

**PHYSIOTHERAPY MANAGEMENT FOR COVID-19 IN THE
PRIMARY, COMMUNITY AND ACUTE (HOSPITAL) SETTINGS**

A PRELIMINARY GUIDELINE

SUBMITTED BY

GUIDELINE DEVELOPMENT COMMITTEE FOR COVID-19

TO

GHANA PHYSIOTHERAPY ASSOCIATION

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1.0 BRIEF INTRODUCTION

COVID-19 is caused by a novel corona virus known as SARS-CoV-2 which is believed to be zoonotic in nature (i.e. originated from animal and transmitted to humans).¹ Given its direct impacts on human lungs, it can be classified as restrictive respiratory disorder. The World Health Organization (WHO) has raised COVID-19 risk as “very high” at global level with rapid transmission rate (R_0) of 2.2 which is relatively phenomenal compared to other previous pandemics including H1N1 flu, SARS MERS-CoV etc.^{2,3} These unique features present the virus as the most deadly pandemic in the recent time. Whilst the mortality rate of this noble virus is not extraordinary, the high rate of its transmission has raised serious concerns for WHO, governments and professional bodies across the globe. As research and scientific drives continue to strive to curtail COVID-19 pandemic, the need for coordinated effort becomes crucial among healthcare professionals, communities, patients and informal healthcare providers, taking into cognizance the specific local context.

In Ghana, Physiotherapists (PTs) remain the most viable rehabilitation professionals that provide direct contact with patients thus placing them at vantage position to mitigate the transmission of infectious diseases as early as possible.^{4,5} PTs are often part of the first contact practitioners, which implies that they share responsibility for the early identification of disease conditions and/or managing workload across healthcare settings as the needs may arise.^{4,6} In view of the rising local and community transmissions of COVID-19 in Ghana, it is highly probable that patients seeking physiotherapy service for other disabling conditions may be potential carriers of the virus. Thus, it is important to define the specific roles of the PTs regarding the prevention of further spread of COVID-19 pandemic and facilitation of its containment.

1.1 Rationale

COVID-19 has caused an unprecedented pandemic across nations since its discovery in late 2019. To date, no medication has been established by which the disease can either be cured or repressed. The general adopted principles remain quick identification of the symptoms, cessation of its transmission and its containment by all healthcare providers and the general populace.^{5,7} It is thus a shared responsibility of the PTs to provide total support for their patients whilst also protecting their personal health and safety in the course of service delivery.⁸ Given the social, cultural and geographical peculiarities of Ghana and general health policy, it is logical for the Ghana Physiotherapy Association (GPA) to evolve an evidence-based blueprint for her members whilst also keeping abreast with the global efforts in proffering effective cure for people afflicted with COVID-19.

1.2 Aims of the Guidelines

The guideline is therefore aimed at:

- a) Advocating knowledge update among Ghanaian PTs regarding current information about COVID -19 pandemic.
- b) Depicting the scope of PTs in the management of COVID-19 pandemic within the limit provided by the disease.
- c) Documenting the mode of intervention by PTs for guide among GPA members.
- d) Integrating WHO and Center for Disease Control standard guidelines for COVID-19 into the PTs daily practice.
- e) Providing the available evidence-based support for physiotherapy-specific outfits.
- f) Suggesting roadmap for technology driven healthcare and collaboration with other healthcare team.

2.0 METHODS

2.1 Setting

The main methods adopted for devising the guideline take into account the three healthcare settings in which PTs service are highly demanded, namely:

- a. **Primary care setting** e.g. private physiotherapy practice.
- b. **Community healthcare setting** e.g. field works and itinerary (home visit) physiotherapy practice.
- c. **Acute/Hospital-based setting** e.g. conventional (public) institution-based physiotherapy practice.

2.2 Framework

Taking the afore-stated settings into consideration, the framework for the review was outlined as follows:

- i. The key considerations and mandates for the Ghanaian PTs in the management of COVID-19.
- ii. The required assessment techniques by the Ghanaian PTs and its modification for people with COVID-19.
- iii. Evidence-based physiotherapy-specific interventions which are adaptable to people with COVID-19.
- iv. Consideration for technology driven healthcare (e.g. Tele-health) in the management of people with COVID-19.
- v. Rehabilitation to restore function including PTs role in multi-disciplinary approach for people with COVID-19.

2.3 Procedure

A group of Clinical and Academic PTs was drawn among GPA members to urgently draft a management protocol that could serve as a guide for the practicing PTs in Ghana. The committee kicked start the exercise immediately by sharing tasks based on the agreed framework. Bearing in mind the urgency of the mandate, each member was tasked to submit his/her findings within two days. Given the dearth of local published studies on respiratory physiotherapy in Ghana, the team employed viable search engines and resources including template guidelines to extract information as deemed applicable to Ghanaian settings. The review exercises involved the use of downloaded articles from Scopus, Science Direct, Academic Search Complete, AMED, CINAHL, MEDLINE, PsycINFO, physiotherapy-specific resource sites such as Physio-pedia as well as diverse opinions obtained from professional colleagues based on specialty practice. The key words employed were retrieved from rehabilitation interventions outlined in the handbook of COVID-19 prevention and treatment.⁹ Members met virtually (via zoom video cloud, skype and call conference) on April 19, 20 and 23, 2020, to critically review information obtained from various sources to reach a consensus by simple majority vote. The final draft was made available to every member for ratification.

2.4 Strength

The strength of the protocol lies on the consultation with the most recent, relevant COVID-19 clinical practice guidelines from highly respected organizations (such as WHO and WCPT), national physiotherapy organizations (such as America Physical Therapy Association, Australian Physiotherapy Association etc) and from peer-reviewed studies, to present a transparent report.

2.5 Weakness

The main weakness of this document is the total dearth of studies on acute respiratory conditions to serve as a template on local context. More importantly, the physiotherapy management of COVID-19 is still evolving, thus making the present document a preliminary guideline.

3.0 FINDINGS

Based on the meticulous search and critical review within the available timeframe and material resources, the committee hereby presents their findings as follows:

3.1 General key considerations and preparedness for Ghanaian PTs.⁶

- a) **Stay current** –Be well-grounded in current information about COVID-19 guidance by staying in tune with the WHO guidelines, Center for Disease Control (CDC) evolving resources⁷ and directives from the Ghana Health Services.¹⁰
- b) **Composure** –Assess the current situation objectively and assume leadership position by providing information for decisions making and reassurance so as to allay fear and panic among Ghanaians.
- c) **Minimize exposure in your setting** - Review infection prevention and control (IPC) guidelines regularly and avoid practice without the availability of as Personal Protective Equipment (PPE).^{7,11}
- d) **Get educated** – Participate in training related to COVID-19 management strategies and procedures, including rehearsals of potential scenarios, such as a COVID-19 case being identified on the clinic premises.

- e) **Get involved** – Be part of workforce planning in your setting as found appropriate by offering services to reduce workload on emergency departments and frontline practitioners.

3.2 Setting-specific mandates for Ghanaian PTs

Although adherence to IPC by PTs working at different settings is expected to be the same and they can potentially contribute to reducing the workload of hospitals in many different settings, there are setting specific roles.

3.2.1 Primary Care

There are two main considerations for PTs in primary care: avoid transmission and provide education for patients.^{4,6}

Avoid transmission of COVID-19, by:

- Performing hand and respiratory hygiene.
- Providing IPC protocols in your practice setting and this should be communicated to all staff.⁷
- Placing additional signage in and around the clinic about preventive measures.
- Ensuring regular cleaning and disinfection of the clinic and equipment, especially after attendance by a suspect COVID-19 patient.
- Providing up to date information about the virus to staff and patients through pamphlets and social media in popular local dialects.
- Modifying physical assessments of suspect and/or confirmed cases of COVID-19 by avoiding unnecessary direct physical contact.
- Booking new appointments through phone calls to assess the risk level of the appointee as regards COVID-19.
- Encouraging patients with symptoms to stay at home upon request for appointments.

- Liaising with staff and local public health specialists.
- Holding regular team meetings with staff to review information and provide new updates.
- Initiating active screening (asking questions) and passive screening (signage) of patients for COVID-19 at the clinic for early identification.⁵
- Ensuring that patients with respiratory symptoms are screened actively by direct questioning or incorporating a question on symptoms of cold or flu-like illness.
- Providing all patients with tissues, face mask and alcohol hand rub.¹²

Provide education by:

- Sharing knowledge on preventing transmission of COVID-19 during interaction with patients.
- Being proactive in offering health maintenance strategies e.g. commensurate activity for individual, advice on good nutrition and good sleep hygiene.
- Advising people to keep mentally active with in-door recreation and maintain social relationships with friends.

3.2.2 Community Care

PTs can get involved in COVID-19 with mild symptoms by providing care at home. Assessment of patient's environment for suitability becomes necessary regarding care. The WHO guidelines for home care for patients with mild symptoms and co-morbid conditions should be followed.¹³

PTs should satisfy the following questions whilst planning:

- Will the patient and family be able to adhere to the recommended precautions as part of home care isolation?
- Will the patient and family be able to correctly handle safety concerns that arise while isolating at home?

- Will there be communication link between the patient, the healthcare professional and the public health authority of a specific area?
- Do the patient and family members have adequate education concerning the basic hand and respiratory hygiene principles?
- Will the patients be able to receive ongoing support by the local authority?

Having provided answers to the above, the following recommendations for Patients, Families and Carers will suffice: ^{6,12}

- Patients should remain in a well-ventilated room (open windows and doors).
- Limit movement of patients around the home and limit shared spaces.
- Shared spaces should be well-ventilated at all times.
- Family or household members should practice social distancing at all time
- No visitors should be allowed until the patient has recovered and has no more signs and symptoms.
- Proper hand hygiene is essential after any contact with the patient or their immediate environment.
- The patient should wear a medical mask to contain respiratory secretions.
- Respiratory hygiene should be practiced
- Relative should also wear medical face mask whilst providing care

N.B. For COVID-19 Patients, PTs should avoid physical contact in the community. Should there be any need for contact; PTs should follow the following procedures:

- Avoid direct contact with bodily fluids.
- Dispose of all gloves and masks used during home care isolation as infectious waste.
- Avoid any exposure to contaminated items used by the patient.
- Be familiar with and be able to select, use, remove and dispose of the correct PPE to be used.

3.2.3 Acute (Hospital) Care

In a conventional hospital setting, a minority group of people may present with more severe symptoms of COVID-19 and may need to be hospitalized, most often with pneumonia or septic shock. PTs may have a stake in the respiratory care of the patient. Personal safety of PTs becomes crucial by ensuring:

- Adequate availability and access to PPE.¹⁴
- Taking adequate breaks during and between shifts.
- That they access appropriate support services for the psychological stability (if available)

In addition to the above, the following strict protocols must be followed:⁴

- Treat the patient in a single room with the door closed where possible.
- Limit the number of staff present.
- Minimize entry and exit from the room during treatment.
- PTs should avoid contact with Covid-19 patients if PTs:¹⁵
 - Are pregnant
 - Have a known chronic respiratory illness,
 - Are immunosuppressed or have immune deficiencies and
 - Are over the age of 60 years

The general preparations required by PTs are presented in **Appendix 2**.

4.0 Brief Reports on the Evidenced Based Interventions for COVID-19

4.1 Evidence support for Assessment protocol

Due to the novelty of COVID-19, literature remains silent on the specific scientific evidence for assessment. Committee thus resorted to adopt the recommendations of the existing assessment tools/methods for severe respiratory conditions and the International classification of functioning, disability and health (ICF) conceptual

framework¹⁶ to identify the rehabilitation needs for persons with or recovered from covid-19.

4.2 Scientific evidence on COVID therapy

4.2.1 Positioning –Italian physical therapists’ response to the novel COVID-19 Emergency recommended prone positioning for optimal breathing particularly when patients are being weaned off invasive mechanical ventilation protocols .¹⁷ In an event where prone position is not possible, semi flower position (turning from 15 to 45 degrees) and up to 60 degrees depending on the level of consciousness.⁹ Standing-bed is recommended for conscious COVID-19 patients. There is no evidence on the duration of standing or stooping on a chest table and at what stage of recovery should this be done.

4.2.2 Respiratory exercise

Deep slow breathing exercise, and chest expansion breathing combined with shoulder expansion are the recommended effective breathing exercises for COVID-19 patients.⁹ Shoulder expansion or retraction expands the thoracic cage thereby promoting adequate inspiration. Evidence has shown that deep slow breathing, a form of pranayama breathing exercises, is effective in the treatment of cardiopulmonary disease.^{18,19}

4.2.3 Active Cycle Breathing Technique

A recent review on current evidence of physiotherapy for patients with cystic fibrosis revealed that Active Cycle of Breathing Technique (ACBT) was comparable with other treatments on various outcome measures.²⁰ Contrarily, two reviews on effectiveness of physiotherapy on patient with Pneumonia prohibit chest physiotherapy as routine adjunctive treatment for adults. ^{21,22}

5.0 The Required Assessment Techniques for Patients with COVID-19

5.1 Subjective assessment

WHO recommendations on the subjective assessment of patients with COVID-19 encourage active screening of patients (via patient's folder and interview) and passive screening via signage for hand and respiratory hygiene.⁵

5.2 Objective assessment

PTs' assessment will depend on the stage of the condition, its severity and the healthcare setting. Objective assessment should include airway patency, breathing and disability for all the patients. PTs' involvement should largely include observation (e.g. respiratory rate, level of consciousness), measurement (e.g. chest expansion) and listening (e.g. breath sound).²³ Selection of outcome measures should target respiratory rate, pain assessment, cough effectiveness, mobility status, fitness status and other precipitated secondary respiratory problems. Physiotherapy documentation should include, self-report of the patient, detailed specific intervention, equipment used, changes in patient status, notable adverse reactions, progression towards stated goals, communication with other care providers, the patient and their family.⁶ Template for documentation of physiotherapy assessment is shown in **Table 1**.

Table 1: Proposed template for assessment notes

CURRENT CONDITION	
GOALS	
Subjective assessment	
Objective assessment	
Analysis of problems	
Plans of goals	
Evaluation	
Progress Note	

6.0 Specific interventions for COVID-19 patients

The spectrum of disease severity with the Covid-19 infection ranges from an asymptomatic infection to mild upper respiratory tract illness and then to severe viral pneumonia with respiratory failure and septic shock.¹ According to WHO, about 80% of COVID-19 cases remain asymptomatic or mild while 15% of cases progress to a severe state of infection requiring oxygen and 5% are critical requiring ventilation and life support. Patient with lung conditions including acute respiratory distress syndrome (ARDS) which is a major cause of death among patients with COVID-19 infection will benefit immensely from exercises.²⁴ Therefore, early physiotherapy intervention is key to reducing breathing difficulties and other symptoms, ease anxiety and depression and lower the incidence of complications.⁹ Details of the interventions are presented in **Table 2. Appendix 3** summarizes the assessment and overall management of patients with COVID-19.

Table 2: Outline of physiotherapy intervention for COVID-19.²⁷

Stage of Condition	Recommended Physiotherapy Intervention
Early Phase of COVID-19	
<ul style="list-style-type: none"> Asymptomatic and mild symptoms without significant respiratory compromise (e.g. fevers, dry cough, no chest x-ray changes) A low-level oxygen requirement (e.g. oxygen flow $\leq 5\text{L}/\text{min}$ for $\text{SpO}_2 \geq 90\%$). Patient with non-productive cough Patient coughing and able to clear secretions independently. 	<ul style="list-style-type: none"> No physical contact with patient to provide physiotherapy. However, advice on keeping active could be done via phone. Daily moderate aerobic exercises (brisk walking, jumping jacks, jogging in place, dancing).²⁴ Design simple exercise poster (e.g. with indications for daily walks, stretches, strengthening and balance exercises) to be posted within patients rooms and wards
Acute Phase of COVID-19	
<ul style="list-style-type: none"> Inadequate airway clearance (productive cough with inability to independently clear airways) and co-existing respiratory or neuromuscular comorbidities. Severe respiratory failure with increasing oxygen requirements, 	<ul style="list-style-type: none"> Respiratory physiotherapy including; Airway clearance techniques (e.g. positioning, deep slow breathing, percussion, shaking and vibrations) Prone position to optimise oxygenation and should last 12–16 hours per day.²⁵ NOTE: Discontinue procedure in case of serious

fever, difficulty breathing, frequent, severe or productive coughing episodes, chest x-ray / CT / lung ultrasound changes consistent with consolidation.	<p>complication or worsening of oxygenation (i.e. 20% decrease in P/F compared to the supine position).²⁶ P/F = PaO_2/FiO_2 ratio is the ratio of arterial oxygen partial pressure (PaO_2 in mmHg) to fractional inspired oxygen (FiO_2).</p> <ul style="list-style-type: none"> ● Elevation of head side of bed as tolerated by patient (30°-45°-60°)⁹ ● Passive range of motion exercises to limbs
<ul style="list-style-type: none"> ● ICU acquired weakness (ICU-AW) mostly in patients with comorbidities 	<ul style="list-style-type: none"> ● Static quadriceps contraction exercise; active/active assisted range of motion exercises; bed mobility; sitting out of bed; sitting balance; sit to stand. ● Low to moderate resistance exercises e.g. with theraband, hand weights
Post-Acute Phase Rehabilitation	<ul style="list-style-type: none"> ● Tilt bed standing; Moderate to high resistance exercises; gait training with or without assistive devices; aerobic activities including treadmill; upper limb or lower limb ergometry (ergonomic cycling/arm cycling).
Functional rehabilitation to return home	<ul style="list-style-type: none"> ● Patients should be encouraged to maintain function; sit out of bed; perform activities of daily living. ● Continue post-acute phase rehabilitation with progression (duration, weight, repetition)
	<ul style="list-style-type: none"> ● There is no evidence for incentive spirometry in patients with COVID-19.

Table 3 outlines some necessary precautions to be taken by PTs in the course of administering prone positioning therapy as obtained from previous findings.²⁸

Table 3: Precaution for prone positioning

Complications	Suggested precaution
<ul style="list-style-type: none"> ■ Pressure ulcers 	<ul style="list-style-type: none"> ● Change of head and arm posture every 4-6 hours. ● Verify that the endotracheal tube is not pressed against the mouth/lips and that the gastric nose tube does not exert excessive pressure against the nostril.

	<ul style="list-style-type: none"> ● Use adequate anti-decubitus equipment and protect the higher-pressure areas, for example using high density or resilient foams
<ul style="list-style-type: none"> ■ Facial / periorbital oedema 	<ul style="list-style-type: none"> ● Keep the bed in anti-Trendelenburg position at 30° (head elevated higher than the feet)
<ul style="list-style-type: none"> ■ Corneal and/or conjunctiva damage 	<ul style="list-style-type: none"> ● Clean and close eyelids and protect the eyes by applying ophthalmic ointment and a protective patch
<ul style="list-style-type: none"> ■ Poor positioning of the auricle 	<ul style="list-style-type: none"> ● Verify that the lower ear is not bent.
<ul style="list-style-type: none"> ■ Brachial plexus injury 	<ul style="list-style-type: none"> ● Practice correct positioning and modify upper limb postures
<ul style="list-style-type: none"> ■ Venous access and catheter stability problems 	<ul style="list-style-type: none"> ● Make sure the accesses are well fixed and do not exert excessive pressure on the skin.
<ul style="list-style-type: none"> ■ Staff injury 	<ul style="list-style-type: none"> ● Correctly educate the operators and identify the appropriate number of healthcare practitioners involved in the prone position manoeuvre according to patient size and to the number of devices available. ● Correctly manage the devices and optimize staff coordination during the execution of the manoeuvre

The following are interventions which are likely to increase the risk of respiratory distress which should be avoided in the acute phase of COVID-19:²⁸

- Diaphragmatic breathing
- Incentive spirometry
- Pursed lips breathing
- Respiratory muscle training
- Exercise training
- Mobilization during clinical instability (multi-disciplinary decision required)

- Nasal washings
- Bronchial hygiene
- Thoracic mobilization

7.0 Rehabilitation and alternative option for healthcare

The ravaging effects of COVID-19 due to its rapid spread underscore the need for alternative healthcare to mitigate the exponential transmission. Technology driven method such as Tele-rehabilitation is being considered a useful option to minimize physical contact particularly at the rehabilitation phase. Previous reviews have lent supports for Tele-rehabilitation as a practical alternative to conventional face-to-face rehabilitation therapy.^{29,30} Three phases are identified: Primary, Secondary and Tertiary management as outlined below:

7.1 Primary management

Indication: People susceptible to COVID-19 (People of all ages)

Exercise type: 1. Aerobic exercises

2. Flexibility exercises

3. Strengthening exercises

Precaution: The WHO exercises prescription must be adhered to with vivid explanation to the clients.

- **Recommendation**

Visual or audio-visual exercises should be designed by PTs for dissemination via social media. This can also be reinforced with public education through workbooks and pamphlets.

7.2 Secondary management

Indication: mild to moderate COVID -19 patients

Exercise type: Refer **Table 2** or **Appendix 3**.

Precaution: All exercises should be prescribed and supervised by the PTs through phone calls or video conferencing.

- **Recommendation**

Videoconferencing should be employed for managing COVID-19 patients with mild to moderate symptoms.

7.3 Tertiary management

There have been reports of stigmatization post-discharge from the isolation center. This development may pose negative emotional effects on the patients thereby limiting engagement in physical activity.

Indication: Discharged COVID-19 patients

Exercise type: Same as primary management

Precaution: This should occasionally be supervised by a physiotherapist through a phone call

- **Recommendation**

Adequate monitoring is required through phone calls or video-conferencing. Patients also need re-assurance to defray fear and depression.

N.B.

The above management strategy is more rewarding if performed with other healthcare professionals including Physicians, Dieticians, Occupational Therapists, Clinical Psychologists and rehabilitation nurses. Cross information and information sharing is very paramount.

8.0 Conclusion

The review process was premised on “adopt to adapt” principles due largely to the paucity of information locally on one hand and the novelty presented by the virus on the other. The validity of the document rests on the obtainment of information from reliable sources in order to keep abreast with global development on COVID-19.

9.0 Recommendation

1. In view of the scarcity of local physiotherapy-specific studies on COVID-19 and respiratory condition in general, a GPA-led randomized control trial is proposed for future use.
2. Members should use all the recommended procedures with strict adherence to the caution therein since information on COVID-19 is still evolving.
3. This document should be subjected to review after two years for update.

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Appendix 1: Further Reading Sources

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4. https://www.thelancet.com/coronavirus?dgcid=etoc-edschoice_email_tlcoronavirus20 - The Lancet COVID-19 Resource Center
5. <https://www.coursera.org/learn/covid-19?#syllabus> - This is a current online course offered through Imperial College London
6. <https://coronavirus.jhu.edu> - the Johns Hopkins University & Medicine Coronavirus Resource Center
7. JAMA network Coronavirus Disease 2019 (COVID-19) - research articles related to the pandemic
8. Respiratory physiotherapy in patients with COVID-19 infection in acute setting: a Position Paper of the Italian Association of Respiratory Physiotherapists (ARIR)
9. Link to a real-time map of global cases by Johns Hopkins University This article explains it further
- [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30120-1/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30120-1/fulltext)

Appendix 2: General Requirements by PTs

COVID 19: Key considerations for Ghanaian PTs

- Stay current: Update with WHO & CDC guidelines on COVID_19
- Be composed: Allay fear and panic about the pandemic
- Minimize exposure: Review WHO-IPC guidelines regularly
- Get educated: Participate in training for COVID-19 management
- Get involved: Be part of workforce planning in your setting

Setting-specific requirements

Primary Care Setting

Avoid transmission by:

- Observing hand hygiene
- Ensuring respiratory hygiene
- Displaying IPC protocols
- Displaying signage
- Modify physical contact
- Book appointment with Phone call
- Initiate active and passive screening of clients
- Work with PPE

Provide education by

- Sharing knowledge
- Offering proactive advice on general health
- Offering advice on mental state of the clients

Acute (Hospital) Care

- Ascertains the level of severity
- Don appropriate PPE
- Treat the patient in a single room
- Limit the number of staff present
- Minimize entry and exit from the room
- Take adequate breaks during shifts
- Avail the patients for ongoing support
- Document all your activities with the client
- Pregnant PTs, those who are > 60years, immunosuppressed and those with underlying respiratory illness should not come in contact with COVID_19 clients.

Community Care Setting

PTs should check if the client will be able to:

- Adhere to precautions
- Handle safety concerns
- Obtain adequate information
- Adhere to basic hand and respiratory hygiene
- Receive ongoing support from the local authority

PTs should take the following cautions:

- Obtain appropriate PPE
- Avoid direct contact with bodily fluids
- Avoid contact with contaminated surface

Appendix 3: COVID Assessment and Management

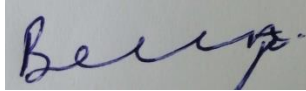


Appendix 3: Flowchart of Physiotherapy Assessment and Recommended Interventions for COVID-19
Information Source:

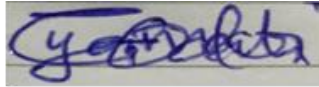
- Liang, T., 2020. Handbook of COVID-19 prevention and treatment. Zhejiang: Zhejiang University School of Medicine Pg. 43-44
- Elias, B., Shen, C. and Bar-Yam, Y., 2020. Respiratory Health for Better COVID-19 Outcomes.
- Thomas, P., Baldwin, C., Bissett, B., Boden, I., Gosselink, R., Granger, C.L., Hodgson, C., Jones, A.Y., Kho, M.E., Moses, R. and Ntoumenopoulos, G., 2020. Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations. Journal of Physiotherapy.

Appendix 4: Signature page

Prof. Ajediran Idowu Bello

A handwritten signature in black ink, appearing to read 'Bello' with a stylized flourish at the end.

Dr. (Mrs) Gifty Gyamah Nyante

A handwritten signature in blue ink, appearing to read 'Gyama' with a stylized flourish.

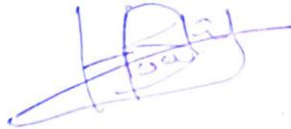
Ms. Mary Wetani Agoriwo

A handwritten signature in blue ink, appearing to read 'Mary' with a stylized flourish.

Flt Lt Stella Elikplim Lawerteh

A handwritten signature in blue ink, appearing to read 'Stella' with a stylized flourish.

PT Hosea Boakye (Mr)

A handwritten signature in blue ink, appearing to read 'Hosea' with a stylized flourish.