

# Long Covid

## Definition, incidence and healthcare issues

Enquiry No. 2022/26

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### Abstract

This paper examines the definition, incidence and health service needs relating to the condition 'Long Covid' (also known as 'Post Covid-19 condition').

The WHO uses the following definition: "Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis."

The lower end estimates suggest an incidence rate of 10 per cent. Using this level, a rough estimate of the number of people in Ireland with /who will develop the condition is 114,000 (rising along with Covid case numbers). Not all these people may require health services. The HSE response and policy implications are discussed.



## Contents

Summary .....	2
Introduction and research question .....	2
Definition.....	2
Incidence .....	5
The impact of Long Covid on health services.....	7
Recommended treatment / services.....	8
Method.....	10
Appendix - Impact on individuals.....	11

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## Summary

This paper has been prepared in response to an enquiry seeking information on Long Covid. Of specific interest are the definition, impact, services required and status of services in Ireland for patients with Long Covid or Post-Covid Condition. Key points of this paper are:

- The study of 'Long Covid' is an emerging area.
- The WHO has recognised and published a definition of 'Post COVID-19 Condition'. This definition was published in October 2021 and is subject to change, given the novel nature of the illness and how rapidly the situation is evolving.
- Long or Post Covid takes in a wide breadth of symptoms including fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning.
- Estimates of incidence of the condition vary greatly and knowledge is developing quickly in this area.
- Using the lower end of current estimates (10% of people with acute Covid-19) there may be approximately 114,500 people in Ireland who have or will develop 'Long-Covid' (rising proportionately along with Covid-19 case numbers). This is a rough estimate and not supported by any specific Irish data.
- The literature indicates that not all these people may require health services.
- The HSE has agreed a 'Model of Care' for Long-Covid and its implementation has commenced.
- The literature on the healthcare response to Long Covid emphasises the need for patients to be assessed treated by multi-disciplinary teams, the need for on-going research, and the need to incorporate an understanding of the lived experience of people with the condition into understanding the condition.

## Introduction and research question

This paper examines issues around the condition known as 'Long Covid'. In particular it provides a definition of the condition, presents a synopsis of the current literature on the incidence of Long Covid and looks at the steps being taken to support those with Long Covid.

It is important to state at the outset that evidence around Long Covid is changing over time. In the research for this paper, every effort has been to source (in the time available) the most recent information to answer the questions as posed. The dates of all sources used are stated.

A short section on methods follows the main text of the paper.

## Definition

The World Health Organisation (WHO) has recognised Long-Covid, which it terms 'post COVID-19 condition'. It has developed a clinical case definition of **post COVID-19 condition** by using a consensus methodology. This first version (dated October 2021) was developed by patients, researchers and others, representing all WHO regions, with the understanding that the definition

may change as new evidence emerges and our understanding of the consequences of COVID-19 continues to evolve. The definition is reproduced in Box 1 below. <sup>1</sup>

**Box 1: WHO definition of post Covid-19 condition. October 2021.**

Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis.

Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time.

Giving more detail on what the 'other' symptoms might be (referred to above in the WHO definition), the UK National Institute for Health and Care Excellence (NICE) has issued guidance on Long Covid including a list of 'common symptoms'. They highlight that symptoms after acute COVID-19 are highly variable and wide ranging. The most commonly reported symptoms include (but are not limited to) the following:<sup>2</sup>

**Respiratory symptoms**

- Breathlessness
- Cough

**Cardiovascular symptoms**

- Chest tightness
- Chest pain
- Palpitations

**Generalised symptoms**

- Fatigue
- Fever
- Pain

**Neurological symptoms**

- Cognitive impairment ('brain fog', loss of concentration or memory issues)
- Headache
- Sleep disturbance
- Peripheral neuropathy symptoms (pins and needles and numbness)
- Dizziness
- Delirium (in older populations)
- Mobility impairment
- Visual disturbance

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<sup>1</sup> World Health Organization (2021) *A clinical case definition of post Covid-19 condition by a Delphi consensus*, 6 October 2021. Available at: <https://www.who.int/publications/i/item/WHO-2019-nCoV-Post-COVID-19-condition-Clinical-case-definition-2021.1>

<sup>2</sup> UK National Institute for Health and Care Excellence (2022) COVID-19 rapid guideline: managing the long-term effects of COVID-19; November 2021. Accessed 14/01/2022: <https://www.nice.org.uk/guidance/ng188/chapter/Recommendations>

**Gastrointestinal symptoms**

- Abdominal pain
- Nausea and vomiting
- Diarrhoea
- Weight loss and reduced appetite

**Musculoskeletal symptoms**

- Joint pain
- Muscle pain

**Ear, nose and throat symptoms**

- Tinnitus
- Earache
- Sore throat
- Dizziness
- Loss of taste and/or smell
- Nasal congestion

**Dermatological symptoms**

- Skin rashes
- Hair loss

**Psychological/psychiatric symptoms**

- Symptoms of depression
- Symptoms of anxiety
- Symptoms of post-traumatic stress disorder

The following symptoms and signs are less commonly reported in children and young people than in adults:

- shortness of breath
- persistent cough
- pain on breathing
- palpitations
- variations in heart rate
- chest pain.

According to the WHO, most patients infected with COVID-19 fully recover, but some experience long-term effects on several body systems (as above). These effects appear to occur irrespective of the initial severity of infection, but occur more frequently in women, middle age, and in those with more symptoms initially.<sup>3</sup>

The WHO European Observatory on Health Systems and Policies, notes the broader impact arising from the mental and physical health problems of Long Covid:

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<sup>3</sup> World Health Organization (2021) as before.

“Long COVID has a serious impact on people’s ability to go back to work or have a social life. It affects their mental health and may have significant economic consequences for them, their families and for society.”<sup>4</sup>

## Incidence

In the context of enormous healthcare efforts in treating acute illness and implementing vaccination programmes, Long Covid has been called a “hidden an iceberg of long-term illness”<sup>5</sup>.

Various studies published by authors around the world give different incidence rates for Long Covid. The incidence reported/estimated seems to be affected by the methods used – for instance – whether the population studies is patients who were in hospital or those who were never admitted to hospital. Some key papers found:

- A HSE Review of Evidence undertaken in 2020 stated:
  - “In a study by Carfi *et al* among patients who had recovered from COVID-19 at a Rome hospital, 87.4% reported persistence of at least one symptom, most often fatigue, dyspnea [shortness of breath], joint pain, chest pain and cough. According to Greenhalgh *et al*, approximately 10% of people experience prolonged illness after COVID-19.”<sup>6</sup>
- A frequently cited number is 10% figure report by the authors Greehalgh et al in their 2020 paper referred to in the HSE quote above. This estimate was based on the UK COVID Symptom Study, in which people enter their ongoing symptoms on a smartphone app. This percentage is lower than that cited in many published observational studies, that look at just people who were admitted to hospital or attending specialist clinics.<sup>7</sup>
- An August 2021 review review found:
  - “The incidence of post-COVID syndrome is estimated at 10-35%, while for hospitalized patients it may reach 85%.”<sup>8</sup>
- A University of Oxford Study published in September 2021 and using US health records found that:
  - “37% of people had at least one long-COVID symptom diagnosed in the 3-6 month period after COVID-19 infection. The most common symptoms were breathing problems, abdominal symptoms, fatigue, pain and anxiety/depression.”<sup>9</sup>

This study was based on those with health records of electronic health records (EHRs) data from 81 million patients including 273,618 COVID-19 survivors. These survivors had

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<sup>4</sup> Rajan S, Khunti K, Alwan N, et al.(2021) ‘[In the wake of the pandemic: Preparing for Long COVID](#)’ Policy Brief, No. 39. Copenhagen (Denmark): [European Observatory on Health Systems and Policies](#).

<sup>5</sup> Sivan, M, Rayner, C and Delaney, B (2021) ‘Fresh evidence of the scale and scope of long covid - The NHS must reconfigure services to manage enduring multimorbidity following covid-19’, *BMJ*, 1 April 2021; <https://www.bmj.com/content/373/bmj.n853>

<sup>6</sup> HSE National Health Library and Knowledge Team (2020) What is the latest evidence about the existence of long-COVID or post-COVID and its persistence for COVID-19 survivors? What evidence is currently available on the management of patients who have post viral fatigue syndrome due to COVID-19? <https://hselibrary.ie/wp-content/uploads/2021/01/Evidence-Summary-COVID-19-Long-COVID.pdf>

<sup>7</sup> Greenhalgh T, Knight M, A, Court C, Buxton M, Husain L. Management of post-acute covid-19 in primary care *BMJ* 2020; 370 :m3026 doi:10.1136/bmj.m3026; <https://www.bmj.com/content/370/bmj.m3026.long>

<sup>8</sup> <https://www.sciencedirect.com/science/article/pii/S0188440921000813?via%3Dihub>

<sup>9</sup> [Over a third of COVID-19 patients diagnosed with at least one long-COVID symptom | University of Oxford](#)

sought medical assistance for their symptoms (hence their symptoms were identifiable in their health records).

- A policy paper by the WHO European Observatory on Health Systems and Policies used the 10% figure for longer-term impact, stating<sup>10</sup>:
  - “COVID-19 can cause persistent ill-health. Around a quarter of people who have had the virus experience symptoms that continue for at least a month but one in 10 are still unwell after 12 weeks. This has been described by patient groups as “Long COVID.” [the 12 week mark meets the WHO definition for post-Covid condition].

Given the variation in findings and emerging nature of the evidence, it is worth noting that:

- The lowest estimate for those not hospitalised with acute Covid-19 but experiencing symptoms of Long Covid after a minimum of 12 weeks, appears to be 10%.
- In terms of health service needs, the Greenhalgh study cited above states “many such patients recover spontaneously (if slowly) with holistic support, rest, symptomatic treatment, and gradual increase in activity.”
- As 1,145,968 people in Ireland have tested positive for Covid-19 (reported 24 January 2022)<sup>11</sup>.
- However, it is widely acknowledged that many people have been infected but not tested and therefore not counted in official statistics, meaning the actual number is higher.
- So, using the official figure of Covid-19 cases and the estimate from the literature, we can estimate the number of people in **Ireland** who have had Covid-19 and who are/who will experience Long Covid **at a minimum of 114,500** (based on case data on 24 January 2022 and rising in proportion to Covid-19 case numbers as infections continue). This is a rough estimate, not supported by any specific Irish data.
- Not all of this group may require health services.
- As Covid-19 case numbers grow, the number of Long Covid cases will also grow, proportionately.

In terms of policy planning, it would be useful to know how severe symptoms are and how long they last. Research for this paper did not specifically seek out this information and there was no substantial information on it identified in the papers that were reviewed.

It may be of interest to note that :

- Long Covid Ireland Facebook page has over 2,500 followers.
- In the UK the Office for National Statistics (ONS) is running regular surveys of the population on Covid-19 infection and impacts: See:  
<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/6january2022>

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<sup>10</sup> Rajan S, Khunti K, Alwan N, et al.(2021) [‘In the wake of the pandemic: Preparing for Long COVID’](#) Policy Brief, No. 39. Copenhagen (Denmark): [European Observatory on Health Systems and Policies](#).

<sup>11</sup> <https://www.ecdc.europa.eu/en/cases-2019-ncov-eueea>

## The impact of Long Covid on health services

In depth searches of the HSE website and a variety of HSE documents were undertaken for this enquiry. These did not identify any sources quantifying or indicating the nature or scale of the impact of Long Covid on Irish health services.

A response by the HSE to a PQ in September 2021 stated that the establishment of specialist Long Covid clinics was planned. (see: <https://www.hse.ie/eng/about/personalpq/pq/2021-pq-responses/september-2021/pq-44034-21-jennifer-carroll-macneill.pdf>).

I contacted the HSE to seek information specific to this paper. The main text of the HSE response (received 21 January) is reproduced in Box 2 below. It indicates that a Model of Care for Long Covid has been agreed (with 14 specific clinics planned) and is currently being implemented.

**Box 2: HSE response to enquiry on plans and progress re specific long covid care.**

**Office of the Head of Operations, Community Operations - Primary Care, 21 January 2022.**

***The HSE Plans for Long COVID services to patients:***

The HSE has developed an interim Model of Care for Long COVID in September 2021. The aim of this Model of Care is to provide a framework for the design and delivery of services for patients experiencing Long COVID. This Model of Care aims to build on existing service provision, in addition to establishing new services and supports across a number of different health care settings including acute hospitals, general practice and community services. A programme manager and clinic leads representing the areas of neurology, respiratory medicine, infectious disease and rehabilitation have been appointed within the HSE to drive implementation of this Model of Care. This work is being overseen by a National Steering Group.

***Most particularly in implementation / progress to date - indicating what services are in place and those that are planned / when they are expected to be in place:***

Post-Acute and Long COVID clinics have been developed at hospitals across the country to provide follow up care for patients who are experiencing prolonged signs and symptoms of COVID-19. These clinics have been established to address the presenting local need at individual hospital sites.

Implementation of the Model of Care will focus on the expansion of existing Post-Acute and Long COVID clinics, in addition to the establishment of new clinics as identified within the Model. There will be a total of fourteen clinics and each hospital group will have access to both Post-Acute and Long COVID clinic. The allocation of new and additional resources to these clinics will ensure that all services are operating to the same high standard of care. A variety of disciplines will need to be recruited to support these clinics, therefore it is difficult to provide precise timelines for when these clinics will become fully operational. The implementation team is working with hospital sites to identify gaps in current resources and to drive recruitment.

Pathways to and from GPs and community services will evolve once these have been established.

Further to the above, it may be useful to note that the [HSE Winter plan 2021-2022](#) identified 'long covid' among the risks to effective health service delivery (see quote below) but did not give greater detail:

"There are also new risks emerging including the impact of delayed care as a result of the postponement of care and **long COVID** on service users and associated service demand"<sup>12</sup> [emphasis added]

Also in the context of Long Covid, Prof Anthony Staines, DCU, is quoted in an *Irish Times* article (August 2021) as saying that the Irish health services are poor at managing chronic illness and ill equipped to respond to Long Covid.<sup>13</sup>

## Recommended treatment / services

This section seeks to respond to the part of your enquiry seeking information on "possible **mitigation measures** that could be put in place to manage people with long covid and the recognition of it."

A number of sources call for various responses to Long Covid / Post Covid condition. This is an emerging area. Research for this paper did not include looking for evidence of outcomes of interventions. Information from sources below is the most up to date that could be identified in the time available (dates of publication/access of sources are noted).

Psychiatrists, Professor Brendan Kelly (TCD and Tallaght Hospital) and Professor Gautam Gulati (University of Limerick) published an article overviewing Long Covid in November 2021. It in they stated that:

"Clearly, this is a condition in need of sustained attention, careful evaluation, multi-disciplinary treatment and ongoing study."<sup>14</sup>

In May 2021, the HSE National Health Library and Knowledge Team (2020) reviewed the literature on models of care available / required for post-Covid patients. It found:<sup>15</sup>

"There is an emerging consensus in the literature of the importance of multi-disciplinary team rehabilitation processes to support post-acute COVID-19 patents."

They also found that COVID-19 has resulted in a growing population of individuals with a range of persistent symptoms:<sup>16</sup>

"COVID-19 has resulted in a growing population of individuals with a range of persistent symptoms that develop during or after SARS-CoV-2 infection, continue for  $\geq 12$  weeks, and

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<sup>12</sup> <https://www.hse.ie/eng/services/publications/winter-plan-2021-2022.pdf>

<sup>13</sup> <https://www.irishtimes.com/news/health/health-service-not-equipped-to-treat-long-covid-patients-says-expert-1.4639018>

<sup>14</sup> B D Kelly, G Gulati, Long COVID: the elephant in the room, *QJM: An International Journal of Medicine*, 2021;, hcab299, <https://doi.org/10.1093/qjmed/hcab299>

<sup>15</sup> [HSE Library » What models of care are available for patients recovering from COVID-19 with persisting symptoms? What models of care are available for long COVID, or post-acute sequelae of COVID-19?](#)

<sup>16</sup> [HSE Library » What models of care are available for patients recovering from COVID-19 with persisting symptoms? What models of care are available for long COVID, or post-acute sequelae of COVID-19?](#)

are not explained by an alternative diagnosis. Significant physical, psychological, and cognitive impairments may persist despite clinical resolution of the infection.

Post-acute COVID-19 rehabilitation will assume increasing importance with a need for multi-disciplinary assessments:

“Post-acute COVID-19 rehabilitation will assume increasing importance as a surge of patients are discharged from hospital, placing a burden on health systems.

The rehabilitation needs of patients are varied and multi-faceted, and post COVID-19 clinics should offer multidisciplinary assessments. Experience from recently established COVID-19 recovery services in Ireland and Britain suggests that significant physical, psychological and cognitive impairments may persist; and that multidisciplinary teams should integrate respiratory, cardiology, rheumatology, radiology, psychology and immunology services into an holistic post-discharge model of follow-up.”

The importance of assessment of post-acute COVID-19 patients after discharge and of access to appropriate clinical rehabilitation pathways was emphasised:

“Emerging literature emphasizes the importance of assessment of post-acute COVID-19 patients after discharge; and of preparedness with appropriate clinical rehabilitation pathways.

Initial multidisciplinary assessment post-COVID-19 may play a role in reducing unnecessary chest X-rays and clinic appointments, and in helping to focus on those most likely to require follow-up.”

In terms of the health/healthcare response, common themes arising in the literature reviewed for this paper are:

- the need to have patients with post-Covid condition assessed and treated by multi-disciplinary teams,
- the need for on-going research to better understand the condition and its treatment, and
- the need to incorporate an understanding of the lived experience of people with the condition into understanding the condition.<sup>17</sup>

The European Observatory on Health Systems and Policies summarised the policy implications of long covid for healthcare and beyond as set out in Box 3 below.

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<sup>17</sup> See: Macpherson K, Cooper K, Harbour J, et al (2022) '[Experiences of living with long COVID and of accessing healthcare services: a qualitative systematic review](#)' BMJ Open;12:e050979. doi: 10.1136/bmjopen-2021-050979 and [Long COVID guidelines need to reflect lived experience - The Lancet](#)

**Box 3: Policy implications of long covid****World Health Organisation (WHO) European Observatory on Health Systems and Policies<sup>18</sup>****February 2021**

The new policy brief highlights areas where policy-makers can take action to meet the challenge of post-COVID conditions based on what is currently known, including by:

- taking multidisciplinary, multispecialty approaches to assessment and management;
- developing new care pathways and contextually appropriate guidelines with patients and their families, so that primary care in particular can tailor case management to the manifestations of disease;
- creating appropriate services, including rehabilitation and online support tools;
- tackling the wider consequences of post-COVID conditions, including by addressing employment rights, sick pay policies, and access to disability benefits;
- involving patients to foster self-care and self-help, and to shape awareness of post-COVID conditions and their implications for services and research; and
- implementing patient registers and other surveillance systems and following up with patients to support the research that is so critical to understanding and treating post-COVID conditions.

**Social welfare**

As the above text from the European Observatory on Health Systems and Policies cites employment rights and sick pay and disability benefit it is worth looking at the situation in Ireland in relation to illness benefit. Enhanced illness benefit is available to people diagnosed with COVID-19. It is payable at rate of €350 per week for a maximum of ten weeks. This payment is due to continue to be in place until early February 2022.<sup>19</sup> At present, there is no specific social security (social welfare) payment available related to Long Covid.

**Method**

For this research a search of relevant sources / websites was conducted including: Cochrane Library, WHO general website, HSE, and the WHO European Observatory on Health Systems and Policy. In addition, thorough online searching using generalist (e.g. Google) and specialist search engines (e.g. Google Scholar and SocINDEX) and databases (e.g. Lenus) was undertaken.

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<sup>18</sup> <https://eurohealthobservatory.who.int/news-room/news/item/25-02-2021-new-policy-brief-calls-on-decision-makers-to-support-patients-as-1-in-10-report-symptoms-of-long-covid>

<sup>19</sup> [COVID-19 enhanced Illness Benefit \(citizensinformation.ie\)](https://citizensinformation.ie/en/health-and-social-care/illness-benefit)

## Appendix - Impact on individuals

An extract from a HSE Evidence Review on the subject of long covid is presented in Box A below. This describes the impact of long-covid on individuals based on the evidence available (dated May 2021).

### **Box A: Long-term impact of Covid-19 infection on individuals – early evidence<sup>20</sup>**

COVID-19 can result in prolonged illness and persistent symptoms, even in young adults and persons with no underlying medical conditions who were not hospitalised (Carfi et al., 2020 and WHO, 2020) Evidence continues to emerge and the true nature of long term effects of COVID-19 infection on some individuals is still being studied. In Carfi's study among patients who had recovered from COVID-19 at a Rome hospital, 87.4% reported persistence of at least one symptom, most often fatigue, dyspnoea, joint pain, chest pain and cough. According to Greenhalgh et al., (2020), approximately 10% of people experience prolonged illness after COVID-19.

Breathlessness, chest heaviness, muscle pain, palpitations and fatigue are among the continuing and debilitating symptoms being reported by people with COVID-19 often months after the onset of the disease and after they have been declared recovered (2020). Mardani (2020) states that longer-term complications may include heart failure, neurological disease and lung disease. Symptoms may include fatigue and brain fog, which may be related to cytokines that cross the blood-brain-barrier and affect the brain (Mahase, 2020 and Mardini, 2020); and may be indicative of a post-viral syndrome associated with COVID-19. Insomnia, general myalgia, dermatological manifestations, exercise intolerance, temperature dysregulation and increased anxiety are other common symptoms (Halpin et al., 2020, Mahase, 2020 and Nath 2020).

In a purposive sample of 100 survivors assessed four to eight weeks after discharge from hospital, Halpin et al.,(2020) found that new illness-related fatigue was the most common reported symptom by 72% of participants who had required treatment in an intensive care unit and 60.3% managed in hospital wards without needing ICU care. The next most common symptoms were breathlessness (65.6% in ICU group and 42.6% in ward group) and psychological distress (46.9% in ICU group and 23.5% in ward group). Marshall (2020) and Kemp et al.,(2020) suggest that the virus may injure multiple organs, and although the most severe infections also cause the worst long-term impacts, even mild cases can have life-changing effects notably a lingering malaise similar to chronic fatigue syndrome. Potential long-term effects include damage to the lungs, to the immune system, to the heart, and to the brain,

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<sup>20</sup> Crowley, P. and Hughes, A. (2021), The impact of COVID-19 pandemic and the societal restrictions on the health and wellbeing of the population, and on the health service capacity and delivery: A plan for healthcare and population health recovery, Version 2 (May 2021). Dublin: National QI Team, Health Service Executive ; see: <https://www.hse.ie/eng/about/who/qid/covid-19-qi-learning/qi-resources-to-support-learning-from-covid19/covid-19-pandemic-impact-paper-2021.pdf>

resulting in neurological complications such as delirium, confusion and memory loss (Marshall, 2020).

Olfactory dysfunction is another lingering symptom with up to 10% of patients reporting persistent loss or distortion of smell or taste eight weeks after symptom onset (Hopkins et al., 2020, Fjaeldstad, 2020 and Vaira et al., 2020). Chary et al., (2020) however, conclude that although olfactory and gustatory dysfunctions related to COVID-19 are frequently reported and prevalent in mild symptomatic forms of the disease, recovery in most cases seems rapid and complete. Carvalho-Schneider et al., (2020) recommend a prolonged medical follow-up of patients with COVID-19 regardless of the severity of initial clinical presentation.

One of the most insidious long-term effects of COVID-19 is its least understood: severe fatigue (Marshall, 2020 and Townsend et al., 2020). Over the past nine months, an increasing number of people have reported crippling exhaustion and malaise after having the virus. Symptoms such as foggy thoughts, breathlessness and exhaustion resemble chronic fatigue syndrome, also known as myalgic encephalomyelitis (CFS/ME); comparisons with CFS/ME are frequent in the literature (Rubin, 2020, Mardini, 2020, Marshall, 2020, Lyons et al., 2020, Mahase, 2020 and Rooney et al., 2020).

Pero et al., (2020) speculate that psychiatric illness and fatigue may also be a long-term effect of COVID-19, as it was previously for the SARS epidemic. Lyons et al., (2020) also caution about the potential for a significant and persistent negative mental health impact based on previous experience with other pandemics.

Rooney et al., (2020) conclude that physical function and fitness are impaired following SARS-CoV infection and impairments may persist up to two years' post-infection. However, there are concerns related to the impact of graded exercise therapy for managing post-viral fatigue in patients recovering from COVID-19, with NICE acknowledging that graded exercise therapy may not be appropriate for some patients (Torjesen, 2020). There are no definitive, evidence-based recommendations for the management of post-acute COVID-19 as yet. Therefore, patients should be managed pragmatically and symptomatically e.g. antipyretic for fever, breathing techniques for chronic cough, home pulse oximetry for monitoring breathlessness, pulmonary rehabilitation, staged return to exercise (BMJ, 2020). Greengalgh et al., (2020) state that patients recover spontaneously (if slowly) with holistic support, rest, symptomatic treatment and gradual increase in activity. Indications for specialist assessment include clinical concern along with respiratory, cardiac or neurological symptoms that are new, persistent, or progressive.

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