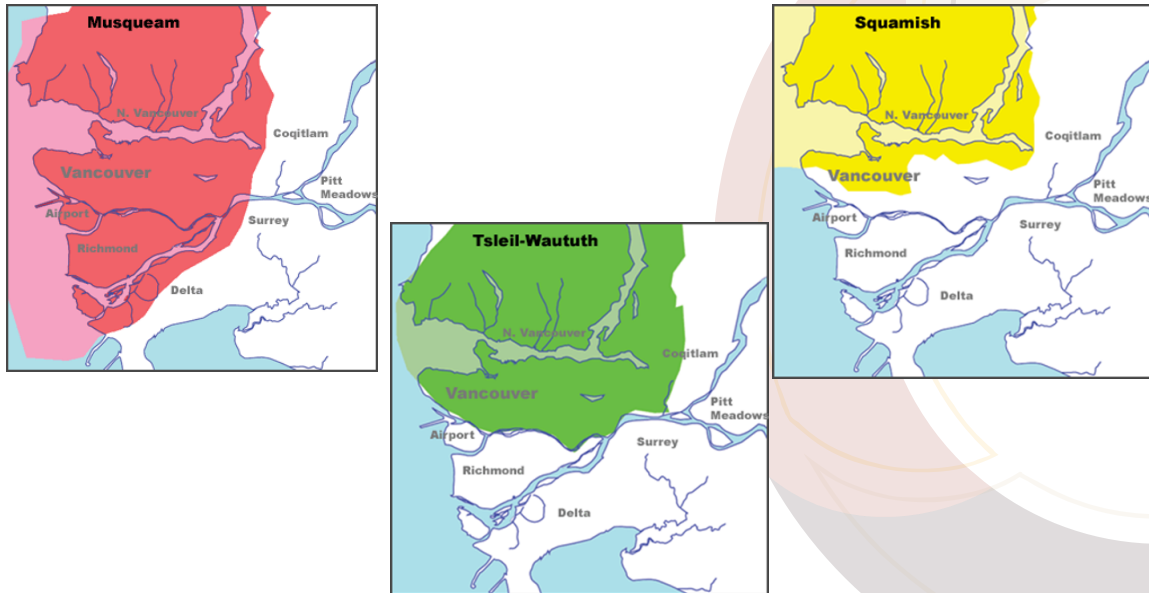


We would like to acknowledge that we are gathered today on the traditional territories of the Musqueam, Squamish and Tsleil-Waututh peoples.

Source: [www.ijohomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html](http://www.ijohomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html)



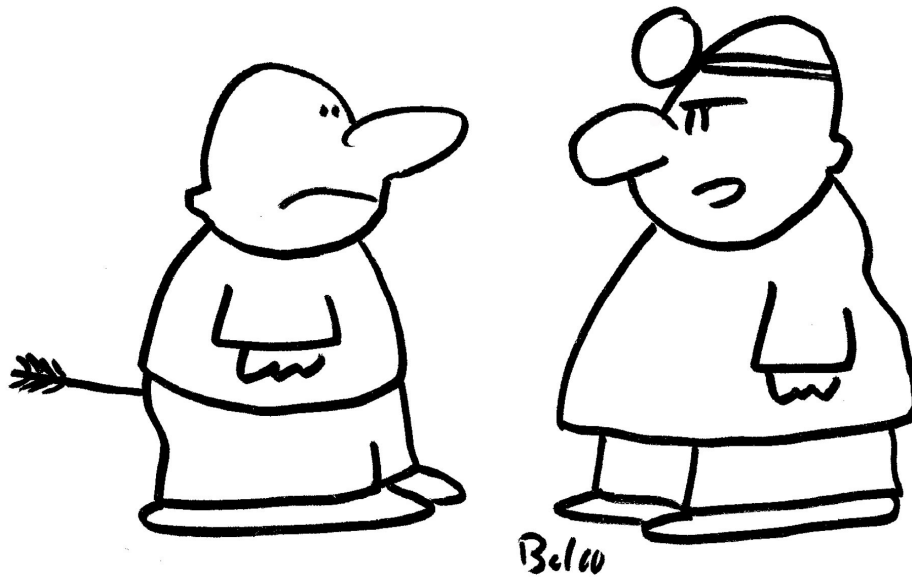
# LONG COVID, CHRONIC FATIGUE SYNDROME, FIBROMYALGIA PRIMARY CARE TOOLKIT

**Ric Arseneau, MD FRCPC MA(Ed) MBA FACP CGP**  
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St. Paul's Hospital  
University of British Columbia



[DrRicArseneau.ca](http://DrRicArseneau.ca)

No Conflicts of Interest to Declare



"How do I know you're not malingering?"

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MEDICALLY  
UNEXPLAINED  
PHYSICAL SYMPTOMS  
(MUPS)

IS IT REAL ?

Psychological / psychiatric  
Not real  
Nothing you can do  
Frustrating / unsatisfying

Free-association exercise with housestaff



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# IS IT RARE ?

## Health Reports

### Medically unexplained physical symptoms (MUPS) among adults in Canada: Comorbidity, health care use and employment

by Jungwee Park and Heather Gilmour

Release date: March 15, 2017



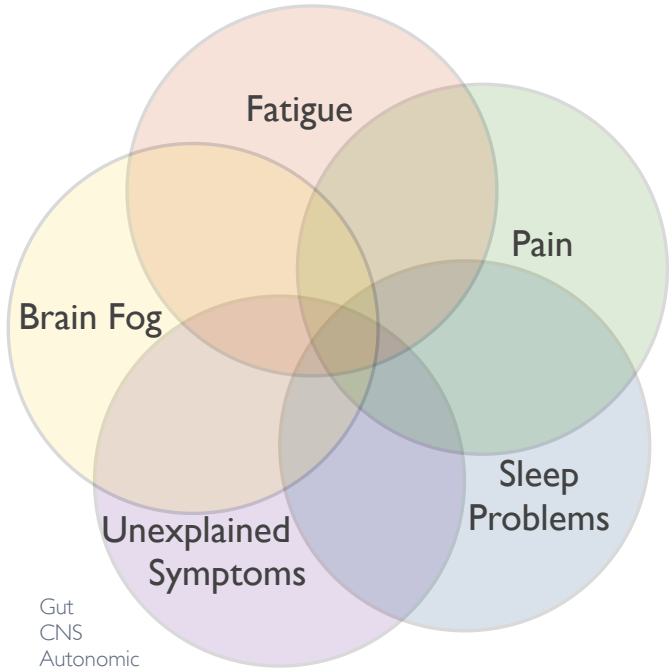
### Medically unexplained physical symptoms (MUPS) among adults in Canada: Comorbidity, health care use and employment

by Jungwee Park and Heather Gilmour

#### Abstract

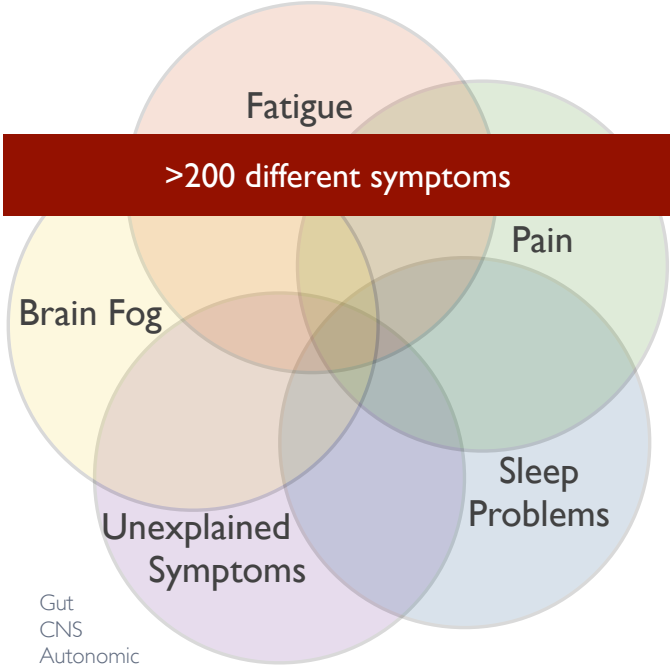
Based on data from the 2014 Canadian Community Health Survey and the 2012 Canadian Community Health Survey-Mental Health, this study provides estimates of the prevalence of medically unexplained physical symptoms (MUPS) in the household population aged 25 or older. MUPS are examined in relation to sociodemographic characteristics, physical and mental comorbidity, health care use and unmet needs, labour force participation and productivity. In 2014, 5.5% of Canadian adults—an estimated 1.3 million – reported having chronic fatigue syndrome (1.6%), fibromyalgia (2.0%) and/or multiple chemical sensitivity (2.7%). Half (51%) of people with MUPS reported other chronic physical conditions, compared with 8% of those without MUPS. Similarly, mental comorbidities were more prevalent among those with MUPS. Higher health care use was observed among people with MUPS, but 25% of them reported unmet health care needs, compared with 11% of those without MUPS. People with MUPS were more likely than those without MUPS to be permanently unable to work or to not have a job; fewer than half (45%) were employed. Among those who were employed, 18% had missed work because of a chronic condition, compared with 5% of workers without MUPS.

# OVERLAPPING GROUPS



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# OVERLAPPING GROUPS



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## BIRDS OF A FEATHER - CSS

- ME/CFS
- Fibromyalgia (FM)
- Myofascial Pain Syndrome (MPS)
- Migraines
- Tension Type Headaches
- Irritable Bowel Syndrome (IBS)
- Postural Orthostatic Tachycardia Syndrome (POTS)
- Interstitial Cystitis (IC)
- Pelvic Pain Syndrome (PPS)
- PTSD
- Non-Cardiac Chest Pain (Costochondritis)
- Temporomandibular Disorder (TMD)
- Irritable Larynx Syndrome (ILS)
- Central Abdominal Pains Syndrome (AKA Functional)
- Other Pain Syndromes

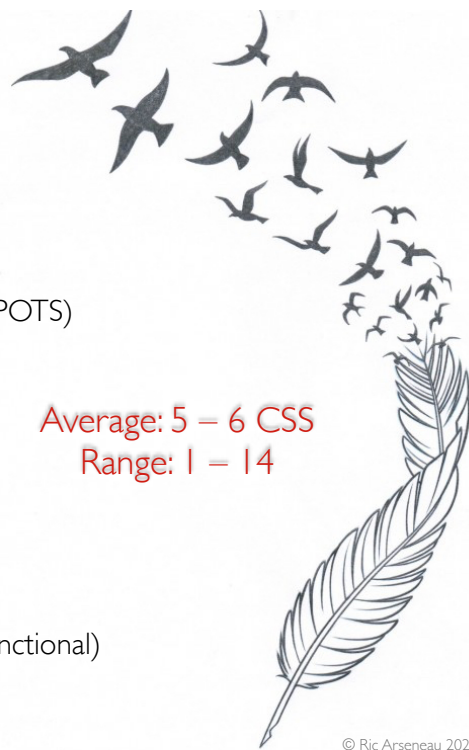


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## BIRDS OF A FEATHER - CSS

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- Irritable Larynx Syndrome (ILS)
- Central Abdominal Pains Syndrome (AKA Functional)
- Other Pain Syndromes



Average: 5 – 6 CSS  
Range: 1 – 14

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# AN ALPHABET SOUP OF ACRONYMS

ME/CFS  
PTSD  
MPS  
FM  
IC  
IBS  
POTS  
MCAS



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# AN ALPHABET SOUP OF ACRONYMS



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# PREDISPOSING

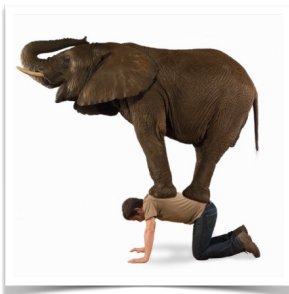
- Genetic predisposition
  - Twin studies
    - Identical - 50%
    - Fraternal - 25%
  - Family members
- Adverse childhood events and trauma



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# PRECIPITANT / STRESSOR



## Physical

- Car accident
- Surgery
- Other injury



## Psychological

- Trauma (PTSD)
- "Burn out"
- Other



## Infectious

- **Viral**
- Bacterial
- Other

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**Post-infective and chronic fatigue syndromes precipitated by viral and non-viral pathogens: prospective cohort study**

Ian Hickie, Tracey Davenport, Denis Wakefield, Ute Vollmer-Conna, Barbara Cameron, Suzanne D Vernon, William C Reeves, Andrew Lloyd, for the Dubbo Infection Outcomes Study Group

BMJ, doi:10.1136/bmj.38933.585764.AE (published 1 September 2006)

**Design** Prospective cohort study following patients from the time of acute infection with Epstein-Barr virus (glandular fever), *Coxiella burnetii* (Q fever), or Ross River virus (epidemic polyarthritis).

**Results** Prolonged illness characterised by disabling fatigue, musculoskeletal pain, neurocognitive difficulties, and mood disturbance was evident in 29 (12%) of 253 participants at six months, of whom 28 (11%) met the diagnostic criteria for chronic fatigue syndrome.

**Conclusions** A relatively uniform post-infective fatigue syndrome persists in a significant minority of patients for six months or more after clinical infection with several different viral and non-viral micro-organisms. Post-infective fatigue syndrome is a valid illness model for investigating one pathophysiological pathway to chronic fatigue syndrome.

- 11% ME/CFS at 6 mo.
- Consistent across infections
- Related to *host response* rather than pathogen

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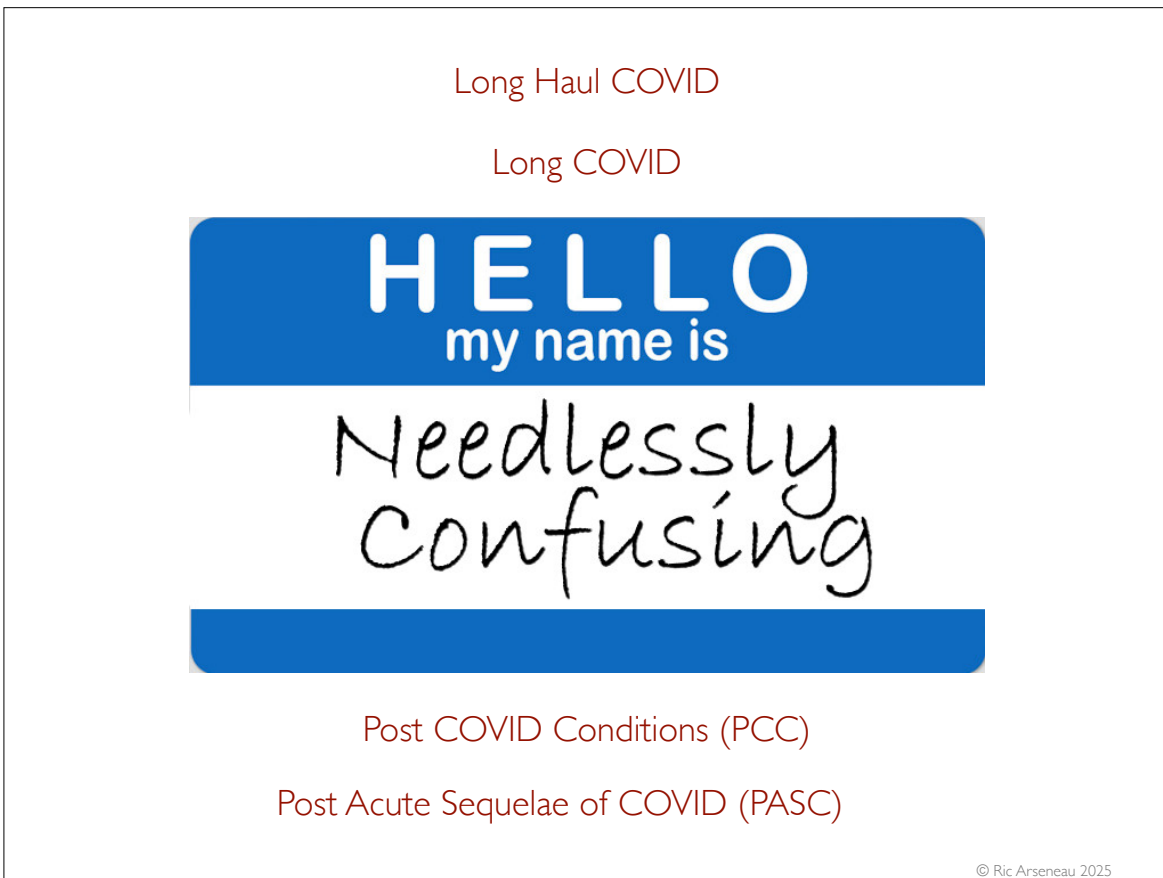


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# Central Sensitization Phenotypes in Post Acute Sequelae of SARS-CoV-2 Infection (PASC): Defining the Post COVID Syndrome

Dates received: 24 May 2021; revised: 17 June 2021; accepted: 18 June 2021.

Journal of Primary Care & Community Health  
Volume 12: 1–8  
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DOI: 10.1177/21501327211030826  
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- Mayo Clinic Rochester
- Post acute sequelae of SARS-CoV-2 infection (PASC)
  - Heterogeneous group
- 3 Groups
  1. Tissue damage
    - e.g., lung scarring, myocarditis, anosmia
  2. No identifiable tissue damage
    - Post-viral syndrome (ME/CFS)
    - CSS (Mayo Clinic)
  3. Psychiatric / psychological



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  2. No identifiable tissue damage
    - Post-viral syndrome (ME/CFS)
    - CSS (Mayo Clinic)
  3. Psychiatric / psychological

Long  
COVID



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# POST COVID CONDITIONS (PCC)

- Tissue damage / inflammation
  - Lung scarring, DVT, anosmia, myocarditis
- Autoimmune
  - RA, SLE, IBD, Sjogren's, alopecia, vitiligo
- Metabolic
  - DM, HTN, High cholesterol
- Psychiatric / psychological
  - Depression, anxiety, PTSD
- Post-viral syndromes: Long COVID
  - ME/CFS, FM, POTS, MCAS, ...





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A screenshot of the Ovid search interface. The page is titled 'Ovid®' and includes navigation links for 'My Account', 'Ovid® search builder', 'asHaway', 'Help', 'Feedback', and 'Logoff'. Below the navigation is a search bar with the text 'long covid' entered. The search results section shows '1 Resource selected | Hide | Change' and 'Ovid MEDLINE(R) and In-Process, In-Data-Review &amp; Other Non-Indexed Citations 1946 to July 28, 2023'. The search criteria are 'Keyword' and 'long covid'. There are also options for 'Limits (expand)', 'Include Multimedia', and 'Map Term to Subject Heading'. The footer includes copyright information for Ovid Technologies, Inc. and various language options.

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Ovid® My Account  askaway  Help Feedback Logoff

Search Journals Books Multimedia My Workspace EBP Tools ... What's New

**Your term mapped to the following Subject Headings:**  
 Click on a subject heading to view more general and more specific terms within the tree.  
 See term mapped to thesaurus term

Include All Subheadings  
 Combine with:

Select	Subject Heading	Explode	Focus	Scope
<input checked="" type="checkbox"/>	Post-Acute COVID-19 Syndrome	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	long covid.mp. search as Keyword			

**Hints:**

- Trigger a Subject Heading link to view its tree - related terms that are more general and more specific.
- Select the Explode box if you wish to retrieve results using the selected term and all of its more specific terms.
- Select the Focus box if you wish to limit your search to those documents in which your subject heading is considered the major point of the article.
- If your search did not map to a desirable subject heading, select the box Search as Keyword.
- If you select more than one term, you can combine them using a boolean operator (AND or OR).

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**RESEARCH**

**Open Access**



# Prevalence of symptoms, comorbidities, fibrin amyloid microclots and platelet pathology in individuals with Long COVID/Post-Acute Sequelae of COVID-19 (PASC)

## Data collection and analysis of patients who filled in the South African Long COVID/PASC registry

The South African Long COVID/PASC registry is an online platform where patients can self-report long COVID/PASC symptoms and previous comorbidities.

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NEWS & FEATURES

# Looking for Long Covid: A Clash of Definition and Study Design

*Influential studies from the VA St. Louis take a broad view of long Covid. Not every expert agrees with the approach.*

BY SARA TALPOS  
07.25.2024



NEWS & FEATURES

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BY SARA TALPOS  
07.25.2024

# LONG COVID AS POST VIRAL SYNDROMES

Mayo Clinic



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## LONG COVID SPECTRUM

Syndromes: You're *In* or Your *Out*



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# LONG COVID SPECTRUM

Are Long COVID and ME/CFS the same thing ?



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# ME/CFS PRECIPITANTS



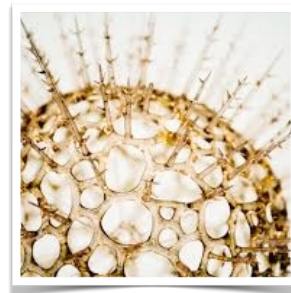
## Physical

- Car accident
- Surgery
- Other injury



## Psychological

- Trauma (PTSD)
- "Burn out"
- Other



## Infectious

- **Viral**
- Bacterial
- Other

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# LESSER KNOWN ME/CFS PRECIPITANTS

- Vaccination : ASIA Syndrome  
Autoimmune/Inflammatory Syndrome Induced by Adjuvant
- Medical illness – e.g., cancer, neurological event, cardiac event
- Exposure to chemical/ environmental toxins
- Recent international travel
- Childbirth

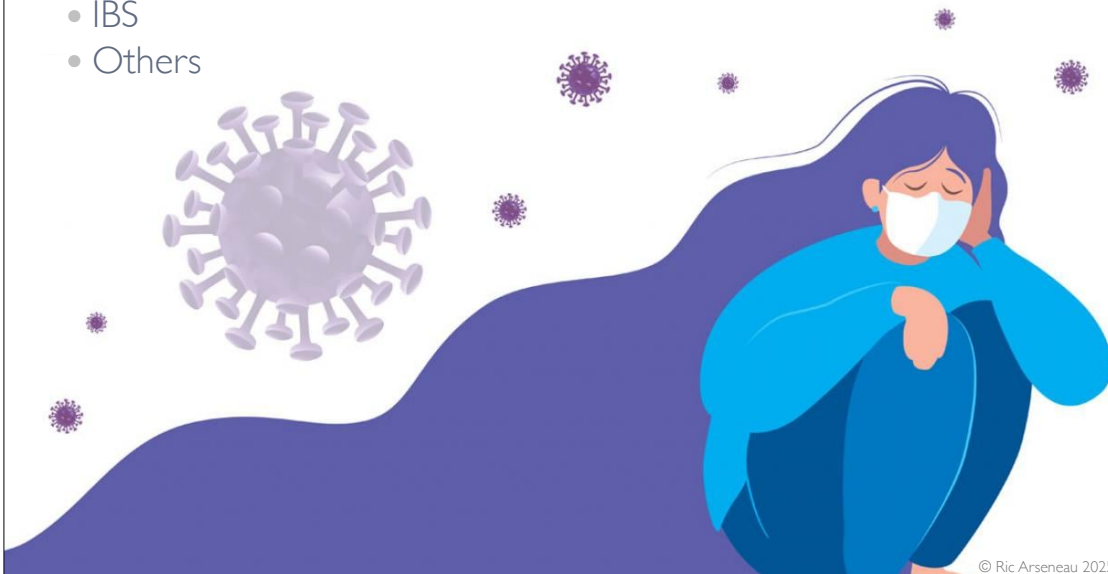


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# POST VIRAL / INFECTIOUS SYNDROMES

- ME/CF and FM
- POTS (postural orthostatic tachycardia syndrome)
- MCAS (mast cell activation syndrome)
- IBS
- Others



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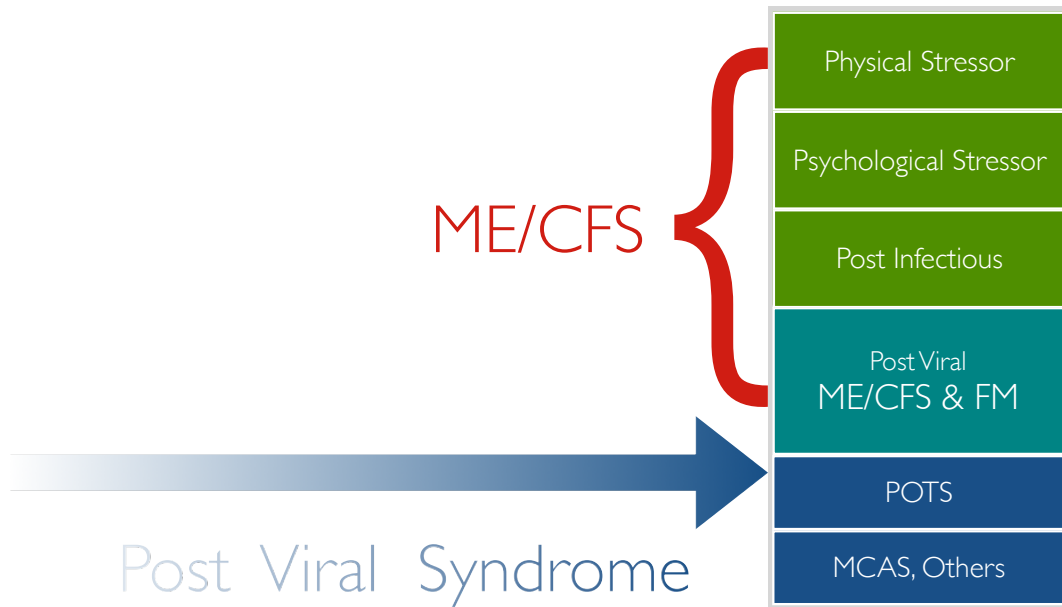
# LONG COVID SPECTRUM



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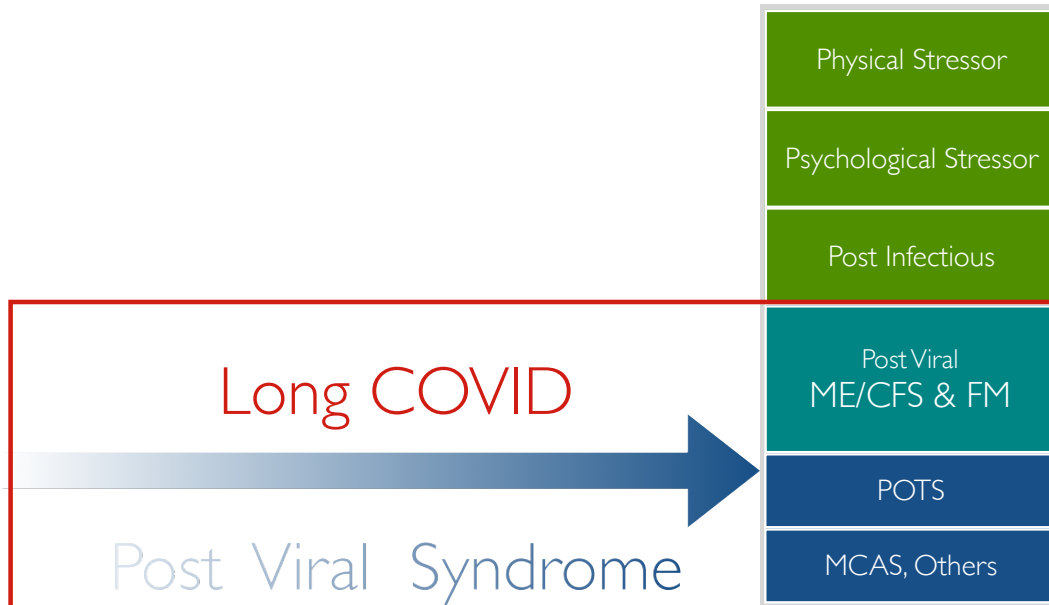
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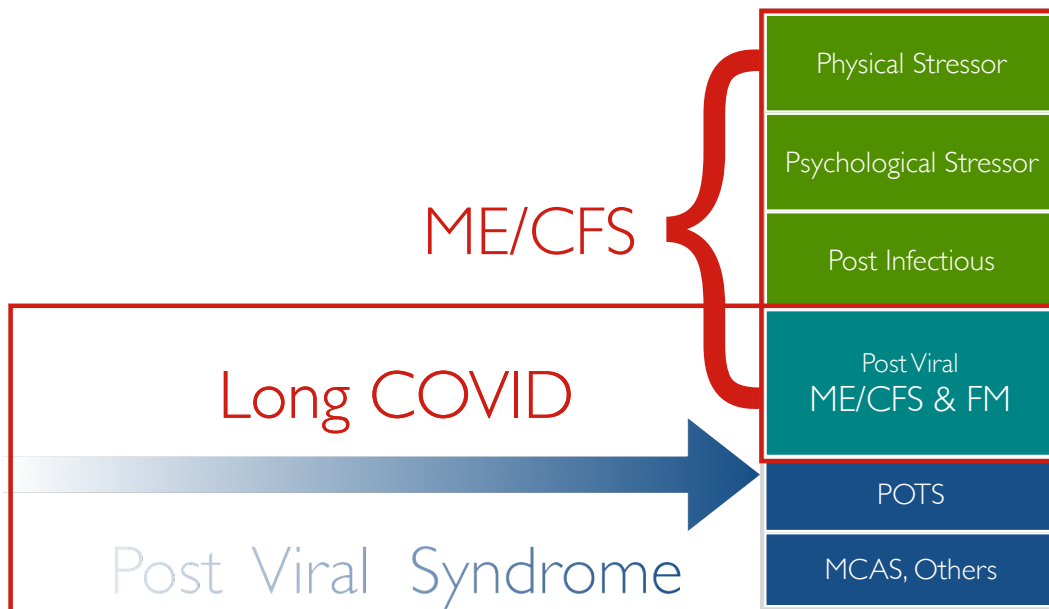
# LONG COVID SPECTRUM



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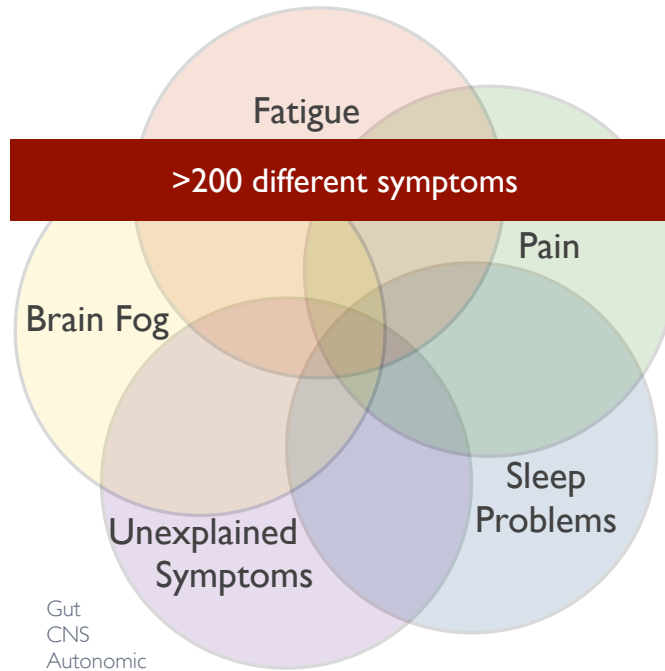
# LONG COVID SPECTRUM



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# OVERLAPPING GROUPS



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Word of the day:

**Exhaustipated**

(adj.) Too tired to give a shit.

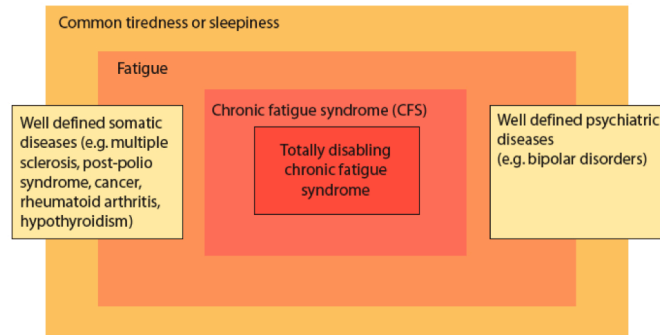


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# DIAGNOSING FATIGUE

ACTA NEUROL SCAND 2007

*"I'm tired too..."*



**Figure 1.** Schematic outline of how CFS should be differentiated from well-defined somatic and mental diseases as well as other subjective complaints (like common tiredness and sleepiness). (Adopted from (19) and slightly modified, with permission.).

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# PATHOLOGICAL FATIGUE



Unexplained



Does not improve with Rest



Post Exertional Malaise: "Crash"

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# PATHOLOGICAL FATIGUE



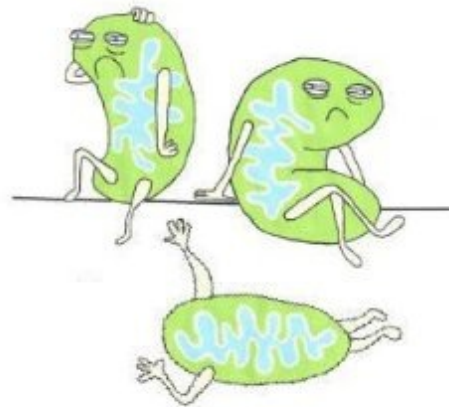
Post “Exertional” Malaise: “Crash” for  $\geq 1$  day

- Pathognomonic symptom of ME/CFS
- Exertion Not Exercise
- ... and worsening of symptoms (PESE)
- But not just exertion:
  - Physical exertion, cognitive exertion, emotion/stress, and environmental stimulation

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## Diagnosis and Treatment of Chronic Fatigue Syndrome

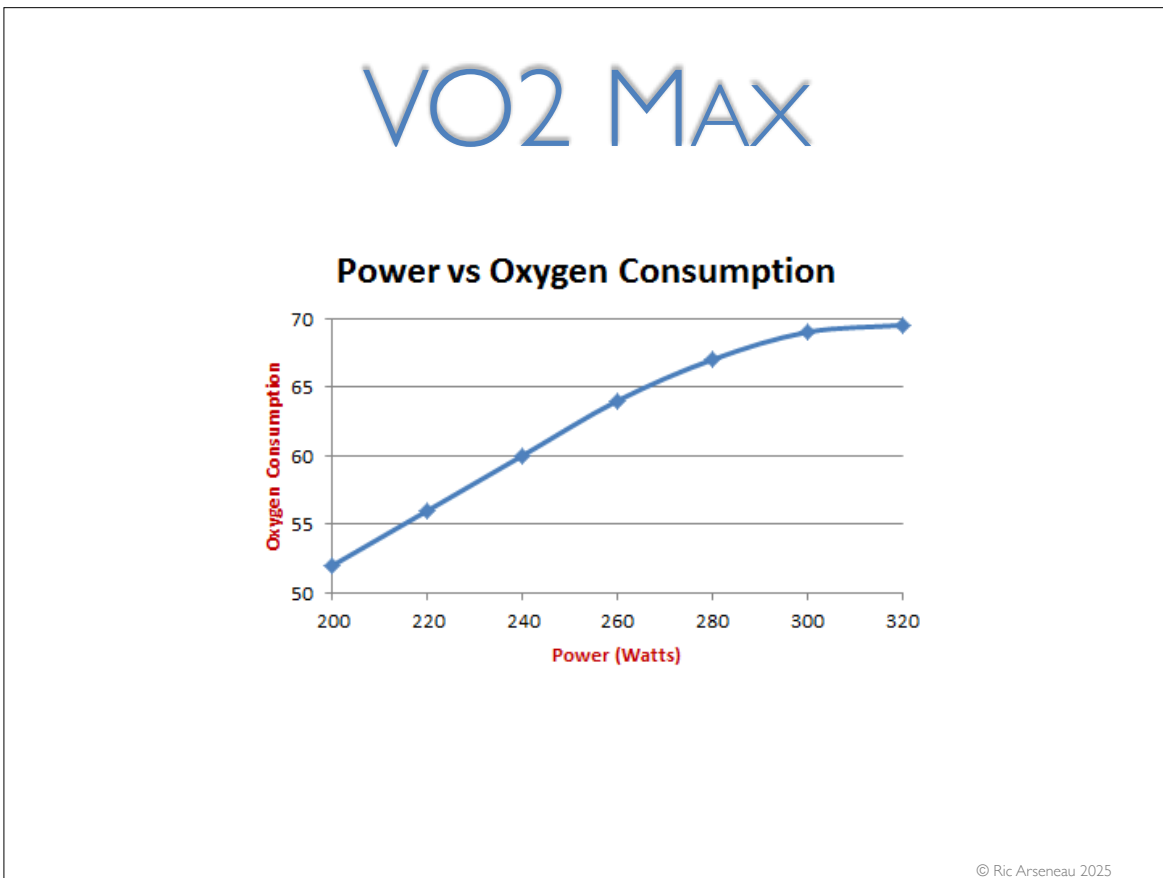


it's mitochondria, not hypochondria

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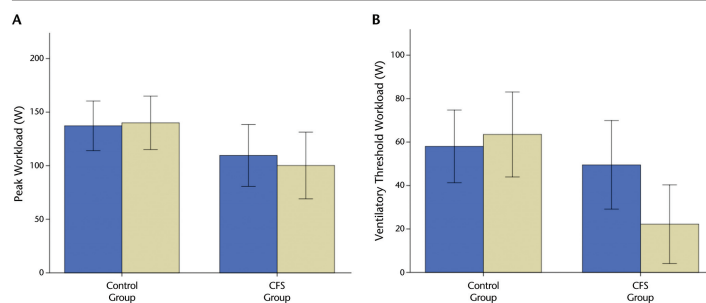
43



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# Discriminative Validity of Metabolic and Workload Measurements for Identifying People With Chronic Fatigue Syndrome

Christopher R. Snell, Staci R. Stevens, Todd E. Davenport, J. Mark Van Ness

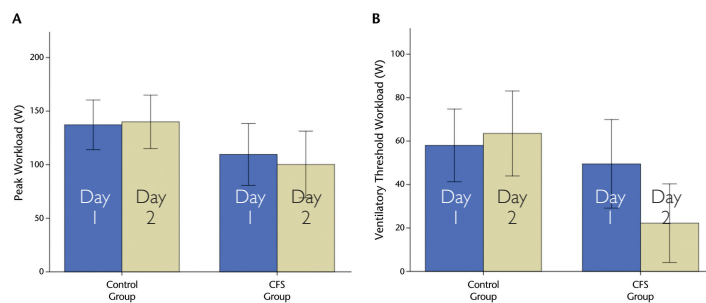


**Figure 2.** Measurements of workload at peak exercise (A) and at the ventilatory threshold (B) in participants with chronic fatigue syndrome (CFS) and control participants during cardiopulmonary exercise test 1 (blue bars) and cardiopulmonary exercise test 2 (gold bars). Error bars represent 1 standard deviation.

November 2013 Volume 93 Number 11 Physical Therapy 1489

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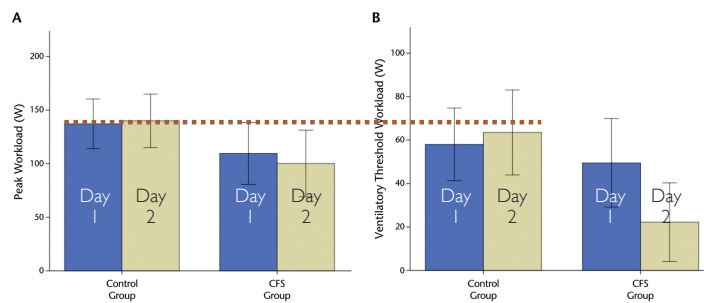


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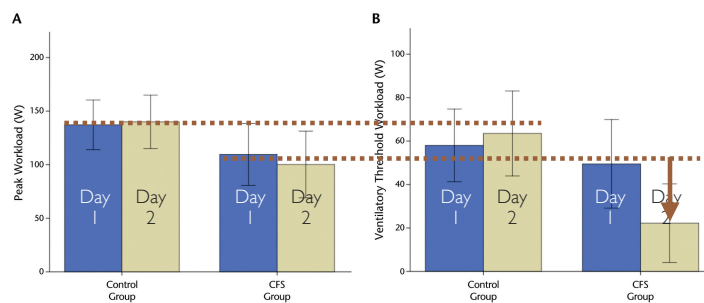
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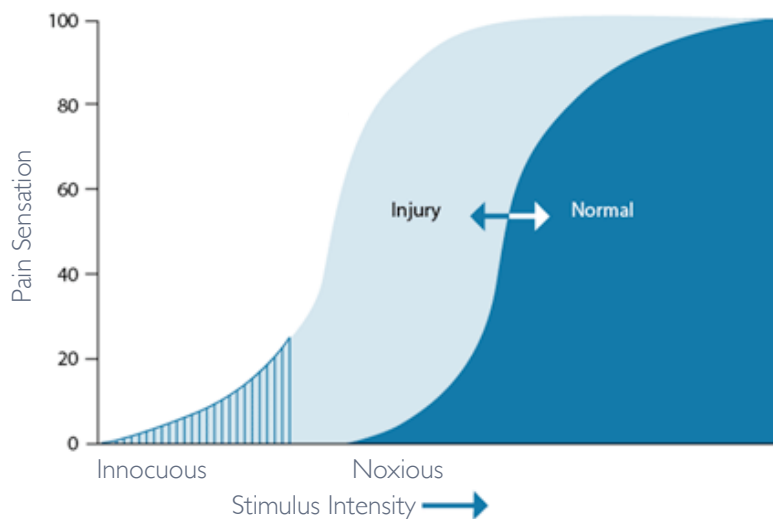
# CHRONIC PAIN – A NEW TYPE

- Pain falls into three categories:
  - Nociceptive – inflammation and damage
  - Neuropathic – damaged or irritated nerves
  - *Nociplastic*
    - Volume knob for pain is turned up
    - “Central sensitization”
    - e.g., FM
- A person might have more than one type of pain

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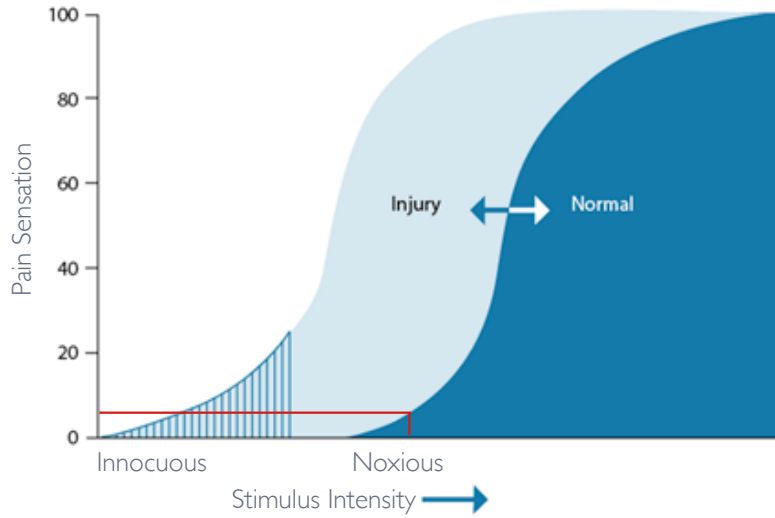
## CHRONIC PAIN: SENSITIVITY SHIFT



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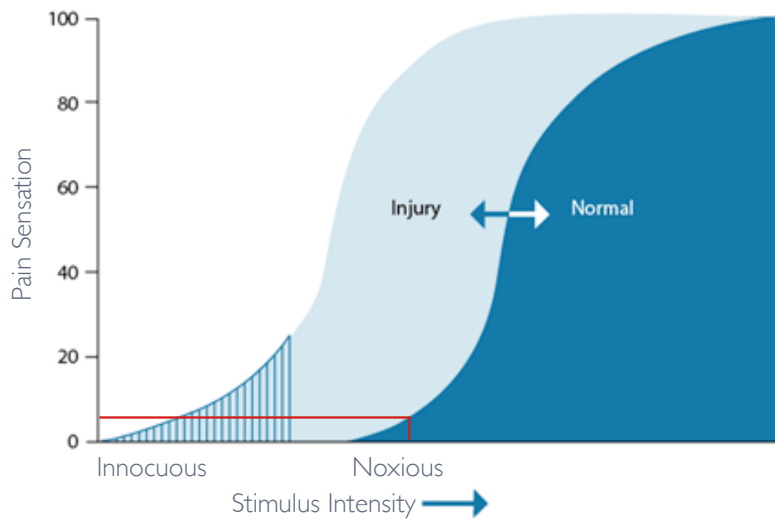
# CHRONIC PAIN: SENSITIVITY SHIFT



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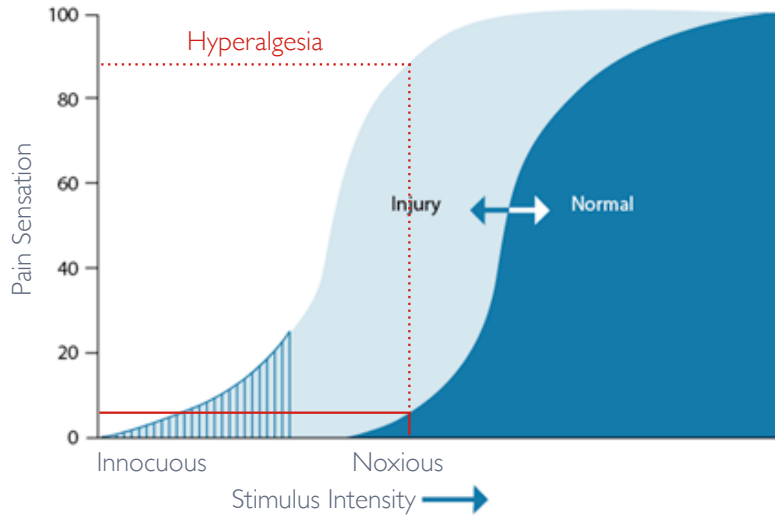
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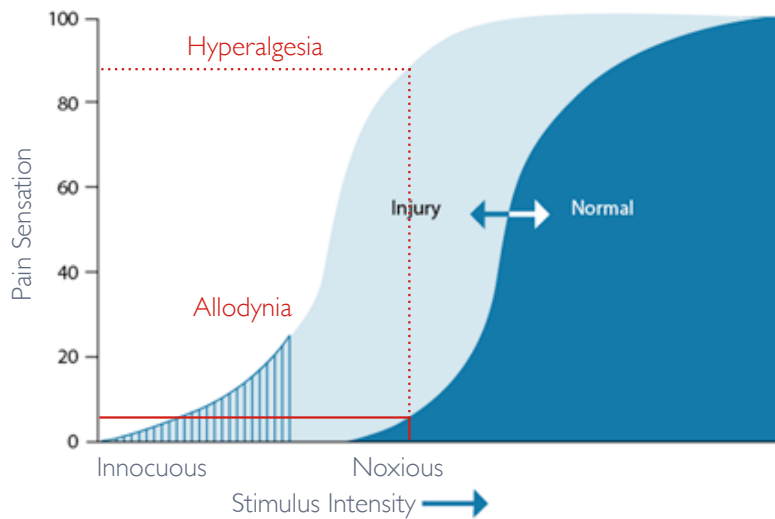
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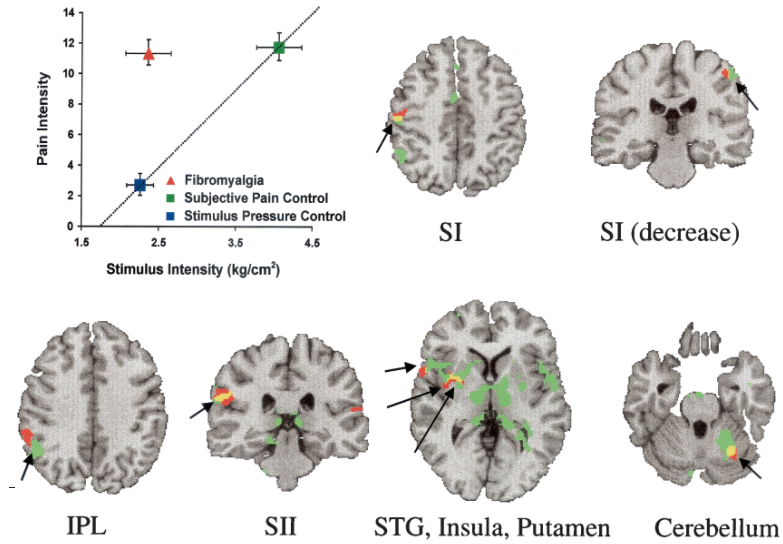


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## Functional Magnetic Resonance Imaging Evidence of Augmented Pain Processing in Fibromyalgia

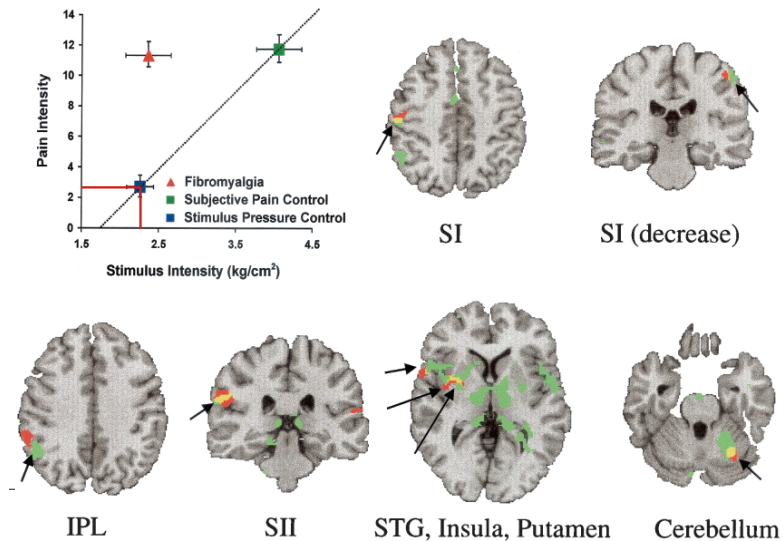
Richard H. Gracely,<sup>1</sup> Frank Petzke,<sup>2</sup> Julie M. Wolf,<sup>3</sup> and Daniel J. Clauw<sup>2</sup>



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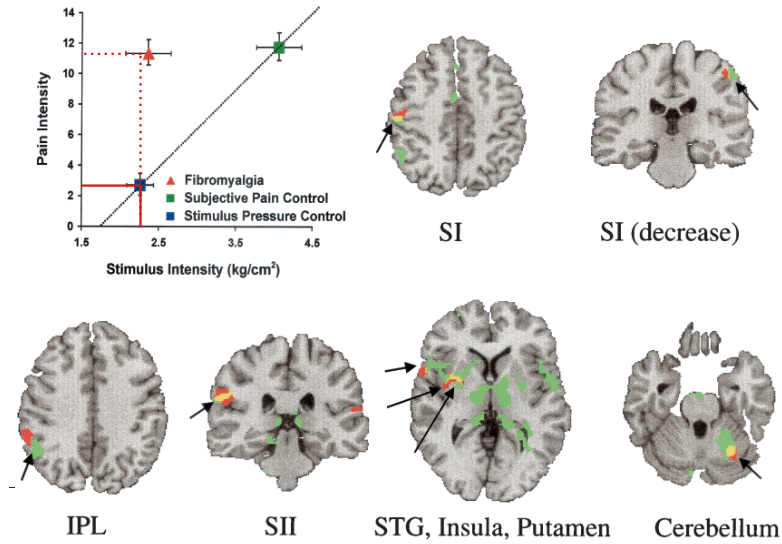


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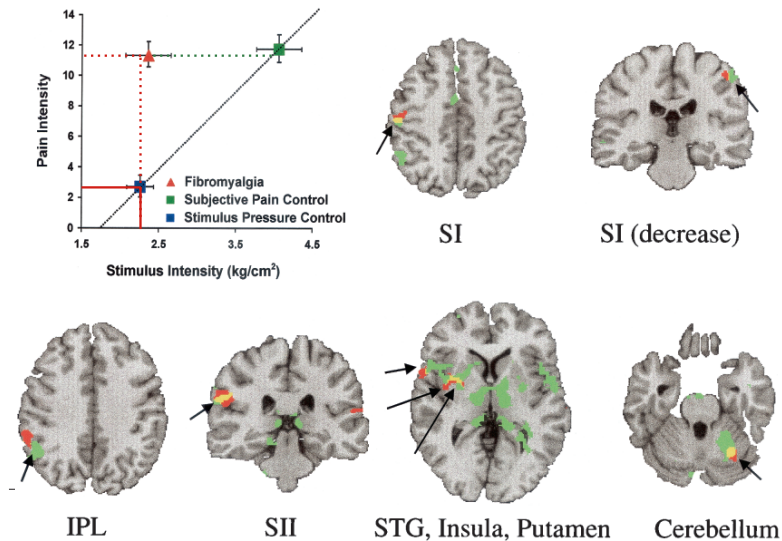
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# ORTHOSTATIC INTOLERANCE

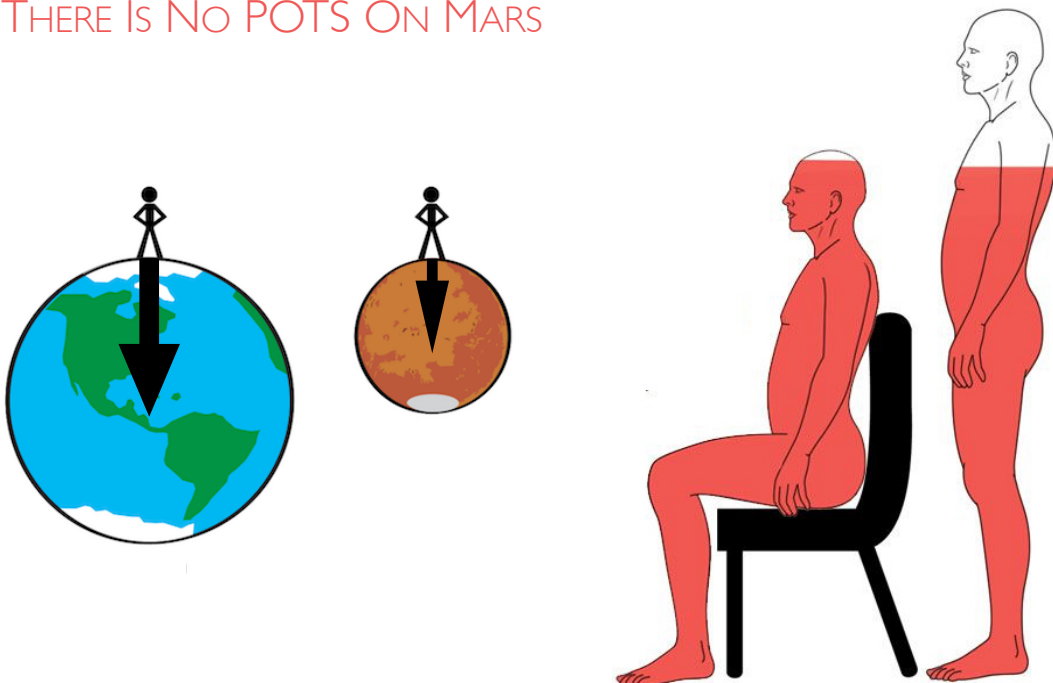
POTS (POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME) & DYSAUTONOMIA



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## POTS: A DISEASE OF GRAVITY

THERE IS NO POTS ON MARS



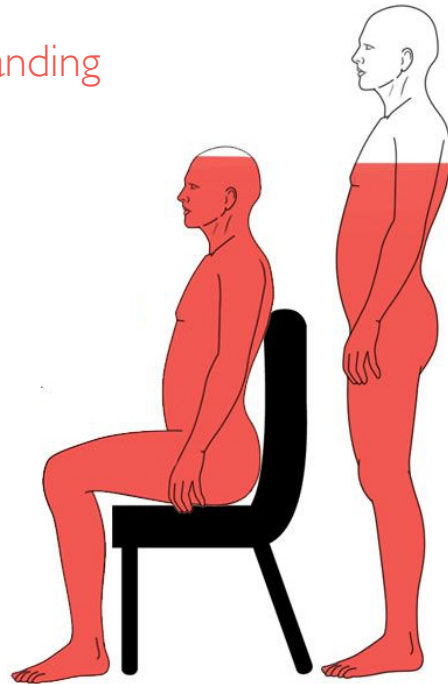
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## POTS : POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME

### Going from lying (or sitting) to standing

- Pooling of blood in the lower body
- Not enough blood to the brain
- Dizziness and fainting
- Heart increases to compensate
  - But makes things worse...
  - Faster heart rate (tachycardia)
    - Means less filling time
    - Means less blood get pumped

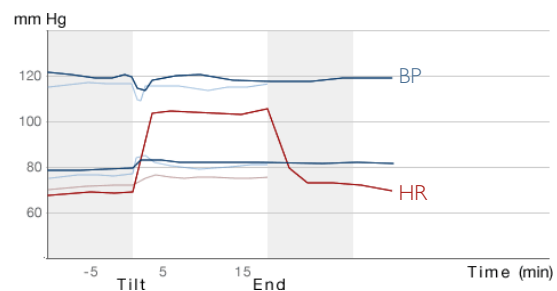
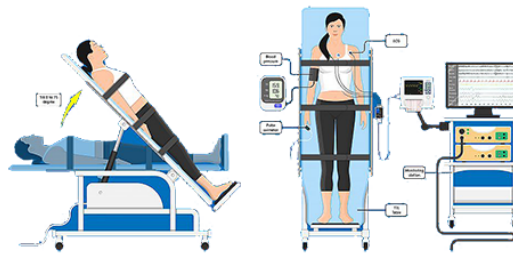


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## POTS – TILT-TABLE TESTING

- Not widely available
- More false positives
- More false negatives if not done in early AM
- Reserved for special circumstances

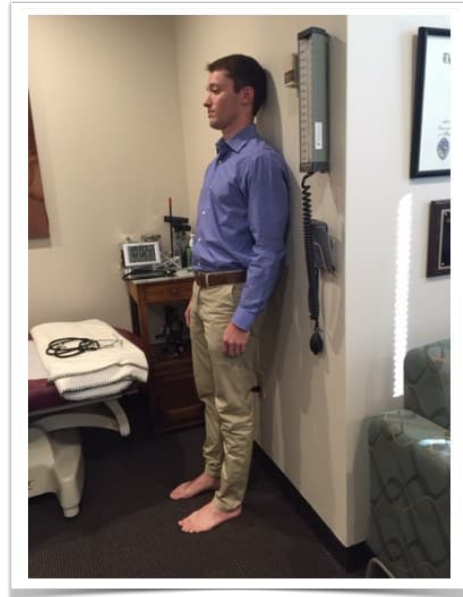


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# NASA LEAN TEST

- **POTS Dx criteria**
  - 1st thing in the AM
  - HR before getting out of bed
  - HR upon standing: time 0, 1, 3 5, 10 min
  - HR > 120 or ↑ 30 BPM
- **NASA lean test**
  - [Download fillable test sheet and resources](#)
- **Tips**
  - Have a friend help
  - Heart monitor helpful
  - Monitor BP (rule out NMH – low BP)
  - You can stop when you meet criteria

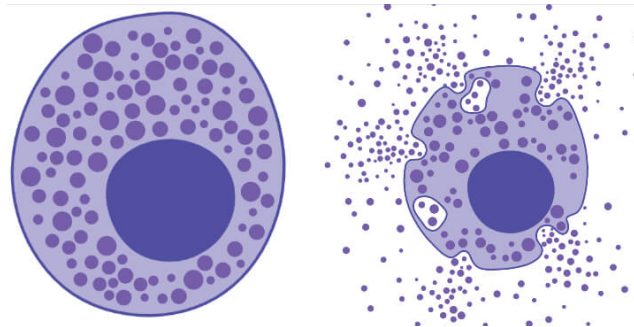


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# MCAS

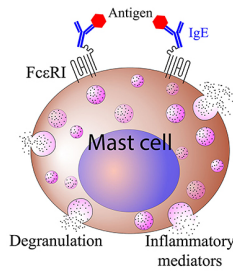
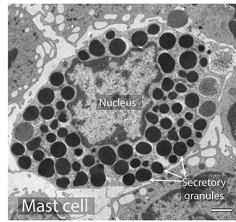
## MAST CELL ACTIVATION SYNDROME IN PATIENTS WITH ME/CFS, FM, AND LONG COVID



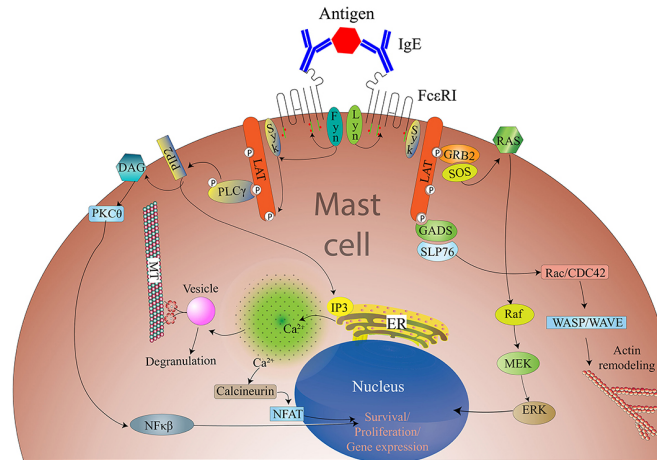
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# ALLERGIES - IGE MEDIATED

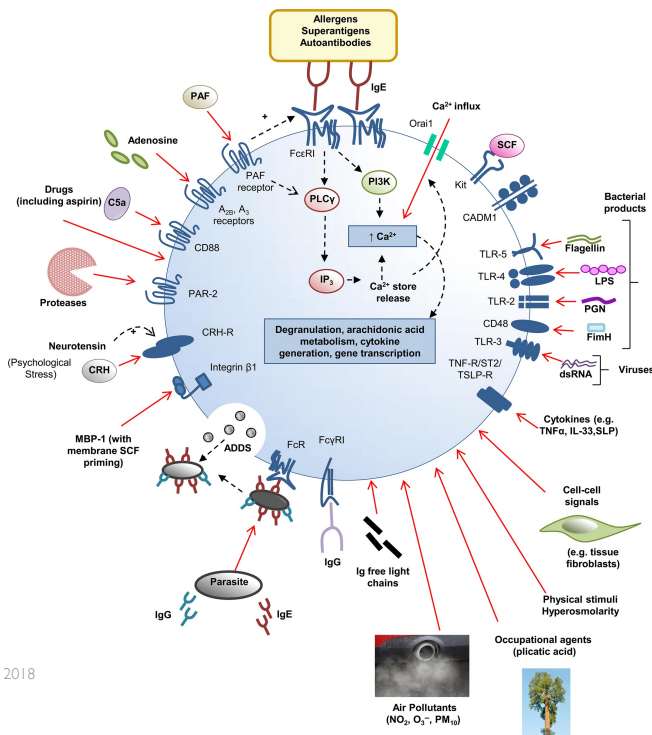


Inflammatory Mediators
TNFα, leukotrienes, IL-12, IL-6, CCL20, IFN γ, histamine, IL-5, IL-13, IL-16, IL-8/CXCL8, IL-1β, MCP-1, CCL5, MC tryptase, IL-4, TGFβ, IL-2, IL-10, serotonin, etc.

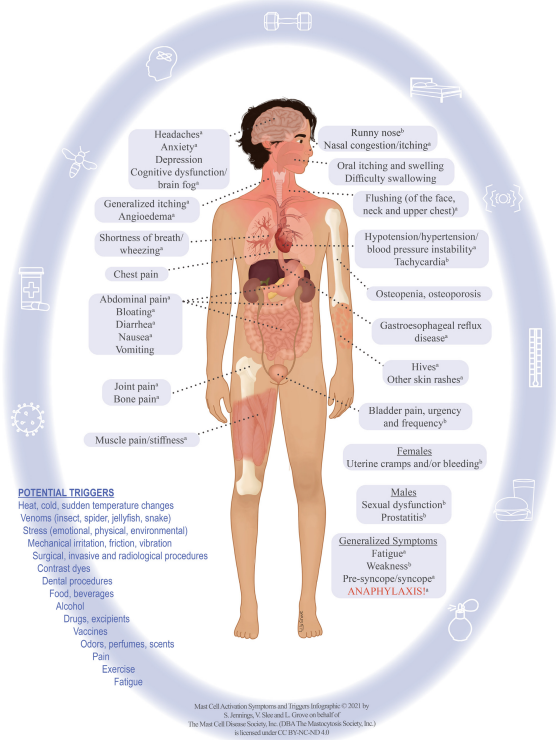


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# MAST CELL RECEPTORS



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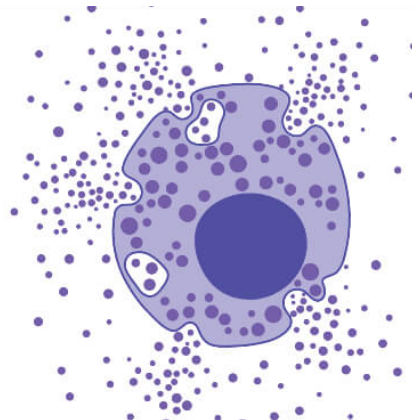
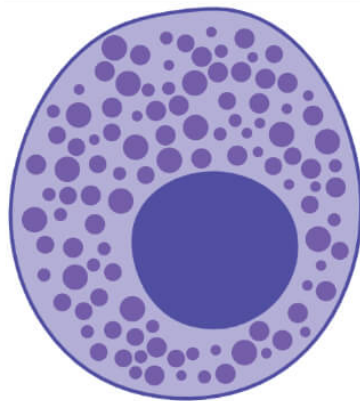


Symptoms can be acute, episodic and recurrent, or chronic and frequent, and may present as generalized, systemic symptoms, including anaphylaxis

71% indicated food restrictions

Mast Cell Activation Symptoms and Triggers Infographic © 2021 by S. Jennings & Shared.Life.com/infographic/ The Mast Cell Disease Society, Inc. (DBA The Mastocytosis Society, Inc.) www.mastcell.org CC BY-NC-ND 4.0

## MAST CELL ACTIVATION

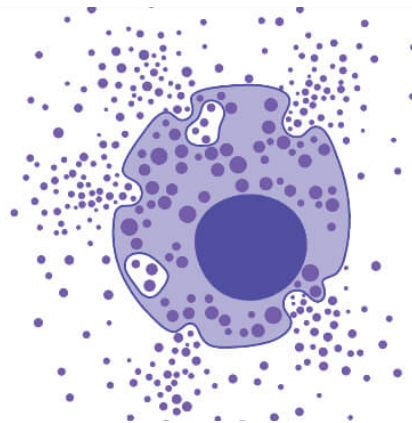
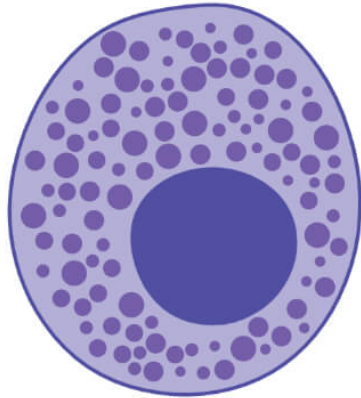


- “Activated” mast cells
- “Twitchy”
  - Lower stimulation threshold
- Non-specific histamine release

- Overlap with ME/CFS and FM symptoms
- Fatigue, pain, brain fog, others



# MAST CELL ACTIVATION



- “Activated” mast cells
- “Twitchy”
  - Lower stimulation threshold
- Non-specific histamine release

- Bone pain
- Skin (e.g., hives)
- Gut symptoms / food intolerance
- Medication intolerance
- Allergy-type symptoms
- Lung symptoms

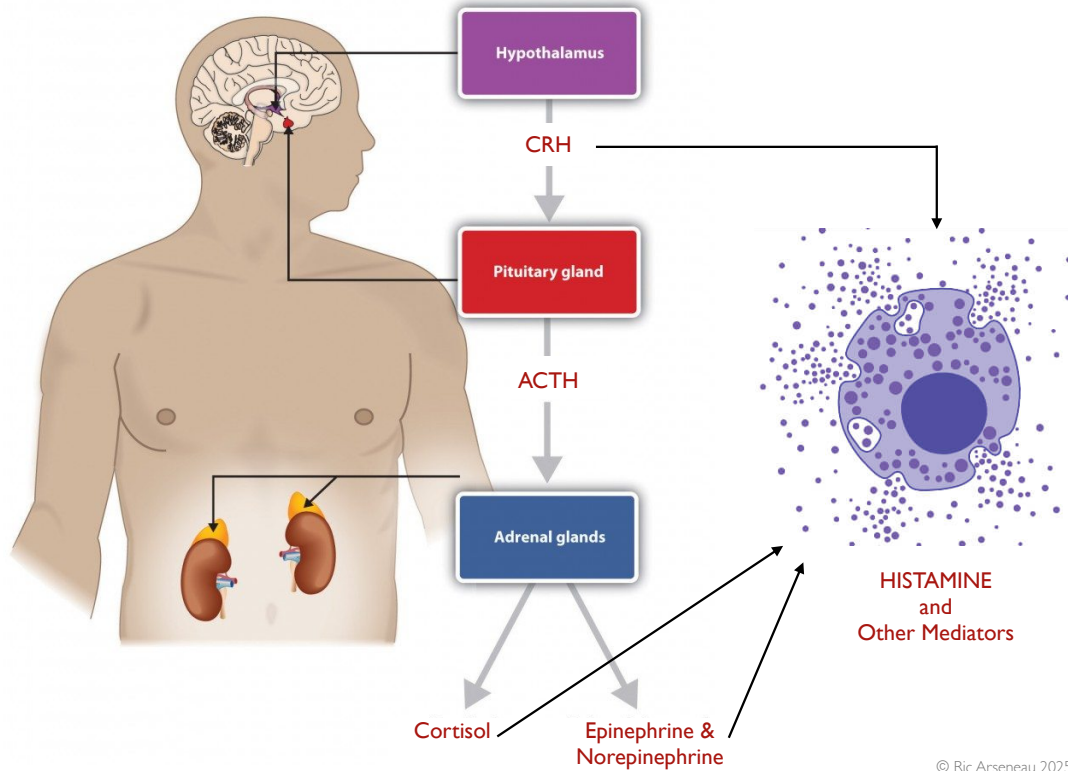
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# HPA AXIS



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DE GRUYTER

Diagnosis 2021; 8(2): 137–152

## Review

# Diagnosis of mast cell activation syndrome: a global “consensus-2”

- Lab tests (e.g, tryptase) usually normal
- Disputes regarding diagnostic criteria
- No studies of validity of criteria
- Practical approach: therapeutic trial of triple therapy
  - Sedating H1 blocker; Non-sedating H1 blocker; H2 blocker

**Table 2:** Broadly accepted characteristics defining the mast cell activation syndrome (MCAS) population.

1. An MCAS patient must have symptoms consistent with *chronic* MCA, which is *aberrant* (i.e. abnormal, whether constitutive/baseline and/or reactive to some identifiable trigger; note most MCAS patients have *both* constitutive and reactive MCA, even if either form is just to a modest degree at a given point), and, in many patients, accompanied by periodic *flares* (a.k.a. “spells,” “episodes,” and such) of certain subsets of their symptoms
2. An MCAS patient must have signs/symptoms of aberrant MCA in *multiple* (i.e. at least two) organ systems
3. An MCAS patient must (with reasonable confidence) *not* have some other disease accounting better than MCA for the full range and duration of the observed symptoms/signs

The characteristics listed here are a synthesis of the published proposals for diagnostic criteria for MCAS [7–9, 20–22, 24].


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# EHLERS-DANLOS SYNDROME HYPERMOBILE TYPE HYPERMOBILE SPECTRUM DISORDER

**Beighton Score**  
5/9 points = Hypermobility



1 point for each thumb  
1 pt for each finger  
1 pt for each elbow  
1 pt for each knee  
1 pt for straight legs + arms

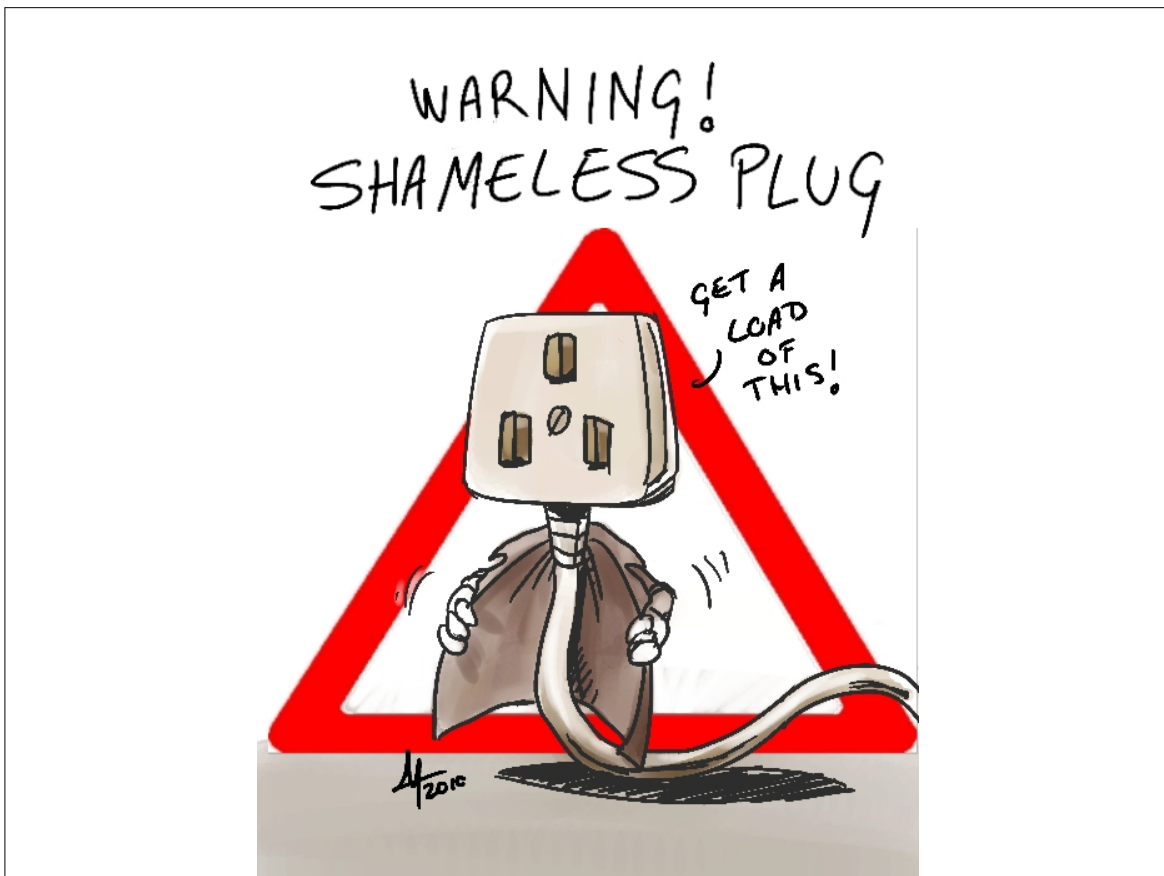
**Brighton Criteria**

- Major Criteria
  - Beighton score of  $\geq 4$  (Figure 4)
  - Arthralgia for longer than 3 months in 4 or more joints
- Minor Criteria
  - Beighton score of 1, 2, or 3 (Figure 4)
  - Arthralgia (> 3-month duration) in one to three joints or back pain (> 3-month duration) or spondylosis, spondylolysis/spondylolisthesis
  - Dislocation or subluxation in more than one joint, or in one joint on more than one occasion
  - Three or more soft tissue lesions (eg, epicondylitis, tenosynovitis, bursitis)
  - Marfanoid habitus (tall, slim, span greater than height (> 1.03 ratio), upper segment less than lower segment (< 0.89 ratio), arachnodactyly)
  - Skin striae, hyperextensibility, thin skin, or abnormal scarring
  - Ocular signs: drooping eyelids, myopia, antimongoloid slant
  - Varicose veins, hernia, or uterine or rectal prolapse
  - Mitral valve prolapse
- Requirement for Diagnosis
  - Any one of the following:
    - two major criteria
    - one major plus two minor criteria
    - four minor criteria
    - two minor criteria and unequivocally affected first-degree relative in family history

BEIGHTON SCORE + BRIGHTON CRITERIA  
= EHLERS - DANLOS SYNDROME

Genetic testing not available

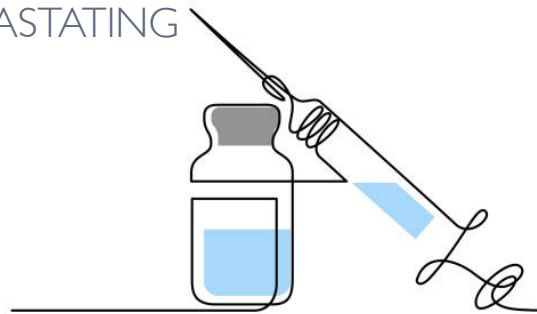
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# PREVENTION / RISK REDUCTION

You may be over COVID but COVID isn't over you !

- Recurrent infection can be DEVASTATING
- Ventilation
- Social distancing
- N95 mask
- Vaccination
  - Novavax better than mRNA
  - Flare of symptoms usually get back to baseline
  - Flare from COVID often *permanent*



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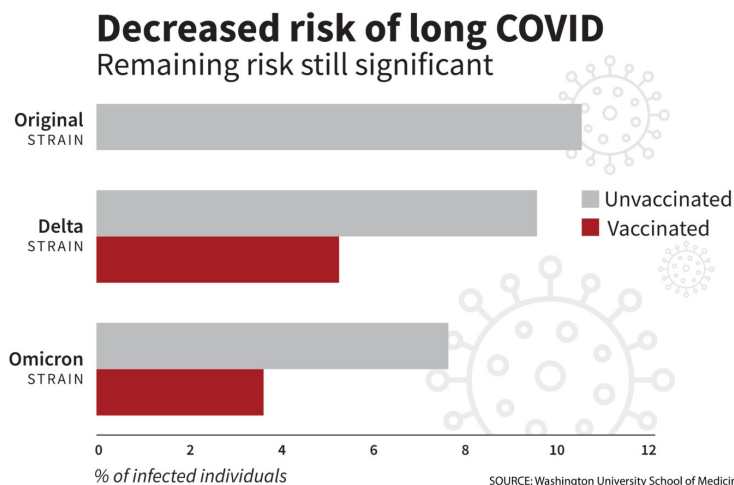


NEWS RELEASE

## Risk of long COVID declined over course of pandemic

Drop attributed mostly to vaccination but remaining risk still significant

by **Kristina Sauerwein** • July 17, 2024



SARA MOSER

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# ME/CFS, FM, AND LONG COVID

## PRIMARY CARE TOOLKIT



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Home NEW PATIENTS About ▼ Contact Resources ▲ ME TV on YouTube Referral Form FAQ

## Primary Care Toolkit ME/CFS, FM, and Long COVID

[Patient Symptom Inventory](#)

[Assessment Tool](#)

[Sit / Stand Test \(Rapid exercise tests for exertional desaturation\)](#)

[NASA Lean Test for POTS and NMH](#)

[Baseline Testing and Evaluation](#)

[Medication and Treatment Handouts](#)

### Webinars – Long COVID, ME/CFS, and FM: A Primary Care Toolkit

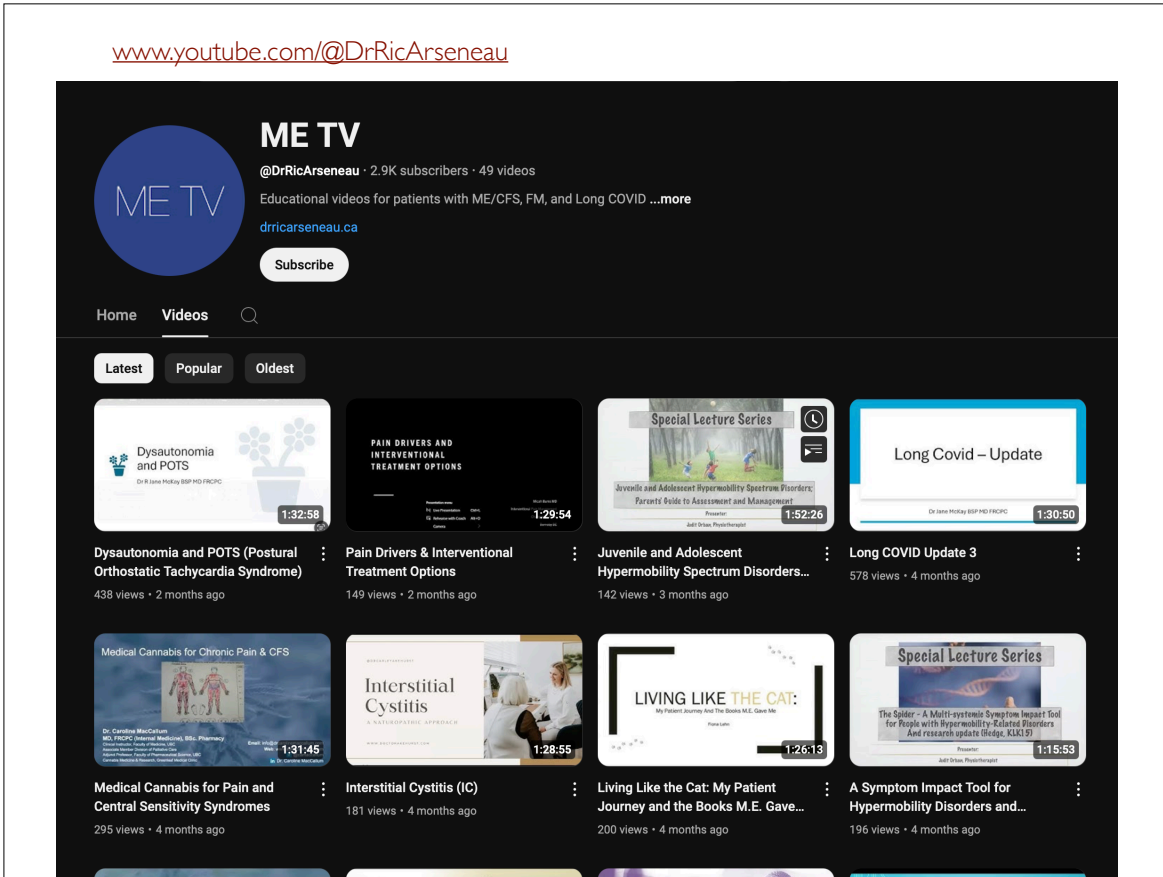
[Part 1](#) (Overview)

[Part 2](#) (Using the Toolkit)

Medication Handouts  
Videos  
Helpful Websites  
POTS Handout (NASA Lean Test)  
Baseline Testing and Evaluation  
Family & Friends  
[Primary Care Toolkit](#)



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**LONG COVID THE ANSWERS**  
CREDIBLE INFORMATION & RELIEF

- ▶ Educating the public & medical professionals to identify, manage & relieve long COVID symptoms.
- ▶ Collaborating with top scientists, doctors & long-haulers to share evidence-based insights & innovative strategies.
- ▶ Bridging research & practice to improve health outcomes, reduce transmission & enhance quality of life.

**Empowering Health through Knowledge**

# QUESTIONS...

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