

# Long-term COVID-19 complications: a multidisciplinary clinic follow-up approach

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## Background

The COVID-19 pandemic has put a strain on the NHS secondary to the unprecedented number of acute admissions requiring high-dependency unit (HDU) and intensive care unit (ITU) support due to respiratory failure and sequela of hypercoagulability. The long-term complications of COVID-19 pneumonia are also beginning to emerge, with growing clinical experience directing us to focus on integrating disease severity with the likelihood of long-term multi-organ complications alongside the psychosocial holistic care required by these patients.<sup>1–3</sup> We describe our multidisciplinary team (MDT) observational experience at Gloucestershire Hospitals NHS Foundation Trust of delivering personalised holistic multicomponent interventions for all patients discharged from a HDU/ITU. Our intervention used a unified follow-up pathway to address multi-organ complications and psychological trauma, setting rehabilitation goals and using a GP action plan to improve the long-term outcomes of these patients.

## Method

The MDT follow-up consisted of an interprofessional carousel, incorporating review from colleagues in intensive care, respiratory, therapy, psychology, pharmacy, dietetics and community wellbeing and using a unified pro forma adapted to address individual patient needs. 37 patients were followed up over a 4-week period using this approach. Long-term complications of COVID-19 were identified and addressed by relaying the subsequent action plan to primary care (Fig 1).

## Results

The ongoing biopsychosocial complications identified from the MDT follow-up of COVID-19 patients are summarised in Table 1. Fatigue was the prevalent complaint, followed by breathlessness, decline in functional and mental health and hair loss. Onward referrals for subspecialist input were made from clinic and action plans relayed to primary care in all patients.

**Table 1. Multidisciplinary follow-up clinic findings in COVID-19**

Symptom	Number affected
Fatigue	36 (97%)
Persistent functional status decline	29 (78%)
Mental health complications including post-traumatic stress disorder	29 (78%)
Breathlessness; pulmonary complications including dysfunctional breathing / venous thromboembolic disease / persistent pulmonary infiltrates	28 (76%)
Telogen effluvium	27 (73%)
Ongoing memory impairment / concentration issues	25 (68%)
Neuropathic pain / brachial plexus injury / brain injury	21 (57%)
Sleep disturbance	14 (38%)
Renal dysfunction (AKI 1–3) with ongoing surveillance requirement	20 (54%)
Social issues	7 (18%)
Visual concerns	6 (16%)
Dry mouth	2 (5%)
Persistent anosmia	2 (5%)

## Discussion

The extent and severity of long-term complications secondary to COVID-19 may cause substantial morbidity, and further studies are required to evaluate the long-term effects of COVID-19 in at-risk groups and determine how to manage them optimally.

Our observational study of the HDU/ITU COVID-19 follow-up cohort demonstrates a range of perplexing clinical sequelae and emphasises the need to utilise the available resources to deliver high-quality patient care and to develop a better understanding of this condition in order to minimise the long-term costs that will be incurred by failing to address COVID-19-related complications.

We advocate a multidisciplinary approach to following up COVID-19 patients. This approach will allow personalised

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**Image 1 - GP Actions Plan**

<b>Insult / Ongoing Issue</b>	<b>Action required by patient</b>	<b>Action by GP</b>
AKI Stage 1-3 / RRT:	Kidney surveillance will be required for the next few years	Annual U&Es with dipstick of urine and quantification of proteinuria e.g. protein: creatinine ratio (PCR) as increased risk of progressive CKD.
Lung injury / initially aim to prevent further infection	Ensure vaccinations to decrease risk of infections	Vaccinations: Annual flu and Pneumococcal vaccination if not previously given
Functional Status	6 minute walk test	Further investigations and onward referral to respiratory if desaturation, reduced exercise tolerance with raised MRC Dyspnoea score (Direct referral will be made from clinic)
Thin/loss of hair (Telogen effluvium)	Telogen effluvium link available on the Glosicu.org website Blood test to rule out other treatable causes	Further advice available from British Dermatology society regarding Telogen effluvium GP Please complete TFTs/iron studies
Extended thromboprophylaxis	Blood thinning medicines to treat clots	Referral to respiratory if suspicious of chronic thromboembolic disease
Sleep dysfunction	Keep Sleep diary try to ensure good sleep hygiene on amitriptyline sleeping better	To consider OSA as a possible underlying pathology if doesn't improve Keep under review
Flying Am I fit to fly?	<a href="https://www.caa.co.uk/Passengers/Before-you-fly/Am-I-fit-to-fly/Health-information-for-passengers/Getting-medical-clearance-to-fly/">https://www.caa.co.uk/Passengers/Before-you-fly/Am-I-fit-to-fly/Health-information-for-passengers/Getting-medical-clearance-to-fly/</a>  If you desaturations <92% during/after your 6 MWT that would indicate the potential need for O2 on a flight.	<a href="https://www.caa.co.uk/Passengers/Before-you-fly/Am-I-fit-to-fly/Guidance-for-health-professionals/Assessing-fitness-to-fly/">https://www.caa.co.uk/Passengers/Before-you-fly/Am-I-fit-to-fly/Guidance-for-health-professionals/Assessing-fitness-to-fly/</a>
Brachial Plexus/ Other Nerve Injury	Engage with Rehabilitation	To follow up on technician studies by neurophysiology. (Direct referral will be made from clinic)
Pharmacy	Liaise with pharmacy to understand the rationale of administered medications	GP monitoring and review medication _x_ In 2-3 months time.
Mental health/Delirium /Reduced concentration	Perform MOCA Test	Needs follow up/ memory screening (MOCA Score – Montreal Cognitive Assessment). We have signposted and introduced to community wellbeing service
Family	Trying to get engagement with available services such as Lets Talk, Cotswold community well being, Your circle etc	Encouraging participation and referral to some of these support groups
Other		Encourage uptake of Healthy Lifestyle Service support Ki-Active offered

Fig 1. GP action plan.

holistic multicomponent interventions with early identification of potentially life-limiting complications, without over-investigating patients making a full recovery, while ensuring primary care colleagues have an action plan to pragmatically manage these patients upon discharge. ■

**Conflicts of interest**

None declared.

**References**

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