Understanding ”Post-Acute COVID19”

VCH Family & Community Practice Rounds

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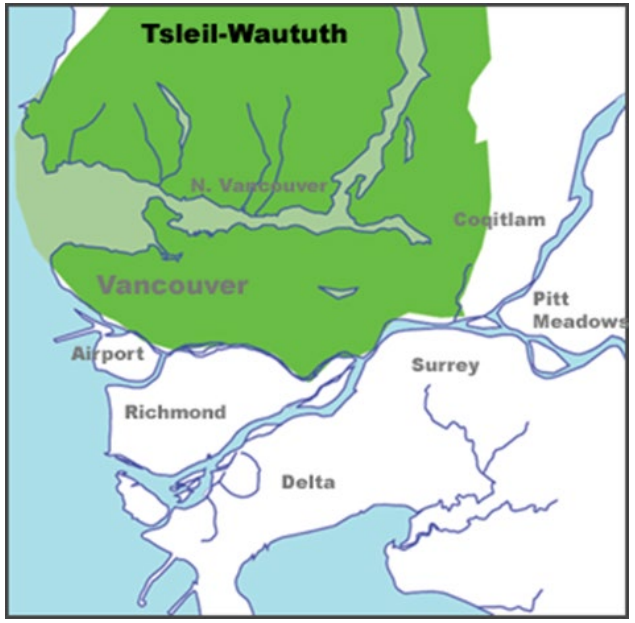
We would like to acknowledge that we are gathered today on the traditional territories of the Musqueam, Squamish and Tsleil-Waututh peoples.

Source: www.johomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html



OBJECTIVES

- Understanding the virus
- What is “LONG COVID” – understanding the various definitions
- Best practices for investigating symptoms
- Understanding prevalence of disease
- How to support patients in primary care
- Resources for your patients

PC – ICCN

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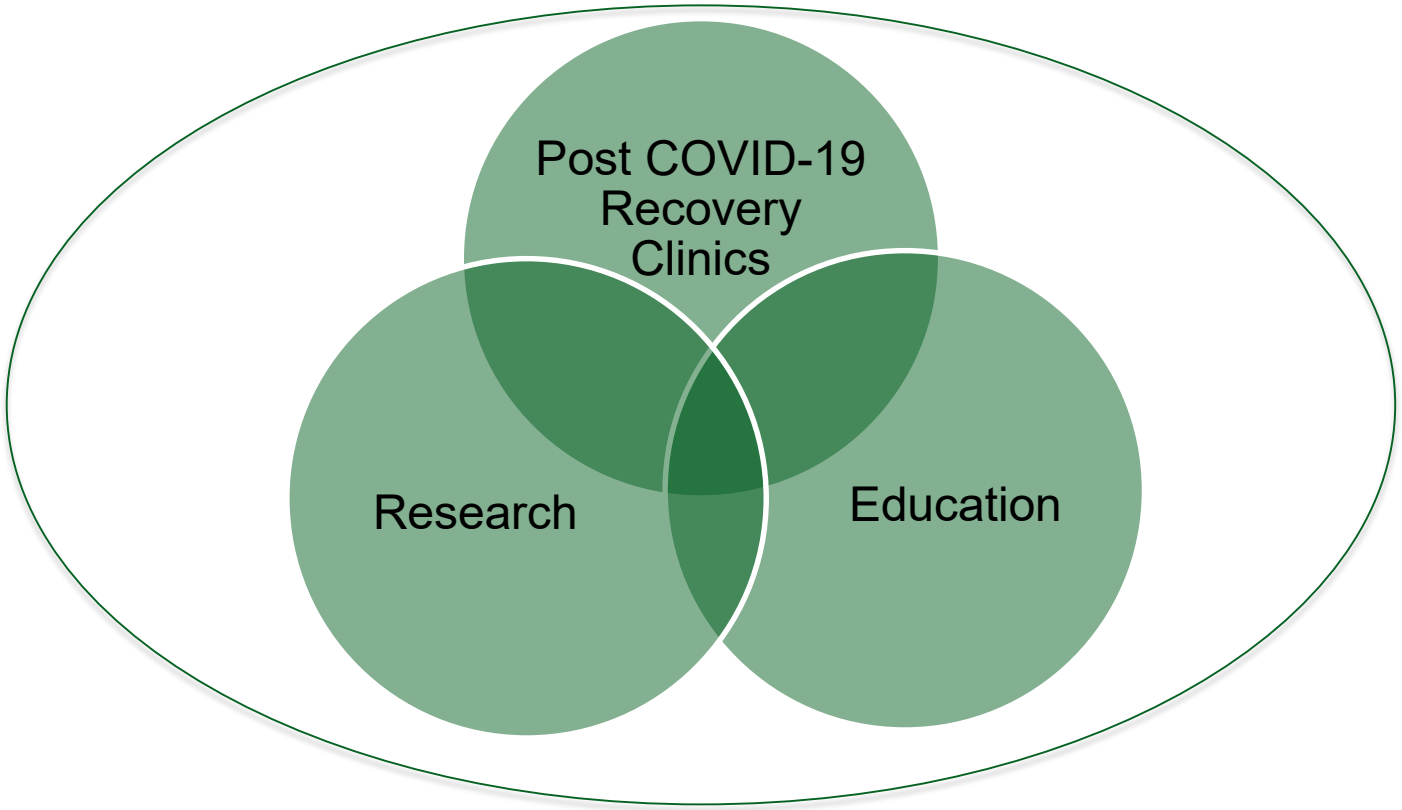
Co-ordinate care, research, and education

for optimal outcomes for Patients and Health care systems



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Province-wide solutions. Better health.
First Nations Health Authority
Health through wellness
fraserhealth
island health
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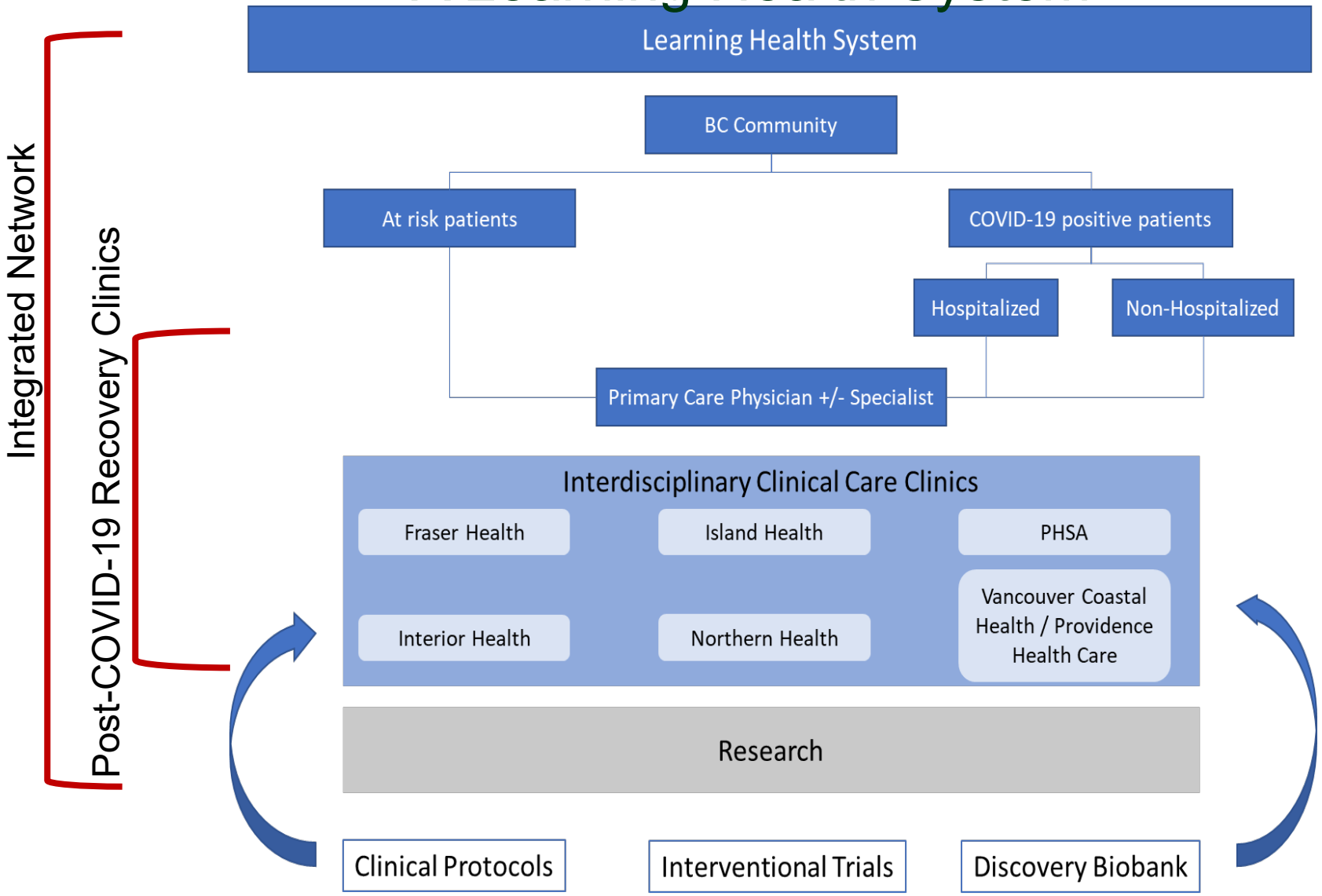
Provincial Network of Post COVID-19 Recovery Clinics
A Learning Health System



UNDERSTANDING THE VIRUS

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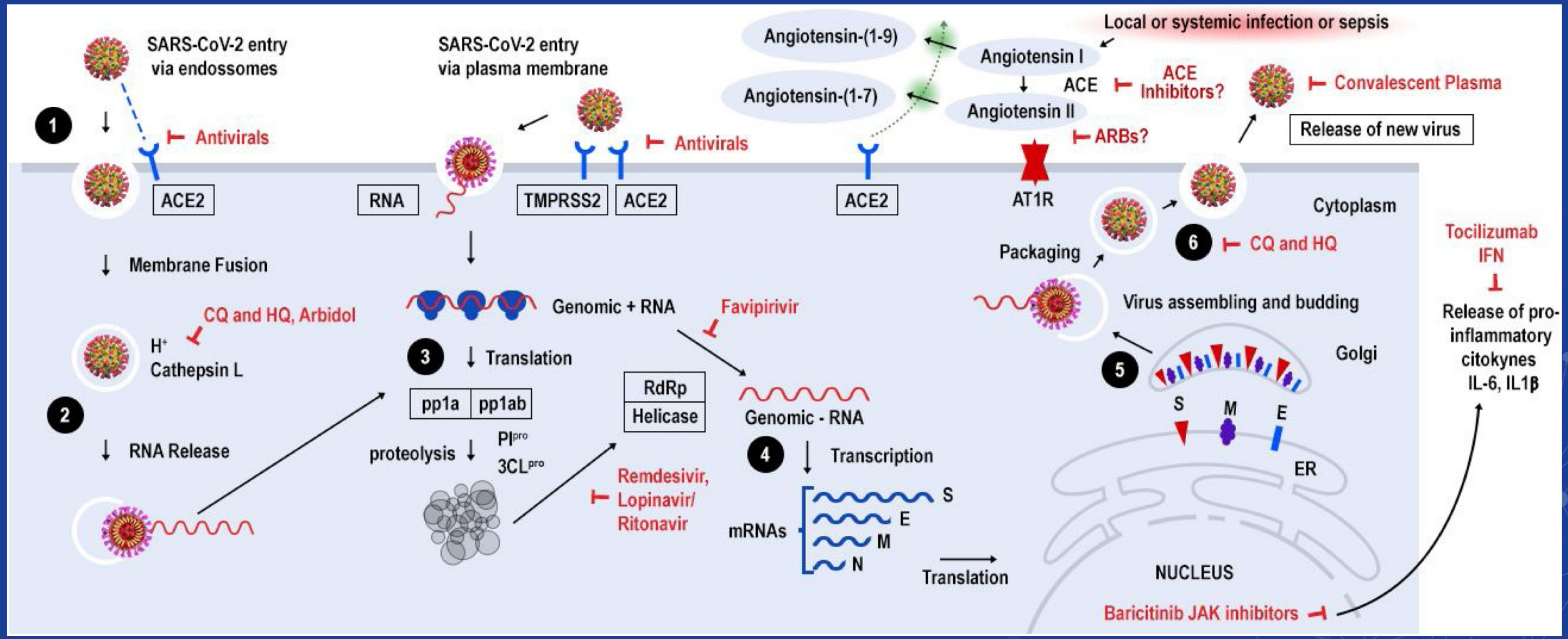


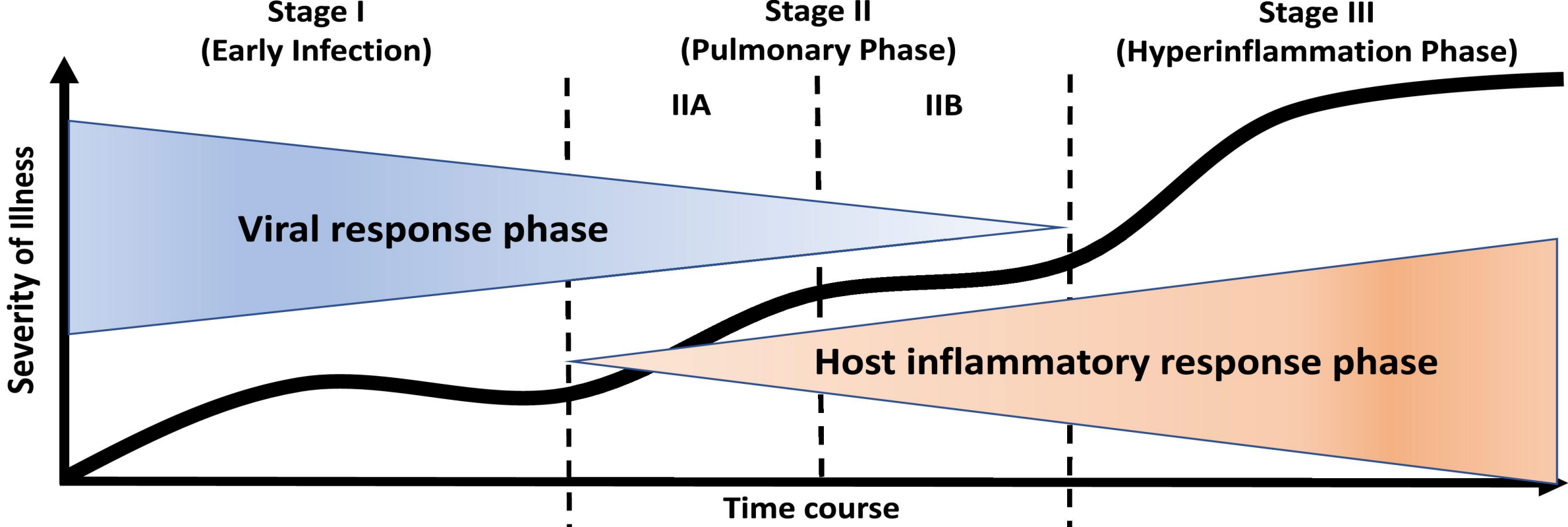
https://doi.org/10.1016/j.biopha.2020.110493

Understanding Host Defense

- Early in infection, SARS-CoV-2 targets cells, such as nasal and bronchial epithelial cells and pneumocytes, through the viral structural spike (S) protein that binds to the angiotensin-converting enzyme 2 (ACE2) receptor
- ACE2 are expressed in host target cells, particularly alveolar epithelial type II cells
- Similar to other respiratory viral diseases, such as influenza, profound lymphopenia may occur in individuals with COVID-19 when SARS-CoV-2 infects and kills T lymphocyte cells

Understanding Host Defense

- ACE2 is broadly expressed in vascular endothelium, respiratory epithelium, alveolar monocytes, and macrophages
- Tropism of the upper respiratory tissue probably explains continuous pharyngeal shedding of the virus and a more efficient transmission of SARS-CoV-2 than SARS-CoV when symptoms are still minimal and restricted to the upper respiratory tract
- Later in disease course, COVID-19 resembles SARS in terms of viral replication in the lower respiratory tract, and generates secondary viremia, followed by extensive attack against target organs that express ACE2, such as heart, kidney, gastrointestinal tract and vast distal vasculature.



	Stage I (Early Infection)	Stage II (Pulmonary Phase)	Stage III (Hyperinflammation Phase)
Clinical Symptoms	Mild constitutional symptoms Fever >99.6˚F Dry Cough	Shortness of Breath without (IIA) and with Hypoxia (IIB) (PaO2/FiO2≤300mmHg)	ARDS SIRS/Shock Cardiac Failure
Clinical Signs	Lymphopenia	Abnormal chest imaging Transaminitis Low-normal procalcitonin	Elevated inflammatory markers (CRP, LDH, IL-6, D-dimer, ferritin) Troponin, NT-proBNP elevation

Understanding Host Defense

- In severe COVID-19, fulminant activation of coagulation and consumption of clotting factors occur.

- Inflamed lung tissues and pulmonary endothelial cells may result in microthrombi formation and contribute to the high incidence of thrombotic complications, such as deep venous thrombosis, pulmonary embolism, and thrombotic arterial complications

Understanding Host Defense

- Covid-19 may be associated with a dysregulated immune response and hyperinflammation, which can lead to or exacerbate acute respiratory distress syndrome and multiorgan failure.

- Higher levels of interleukin-6 have been positively correlated with cases of critical and severe Covid-19, whereas lower levels of interleukin-6 have been correlated with mild disease and elevated levels predictive of mechanical ventilation

What is ”Long COVID”

- No standard definition but common nomenclature includes:
  - LONG COVID
  - CHRONIC COVID
  - LONG HAUL COVID
  - Post-Acute Sequelae of SARS-CoV-2 infection (PASC)
  - POST-ACUTE COVID 19 SYNDROME

What is ”Long COVID”

- Typically will need to be symptomatic for >12 weeks
- The 4-12 week mark is still a but ambiguous, but reasonable to just refer to it as a subacute period
  - Unclear who will develop longterm symptoms

We are seeing a wide variety of patient phenotypes

- Post-Hospitalization/ICU (PICS)
- Non-hospitalized and very symptomatic (fatigue, brain fog, insomnia)
- Asymptomatic
- Mildly symptomatic (hospitalized and non-hospitalized)
  - Similar to protracted mono-type illness

Post-Hospitalization/ICU (PICS)

- For this population, we are seeing recovery as expected in the PICS population
- Many are still symptomatic at 3, 6, 12 months.
  - We do not know how to predict rate of recovery, but ICU delirium, length in ICU, sedation, etc.. are presumed risk factors
  - However, we are counselling that overall we are seeing improvement at each visit
- There is a percentage of individuals at the 3 month mark who are asymptomatic

Non-hospitalized and very symptomatic

- Often what we hear most about on news and what patients are most fearful of (LONG COVID)
- Still a novel disease and don't know have good estimates for longterm outcome

Non-hospitalized and very symptomatic

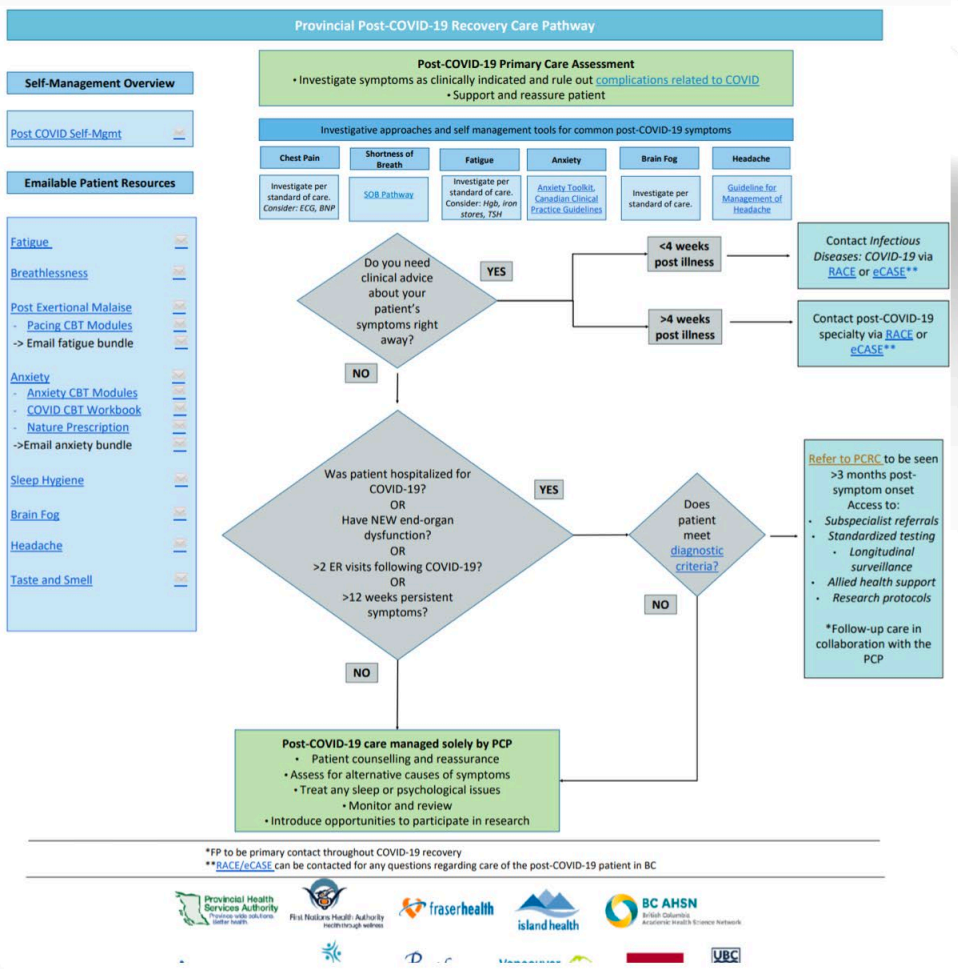
- What we know
  - If minimal symptoms at 3 months, unlikely to develop any new symptoms
  - If very high symptom burden at 3 months, very hard to predict outcome
  - If high symptom burden and slow improvement, likely to continue to improve
  - Estimates of symptoms at 12 weeks:
    - Likely ~15% of positive tests
    - When considering debilitating symptoms: 1.2% of 20 year old cases to 4.8% of 60 year old cases

Investigating Symptoms

- Given wide variety of presentations and symptoms, there are no guidelines.
  - Investigate as you would if COVID wasn't diagnosed
  - Look for red flags
    - Pleurisy, signs of DVT, increased ICP
    - Hypoxia
  - Mental health screening
  - Fatigue: CBC, TSH, Ferritin, OSA testing
  - Palpitations: CBC, TSH, ECG, +/- Holter, orthostatic vitals
  - Brain fog/neuropsychiatric: Mental health screening

Investigating symptoms

- Check out the Post-COVID-19 Recovery Care Pathway on Pathways for practical approaches to investigating symptoms and self management techniques



What we have learned

- CXR: In non-hospitalized patients, almost never identify any abnormalities (unless incidental).
  - Can be useful for reassurance
- CT Scans (NON-PE): similar as above. Changes being seen in hospitalized
- PFTs: Not overly helpful for management (Decreased DLCO in hospitalized patients)
- D-Dimers: approximately 50% of hospitalized patients have persistently positive D-dimers. Not being seen in outpatients, so can still be used as as rule-out test.
- If liver enzymes still elevated after 3 months, look for other causes

PATHOPHYSIOLOGY

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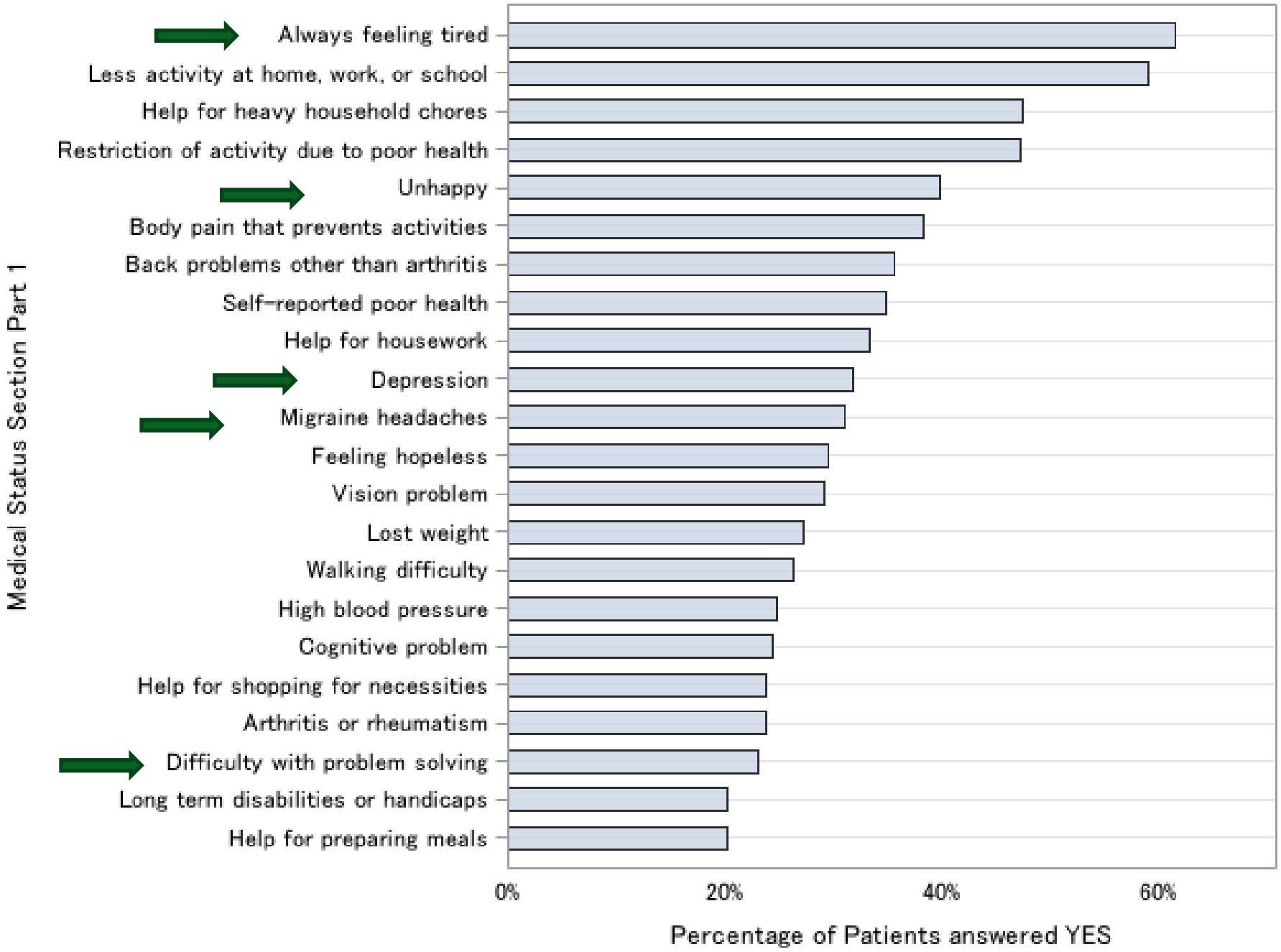
PATHOPHYSIOLOGY

- Unfortunately remains unknown at this time. Theories include:
  - persistent live virus
  - autoimmune
  - inflammatory sequelae
  - dysautonomia

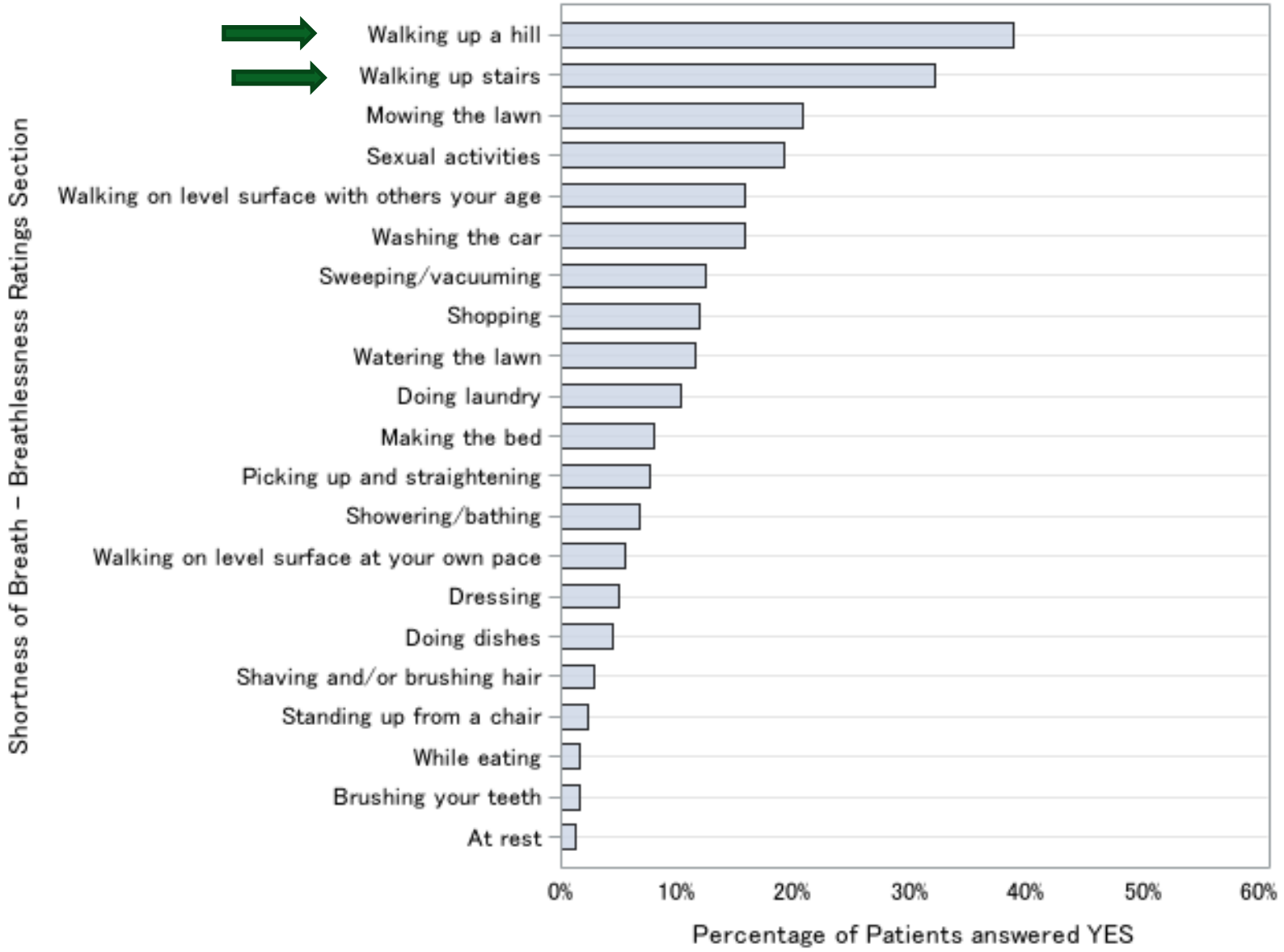
LOCAL DATA



Substantial burden of symptoms

Tiredness,
Reduced activity
Requiring help
Depression
Headaches

25% : Difficulty with problem solving “ Brain fog’



Shortness of Breath

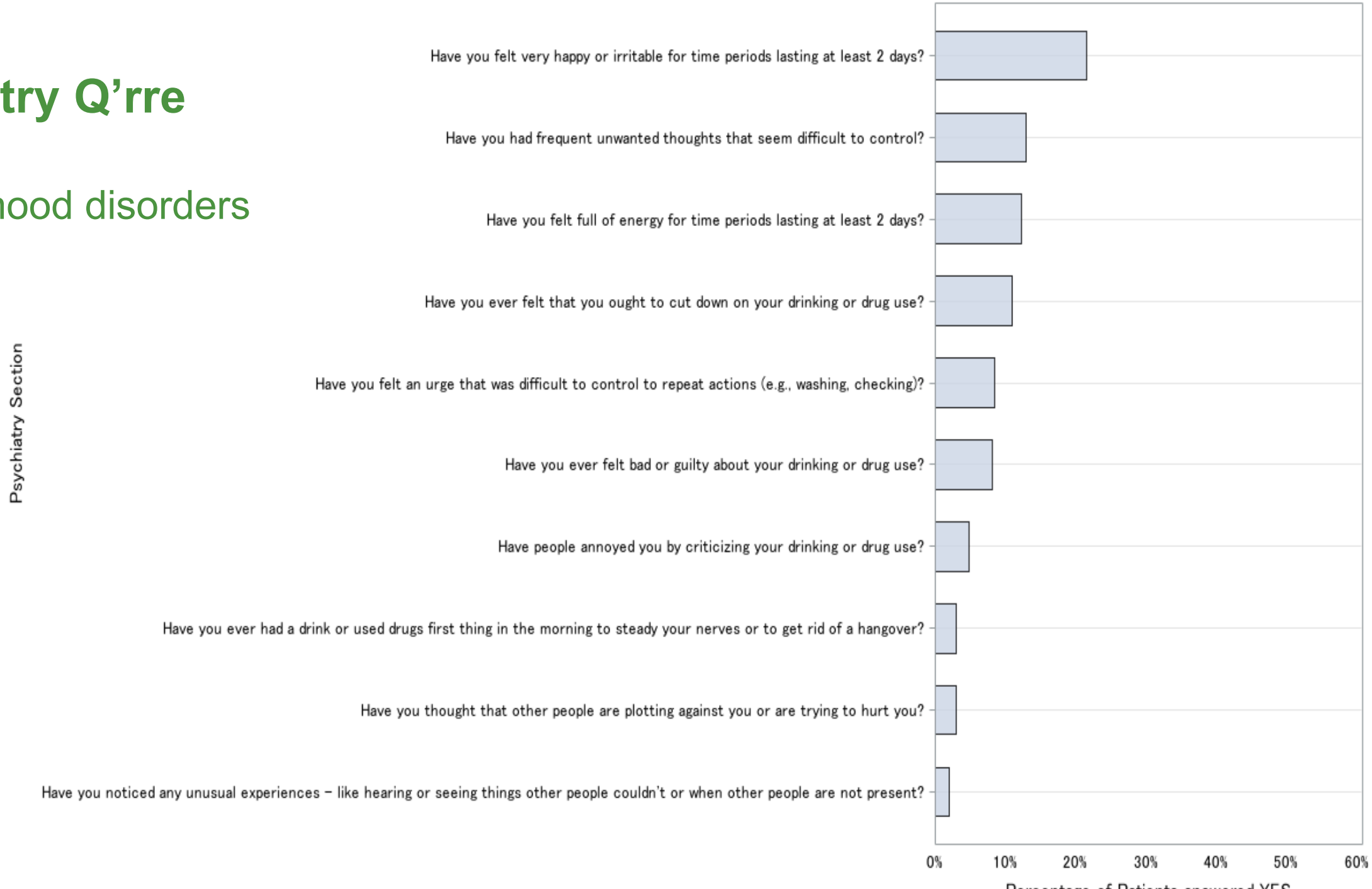
40-50% of patients describe Shortness of breath with walking up hills or stairs

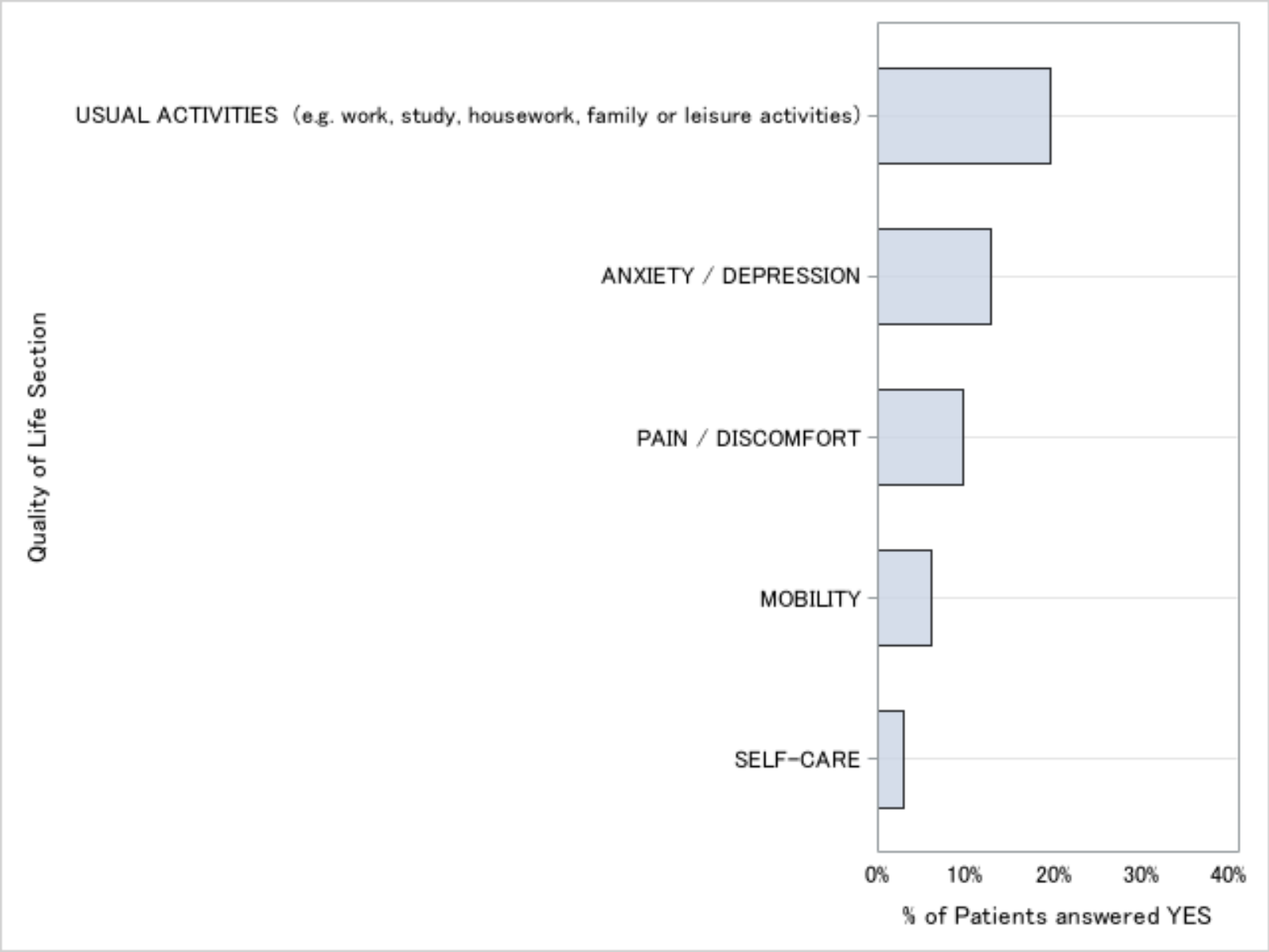
15% report SOB with minimal activities

For an average day during the past week, rate your breathlessness on a scale of 0 to 5, where 0 is not at all breathless and 5 is maximally breathless or too breathless to do the activity. (Consider >3 as YES)

Psychiatry Q’rre

15-20% mood disorders

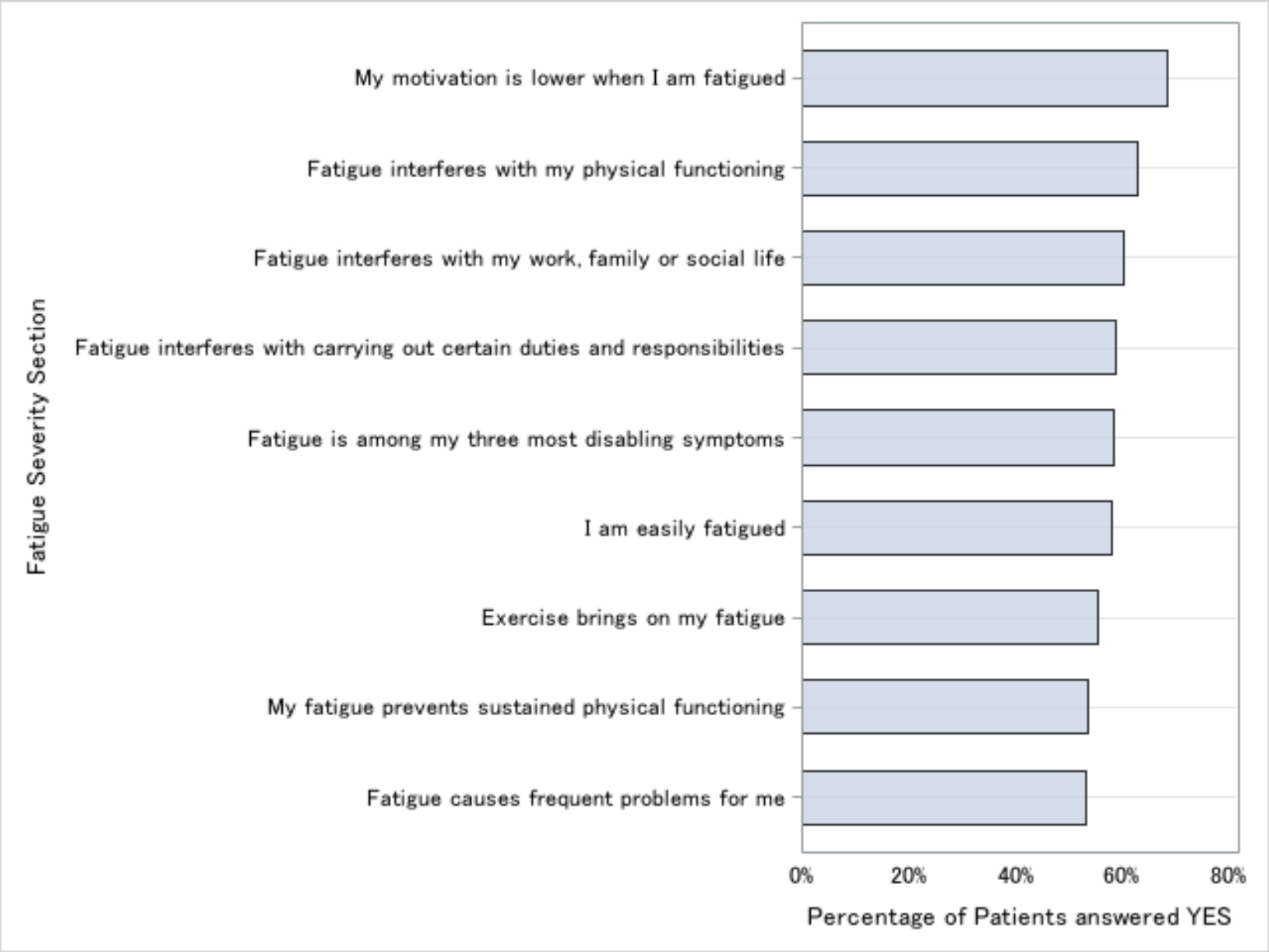




Quality of Life

25% report problems doing 'normal' activities

Rating your health TODAY 1 = have no problems doing things 5 = unable to do things (Consider >3 as patients with problems)

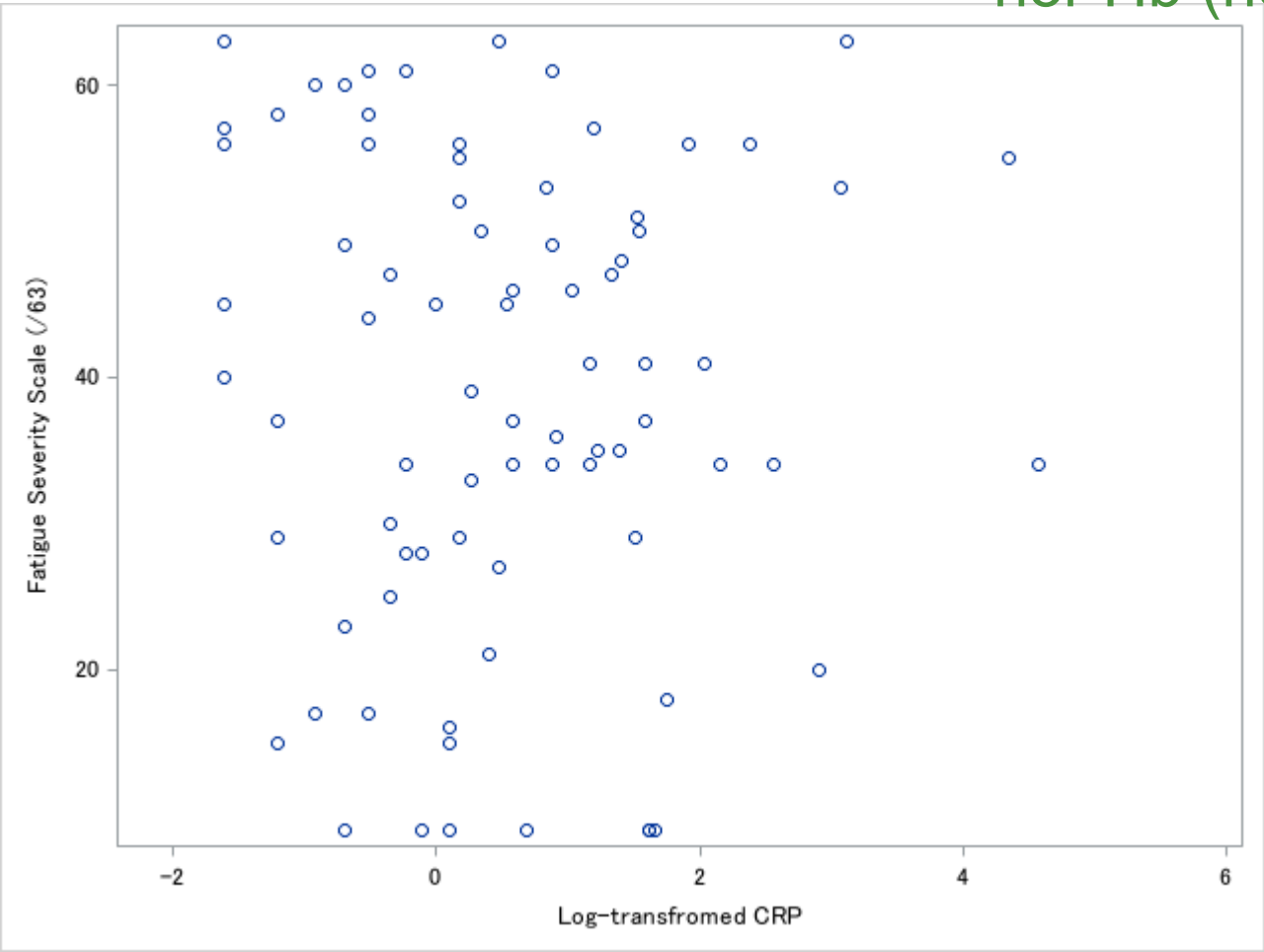


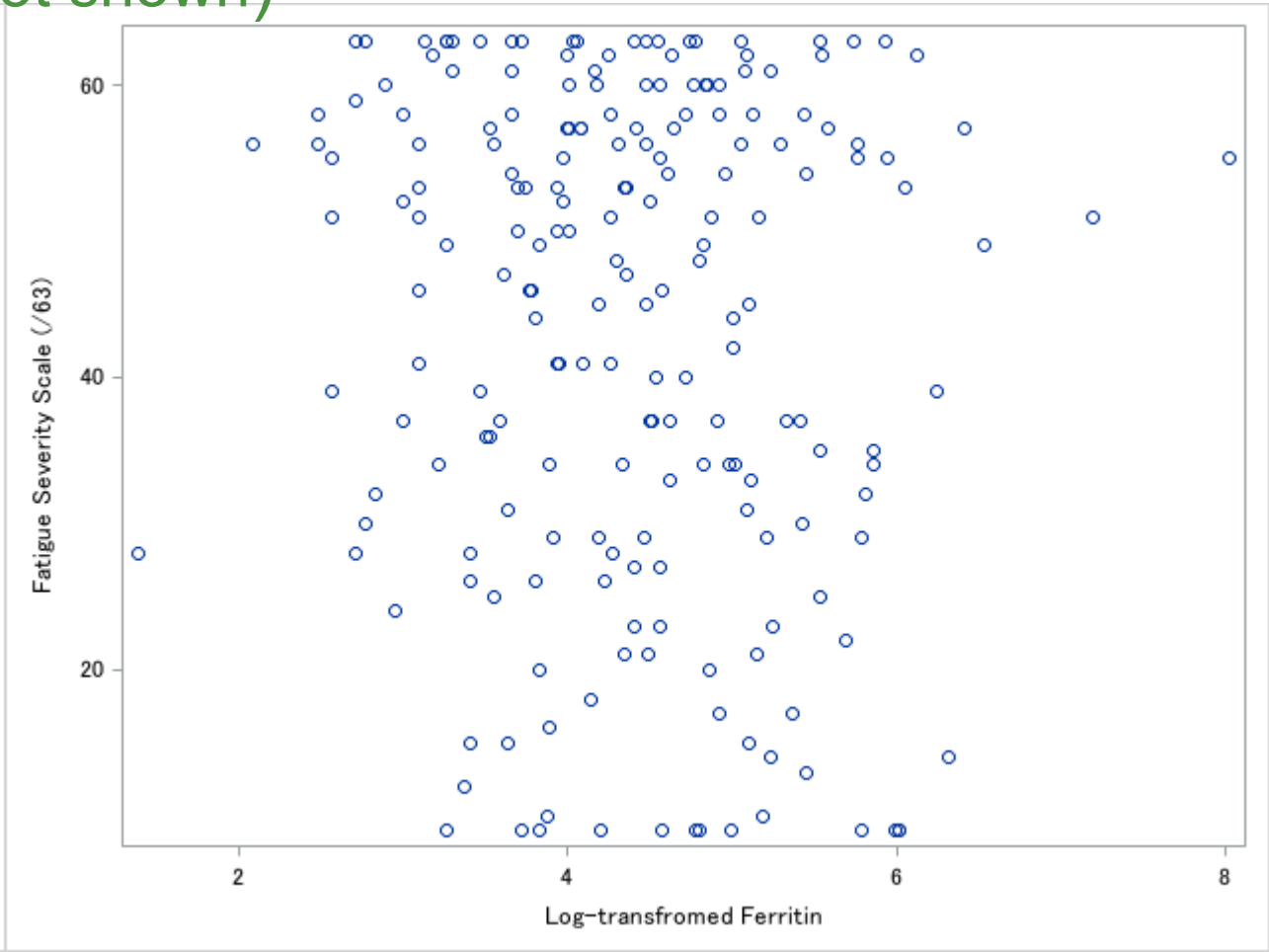
Fatigue Severity Score

60% report fatigue interferes with my life

How you have been feeling on average over the past week. 1 = strongly disagree 4 = neither agree nor disagree 7 = strongly agree. (Consider >4 as YES)

No apparent relationship between Fatigue severity and any of CRP, Ferritin, nor Hb (not shown)





*Correlation=-0.06, P-value = 0.6154

*Correlation=-0.10, P-value = 0.1423

D-DIMERS

- Approximately 50% of hospitalized patients will have positive D-DIMERS
  - DOES NOT IMPLY UNDERLYING VENOUS THROMBOEMBOLIC DISEASE
  - LIKELY ENDOTHELIAL DYSFUNCTION. ? CORRELATES WITH SYMPTOMS

PREVALENCE OF ”POST ACUTE C19”

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Prevalence of ongoing symptoms

- Using UK COVID-19 Infection Survey data
  - Self reported (>20,000 participants)
  - between 3% and 12% of people infected with coronavirus have symptoms 12 weeks after the initial infection;
  - between 7% and 18% when considering only people who were symptomatic at the acute phase of infection.

  - In the UK estimates suggest that 643,000 people in private households in the UK could be experiencing activity-limiting long COVID symptoms.

SYMPTOMS

- Fatigue – 58%
- SOB – 42%
- Myalgias - 32%
- Difficulty Concentrating – 31%

SYMPTOMS

- Prevalence of self-reported long COVID was greatest in
  - people aged 35 to 69 years
  - females
  - people living in the most deprived areas
  - those working in health or social care,
  - those with another activity-limiting health condition or disability.

VACCINES

Get Vaccinated after Infection

Reduced Risk of Reinfection with SARS-CoV-2 After COVID-19 Vaccination — Kentucky, May–June 2021

Weekly / August 13, 2021 / 70(32);1081-1083

On August 6, 2021, this report was posted online as an MMWR *Early Release.*

Alyson M. Cavanaugh, DPT, PhD[1,2]; Kevin B. Spicer, MD, PhD[2,3]; Douglas Thoroughman, PhD[2,4]; Connor Glick, MS[2]; Kathleen Winter, PhD[2,5] (View author affiliations)

- OR 2.34 for those unvaccinated to be reinfected

Likely reduced risk of ”LONG COVID”

- Between December 2020 and July 2021, symptoms of more than 1.2 million adults who received one coronavirus vaccination and 971,504 who received two vaccinations were monitored.
  - Just 0.2% of fully-vaccinated people said they had had a Covid infection after vaccination (2,370 cases)
- Of the 592 fully vaccinated people with Covid who continued to provide data for more than a month,
  - 5% had symptoms >28 days
  - Compared to 11% without vaccination

SUPPORTING YOUR PATIENTS

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Supporting your patients

- Education – No quick fix
- Directing to resources available (PHSA)
- Therapeutic listening
- Validating symptoms

Supporting your patients

- COVID19 recovery is rooted in self management and understanding the condition
- Recovery is not linear
  - Fluctuating symptoms and often setbacks
  - Plan, pacing, prioritization
- Referral to PCRC as needed

Post-COVID-19 Care & Recovery

Support your understanding and management of symptoms as you recover from COVID-19.

Most people with COVID-19 recover within two weeks. But, some people with more severe symptoms can take twelve weeks or more to feel better.

This page includes fact sheets, links to external websites and other material that may support your understanding and management of your COVID-19 recovery.

Symptom management fact sheets +

Tools for managing symptoms +

Videos on recovery and care +

COVID-19 recovery resources +

Visit the BC Centre for Disease Control for information about COVID-19, how to protect yourself, your family and your community and what to do if you suspect you have the virus.

Quick links

- Post-COVID-19 recovery clinics
- Post-COVID-19 clinical care resources
- BCCDC COVID-19 health info

RESOURCES

Resources

- PHSA - ”google” PHSA COVID19 Recovery
- PATHWAYS
- NHS Your Covid Recovery
- Victora CBT skills (cbtskills.ca)

Network partners

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Health through wellness

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