REFERENCES

1. NHS England 2021, *National Guidance for post COVID syndrome assessment clinics*, viewed 21/6/2021, available at < <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/11/C1248-national-guidance-post-covid-syndrome-assessment-clinics-v2.pdf>>
2. Razai MS, Kankam HKN, Majeed A, Esmail A, Williams DR. Mitigating ethnic disparities in covid 19 and beyond. *The Bmj* 2021;372:m4921.

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CHAOTIC BREATHING IN POST COVID-19 BREATHLESSNESS: A KEY FEATURE CHARACTERISED BY APPROXIMATE ENTROPY

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Abstract P142 Table 1 Baseline characteristics and exercise measurements

	Post COVID-19 BPD (N = 20)	Non-COVID BPD (N = 20)	Healthy controls (N = 15)
BASELINE CHARACTERISTICS			
Age/years	41 (10)	49 (14)	50 (18)
Gender M:F	6:14	6:14	9:6
BMI (kg/m ²)	25 (4)	26 (5)	25 (4)
Nijmegen score (/64)	23 (12–44)	23 (14–41)	-
FEV1 (% pred)	111 (13)	107 (16)	96 (6)
FVC (% pred)	118 (14)	114 (16)	107 (12)
FEV1/FVC Ratio	80 (6)	78 (6)	75 (12)
Resting SpO ₂ (%)	98 (95–100)	99 (94–100)	97 (96–99)
Resting HCO ₃ – (earlobe) (mmol/L)	24 (5)	22 (3)	24 (2)
Resting PaCO ₂ (kPa)	4.4 (0.8)	4.3 (0.7)	4.7 (0.5)
Resting BORG CR-10 dyspnoea (/10)	0.7 (0.8)	1.4 (1.3)	0.2 (0.6)
PEAK exercise CPET Variables			
Duration of test (minutes)	10 (4)	9 (2)	15 (3)
Main reason cited for exercise cessation	Legs = 6 Breathing = 14	Legs = 8 Breathing = 12	Legs = 6 Breathing = 4
BORG CR-10 dyspnoea (/10)	End=5.3 (2.3)	End=4.2 (1.5)	End=4.1 (1.7)
Peak VO ₂ (L/min)	2.18 (0.87)	1.52 (0.62)	2.77 (1.22)
Peak VO ₂ (% predicted)	106.5 (33.1)	79.8 (17.5)	124.8 (27.3)
Peak VO ₂ (mL/min/kg)	29.6 (7.6)	20.7 (7.1)	37.8 (14.8)
Peak Heart Rate (beats/min)	170 (12.6)	141 (26)	167 (15)
Heart Rate Reserve (beats/min)	20 (19)	30 (20)	2 (13)
Peak VE (L/min)	89 (26)	60 (27)	96 (35)
Peak Tidal Volume (L)	2.6 (1.3)	1.86 (0.88)	2.37 (0.71)
Peak Breathing Frequency (/min)	43 (23)	31 (9)	33 (8)
Peak SpO ₂ (%)	97 (93–100)	99 (94–100)	95 (73–98)
PEAK exercise gas exchange values			
PaO ₂ (kPa)	13.3 (3.2)	13.8 (1.2)	13.7 (1.2)
PaCO ₂ (kPa)	4.4 (1.1)	4.2 (0.7)	4.1 (0.7)
PETCO ₂ (kPa)	4.4 (0.6)	4.3 (0.5)	4.8 (0.8)
P(A-a)O ₂ difference (kPa)	2.8 (1.2)	2.1 (0.9)	2.6 (0.9)
P(a-ET)CO ₂ difference (kPa)	- 0.10 (0.25)	-0.09 (0.37)	-0.35 (0.53)
Approximate entropy (ApEn) of ventilatory variables during incremental exercise			
ApEn Tidal Volume	1.61 (0.05)	1.28 (0.23)	1.02 (0.29)
ApEn Breathing Frequency	1.40 (0.10)	1.41 (0.20)	1.32 (0.21)
ApEn Minute Ventilation	1.22 (0.11)	0.97 (0.30)	0.65 (0.23)

Data shown as mean (SD) or median (range); M:F: Male:Female; BMI: body mass index; FEV1: forced expiratory volume in the first second; FVC: forced vital capacity; SpO₂: oxygen saturation; CPET: cardiopulmonary exercise test; VO₂: oxygen consumption; VE:

Background Exertional dyspnoea is a pervasive clinical feature for many patients following COVID-19 infection, with a high prevalence of breathing pattern disorder (BPD) reported. In this study we aimed to characterise exercise ventilatory patterns in patients with exertional dyspnoea following COVID-19 infection, using a non-linear statistical approach.

Method Patients who underwent cardiopulmonary exercise testing (CPET) for unexplained exertional breathlessness following COVID-19 infection, confirmed on PCR or antibody testing, were audited, between May 20 and May 21. Those with evidence of persistent parenchymal changes, thromboembolic disease, or cardiac dysfunction were excluded. Ventilatory irregularity during exercise quantified by approximate entropy (ApEn) was assessed and compared to a historical cohort of controls with non-COVID19 related BPD and health individuals.

Results Over the study period, 20 patients (mean age 41 years (SD 10), 14 (70%) female) fulfilled inclusion criteria and underwent CPET at a median of 4 months (range 3–10) following infection. Chest and cardiac imaging was normal in all patients who had follow-up investigations. Spirometric indices were also normal and the mean (SD) DLCO and KCO were 83% (11.7) and 94% (9.5) predicted, respectively. On exercise testing, most COVID-19 patients stopped secondary to dyspnoea, with a BORG median at 5 (i.e. 'severe') but had a normal VO₂ peak (107% predicted) and gas exchange response, with low indices of VQ mismatching (table 1). ApEn was elevated for tidal volume and VE but similar to non-COVID BPD.

Conclusions Post COVID BPD can be characterised by application of non-linear statistical modelling of exercise ventilatory data. This approach now needs further validation to facilitate application in automated CPET equipment, to identify and highlight this important differential diagnosis.

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'IT GIVES YOU THAT HOPE, KNOWING THAT YOU ARE NOT ALONE' – THE JOURNEY OF COVID-19 RECOVERY AND THE REHABILITATION BOAT

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Introduction The persistent symptoms of COVID-19 are well documented.¹ There is encouraging early data for improvements in fatigue, exercise capacity and cognition in those attending a supervised rehabilitation programme.² There is no published data on its perceived acceptability. This study aims to understand patients' lived experience of recovery from this novel disease including experiences of attending a COVID-19 rehabilitation programme.

Methods Patients who attended COVID-19 rehabilitation were invited to take part in virtual focus groups or 1:1 interviews conducted by independent researchers. Inductive thematic analysis was used. A reflective log provided a transparent account of data collection and analysis. Transcripts were coded by the first author and one other researcher, themes were generated and agreed.

Theme - The Recovery Journey				
Sub-themes:				
Expectations	Individual and Varied Journeys	Mental and Physical Improvement	Journey Continues	Self-values and identity
The Recovery Journey describes the varied journeys through the recovery process, from expectation of rehabilitation through to the on-going journey following rehabilitation. Patients described significant changes in their symptoms, well-being, self-values and identity throughout their recovery. <i>"the difference is just amazing and able to do what you want to do and feel happy and not worried of what is going to happen. The differences is just mind-blowing"</i> <i>"you know what, I'm privileged to be a survivor"</i>				
Theme -The Rehabilitation Boat				
Sub-themes				
Programme Delivery	Safe and Supportive	Validation and Assurance	Shared Reflection	The Education Forum
The Rehabilitation Boat describes the overall feeling of togetherness, support and empathy from peers and staff. Patients felt safe in the rehabilitation environment but would like the programme to be longer. <i>"In the group...we were able to discuss between us other symptoms as well and it was nice to be able to reflect because... sometimes I feel like I'm going mad and it's just nice to know that other people are actually experiencing similar things to you"</i> <i>"So I came here with this whole load of frustration and then it was just, you know what, it was just that camaraderie in that group of people just being open."</i>				

Abstract P143 Figure 1 The over-arching themes, sub-themes and illustrative quotes

Findings 13 patients were interviewed (n=9 in two focus groups, n=4 1:1 interviews) (54% male, 62% white British). Themes, sub-themes and illustrative quotes are provided in figure 1. The two over-arching themes were: The Recovery Journey and The Rehabilitation Boat. Patients experienced varied journeys through recovery, but described a feeling of togetherness and support in the rehabilitation environment.

Overall, the severity of acute and post-COVID-19 symptoms were unexpected. For some, symptoms were misunderstood or misbelieved. Expectations for rehabilitation were varied. The opportunity to reflect on shared experiences was valuable and facilitated by offering education sessions as an open forum which was perceived as an important part of the programme. There was a sense of being a survivor and gratitude for support in recovery. Patients described a shift in values to prioritising a healthy lifestyle.

Conclusions Attending rehabilitation for COVID-19 was considered acceptable and important part of recovery and a positive experience. The opportunity to share the experience with others in the same boat was highly valued in the context of an unexpected and potentially lonely COVID-19 recovery.

REFERENCES

- PHOSP-COVID Collaborative Group, Evans R, McAuley H. Physical, cognitive and mental health impacts of COVID-19 following hospitalisation - a multi-centre prospective cohort study. *MedRxiv*. 2021.

- Daynes E, Gerlis C, Chaplin E, Gardiner N, S Singh. Early experiences of rehabilitations for patients post-COVID to improve fatigue, breathlessness, exercise capacity and cognition. *CRD*. 2021.

Assessing, managing and predicting outcomes in ILD

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RED CELL DISTRIBUTION WIDTH (RDW) AND NEUTROPHIL LYMPHOCYTE RATIO (NLR) AS PROGNOSTIC MARKERS IN IDIOPATHIC PULMONARY FIBROSIS (IPF)

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Introduction and Objectives Idiopathic Pulmonary Fibrosis (IPF) has a median survival of ~ 2–3 years, but there is significant variability and hence difficulty in advising patients at a personal level. The full blood count (FBC) is readily accessible and gives a Red Cell Distribution Width (RDW), which