Implications for the General Practitioner of Long Covid Syndrome

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ABSTRACT

People living with "Long Covid" describe a complex and multifaceted condition that involves a variety of physical, cognitive, psychological, and social implications. There is an emerging recognition of Long Covid but the evidence base is limited and fragmented and many research questions remain. It is currently estimated that 10% of people whose COVID-19 was managed at home experience persistent symptoms beyond a month, indicating a significant impact on the economy and healthcare. The complexity of managing the post-COVID-19 syndrome, including the various pre-morbidities and multisystemic manifestations of COVID-19 infection of affected patients requires professionals with integrated approaches rather than specific organs or diseases, and that is the place of the General Practitioner (GP) in health services. The basic pillars of general medicine are applied to the assistance of Long COVID giving rise to a series of key areas for therapeutic interventions of the GP: 1. Understanding and managing symptoms; 2. Management of functional impact on return to work, roles, and activities of daily living; 3.-Attention centered on the patient, empathy, and assertiveness (avoid iatrogenesis); 4. Rehabilitation; 5. Vaccination; 6. Registration and Research; 7. Community care; and 8. Patient education.

Keywords: COVID-19; SARS-CoV-2; Post-COVID-19 condition; Long COVID; General Practice.

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Introduction

The coronavirus disease (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in China in December 2019.[1] and spread rapidly in many countries. COVID-19 is a devastating disease that has infected millions of people since the beginning of 2020, through its multisystemic manifestations that vary widely in severity.[2] Common symptoms in the acute phase include cough, fever, dyspnea, musculoskeletal symptoms (myalgia, joint pain, fatigue), gastrointestinal symptoms, and anosmia/dysgeusia.[3-6] But, data is emerging that many patients have long-lasting symptoms, several months after initial infection with COVID-19.[7]

Because current knowledge about the types and severity of medical illnesses faced by patients who recovered from coronavirus disease 2019 is limited, it is unknown whether these illnesses are direct sequelae of COVID-19 disease infection. or unrelated events.[2] When it comes to strategies for the COVID-19 pandemic, doctors and politicians often discuss infection and death rates, effects on children and adolescents, or socioeconomic effects. The long-term consequences of COVID-19 receive little attention, although they are of considerable importance for those affected, for the health system, and for the entire economy.[8]

The first reports of persistent symptoms after COVID-19 pointed to a long-term debilitating

fate for an undetermined proportion of people surviving COVID-19. More than one year later there is no consensus on the name, duration, or symptoms of this syndrome, alternatively known as "'post-acute COVID-19", "post-COVID syndrome" or "prolonged/long COVID".[9]

People living with "Long Covid" around the world describe a complex and multifaceted condition that involves a variety of physical, cognitive, psychological, and social implications, and although there is an emerging recognition of Long COVID, the evidence base is limited and fragmented and many research questions remain.[10] Like many other diseases, COVID-19 can cause long-lasting problems. Several studies suggest that 1 in 10 COVID-19 patients, including hospitalized and non-hospitalized individuals, had continuous symptoms 12 weeks after a positive test.[11,12]

Between 170 and 205 persistent, intermittent, and recurrent symptoms have been attributed to prolonged COVID, lasting between 4 weeks and > 1 year after infection with the SARS-CoV-2 coronavirus. Many of the self-reported symptoms, such as intermittent headaches or tiredness, are nonspecific and prevalent in the general population, while others, such as the inability to yawn or chapped lips, are biologically implausible and unlikely to meet the Bradford criteria Hill for causality.[9]

Treatment services for the long-term consequences of COVID-19 must be urgently absorbed by health and care systems. Addressing this requires a much clearer picture of the burden of disease than currently exists.[11] To be prepared for long-term COVID-19 problems, all health systems will need to monitor "recovered" patients, assess the prevalence of persistent symptoms, and seek ways to help these patients.[13]

In this context, the objective of this article is to reflect on the role of the general practitioner (GP) in the medical care of Long COVID.

Methods

For the literature review, a pragmatic approach was used that was based on a non-systematic or opportunistic narrative review considered the bibliographic references of selected articles and opportunistic searches on the Internet. This article should be understood as a personal view, based on the author's experience and the literature review as described above.

Discussion

Definitions: There is no widely accepted definition of Long COVID. The National Institute for Health and Care Excellence provides a useful outline for definitions of COVID:

1. Acute covid-19: signs and symptoms of covid-19: ≤4 weeks
2. Ongoing symptomatic covid-19: signs and symptoms of covid-19: 4-12 weeks
3. Post-covid-19 syndrome: signs and symptoms that develop during or after covid-19, lasting > 12 weeks and not explained by another diagnosis.[14]

Thus, "post COVID-19 syndrome" or "long COVID" can be described as a set of persistent physical, cognitive, and/or psychological symptoms that continue for more than 12 weeks after the illness and that are not explained by an alternative diagnosis. Persistent symptoms appear to be more likely after a severe illness than after a non-severe illness, and people treated in the intensive care unit reported the most pronounced symptoms during the convalescent period. But people with mild COVID-19 can report pronounced symptoms weeks to months after acute illness. That is, these symptoms are experienced not only by patients discharged from the hospital but also by those in the community who did not

require hospital care. Symptoms Specific may include extreme tiredness, shortness of breath, chest pain, memory problems, heart palpitations, dizziness, joint pain, cough, loss of taste or smell (or both), myalgia, and gastrointestinal disorders.[15,16]

Causes of a prolonged COVID, pathophysiology and histopathology

The current literature lacks a characterization of post-recovery sequelae among COVID-19 patients.[17] Current evidence suggests that COVID-19 may have long-term effects on body systems, including lung, cardiovascular, kidney, and nervous, and psychological effects. Post-recovery infectious complications are common in patients with prolonged COVID-19 ranging from mild infections to life-threatening conditions. Persistent symptoms have been associated with evidence of multi-organ damage, even in young, low-risk populations. However, currently, only a small proportion of these symptoms are pathologically explained. Understanding the histopathological and pathophysiological correlates of these symptoms is, therefore, a top priority for COVID-19 research, and clinical services must develop in parallel with this new information as it emerges.

COVID-19 can cause long-term organic pathology in the absence of symptoms. For example, one study reported abnormal lung function in one in four patients 3 months after leaving the hospital. Coagulation markers predicted reduced diffusing capacity of the lung during acute disease, suggesting that the reduction in lung function could be due to an underlying vascular pathology. However, respiratory symptoms had resolved at this point for most of the patients in the study. Signs of myocardial inflammation on cardiac MRI also persist for many weeks after acute COVID-19, although the clinical consequences of this are unclear. The GP must be cautious when interpreting abnormal pathology; These findings may be clinically relevant, or they may be transient and perhaps even nonspecific for COVID-19, reflecting instead any serious viral illness.[2,16,17] Causes of a prolonged COVID, pathophysiology, and histopathology.

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be transient and perhaps even nonspecific for COVID-19, reflecting instead any serious viral illness.[2,16,17]

There are several working theories about the causes of a prolonged COVID. Some studies suggest that the virus or its debris can lurk in the body and continue to stimulate the immune system. Or it is possible that the virus has been eliminated, but the immune system continues to fight against a perceived enemy, or the tissues may have been damaged during the initial immune response, leading to long-term symptoms.[18,19]

Long Covid prevalence

Existing evidence suggests large variations in estimates of the prevalence and incidence of post-COVID syndrome due to differences in study populations, recruitment methods, follow-up periods, and sample sizes.[20] It is currently estimated that 10% of people whose COVID-19 was managed at home experience persistent symptoms beyond a month, indicating a significant impact on the economy and overall healthcare.[21,22] The UK Office for National Statistics (ONS) has followed more than 20,000 people who tested positive since April 2020. The ONS found that 14% still reported symptoms after at least 12 weeks.[23] A study in Italy had monitored 143 people on routine visits 7 weeks after recovering from COVID-19 and found that 53% of patients reported fatigue, 43% reported shortness of breath, and 27% reported joint pain on the visit. Furthermore, up to 32% of patients reported having one or two persistent symptoms, while 55% reported that at least three symptoms persisted for an average of 36.1 days after discharge. Another series of 100 patients in the UK reported fatigue in 64% of patients, dyspnea in 50% of patients, neuropsychological symptoms in 31% of patients, and persistent new urinary incontinence in 13% of patients up to 48 days after discharge.

A larger ambidirectional cohort study conducted in China had followed up COVID-19 patients 6 months after discharge from acute infection. Of 1,733 patients, 1,265 patients (76%) reported symptoms during follow-up, and the most frequently reported symptoms were muscle fatigue or weakness (63%), sleep difficulties (26%), and anxiety/depression (23%). The authors also reported a significant decline in lung function in COVID-19 survivors, especially those who were most severely ill during acute COVID-19 infection.[2] Up to 30% of patients have persistent symptoms that are a continuation of those they experienced when seriously ill. The other 70% tend to have new symptoms that are specific to long-term COVID.[18]

Long COVID Diagnosis

The current data on prolonged COVID leads to an area of uncertainty: the most common symptoms - fatigue, weakness, insomnia, dyspnea, and mental confusion - are difficult to quantify. Fatigue compared to what? When it comes to cognition, the past 12 months have not been an easy time to focus on a task. And most GPs can't count on both hands the number of people I've seen in the clinic who report good sleep. Then there is a selection bias in many of the reports.[24] There is no single sign or lab test that can distinguish this syndrome from something else. It has been hypothesized that the diagnosis is being driven by interest groups rather than science.[25] Others compare it to other chronic conditions, such as fibromyalgia, for which there are no definitive diagnostic tests. Some suggest that it is a psychosomatic illness. Regardless, patients and their advocates played a crucial role in gaining attention and acceptance of long COVID.[18,23]

Role of the GP

What can be done by GP to help people with long-term COVID? At this time, the options are quite limited, because the disorder is poorly understood. Some countries are opening clinics for people with long-term COVID. As a new virus, there is currently no established evidence base for Post COVID-19 syndrome; therefore, interventions have been based on evaluation, clinical reasoning, experience, and judgment of trained clinicians.[25] The complexity of managing the post-COVID-19 syndrome, including the various pre-morbidities and multisystemic manifestations of COVID-19 infection of affected patients (On average, each person has about 16 or 17 symptoms), requires a multidisciplinary team to adequately respond to the medical needs of COVID-19 survivors. These survivors may experience a worsening of pre-existing medical conditions, in addition to the physical strain and mental stress associated with COVID-19. While COVID-19 is an infectious disease that primarily affects the lungs, its survivors have reported multisystem complications, spanning virtually every branch of medicine. In any case, it is a group of emerging patients who have complex multidisciplinary needs. Therefore, Long COVID assistance needs a comprehensive and multidisciplinary model.[22,25]

With limited knowledge of the aftermath of COVID-19 infection, a holistic approach that incorporates primary care is required. Thus, the diagnosis, treatment, and prevention of post-covid syndrome may require integrated approaches rather than specific organs or diseases, and that is the place of the GP in healthcare services. The fundamental concepts of General medicine are basic pillars for Long COVID care: 1.Comprehensiveness and integrality; 2.Continuity; 3.Context and contextualization; 4.Uncertainty; 5.Complexity; 6.Community; 7.Patient-centered Interview; 8.Biopsychosocial Model; 9.Actors and resources/strengths of the patients; 10.Medicalization and technology; 11.Family; 12.The meaning of Symptoms; 13.Diagnosis and treatment; 14.Concept of health and disease; 15.Variability.[26-28]

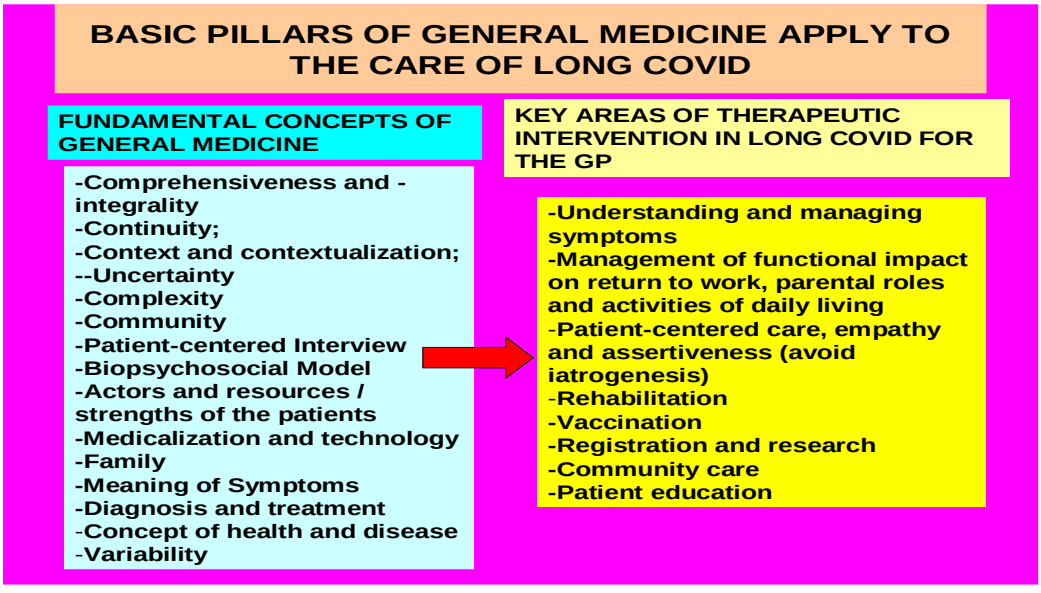

Figure 1: Basic Pillars of General Medicine Apply to the Care of Long Covid

The key areas of therapeutic intervention of the GP are (**Table 1**):

1. Understanding and managing symptoms

They are mainly, fatigue (70%), dyspnea (51%), and cognitive problems (12%). Complications are frequently seen in patients recovering from COVID-19, ranging from mild to life-threatening conditions. Patients who developed acute respiratory distress syndrome, pulmonary embolism, arrhythmia, myocarditis, or other cardiopulmonary complications during the acute phase require multi-specialty care and long-term COVID follow-up. The GP should be alert and monitor patients for possible adverse events after recovery from SARS-CoV-2 infection.[17] Hundreds of persistent, intermittent, and recurrent symptoms have been attributed to Long COVID. Many of the self-reported symptoms, such as intermittent headaches or tiredness, are nonspecific and prevalent in the general population, while others, such as the inability to yawn or chapped lips are biologically implausible and unlikely to meet the Bradford criteria Hill for causality.[9] The task of GP is to discover the true nature of the health problem. The reason for consultation expressed by the patient is a manifest content. The GP must transform or complete those ideas that are latent or initially hidden. The latent content of the symptom/problem/ motive may be incomprehensible at the beginning[29], which can also have different meanings in men and women.[30,31] as well as in different ethnic origin, socio-economic contexts, or in a different stage of the family life cycle.[32]

2. Management of functional impact on return to work, parental roles and activities of daily living

The intervention of the GP must mean psychosocial support to patients and their families.[33] Much of the challenge will be social and political, because people with prolonged COVID must rest, often for months, and need support while they do so. Their conditions "must be recognized as a disability.[23]

3.-Patient-centered care, empathy and assertiveness (avoid iatrogenesis)

It is important that GP be aware of accepting the patient's offer of symptoms and organizing them by including himself in the dynamic field that is configured. The knowledge and understanding of the symptom-its diagnosis-depends on the doctor-patient relationship, and it is this relationship that signals (such as road marking) the clinical setting. The biopsychosocial (BPS) model is the framework where Patient-Centered Care is included (PCC). The BPS model and the PCC overlap.[34] The patient arrives with his symptoms; the doctor prescribes a drug or gives advice. What really happens during the consultation in general medicine? What really happens in the short time of 10 minutes? It is a magical moment. The GP in a few minutes makes a diagnosis and prescribes a treatment. How can the GP do that? Where does this magic reside? Mainly it is in the doctor-patient relationship.[35]

Psychological phenomena of the doctor-patient relationship influence the therapeutic process. Among these phenomena are transference (the emotions of the patient towards the doctor), and countertransference (the emotional reactions of the doctor towards the patient). Doctor and patient are within an interactive relationship in a conscious and unconscious way: the patient is influenced by the doctor and vice versa. In general medicine, transference /countertransference has connotations of placebo effect and nocebo. The challenge of the doctor-patient relationship for the GP is to realize the transference and countertransference phenomena and use them

to achieve placebo effects and minimize the nocebo, and also respecting the needs of both parties.[36]

GPs should take practical steps to address the range of symptoms associated with the post-COVID syndrome, as well as conduct research efforts to better understand the long-term health effects of COVID-19. Furthermore, patients frequently report that they contact GPs for help in managing these lesser-known and painful symptoms, but find that some clinicians are unable or unwilling to help patients manage them due to a lack of scientists data.[37] It should be remembered that people with any symptoms, by definition, suffer, and empathic care is required.[24]

But on the other hand, there is a persistent unnoticed COVID-19 danger: medical iatrogenesis.[24] The myriad symptoms attributable to after-effects of SARS-CoV-2 infection, the uncertain etiology, and the immense care and resources you are receiving may be the perfect prescription for medical iatrogenesis, unwanted procedural complication, and indications fueled by four factors: good intentions, uncertainty, the incentive to act (rather than observe) and fear. In this context, a conservative approach seems reasonable.[24] patient-centered care by the primary care physician is crucial to curbing preventable adverse events.[17]

4. Rehabilitation

Through primary care services, it is possible to provide rehabilitation and support to recovering patients requiring rehabilitation in the post-acute infectious phase of COVID-19. These patients often have breathing difficulties and a useful intervention is a rehabilitation.[23]

5. Vaccination

COVID-19 vaccines could play a role in treating Long COVID patients. Although many COVID-19 vaccines prevent death and serious illness, scientists do not yet know if they prevent prolonged COVID. A UK survey of more than 800 people with prolonged COVID reported that 57% saw an overall improvement in their symptoms, 24% no change, and 19% deterioration after their first dose of vaccine. In any case, people must be vaccinated to emerge from the pandemic, but first, the GP must address their concern about whether the vaccine will help, not harm, or be harmful.[23]

6.-Registration and research

It has been suggested that implementing well-functioning patient registries and other surveillance systems, creating patient cohorts, and monitoring those affected are means of supporting the research; that is so critical to understanding and treating Long COVID.[38-42] Although it is essential for any positive therapeutic relationship that clinicians listen to their patients, this alone is rarely sufficient to treat symptoms. Understanding and treating protracted COVID will require an intense, rapid, and multidisciplinary research effort. It is not known whether prolonged COVID is a new and distinct syndrome, or multiple, partially overlapping syndromes that occur alone or in combination, and how much of this syndrome is explained by post-intensive care syndrome (seen after admission to intensive care for non-COVID-19 disease), postviral fatigue syndrome or post-traumatic stress disorder.[16,43]

An important limitation of current studies is the lack of adequate controls with which to objectively identify and quantify attributable symptoms, especially in the evaluation of longer-term sequelae, because many of the reported symptoms of prolonged COVID are nonspecific and prevalent in the general

population and also because some of the reported symptoms have been intermittent or recurrent or have emerged several weeks or months after infection. Here the role of the GP who continuously attends to people is important.[44-47]

7. Community care

All health problems are biopsychosocial, and individual, group, and the community at the same time. Individual, family and community care, and bio, psycho and social care are an indivisible whole. Community is established through geography, but also through "nexus", through relationships.[48] Although the long-term impact of COVID-19 sequelae is still unclear, it is likely that a large number of patients will experience persistent symptoms, especially in those geographic regions where large outbreaks have occurred. To improve patient outcomes, it is essential to adopt an interprofessional and community-based pattern of care through the promotion of remote technologies, telehealth appointments with the GP, and the adoption of locally relevant solutions.[17] The GP community care includes information on resources and mutual aid groups.[48]

8. Patient education

Investing time in patient education with COVID-19 is probably the most useful measure for outpatient management. The information that the GP gives to the patient with COVID-19 can have an important impact on its clinical course, on its mental health and on the prevention of new infections.[49,50]

Key Areas of Therapeutic Intervention for the GP	
1	Understanding and managing symptoms
2	Management of functional impact on return to work, parental roles and activities of daily living
3	Patient-centered care, empathy and assertiveness (avoid iatrogenesis)
4	Rehabilitation
5	Vaccination
6	Registration and research
7	Community care
8	Patient education

Table 1: Key Areas of Therapeutic Intervention for the GGP

Conclusion

People living with "Long Covid" around the world describe a complex and multifaceted condition that involves a variety of physical, cognitive, psychological, and social implications, and although there is an emerging recognition of Long Covid, the evidence base is limited and fragmented and many research questions remain. It is currently estimated that 10% of people whose COVID-19 was managed at home experience persistent symptoms beyond a month, indicating a significant impact on the economy and overall healthcare. Treatment services for the long-term consequences of COVID-19 must already be urgently absorbed by health and care systems. The complexity of managing the post-COVID-19 syndrome, including the various pre-

morbidities and multisystemic manifestations of COVID-19 infection of affected patients requires professionals with integrated approaches rather than specific organs or diseases, and that is the place of the GP in health services. The fundamental concepts of General medicine are basic pillars for long COVID care: 1. Comprehensiveness and integrality; Continuity; Context and contextualization; Uncertainty; Complexity; Community; Patient-centered Interview; Biopsychosocial Model; Actors and resources/strengths of the patients; Medicalization and technology; Family; Meaning of Symptoms; Diagnosis and treatment; Concept of health and disease; and Variability. These basic pillars of general medicine apply to the care of Long COVID give place to key areas of therapeutic intervention for the GP (**Table 1**). The key areas are: 1) Symptom management; 2) Management of functional impact on return to work, parental roles and activities of daily living; 3) Attention centered on the patient, empathy and assertiveness (avoid iatrogenesis); 4) Rehabilitation; 5) Vaccination; 6) Registration and Research; 7) Community care, and 8) Patient education.

References

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet; 395(10223):497–506. https://doi.org/10.1016/S0140-6736(20)30183-5
2. Hsieh JYC, Chin TT (2021) An emerging entity after pandemic: Post-coronavirus disease 2019 syndrome and associated medical complications. SAGE Open Medicine. doi: https://doi.org/10.1177%2F20503121211023631
3. Carfì A, Bernabei R, Landi F, for the Gemelli Against COVID-19 Post-Acute Care Study Group (2020) Persistent Symptoms in Patients After Acute COVID-19. JAMA; 324(6):603–5. doi: https://doi.org/10.1001/jama.2020.12603
4. Docherty AB, Harrison EM, Green CA, et al. (2020) Features of 20 133 UK patients in hospital with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol: prospective observational cohort study. BMJ; 369: m1985. doi: https://doi.org/10.1136/bmj.m1985
5. Wang D, Hu B, Hu C, et al. (2020) Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. JAMA; 323(11): 1061-69. doi: https://doi.org/10.1001/jama.2020.1585
6. Landi F, Barillaro C, Bellieni A, et al. (2020) The new challenge of geriatrics: saving frail older people from the SARS-CoV-2 pandemic infection. J Nutr Health Aging; 24(5): 466-70. doi: https://doi.org/10.1007/s12603-020-1356-x
7. Mahase E (2020) Long covid could be four different syndromes, review suggests. BMJ; 371: m3981. doi: https://doi.org/10.1136/bmj.m3981
8. Kron T (2021) Long-COVID: [Infectiously recovered, but not healthy -at least every 10th patient suffers from these long-term consequences]. Medscape; 25. Februar. https://deutsch.medscape.com/artikelansicht/4909757
9. Amin-Chowdhury Z, Ladhani SN (2021) Causation or confounding: why controls are critical for characterizing

long COVID. Nat Med; 27: 1129–30. doi: https://doi.org/10.1038/s41591-021-01402-w

10. Carson G, Long Covid Forum Group (2021) Research priorities for Long Covid: refined through an international multi-stakeholder forum. BMC Med; 19: 84. doi: https://doi.org/10.1186/s12916-021-01947-0
11. Briggs A, Vassall A (2021) Count the cost of disability caused by COVID-19. Focusing only on cases and deaths hides the pandemic's lasting health burden on people, societies and economies. Nature; 593: 502-5. https://doi.org/10.1038/d41586-021-01392-2
12. Mullard A (2021) Long COVID's long R&D agenda. Nat Rev Drug Discov. doi: https://doi.org/10.1038/d41573-021-00069-9
13. Nisen M, He E (2020) Covid Everlasting. Bloomberg Opinion; September 22. https://www.bloomberg.com/graphics/2020-opinion-covid-long-haulers-chronic-illness/
14. National Institute for Health and Care Excellence (2020) Covid-19 rapid guideline: managing the long-term effects of covid-19. www.nice.org.uk/guidance/ng188
15. Post-COVID Syndrome (Long COVID) (2021) NHS England and NHS Improvement. https://www.england.nhs.uk/coronavirus/post-covid-syndrome-long-covid/Google Scholar
16. Kondratiuk AL, Pillay TD, Kon OM, Lalvani A (2021) A conceptual framework to accelerate the clinical impact of evolving research into long COVID. Lancet Infect Diseases. doi: https://doi.org/10.1016/S1473-3099(21)00136-5
17. Sarfraz Z, Sarfraz A, Barrios A, et al. (2021) Cardio-Pulmonary Sequelae in Recovered COVID-19 Patients: Considerations for Primary Care. J Prim Care *Community Health*. doi: https://doi.org/10.1177%2F21501327211023726
18. Andrews M, Zuraw L (2021) Doctors Scramble to Understand Long COVID, but Causes and Prognosis Are Elusive. Medscape; Apr 22. https://www.medscape.com/viewarticle/949800?src=WNL_mdpls_210427_mscpedit_fmed&uac=327178AR&spon=34&impID=3338689&faf=1#vp_1
19. Piore A (2021) Could covid lead to a lifetime of autoimmune disease? Evidence is growing that in some people covid infections are producing autoantibodies targeting the body's organs. If true, it could mean years of lingering sickness and misery for many. MIT Technology Review; April 23. https://www.technologyreview.com/2021/04/23/1023438/long-term-covid-antibodies-autoantibodies-immunity-cytokines-lupus/?utm_source=engagement_email&utm_medium=email&utm_campaign=site_visitor.unpaid.engagement&utm_content=04.25.non-subs&mc_cid=4581ec1717&mc_eid=647a60bd64
20. Ayoubkhani D, Khunti K, Nafilyan V, et al. (2021) Post-covid syndrome in individuals admitted to hospital with covid-19: retrospective cohort study. BMJ; 372: n693. Doi: https://doi.org/10.1136/bmj.n693
21. Sudre CH, Murray B, Varsavsky T, et al. (2020) Attributes and predictors of long-covid: analysis of covid cases and

their symptoms collected by the Covid Symptoms Study app. MedRxiv. https://www.medrxiv.org/content/10.1101/2020.10.19.20214494v1 Google Scholar

22. Turabian JL (2021) Post-Acute Covid-19 in General Medicine: A Clinical-Epidemiological Reporting of 33 Patients from March 2020 to March 2021 in Toledo (Spain). Epidemol Int; 5(S1): 000S1-018. doi: https://doi.org/10.23880/eij-16000S1-018
23. Marshall M (2021) The four most urgent questions about long COVID. Scientists are starting to get insights into the lingering disorder that affects some people infected with SARS-CoV-2 — but many mysteries remain unsolved. Nature; 594: 168-70. doi: https://doi.org/10.1038/d41586-021-01511-z
24. Mandrola JM (2021) Why Long COVID Worries Me. Medscape; Apr 05. https://www.medscape.com/viewarticle/948674
25. Devine J (2021) The Dubious Origins of Long Covid. Echoes of chronic fatigue in the effort to blame the coronavirus for a host of questionable symptoms. The Wall Street Journal; March 22. https://www.wsj.com/articles/the-dubious-origins-of-long-covid-11616452583?mod=opinion_lead_pos5
26. Turabian JL (1995) Cuadernos de Medicina de Familia y Comunitaria. Una introducción a los principios de Medicina de Familia. [Notebooks of Family and Community Medicine. An introduction to the principles of Family Medicine]. Madrid: Díaz de Santos. http://www.amazon.co.uk/Cuadernos-medicina-familia-y-comunitaria/dp/8479781920
27. Turabian JL (2017) Fables of Family Medicine. A collection of fables that teach the Principles of Family Medicine. Saarbrücken, Deutschland/Germany: Editorial Académica Española. https://www.morebooks.de/store/gb/book/fables-of-family-medicine/isbn/978-3-639-53052-0
28. Turabian JL (2017) Stories Notebook about the Fundamental Concepts in Family Medicine: An Introduction. J Gen Pract (Los Angel); 5: 283. doi:10.4172/2329-9126.1000283. https://doi.org/10.4172/2329-9126.1000283
29. Turabian JL (2019) Interpretation of the Reasons for Consultation: Manifest and Latent Content. the Initiation of the Diagnostic Process in General Medicine. Archives of Community and Family Medicine; 2(1). https://www.sryahwapublications.com/archives-of-community-and-family-medicine/pdf/v2-i1/1.pdf
30. Turabian JL (2017) Is The Meaning of Symptoms the Same in Women And Men?. J Women's Health Care 6:376. https://doi.org/10.4172/2167-0420.1000e129
31. Turabian JL (2020) Sex and Gender Bio-psychosocial Differences in Coronavirus Disease 2019 (Covid-19): Men have more Biological Problems, but Women Suffer more Long-Term Serious Psychosocial Consequences and with more Implications for Population. J Women's Health Care 9:487. https://www.longdom.org/open-access/sex-and-gender-biopsychosocial-differences-in-coronavirus-disease-2019-covid19-men-have-more-biological-problems-but-wom.pdf

32. Turabián JL, Báez-Montiel B and Gutiérrez-Islas E (2016) Type of Presentation of Coronary Artery Disease According the Family Life Cycle. SM J Community Med; 2(2): 1019. https://smjournals.com/community-medicine/fulltext/smcm-v2-1019.php
33. Parkin A, Davison J, Tarrant R, et al. (2021) A Multidisciplinary NHS COVID-19 Service to Manage Post-COVID-19 Syndrome in the Community. J Prim Care *Community Health*. doi: https://doi.org/10.1177/21501327211010994
34. Turabian JL (2018) Patient-centered care and biopsychosocial model. Trends Gen Pract; 1. doi: https://doi.org/10.15761/TGP.1000114
35. Turabian JL (2018) The enormous potential of the doctor-patient relationship. Trends Gen Pract 1: doi: https://doi.org/10.15761/TGP.1000115
36. Turabian JL (2020) Transference and countertransference are linked to placebo-nocebo effects and they are an auxiliary resource of unparalleled value in general medicine: Recommendations for general practitioners. Arch Psychiatr Ment Health; 4: 001-008. https://doi.org/10.29328/journal.apmh.1001010
37. Lambert NJ, Survivor Corps COVID-19 (2020) "Long Hauler" Symptoms Survey Report Indiana University School of Medicine. https://dig.abclocal.go.com/wls/documents/2020/072720-wls-covid-symptom-study-doc.pdf
38. WHO (2021) In the wake of the pandemic: preparing for Long COVID. https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/publications-and-technical-guidance/2021/in-the-wake-of-the-pandemic-preparing-for-long-covid-2021
39. Alger HM, Williams IV JH, Walchok JG, Bolles M, Fonarow GC, Rutan C (2020) Role of data registries in the time of COVID-19. Circ Cardiovasc Qual Outcomes; 13: e006766. doi: https://doi.org/10.1161/CIRCOUTCOMES.120.006766
40. Nanda S, Toussaint L, Vincent A, et al. (2021) A Midwest COVID-19 Cohort for the Evaluation of Multimorbidity and Adverse Outcomes from COVID-19. J Prim Care Community Health. doi: https://doi.org/10.1177%2F21501327211010991
41. National Institutes of Health (2021) List of Registries. Updated January 6, 2021. https://www.nih.gov/health-information/nih-clinical-research-trials-you/list-registriesGoogle Scholar
42. Gliklich R, Dreyer N, Leavy M, eds. (2014) Registries for Evaluating Patient Outcomes: A User's Guide. Third edition. Two volumes. (Prepared by the Outcome DEcIDE Center [Outcome Sciences, Inc., a Quintiles company] under Contract No. 290 2005 00351 TO7.) AHRQ Publication No. 13(14)-EHC111. Rockville, MD: Agency for Healthcare Research and Quality.
43. Maxwell E (2020) A dynamic review of the evidence around ongoing covid-19 symptoms (often called long covid). National Insitute for Health Research; Oct 15, https://evidence.nihr.ac.uk/themedreview/living-with-covid19/

44. Turabian JL (2020) Epidemiological Value of Continuity of Care in General Medicine (Part one of Two). Epidemol Int J; 4(1): 000135. https://medwinpublishers.com/EIJ/EIJ16000135.pdf
45. Turabian JL (2020) Epidemiological Value of Continuity of Care in General Medicine (Part Two). Epidemol Int J 2020; 4(1): 000138. https://medwinpublishers.com/EIJ/EIJ16000138.pdf
46. Turabian JL (2017) A Narrative Review of Natural History of Diseases and Continuity of Care in Family Medicine. Arch Community. Med Public Health 3(1): 041-047. https://www.peertechz.com/articles/a-narrative-review-of-natural-history-of-diseases-and-continuity-of-care-in-family-medicine.pdf
47. Turabian JL (2017) Opportunistic Prevention in Family Medicine: Anticipatory Care, Case-Finding and Continuity of Care. J Health Care Prev; 1: 101. https://www.omicsonline.org/open-access/opportunistic-prevention-in-family-medicine-anticipatory-care-casefinding-and-continuity-of-care.pdf
48. Turabian JL , Perez Franco B (2001) Actividades Comunitarias en Medicina de Familia y Atención Primaria. [Community Activities in Family Medicine and Primary Care]. Madrid: Díaz de Santos. https://books.google.es/books/about/Actividades_comunitarias_en_medicina_de.html?id=5TYJGHY6Nj0C&redir_esc=y
49. Pérez-Cortés Villalobos A (2021) [5 Evidence-Based Points for Managing COVID-19]. Medscape; 13 de jul. https://espanol.medscape.com/verarticulo/5907350
50. Greenhalgh T, Knight M, Court C, Buxton M, Husain L (2020) Management of post-acute covid-19 in primary care; BMJ; 370: m3026. doi: https://doi.org/10.1136/bmj.m3026

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