



News and research from NHS Highland's COVID Recovery Service

nhsh.covidrecovery@nhs.scot

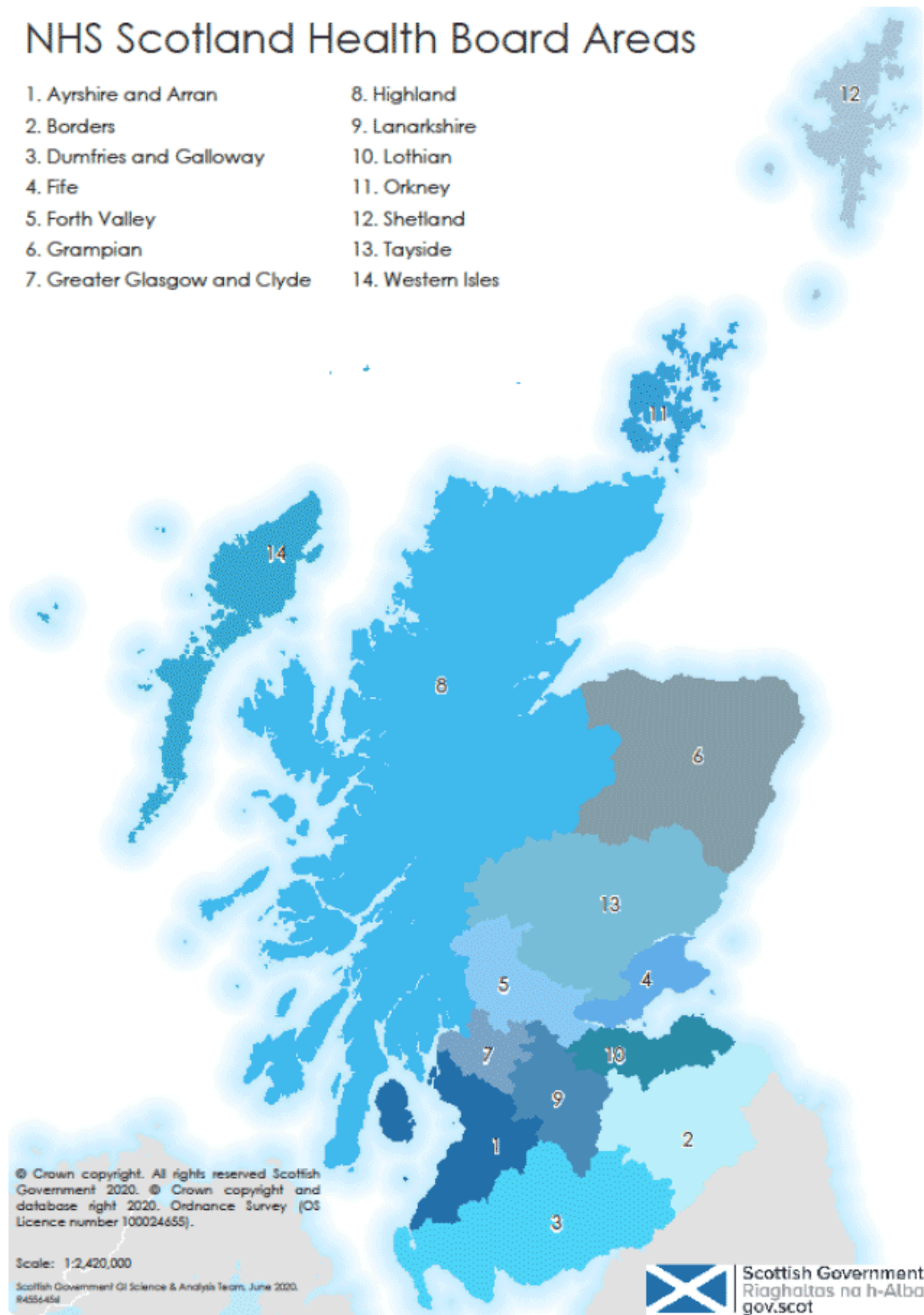
Janet.Scott3@nhs.scot

Consultant in Infectious Disease & Research Medicine, Raigmore Hospital

Affiliate Clinical Senior Lecturer ,MRC-University of Glasgow center for Virus Research

NHS Scotland Health Board Areas

1. Ayrshire and Arran
2. Borders
3. Dumfries and Galloway
4. Fife
5. Forth Valley
6. Grampian
7. Greater Glasgow and Clyde
8. Highland
9. Lanarkshire
10. Lothian
11. Orkney
12. Shetland
13. Tayside
14. Western Isles



Small part time team

Hannes De Kock (Clinical psychology and Team Lead)
Andrea Douglas (Rehabilitation Physiotherapist)
Susan Walker (Occupational Therapist)
Linda O'Brien (Administrator)

Janet Scott (Physician) 1 day/week
Carolyn Forsyth (GP) 1 day/week

Hon Team member: Mehran Asgari (POTS
Cardiologist)



Management of Long COVID

1. Rule out alternative diagnosis

2. Reverse the reversible

3. Rehabilitation

Physiotherapy (Breathing Pattern Disorder)
Occupational Therapy
Clinical psychology

4. Research

COVID in Scotland (CIS)
ISARIC Global/ PHOSP
Locomotion
Stimulate-ICP
Remdesivir



COVID Recovery Service

Physician,
Occupational Therapy,
Physiotherapy,
Psychology

A multidisciplinary team
approach

NASA Lean test
and POTS clinic

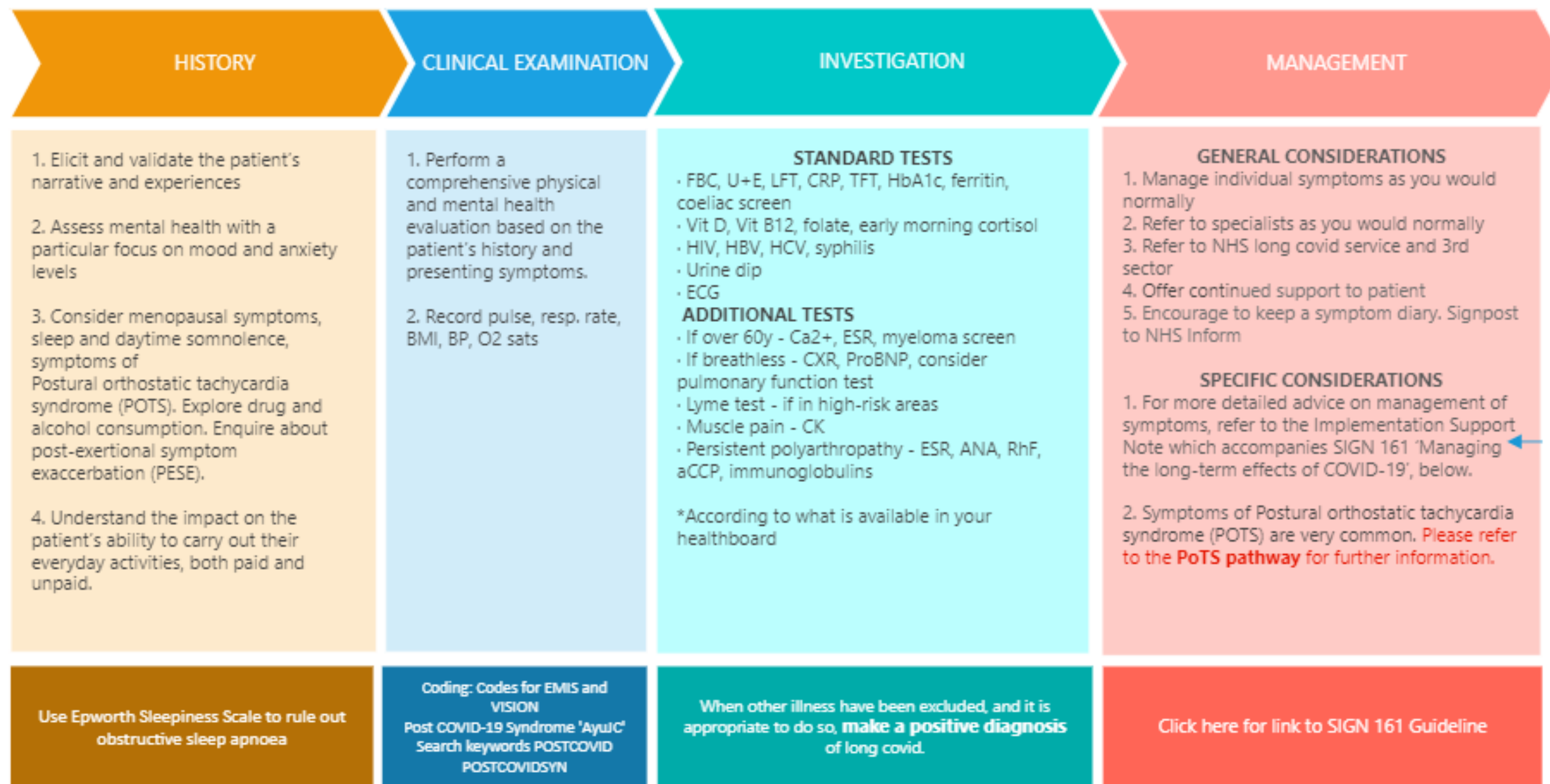
Specialized assessments for
autonomic dysfunction and
postural orthostatic
tachycardia syndrome
(POTS), which can be
associated with Long COVID.

ELROS App

The COVID Recovery Service
has access to the ELROS App
to assess symptoms,
including C19-YRS, MRC
Dyspnea score, and EQ5DL.

Guideline for GP Assessment of Adults with Suspected Long Covid

Long Covid* is a diagnosis of exclusion, the assessment should be carried out by GPs rather than other primary care clinicians



*Long Covid is the term preferred by patients

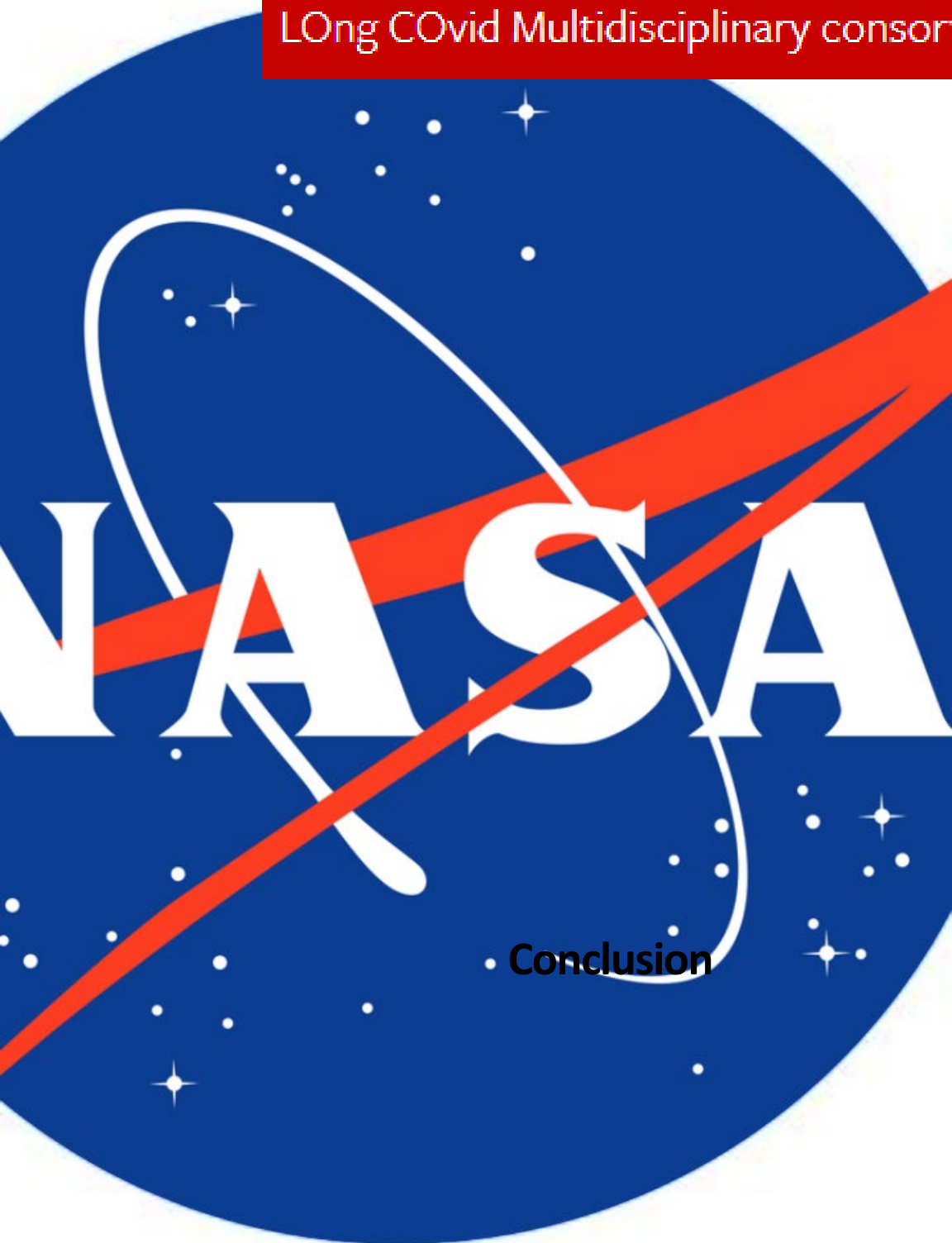


Referral Audit Results:

- 70% of bloods were abnormal (N=50 patients)
- 52% of abnormalities could be treated in primary care

Alternative/ other coexisting diagnosis:

- undiagnosed worsening conditions, such as asthma
- new diagnoses, including multiple myeloma, rheumatoid arthritis, diabetes, COPD, ulcerative colitis, colitis, ADHD,
- many cases of sleep apnoea,
- often accompanied by deficiencies like low folate, vitamin D, or ferritin.



Prevalence of orthostatic intolerance in Long Covid clinic patients: A multicentre observational study

Cassie Lee, Darren C Greenwood, Harsha Master, Kumaran Balasundaram, Paul Williams, Janet T. Scott, Conor Wood, Rowena Cooper, Julie L. Darbyshire, Ana Espinosa Gonzalez, Helen E. Davies, Thomas Osborne, Joanna Corrado, Nafi Iftexhar, Natalie Rogers, Brendan Delaney, Trish Greenhalgh, Manoj Sivan

medRxiv 2023.12.18.23299958; doi: <https://doi.org/10.1101/2023.12.18.23299958>

+ Add to Selected Citations

- **11%** of long covid participants meeting criteria for PoTS, but **0%** but **0%** in healthy volunteers.
- We recommend all patients attending long covid clinics are offered offered an NLT and appropriate management commenced.

NASA Lean Test

PLEASE COMPLETE THE TABLE BELOW INDICATING YOUR ANSWER BY CIRCLING YES/NO/Not sure :

Symptom	Have you had this for 3 months or more?	If YES, can it be worse when upright?	If YES, does this improve when sitting or lying?
Light-headedness / dizziness	Yes / No	Yes / No / Not sure	Yes / No / Not sure
Palpitation ("heart racing")	Yes / No	Yes / No / Not sure	Yes / No / Not sure
Tremor / shaky	Yes / No	Yes / No / Not sure	Yes / No / Not sure
Unusual chest discomfort	Yes / No	Yes / No / Not sure	Yes / No / Not sure
Any comments or other symptoms you experience which are linked with an upright posture?			

How Do I Complete the Test?

The test can sometimes cause you to become dizzy or lightheaded, therefore, **please ONLY carry out the test with someone else present** (e.g. a friend or partner) and **STOP** if you feel unwell or unable to complete the full 10 minutes.



Step 1

Please find somewhere comfortable to lie down face up, on your back. This helps your body to settle before the test



Step 2

Once you are comfortable, **time 5 minutes**.



Step 3

After 5 minutes, **measure your pulse and BP twice**, recording these in the table below. These are your base line measurements.

N.B: if the two readings are very different, measure your pulse and BP every 5 minutes until you have taken two readings that are relatively close and then record the readings in the table below.



Step 4

Carefully stand up and you can either **stand up right** OR **lean**, resting your shoulder blades against a wall with your feet together 20-30cm away from the wall.



Step 5

Once you are comfortable standing or leaning against a wall, please measure your **pulse and BP for up to 10 minutes**, recording the readings at **1, 2, 4, 6, 8 and 10 minutes** in the table below.

Please also write down any symptoms you feel during the test.

Evaluation of the use of Home NASA Lean Tests for Patients with Long COVID in NHS Highland

R.Cooper¹

S. Walker², A. Douglas², L. O'Brien², L. Currie², J.H. De Kock^{2,3}, C. Lee⁴, P. Williams⁵, M. Sivan^{6,7,8}, J. L. Darbyshire⁹, H. Asgari¹⁰, J.T. Scott^{2,11}

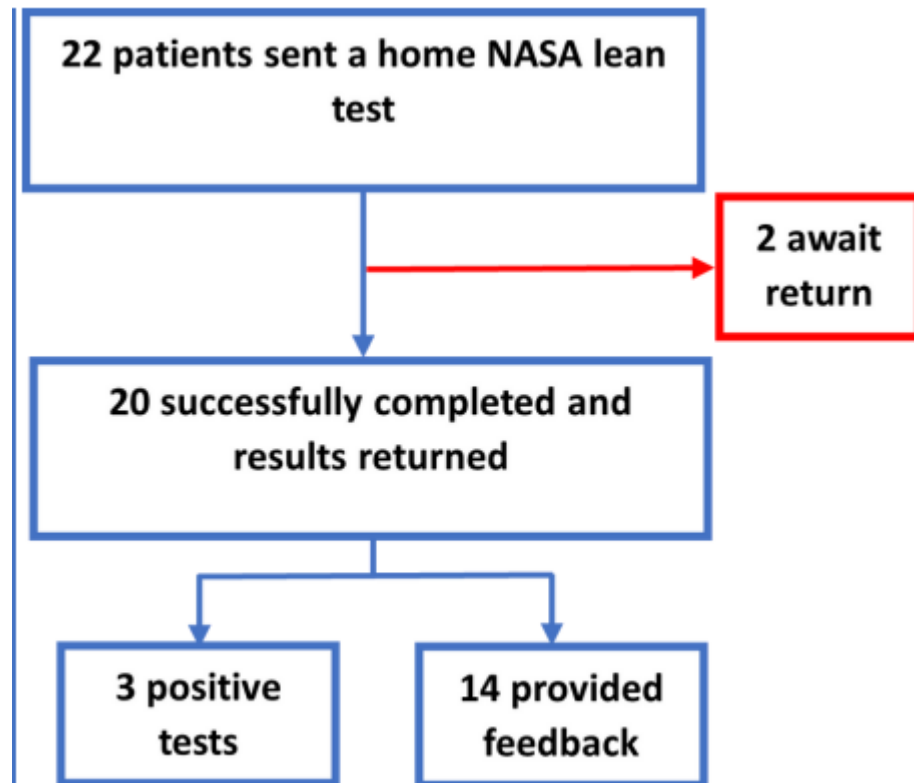
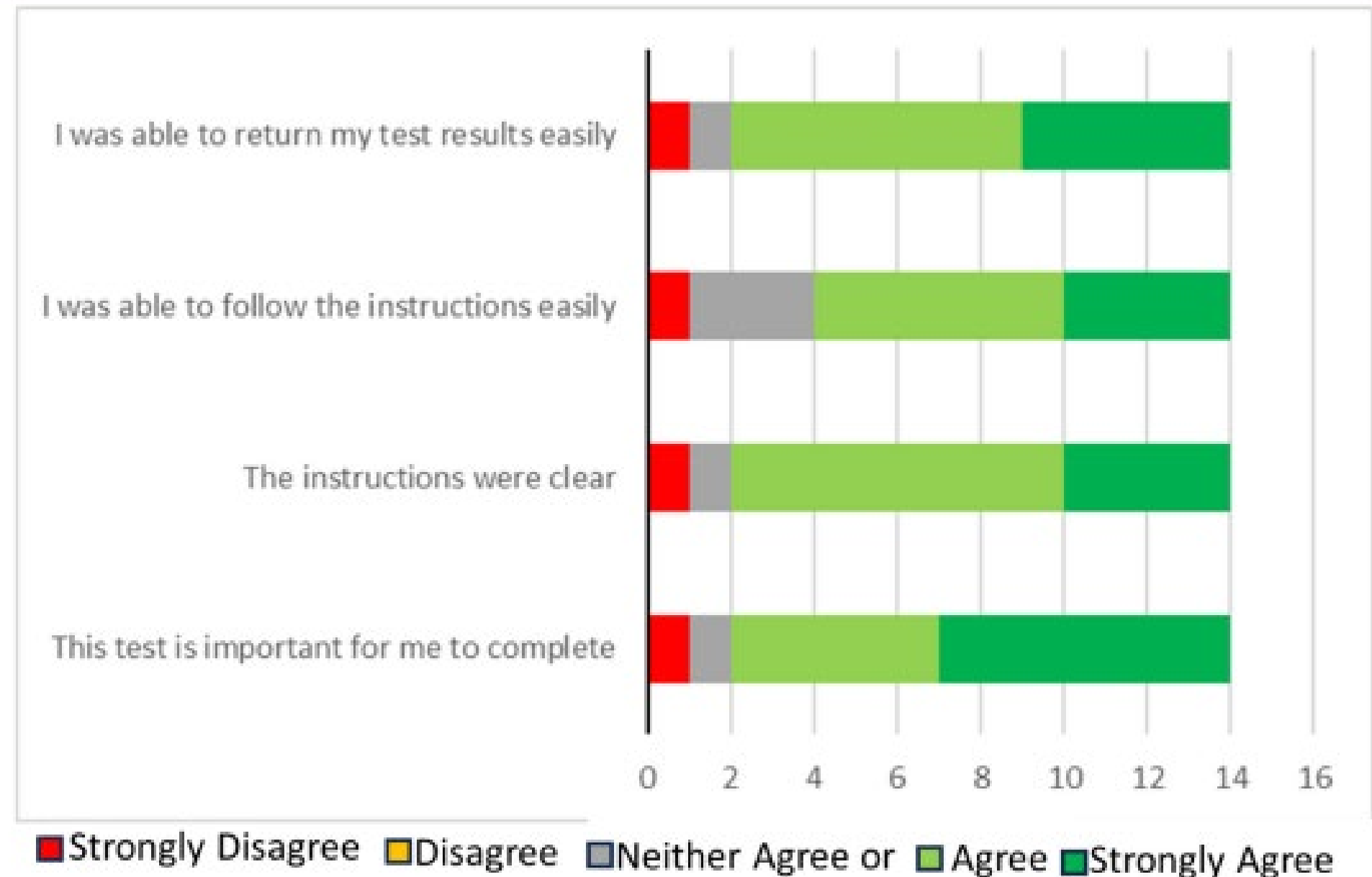


Figure 4 Study Population Flow Chart

Demographics		
Age	Median	50.5
	Range	27-71
Sex (%)	Female	50%

Figure 2 Study population Demographics



POTS Pathway.

The service Pathway

New Patient

A Patient is referred to the NHH Long COVID recovery service



Home NASA Lean Test

The home NASA lean test is posted/emailed out +/- a BP cuff.



Results returned

Patient completes and returns the test results which are reviewed by the service.



Positive tests

Patients with positive tests are:

- Referred to the POTS cardiology specialist for tilt table testing and specialist input.
- Commenced on non pharmacological therapy for POTS



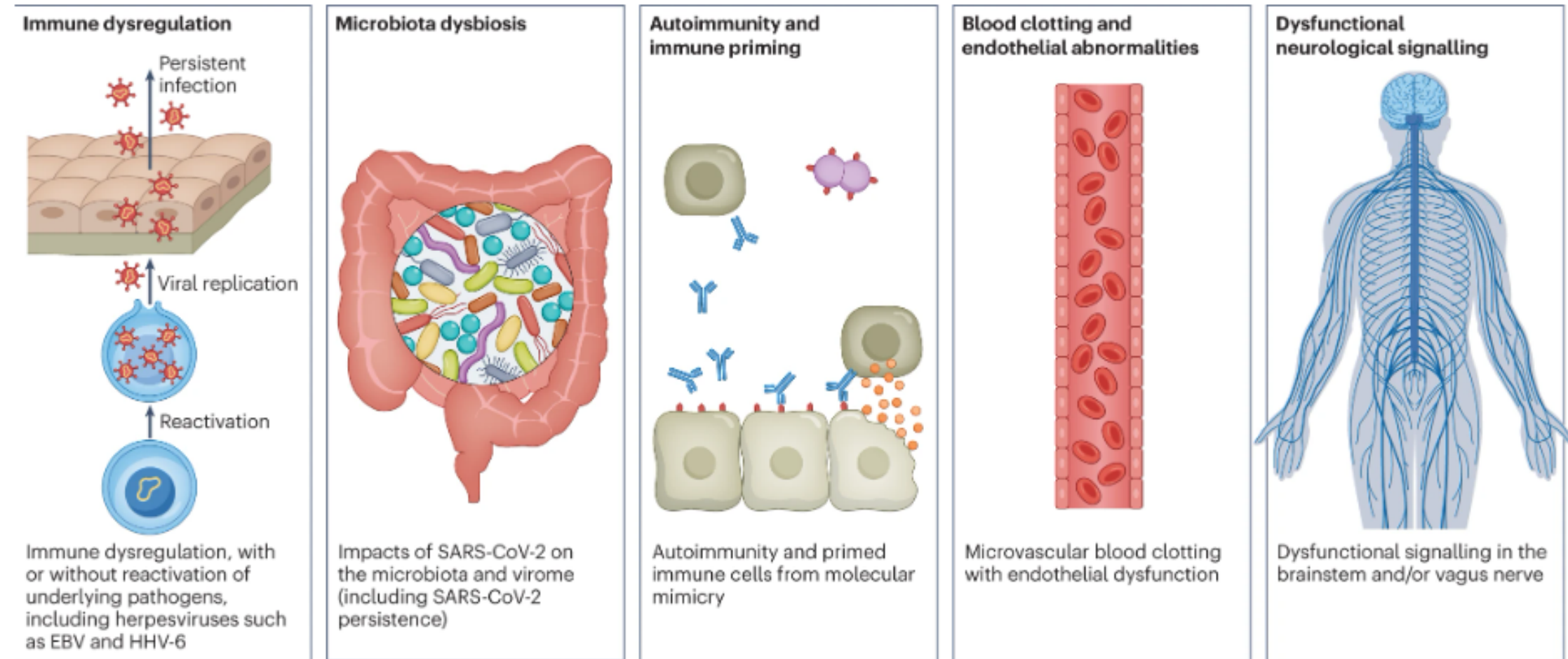
Negative tests

Patients with negative tests are informed of their test results.



Fig. 3: Hypothesized mechanisms of long COVID pathogenesis.

From: [Long COVID: major findings, mechanisms and recommendations](#)



There are several hypothesized mechanisms for long COVID pathogenesis, including immune dysregulation, microbiota disruption, autoimmunity, clotting and endothelial abnormality, and dysfunctional neurological signalling. EBV, Epstein–Barr virus; HHV-6, human herpesvirus 6; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Review Article | [Published: 13 January 2023](#)

Long COVID: major findings, mechanisms and recommendations

[Hannah E. Davis](#), [Lisa McCorkell](#), [Julia Moore Vogel](#) & [Eric J. Topol](#)

Pharmacological interventions for Long COVID

- Menopause: e.g. HRT
- Post viral arthropathy: Celecoxib and steroids
- Sleep: Sleepio app, Melatonin
- POTS: e.g. Ivabradine, Fludrocortisone, Midrodrine, Atenolol
- Angioedema/allergy (? MCAS): e.g. Antihistamine/H1R blockers
- Low dose naltrexone



<https://www.stimulate-icp.org>

- Over 18
- Diagnosis of Long COVID
- Not hospitalised for acute COVID-19
- No contraindications to trial medications
- NHS Highlands

1. Loratadine (10mg) & Famotidine (40mg) OD
2. Colchicine (500mcg BD)
3. Rivaroxaban (10mg OD)
4. Standard of care

12 week course

24 week course

Fatigue assessment
scale @ 12 weeks



Horizon Scanning

1 Upcoming Treatments

Ongoing research and clinical trials exploring potential treatments and interventions for Long COVID (, Remdesivir)

2 Infection Recovery Service

- Post treatment Lyme
- Chronic Fatigue Syndrome
- Other post-viral illnesses that share similarities with Long COVID.



Take home messages

- Chronic debilitating multi-organ syndrome affecting 3-6% of the population
- We are a small part time team
- New GP assessment guidelines
- Large research effort
- 11% of LC patients have a positive NASA lean test
- Stimulate-ICP drug trial opening in the next week.
- Remdesivir trial later in the year



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The Team

Linda Currie (Clinical Lead) part time

Hannes De Kock (Clinical psychology and Team Lead) part time

Andrea Douglas (Rehabilitation Physiotherapist) part time

Susan Walker (Occupational Therapist) part time

Janet Scott (ID doctor) 1 day/week

Carolyn Forsythe (GP) 1 day/week

Linda O'Brien (Administrator) part time

Rowena MacLoed (NHS Highland R&D)



Camilla Milne

Lead Clinician National Strategic Network for Long Term Effects of COVID-19