

## LETTERS

### **Suggestions for changes in professional procedures and adaptation to COVID-19: new models of care in the rehabilitation setting**

*Suggerimenti per un adattamento a COVID-19 e modifiche nelle procedure professionali: nuovi modelli di assistenza in ambito riabilitativo*

Dear Editor:

The COVID-19 (COrona Virus Disease 2019), due to the SARS-COV-2 (Severe Acute Respiratory Syndrome Corona Virus 2) has been an unprecedented global challenge for the healthcare systems (1). The pandemic requires targeted action, particularly in the healthcare system, including physical medicine and rehabilitation (PMR) services by virtue of increasing patients with disabilities related to COVID-19, in order to reduce disability and restore function out of the acute hospital facility (1). Many PMR-professionals have been reassigned to join the multi-professional acute-care teams and the outpatient rehabilitation services have been closed to avoid spreading of the infection. However, COVID-19 is severely testing patients with chronic diseases, who require rehabilitation (2, 3).

The worldwide need of timely information on rehabilitation of patients with disabilities secondary to COVID-19 infection has been widely emphasized in the literature (2).

#### **1. Planning for Hospital and Inpatient and Outpatient Rehabilitation Settings**

Continuous reorganization and adaptation of hospitals and Hospital-Rehabilitation Facilities (HRF) activities is needed, keeping “business as usual” (2, 4). During the hospitalization in the traditional rehabilitation departments, a high-frequency of physical contact is required (physiotherapy, shared instrumental physical-therapies, etc.) (2-5). Confidential medical equipment should be chosen to handle COVID-19 suspected cases. The number of visitors should be limited. Patients and staff should be aware of the appropriate cleaning procedures (2, 4). Work activities should be reorganized to limit the risk of staff contamination, working on a continuous calendar (2, 4).

Quarantine also heavily involved outpatient rehabilitation-services, with repercussions on those patients who strongly rely on continued treatment to avoid deteriorating their condition. Telerehabilitation should be an optimal strategy to ensure rehabilitation at home. Home exercise programs should be prescribed to ensure patient care by minimizing functional deficits and disability (1, 2) (Table 1).

#### **2. Telerehabilitation**

Telerehabilitation refers to the provision of rehabilitation services to patients through a remote location using communication technologies (6). Applicable not only during the pandemic period, it can significantly improve access to care for geographically remote areas or for patients who have physical, financial and logistical difficulties (6).

Italy was hit first in Europe and the Italian Society of Physical and Rehabilitation Medicine (SIMFER) is taking the lead in the dissemination of telemedicine experiences (6), providing reports on the topic, organizing webinars training (2) and by activating a remote telerehabilitation support service, with the aim of providing advice to people with disabilities and caregivers (7-9). In the literature, many elements of both orthopedic (Table 2) and neurological examination are reported as highly feasible through virtual performances (8, 9). Home physical therapy with digital tools, including video feedback and wearable sensors, will facilitate recovery for patients and increase compliance with cost and results optimization (7).

Table 1 - Adaptions and changes in professional procedures during COVID-19 Pandemic.

Legenda: PPE= personal protective equipment.

Facilities to manage Covid-19 infection risk	Paper towels, hand soaps, waste receptacles and alcohol-based hand sanitizer have to be available in readily accessible areas. The waiting room should be equipped with a disinfectant suspender and posters of important behavioral measures (the correct performance of a disinfectant hand rub; hand and respiratory hygiene; no handshake; one-meter distance wherever possible; the importance of wearing facemask while sharing the same room). Shared reading or other material should be removed. Staff and patients should not share the same sanitary facility, which should be provided with an additional disinfectant suspender, disposable towels and a closed bin (incl. bin bag) with a treadle to open. The treatment room should be structurally separated from any other room and correctly ventilated. Therapeutic equipment should be minimized, as it must be disinfected after use. Whenever possible, prefer disposable devices. The room should provide a washbasin, one suspender for soap and one for disinfectant and a closed bin with a treadle.
The revision of appointment booking	Scheduling of the first appointment should be proceeded via phone in place of face-to-face meetings. Triage procedures should be applied to identify persons with presumptive Covid-19 related symptoms as well as to assign appropriate levels of care. Practitioners, then, should assess the urgency of treatment and post-pone non-urgent appointments. Many follow-up appointments seem to be amenable to such an approach (via phone), e.g. monitoring of symptoms improvement after traumatic injuries or adjustment medication doses. However, many appointments require examination and the importance of non-verbal communication or body language is lost.
Cases of unpostponable need of physiotherapy	The therapist should check for a possible infection with COVID-19, asking whether the patient has had signs or symptoms of an acute infection (fever, cough, sore throat) or she/he has had contact to a person showing signs or symptoms of such an infection within the last 14 days.
Appropriate use of PPE and devices	Equipment that is not suitable for disinfection should not be used in any case. Single use covers for the treatment bed are mandatory.
Patients' triage and adaptation to maintain a safe rehabilitation environment	Patients should be triaged and tested for fever and flu signs or symptoms immediately upon entering the facility. Triage booths should be set up outside the structure to screen persons safely. Patients should be advised to arrive only short before the appointment and wait, whenever possible, outside to reduce crowding in waiting rooms. Accompanying persons should remain outside. Moreover, patients should be informed about the necessity of strict adherence to timeline (delayed arrival eventuates in deduction of therapy-time), the need of wearing a mask that covers mouth and nose and the importance of a correct hand hygiene.
Procedures of patient visit	It is fundamental to minimize the time that patients spend in the practice and to avoid that patients meet each other encouraging them to limit the time spent in the waiting area to a minimum. Disinfection of hands and donning of a face mask prior to entering the treatment room should be mandatory: if the patient has no mask, the therapist should be able to provide one. Before the patient enters the treatment room, the practitioner him-self should re-check for hand-hygiene and facemask. Never forget that also asymptomatic individuals may infect others, therefore personnel should wear PPE with every patient. It should be explained to the patient that a distance of 1 meter is maintained, whenever possible (e.g. for history taking or while talking to the patient during the whole session); the treatment session should be carried out in a way that direct contact to the patient is reduced to a minimum (e.g. more verbal than tactile instructions). At the end of the appointment, a written exercise program should be provided, so that the patients can re-check the prescribed exercises better on their own. Furthermore, it should be discussed, whether all treatments should be done on site, or if all or some follow-ups could take place in a tele-rehabilitation setting.
Proper procedures of cleaning	Once the appointment is over, in-between patients, there should be enough time for the therapist to: doffing and donning of PPE; washing and disinfection of hands; disinfection of all surfaces that were in contact with the patient (including door handles); opening of all the windows to adequately ventilate the room.

Table 2 - The virtual orthopaedic examination.

Legenda: ASIS: Anterior Superior Iliac Spine; FADIR: Flexion - ADduction – IntraRotation;

FABER: Flexion, ABduction, ExtRotation; RoM: Range Of Motion.

Knee	First of all, the examination could begin with the observation of patient's gait. Then, it is possible observe changes in overlying skin, presence of visible effusion, or erythema, muscle atrophy or symmetry, quality of quadriceps contraction. Range of motion is assessed in the standing or sitting position, using a web-based goniometer. Hyperextension is best assessed by viewing the leg from the side in the standing position. Flexion is measured by having the patient pull the heel toward the body in the sitting position. Thessaly test, in which the patient stands on the affected leg bent at 20° while rotating the body internally and externally, can be performed to monitor meniscal pathology. Single-leg stance and squat are measured from the frontal view to evaluate quadriceps, hip, and core function.
Hip	For mensuration of leg length is possible to use a virtual ruler from the ASIS to the floor. To measure hip flexion, asking the patient to lie back with one side to the camera and to pull the knee to the chest. The measurements of internal and external rotation are obtained by having the patient sit in a chair facing the camera and rotating the hip with the knee bent at 90°. FADIR and FABER test can be verified demonstrating the test and having the patient mimic this motion. The valuation of abduction strength in the side-lying position (gluteus medius, L5) can be assessed. Strength in L5 / S1 can be verified through toe-walking, strength in L4 through heel-walking. Hip extension strength (gluteus, L5 / S1) can be assessed by asking the patient to rise from the chair without using arms to assist.
Shoulder	Evaluation begins assessing range of motion of cervical spine. It is important to inspect shoulder anteriorly and posteriorly for overlying skin changes, scars, erythema or ecchymosis and atrophy. The patient is asked to point with one finger to the area of maximal discomfort. RoM is assessed with a virtual goniometer. Active abduction is performed with the patient facing the camera. External rotation is measured with the arms at the waist. Flexion is assessed by having the patient turn 90° to the side. In the same position, the arms are abducted to 90°, and external and internal rotation are evaluated in the limb closest to the camera. Evaluations of the distal extremity are important to exclude an acute injury. Scapular motion is evaluated by having the patient face away from the camera during active abduction and forward flexion. A wall push-up can be performed while observing for scapular symmetry and strength.
Elbow	Examination begins with visual inspection of eventual presence of skin changes, effusion, erythema, or ecchymosis. The patient is asked to point to the area of maximal pain. Flexion and extension of the elbow are observed with the patient facing the camera and abducting the arm to 90°, with the palms facing upward. Range of motion can be measured with a virtual goniometer. Supination and pronation are measured by having the patient facing the camera, with the arms at the sides and the elbows bent to 90°. It is also possible to evaluate biceps and triceps injuries, the asymmetry in the contour of muscles. To assess for posterolateral stability, the chair push-up test can be performed by having the patient turn 90° with the injured elbow closest to the camera and push off from a chair, with the forearm in supination. Pain or apprehension during this maneuver may suggest possible posterolateral rotatory instability. Provocative test can be used to evaluate the presence of lateral or medial epicondylitis.

### 3. Protection of Patients and Professionals

In the context of HRF, many preventive and organizational measures are needed to prevent transmission (Table 3) (2).

Table 3 - Health care facilities to prevent virus transmission.

Use of good quality PPE (e.g. masks, gloves, gowns) according to the guidelines of authorities.	PPE is only effective if the donning and doffing is carried out correctly. Therefore, staff should be trained on PPE donning and removal procedures to develop the necessary skills to do so. The level of PPE protection should be titrated against the risk of infection: rehabilitation staff like speech and swallowing therapists and chest physiotherapists are at increased risk because their close contact with and direct exposure to respiratory droplets from patients. Thus, they should wear high levels of PPE.
Prepare for PPE shortage.	Hospital management should procure to staff enough PPE supplies for several months, taking into account surge need depends on the evolving epidemic curve. In many countries, supply chains for PPE have been reinforced.
Accurate cleaning and disinfection of the facility	Environmental persistence of coronaviruses varies with ambient temperature and humidity, surface type, and viral load. The coronavirus can persist on inanimate surfaces at typical room temperatures and humidity for up to 9 days but inactivated efficiently by surface disinfection procedures with 62%-71% ethanol, 0.5% hydrogen peroxide, or 0.1% sodium hypochlorite within 1 minute. Given the possibility of virus persistence on rehabilitation equipment such as electrode sponges, water for hot pack units and topical lotion, it is essential to pay attention to such surfaces, with consideration of available disinfectants.
Patients and Staff behaviours	Enforce patients and staff hand hygiene procedures, especially in-between procedures involving different people.
Safe treatment of waste	PPE and any other disposable and contaminated device should be disposed in a separate, closed bin.

Legenda: PPE= personal protective equipment.

## 4. Specific rehabilitative settings and requirements

### 4.1. Neuromuscular disorders

Based on the guidance produced by several national neurology societies, it is possible to define the risk of a severe course of COVID-19 in different forms of neuromuscular disorders (more vulnerable populations) (10). The risk may be high or very-high, depending on certain characteristics (chest/diaphragm muscle-weakness, mask-ventilation, tracheotomy, weak cough, cardiac involvement, diabetes, obesity, steroid use and immunosuppressant treatment) (10). Neuromuscular-rehabilitation centers should train neuromuscular care telephone services in order to offer the opportunity to continue routine care. Patients should be provided with a supply of drugs and ventilatory support equipment for the isolation period to avoid hospitalization (10).

### 4.2. Musculoskeletal pathology

During the COVID-19 pandemic, governments recommended postponing elective procedures, including those in the orthopedic field. While patients await surgery, surgeons should provide them with suggestions to better manage related aspects (pain). Patients who do not require in-person visits must be identified in order to provide remote alternatives (Telemedicine) (11).

### 4.3. Disabled and Hospice Home Care Patients

Patients with disabilities, suffering chronic diseases, are more vulnerable to COVID-19. These patients should be treated in an independent space, minimizing the number of HCWs involved. Doctors and HCWs must take all hygienic measures against infections. If there is not a history of exposure to COVID-19, medical treatment should be administered at home (2).

#### 4.4. Cardiac Rehabilitation

Cardiovascular disease patients represent one of the vulnerable categories (12). In the medium-term scenario, the challenge for cardiac rehabilitation units will be to face a population of patients with higher than usual cardiovascular-risk. Inadequate secondary prevention and poor adherence to drugs represent important risks factor (12). Prescribing an adequate diet and 150 min/week of physical activity could be a good solution for these patients (12).

### 5. Pain management

Proper pain management during the COVID-19 pandemic is necessary to avoid physical and psychological consequences (13).

#### 5.1. Procedures

The American Academy of Pain Medicine has provided a framework for pain management during epidemics, balancing the need to access pain treatment with that to avoid disease transmission (13).

#### 5.2. Medications

##### 5.2.1. Use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and steroids

There is currently no scientific link between NSAIDs and the worsening of COVID-19. Patients taking NSAIDs for chronic diseases have no scientific reason to stop treatment, at the lowest effective dose and for the shortest period necessary (13).

The effects of glucocorticoids on the immune response may increase the risk of infection, therefore administration should be carefully evaluated in patients with chronic pain (13).

##### 5.2.2. Managing opioids prescription

In the inability to carry out a careful evaluation in person of the ongoing treatment, many countries have made changes to their policy on controlled substances (13).

### Conclusions

There are currently no Food and Drug Administration (FDA) or European Medicines Agency (EMA) approved drugs for the treatment, or vaccines to prevent, COVID-19. Therefore, it seems clear that healthcare, particularly for the elderly with chronic diseases, needs to switch quickly to new models of practice. Among these, tele-rehabilitation has proven to be a viable option for maintaining many rehabilitation services and providing home care at reduced costs and time savings. After the epidemic, rehabilitation activities should consider COVID-19 post-intensive care syndrome.

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