How to assess & diagnose Long COVID

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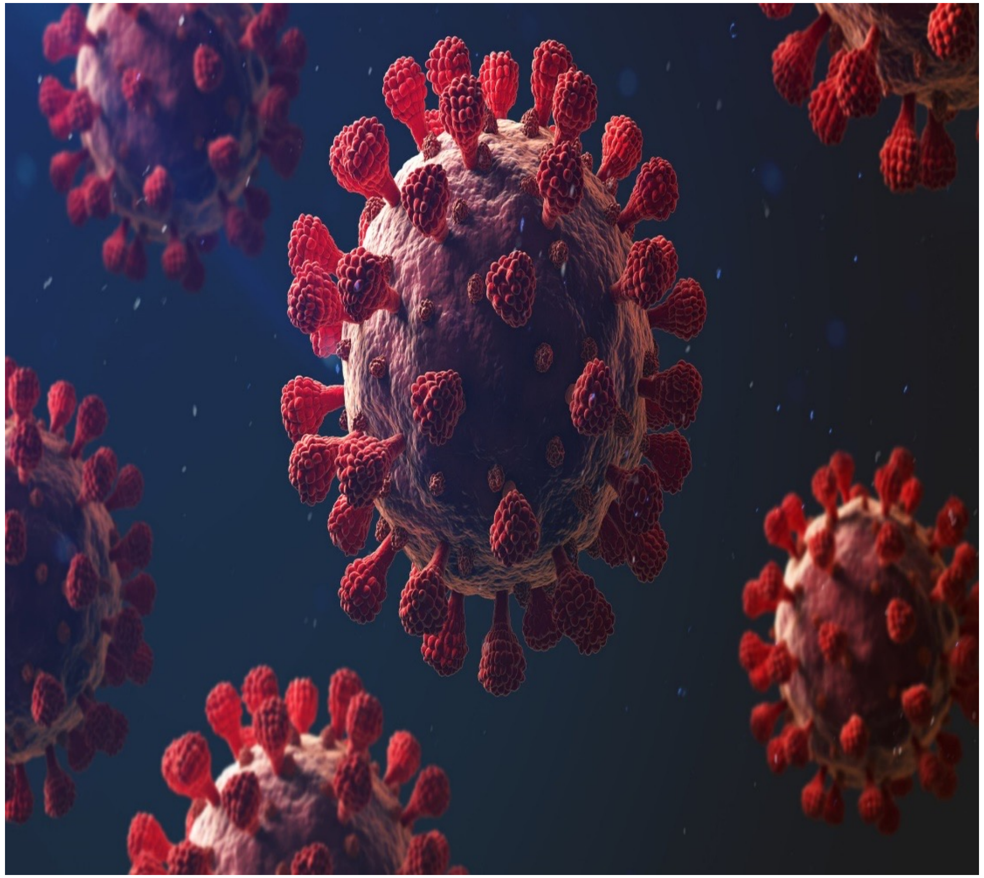
Aims and Objectives

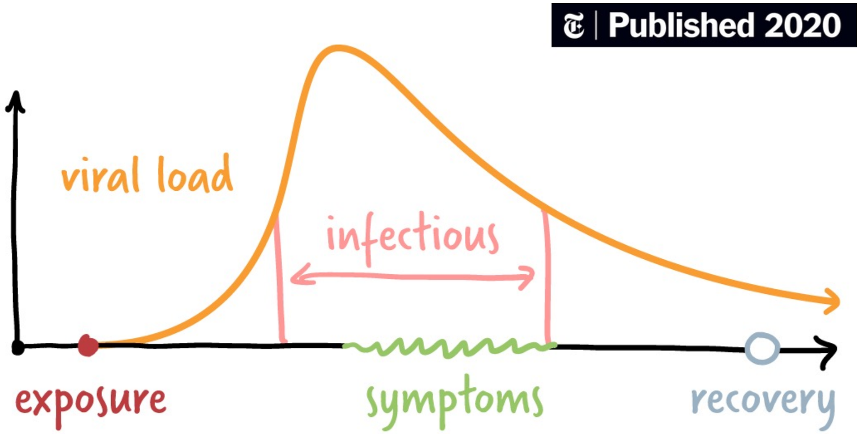


- What is Long COVID
    - Diagnosis
- What are the symptoms
    - When to investigate these symptoms
- What Investigations to do and when
- What can be done in Primary Care
- When to Refer?
    - Which patients need to be referred
    - What stage to refer?
    - Which specialty to refer

Phases – Positive test not a required

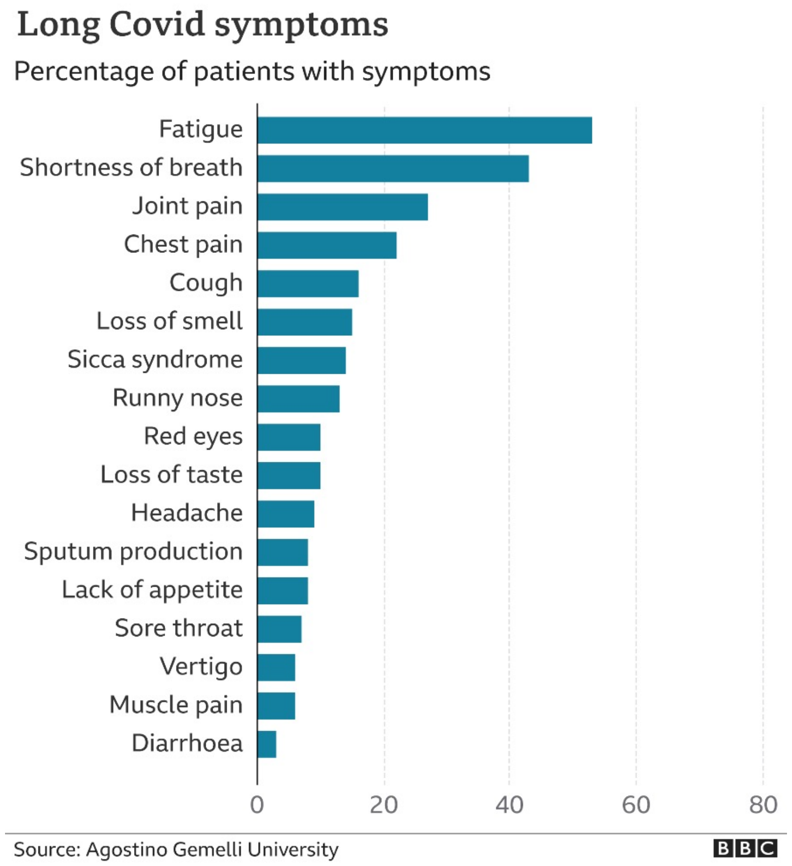
- Acute Covid <4 weeks
- Ongoing symptomatic Covid -19
  - 4-12 weeks
  - Most symptoms resolve in the first 12 weeks
- Post covid -19 Syndrome
  - Developed during an infection but persist after 12 weeks
  - Are not explained by an alternative diagnosis

Life threatening complications may develop at any time so will need investigation urgently



What is being observed…

- 16-56% reported symptoms after 12 weeks
- Upto 83% (4-12 weeks) 76% at 6 months
- 50% of hospitalised patients at 3 months
- Study in China (Lancet 2021;398:747)
    - SOB & Anxiety increased from 6 -12 months
    - 88% of employed people returned to work at 12months

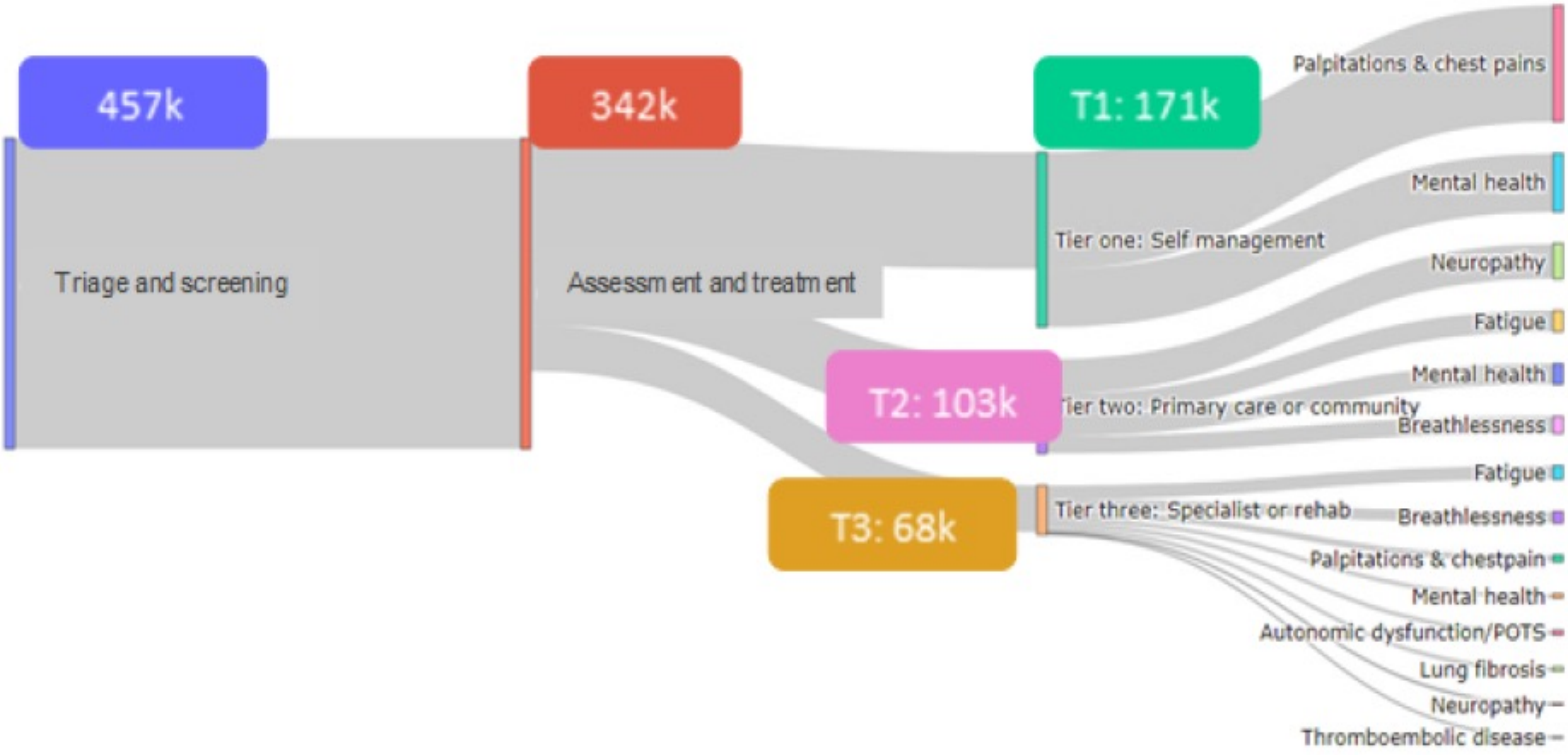


- Likelihood of Long COVID developing is not thought to be associated with any particular symptom, severity of COVID infection or whether hospitalised or not
- Vaccinated group Long COVID incidence is unknown

Raise awareness – provide info to all patients

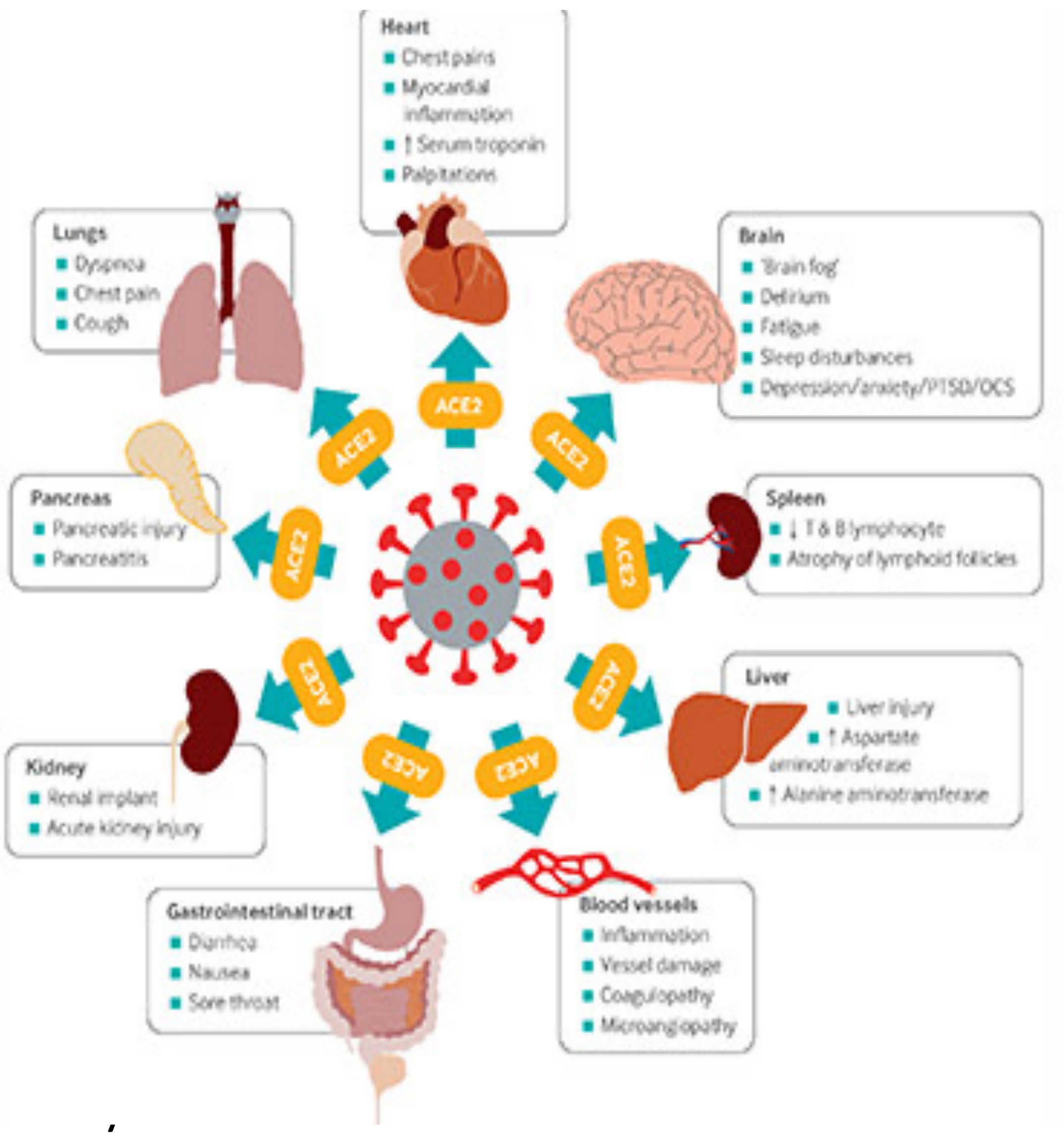
- The normal trajectory of recovery
  - What to expect in the recovery period
  - When and how to seek help
- Written info is better
    - Due to fatigue and cognitive symptoms
    - Reduced ability to take in complex information
- Self-Monitoring may be beneficial but has potential to cause anxiety
- NHS website Your COVID recovery is useful
  - https://www.yourcovidrecovery.nhs.uk
  - Snomed codes
    - Signposting to Your COVID Recovery 1325021000000106
    - Referral to Your COVID Recovery rehabilitation platform 1325041000000104

What we are trying to do…..



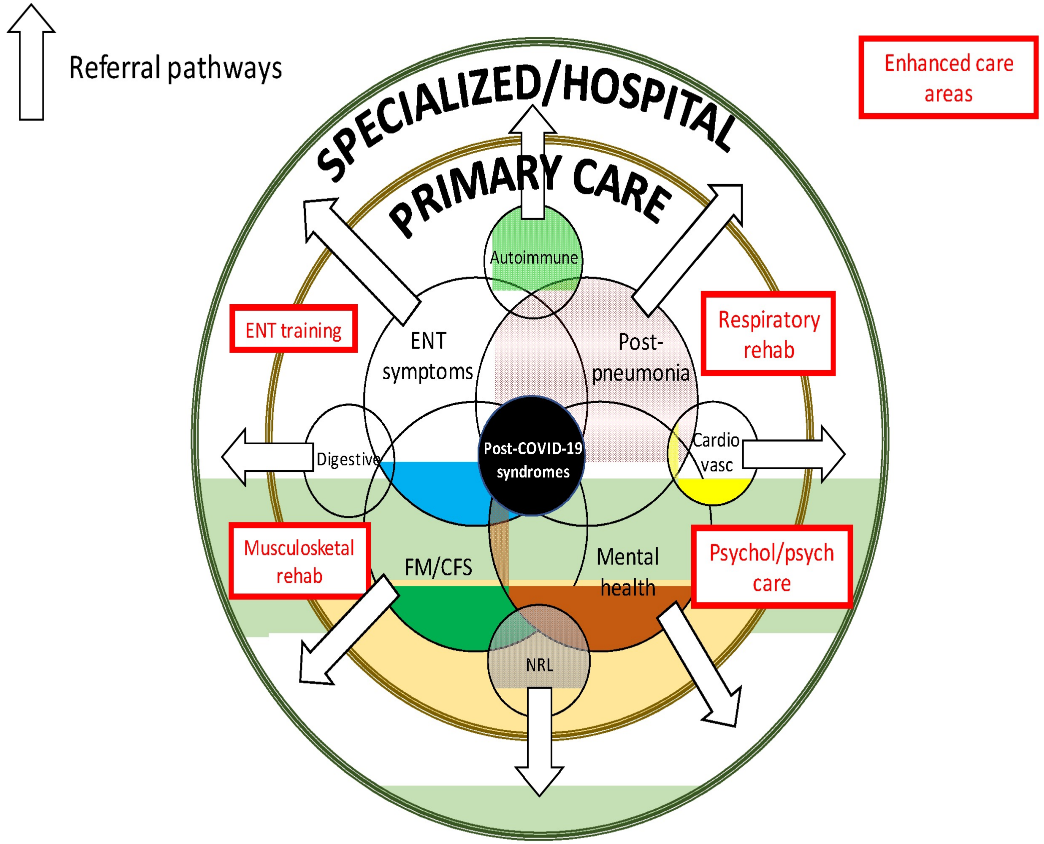
Features of Long Covid Multi-system disorder

- General non specific
  - Tiredness, fever, pain
  - absence/reduced performance at work
- Fatigue
- Mental health
  - anxiety low mood
  - PTSD Depression Poor Sleep
- Persistent Respiratory symptoms
  - Cough and breathlessness
- Thromboembolism
  - Hospitalised patients get anti coag
  - incidence unknown in community
- Cardiac
  - 20% of admitted, Myocarditis, pericarditis, MI



Features....

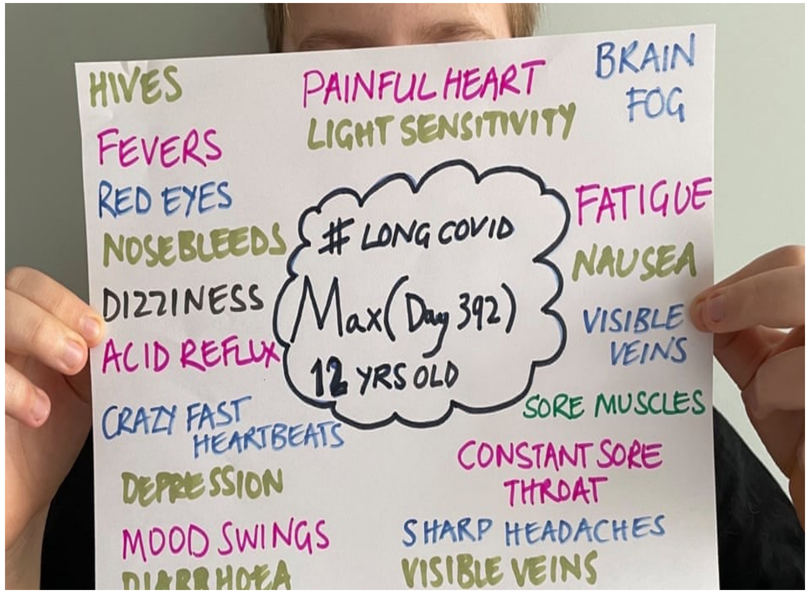
- Neurological symptoms
  - Brain fog, cog. Impairment, loss of concentration,
  - headache, sleep disturbance, peripheral neuropathy,
  - dizziness, visual disturbance,
- Neurological complications
  - ischemic stroke, seizures, encephalitis,
  - cranial nerve neuropathies
- Other symptoms mentioned by NICE with no specific management
  - MSK
    - Joint & muscle pain,
  - GI
    - Abdominal pain, nausea, Vomiting, Diarrhoea, weight loss ,
  - ENT
    - Tinnitus earache sore throat loss of taste and smell, nasal congestion
  - Skin rashes hair loss Mobility impairment
  - BMJ highlighted risks of pancreatic/liver/AKI injury and renal impairment



Special cases

Children

- Poor concentration
- Short term memory loss
- Difficulty with usual tasks > 4 weeks
- Less likely to have:
    - Shortness of breath
    - Persistent cough
    - Pain on breathing
    - Palpitations
    - Heart rate variability
    - Chest pain

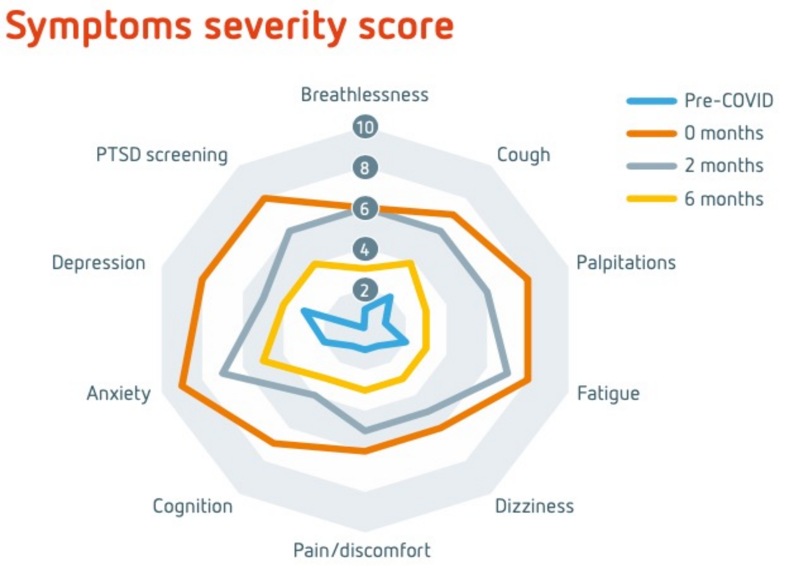


Older Adults

- Sarcopenia
- Anorexia/reduced appetite
- Malnutrition
- Depression
- Delirium
- Post Covid-19 chronic pain
- Worsening Frailty & Dementia
    - Need more community support
        - Short-term care packages
        - Advanced care planning
        - Social isolation
        - Loneliness
        - Bereavement

Assessment of Long Covid-19

- Symptoms of >4 weeks require a review in primary care
  - Rv clinical history –nature/severity/timing/fluctuations
  - Impact on personal life and activities
- Use of screening questionnaires
  - Not validated but recommended by NICE
  - Use as adjunct
  - Yorkshire rehab questionnaire – web based
    - https://www.ncr.co.uk/2020/06/c19-yrs
  - Modified ISARIC global paediatric COVID-19
    - https://isaric.org/research/covid-19-clinical-research-resources/paediatric-follow-up/



Investigation and management

- Long COVID is a diagnosis of exclusion
- Think about what **other** conditions
- Investigate any red flag symptoms/signs as appropriate
- **For new or ongoing symptoms > 4weeks**
  - Bloods
    - FBC, Renal and liver profile, CRP, HbA1c and thyroid function
    - BNP for heart failure
    - Ferritin to assess Inflammation and pro-thrombotic state
    - BMJ mentions Troponin ???needs admission if indicated
    - D-dimers – again its good if negative but if positive – creates medical uncertainty

Postural symptoms – Palpitations or dizziness

- Lying and standing BP/HR
- NICE – 3 min active stand test
- 10 mins if postural tachycardia syndrome/autonomic dysfunction
  - Lying patient down
  - Checking BP/HR then rechecking upon standing
  - Keep doing this at 3 min intervals up to 10 mins

Management of features

Fatigue

- Very common
- Rates differ in studies 12% vs 93%
- No evidence for drug or non-drug
- Conflicting opinion about CBT/psychological input
- BMJ 2021;374:n1648
- Fatigue and breathlessness - Exercise tolerance test
  - 1 min sit-to-stand test
  - Breathlessness, pulse, sats

General non specific

- Holistic and Empathic assessment
- Significant improvement at 6 weeks with Exercise and yoga
- Goal setting and general wellbeing
- Offer support with work – phased return/amended duties
- https://www.fom.ac.uk/wp-content/uploads/longCOVID_guidance_04.pdf
- No evidence for vitamins
- Vitamin D Is not currently recommended to prevent of treat COVID-19

Management of features

Thromboembolism

- COVID-19 increases risk
- Incidence in community unknown
- Low threshold for VTE
  - Increasing or Acute breathlessness
  - Tachycardia
  - Chest pain
  - Persisting or deteriorating hypoxia
  - Features of dvt
- Assess and refer as normal

Mental health

- Affects 34% in the 6 m after
- Healthcare workers with PTSD
  - Re-experiencing traumatic events intrusive memories
  - Strong overwhelming emotions and physical sensations
  - Attempts to avoid memories or reminders
  - Hypervigilance
- Many do not need medications
  - Supportive empathic consultations
- consider broader issues
  - social connection
  - wellbeing nutrition hydration self-care
- Refer immediately if risk of suicide or sever psychiatry symptoms
- Refer urgently if risk of self-harm that doesn’t require immediate referral

Respiratory symptoms

<u>Persistent cough or breathlessness</u>

- Spontaneous ongoing recovery is common in first 6 weeks
- Mild SOB is common
  - manage with breathing exercises/home pulse oximetry
- Lifestyle advice
  - stop smoking,
  - avoid pollutants
  - avoid temperature extremes
- Antibiotics if bacterial superinfection is suspected

- ***<u>CXR?</u>*** NICE suggests after 12 weeks if continued resp Sx
  - Plain CXR not sufficient to rule out Lung Disease
  - Refer if concerned even if cxr normal
- If hospitalised then might need follow up CXR post discharge
- NICE makes no specific referral suggestions
- BTS suggest to refer if
  - severe breathlessness to help detect
    - Pulmonary fibrosis
    - Pulmonary vascular disease such as pulmonary hypertension

Management of features

Cardiac

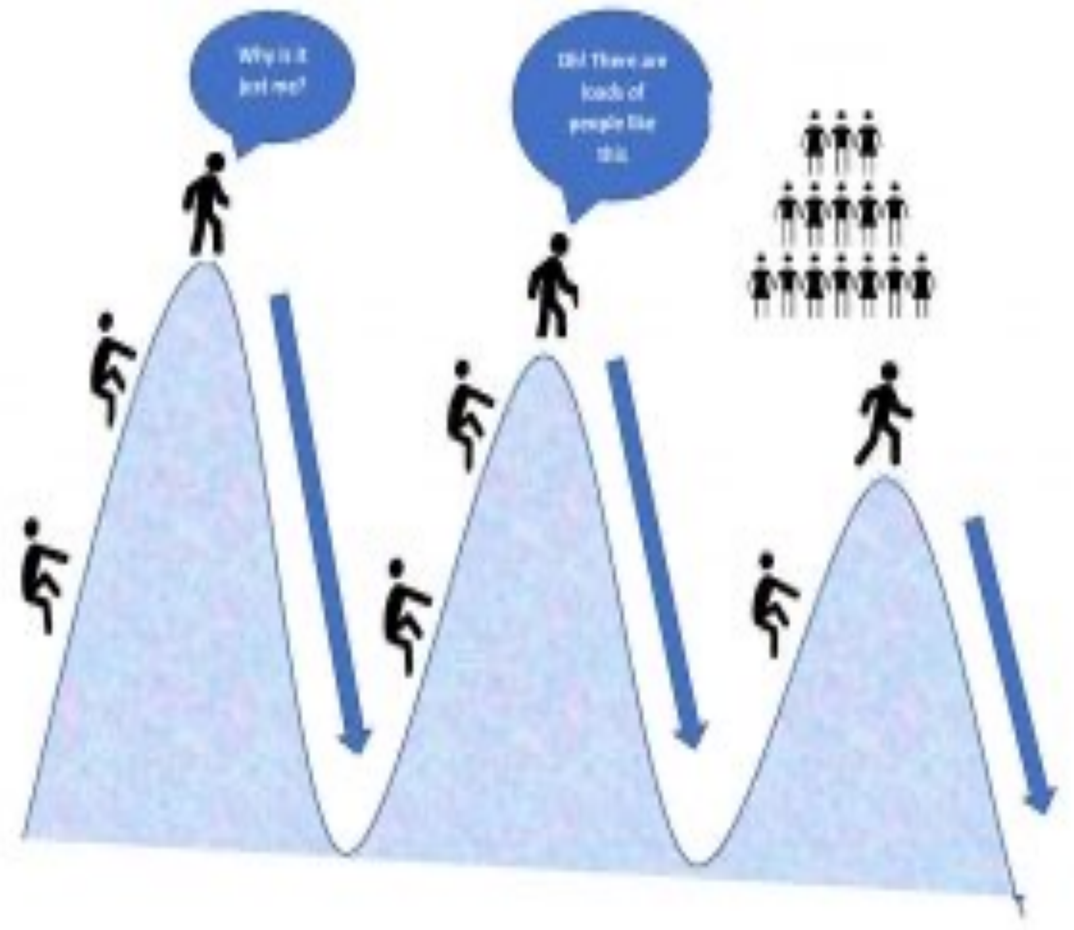
- Chest pain 22% after 8 wks
- ACS = ADMIT
- Refer if significant cardiac Dx
- ECG may be helpful as may
- CK/BNP/Troponin
    - Myocarditis
    - pericarditis
- People with myocarditis should avoid intense exercise for at least 3 months
- High level Athletes will need specialist assessment before returning to sport

Neurological

- Affects 34% in the 6 m after Inf.
- Symptoms if new need validated tools to assess
- Any complications such as stroke/seizures/encephalitis/
- Cranial nerve neuropathies will need appropriate referral

Points to consider with Long COVID

- Sequelae of Covid-19
  - Multisystem
  - Fluctuates
  - Lasts for prolonged periods
- Relatively new entity
- Limited evidence for any intervention
- Empathic consulting style
  - Sharing the frustration of uncertainty
- Always ensure management of comorbidities is optimised
- Diagnosis of exclusion
  - not to miss other medical conditions



What happens in the Long COVID clinic?

Consultant

Psychology

THE ONE STOP SHOP

(Virtual triage/Face 2 Face)

Input from other subspecialty as required

Occupational Therapy

Physiotherapy

A great mimic! – General Review

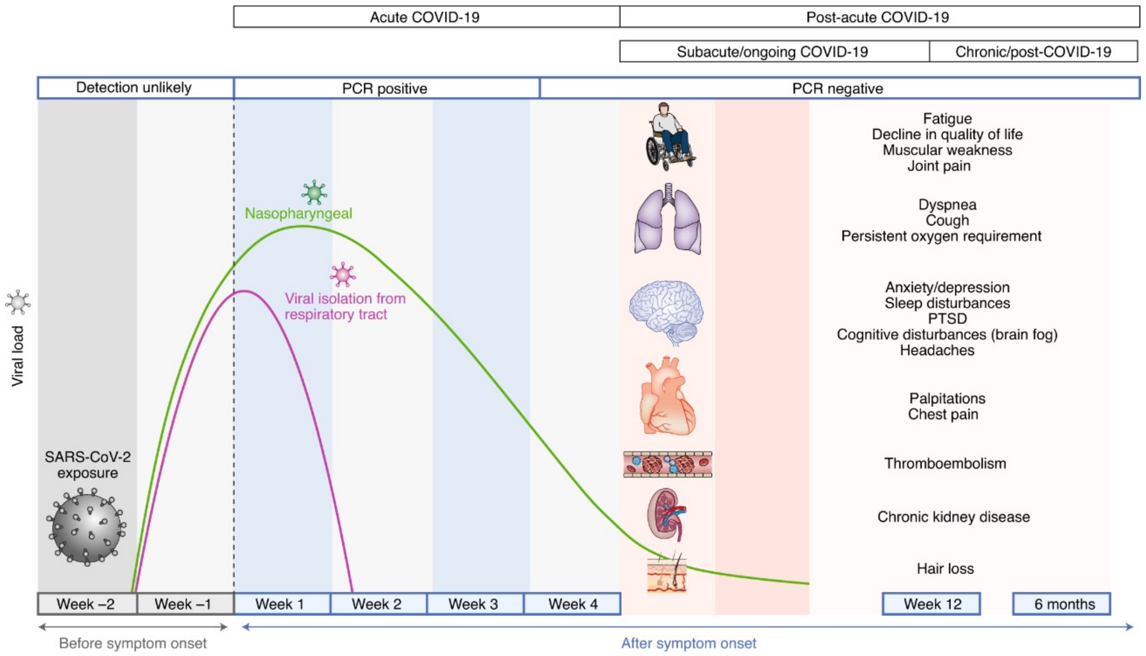
Key is to exclude an alternative diagnosis.

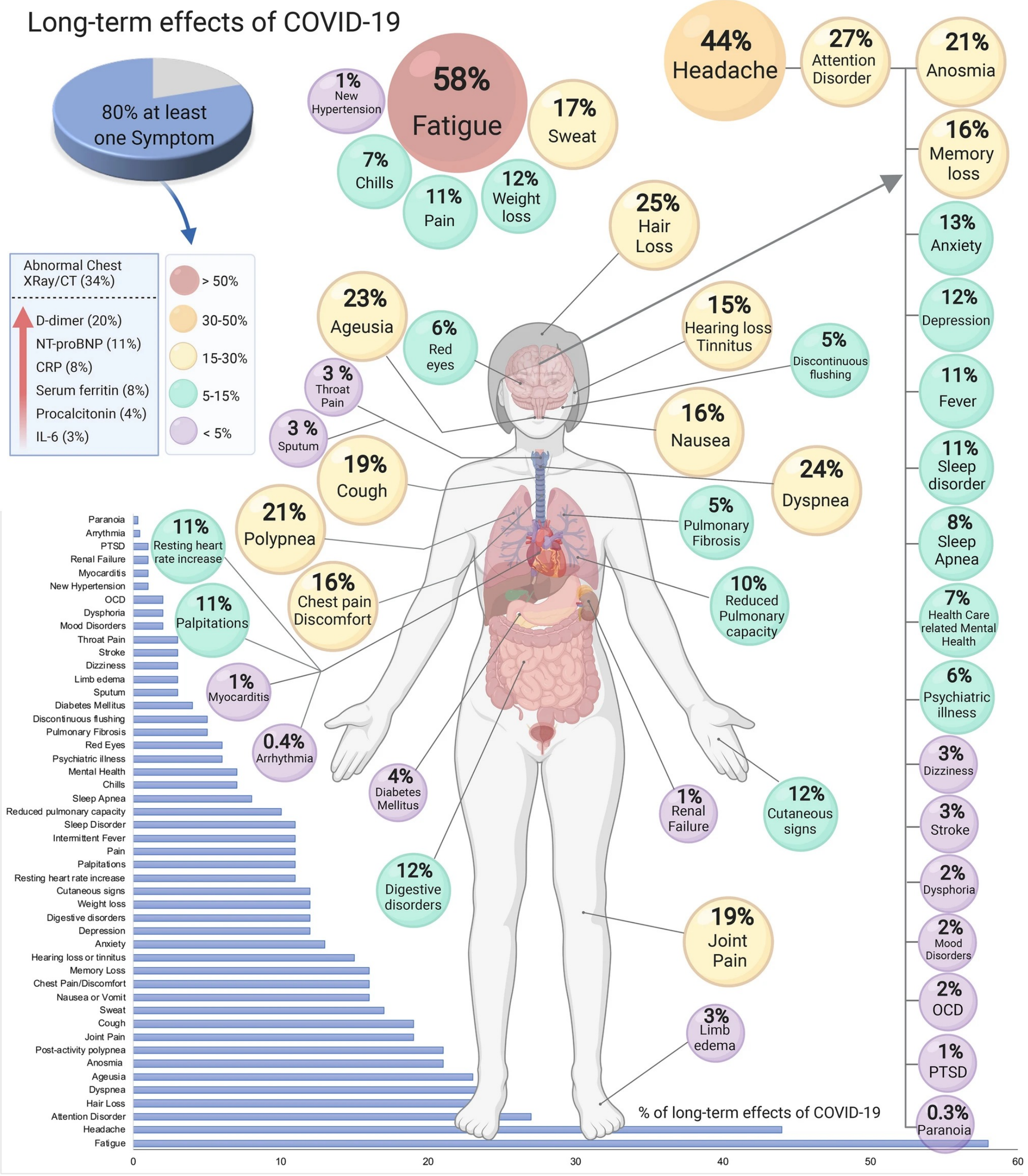
- Watch out for red flags
- Respiratory features – Breathlessness, Cough
  - Severity (MCR), Evidence of hypoxia?,
  - Pulse oximetry – at rest and exertional. PEFR.
  - Consider BNP.
  - CXR
- Cardiovascular features - Chest pain/Palpitations/Dizziness.
  - Hx of IHD
  - ECG and consider ECHO, 24hr tape, postural hypotension, changes in HR.
- General – Fatigue/Myalgia/Joint Pain/Rashes
  - Reversible causes of fatigue- B12, TFTS, Vitamin D, Blood Glucose, HBA1C, Cortisol, FBC – Iron levels/folate/ferritin
  - Explore features suggestive of connective tissue disorder
  - Neurological – Evidence of focal neurology, Community Headache pathway
  - Anosmia/Parosmia – British ENT association guidance

Red flags

How are patients affected?

- Long COVID is real, and its important to validate this
- No diagnostic test
- Broad general assessment
  - Symptom based approach
  - Exclusion of significant alternatives
  - Timeline of disease is important
  - Impact upon function, QOL, financial
  - Not only physical





North East London Health & Care Partnership

What are we seeing:

- Abnormal breathing patterns
- Evidence of cardiac disease
- POTS/Dysautonomia
- Asthma
- Autoimmune disease
- Hormonal disturbances
- ENT issues
- Psychological difficulties

Lopez-Leon, S., Wegman-Ostrosky, T., Perelman, C. et al. More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. Sci Rep 11, 16144 (2021). https://doi.org/10.1038/s41598-021-95565-8

What assessments to consider?

All assessments, whether the first or on an ongoing basis, should consider physical, psychological and cognitive problems.

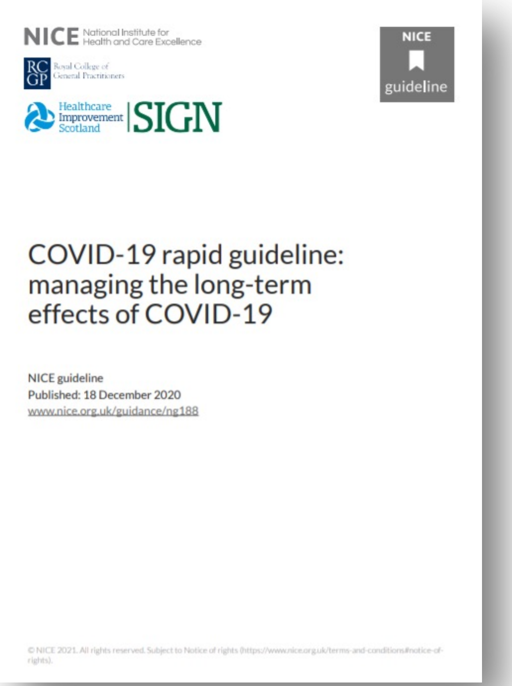
What screening tools to consider?

Initial evaluations:

- Yorkshire Screening Tool
- Newcastle Screening Tool
- Post-COVID functional Scale
- GAD-2, PHQ-2, TSQ.

Evaluation tools:

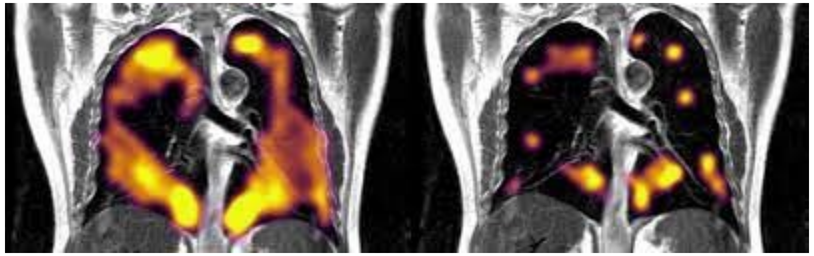
- Breathlessness: BORG, MRC, BPAT, Breathlessness Scale
- Fatigue: - FACIT-Fatigue
- Mental Health: PHQ-2, GAD-2, TSQ.
- Quality of Life assessments EQ-E5-DL (including VAS), Work and Social Adjustment Scale


NICE National Institute for Health and Care Excellence
RCGP Royal College of General Practitioners
Healthcare Improvement Scotland | SIGN
NICE guideline

COVID-19 rapid guideline: managing the long-term effects of COVID-19

NICE guideline
Published: 18 December 2020
www.nice.org.uk/guidance/ng188

Specific Investigations



- Recognised complications

- Respiratory
  - PEFR, Pulmonary Function Tests, HRCT +/- CTPA or VQ
  - ?evidence of pneumonitis, fibrosis, bronchiectasis, VTE
  - ?Exacerbation of known underlying lung diseases
  - ?Dysfunctional breathlessness.

- Cardiovascular
  - ECG, ECHO, 24hr tape +/- CMR.
  - ?Evidence of POTS, Myocarditis
  - ?Exacerbation of underlying cardiac disease or new presentation of IHD

- Fatigue
  - B12, Ferritin, TFTS, Blood Glucose/HBA1C, LFTS, Renal function, Early morning cortisol, CK, ESR +/- viral screens
  - ?Post-Viral Fatigue
  - ?New presentation CTD.
- Gastroenterology
  - LFTs, Stool samples,
  - ?Covid associated IBS, H Pylori

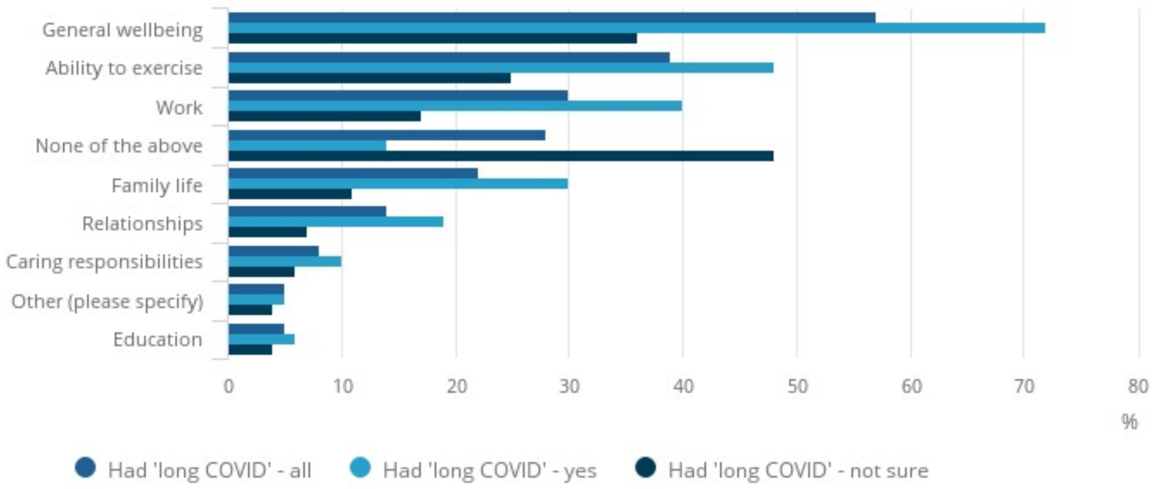
- Neurological
  - CT Head/MRI Head/Nerve Conduction studies
  - ?Hx of migraines, exclude PNS disease
  - Often complicated by stay on ICU ?CC neuropathy.
  - Dementia screens.

What areas need attention?

- What are the predominant symptoms?
- How are they affected?
- How can we meet their needs?
- How can they be supported to meet their needs?

Figure 2: Adults reporting having long COVID most frequently reported this impacted their general well-being, ability to exercise or their work

Of adults who self-reported long COVID, Great Britain, 7 April to 13 June 2021

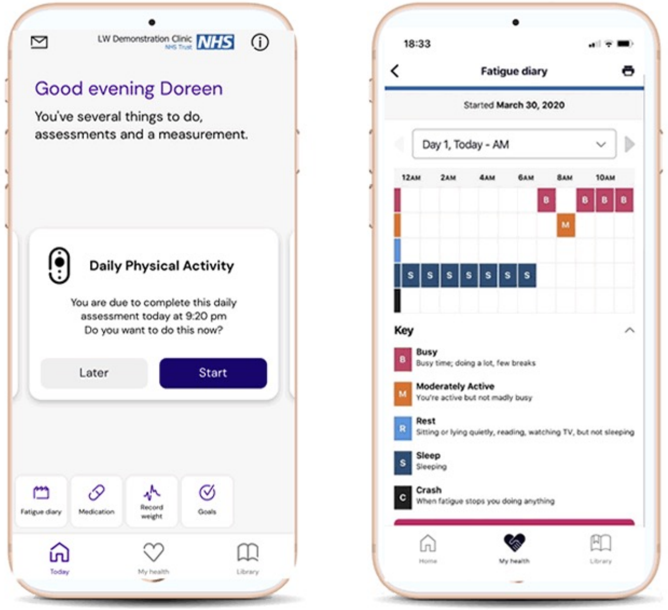


Source: Office for National Statistics – Opinions and Lifestyle Survey

Patient self monitoring and assessment

- Symptom diary
- Self assessment and monitoring

- Sleep diary
- Pacing
- Smell/Taste
- Breath Hold
- Fatigue diary



Living With

Your COVID Recovery

Session/Day	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Exercises	Sets	Symptoms	Sets	Symptoms	Sets	Symptoms	Sets	Symptoms	Sets	Symptoms	Sets	Symptoms	Sets	Symptoms
Steps	15 reps	Breathless RPE–7 Tired for 3 days												
Walking up the stairs					5 mins	Breathless RPE–5								
Dog walk									30 mins	RPE–5 Tired for 2 days				
Making dinner											45 mins	Aching muscles. Physical and cognitive fatigue next day		

ONGOING REVIEW AND RE-ASSESSMENT

MEDICAL MANAGEMENT/SUPPORT

Face to Face and virtual review

Ongoing review
Repeat Investigations – Radiology, Biochemistry

Ongoing Functional assessments
Fatigue
Breathlessness
Mental Heath
Emotional health
Work based assessment

THERAPY MANAGEMENT/SUPPORT

6-week virtual programme
Face to Face assessment
Home based/Site based

Ongoing Functional assessments
Fatigue
Breathlessness
Mental Health
Emotional Health

Work based assessment

Long COVID Clinic Patient Feedback

"I am really thankful for the opportunity to attend the clinic and am really grateful for all of the team members who have taken time to listen to my concerns and think that the advice and support has been wonderful. I feel really optimistic now about my recovery"

"The clinic has been wonderful. I am really blessed to have been looked after so well from start to finish. I am so thankful for everything that the NHS staff did for me during my admission and I am alive today due to their hard work and dedicated. You have continued to support me since my illness began and throughout my recovery. I am very grateful for all that the team on the wards and in this clinic has done to support my recovery"

"It is absolutely fantastic being able to see so many different specialists at the same time. I feel as though I now have lots of additional support and have been given great advice that I hope I can take forward and am sure will support my recovery"

"It was fantastic that I was able to be reviewed by a number of different people in one sitting and undertake the necessary investigations so quickly since my first attendance and referral to the clinic. I was really pleased with the support and advice that I have been given and am now reassured that I will continue to recover"

"I feel really lucky to have been able to attend a clinic where my symptoms were taken seriously and addressed and that I have been supported in such a way that I now feel confident that I can recover and that I will be able to return to work".

Resources

- https://www.pulsetoday.co.uk/covid-19-primary-care-resources/guides/testing-trials-and-research/management-of-long-covid-in-primary-care
- Lopez-Leon, S., Wegman-Ostrosky, T., Perelman, C. et al. More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. Sci Rep 11, 16144 (2021). https://doi.org/10.1038/s41598-021-95565-8
- Report template - NHSI website (england.nhs.uk)
- Physical, cognitive and mental health impacts of COVID-19 following hospitalisation – a multi-centre prospective cohort study. PHOSP-COVID Collaborative Group, Rachael Andrea Evans. Pre-Print. medRxiv 2021
- NIHR Living with COVID - https://evidence.nihr.ac.uk/themedreview/living-with-covid19-second-review/
- Dennis A, Wamil M, Alberts J On behalf of COVERSCAN study investigators, *et al* Multiorgan impairment in low-risk individuals with post-COVID-19 syndrome: a prospective, community-based study *BMJ Open* 2021;11:e048391. doi: 10.1136/bmjopen-2020-048391
- Yong SJ. Long COVID or post-COVID-19 syndrome: putative pathophysiology, risk factors, and treatments. Infect Dis (Lond). 2021;53(10):737-754. doi:10.1080/23744235.2021.1924397
- Ortona E, Malorni W. Long COVID: to investigate immunological mechanisms and sex/gender related aspects as fundamental steps for tailored therapy. Eur Respir J 2022; 59: 2102245 [DOI: 10.1183/13993003.02245-2021]
- Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK - Office for National Statistics (ons.gov.uk)
- Stephen, T et al. (2021) Long COVID - the physical and mental health of children and non-hospitalised young people 3 months after SARS-CoV-2 infection; a national matched cohort study (The CLoCk) Study (Pre-Print) Accessed at: Long COVID - the physical and mental health of children and non-hospitalised young people 3 months after SARS-CoV-2 infection; a national matched cohort study (The CLoCk) Study. | Research Square
- Nalbandian, A., Sehgal, K., Gupta, A. et al. Post-acute COVID-19 syndrome. Nat Med 27, 601–615 (2021).

Helpful resources

- https://www.newhamtraininghub.org/programmes/nel-long-covid-community-of-practice/
- https://www.yourcovidrecovery.nhs.uk/
- https://www.entuk.org/guideline-management-covid-19-anosmia
- https://abscent.org/nosewell
- https://www.sleepstation.org.uk/
- https://www.longcovid.org/
- https://www.rcot.co.uk/recovering-covid-19-post-viral-fatigue-and-conserving-energy

Questions and Feedback