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**1. How to Conduct an Outpatient Telemedicine Rehabilitation or Prehabilitation Visit.**

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**Abstract:** The novel coronavirus pandemic is resulting in an accelerated conversion of in-person physician visits to virtual visits. As barriers to adoption of telemedicine are rapidly decreasing, it is important to recognize the need for practical and immediately deployable information that can improve doctor-patient interactions, facilitate accurate documentation, and increase confidence in the transition to virtual visits. In this article we aim to outline the components of an outpatient telemedicine visit for physiatrists with a particular focus on an adapted virtual physical examination. Uses of telemedicine may include future largescale concerns such as natural disasters or climate change. We describe a general approach to the visit, review definitions of terms commonly used in telemedicine, and offer tips for optimizing the encounter. This article is protected by copyright. All rights reserved.

**Database:** Medline

BMJ Opinion

Covid-19: Home based exercise activities could help during self isolation

March 16, 2020

During this covid-19 pandemic, public health recommendations are to minimise infection spread, with country-specific recommendations. Typically these focus on self isolation, reduced social contact, and scrupulous hand hygiene. Evidence to date indicates that the groups most of risk of serious sequelae of covid-19 have features that cannot be changed, such as advanced age and pre-existing illnesses, the latter typically hypertension, chronic respiratory disease, and diabetes.

We believe that what is lacking from the current advice, and the behavioural changes considered for the public, is the possibility to harness pre-exposure conditioning as a positive way to help our fellow human beings prepare physically and psychologically for infection and its sequelae. [1] Prior to anticipated medical stresses such as elective surgery or pregnancy, standard advice is to optimise physical fitness. [2] This is particularly pertinent since the covid-19 quarantine-like measures may appear to be favouring a more sedentary approach with individuals waiting indoors, hoping to avoid the perceived inevitable infection. [3]

Meta-analyses indicate that all types of respiratory muscle training improve exercise performance, with benefits greater in less fit individuals. [4] Applied specifically to medical stresses, in randomised controlled trials, exercise in preparation for surgery is associated with a lower postoperative complication rate and earlier restoration of functional status. [5,6] In other conditions where cardiovascular function is impaired, for example after pregnancy affected by pre-eclampsia, it is possible through exercise to increase intravascular volume and improve cardiovascular function. [7] Even a 4 week programme of moderate intensity exercise can increase cardio-respiratory fitness. [8]

So while ensuring appropriate quarantine and public health advice is being followed, we suggest Public Health advice encourages all to try to do a little more activity, every day, to improve their physical preparation in case they are infected with the coronavirus and are unlucky enough to be more severely affected. [3] This advice is particularly pertinent to those that are at risk whether through age or co-mordibities. This is first to prevent any physical deterioration due to isolation, and secondly, to optimize cardio-respiratory fitness to reduce the risk of complications.

We therefore suggest:

1. Home based exercises, following NHS advice on physical activity guidelines (e.g. for older adults [9]) should be included as an essential part of the self isolation/ protection guidelines. Walking extra steps around the same rooms on the flat, or using stairs – even one step up and down- is better than sitting or lying most of the day. Particularly so if such a routine is performed every few hours. Furthermore, where it is possible to take walks while avoiding unnecessary social contact, this should be encouraged. Encouraging the elderly to sit upright and to take deep breaths will expand lung volume and reduce the risk of atelectasis.
2. These exercises are continued daily, but stopped if a temperature develops, if the individual becomes unwell, or if covid-19 is diagnosed.

The rationale can be explained to patients through public information sites, which explain why cardiac work would be increased due to the illness, and why benefits accrued from previous training should be beneficial. [10]

We believe that pre-exposure conditioning may represent an important and effective individual intervention with a potential public health benefit. Such a strategy would also empower a largely passive population and to some extent counter the feeling of inevitability that surrounds the covid-19 and possibly future epidemics of this sort.

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***Competing interests****: None declared.*

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[10] www.theoxygentrain.net

**Contributions**

CLS devised the manuscript, wrote the first draft and contributed to revisions.  KM made intellectual contributions and revised the manuscript. CL made intellectual contributions and revised the manuscript.  All authors approved the final version

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There are no data to share

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**Patient and Public Involvement**

Patient queries led to the initial decision to generate an opinion piece.  The authors intend to involve patient self help groups in dissemination of the article once published.

BMJ Opinion

## Julie K. Silver: Prehabilitation could save lives in a pandemic

March 19, 2020

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By definition, [prehabilitation](https://www.ncbi.nlm.nih.gov/pubmed/23756434) involves interventions aimed at improving patients’ health prior to an anticipated upcoming physiologic stressor so that they are better able to withstand that stress. Many decades ago, prehabilitation emerged as a way to prepare soldiers for battle in World War II. A study published in 1946 in *The British Medical Journal* entitled [Prehabilitation, Rehabilitation and Revocation in the Army](https://www.ncbi.nlm.nih.gov/pubmed/20989832) described an experiment in which “good food, lodging, hygiene, and recreation combined with controlled physical training and education” for a period of approximately two months were found to improve the health ratings of 85% of the 12,000 men who participated. The report stated that the participants’ outlook on life also improved, and that these physical and psychological changes were “astonishingly easy” to accomplish. Modern day military training continues to use prehabilitation-type interventions.

Although the coronoavirus pandemic is not a literal war, many people will have to “fight” a future infection, and what science has taught us since the British military study was published could be vital in helping affected patients to survive. Crucial to understanding why prehabilitation may be particularly valuable during a pandemic is to recognize that strategies that might help slow the spread of disease and perhaps reduce its overall incidence (i.e., social distancing and sheltering in place), could have the unintentional and harmful effect of decreased physical activity and contribute to cardiopulmonary deconditioning. In particular, the elderly, who are most vulnerable to pulmonary complications from coronavirus, may exhibit a decrease in their baseline cardiac and pulmonary fitness that could substantially impact their outcomes and increase morbidity and mortality.

Prehabilitation has not yet been evaluated in the setting of an infectious pandemic disease. However, there is currently a window of opportunity that exists, whereby physicians can recommend a best practices approach (based on the evidence base to date in other diagnostic conditions) and advise patients and the public about how to maintain and optimize their baseline fitness and nutritional health in the midst of the coronavirus pandemic. Notably, best practice prehabilitation recommendations can be followed while simultaneously adhering to social distancing and sheltering in place; these are not mutually exclusive and can be done together to optimize someone’s health and keep everyone as safe as possible.

In pre-surgical protocols, [best practices prehabilitation is multimodal](https://www.sciencedirect.com/science/article/abs/pii/S1047965116300742?via%3Dihub) (versus unimodal as “exercise only”) and involves a combination of exercise, nutrition, smoking cessation, and stress reduction. Regarding exercise, there is a large body of research that shows that muscle wasting and cardiopulmonary deconditioning occurs rapidly during reduction in physical activity (e.g., bedrest). Thus, an important goal is to encourage people to remain at least at their baseline activity level in order to avoid losing muscle strength and decreasing cardiopulmonary conditioning.

Importantly, small changes in cardiopulmonary fitness may have a large impact on patients who are medically frail, including elderly patients with multiple co-morbidities. As such, prehabilitation may have the greatest positive effect on those who are most vulnerable. [A 2019 report](https://www.ncbi.nlm.nih.gov/pubmed/30507681) in the journal *Current Opinion in Anesthesiology* stated, “Identifying high-risk patients at the earliest possible stage and increasing their physiological reserve prior to surgery is a promising approach that seems to result in remarkable improvements for older patients.” All healthcare professionals should follow established exercise guidelines when giving advice about increasing activity levels. In older individuals or those who are medically frail, a cautious approach is warranted and exercise recommendations should be carefully individualized and tailored to ensure safety and efficacy.

Nutrition plays an essential, though often underappreciated, role in prehabilitation. [Protein supplementation in prehabilitation has been studied](https://aaic.net.au/document/?D=20180197), particularly in the context of increased exercise (recalling that in sports medicine, an increase in training and protein intake are routinely recommended together). Furthermore, there are numerous studies that show relationships with improved glycemic control correlating with reduced post-operative infection rates in people with diabetes. Thus, glycemic control has also been proposed as a key consideration in prehabilitation protocols. Finally, medical advice and education about smoking cessation and reducing stress can be useful, and benefits are easily appreciated in overall improvements in pulmonary capacity and function.

While the benefits of exercise and nutrition in prehabilitation are readily appreciated and incorporated in generic prehabilitation protocols prior to surgery, their application to optimization of health during infectious pandemic disease are also relevant. However, once someone becomes symptomatic and/or is diagnosed with coronavirus, then the types of interventions recommended for prehabilitation may no longer be appropriate. Since most people who develop pulmonary complications from coronavirus will survive, it is also worthwhile considering who will benefit from conventional rehabilitation interventions post-infection.

As telemedicine becomes widely adopted during this pandemic, it is worth mentioning that prehabilitation interventions may be delivered by using this technology, and further optimized with the aid of wearable devices and newer innovations that will continue to feature in 21st century medicine. A recent study of patients who underwent total knee arthroplasty found that a telemedicine prehabilitation intervention significantly decreased hospital length of stay compared to the control group. In this study, the protocol included advice on exercise, nutrition, home safety, reducing medical risks, and pain management skills. Another recent report showed that at-home prehabilitation is feasible. [This small study](https://journals.lww.com/ajpmr/pages/articleviewer.aspx?year=2019&issue=05000&article=00009&type=Fulltext) (n=14) was published in the *American Journal of Physical Medicine and Rehabilitation* and found that the majority of older, frail participants (median age 79 years) followed the exercises and prepared the recipes in a [Fit4SurgeryTV](http://www.fit4surgery.nl/#fit4surgery-tv) at home programme for approximately one month. The application of such prehabilitation telemedicine strategies in the context of infectious pandemic diseases are even more applicable in settings where direct contact is less desirable. Thus, the combination of telemedicine with prehabilitation for infectious disease may prove to be symbiotic and very beneficial entities in future medicine.

For people who remain at risk for coronavirus infection, now is a good time to consider prehabilitation and the types of interventions that have been proven to improve health prior to an upcoming physiologic stress. Knowledge is power, and there is no better time than a pandemic to empower our patients and the public with information that could decrease morbidity and mortality.

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# Covid-19 Outbreak Highlights: Importance of Home- Based Rehabilitation in Orthopedic Surgery

Document Type: LETTER TO THE EDITOR

**Archives of Bone & Joint Surgery**

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**Abstract**

Effectiveness of rehabilitation process is undeniable in many musculoskeletal and joint conditions. There are increasing evidences that elecronic visits and tele-rehabalition programs are useful. When social distancing policies limit orthopedic surgeons to use hospital or clinic-based rehabilitation, developing of Home-based & Tele-rehabilitation modalities are highly recommended by Orthopedic surgeons , physiatrists and physiotherapists societies.

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