays with an App.

Used daily initially for a few minutes building up to longer spells as required.

Retrains the body's stress response in the same way meditation does.

Works by stimulating the Vagus nerves which control many functions including heart rate, blood pressure, breathing rate, the gut movement, and the psychological stress-response and indirectly hormonal balance.

Details can be read here **www.getsensate.com**

Therapeutic Approaches – Detoxification & Detoxicants

- Eliminate constipation and ensure regular bowel movements
- Stimulate all detox pathways
  - Methylation (top of the list)
  - Liposomal Glutathione
  - Trans-Sulphuration
  - Glucuronidation

Therapeutic Approaches – Pointers

Aim treatment at the following:

- Lifestyle changes
- Psychology
- Infection
- Detoxification
- Nutrition
- Neuronal and Nerve receptor repair
- Neurotransmitter activity

Therapeutic Approaches – Nutritional

- Essential Fatty acids – varying authorities range balance between Omega3:Omega 6 as 1:1, 2:1 & 1:4 !
- Phosphatidylcholine
- Phosphatidylserine
- Amino acids – Tyrosine, L-Theanine, 5-HTP or Tryptophan and several others
- Minerals especially magnesium
- Vitamins – especially B6 & B12 but all those in B-Complex

Guidance from investigations helps narrow down requirements

Therapeutic Approaches – Immune stimulation

- Aim at activating the innate immunity

  (particularly if viral and mould infection is suspected)
- Keep the skin healthy
- Keep the gums healthy
- Avoid any foods ‘that hurt’ (i.e. cause heart burn, reflux, abdominal bloating) including too hot drinks, alcohol without food, NSAID drugs
- Antioxidants - vitamin E, D &., vitamin C, β-carotene, selenium, copper, iron, and zinc
- Polyphenols (Curcumin especially, resveratrol, and sulforaphane)

Therapeutic Approaches – Immune stimulation.

- Monolaurine
- Beta-glucans
- Adaptogens
- Rhodiola
- Ashwaganda (Withania somnifera)
- Eleutherococcus senticosus – Siberian ginseng root
- Schizandra chinensis berries

- **ASPERGILLUS PROTOCOL**
- Liposomal Glutathione
- Amino acid broad supplement (? Pea powder)
- Activated Charcoal – start with minimum rising to maximum dose
- Bentonite Clay - build up to max dose
- Zeolite
- Guggul gum – build up to max on label
- N Acetyl cyteine 500 mgs bd
- High dose antioxidants

Covid – SARS CoV-2 & Psychiatric Affects

- *SARS-CoV-2-**human protein interactions** may lead to the development of delirium, psychosis, seizures, encephalitis, stroke, sensory impairments, peripheral nerve diseases, and autoimmune disorders*
- Yapici-Eser H, et al Neuropsychiatric Symptoms of COVID-19 Explained by SARS-CoV-2 Proteins' Mimicry of Human Protein Interactions. Front Hum Neurosci. 2021 Mar 23;15:656313. doi: 10.3389/fnhum.2021.656313. PMID: 33833673; PMCID: PMC8021734.

- Indirectly the effects of lockdown, social distancing, isolation, mask wearing.

Long Covid & Spike Proteins

Theories of causation of Long Covid include long term manufacture or maintenance *in situ* of Spike protein

"Mechanistically, we demonstrated that purified SARS-CoV-2 ***spike glycoprotein*** *activated the NLRP3 inflammasome in LPS-primed microglia"*

- Albornoz EA, et al *SARS-CoV-2 drives NLRP3 inflammasome activation in human microglia through spike protein*. Mol Psychiatry. 2022 Nov 1. doi: 10.1038/s41380-022-01831-0. Epub ahead of print. PMID: 36316366.

Therefor this might indicate risk from mRNA vaccination production of Spike protein.

- *The accumulation of SARS-CoV-2 spike protein in the skull-meninges-brain axis presents potential molecular mechanisms and therapeutic targets for neurological complications in long-COVID-19 patients.*

- **SARS-CoV-2 Spike Protein Accumulation in the Skull-Meninges-Brain Axis: Potential Implications for Long-Term Neurological Complications in post-COVID-19** Zhouyi Rong et al **doi:** https://doi.org/10.1101/2023.04.04.535604

(Other theories include: Chronic SARS CoV -2 infection, Mast Cell Activation, Permanent DNA alteration, Permanent metabolic damage and others.

Long Covid.
The Front Line Covid-19 Critical Care Alliance

PREVENTION PROTOCOLS -
https://covid19criticalcare.com/treatment-protocols/i-recover-long-covid-treatment/

I-RECOVER SM
An Approach to Treating Long COVID

I-RECOVER SM

Vaccine Injury

Long Covid & Chronic Viral Infections – First Line Treatments

- Intermittent daily fasting or periodic daily fasts
- Moderating physical activity
- Sunlight and Photobiomodulation (previously known as Low Level Laser Therapy – LLLT)
- Probiotics/prebiotics
- Nattokinase
- Aspirin
- Magnesium
- Methylene blue
- Resveratrol

Long Covid & Chronic Viral Infections – Second/Third Line Treatments

- Vitamin D (with Vitamin K2)
- N-acetyl cysteine
- Cardio Miracle™ L-arginine/L-citrulline supplements
- Omega-3 fatty acids
- Nigella sativa
- Vitamin C & Intravenous Vitamin C
- Spermidine
- Mitochondrial therapy

- Non-invasive brain stimulation
- Behavioural modification, relaxation therapy, mindfulness therapy, and psychological support
- Hyperbaric oxygen therapy
- Low Magnitude Mechanical Stimulation

Long Covid & Chronic Viral Infections – Prescription only Treatments

First Line

- Ivermectin
- Melatonin
- Low-dose naltrexone

Second/third line

- Nicotine (2023 Jan 18;9(1):2. doi: 10.1186/s42234-023-00104-7)
- Sildenafil (Viagra) with or without L-arginine- L-Citrulline
- Hydroxychloroquine
- Low-dose corticosteroid

Special Mention Low Dose Naltrexone

Low Dose Naltrexone (LDN) is a low dose of a drug used conventionally for opiate addiction at doses of 50 mgs +.

LDN dosage 0.125mg - 4.5mgs (1/200th to 1/10th the conventional dose)

Mechanism based on a mild blockage of the body's own opiate receptors which causes the body to increase its production of natural opiates (Endorphins and encephalins).

Opiate receptors found throughout the body effecting nearly all systems in the body. https://ldnresearchtrust.org/what-is-low-dose-naltrexone-ld

Studies in Psychiatric and mood disorders are presented by the LDN Research Trust here: https://ldnresearchtrust.org/sites/default/files/inline-files/Dr-Mark-Shukhman.pdf

This peer reviewed paper discusses LDN's effects in mood disorder amongst many other complaints https://www.naturalmedicinejournal.com/journal/2018-04/uses-low-dose-naltrexone-clinical-practice

Tests & Investigations

Neuroinflammation – blood test through Lab 4 More

Neurotransmitter – useful advice & for persuasion

Precision Point Advanced Intestinal Barrier

Organic Acid Test (OAT) – highlights mycotoxins, mitochondrial dysfunction and other Mycotoxin

OAT + Mycotox Combo

Viral Infections through Immunoscience Labs.

Cyrex Tests:

Alzheimer's LINX

Array 20 - Blood Brain Barrier Permeability

Array 14 - Mucosal Immune Reactivity Screen (saliva)

Neuro Basic Profile

Neuro Basic Profile; urine

Order: 190723-2166
Client #: 38596
Regenerus Laboratories Ltd
Aero 14 Redhill Aerodrome Kings Mill Lane
Redhill, Surrey, RH1 5YP
United Kingdom

Age: 27 **DOB:** 08/07/1991
Sex: Male
Body Mass Index (BMI): 34

Sample Collection	Date/Time
Date Collected	07/17/2019
Wake Up Time	13:30
Collection Period	2nd morning void
Date Received	07/23/2019
Date Reported	07/29/2019

Analyte	Result	Unit per Creatinine	L WRI H	Reference Interval
Serotonin	95.2	µg/g		50 – 98
Dopamine	164	µg/g		110 – 200
Norepinephrine	4.2	µg/g		18 – 42
Epinephrine	2.4	µg/g		1.3 – 7.3
Norepinephrine / Epinephrine ratio	1.8			< 12
Glutamate	21	µmol/g		9.0 – 40.0
Gamma-aminobutyrate (GABA)	1.7	µmol/g		1.6 – 3.5
Glycine	2543	µmol/g		350 – 1500
Histamine	24	µg/g		12 – 30
Phenethylamine (PEA)	36	nmol/g		26 – 70
Creatinine	40.7	mg/dL		35 – 240

Neurotransmitter Comments:

- Urinary neurotransmitter levels provide an overall assessment of the body's ability to make and break down neurotransmitters and are representative of whole body levels. They are required for neurotransmission throughout the body. Direct assessment of neurotransmitter levels and metabolism in the central nervous system is not clinically feasible and approximately twenty percent of the total urinary levels are derived from the brain. The enzymes, cofactors and precursors in neurotransmitter metabolism in general are the same in the periphery and in the central nervous system. Therefore, alterations in urinary neurotransmitter levels assessed in urine provide important clinical information, and may be associated with many symptoms including cognitive and mood concerns, diminished drive, fatigue and sleep difficulties, cravings, addictions and pain.
- Upper range serotonin may be associated with symptoms of increased anxiety, agitation, and diarrhea (IBS-like symptoms). Serotonin levels may be increased by low protein or high-carbohydrate meals, insulin and tryptophan or 5-HTP supplementation. Many mood altering medications, including SSRIs and SNRIs, may influence serotonin levels. L-theanine may affect serotonin function.
- Low norepinephrine and low range epinephrine may be associated with depression and mood changes as well as fatigue, difficulty concentrating, decreased ability to stay focused on tasks and diminished sense of personal/professional drive. Norepinephrine is converted from dopamine requiring vitamin C, copper and niacin (B3). L-tyrosine, L-theanine and Mucuna pruriens influence this pathway.
- Low range GABA may be associated with anxiety, poor impulse control, depression, pain and decreased sleep quality. Low GABA may be seen in individuals deficient in vitamin B6. L-theanine, GABA and glutamine may positively affect functional GABA activity, and phenibut exerts GABA-like effects (experimental models).
- Glycine is a non-essential amino acid that acts as an inhibitory neurotransmitter in the central nervous system. Elevated glycine levels may be associated with compromised cognitive processing. Elevated levels may be seen with glycine supplementation. Glycine may be given in conjunction with pharmaceutical agents when supporting schizophrenia or psychosis. Lipoic acid may enhance glycine break down. Break down of glycine requires vitamin B6 and tetrahydrofolate as cofactors. Note: High levels of glycine may interact with clozapine and decrease its clinical efficacy.
- Considerations to address the demonstrated imbalances beyond the identified co-factors and amino acid precursors may include dosage adjustments if indicated, as well as nervine and adaptogenic herbs, methylation support, vitamin D, and gastrointestinal health optimization.

Notes:
Results are creatinine corrected to account for urine dilution variations. Creatinine is not meant to be used as an indicator of renal function.
RI= Reference Interval, L (blue)= Low (below RI), WRI (green)= Within RI (optimal), WRI (yellow)= Within RI (not optimal), H (red)= High (above RI)
Methodology: LCMS QQQ,Creatinine by Jaffe Reaction

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

Neuroinflammation Profile

MVZ Labor Bavariahaus
Karlstrasse 46
D-80333 München
Tel.: 0049 89 54 32 17 0

Lab4more
Mehr als nur ein Labor

Sharma, Rajenda Dr.	**Name**						
87 North Rd. Poole	**D.o.B.**	09.01.1965	**Gender**	W	**Request No.**	**100356353**
GB Dorset BH14 0LT	**Address**				**Received**	15.02.2023
Fax					**Reported**	23.02.2023
Client No. 1981	**Patient No.**	740155	**Sampl. Time**		14.02.2023 10:10:00	

Height [ ] cm **Weight** [ ] kg **Body Mass Index** [ ]

Medical History:
Keine Angaben

Interpretation:
Neuroinflammation markers Interleukin 1ß, MCPÜ -1 and MIP-1 alpha are raised.
BDNF-Levels are however within references.

Further therapeutic control recommended!

Kind Regards
Dipl.Biol. B. Knabenschuh

PsychoneuroInflammation

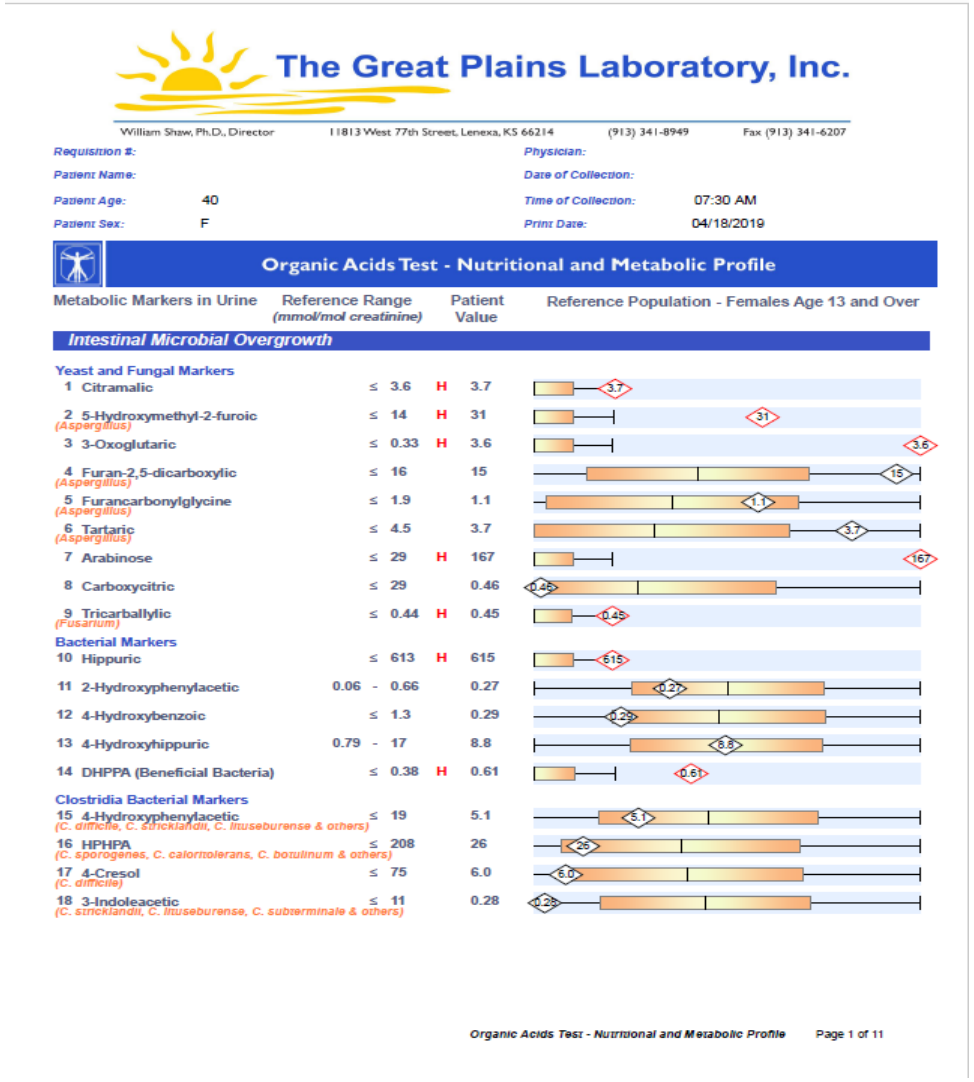
Test Name	Result	Ref. Range	Units	Previous	Trend Line /Date
Neuroinflammation					
Interleukin 1ß (S)	↑ **39**	< 5	pg/ml		
Interleukin 12 (S)	**<1**	< 1	pg/ml		
Interleukin 18 (S)	**81**	< 150	pg/ml		
MCP-1	↑ **272**	< 100	pg/ml		
S-100 (Diasorin)	**118**	< 150	pg/ml		
MIP-1 alpha	↑ **95**	< 3	pg/ml		
BDNF total (S)	**30.7**	14 - 32	ng/ml		
Therapeutic Range: 30 -40 ng/ml					
BDNF free (P)	**7.0**	3 - 20	ng/ml		

Laboratory diagnostics carried out and validated by MVZ Labor Bavariahaus, in the case of individual parameters by the authorised partner laboratory, where applicable.

General Information:

Interleukin 1ß
IL-1ß - together with IL-6 and TNF-alpha – is the major proinflammatory cytokine, produced mainly by monocytes/macrophages but also by many other cells like vascular endothelia, epithelial cells, fat and nerve cells. Most of the time IL-1ß is released in the initial phase of inflammatory reactions together with TNF -alpha and IL-6, with TNF-alpha being the main cytokine of the reaction.
IL-1ß is produced and released together with its analogue IL1 -alpha. The two IL1 variants have a very similar activity profile but IL 1ß is generally the more active and more potent variant. The major functions of IL -1ß are activation of the cellular immune response (T cells), stimulation of TNF -alpha and IL 6 release, increased secretion of stress hormones (CRH, Cortisol) and induction of central reactions like fever, pain, metabolism (insulin secretion), cognitive performance, etc. Its inflammatory signals generate prostaglandins via induction of cyclooxygenase 2, stimulate phospholipid breakdown and increase the production of inflammatory NO. All these effects are mediated by NF -kB.

OAT – Organic Oat Test



The Great Plains Laboratory, Inc.

William Shaw, Ph.D., Director | 11813 West 77th Street, Lenexa, KS 66214 | (913) 341-8949 | Fax (913) 341-6207

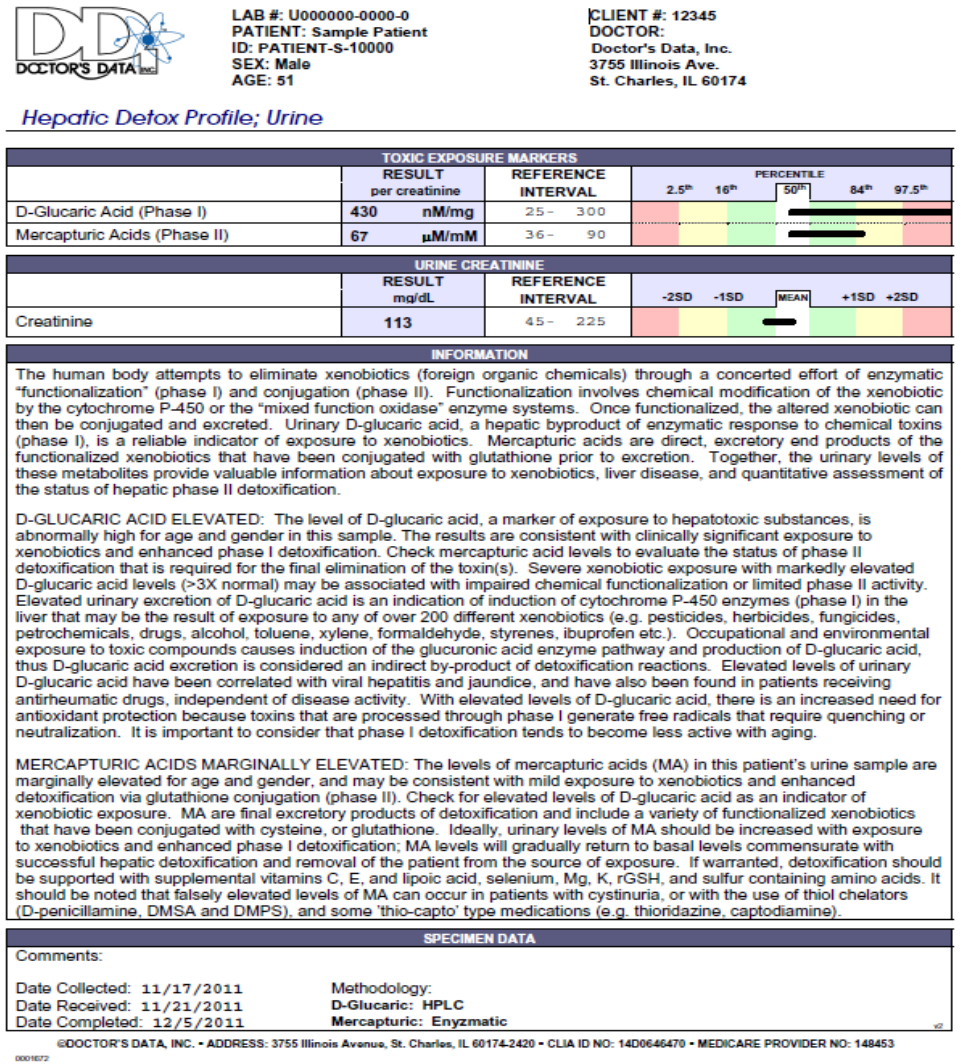
Requisition #:
Patient Name:
Patient Age: 40
Patient Sex: F
Physician:
Date of Collection:
Time of Collection: 07:30 AM
Print Date: 04/18/2019

Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient Value	Reference Population - Females Age 13 and Over
Intestinal Microbial Overgrowth				
Yeast and Fungal Markers				
1 Citramalic	≤ 3.6	H	3.7	
2 5-Hydroxymethyl-2-furoic *(Aspergillus)*	≤ 14	H	31	
3 3-Oxoglutaric	≤ 0.33	H	3.6	
4 Furan-2,5-dicarboxylic *(Aspergillus)*	≤ 16		15	
5 Furancarbonylglycine *(Aspergillus)*	≤ 1.9		1.1	
6 Tartaric *(Aspergillus)*	≤ 4.5		3.7	
7 Arabinose	≤ 29	H	167	
8 Carboxycitric	≤ 29		0.46	
9 Tricarballylic *(Fusarium)*	≤ 0.44	H	0.45	
Bacterial Markers				
10 Hippuric	≤ 613	H	615	
11 2-Hydroxyphenylacetic	0.06 - 0.66		0.27	
12 4-Hydroxybenzoic	≤ 1.3		0.29	
13 4-Hydroxyhippuric	0.79 - 17		8.8	
14 DHPPA (Beneficial Bacteria)	≤ 0.38	H	0.61	
Clostridia Bacterial Markers				
15 4-Hydroxyphenylacetic *(C. difficile, C. sticklandii, C. lituseburense & others)*	≤ 19		5.1	
16 HPHPA *(C. sporogenes, C. caloritolerans, C. botulinum & others)*	≤ 208		26	
17 4-Cresol *(C. difficile)*	≤ 75		6.0	
18 3-Indoleacetic *(C. sticklandii, C. lituseburense, C. subterminale & others)*	≤ 11		0.28	

Organic Acids Test - Nutritional and Metabolic Profile Page 1 of 11

Hepatic Detox Profile



LAB #: U000000-0000-0
PATIENT: Sample Patient
ID: PATIENT-S-10000
SEX: Male
AGE: 51

CLIENT #: 12345
DOCTOR:
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Hepatic Detox Profile; Urine

TOXIC EXPOSURE MARKERS

	RESULT per creatinine	REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
D-Glucaric Acid (Phase I)	430 nM/mg	25 - 300	
Mercapturic Acids (Phase II)	67 µM/mM	36 - 90	

URINE CREATININE

	RESULT mg/dL	REFERENCE INTERVAL	-2SD -1SD MEAN +1SD +2SD
Creatinine	113	45 - 225	

INFORMATION

The human body attempts to eliminate xenobiotics (foreign organic chemicals) through a concerted effort of enzymatic "functionalization" (phase I) and conjugation (phase II). Functionalization involves chemical modification of the xenobiotic by the cytochrome P-450 or the "mixed function oxidase" enzyme systems. Once functionalized, the altered xenobiotic can then be conjugated and excreted. Urinary D-glucaric acid, a hepatic byproduct of enzymatic response to chemical toxins (phase I), is a reliable indicator of exposure to xenobiotics. Mercapturic acids are direct, excretory end products of the functionalized xenobiotics that have been conjugated with glutathione prior to excretion. Together, the urinary levels of these metabolites provide valuable information about exposure to xenobiotics, liver disease, and quantitative assessment of the status of hepatic phase II detoxification.

D-GLUCARIC ACID ELEVATED: The level of D-glucaric acid, a marker of exposure to hepatotoxic substances, is abnormally high for age and gender in this sample. The results are consistent with clinically significant exposure to xenobiotics and enhanced phase I detoxification. Check mercapturic acid levels to evaluate the status of phase II detoxification that is required for the final elimination of the toxin(s). Severe xenobiotic exposure with markedly elevated D-glucaric acid levels (>3X normal) may be associated with impaired chemical functionalization or limited phase II activity. Elevated urinary excretion of D-glucaric acid is an indication of induction of cytochrome P-450 enzymes (phase I) in the liver that may be the result of exposure to any of over 200 different xenobiotics (e.g. pesticides, herbicides, fungicides, petrochemicals, drugs, alcohol, toluene, xylene, formaldehyde, styrenes, ibuprofen etc.). Occupational and environmental exposure to toxic compounds causes induction of the glucuronic acid enzyme pathway and production of D-glucaric acid, thus D-glucaric acid excretion is considered an indirect by-product of detoxification reactions. Elevated levels of urinary D-glucaric acid have been correlated with viral hepatitis and jaundice, and have also been found in patients receiving antirheumatic drugs, independent of disease activity. With elevated levels of D-glucaric acid, there is an increased need for antioxidant protection because toxins that are processed through phase I generate free radicals that require quenching or neutralization. It is important to consider that phase I detoxification tends to become less active with aging.

MERCAPTURIC ACIDS MARGINALLY ELEVATED: The levels of mercapturic acids (MA) in this patient's urine sample are marginally elevated for age and gender, and may be consistent with mild exposure to xenobiotics and enhanced detoxification via glutathione conjugation (phase II). Check for elevated levels of D-glucaric acid as an indicator of xenobiotic exposure. MA are final excretory products of detoxification and include a variety of functionalized xenobiotics that have been conjugated with cysteine, or glutathione. Ideally, urinary levels of MA should be increased with exposure to xenobiotics and enhanced phase I detoxification; MA levels will gradually return to basal levels commensurate with successful hepatic detoxification and removal of the patient from the source of exposure. If warranted, detoxification should be supported with supplemental vitamins C, E, and lipoic acid, selenium, Mg, K, rGSH, and sulfur containing amino acids. It should be noted that falsely elevated levels of MA can occur in patients with cystinuria, or with the use of thiol chelators (D-penicillamine, DMSA and DMPS), and some 'thio-capto' type medications (e.g. thioridazine, captodiamine).

SPECIMEN DATA

Comments:

Date Collected: 11/17/2011
Date Received: 11/21/2011
Date Completed: 12/5/2011

Methodology:
D-Glucaric: HPLC
Mercapturic: Enyzmatic

Blood Brain Barrier

CYREX Laboratories

2602 S. 24th Street . Phoenix, AZ 85034
Tel 602 759 1245 . Fax 602 759 8331 . www.CyrexLabs.com

ACCESSION #: 17-108497
REQUISITION #: T05170963
SAMPLE TYPE: Serum
DOCTOR / PATIENT ID:
PAGES: 1 of 1

DATE COLLECTED: 5/11/2017
DATE RECEIVED: 5/11/2017
DATE OF REPORT: 7/11/2017

PRACTITIONER

DEMODR, DEMODR TEST
2602 S. 24th Street
Phoenix, Arizona 85034

PATIENT

Name: REPORT, SAMPLE
DOB: 11/01/1990
Gender: M

TEST	RESULT			
Array 20 - Blood Brain Barrier Permeability Screen	**IN RANGE (Normal)**	**EQUIVOCAL***	**OUT OF RANGE**	**REFERENCE** (ELISA Index)
Blood Brain Barrier Protein IgG+IgA			2.53	0.3-2.2
Blood Brain Barrier Protein IgM		1.75		0.3-2.2

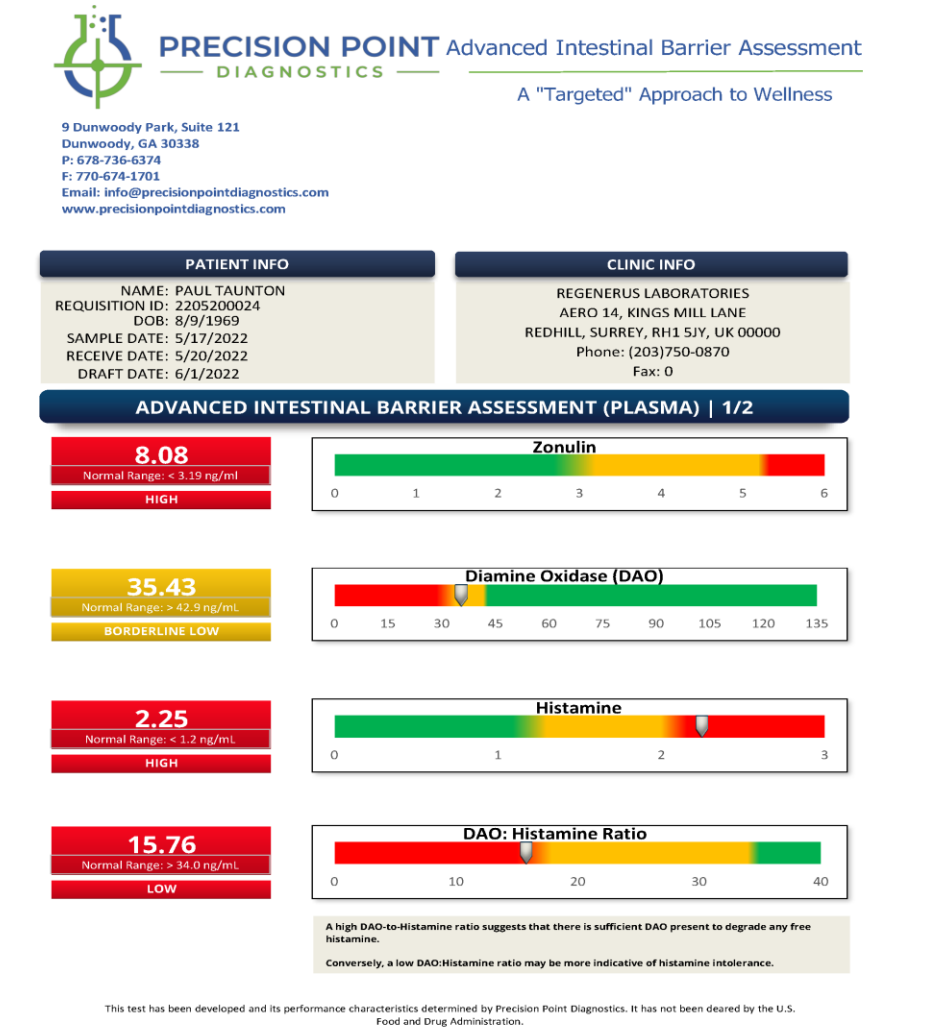
* Reference ranges are calculated based on the mean ±2 standard deviations (SD). Results > 1 SD, and <2 SDs above the mean are considered to be equivocal. An equivocal result represents the range between negative and suspicious low positive results. Results >2 SDs are considered out of range, and positive.

Mark G. Kartub, M.D., Medical Director

Cyrex Laboratories is certified under the Clinical Laboratory Improvement Amendments of 1988 ("CLIA") as qualified to perform high-complexity clinical testing. Test result data on its own does not constitute a diagnosis. Only a physician or qualified healthcare professional should interpret the significance of a clinical lab test or make a diagnosis. This test was developed and its performance characteristics determined by Cyrex Laboratories, LLC. The names and titles of tests and arrays are for reference purposes only.

Sample Report

Advanced Intestinal Barrier Assessment



PRECISION POINT DIAGNOSTICS Advanced Intestinal Barrier Assessment

A "Targeted" Approach to Wellness

9 Dunwoody Park, Suite 121
Dunwoody, GA 30338
P: 678-736-6374
F: 770-674-1701
Email: info@precisionpointdiagnostics.com
www.precisionpointdiagnostics.com

PATIENT INFO

NAME: PAUL TAUNTON
REQUISITION ID: 2205200024
DOB: 8/9/1969
SAMPLE DATE: 5/17/2022
RECEIVE DATE: 5/20/2022
DRAFT DATE: 6/1/2022

CLINIC INFO

REGENERUS LABORATORIES
AERO 14, KINGS MILL LANE
REDHILL, SURREY, RH1 5JY, UK 00000
Phone: (203)750-0870
Fax: 0

ADVANCED INTESTINAL BARRIER ASSESSMENT (PLASMA) | 1/2

8.08	Normal Range: < 3.19 ng/ml	HIGH
35.43	Normal Range: > 42.9 ng/mL	BORDERLINE LOW
2.25	Normal Range: < 1.2 ng/mL	HIGH
15.76	Normal Range: > 34.0 ng/mL	LOW

Zonulin: 0 1 2 3 4 5 6

Diamine Oxidase (DAO): 0 15 30 45 60 75 90 105 120 135

Histamine: 0 1 2 3

DAO: Histamine Ratio: 0 10 20 30 40

A high DAO-to-Histamine ratio suggests that there is sufficient DAO present to degrade any free histamine.

Conversely, a low DAO:Histamine ratio may be more indicative of histamine intolerance.

This test has been developed and its performance characteristics determined by Precision Point Diagnostics. It has not been deared by the U.S. Food and Drug Administration.

Lab Director: Steven Lobel, PhD
Analysis performed by:
Dunwoody Labs Inc. DBA, Precision Point Diagnostics

GA Clinical License: 044-160
CLIA ID: 11D1101209

CYREX Laboratories

2602 S. 24th Street . Phoenix, AZ 85034
Tel 602 759 1245 . Fax 602 759 8331 . www.CyrexLabs.com

ACCESSION #: 19-SAMPL
REQUISITION #: TSAMPL
SAMPLE TYPE: Serum
DOCTOR / PATIENT ID:
PAGES: 1 of 2

DATE COLLECTED: 5/15/2019
DATE RECEIVED: 5/17/2019
DATE OF REPORT: 5/24/2019

PRACTITIONER

SAMPLE, DOCTOR
2602 S. 24th Street
Phoenix, Arizona 85034

PATIENT

Name: SAMPLE, PATIENT
DOB: 01/01/1971
Gender: F

TEST	RESULT			
Alzheimer's LINX™ - Alzheimer's-Associated Immune Reactivity **	IN RANGE (Normal)	EQUIVOCAL*	OUT OF RANGE	REFERENCE (ELISA Index)
Brain Proteins				
Tau Protein	0.41			0.0-1.2
Amyloid-Beta Peptide		1.21		0.1-1.4
Rabaptin-5 + Presenilin			1.48	0.0-1.4
Alpha-Synuclein		1.10		0.3-1.3
Growth Factors				
Beta Nerve Growth Factor	1.11			0.3-1.5
Brain Derived Neurotrophic Factor	0.68			0.1-1.2
Neurotrophins	0.32			0.3-1.6
Somatotropin	0.85			0.3-1.4
Enteric Nerve, Enzymes and Neurological Peptides				
Enteric Nerve + Vasoactive Intestinal Peptide	0.36			0.0-1.0
Transglutaminases		1.38		0.4-1.5
Pathogens				
Oral Pathogens	1.11			0.2-1.6
Enterococcus faecalis	0.96			0.5-1.6
Escherichia coli CDT + Salmonella CDT	0.80			0.2-1.3
Campylobacter jejuni CDT	0.52			0.1-1.5
Herpes Type-1	0.45			0.0-1.5
Chemicals				
Aluminums	0.36			0.0-1.3
Dinitrophenyl	0.80			0.3-1.4
Ethyl + Methyl Mercury	0.49			0.2-1.1
Phthalates			2.99	0.2-1.2
Foods Cross-Reactive to Amyloid Beta				
Egg Yolk, Raw + Cooked			1.41	0.0-1.4

Download your Patient Educational Guide at https://www.cyrexlabs.com/docs/linx-peg.pdf

** For details on the method of cooking, please see specification sheets. All analytes are tested for IgG .

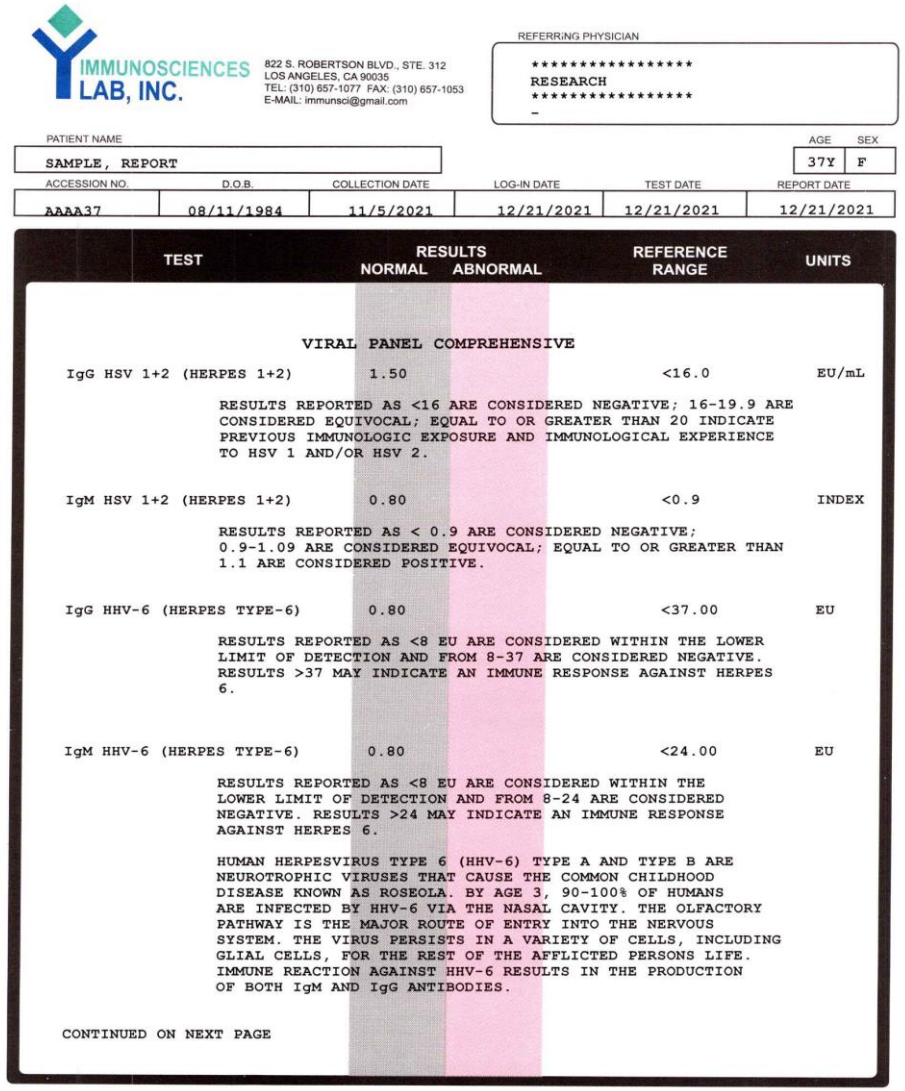
Long Covid Test

- Immunoscience Labs: IgG – SARS CoV-2

- Bruce Patterson - IncellKINE, IncellDx, Inc - £1,000 + test) using the following analytes: TNF-α, IL-4, IL-13, IL-2, GM-CSF, sCD40L, CCL5 (RANTES), CCL3 (MIP-1α), IL-6, IL-10, IFN-γ, VEGF, IL-8, and CCL4 (MIP-1β)

  https://www.frontiersin.org/articles/10.3389/fimmu.2021.700782/full

Viral Immunity



IMMUNOSCIENCES LAB, INC.
822 S. ROBERTSON BLVD., STE. 312
LOS ANGELES, CA 90035
TEL: (310) 657-1077 FAX: (310) 657-1053
E-MAIL: immunsci@gmail.com

REFERRING PHYSICIAN
****
RESEARCH
****
-

PATIENT NAME	AGE	SEX
SAMPLE, REPORT	37Y	F

ACCESSION NO.	D.O.B.	COLLECTION DATE	LOG-IN DATE	TEST DATE	REPORT DATE
AAAA37	08/11/1984	11/5/2021	12/21/2021	12/21/2021	12/21/2021

TEST	RESULTS NORMAL	RESULTS ABNORMAL	REFERENCE RANGE	UNITS
VIRAL PANEL COMPREHENSIVE				
IgG HSV 1+2 (HERPES 1+2)	1.50		<16.0	EU/mL
RESULTS REPORTED AS <16 ARE CONSIDERED NEGATIVE; 16-19.9 ARE CONSIDERED EQUIVOCAL; EQUAL TO OR GREATER THAN 20 INDICATE PREVIOUS IMMUNOLOGIC EXPOSURE AND IMMUNOLOGICAL EXPERIENCE TO HSV 1 AND/OR HSV 2.				
IgM HSV 1+2 (HERPES 1+2)	0.80		<0.9	INDEX
RESULTS REPORTED AS < 0.9 ARE CONSIDERED NEGATIVE; 0.9-1.09 ARE CONSIDERED EQUIVOCAL; EQUAL TO OR GREATER THAN 1.1 ARE CONSIDERED POSITIVE.				
IgG HHV-6 (HERPES TYPE-6)	0.80		<37.00	EU
RESULTS REPORTED AS <8 EU ARE CONSIDERED WITHIN THE LOWER LIMIT OF DETECTION AND FROM 8-37 ARE CONSIDERED NEGATIVE. RESULTS >37 MAY INDICATE AN IMMUNE RESPONSE AGAINST HERPES 6.				
IgM HHV-6 (HERPES TYPE-6)	0.80		<24.00	EU
RESULTS REPORTED AS <8 EU ARE CONSIDERED WITHIN THE LOWER LIMIT OF DETECTION AND FROM 8-24 ARE CONSIDERED NEGATIVE. RESULTS >24 MAY INDICATE AN IMMUNE RESPONSE AGAINST HERPES 6.				
HUMAN HERPESVIRUS TYPE 6 (HHV-6) TYPE A AND TYPE B ARE NEUROTROPHIC VIRUSES THAT CAUSE THE COMMON CHILDHOOD DISEASE KNOWN AS ROSEOLA. BY AGE 3, 90-100% OF HUMANS ARE INFECTED BY HHV-6 VIA THE NASAL CAVITY. THE OLFACTORY PATHWAY IS THE MAJOR ROUTE OF ENTRY INTO THE NERVOUS SYSTEM. THE VIRUS PERSISTS IN A VARIETY OF CELLS, INCLUDING GLIAL CELLS, FOR THE REST OF THE AFFLICTED PERSONS LIFE. IMMUNE REACTION AGAINST HHV-6 RESULTS IN THE PRODUCTION OF BOTH IgM AND IgG ANTIBODIES.				

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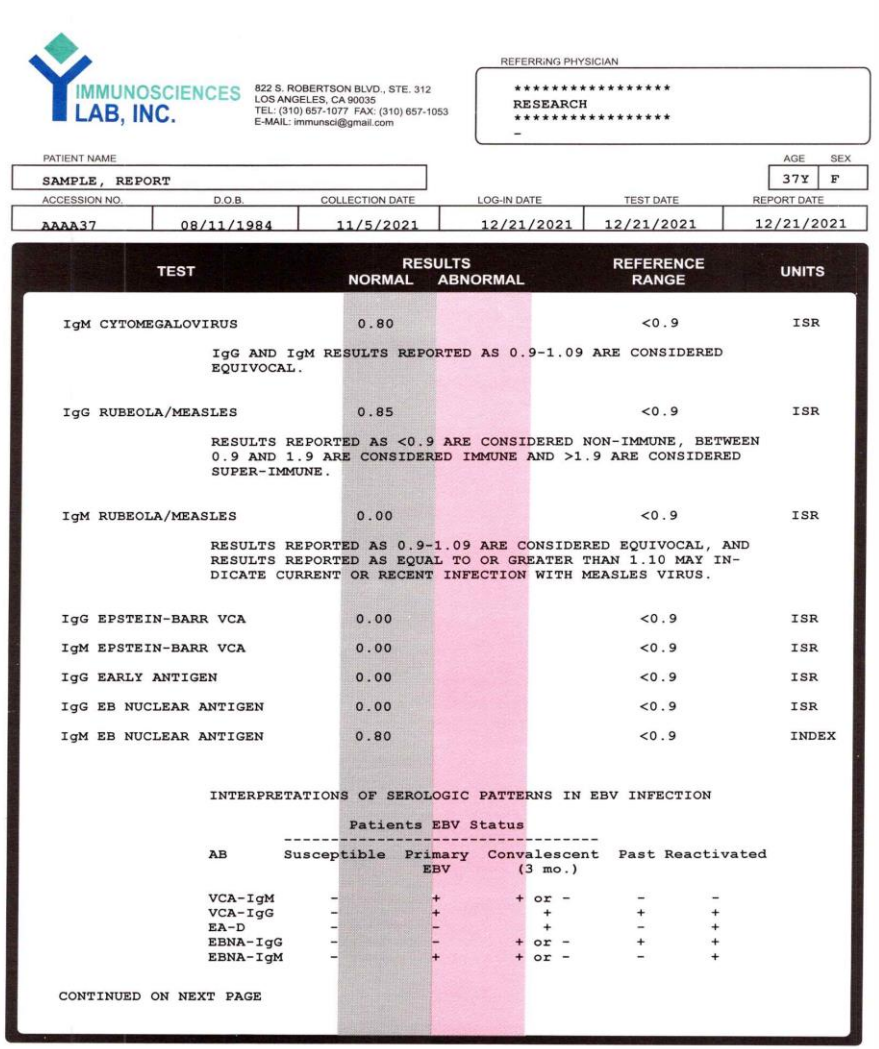
Viral Immunity



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TEL: (310) 657-1077 FAX: (310) 657-1053
E-MAIL: immunsci@gmail.com

REFERRING PHYSICIAN
****
RESEARCH
****

PATIENT NAME: SAMPLE, REPORT
AGE: 37Y
SEX: F

ACCESSION NO.	D.O.B.	COLLECTION DATE	LOG-IN DATE	TEST DATE	REPORT DATE
AAAA37	08/11/1984	11/5/2021	12/21/2021	12/21/2021	12/21/2021

TEST	RESULTS NORMAL	RESULTS ABNORMAL	REFERENCE RANGE	UNITS
IgM CYTOMEGALOVIRUS	0.80		<0.9	ISR
IgG AND IgM RESULTS REPORTED AS 0.9-1.09 ARE CONSIDERED EQUIVOCAL.				
IgG RUBEOLA/MEASLES	0.85		<0.9	ISR
RESULTS REPORTED AS <0.9 ARE CONSIDERED NON-IMMUNE, BETWEEN 0.9 AND 1.9 ARE CONSIDERED IMMUNE AND >1.9 ARE CONSIDERED SUPER-IMMUNE.				
IgM RUBEOLA/MEASLES	0.00		<0.9	ISR
RESULTS REPORTED AS 0.9-1.09 ARE CONSIDERED EQUIVOCAL, AND RESULTS REPORTED AS EQUAL TO OR GREATER THAN 1.10 MAY INDICATE CURRENT OR RECENT INFECTION WITH MEASLES VIRUS.				
IgG EPSTEIN-BARR VCA	0.00		<0.9	ISR
IgM EPSTEIN-BARR VCA	0.00		<0.9	ISR
IgG EARLY ANTIGEN	0.00		<0.9	ISR
IgG EB NUCLEAR ANTIGEN	0.00		<0.9	ISR
IgM EB NUCLEAR ANTIGEN	0.80		<0.9	INDEX

INTERPRETATIONS OF SEROLOGIC PATTERNS IN EBV INFECTION

	Patients EBV Status				
AB	Susceptible	Primary EBV	Convalescent (3 mo.)	Past	Reactivated
VCA-IgM	-	+	+ or -	-	-
VCA-IgG	-	+	+	+	+
EA-D	-	-	+	-	+
EBNA-IgG	-	-	+ or -	+	+
EBNA-IgM	-	+	+ or -	-	+

CONTINUED ON NEXT PAGE

Thank you for listening

Dr Rajendra Sharma
MB BCh BAO LRCP&S(Ire) MFHom
www.drsharmadiagnostics.com

Link to my book:
https://tinyurl.com/45njyut2