



UNDERSTANDING & TREATING SPIKE PROTEIN-INDUCED DISEASES

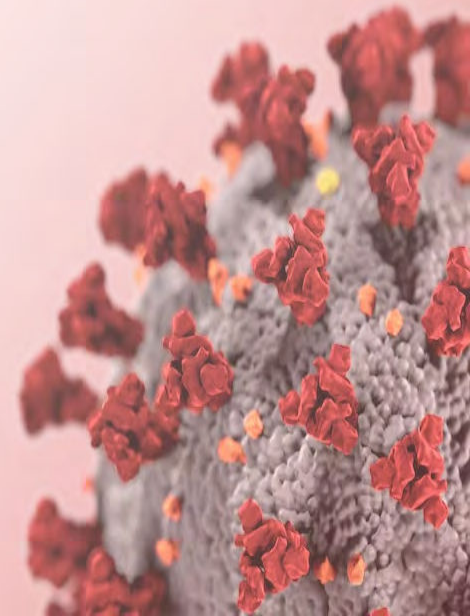
October 14-16, 2022 • Orlando, Florida

I-RECOVER

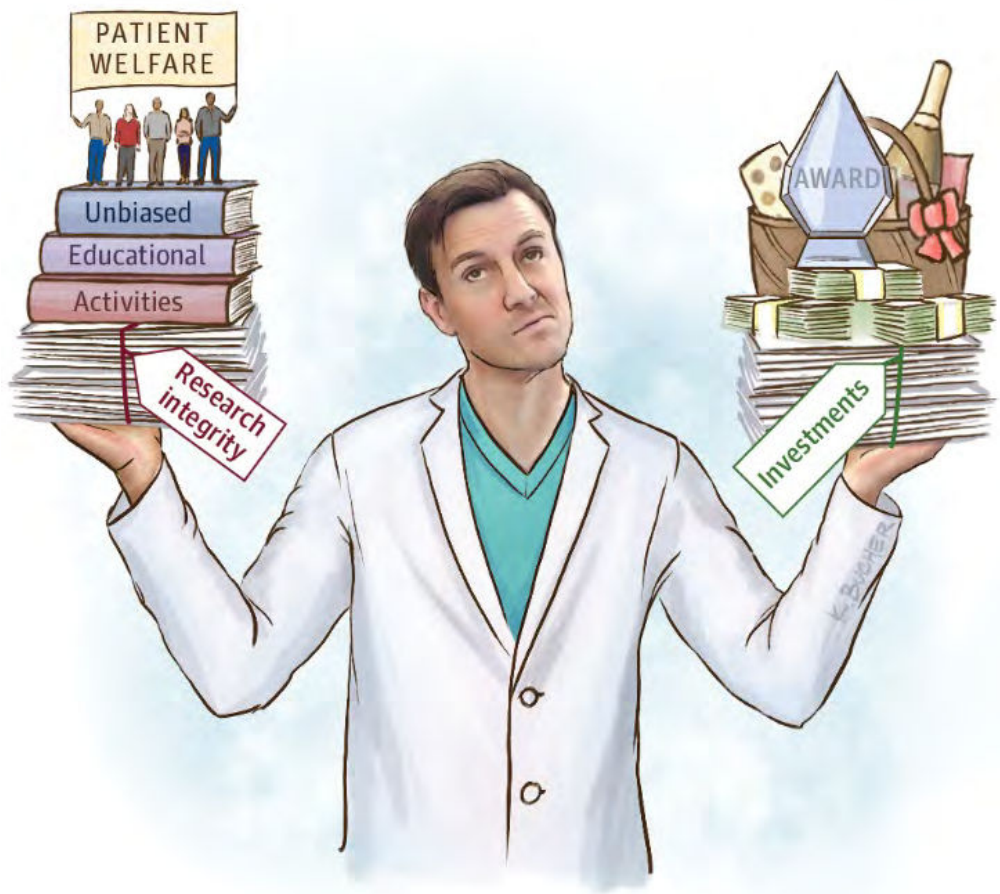
Post-Vaccine Treatment Protocol

Presented By:

Paul Marik, MD, FCCP, FCCM



Conflicts of Interest



Outline

- Definition
- Epidemiology (Steve Kirsch)
- Pathogenesis (Dr Ryan Cole)
- Risk Factors
- **Clinical features**
- **General approach to treatment**
 - Baseline testing
 - First Line therapeutics
 - Adjunctive/Second line therapies
 - Third line and other potential therapies



Definition

Although no official definition exists for '**post-COVID-vaccine syndrome**,' a temporal correlation between receiving a COVID-19 vaccine and beginning or worsening of a patient's clinical manifestations is sufficient to diagnose as a COVID-19 vaccine-induced injury, when the symptoms are unexplained by other concurrent causes.

There are significant overlaps between the symptoms and features of long COVID/long-hauler syndrome and post-vaccine syndrome. However, several clinical features appear to be characteristic of post-vaccine syndrome. To complicate matters further, patients with long COVID are often also vaccinated, making the issue of definition more difficult.



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ALC-0315

mRNA LNP formulation

ALC-0159

Cationic/ionizable lipids

e.g., DOTMA, DOTAP / MC3, C12-200

- nucleic acids complexation
- membrane fusion

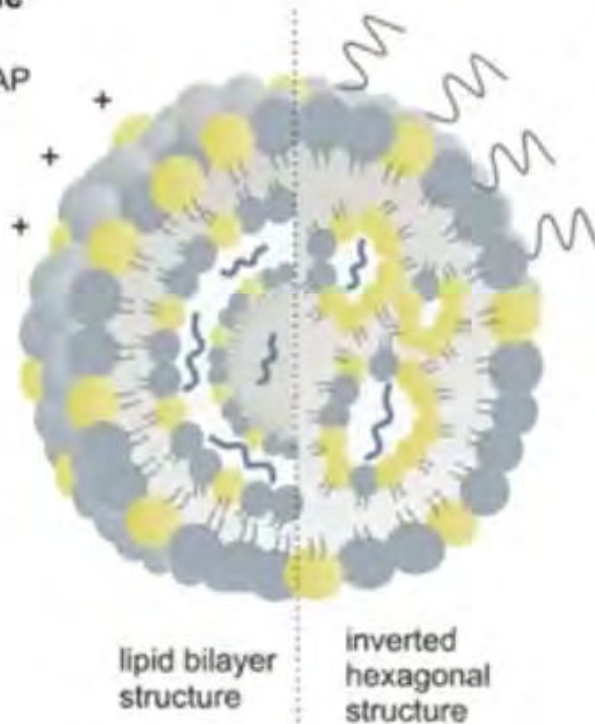
Structural helper lipids

e.g., DSPC, DPPC

- bilayer support

Cholesterol

- integrity
- endosomal release

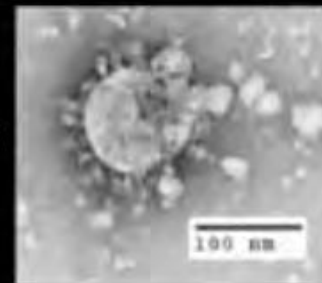


"Stealth" PEG lipids

e.g., DSPE-PEG, DMPE-PEG

- hydrophilic surface
- steric hindrance

SARS



LNPs

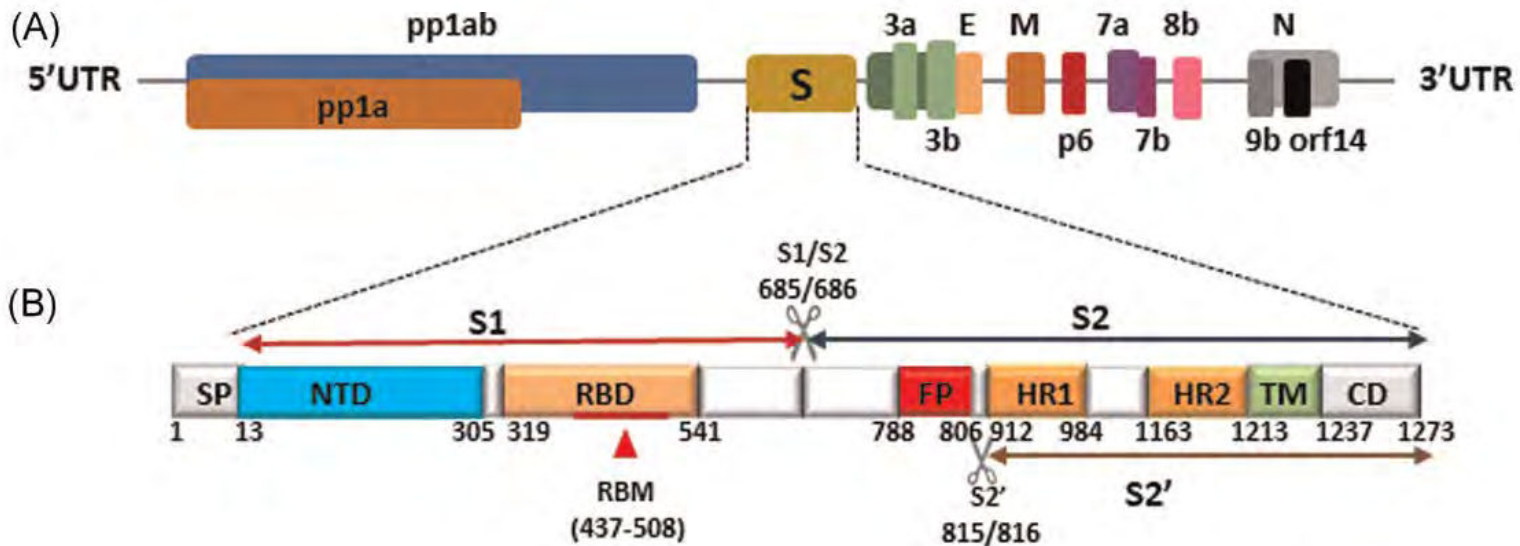
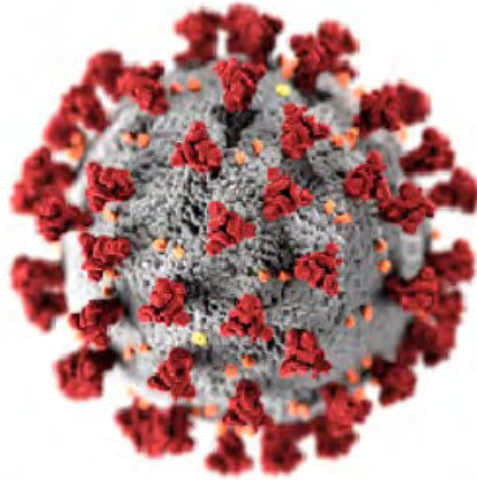


Pathogenesis of vaccine injuries – The LNP

- Acute type 1 hypersensitivity reaction due to polyethylene glycol (PEG) or other components of the nano-lipid particle.
- PEG activates multiple complement components, the activation of which may be responsible for both anaphylaxis and cardiovascular collapse.
- The lipid nanoparticles (LNP) themselves are highly proinflammatory



It's the Damn Spike Protein



Pathogenies of Vaccine Injury- Role of Spike Protein

- A SP (SP-1) induced inflammatory response due to mononuclear cell activation in almost every organ in the body but most notably involving the brain, heart and endocrine organs
- Complement mediated vasculitis
- Multiple auto-antibodies (hundreds) due to molecular mimicry with SP
- SP activates clotting by multiple mechanisms
- Cellular senescence and mitochondrial dysfunction
- Immune suppression with reactivation of latent viruses

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“Spike” Induced Disease



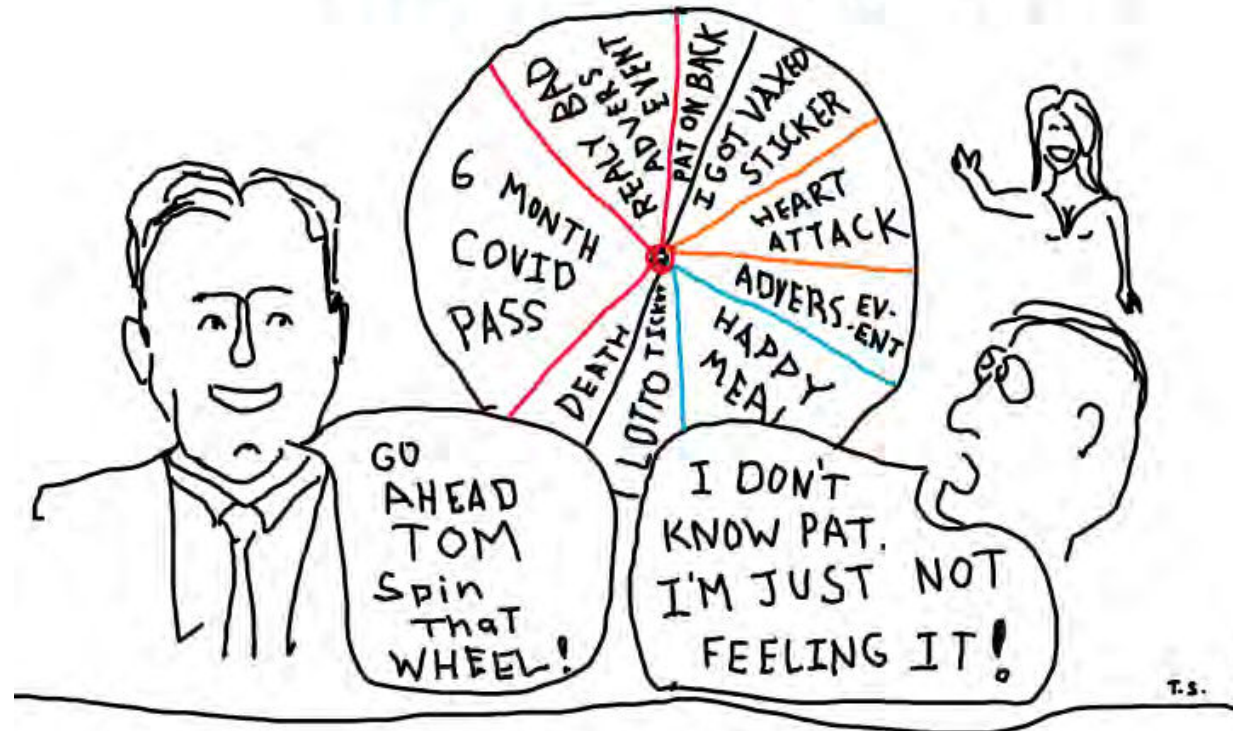
Risk Factors

- Genetic factors
 - First degree relatives
 - Those patients with a methylenetetrahydrofolate reductase (MTHFR) gene mutation and those with Ehlers-Danlos type syndromes may be at an increased risk of injury
- mRNA load and amount of spike produces
- Sex: 80% women in childbearing age
- Underlying nutritional status and comorbidities
 - Deficiency of Vitamin D, B vitamins, Folate etc
 - Preexisting autoimmune disorders and chronic inflammatory diseases

VACCINE

WHEEL-O-Fortune

WITH YOUR HOSTS
PAT SAJAB AND VANNA WHYNOT



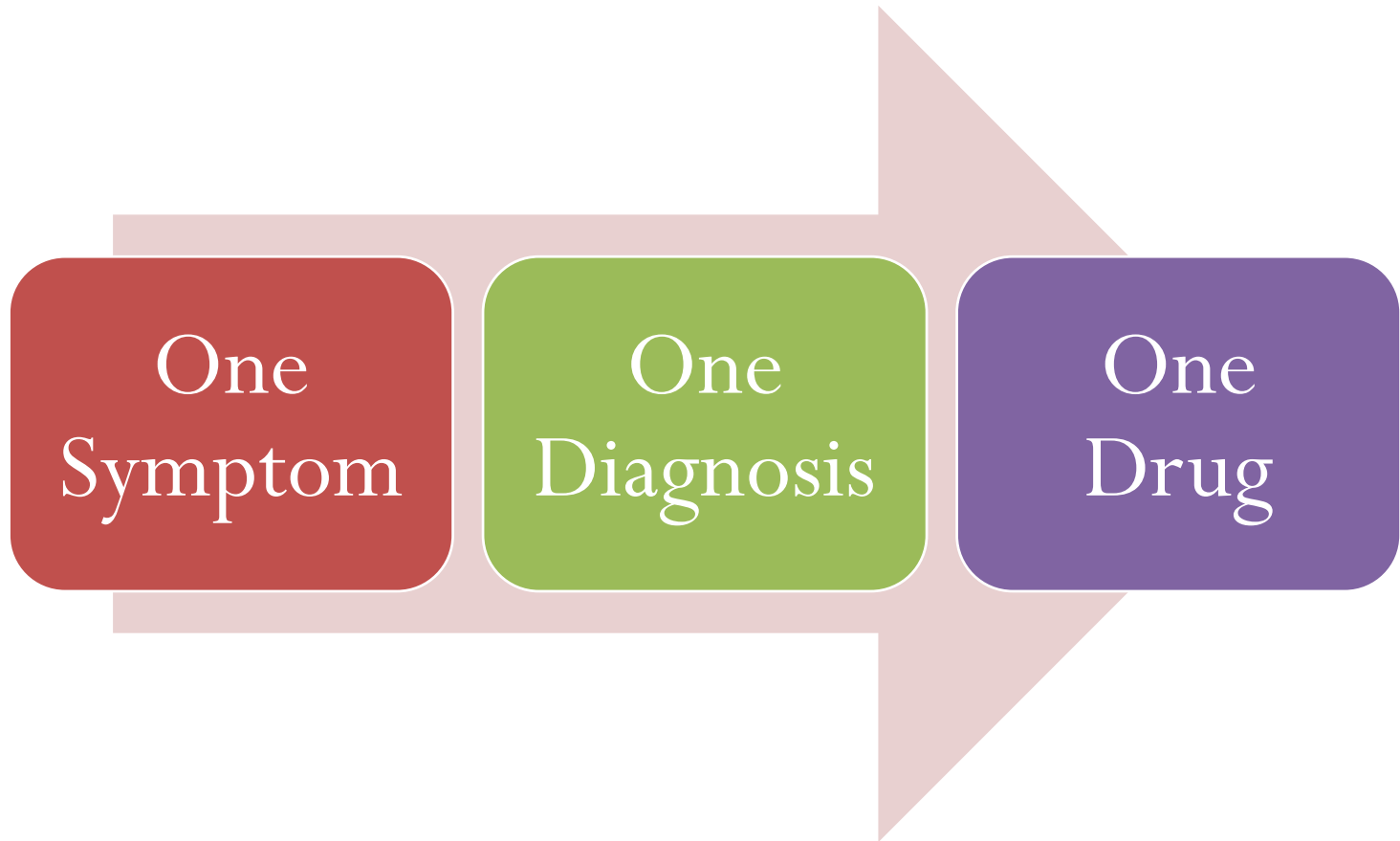
Reproduced with Permission
Hijacked on Flight Covid-19
By Todd J. Smith

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Traditional Medical Model



Complications/ injuries caused by COVID injections

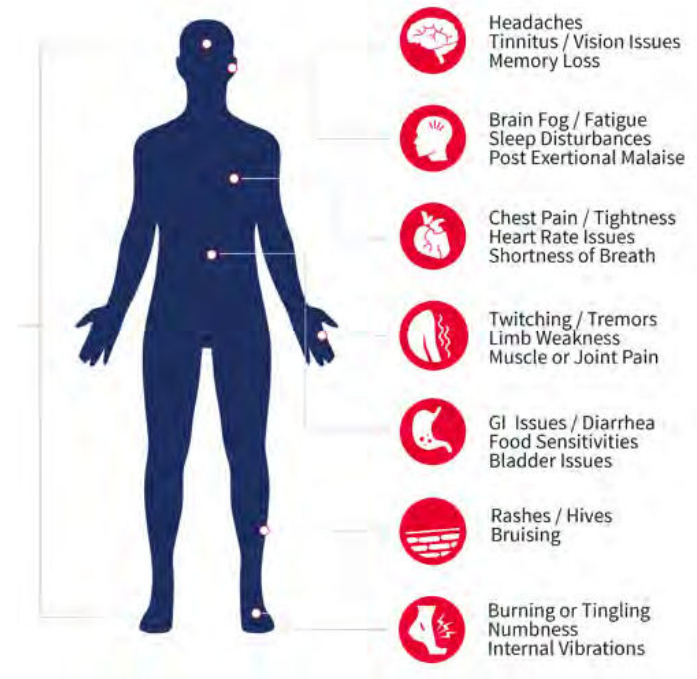
Over 2,000 peer-reviewed articles have been published on COVID vaccine injuries. Find links to these studies at [COVID Vaccine Injuries](#), [REACT19](#), and on [Substack](#). A selection of symptoms is listed below:

- Myocarditis, pericarditis, stress cardiomyopathy (contraction band necrosis)
- Takotsubo cardiomyopathy
- Acute coronary syndrome
- Hypertension
- MIS-V, Multisystem Inflammatory Syndrome
- Thrombosis, including pulmonary emboli and stroke (prothrombotic state)
- Cerebral venous thrombosis
- Thrombocytopenia
- Thrombotic thrombocytopenic purpura
- Idiopathic thrombocytopenic purpura
- Henoch Schönlein Purpura
- Immune mediated hemolysis
- Reactivation and exacerbation of chronic underlying diseases/disorders
- Immune dysregulation
- Metabolic dysregulation (diabetes)
- Menstrual irregularities
- Menorrhagia
- Amenorrhea
- Spontaneous abortion
- Vulval and vaginal ulcers
- Vasculitis, including Leukocytoclastic vasculitis, Granulomatous vasculitis, microscopic polyangiitis
- Guillain-Barre Syndrome
- Acute Myelitis
- Systemic lupus erythematosus
- Bell's Palsy
- Stills disease

Its not a Simple Disease!

Describing The Post Vaccine Injury Syndrome

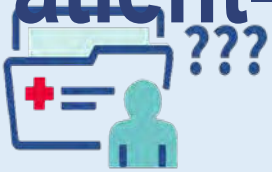
A multi-system Syndrome



REACT¹⁹

RESEARCH • EDUCATION • ACTION • THERAPEUTICS

Patient-Led Research



Symptoms
& Outcomes

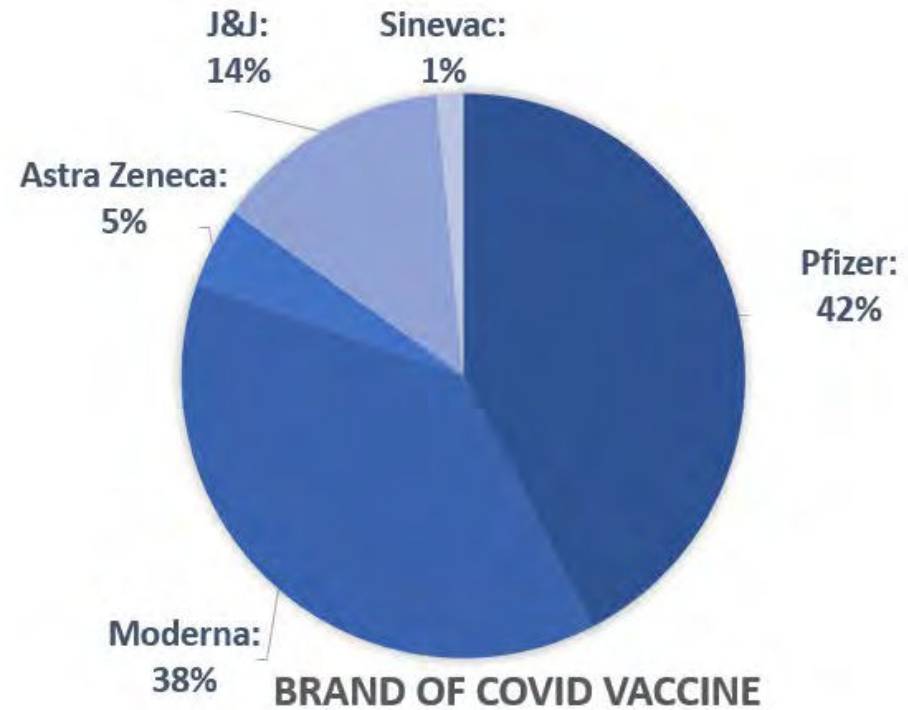
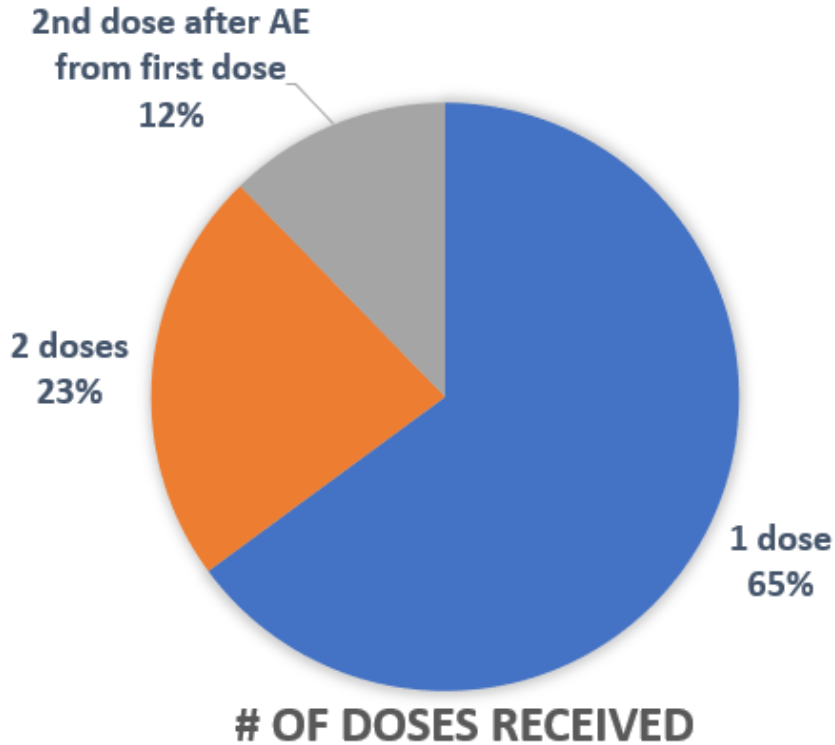
- [Survey #1](#) - Persistent symptoms (508 Participants)
- [Survey #2](#) - Symptom clusters & Outcomes (1042 Participants)



Post Vaccine Syndrome Survey Results

by ReAct19 | Aug 8, 2022 | Physician Resources, Published Science, Research Studies & Surveys |

QTY OF DOSES AND BRAND

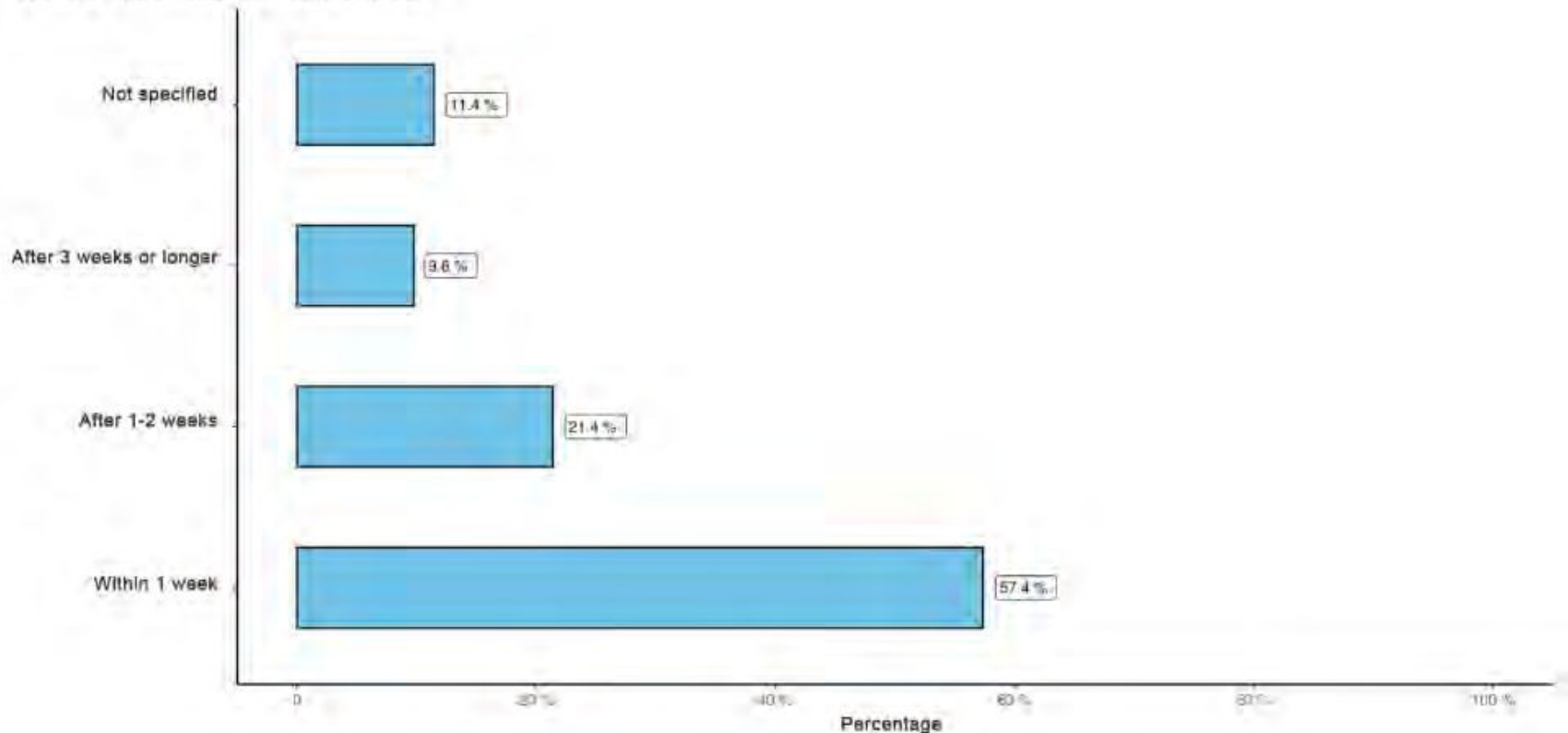


Post Vaccine Syndrome Survey Results

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n = 777

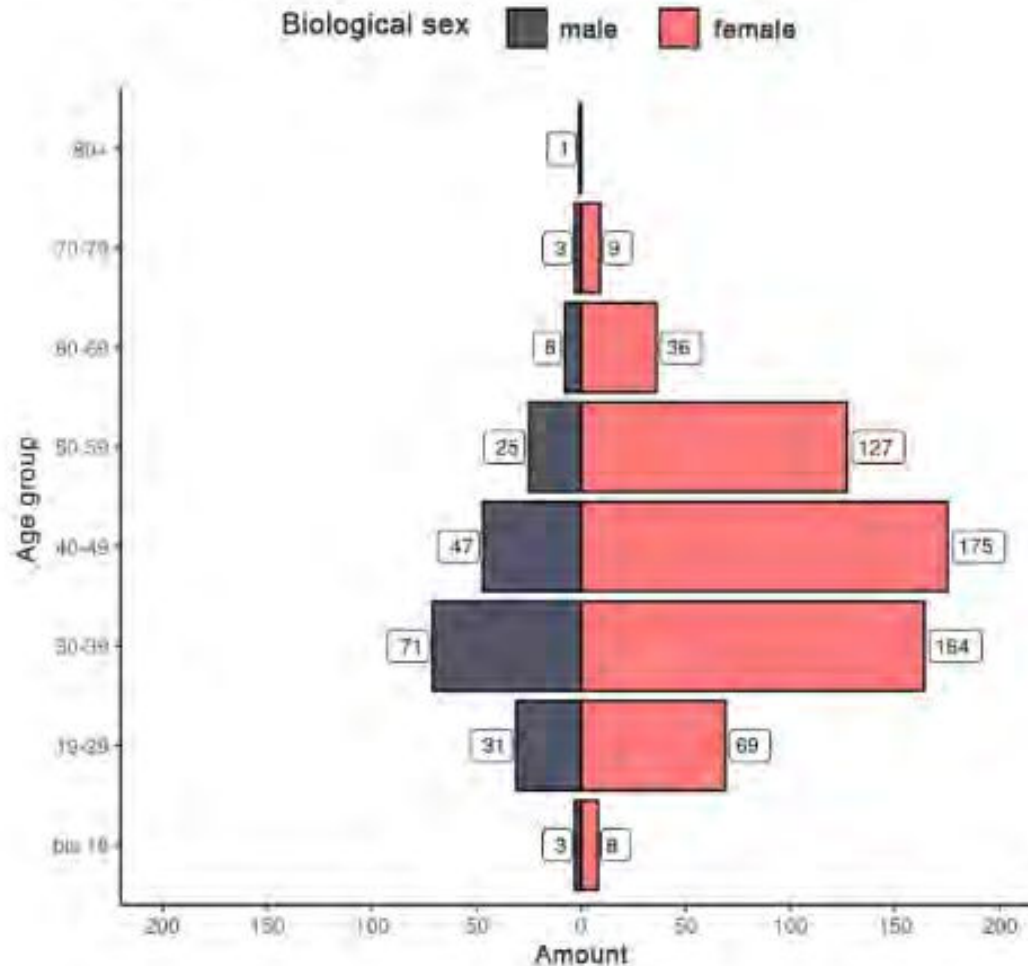
Onset of side effects after 1st vaccination



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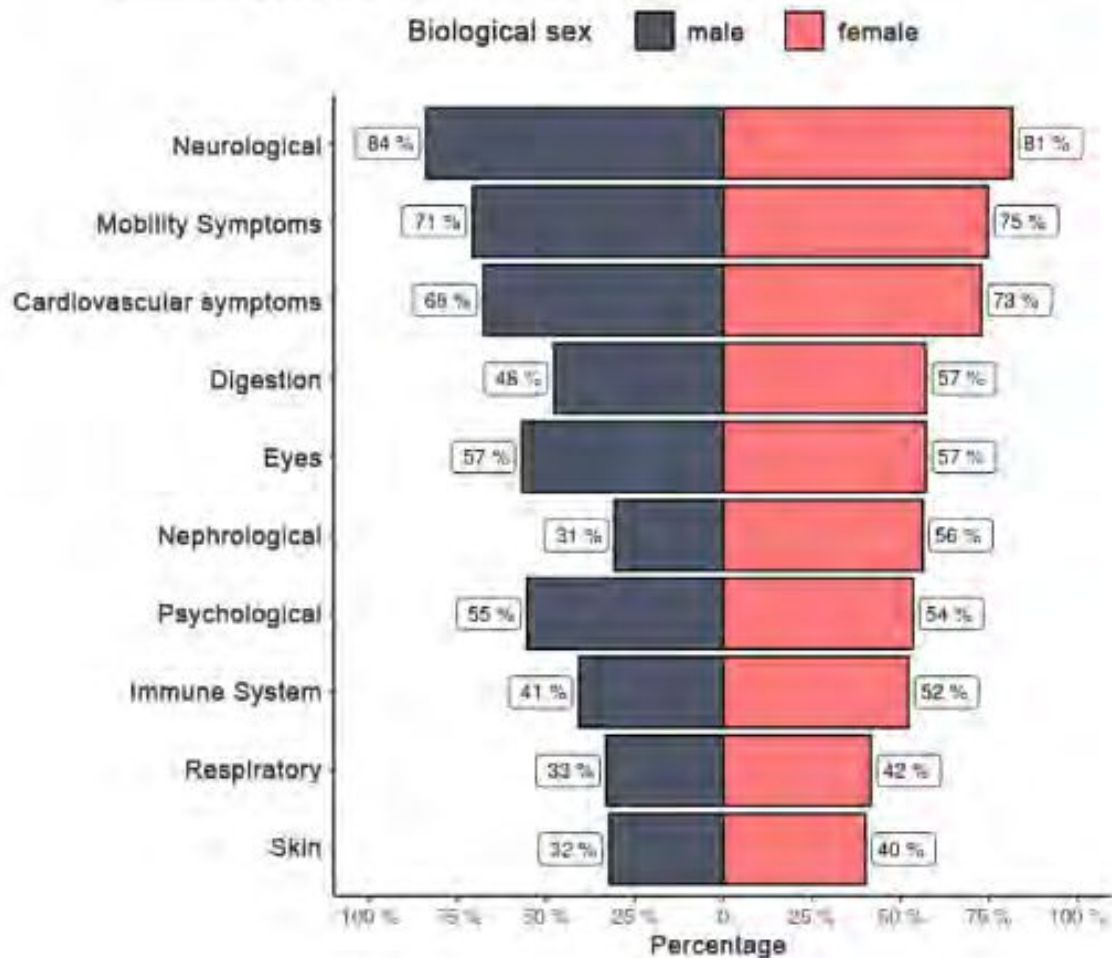
Demographic structure: in absolute numbers



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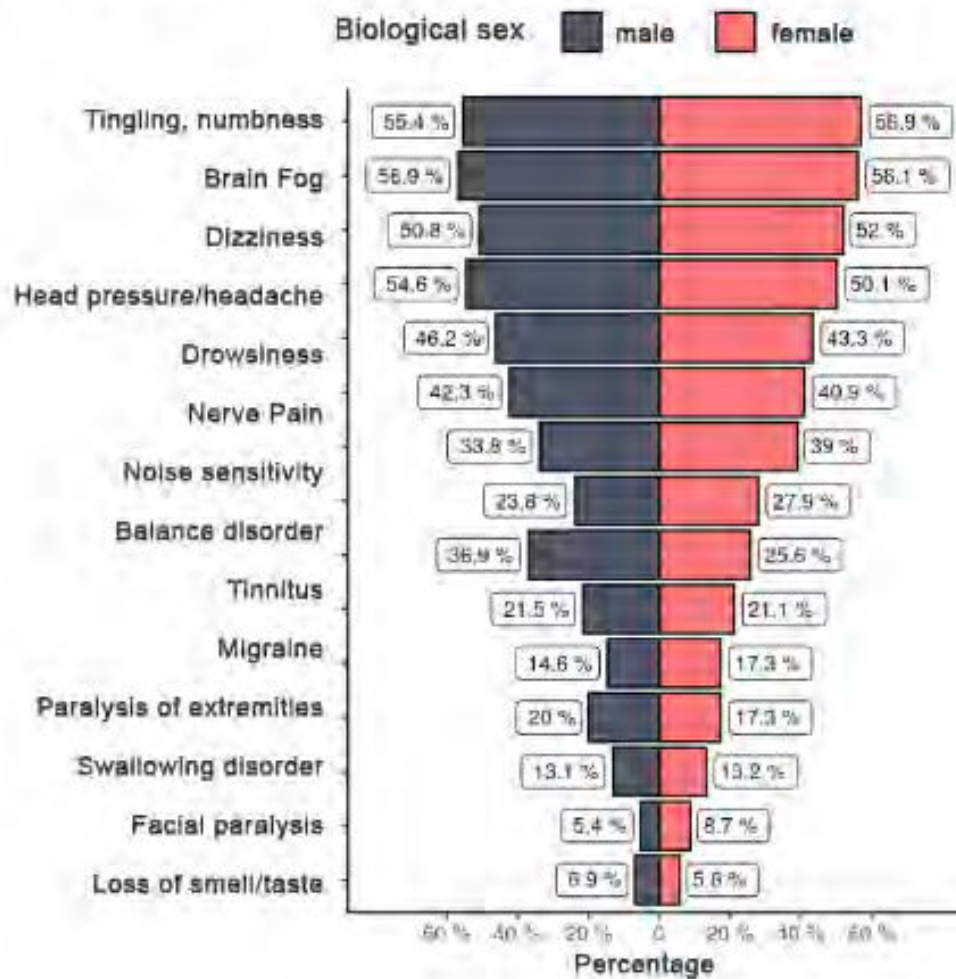
Symptom group prevalence per biological sex



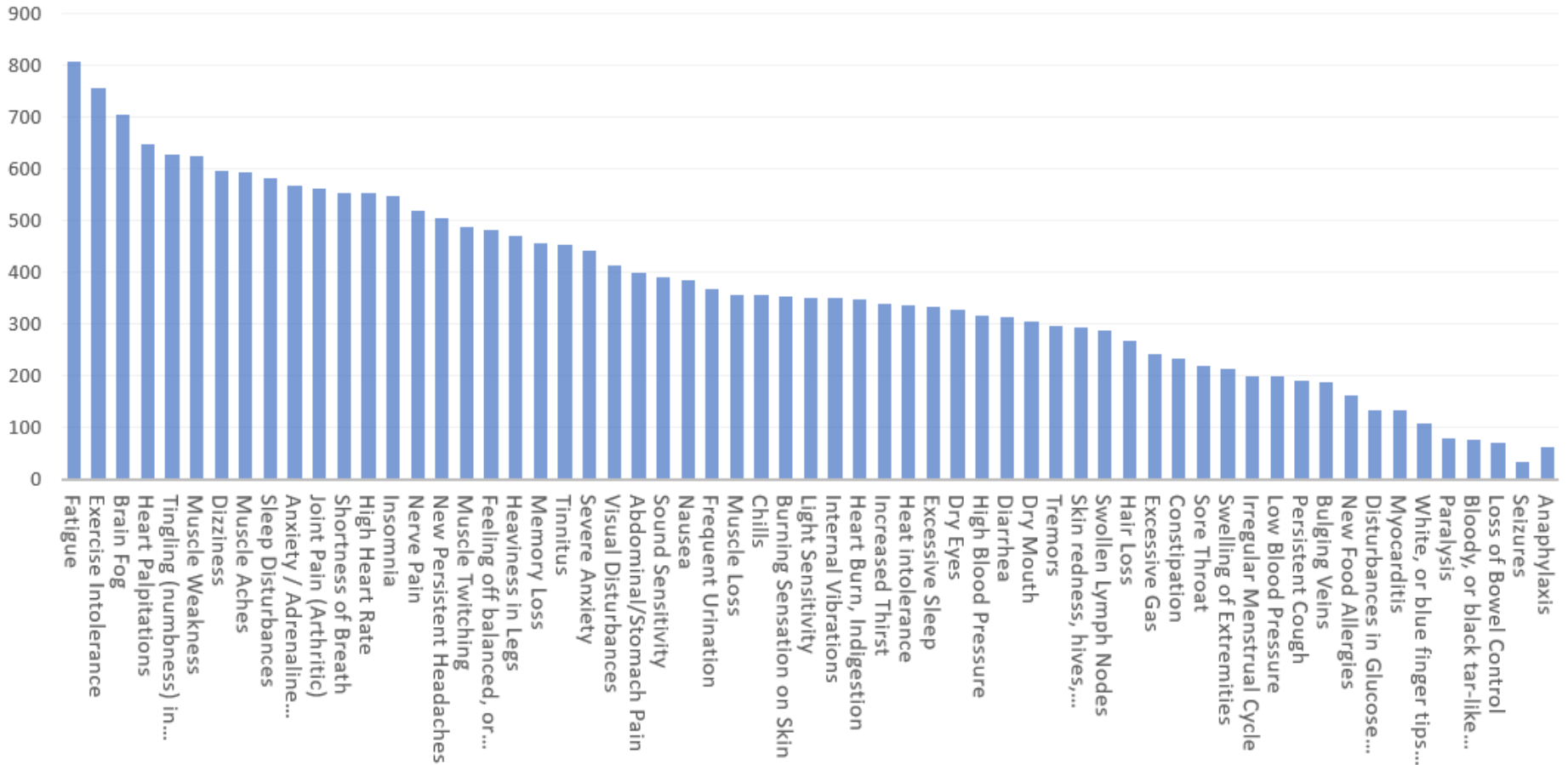
Post Vaccine Syndrome Survey Results

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Frequency (relative proportion) of neurological symptoms



Symptoms



Top 10 Symptoms

Top 10 most common	
[Fatigue]	82.0%
[Exercise Intolerance]	76.3%
[Brain Fog]	71.5%
[Heart Palpitations]	64.8%
[Muscle Weakness]	63.2%
[Tingling (numbness) in Extremities]	63.0%
[Dizziness]	60.0%
[Muscle Aches]	59.4%
[Sleep Disturbances]	58.4%
[Joint Pain (Arthritic)]	57.6%

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 [Exercise Intolerance] - 76.3%
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 [Muscle Aches] - 59.4%
 [Sleep Disturbances] - 58.4%
 [Joint Pain (Arthritic)] - 57.6%
 [Anxiety / Adrenaline Surges] - 56.9%
 [High Heart Rate] - 55.5%
 [Insomnia] - 55.5%
 [Shortness of Breath] - 55.4%
 [Nerve Pain] - 52.0%
 [New Persistent Headaches] - 50.5%
 [Feeling off balanced, or motion at rest] - 48.7%
 [Muscle Twitching] - 48.5%
 [Heaviness in Legs] - 47.6%
 [Memory Loss] - 45.6%
 [Tinnitus] - 45.2%
 [Severe Anxiety] - 44.2%
 [Visual Disturbances] - 41.6%
 [Abdominal/Stomach Pain] - 40.0%
 [Sound Sensitivity] - 39.0%
 [Nausea] - 37.9%
 [Frequent Urination] - 37.0%
 [Chills] - 36.3%
 [Muscle Loss] - 35.9%
 [Burning Sensation on Skin] - 35.6%
 [Light Sensitivity] - 35.0%
 [Heartburn, Indigestion] - 34.9%

Symptom Severity

High number of symptoms correlates to severity



Average number
of symptoms
reported:

23

Quality of Life



Bedbound
9%



Unable to Exercise
54%



Unable to Work
30%

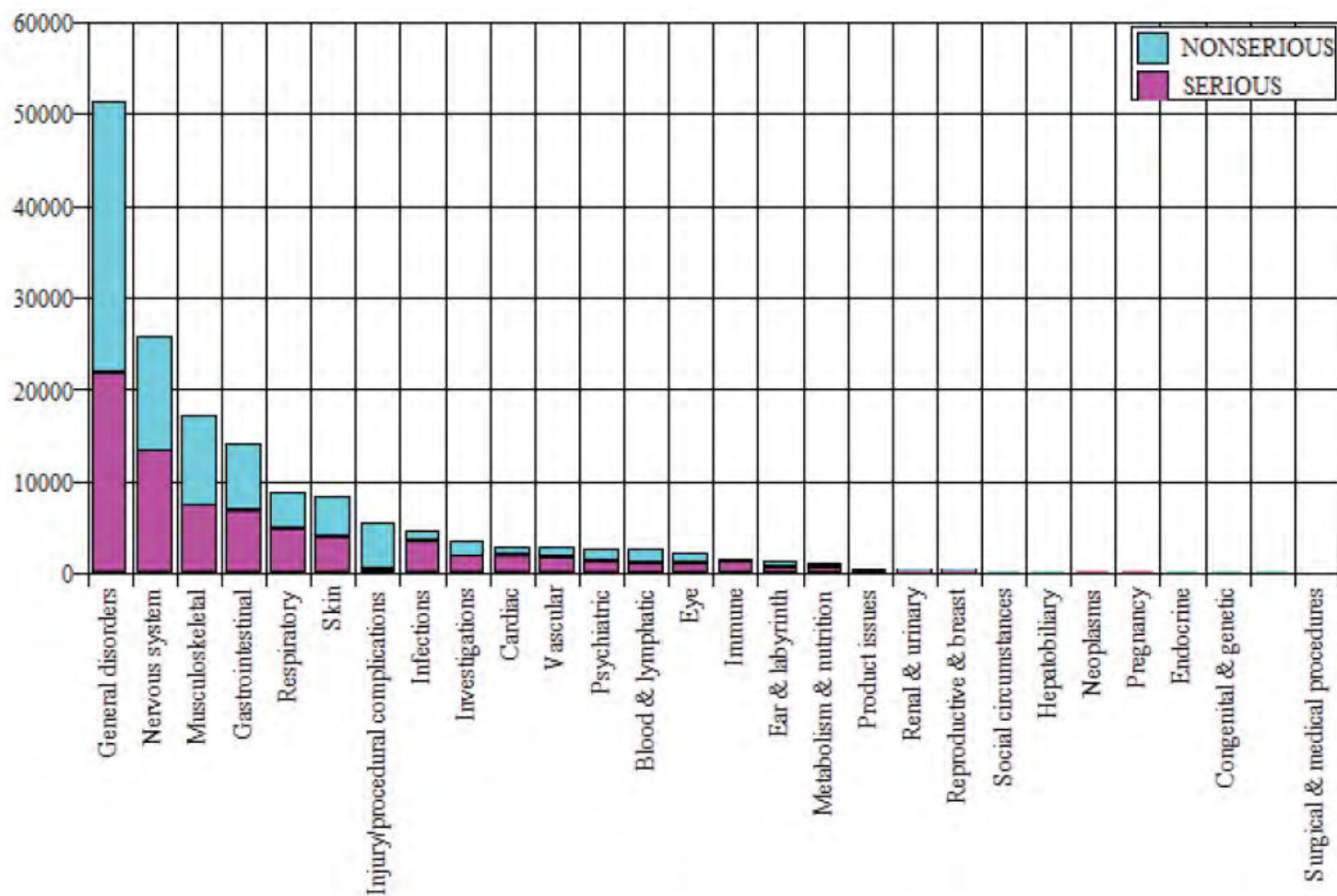
5.3.6 CUMULATIVE ANALYSIS OF POST-AUTHORIZATION ADVERSE EVENT REPORTS OF PF-07302048 (BNT162B2) RECEIVED THROUGH 28-FEB-2021

Table 1. General Overview: Selected Characteristics of All Cases Received During the Reporting Interval

	Characteristics	Relevant cases (N=42086)
Gender:	Female	29914
	Male	9182
	No Data	2990
Age range (years): 0.01 -107 years Mean = 50.9 years n = 34952	≤ 17	175 ^a
	18-30	4953
	31-50	13886
	51-64	7884
	65-74	3098
	≥ 75	5214
	Unknown	6876
Case outcome:	Recovered/Recovering	19582
	Recovered with sequelae	520
	Not recovered at the time of report	11361
	Fatal	1223
	Unknown	9400

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Figure 1. Total Number of BNT162b2 AEs by System Organ Classes and Event Seriousness



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APPENDIX 1. LIST OF ADVERSE EVENTS OF SPECIAL INTEREST

1p36 deletion syndrome; 2-Hydroxyglutaric aciduria; 5'nucleotidase increased; Acoustic neuritis; Acquired C1 inhibitor deficiency; Acquired epidermolysis bullosa; Acquired epileptic aphasia; Acute cutaneous lupus erythematosus; Acute disseminated encephalomyelitis; Acute encephalitis with refractory, repetitive partial seizures; Acute febrile neutrophilic dermatosis; Acute flaccid myelitis; Acute haemorrhagic leukoencephalitis; Acute haemorrhagic oedema of infancy; Acute kidney injury; Acute macular outer retinopathy; Acute motor axonal neuropathy; Acute motor-sensory axonal neuropathy; Acute myocardial infarction; Acute respiratory distress syndrome; Acute respiratory failure; Addison's disease; Administration site thrombosis; Administration site vasculitis; Adrenal thrombosis; Adverse event following immunisation; Ageusia; Agranulocytosis; Air embolism; Alanine aminotransferase abnormal; Alanine aminotransferase increased; Alcoholic seizure; Allergic bronchopulmonary mycosis; Allergic oedema; Alloimmune hepatitis; Alopecia areata; Alpers disease; Alveolar proteinosis; Ammonia abnormal; Ammonia increased; Amniotic cavity infection; Amygdalohippocampectomy; Amyloid arthropathy; Amyloidosis; Amyloidosis senile; Anaphylactic reaction; Anaphylactic shock; Anaphylactic transfusion reaction; Anaphylactoid reaction; Anaphylactoid shock; Anaphylactoid syndrome of pregnancy; Angioedema; Angiopathic neuropathy; Ankylosing spondylitis; Anosmia; Antiacetylcholine receptor antibody positive; Anti-actin antibody positive; Anti-aquaporin-4 antibody positive; Anti-basal ganglia antibody positive; Anti-cyclic citrullinated peptide antibody positive; Anti-epithelial antibody positive; Anti-erythrocyte antibody positive; Anti-exosome complex antibody positive; Anti-GAD antibody negative; Anti-GAD antibody positive; Anti-ganglioside antibody positive; Antigliadin antibody positive; Anti-glomerular basement membrane antibody positive; Anti-glomerular basement membrane disease; Anti-glycyl-tRNA synthetase antibody positive; Anti-HLA antibody test positive; Anti-IA2 antibody positive; Anti-insulin antibody increased; Anti-insulin antibody positive; Anti-insulin receptor antibody increased; Anti-insulin receptor antibody positive; Anti-interferon antibody negative; Anti-interferon antibody positive; Anti-islet cell antibody positive; Antimitochondrial antibody positive; Anti-muscle specific kinase antibody positive; Anti-myelin-associated glycoprotein antibodies positive; Anti-myelin-associated glycoprotein associated polyneuropathy; Antimyocardial antibody positive; Anti-neuronal antibody positive; Antineutrophil cytoplasmic antibody increased; Antineutrophil cytoplasmic antibody positive; Anti-neutrophil cytoplasmic antibody positive vasculitis; Anti-NMDA antibody positive; Antinuclear antibody increased; Antinuclear antibody positive; Antiphospholipid antibodies positive; Antiphospholipid syndrome; Anti-platelet antibody positive; Anti-prothrombin antibody positive; Antiribosomal P antibody positive; Anti-RNA polymerase III antibody positive; Anti-saccharomyces cerevisiae antibody test positive; Anti-sperm antibody positive; Anti-SRP antibody positive; Antisynthetase syndrome; Anti-thyroid antibody positive; Anti-transglutaminase antibody increased; Anti-VGCC antibody positive; Anti-VGKC antibody positive; Anti-vimentin antibody positive; Antiviral prophylaxis; Antiviral treatment; Anti-zinc transporter 8 antibody positive; Aortic embolus; Aortic thrombosis; Aortitis; Aplasia pure red cell; Aplastic anaemia; Application site thrombosis; Application site vasculitis; Arrhythmia; Arterial bypass occlusion; Arterial bypass thrombosis; Arterial thrombosis; Arteriovenous fistula thrombosis; Arteriovenous graft site stenosis; Arteriovenous graft thrombosis; Arteritis; Arteritis

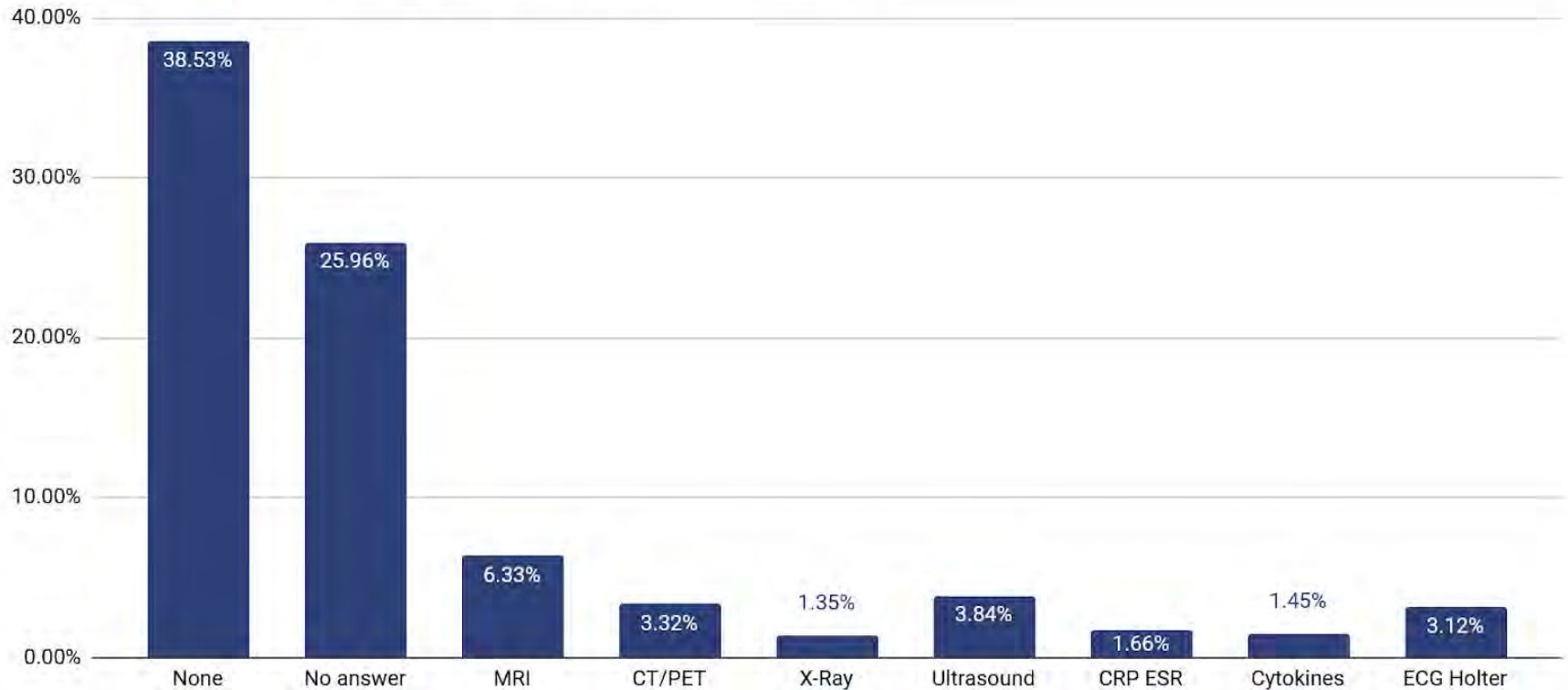
Eight more Pages

Baseline testing

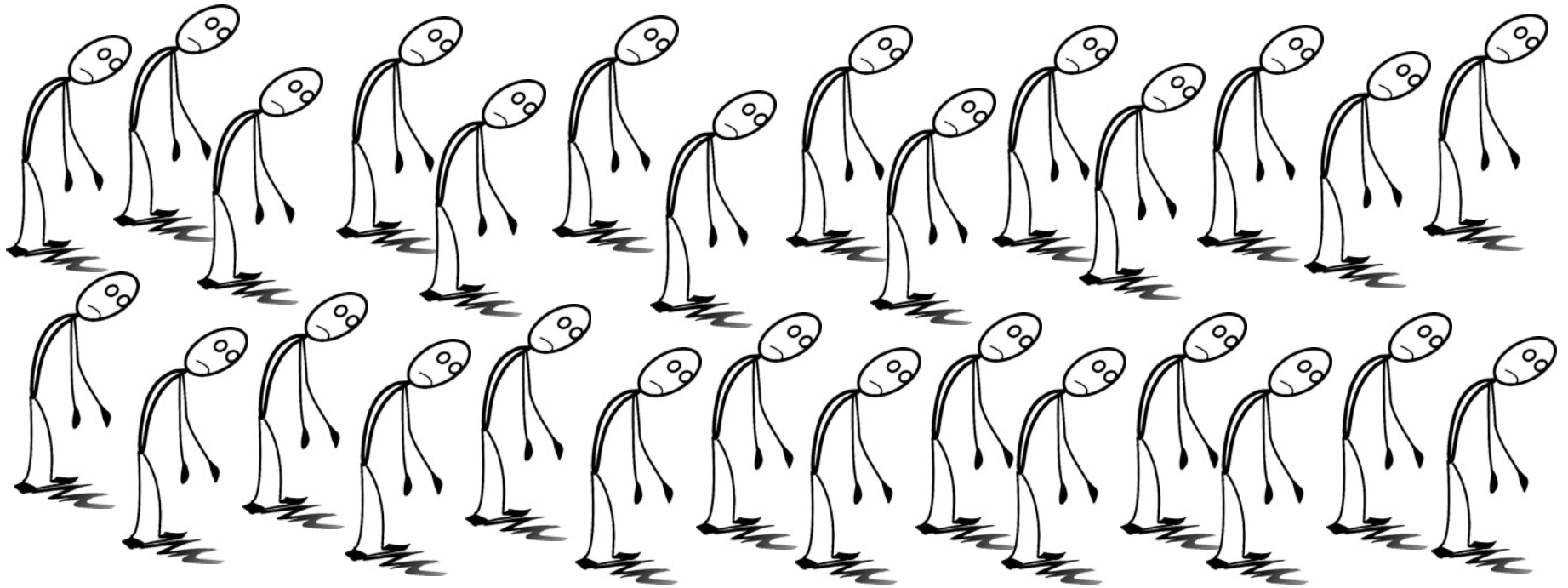
- We recommend several simple, basic screening tests that should be repeated, as clinically indicated, every 4 to 6 months.
- Remember the dictum: “***Only do a test if the result will change your treatment plan***”.
- CBC with diff. and platelet count and standard blood chemistries, including liver function tests
- D-Dimer, CRP, early morning cortisol, TSH, Homocysteine level, HbA1C, Troponin and pro-BNP
- CMV, EBV (early antigen-D IgG or nuclear antigen IgG), Herpes simplex, HHV6 and mycoplasma serology/PCR
- Vitamin D level (25OH Vitamin D)
- Limited screening autoantibodies. Lupus anticoagulant (if positive B2 microglobulin etc.) and ANA. The presence or absence of G protein directed antibodies, anti-ACE-2 antibodies and other antibodies have little impact on the management of these patients

Abnormal Lab results

Labs/tests that came back abnormal, estimated via regular expressions (n=963)



Vax Injured have Limited (No) Access to Health Care



General Approach to Treatment

- As the “vaccine injured syndrome” is not accepted by the medical community there are no published studies on the treatment of this pervasive disease
- Our treatment approach is based on the postulated pathogenetic mechanisms, pharmacologic principles, clinical observation, and patient anecdotes.
- The core problem in post-vaccine syndrome is chronic “immune dysregulation.” The primary treatment goal is to help the body to restore and normalize the immune system—in other words to let the body heal itself.
- Treatment must be individualized according to each patient’s presenting symptoms and disease syndromes
- Patients should serve as their own controls and the response to treatment should dictate the modification of the treatment plan.
- Early treatment is essential; it is likely that the response to treatment will be attenuated when treatment is delayed.
- Patients should avoid unscientific and poorly validated “Spike Protein Detox” programs

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General Approach to Treatment

Eliminate
Spike

- Promote
Autophagy

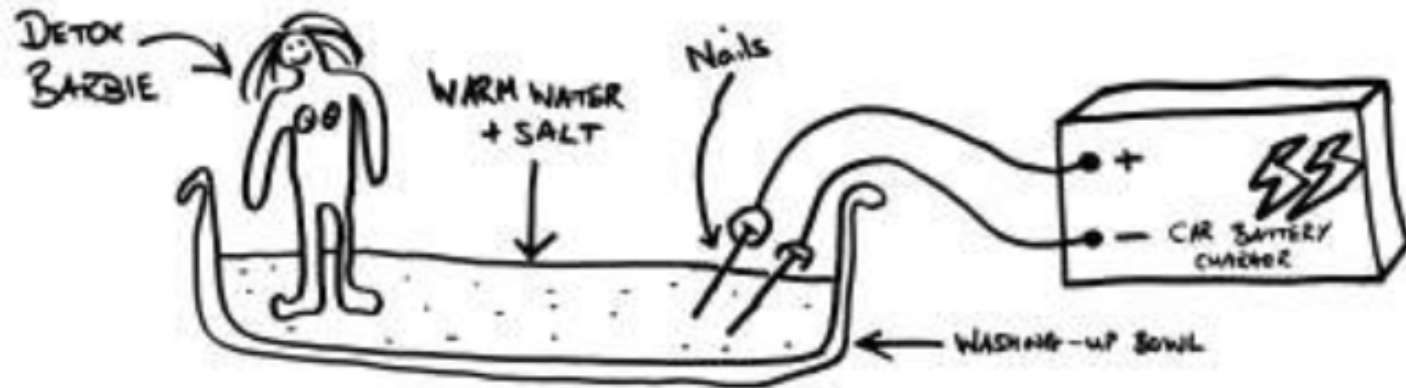
General Approach to Treatment

Eliminate
Spike

- Promote Autophagy

Limit Spike
induced
pathology

- Inflammation
- Clotting & microvascular injury
- Mitochondrial dysfunction



In terms of human biochemistry
"detox" is a meaningless concept
- Dr Ben Goldacre



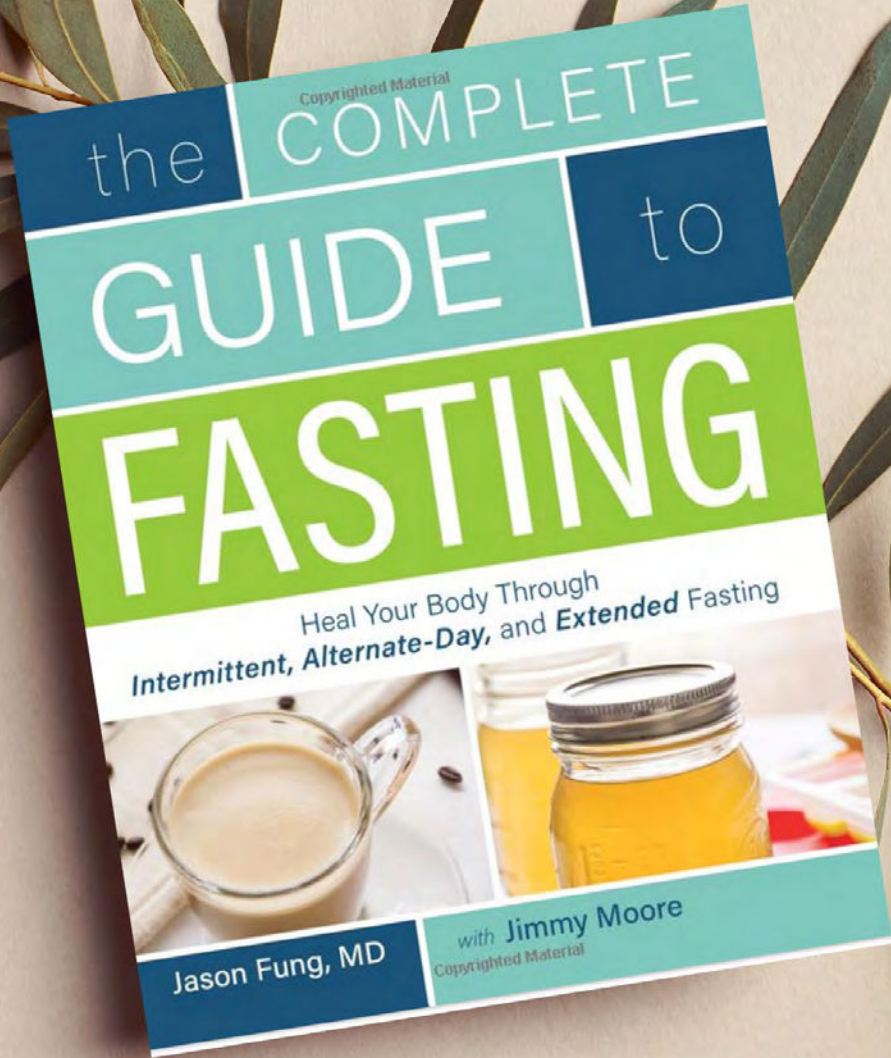
- **Intermittent daily fasting** or periodic daily fasts.
Fasting has a profound effect on promoting immune system homeostasis, partly by stimulating the removal of damaged cells (autophagy) and mitochondria (mitophagy) and clearing misfolded and foreign proteins. Intermittent fasting and autophagy likely have an important role in promoting the breakdown and elimination of the spike protein. Fasting is contraindicated in patients under 18 (impairs growth) and during pregnancy and breastfeeding. Patients with diabetes, as well as those with serious underlying medical conditions, should consult their primary care provider prior to fasting, as changes in their medications may be required and these patients require close monitoring. Hydroxychloroquine may limit the benefit of intermittent fasting. See page 3 for tips on fasting.
- **Spermidine; (follow instructions on product) and/or Resveratrol; (500mg twice daily).**
Spermidine, a naturally occurring polyamine, and resveratrol, a naturally occurring phytochemical, have been shown to promote autophagy. Wheatgerm, mushrooms, grapefruit, apples and mango are high natural sources of spermidine.
- **Ivermectin:** 0.2–0.3 mg/kg, daily for up to 4–6 weeks.
Ivermectin has potent anti-inflammatory properties. It also binds to the spike protein, aiding in the elimination by the host. It is likely that ivermectin and intermittent fasting act synergistically to rid the body of the spike protein. Ivermectin is best taken with or just following a meal for greater absorption. A trial of ivermectin should be considered as first line therapy. It appears that patients can be grouped into two categories: i) ivermectin responders and ii) ivermectin non-responders. This distinction is important, as the latter are more difficult to treat and require more aggressive therapy. Due to the possible drug interaction between quercetin and ivermectin, these drugs should not be taken simultaneously (i.e., should be staggered morning and night).
- **Moderating physical activity:**
Exercise can create worsening symptoms and lead to severe post-exertional fatigue. Patients should moderate activity to tolerable levels, and keep heart rate under 110 bpm. Stretching and low-resistance exercises are preferred over aerobic exercises.
- **Low dose naltrexone (LDN):** Begin with 1 mg/day and increase to 4.5 mg/day, as required. May take 2 to 3 months to see full effect.
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Not symptom specific; listed in order of importance.

- **Intermittent daily fasting** or periodic daily fasts.

Fasting has a profound effect on promoting immune system homeostasis, partly by stimulating the removal of damaged cells (autophagy) and mitochondria (mitophagy) and clearing misfolded and foreign proteins. Intermittent fasting and autophagy likely have an important role in promoting the breakdown and elimination of the spike protein. Fasting is contraindicated in patients under 18 (impairs growth) and during pregnancy and breastfeeding. Patients with diabetes, as well as those with serious underlying medical conditions, should consult their primary care provider prior to fasting, as changes in their medications may be required and these patients require close monitoring. Hydroxychloroquine may limit the benefit of intermittent fasting. See page 3 for tips on fasting.



the

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COMPLETE

GUIDE

to

FASTING

Heal Your Body Through
Intermittent, Alternate-Day, and Extended Fasting



Jason Fung, MD

with Jimmy Moore

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BENEFITS OF INTERMITTENT FASTING

Autophagy

Burn Fat & Lose Weight

Research shows that weekly fasting can trigger weight loss up to 8 percent and waist shrinkage of up to 7%, meaning that fasting is especially useful for losing belly fat.

Balances Insulin Levels

Improves Sleep

Increases HGH

(HGH) is a hormone made in the pituitary gland that leads to low levels of body fat and lean muscle mass. Initial research shows that fasting on a regular basis can boost the amounts your body makes, leading to improvements in your physique.

Anti-Aging

Reduces Inflammation

Chronic inflammation is a trigger for dozens of lifestyle diseases like strokes and heart problems, but intermittent fasting seems to keep inflammation in check by triggering your cells to break it down before it begins to build up.

Balances Blood Sugar

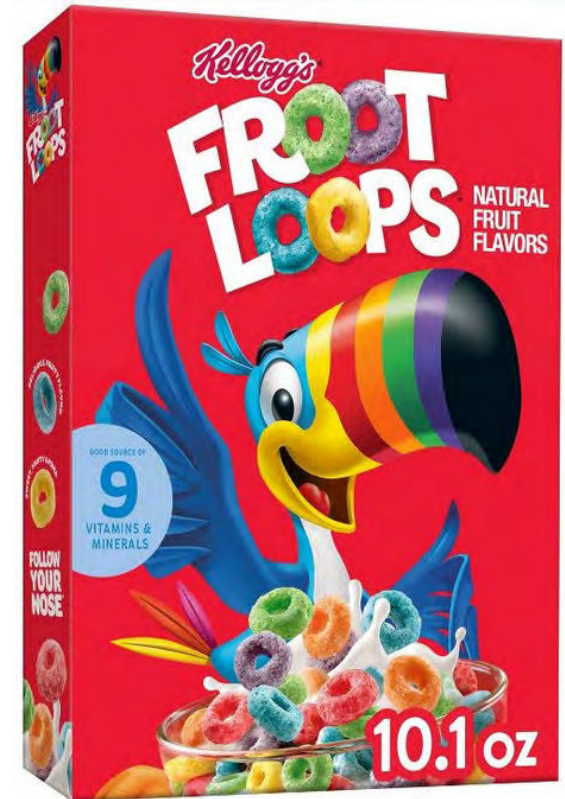
Enhances The Immune System

Reduces Risk of Chronic Disease

Scientific evidence shows that cutting your daily caloric intake by a third can extend your lifespan by over a decade, and intermittent fasting is an easy way to start cutting calories.



Real Food vs “Processed Food”



Low-Carb-High Fat Diet (LCHF)



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Spermidine, a naturally occurring polyamine, and resveratrol, a naturally occurring phytochemical, have been shown to promote autophagy. Wheatgerm, mushrooms, grapefruit, apples and mango are high natural sources of spermidine.

Spermidine



Resveratrol: A pleiotropic molecule

- Activates autophagy
- Anti-inflammatory
- Antioxidant
- Antithrombotic
- Binds spike protein



Supplement Facts

Serving Size 1 Vegetarian Capsule

Amount Per Serving	% Daily Value
Trans-resveratrol [from Japanese knotweed (root)]	250 mg **
Quercetin (as quercetin dihydrate)	150 mg **
Grape (fruit) and wild blueberry (fruit) blend [providing polyphenols, anthocyanins, OPCs]	85 mg **
Fisetin [from wax tree extract (stem)]	10 mg **

**Daily Value not established.

Other ingredients: vegetable cellulose (capsule), microcrystalline cellulose, vegetable stearate, silica, maltodextrin.

Manufactured for:
Quality Supplements and Vitamins, Inc.
Ft. Lauderdale, FL 33309
LifeExtension.com

To report a serious adverse event or obtain
product information, contact 1-866-280-2852.

Trans-resveratrol
500mg BID

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- **Ivermectin: 0.2–0.3 mg/kg, daily for up to 4–6 weeks.**

Ivermectin has potent anti-inflammatory properties. It also binds to the spike protein, aiding in the elimination by the host. It is likely that ivermectin and intermittent fasting act synergistically to rid the body of the spike protein. Ivermectin is best taken with or just following a meal for greater absorption. A trial of ivermectin should be considered as first line therapy. It appears that patients can be grouped into two categories: i) ivermectin responders and ii) ivermectin non-responders. This distinction is important, as the latter are more difficult to treat and require more aggressive therapy. Due to the possible drug interaction between quercetin and ivermectin, these drugs should not be taken simultaneously (i.e., should be staggered morning and night).

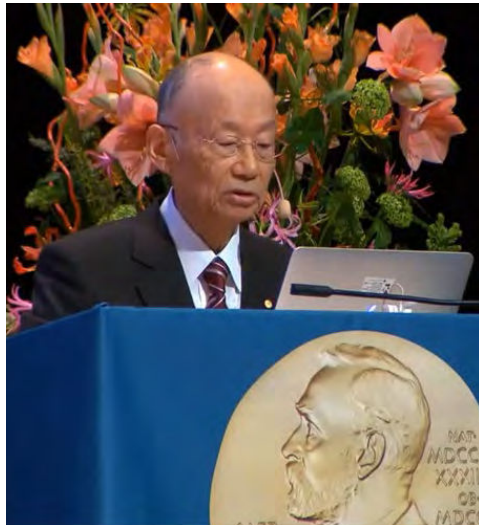
IVERMECTIN – Nature’s Gift to the World



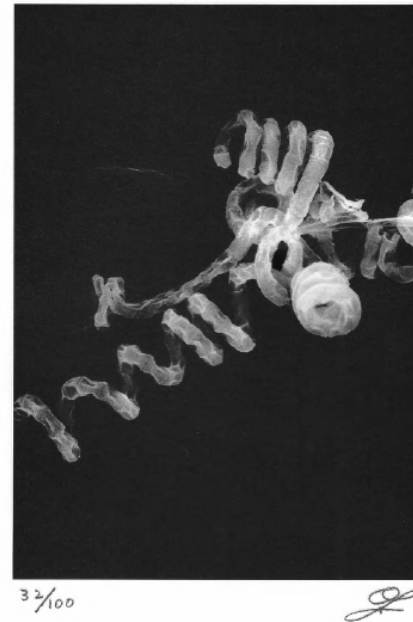
Ivermectin: enigmatic multifaceted 'wonder' drug continues to surprise and exceed expectations

Andy Crump

- Antiviral – multiples sites of action
- Anti-inflammatory
- Binds to spike protein (promotes removal of the protein)
- Simulates autophagy
- Increases Bifidobacterium



Professor Satoshi Omura



Streptomyces avermitilis

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Melatonin and its metabolites

Detoxification of ROS/RNS

- Superoxide anion radical
- Hydrogen peroxide
- Hydroxyl radical
- Peroxynitrite
- Singlet oxygen
- Nitric oxide
- Peroxyl radical
- Alkoxy radical
- Other organic radicals

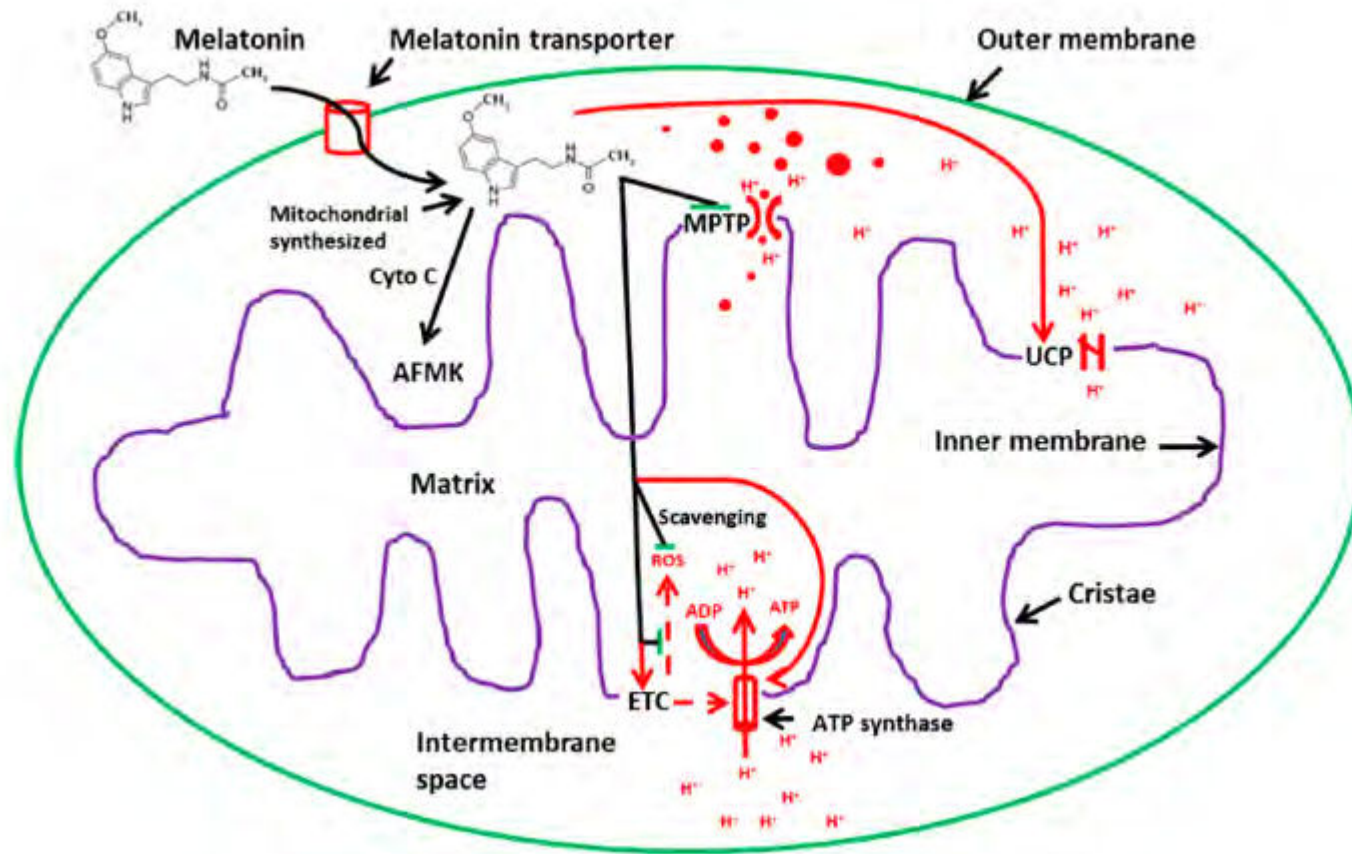
Modulation of redox enzymes

- Superoxide dismutase
- Glutathione peroxidase
- Glutathione reductase
- Glutamyl cysteine ligase
- Cyclo-oxygenase
- Heme-oxygenase
- Nitric oxide synthase
- Paraoxonase
- Myeloperoxidase
- Lipoxygenase
- Catalase

Physiological and metabolic features

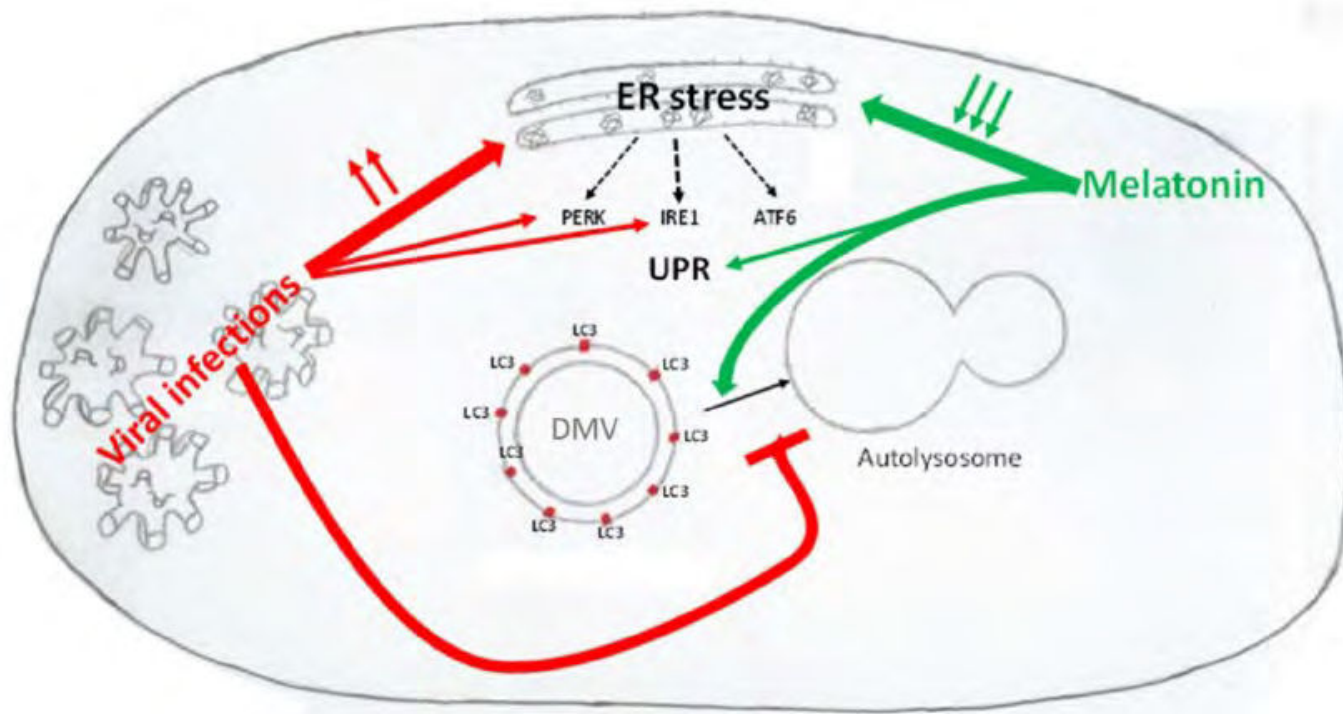
- Universal distribution in animals and plants
- Endogenous and exogenous availability
- Crosses morphophysiological barriers
- High intracellular concentrations
- Anti-inflammatory
- Binds transition metals
- Synergizes with other antioxidants
- Reduces electron leakage from ETC
- Strengthens circadian rhythms
- Both receptor-mediated and receptor-independent actions
- Interactions with ubiquitin/proteasome
- Ubiquitous distribution
- Very high levels in the CSF

Melatonin



Review

ER stress and autophagy induced by SARS-CoV-2: The targets for melatonin treatment



FIRST LINE THERAPIES (continued from page 1)

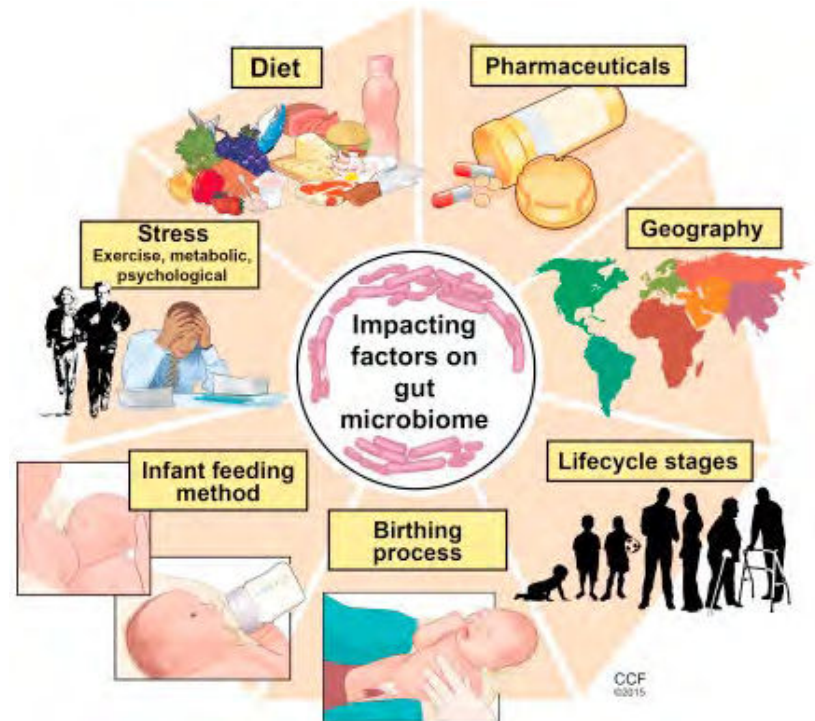
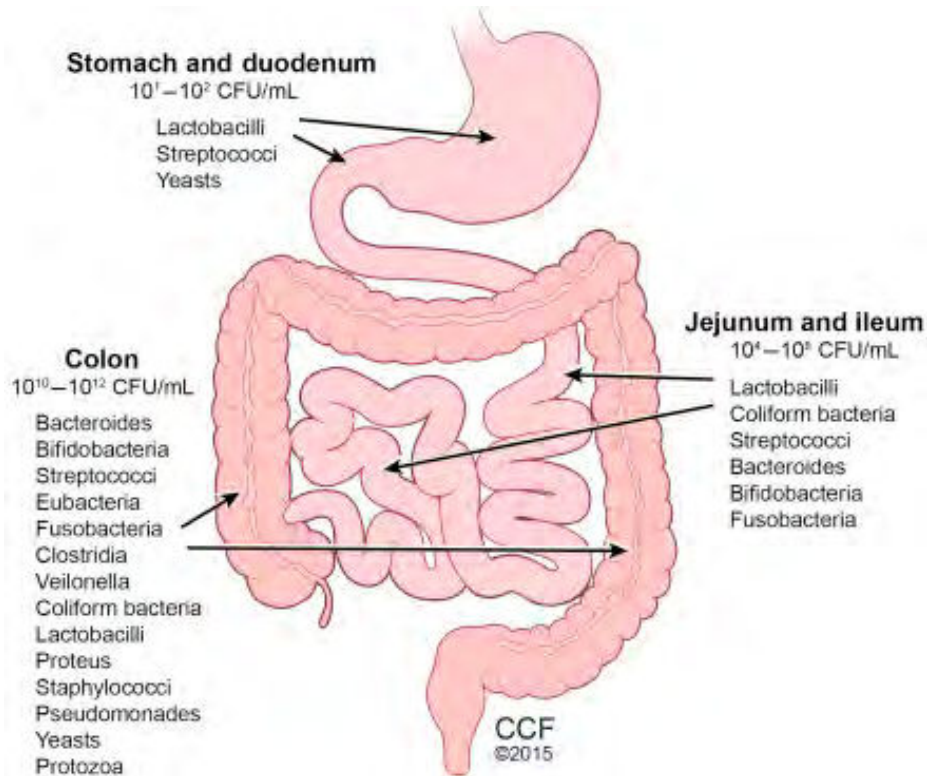
- **Vitamin D and Vitamin K2:** A dose of 4000–5000 units/day of Vitamin D, together with Vitamin K2 100 mcg/day is a reasonable starting dose.
The dose of Vitamin D should be adjusted according to the baseline Vitamin D level.
- ***Nigella sativa* encapsulated oil:** 200–500 mg twice daily.
It should be noted that thymoquinone (the active ingredient of *Nigella sativa*) decreases the absorption of cyclosporine and phenytoin. Patients taking these drugs should, therefore, avoid taking *Nigella sativa*. Furthermore, two cases of serotonin syndrome have been reported in patients taking *Nigella sativa* who underwent general anaesthesia (probable interaction with opiates).
- **Probiotics/prebiotics.**
Patients with post-vaccine syndrome classically have a severe dysbiosis with loss of Bifidobacterium. Kefir is a highly recommended nutritional supplement high in probiotics. Suggested probiotics include Megasporebiotic (Microbiome labs), TrueBifidoPro (US Enzymes) and yourgutplus+.
- **Magnesium:** 500 mg/day.
- **Omega-3 fatty acids:** Vascepa, Lovaza or DHA/EPA; 4 g/day.
Omega-3 fatty acids play an important role in the resolution of inflammation by inducing resolvins production.

Nigellalogy: A Review on *Nigella Sativa*

- *Nigella sativa* L. (*N. sativa*) is a small shrub native to Southern Europe, North Africa and Southeast Asia and cultivated in many countries in the world
- The ripe fruit contains numerous tiny seeds, dark black in color. The seed and oil of *N. sativa* used in ancient remedies for thousands of years
- Thymohydroquinone (TQ), dithymoquinone, sesquiterpene are the most important active components
- Antibacterial (gram +ve and gram -Ve), antifungal, antiviral (inhibits viral protease), anti-inflammatory, anti-oxidant and immunomodulatory properties

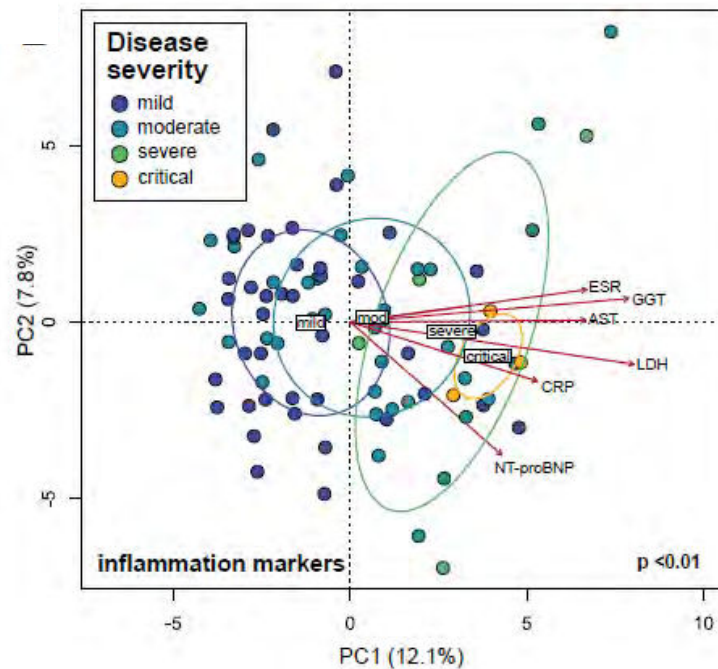


The Microbiome

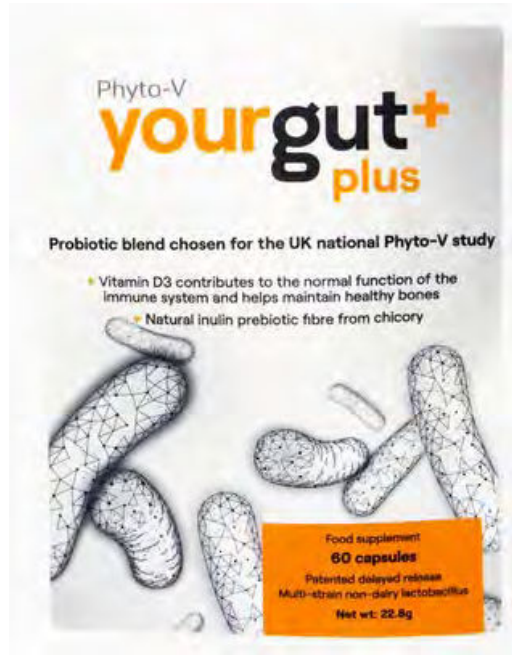


Gut microbiota composition reflects disease severity and dysfunctional immune responses in patients with COVID-19

- *F. prausnitzii* and *Bifidobacterium bifidum* were negatively correlated with severity after adjusting for antibiotic use and patients' age ($p < 0.05$)
- C-X-C motif ligand 10 (CXCL10), IL-10, TNF- α , AST, CRP were significantly associated with microbiota composition



Pre- and Probiotics



Chia Seeds

ADJUNCTIVE/SECOND LINE THERAPIES

Listed in order of importance.

■ “Mitochondrial energy optimizer”

■ Non-invasive brain stimulation (NIBS):

NIBS using transcranial direct current stimulation or transcranial magnetic stimulation has been demonstrated to improve cognitive function in patients with long COVID as well as other neurological diseases. NIBS is painless, extremely safe, and easy to administer. It is a recognized therapy offered by many Physical Medicine and Rehabilitation Centers. Patients may also purchase an FDA-approved device for home use.

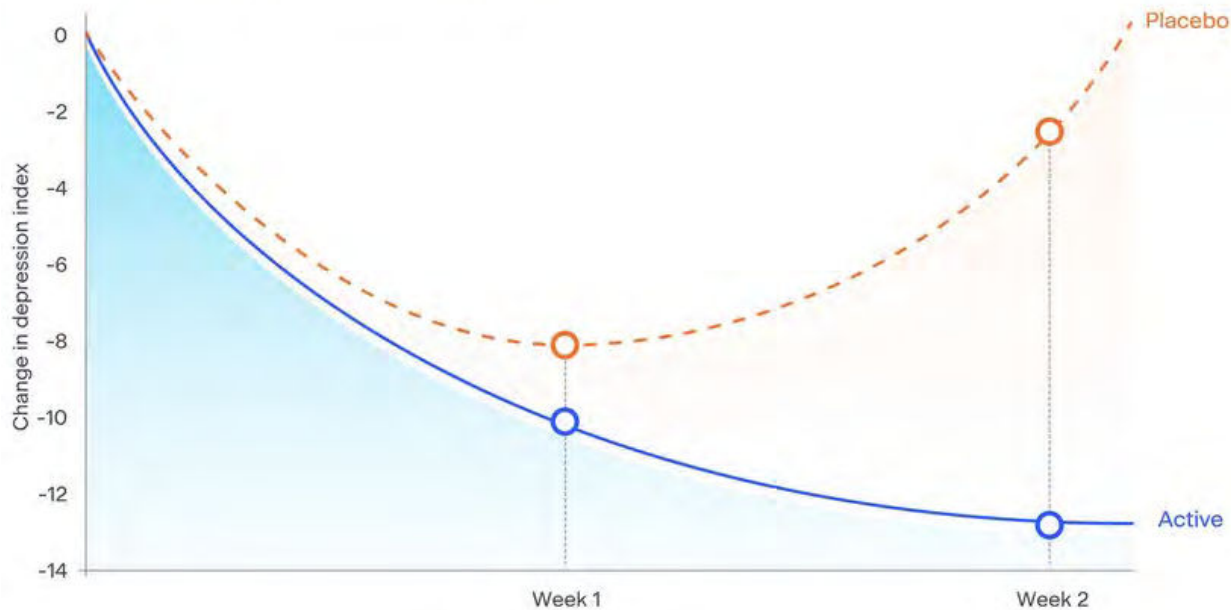
■ N-acetyl cysteine (NAC): 600–1500 mg/day.

- #### ■ Intravenous Vitamin C: 25 g weekly, together with oral Vitamin C 1000 mg (1 gram) 2–3 times per day.
- High dose IV vitamin C is “caustic” to the veins and should be given slowly over 2–4 hours. Furthermore, to assess patient tolerability the initial dose should be between 7.5–15 g. Total daily doses of 8–12 g have been well-tolerated, however chronic high doses have been associated with the development of kidney stones, so the duration of therapy should be limited. Wean IV Vitamin C as tolerated.

Non-Invasive Brain Stimulation

Treatment of Bipolar II Depression

Clinical trial conducted at Mount Sinai Hospital



Non-invasive brain microcurrent stimulation therapy of long-COVID-19 reduces vascular dysregulation and improves visual and cognitive impairment

Bernhard A. Sabel^{a,*}, Wanshu Zhou^a, Frank Huber^a, Florentina Schmidt^a, Kornelia Sabel^b,
Andreas Gonschorek^c and Mirela Bilc^a

THIRD LINE THERAPIES

■ Hyperbaric oxygen therapy (HBOT).

HBOT has potent anti-inflammatory properties, decreasing pro-inflammatory cytokines while increasing IL-10. Furthermore, HBOT polarizes macrophages toward the M2 phenotype and improves mitochondrial function. Surprisingly, it is the increased pressure, rather than the increase in the concentration of dissolved oxygen, that appears to mediate these effects. HBOT is delivered at varying pressures, both with and without oxygen. The addition of oxygen increases the clinical response. Maximal clinical response is achieved via use of high-pressure chambers (typically reaching 2.4 ATM) with 100% oxygen for 60 minutes. If HBOT is delivered using lower pressure chambers (less than 1.5 ATM) without supplemental oxygen, the clinical response, although present, is significantly less such that a higher number of sessions will be needed to reach a clinical plateau. While there is very limited published data on the treatment of long COVID and post-vaccine syndrome, remarkable life-saving benefits have been reported anecdotally. The duration of treatment should be based on clinical response and continue until the benefit has plateaued. If no benefit is evident clinically after 10 sessions, then HBOT should be considered a therapeutic failure. This therapy is limited by logistical issues and cost.

Scientific Reports | (2022) 12:11252 |

Hyperbaric oxygen therapy improves neurocognitive functions and symptoms of post-COVID condition: randomized controlled trial

OTHER POTENTIAL TREATMENTS

- Plasmapheresis
- Triple anti-coagulation
- Intranasal oxytocin
- Sunlight and photobiomodulation
- Curcumin/Quercetin/Pterostilbene
- Hyperthermia (sauna) cold treatment
- Valproic acid (and resveratrol)
- L-arginine/L-citrulline (and phosphodiesterase 5 inhibitor)
- Intravenous immunoglobulin treatment (IVIG)
- Fluvoxamine
- Methylene blue

Disease Specific Therapeutic Adjuncts

- Small-fiber neuropathy/autonomic neuropathy
- Generalized neurologic symptoms/“brain fog”/fatigue/visual symptoms
- Depression
- Patients with evidence of clotting
- Vaccine induced myocarditis/pericarditis
- Tinnitus



THANK YOU

