Ministry of Health Malaysia

POST COVID-19 MANAGEMENT PROTOCOL

1st Edition | 2021

ANNEX 50

Ministry of Health Malaysia

Medical Development Division
Ministry of Health Malaysia

POST COVID-19
MANAGEMENT PROTOCOL

1st Edition 2021

FOREWORD

BY THE DIRECTOR GENERAL OF HEALTH, MINISTRY OF HEALTH MALAYSIA

COVID-19 is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which was first identified in December 2019 in Wuhan, China. The World Health Organization (WHO) declared COVID-19 as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 and later as a pandemic on 11 March 2020.

COVID-19 pandemic has resulted in a growing population of individuals recovering from acute SARS-CoV-2 infection. While most patients infected with COVID-19 recover and return to normal health, a proportion of patients may develop new, recurrent, or persistent health problems that last for weeks or even months after first being infected with the virus. These conditions are referred as "Long COVID" which include both ongoing symptomatic COVID-19 and Post COVID-19 syndrome.

Post COVID-19 syndrome includes a range of degrees of respiratory symptoms, including respiratory failure and Acute Respiratory Distress Syndrome (ARDS). It also has cardiac, cardiovascular, thromboembolic, and inflammatory complications. In addition, it may also affect patient's mental health such as post-traumatic stress disorder, depression and anxiety disorder.

To address the long-term effects of COVID-19 and its impact on the patient's quality of life, a multidisciplinary team has developed a comprehensive and coordinated treatment protocol through a holistic approach.

I would like to express my sincere congratulation to all those involved in developing this guideline. It is hoped that this document will provide guidance in the management of patients with "Long COVID".

Thank You

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24 June 2021

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ABG	Arterial blood gas
ABVD	Adriamycin, Bleomycin, Vinblastine and Dacarbazine
ACEi	Angiotensin converting enzyme inhibitors
ADL	Activities of daily living
AFSS	Analogue Fatigue Severity Scale
ASD	Acute stress disorder
α-IFN	Alpha interferon
AKD	Acute kidney disease
AKI	Acute kidney injury
AlloSC	Allogeneic Stem Cell Transplant
ALI	Acute lung injury
ALL	Acute Lymphocytic Leukemia
Anti-TNFα	Anti-Tumor necrosis factor α
AML	Acute Myeloid Leukemia
APL	Acute promyelocytic leukemia
ARB	Angiotensin receptor blockers
ARDS	Acute Respiratory Distress Syndrome
ATRA	Arsenic trioxide and all-trans retinoic acid
CRIMES	Concentration, Restlessness, Irritability, Muscle tension, Energy decrease, Sleep disturbance (Mnemonic for anxiety)
BADL	Basic activities of daily living
BCR-ABL	Breakpoint cluster region gene. Abelson proto-oncogene
BCRi	Beta Cell Receptors Inhibitors
BMI	Body Mass Index
BMSE	Brief Mental State Examination
BP	Blood Pressure
BPH	Bilateral Prostate Hyperplasia
CAR-T	Chimeric Antigen Receptor T-Cell Therapy
CBD	Continuous bladder drainage
CCSAC	Canadian Cardiovascular Society Angina Classification
CFS	Clinical Frailty Scale
CHC	Combined hormonal contraception
CKD	Chronic Kidney DIsease
CLL	Chronic Lymphocytic Leukemia
CML	Chronic Myeloid Leukemia
COAD	Chronic obstructive airway disease
CaPO4	Calcium Phosphate
CL	Consultation liaison
CPG	Clinical Practise Guideline
CROSS	COVID-19 Rehabilitation Out-patient Specialized Services
CRS	Cytokine release syndrome

List of Abbreviations

CR2	Complete Remission 2
CTPA	Computed Tomography Pulmonary Angiography
CT-Scan	Computed Tomography Scan
CV	Cardiovascular
CXR	Chest X-ray
DA-EPOCH-R	Dose-adjusted Etoposide, Prednisone, Oncovin, Cyclophosphamide, Doxorubicin Hydrochloride, Rituximab
DASS	Depression Anxiety Stress Scale
Dara-VD	Daratumumab, Velcade and Dexamethasone
DLco	Diffusing capacity of the lungs for carbon monoxide
DMARDs	Disease-modifying anti-rheumatic drugs
DOMS	Delayed onset muscle soreness
DSM-5	Diagnostic and Statistical Manual 5
EBM	Expressed breast milk
ECAQ	Early Cognitive Assessment Questionnaire
ECHO	Echocardiogram
ECOG score	Eastern Cooperative Oncology Group score
ECG	Electrocardiograph
ED	Emergency Department
eGFR	Estimated glomerular filtration rate
ENT	Ear, Nose and Throat
ESA	Erythropoiesis Stimulating Agents
ESKD	End Stage Kidney Disease
FBC	Full blood count
FRID	Fall-risk increasing drugs
FMS	Family Medicine Specialist
FSS	Fatigue Severity Scale
GAD	Generalized Anxiety Disorder
GDS	Geriatric Depression Scale
G-CSF	Granulocyte Colony Stimulating Factor
GGO	Ground glass opacity
HbA1c test	Hemoglobin A1c test
HCW	Healthcare Worker
HD-MTX	High Dose Methotrexate
HDT/ASCT	High Dose Therapy/Autologous Stem Cell Transplant
HRCT	High resolution Computed Tomography
HSCT	Hematopoietic stem-cell transplantation
IADL	Instrumental activities of daily living
ICU	Intensive Care Unit
ID	Infection Disease
Ida	Idarubici

List of Abbreviations

ILD	Interstitial lung disease
IL-6	Interleukin 6
IPSS-R	International Prognostic Scoring System
IT-MTX	Intrathecal Methotrexate
JAK Inhibitors	Janus kinase inhibitors
KDIGO	Kidney Disease Improving Global Outcomes
LTOT	Long term oxygen therapy
LMWH	dose Low-molecular-weight-heparin
MBI	Modified Barthel Index
MCH	Maternal and Child Health
Mini Cog	Mini-Cognitive test
MEC	Medical eligibility criteria for contraceptive use
MERS	Middle East respiratory syndrome
MH	Mental Health
mMRCS	Modified Medical Research Council Scale
MMSE	Mini Mental State Examination
MoCA	Montreal Cognitive Assessment
MOH	Ministry of Health Malaysia
MHPSS	Mental Health and Psychological Support Services
MRC	Medical Research Council
mTOR inhibitors	Mechanistic target of rapamycin inhibitors
MTX	Methotrexate
NICE	National Institute for Health and Care Excellence
NHL	Non-Hodgkin Lymphoma
NYHA	New York Heart Association
O_2	Oxygen
O&G	Obstetrics and Gynaecology
OP	Organizing Pneumonia
PaO2	Partial pressure of oxygen
PCFS	Post COVID-19 Functional Status
PCPR	Post COVID-19 Pulmonary Rehabilitation
PCR	Polymerase chain reaction
PE	Pulmonary embolism
PEP	Positive expiratory pressure
PET-CT	Positron Emission Tomography-Computed Tomography
PFAOMC	Psychological factors affecting other medical conditions
Ph' + ALL	Philadelphia chromosome positive Acute Lymphoblastic Leukemia
Ph' – ALL	Philadelphia chromosome negative Acute Lymphoblastic Leukemia
PHQ2	Patient Health Questionnaire
PHQ9	Patient Health Questionnaire-Depression
PMBCL	Primary Mediastinal Large B-Cell Lymphoma

List of Abbreviations

PPE	Protective Personal Equipment
PR	Pulse rate
PSA	Prostate-Specific Antigen
PTSD	Post-traumatic stress disorder
QoL	Quality of Life
R-CHOP	Rituximab, Cyclophosphamide, Doxorubicin Hydrochloride, Oncovin, Prednisolone
RCGP	Royal College of General Practitioners
R-CVP	Rituximab, cyclophosphamide, Vincristine and Prednisone
RHR	Resting heart rate
RNA	Ribonucleic acid
ROM	Range of motion
RR disease	Relapsed / refractory disease
RRT	Renal replacement therapy
RTD	Return to drive
RTK	Rapid test kit
RT-PCR	Reverse transcription Polymerase chain reaction
RTW	Return to work
TFR	Treatment Free Remission
TUG	Timed-Up-and-Go test
SaO_2	Oxygen saturation
SARS	severe acute respiratory syndrome
SARS-CoV-2 RNA	Severe acute respiratory syndrome coronavirus 2 ribonucleic acid
SCr	Serum Creatinine
SIGECAPS	Sleep changes, Interest, Guilt, Energy, Cognition, Appetite, Psychomotor, Suicide (pneumonic for depression)
SPO_2	Oxygen Saturation
TQWHQ	Two Questions on Depression and One Question on Help
UFEME	Urine Full examination microscopy examination
UK	United Kingdom
UTI	Urinary Tract Infection
VAFS	Visual Analogue Fatigue Scale
VGPR	Very Good Partial Response
VTd	Velcade, Thalidomide and low dose Dexamethasone
VRd	Velcade, Revlimid and low dose Dexamethasone
VTE	Venous thromboembolism
WHO	World Health Organization
WHODAS	World Health Organization Disability Assessment Scale
WM	Waldenstrom Macroglobulinemia
6-MT	6-Mercaptopurine
6MWT	6-Minute Walking Test

CHAPTER 1

GENERAL POST COVID-19 MANAGEMENT

1.0 Introduction

1.1 Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment. It has been further classified into 5 clinical categories (**Table 1.1**).

1.2 COVID-19 pandemic has resulted in a growing population of individuals recovering from acute SARS-CoV-2 infection. Research thus far is showing that COVID-19 has the potential to affect multiple organs in the body. It is best known for causing a range of degrees of respiratory symptoms, including respiratory failure and Acute Respiratory Distress Syndrome (ARDS). It also has cardiac, cardiovascular, thromboembolic, and inflammatory complications, and autopsies have shown that the virus can disseminate systemically: in addition to the respiratory tract, SARS-CoV-2 RNA has been found in the kidneys, liver, heart, and brain.

1.3 Although the evidence base is limited, accumulating observational data suggest that patients recovering from COVID-19 may experience a wide range of symptoms after recovery from acute illness. A holistic approach is required for follow up care and well-being of all Post COVID-19 recovering patients.

	CLINICAL STAGE	
1	Asymptomatic	MILD
2	Symptomatic, no pneumonia	
3	Symptomatic, pneumonia	
4	Symptomatic, pneumonia, requiring supplemental oxygen	SEVERE
5	Critically ill with multiorgan involvement	

Table 1.1: COVID-19 infection further classified into clinical categories[1]:

2.0 Justification

This guidance is to ensure that patients are followed up in a timely manner taking into account factors such as disease severity, likelihood of long-term sequelae and functional disability. This can help to improve patient's health-related quality of life.

3.0 Scope

3.1 This guide contains information for healthcare workers who are providing care for patients previously tested positive to COVID-19 or have a history suggestive of undiagnosed COVID-19 and have or are at risk of Post COVID-19 conditions.

3.2 This document will be updated from time to time as new evidence becomes available.

4.0 Objectives

4.1 This guideline provides a platform for a comprehensive and coordinated treatment approach to COVID-19 aftercare by multidisciplinary teams.

4.2 It makes recommendations about care in all healthcare settings for adults, children and elderly who have post COVID-19 symptoms.

5.0 Operational definitions

5.1 Case definitions

To effectively diagnose, treat and manage a condition it needs to be defined and distinguished from other conditions. A set of definitions has been used to distinguish three phases following infection consistent with COVID-192:

a. Acute COVID-19:
Signs and symptoms of COVID-19 for up to 4 weeks.

b. Ongoing symptomatic COVID-19:
Signs and symptoms of COVID-19 from 4 to 12 weeks.

c. Post COVID-19 syndrome:
Signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis.

5.2 Follow-up locations

a. Hospitals (preferably with specialist)
b. Government health clinics

6.0 Symptoms of Post COVID-19 patients

6.1 Majority of patients seen with Post COVID-19 syndrome will have mild or asymptomatic COVID-19 infections (refer **Figure 1.13**). Post-acute COVID-19 syndrome may still occur after mild infection. Symptomatic Post COVID-19 cases are usually present with clusters of symptoms, often overlapping, which may change over time and can affect any system within the body[1]. Symptoms and the timeline of its occurrence are as illustrated in **Figure 1.13** and **1.24**. This list of symptoms, signs and the timeline will be updated as new evidence emerges.

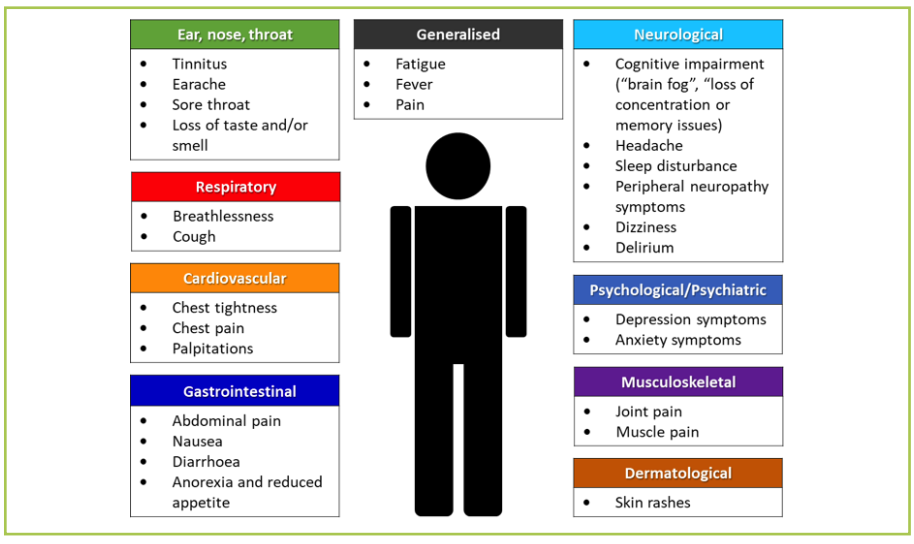


Figure 1.1: Possible common symptoms after acute COVID-19 (but are not limited to)[3]

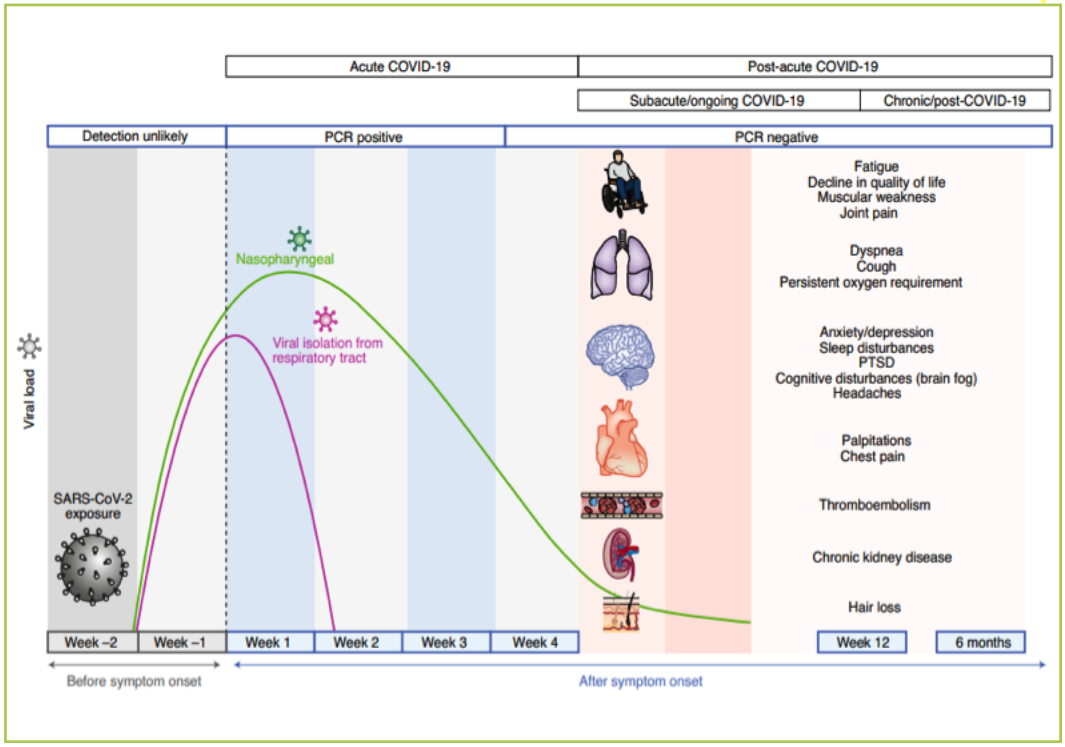


Figure 1.2: Timeline of Post-Acute COVID-19[4].

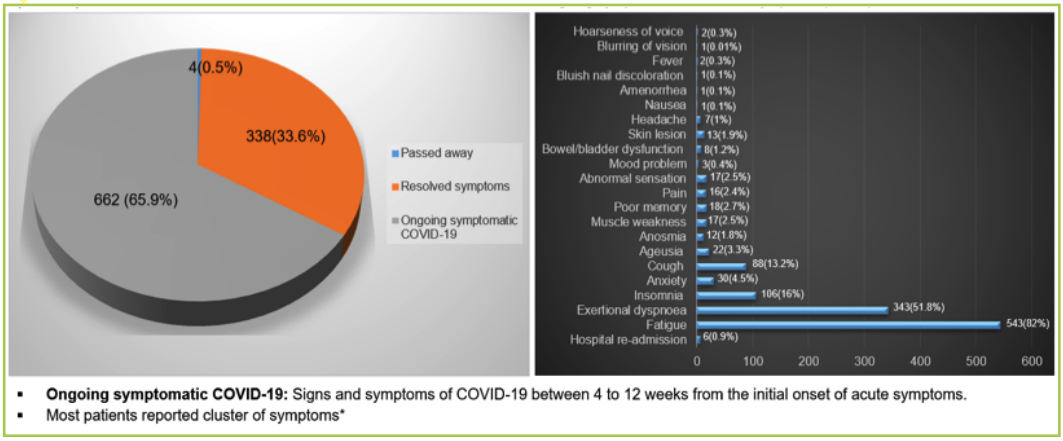
Acute COVID-19 usually last until 4 weeks from the onset of symptoms, beyond which replication-competent SARS-CoV-2 has not been isolated. Post-acute COVID-19 is defined as persistent symptoms and/or delayed or long-term complications beyond 4 weeks from the onset of symptoms. The common symptoms observed in post-acute COVID-19 are summarized

6.2 From the local perspective, preliminary data analyses from Hospital Sungai Buloh COVID-19 Rehabilitation Out-patient Specialized Services (CROSS) 12 database containing 1,880 referrals for its service, a tele-consultation service conducted after 4 weeks of the initial acute COVID-19 symptoms for 1,004 Category 4 and 5 survivors observed that 662 (65.9%) continue to experience ongoing symptomatic COVID-19 symptoms. The five most commonly reported symptoms were fatigue 543(82%); exertional dyspnoea 343(51.8%); insomnia 106(16%); cough 88(11.4%) and anxiety 30(4.5%) (**Figure 1.3** and **1.4**).

6.3 Meanwhile, of the 745 survivors attended physical review after 12 weeks of the initial onset of acute COVID-19 symptoms, 474(63.6%) experienced Post COVID-19 syndrome. The five most commonly reported symptoms were fatigue 276 (73.4%); exertional dyspnoea 92(19.4%); insomnia 66(13.9%); cough 46(9.7%) and pain 35(7.3%) (**Figure 1.5** and **1.6**).

Figure 1.3: Outcome after 4 weeks of initial onset of acute COVID-19 symptoms (N=1,004)

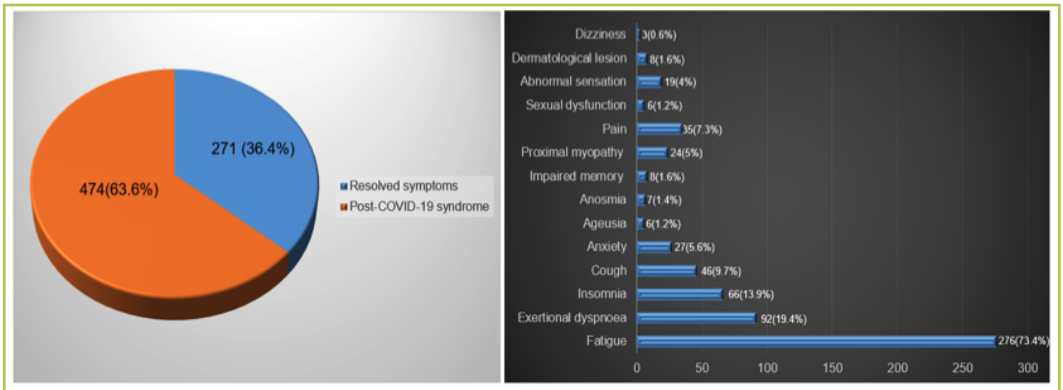
Figure 1.4: Types and frequency of symptoms experienced by survivors with ongoing symptomatic COVID-19. (N=662)



- **Ongoing symptomatic COVID-19:** Signs and symptoms of COVID-19 between 4 to 12 weeks from the initial onset of acute symptoms.
- Most patients reported cluster of symptoms*

Figure 1.5: Outcome after 12 weeks of initial onset of acute COVID-19 symptoms (N=745)

Figure 1.6: Types and frequency of symptoms experienced by survivors with Post COVID-19 syndrome. (N=474)



- **Post-COVID-19 syndrome:** Signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis.
- Most patients reported cluster of symptoms.*

6.4 When assessing any patient, it is important to have an awareness of the known significant sequelae as in **Table 1.2**.

Organs affected	Sequelae
Gastrointestinal	Liver dysfunction Malnutrition due to vomiting and diarrhoea/ breathlessness / loss of appetite
Nephrology	Renal impairment Acute kidney injury
Dermatology	Skin rashes Hair loss

Organs affected	Sequelae
Pulmonary	Persisting interstitial lung disease Impaired lung function Pneumonia/lung cavitation Complications of intubation/ventilation
Cardiovascular	Myocardial infarction Myocarditis Pericarditis Arrhythmia Heart failure
Neurological	Stroke Cognitive impairment Encephalopathy Epilepsy Myelitis Critical care neuropathy/myopathy Cognitive impairment / school performance deterioration Sleep disturbances
Haematological	Hypercoagulable state Anaemia Venous thromboembolism (VTE)
Rheumatological	Post-viral syndrome similar to chronic fatigue syndrome
Endocrine	Deterioration of diabetic control New-onset diabetes Thyroiditis and thyroid dysfunction Primary and secondary adrenal insufficiency Osteoporosis due to prolonged immobilization
Mental health	Worsening of cognitive decline Depression Anxiety Post-traumatic stress disorder (PTSD) following severe illness

Organs affected	Sequelae
Post–intensive care syndrome	Dyspnoea Anxiety Depression Prolonged pain Reduced physical function Reduced quality of life
Nonspecific multisystem post-viral symptoms	Cardiac/respiratory/musculoskeletal deconditioning Pressure sores Common symptoms: i. fatigue ii. dyspnoea iii. joint pain iv. chest pain v. cough vi. change in sense of smell or taste. Less common symptoms include: vii. insomnia viii. low-grade fevers ix. headaches x. neurocognitive difficulties xi. myalgia and weakness xii. gastrointestinal symptoms xiii. rash xiv. depression.

Table 1.2: COVID-19 specific significant sequelae[6]

7.0 Assessment

7.1 Assessment of Post COVID-19 patients is as following:

a. All Category 4 and 5 of COVID-19 cases will be followed-up and given appointment upon discharge to their own clinicians at hospital. Provide patient with a discharge note (refer **Appendix 3**) and appointment to Post COVID-19 Clinic if no existing followed-

up (refer flow chart: **Appendix 1**) using recommended referral letter (refer to **Appendix 4**).

b. Other categories of COVID-19 cases can be referred to Primary Care health facilities upon discharge if necessary for follow-up. Referral Letter as in **Appendix 4** can be used for this purpose. They can also walk in to any primary care health facilities for further assessment and management if symptoms persist (refer flow chart: **Appendix 2**). Referral can be made for those who require a tertiary care management to the nearest hospital (use Referral Letter in **Appendix 4**).

c. Patients with red-flag symptoms should be assessed and stabilized. Refer to hospital if necessary.

7.2 Use a holistic, person-centered approach to assess all cases. This includes a comprehensive clinical history and appropriate examination that involves assessing physical, cognitive, psychological and psychiatric symptoms, as well as functional abilities. Refer to **Appendix 5** for Clerking Sheet for Post COVID-19 Patients. Individual facility or discipline may amend the clerking sheet according to the need of local setting.

7.3 Include this point in the comprehensive clinical history[2,4,8,9,10,11]:

a. History of suspected or confirmed acute COVID-19.

b. The nature and severity of other health conditions and current symptoms.

c. Timing and duration of symptoms since the start of acute COVID-19.

7.4 Important points to note[2,4,8,9,10,11]:

a. While investigating the Post COVID-19 syndromes, ensure symptoms are not attributable to other diagnoses.

b. Be aware that people can have wide-ranging and fluctuating symptoms after acute COVID-19, which can change in nature over time.

c. Discuss how the person's life and activities, for example their work or education, mobility and independence, have been affected by ongoing symptomatic COVID-19 or suspected Post COVID-19 syndrome.

d. Discuss the person's experience of their symptoms and ask about any feelings of worry or distress. Listen to their concerns with empathy and acknowledge the impact of the illness on their day-to-day life, for example activities of daily living, feelings of social isolation, work and education, and wellbeing.

e. For people who may benefit from support during their assessment, for example to help describe their symptoms, include a family member or carer in discussions if the person agrees.

f. Do not predict whether a person is likely to develop Post COVID-19 syndrome based on whether they had certain symptoms (or clusters of symptoms) or were in hospital during acute COVID-19.

g. When investigating possible causes of a gradual decline, deconditioning, worsening frailty or dementia, or loss of interest in eating and drinking in older people, bear in mind that these can be signs of ongoing symptomatic COVID-19 or suspected Post-COVID-19 syndrome.

h. If the person reports new cognitive symptoms, use a validated screening tool to measure any impairment and impact (e.g., Mini Mental State Examination-MMSE and Early Cognitive Assessment Questionnaire - ECAQ)

7.5 Appropriate examinations must be tailored to history taking findings.

8.0 Identify phases of Post COVID-19 cases

Identify the phases of Post COVID-19 patients (refer 5.0) to effectively diagnose, treat and manage the conditions.

9.0 Investigations

9.1 All Post COVID-19 patients must undergo investigations based on clinical indications and availability of tests at your health facilities.

9.2 Establish red flag symptoms that could indicate the need for emergency assessment for serious complication of COVID-19. Red flag symptoms include severe, new onset, or worsening of[4,12]:

a. breathlessness or hypoxia,
b. syncope,
c. unexplained chest pain, palpitations or arrhythmias,
d. delirium, or focal neurological signs or symptoms.
e. Multisystem inflammatory syndrome (in children).

10.0 Management

10.1 Give advice and information on self-management to people with ongoing symptomatic COVID-19 or Post COVID-19 syndrome, starting from their initial assessment. This should include:

a. Ways to self-manage their symptoms, such as setting realistic goals.

b. Who to contact if they are worried about their symptoms or they need support with self-management.

c. Sources of advice and support, including support groups, social prescribing, online forums and apps.

d. How to get support from other services, including social care, housing, and employment, and advice about financial support.

e. Information about new or continuing symptoms of COVID-19 that the person can share with their family, carers and friends.

10.2 Develop a management plan with the person addressing their main symptoms, problems, or risk factors, and an action plan. Consider individual factors and access issues in determining location for further treatment or rehabilitation e.g., home-based, telehealth or face-to-face options.

10.3 Management plan is depending on clinical need and local pathways:

a. Support from integrated and coordinated primary care, community, rehabilitation and mental health services

b. Referral to an integrated multidisciplinary assessment service

c. Referral to specialist care for specific complications.

10.4 When discussing with the person the appropriate level of support and management:

a. Think about the overall impact their symptoms are having on their life, even if each individual symptom alone may not warrant referral

b. Look at the overall trajectory of their symptoms, taking into account that symptoms often fluctuate and recur so they might need different levels of support at different times.

10.5 Patient who developed Post COVID-19 complications will be referred to relevant specialty and managed accordingly.

10.6 Diabetes care Post COVID-19 should ideally address the following;

a. Prevention of type 2 diabetes in those at risk with reinforcement of lifestyle measures

b. Detecting new cases of diabetes early and implementing appropriate pharmacological and nonpharmacological management.

c. Consideration for induction of diabetes remission in new-onset and early type 2 diabetes by lifestyle changes and behaviour therapy that promote weight loss.

d. Effective treatment of glycaemia with appropriate use of various antidiabetic therapies. Effective treatment of related comorbidities such as blood pressure, lipid and weight management to prevent diabetes-related complications

e. Effective screening and monitoring to detect diabetes-related complications early and treat appropriately.

f. Safe care in patients during hospital admission

10.7 Management of common symptoms

a. Cough or breathlessness:
   i. Optimize management of pre-existing respiratory conditions
   ii. Positioning & breathing technique
   iii. Recommend respiratory muscle conditioning (pulmonary rehabilitation)
   iv. Recommend gradual return to exercise guided by symptoms
   v. Consider dietitian assistance if symptoms interfere with nutrition

b. Fatigue:
   i. Maximize self-care, sleep, relaxation and nutrition
   ii. Recommend patients pace and apply prioritization to daily activities
   iii. Recommend caution with return to exercise (reduce if there is any increase in symptoms)
   iv. A monitored return to exercise can be supported by physiotherapy or rehabilitation referral
   v. If fatigue is causing difficulty with activities of daily living (ADLs) refer to rehab

c. Chest pain:
   i. Exclude acute coronary syndrome, myocarditis, pericarditis and arrhythmia
   ii. Manage with reassurance and education regarding symptoms of concern
   iii. Patients who have had myocarditis or pericarditis as a component of their acute illness should have 3-6 months of rest from physical training and athletes should have cardiology supervision of return to training

d. Headaches, low-grade fever and myalgia:
   i. Exclude COVID-19 reinfection or recrudescence
   ii. Prescribe simple supportive measures and analgesia or antipyretics as needed
   iii. Rule out other infections

e. Neurocognitive difficulty:
   i. Prescribe supportive management
   ii. If severe enough to cause difficulty with ADLs, consider cognitive testing and occupational therapy support

f. Depression/anxiety:
   i. Provide information about Post COVID recovery
   ii. Address multifactorial contributors that may require assistance with pain management, independence with ADLs, financial and other social supports and loneliness
   iii. Consider options for supported access to mental health services or online support if patient is unwilling to access face-to-face counselling

g. Thrombosis risk and contraceptive choice:
   i. COVID-19 causes a hypercoagulable state in some people, which may worsen the VTE risk associated with combined hormonal contraception (CHC). The incidence of VTE in biological females of reproductive age with COVID-19 infection is currently not known.
   ii. Patients should be advised of this risk to allow informed choice of contraceptive option
   iii. Patients who have severe illness due to COVID-19 should cease their CHC and VTE prophylaxis should be considered
   iv. The duration of risk is not yet ascertained, so consider recommending a progestogen only or non-hormonal method of contraception for those who cease CHC
   v. It is reasonable to continue CHC in patients who have had asymptomatic or mild COVID-19 infection

11.0 Patients' outcomes and assessment tools

Patient should be assessed for the improvement of Post COVID-19 complications. Assessment depends on the patient complications.

12.0 Conclusion

12.1 It is still unknown about how COVID-19 will affect people over time, but research is ongoing hence it is recommended that the health conditions of people who have had COVID-19 to be closely monitored.

12.2 Even though, most people who have COVID-19 recover quickly, there are potentially long-lasting problems following COVID-19 infection which make the precautionary measures even more important. These include wearing masks, physical distancing, avoiding crowds, getting a vaccine when available and keeping hands clean.

13.0 Appendix:

1. Flow Chart of Post COVID-19 Management at Tertiary Centre (Category 4 and 5)
2. Flow Chart of Post COVID-19 Management for Walk in Cases
3. Discharge Note for COVID-19 Patients
4. Referral Letter for Post COVID-19 Patients
5. Clerking Sheet for Post COVID-19 Patients

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CHAPTER 2

POST COVID-19 MANAGEMENT PROTOCOL IN PRIMARY CARE

1.0 Introduction

1.1 Post COVID-19 patients can present with a variety of symptoms (new onset / persistent / relapse of symptoms) that developed as a sequela of the COVID-19 infection. Patients diagnosed with Category 1-3 COVID-19 infection do not require follow up unless indicated, while patients diagnosed with Category 4-5 COVID-19 infection will be followed up in tertiary centers. However, recent literatures have found that patients who had milder forms of COVID-19 infection can develop long term complications as well[1]. Therefore, primary care doctors should be prepared to receive Post COVID-19 patients who walk in to primary care clinics, post home quarantine, referred from quarantine centers or hospitals for shared care.

1.2 This guideline serves to aid primary care doctors in assessing and managing Post COVID-19 patients in a comprehensive and holistic manner, which include optimizing the patients' general health condition, underlying co-morbidities along with their psychosocial well-being.

2.0 Scopes

2.1 Evaluate Post COVID-19 patients who present to primary care with long COVID symptoms.

2.2 Identify presence of red flags and indications to refer to tertiary centers.

2.3 Follow-up patients with Post COVID-19 infection, whom were given appointment for monitoring comorbidities or complications (vital signs and blood parameters).

3.0 Symptoms

3.1 Post COVID-19 patients may be symptomatic or asymptomatic of COVID-19 infection.

3.2 Symptomatic Post COVID-19 patients may have new, ongoing or worsening symptoms.

3.3 Symptoms are highly variable and wide ranging, which may be singular, multiple, constant, transient, or fluctuating, and can change in nature over time.

3.4 It is also important to be aware of the known significant sequelae while assessing post-acute COVID-19 patients[3] (refer **Table 1.2**).

4.0 Assessment and management

1. Respiratory

Symptoms	Assessment / assessment tools	Management
Presence of respiratory symptoms (new onset / recurrence / persistence) – cough / chest pain / breathlessness	• Respiratory rate • Pulse oximeter • 6-minutes walking test with SPO2* level monitoring / exertional desaturation test* (1-minute sit to stand test) • Chest X-ray* *perform if indicated	1. Refer FMS / respiratory physician if presence of abnormal findings. 2. Consider further investigation and imaging (if clinically indicated). • Lung function test (spirometry & diffusion capacity test). • HRCT (+/- CTPA). 3. Refer chest physician if saturation test falls of 3% from the baseline. 4. Respiratory rehabilitation • Breathing exercises and positioning.

2. Cardiovascular

Symptoms	Assessment / assessment tools	Management
New onset / recurrent / persistent a) Chest pain b) Palpitation c) Failure symptoms Cardiovascular (CV) risk	1. BP, PR, ECG. 2. NYHA 3. CCSAC* *Canadian Cardiovascular Society Angina Classification Framingham cardiovascular risk assessment	1. Refer ED / physician / Cardiologist. 2. Shared care with primary care for optimization of risk factors upon discharge. To optimise management of hypertension, lipid and diabetes management in high CV risk

3. Neurology

Symptoms	Assessment / assessment tools	Management
New onset of acute neurological symptoms - focal weakness/ reduced sensation/ seizure/ altered behaviour / worsening of headache	Full neurological examination	• Refer Neurologist / Physician / medical team • Consider admission
Poor cognitive function (worsening of cognitive function)	Cognitive assessment: Mini Mental State Examination (MMSE) / Montreal Cognitive Assessment (MoCA)	• Mild to moderate – refer occupational therapist • Severe - refer Neurologist / Physician / medical team

4. Psychiatry / mental health

Symptoms	Assessment / assessment tools	Management
Major Depressive Disorder (CPG MDD, 2019)		
• Sleep disturbance • Interest Reduced • Guilt and self-blame • Energy loss and fatigue • Concentration problem • Appetite changes • Psychomotor changes • Suicidal thoughts *SIGECAPS Mnemonic for depression	Available assessment tools: a. Whooley Questions b. DASS 21 c. PHQ2 d. PHQ9	Mild to Moderate (supervised by FMS): • Psychoeducation • Psychotherapy • Pharmacotherapy Moderate to Severe • Refer Psychiatrist Suicidal thoughts / attempt • Referred to Psychiatrist urgently
Generalised Anxiety Disorder (GAD) (DSM5)		
• Anxiety • Worry • Concentration difficulty • Restlessness • Irritability • Muscle tension • Energy low/fatigue • Sleep disturbance *A&W CRIMES Mnemonic for anxiety	GAD7	Mild to Moderate (supervised by FMS): • Psychoeducation • Psychotherapy • Pharmacotherapy Moderate to Severe • Refer Psychiatrist

PTSD (DSM5)		
• Recurrent distressing memories • Recurrent distressing dream • Flashbacks • Intense psychological distress towards the event • Marked psychological reactions towards the event	Nil	Refer Psychiatrist
Other psychological symptoms – refer topic psychology		

Dalam sebulan yang lepas, adakah anda terganggu oleh masalah berikut?
Over the past one month, have you been bothered by the following problems?

No	Soalan/Questions	Jawapan/ Answer
1.	Merasa murung, sedih atau tiada harapan? *Feeling down, depressed or hopeless?*	**Ya/Tidak** ***Yes/No***
2.	Kurang minat atau keseronokan dalam melakukan kerja-kerja? *Having little interest or pleasure in doing things?*	**Ya/Tidak** ***Yes/No***

1. During the past month, have you often been bothered by feeling down, depressed or hopeless? ☐ Yes ☐ No

2. During the past month, have you often been bothered by little interest or pleasure in doing things? ☐ Yes ☐ No

"Yes" to one (or both) questions	**= positive test (requires further evaluation)**
"No" to both questions	**= negative test (not depressed)**

Table 2.1: Whooley Questionnaire (Malay Version)

Dalam tempoh 2 minggu yang lepas, berapa kerapkali anda terganggu oleh masalah berikut?
Over the last 2 weeks, how often have you been bothered by the following problems?

No	Soalan/Questions	Skor/Score
1.	Sedikit minat atau keseronokan dalam melakukan kerja-kerja *Little interest or pleasure in doing things*	Tidak pernah sama sekali/*Not at all* 0 Beberapa hari/*Several days* 1 Lebih dari seminggu/*More than half the days* 2 Hampir setiap hari/*Nearly everyday* 3
2.	Kurang minat atau keseronokan dalam melakukan kerja-kerja *Having little interest or pleasure in doing things?"*	Tidak pernah sama sekali/*Not at all* 0 Beberapa hari/*Several days* 1 Lebih dari seminggu/*More than half the days* 2 Hampir setiap hari/*Nearly everyday* 3

Table 2.2: Patient Health Questionnaire – PHQ2 (Malay Version)

*A cut-off score 3 or more is positive

PHQ-9 Depression

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving .around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
Column totals	___	+ ___	+ ___	+ ___
			= ***Total Score*** ____	

From the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD PHQ). The PHQ was developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues. For research information, contact Dr. Spitzer at rls8@columbia.edu. PRIME-MD® is a trademark of Pfizer Inc. Copyright© 1999 Pfizer Inc. All rights reserved. Reproduced with permission

Figure 2.1: Patient Health Questionnaire 9 – PHQ9

DEPRESSION ANXIETY STRESS SCALE-21 (DASS-21)

SARINGAN MINDA SIHAT

SOAL SELIDIK DASS

Langkah 1: Sila baca dan jawab soal selidik DASS
Langkah 2: Masukkan skala markah jawapan ke dalam ruangan kosong di Bahagian 2, mengikut soalan (S) bagi setap kategori (Stress, Anzieti dan Kemurungan)
Langkah 3: Jumlahkan skala markah bagi setiap kategori bagi mengetahui tahap status kesihatan mental anda.
Langkah 4: Sila isikan keputusan dalam Bahagian 3 dan isikan dalam keratin di muka surat hadapan.

BAHAGIAN 1

Sila baca setiap kenyataan di bawah dan bulatkan jawapan anda pada kertas jawapan berdasarkan jawapan 0,1,2 atau 3 bagi menggambarkan keadaananda sepanjang minggu yang lalu. Tiada jawapan yang betul atau salah. Jangan mengambil masa yang terlalu lama atau menjawab mana-mana kenyataan.

Please read each statement and circle number 0,1,2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

0= Tidak langsung menggambarkan keadaan saya (*Did not apply to me at all*)	2= Banyak atau kerapkali menggambarkan keadaan saya (*Applied to me to a considerable degree, or a good part of time*)
1= Sedikit atau jarang-jarang menggambarkan keadaan saya (*Applied to me to some degree, or sometime*)	3= Sangat banyak atau sangat kerap menggambarkan keadaan saya (*Applied to me very much, or most of the time*)

1	Saya dapati diri saya sukar ditenteramkan. *I found it hard to wind down.*	0	1	2	3
2	Saya sedar mulut saya terasa kering. *I was aware of dryness of my mouth.*	0	1	2	3
3	Saya tidak dapat mengalami perasaan positif sama sekali. *I couldn't seem to experience any positive feeling at all.*	0	1	2	3
4	Saya mengalami kesukaran bernafas (contohnya pernafasan yang laju, tercungap-cungap walaupun tidak melakukan senaman fizikal). *I experienced breathing difficulty e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).*	0	1	2	3

5	Saya sukar untuk mendapatkan semangat bagi melakukan sesuatu perkara. *I found it difficult to work up the initiative to do things.*	0	1	2	3
6	Saya cenderung untuk bertindak keterlaluan dalam sesuatu keadaan. *I tend to over-react to situations.*	0	1	2	3
7	Saya rasa menggeletar (contohnya pada tangan). *I experienced trembling (e.g., in the hands)*	0	1	2	3
8	Saya rasa saya menggunakan banyak tenaga dalam keadaan cemas. *I felt that I was using a lot of nervous energy.*	0	1	2	3
9	Saya bimbang keadaan di mana saya mungkin menjadi panik dan melakukan perkara yang membodohkan diri sendiri. *I was worried about situations in which I might panic and make fool of myself*.	0	1	2	3
10	Saya rasa saya tidak mempunyai apa-apa untuk diharapkan. *I felt that I had nothing to look forward to.*	0	1	2	3
11	Saya dapati diri saya semakin gelisah. *I found myself getting agitate.*	0	1	2	3
12	Saya rasa sukar untuk relaks. *I found it difficult to relax.*	0	1	2	3
13	Saya rasa sedih dan murung. *I felt down-hearted and blue.*	0	1	2	3
14	Saya tidak dapat menahan sabar dengan perkara yang menghalang saya meneruskan apa yang saya lakukan. *I was intolerant of anything that kept me from getting on with what I was doing.*	0	1	2	3
15	Saya rasa hampir-hampir menjadi panik/ cemas. *I felt I was close to panic.*	0	1	2	3
16	Saya tidak bersemangat dengan apa jua yang saya lakukan. *I was unable to become enthusiastic about anything*	0	1	2	3
17	Saya rasa tidak begitu berharga sebagai seorang individu. *I felt I wasn't worth much as a person.*	0	1	2	3
18	Saya rasa mudah tersentuh. *I felt that I wasn't worth much as a person.*	0	1	2	3

BAHAGIAN 2

Panduan Mengira Skor :-
Masukkan skala markah jawapan bagi soalan (S) bagi setiap kategori.

STRES								
Soalan	S1	S6	S8	S11	S12	S14	S18	Jumlah
Markah								

ANZIETI								
Soalan	S2	S4	S7	S9	S15	S19	S20	Jumlah
Markah								

KEMURUNGAN (DEPRESSION)								
Soalan	S3	S5	S10	S13	S16	S17	S21	Jumlah
Markah								

Selepas dijumlahkan, sila rujuk kepada petak skor saringan dan terjemahkan jumlah skor untuk mengetahui tahap status kesihatan mental anda.

SKOR SARINGAN			
	Kemurungan	Anzieti	Stres
Normal	0 - 5	0 - 4	0 - 7
Ringan	6 - 7	5 - 6	8 - 9
Sederhana	8 - 10	7 - 8	10 - 13
Teruk	11 - 14	9 - 10	14 - 17
Sangat Teruk	15 +	11 +	18 +

BAHAGIAN 3

Isikan keputusan (**normal, ringan, sederhana, teruk atau sangat teruk**) dalam jadual di bawah.

KEPUTUSAN UJIAN DASS	
Ujian	Tahap
Stres	
Anzieti	
Kemurungan	
SKOR DASS	

3

Figure 2.2: Depression Anxiety Stress Scale 21 (DASS 21) (Malay Version)

GAD-7 Anxiety

Over the last 2 weeks, how often have you been bothered by the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Column totals: ___ + ___ + ___ + ___

= ***Total Score*** _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

From the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD PHQ). The PHQ was developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues. For research information, contact Dr. Spitzer at rls8@columbia.edu. PRIME-MD® is a trademark of Pfizer Inc. Copyright© 1999 Pfizer Inc. All rights reserved. Reproduced with permission

Figure 2.3: Generalized Anxiety Disorder 7 (GAD-7 Anxiety)

Scoring notes.

PHQ-9 Depression Severity

Scores represent:
0-5 = mild 6-10 = moderate 11-15 = moderately severe 16-20 = severe depression

GAD-7 Anxiety Severity.

This is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of "not at all," "several days," "more than half the days," and "nearly every day," respectively. GAD-7 total score for the seven items ranges from 0 to 21.

Scores represent:
0-5 mild 6-10 moderate 11-15 moderately severe anxiety 15-21 severe anxiety.

Figure 2.4: Scoring notes on PHQ-9 Depression Severity and Generalized Anxiety Disorder 7 (GAD-Anxiety)

5. Rehabilitation / musculoskeletal

<table>
<tr><th>Symptoms</th><th>Assessment / assessment tools</th><th>Management</th></tr>
<tr>
<td>Common musculoskeletal symptoms:
Myalgia, Arthralgia, Pain, Weakness, Fatigue, Reduce effort tolerance, Limited joint movements.</td>
<td>1. Full history taking and relevant physical examination
2. Assessment of the baseline outcome measures:
<table>
<tr><th>Outcome Measures</th><th>Assessment Tool</th></tr>
<tr><td>Muscle strength</td><td>Manual muscle test</td></tr>
<tr><td>Balancing</td><td>Berg Balance scale</td></tr>
<tr><td>Endurance</td><td>6-min walking test</td></tr>
<tr><td>ADL independence</td><td>Modified Barthel Index</td></tr>
<tr><td>Pain</td><td>Numerical rating scale</td></tr>
<tr><td>Fatiguability</td><td>Fatigue Severity Scale and Visual Analogue Fatigue Scale</td></tr>
<tr><td>Dyspnea</td><td>Modified Borg scale</td></tr>
</table>
</td>
<td>1. Relevant investigations to rule out other differential diagnosis.

2. Multidisciplinary team involvement*:
I. Patient education: lifestyle and general health, exercise programme, ADL adaptations and modifications.
II. Physiotherapy
III. Occupational therapy.
IV. Pharmacological treatment
V. Psychosocial support.

*to refer hospital if necessary (e.g., inadequate equipment)</td>
</tr>
<tr><td>Complex medical impairment with complex or existing rehabilitation needs.</td><td>As above</td><td>Refer to Rehabilitation Medicine Specialist</td></tr>
<tr><td>Persistent musculoskeletal symptoms after 12 weeks of intervention at primary care facility.</td><td>Reassessment of outcome measures.</td><td>Refer to Rehabilitation Medicine Specialist</td></tr>
<tr><td>Red flags:
1. Non-resolving dyspnoea or hypoxia, headache, dizziness, syncope, delirium, or focal neurological signs or symptoms.</td><td>Full history taking and relevant physical examination.</td><td>1. Relevant investigations.

2. Urgent referral to respective department.</td></tr>
</table>

Symptoms	Assessment / assessment tools	Management
2. Unexplained chest pain, palpitations or arrhythmias. 3. Multisystem inflammatory syndrome (in children).		

FATIGUE SEVERITY SCALE (FSS)

Date _____ Name_____

Please circle the number between 1 and 7 which you feel best fits the following statements. This refers to your usual way of life within the last week. 1 indicates "strongly disagree" and 7 indicates "strongly agree."

Read and circle a number	Strongly Disagree → Strongly Agree						
1. My motivation is lower when I am fatigued.	1	2	3	4	5	6	7
2. Exercise brings on my fatigue.	1	2	3	4	5	6	7
3. I am easily fatigued.	1	2	3	4	5	6	7
4. Fatigue interferes with my physical functioning.	1	2	3	4	5	6	7
5. Fatigue causes frequent problems for me.	1	2	3	4	5	6	7
6. My fatigue prevents sustained physical functioning.	1	2	3	4	5	6	7
7. Fatigue interferes with carrying out certain duties and responsibilities.	1	2	3	4	5	6	7
8. Fatigue is among my most disabling symptoms.	1	2	3	4	5	6	7
9. Fatigue interferes with my work, family, or social life.	1	2	3	4	5	6	7

Figure 2.5: Fatigue Severity Scale (FSS)

VISUAL ANALOGUE FATIGUE SCALE (VAFS)

Please mark an "X" on the number line which describes your global fatigue with 0 being worst and 10 being normal.

Figure 2.6: Visual Analogue Fatigue Scale (VAFS)

6. Geriatric population (60 years and above)

- Assess patient's condition Post COVID-19 infection by comparing with premorbid state (to look for new changes or previously missed / undetected premorbid / chronic conditions)
- Suggested conditions to assess include:
  - o Decline in mobility
  - o Falls
  - o Decline in activities of daily living (ADL)
  - o Decline in cognition or presence of confusion
  - o Mood or behaviors changes
  - o Incontinence (urine / bowel)
  - o Oral intake and nutrition
  - o Sleep
  - o Increased care or support requirements at home

1 line screening questions (to patient or to caregiver)	Assessment / Assessment tools	Management
a) Cognition: *Is there any problem with memory? or Is the patient confused?*	Available assessment tools: • ECAQ • Mini-Cognitive test (using Mini-Cog Instrument) • MMSE • Montreal Cognitive Assessment (MoCA) Cognitive tests may be affected by: • Delirium • Dementia	1. New deterioration in cognition or new onset of confusion during recent COVID-19 infection may be due to delirium (which may persist for days to weeks after resolution of illness) • If improving trend & clinically well – observe • If persistent or worsening – assess for causes of unresolving delirium (consider referring for inpatient work-up & care) 2. If cognitive impairment or confusion is chronic - consider referring to psychiatrist / geriatric psychiatrist / geriatrician / neurologist to rule out dementia

1 line screening questions (to patient or to caregiver)	Assessment / Assessment tools	Management
	• Depression • Other issues (e.g., vision, hearing, language, education, etc) **Always assess clinically (history-taking, physical examination, & relevant investigations); not solely depend on assessment tools	
b) Mood: *Are you depressed / having low mood?*	Geriatric Depression Scale (GDS)	1. Refer to FMS / counselor / psychologist for intervention if score ≥ 5. 2. If score persistently ≥ 5 after intervention, refer to psychiatrist / geriatric psychiatrist. Refer to geriatrician if patient also has other geriatric issues
c) Polypharmacy: *What medications are you taking?* *→ do pill check with caregivers and ensure adherence*	BP, blood sugar and target organ damage	Optimize BP and glucose to age group targets 1. Target SBP • <150 mmHg for > 80 years old • <140 mmHg for 65-80 years old • <130 mmHg in fit 65-80 years old #apply less strict targets for the frail, functionally and/ or cognitively impaired, those with multi morbidities and those with adverse reactions from therapy. Consider de-prescribing in this group of patients 2. HbA1c target • <7.5% in healthy (few coexisting chronic illness, intact cognitive, and functional status) • <8.0% in complex (multiple co existing chronic illness or mild-moderate cognitive impairment & functional impairment) • <8.5% in very complex / poor health (long term care / end stage chronic illness or moderate-severe cognitive impairment & functional impairment)

1 line screening questions (to patient or to caregiver)	Assessment / Assessment tools	Management
d) Falls: *Have you had any falls?*	• Postural BP • ECG • Eye and hearing assessment • Medication review • Timed-Up-and-Go test (TUG) - normal ≤ 13.5 seconds for community-dwelling older adults	• Refer to physiotherapist for: • Upper and lower limb muscle strengthening exercises (with breathing control) • Gait and balance training • Endurance training • Walking aid / wheelchair training • Refer to occupational therapist for home, ADL and footwear assessment • Manage postural hypotension (medication adjustment, fluid management, etc.) • Identify and deprescribe potential fall-risk increasing drugs (FRIDS) • Vision / hearing impairment – consider referring to ophthalmologist / ENT
e) Incontinence: *Do u have trouble controlling your urine or bowel?*	UFEME, PSA (if indicated)	• Further assessment to evaluate type of urinary incontinence (urge / stress / mixed) and underlying causes / risk factors (UTI, BPH, constipation, etc) • Consider non-pharmacological measures to improve continence (Kegel's exercises, bladder training, improving mobility, timed voiding / scheduled toileting, fluid management, etc.)
f) Frailty:	Clinical Frailty Scale (CFS)* *use CFS application (downloadable from Google Play or Apple iStore)	1. CFS 9 – refer palliative care 2. CFS 4-8 a) Refer dietitian to improve nutrition b) Refer physiotherapist for strengthening exercises
g) Caregiver: *Are yo stressed?*	DASS 21	1. Manage according to DASS findings. 2. Caregiver education in caring for older adults. 3. Teaching caregiver Ryle's tube or catheter (CBD) change and dressing. 4. Arrange home visit / visit to nursing home (domiciliary team). 5. Referral for financial aid (social aid, Baitulmal, Pusat Zakat) if needed.

1 line screening questions (to patient or to caregiver)	Assessment / Assessment tools	Management
h) Is the patient bedbound?	Nil Always assess clinically for underlying cause of immobility	1. Pressure injury prevention (regular turning, skin care, pressure relief surfaces, nutrition optimization, etc.) 2. Wound management (if present) 3. Newly bedbound post-illness - intervene if reversible cause (e.g. deconditioning) 4. Premorbidly bedbound – consider optimizing mobility if possible (e.g., bed to wheelchair transfer)

*For other specific systems which are not covered by chapters, refer to respective departments for further assessment if indicated.

MINI COGNITIVE INSTRUMENTS (MINI-COG)

Mini-Cog©

Instructions for Administration & Scoring

ID:_____ Date:_____

Step 1: Three Word Registration

Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).

The following and other word lists have been used in one or more clinical studies.[1-6] For repeated administrations, use of an alternative word list is recommended.

Version 1	Version 2	Version 3	Version 4	Version 5	Version 6
Banana	Leader	Village	River	Captain	Daughter
Sunrise	Season	Kitchen	Nation	Garden	Heaven
Chair	Table	Baby	Finger	Picture	Mountain

Step 2: Clock Drawing

Say: "Next, I want you to draw a clock for me. First, put in all of the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 11."

Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.

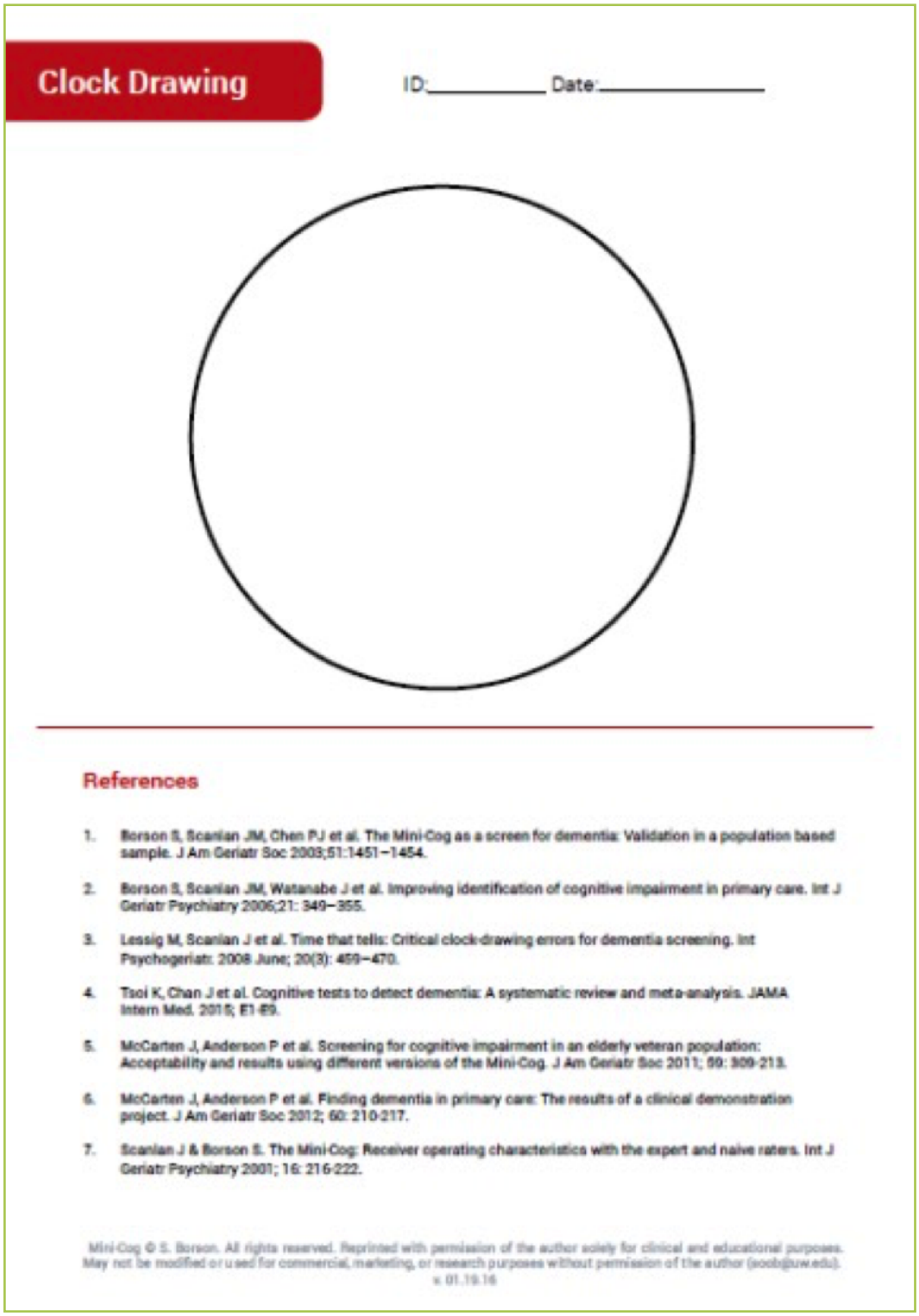
Step 3: Three Word Recall

Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the word list version number and the person's answers below.

Word List Version:_____ Person's Answers: _____ _____ _____

Scoring

Word Recall: _____ (0-3 points)	1 point for each word spontaneously recalled without cueing.
Clock Draw: _____ (0 or 2 points)	Normal clock = 2 points. A normal clock has all numbers placed in the correct sequence and approximately correct position (e.g., 12, 3, 6 and 9 are in anchor positions) with no missing or duplicate numbers. Hands are pointing to the 11 and 2 (11:10). Hand length is not scored. Inability or refusal to draw a clock (abnormal) = 0 points.
Total Score: _____ (0-5 points)	Total score = Word Recall score + Clock Draw score. A cut point of <3 on the Mini-Cog™ has been validated for dementia screening, but many individuals with clinically meaningful cognitive impairment will score higher. When greater sensitivity is desired, a cut point of <4 is recommended as it may indicate a need for further evaluation of cognitive status.



Clock Drawing

ID:_____ Date:_____

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Figure 2.7: Mini Cognitive Instruments (Mini-Cog)

MODIFIED BARTHEL INDEX

NAME :..... I/D NO:.....

DIAGNOSIS:.....

Activity	Criteria	Date	Date	Date	Date	Date
Personal Hygiene	Unable to perform task (0) Substantial help required (1) Moderate help required (3) Minimal help required (4) Fully independent (5)					
Bathing						
Toilet	Unable to perform task (0) Substantial help required (2) Moderate help required (5) Minimal help required (8) Fully independent (10)					
Stair climbing						
Feeding						
Dressing						
Bowel control						
Bladder control						
Chair/Bed transfers	Unable to perform task (0) Substantial help required (3) Moderate help required (8) Minimal help required (12) Fully independent (15)					
Ambulation						
Or Wheelchair (Score only if patient is unable to ambulate and is trained in wheelchair)	Unable to perform task (0) Substantial help required (1) Moderate help required (3) Minimal help required (4) Fully independent (5)					
TOTAL SCORE (100						
DEPENDENCY LEVEL						

*If score ≥ 50 (Moderate/ Severe/ Total), to refer patient to Occupational Therapist.

MBI TOTAL SCORE	DEPENDENCY LEVEL
0 – 24	Total
25 – 49	Severe
50 – 74	Moderate
75 – 90	Mild
91 - 99	Minimal

Assessed by: FMS/MO/OCCUPATIONAL THERAPIST SIGN/OFFICIAL STAMP:.....

Table 2.3: Modified Barthei Index (MBI)

MODIFIED BORG SCALE

Intensity	Scale	Description	Description
Low	0	Nothing at all	
	0.5	Very, very slight	
	1	Very slight	
	2	Slightly	
Moderate	3	Moderate	
	4	Somewhat severe	
	5	Severe	
High	6		
	7	Very severe	
	8		
	9	Very, very severe	
	10	Maximal	

Figure 2.8: Modified Borg Scale

GUIDANCE ON EXERCISE REHABILITATION IN POST-ACUTE COVID-19

Guidance on Exercise Rehabilitation in Post-acute COVID-19

1. **After recovery from mild illness**:
   1 week of low level stretching and strengthening before targeted cardiovascular sessions.

2. **Very mild symptoms**:
   limit activity to slow walk or equivalent. Increase rest periods if symptoms worsen.

3. **Persistent symptom**s:
   limit activity to 60% maximum heart rate until 2-3 weeks after symptoms resolve.

4. **Initial 6 weeks after discharge or illness**:
   it is recommended to keep dyspnoea and fatigue below 4/10 on the Borg Scale. Avoid over vigorous exercise as it can set back recovery.

5. **Any lymphopenia or required oxygen**:
   Need respiratory assessment before resuming exercise.

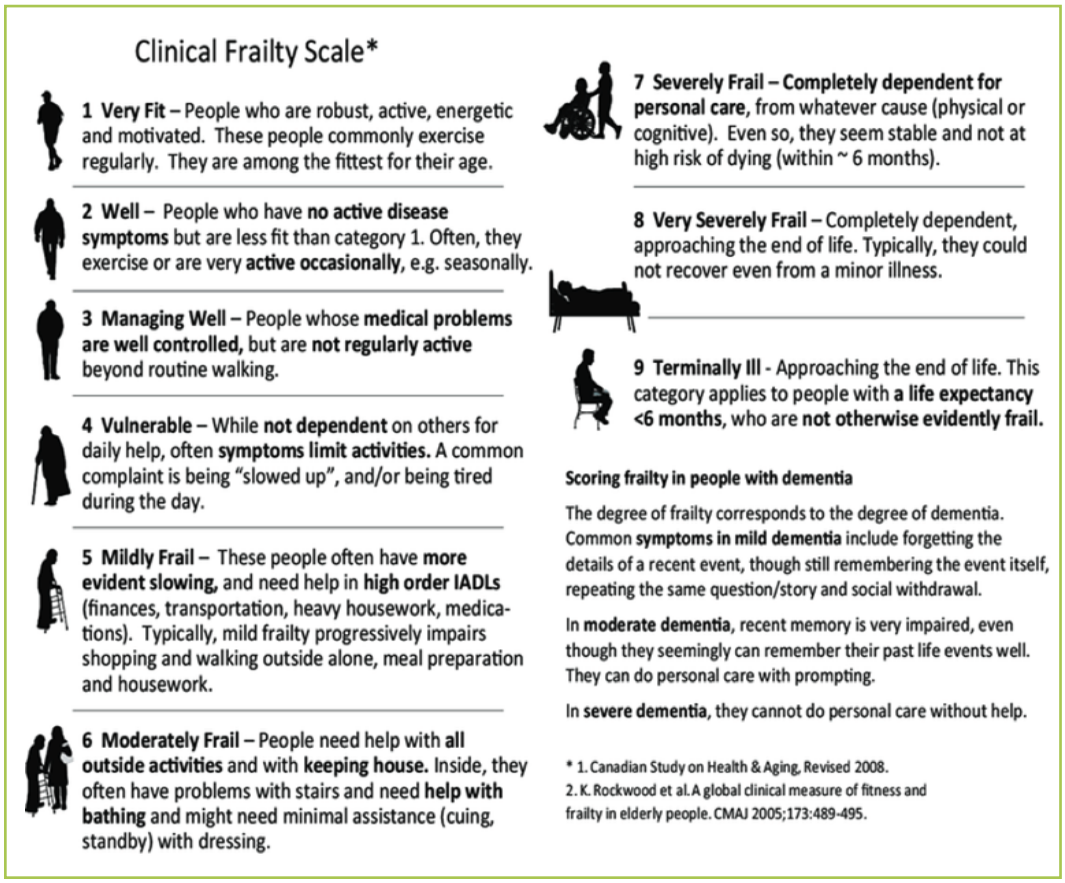
6. **Any cardiac involvement**:
   Need cardiac assessment before resuming.

7. **Patients with myalgia**:
   avoid strengthening exercises until myalgia resolves.

8. **Exercise termination criteria**:
   Exacerbation of respiratory symptoms and fatigue that are not alleviated after rest or presence of new symptoms such as chest tightness, chest pain, dyspnoea, severe cough, dizziness, headache, blurring of vision, palpitations, profuse sweating and unstable gait.

Figure 2.9: Guidance on Exercise Rehabilitation in Post-acute COVID-19

CLINICAL FRAILTY SCALE (CFS)



Clinical Frailty Scale*

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 **Managing Well** – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.

4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.

5 **Mildly Frail** – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house.** Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail – Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9 **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

Figure 2.10: Clinical Frailty Scale (CFS)

EARLY COGNITIVE ASSESSMENT QUESTIONAIRE - ECAQ

MEMORY		**score 1 for each correct answer**
1.	I want you to remember this number. Can you repeat after me (eg: 4517) I shall be testing you again in 10 mins.	_____
2.	How old are you?	_____
3.	When is your birthday? Or in which year were you born?	_____
ORIENTATION – INFORMATION		
4.	What day of the week is today?	_____
5.	What is the date today date month year	_____ _____ _____
6.	What is this place called (eg. clinic, hospital)? Not Necessary to give name of place.	_____
7.	What is his / her job (eg. nurse, doctor)?	_____
MEMORY – RECALL		
8.	Can you recall the number again?	_____
	Total	_____

SCORE

0 – 4 Probable Dementia 5 – 6 Borderline (MCI?) >7 Normal

All those score of 5 or less need to be referred to psychiatrist for further assessment.

Remarks:_____

N.B. This questionnaire is used with permission of its author Prof. Kua E.H. Dept. of Psychological Medicine, National University Hospital, Singapore.

Adopted from *Garispanduan Pemeriksaan Kesihatan Bakal Haji Edisi 8*

Figure 2.11: Early Cognitive Assessment Questionnaire – ECA

MINI MENTAL STATE EXAMINATION (MALAY VERSION)

Malay MMSE Assessment Type: .....

Patient ID: ..... Date:.....

Sex: Male ☐ Female ☐

Educational level: Primary ☐ Secondary ☐ Tertiary ☐

Maximum	Markah pesakit	
5		*Orientasi Masa* Tahun, bulan, hari, tarikh, waktu (+/- 1 jam)
5		*Orientasi Tempat* Negara, Negeri, Bandar,Tempat (hospital/rumah), bilik (wad/klinik)
3		*Pendaftaran* Saya akan menguji ingatan awak. Sila dengar dengan teliti, tiga objek yang saya akan baca, iaitu, oren, kunci dan sikat. Sila sebut semula tiga objek tadi. Ingat betul-betul, kerana saya akan bertanya kemudian.
5		*Perhatian dan Pengiraan (sila guna salah satu kaedah)* *M-MMSE-7*: Sila tolak 7 dari 100 dan teruskan. *M-MMSE -3*: Atau, tolak 3 dari 20 dan teruskan. *M-MMSE-S*: Atau, ejakan perkataan 'DUNIA' dari belakang ke depan.
3		*Ingat Kembali* Sila sebut kembali 3 objek yang telah disebut tadi.
2		*Penamaan* Namakan benda ini. (Pensel dan Jam Tangan)
1		*Ulangan* Sebutkan 'Tidak mungkin dan cukup mustahil'
3		*Arahan tiga peringkat* Ambil kertas dengan tangan kanan, lipat setengah dan letakkan atas lantai/meja.
1		*Pembacaan* Baca dan lakukan .....TUTUP MATA ANDA
1		*Penulisan* Tulis satu ayat yang lengkap.
1		Penyalinan Salinkan rajah berikut 
Jumlah		

	M MMSE-7	M MMSE-3	M MMSE-S
Combined male and female	≤21	≤18	≤17
Male	≤23	≤22	≤19
Female	≤19	≤18	≤18

Adopted from CPG Management of Dementia 2nd Edition, 2009

Figure 2.12: Mini Mental State Examination (Malay Version)

GERIATRIC DEPRESSION SCALE (GDS) (SHORT FORM)

Instructions:
Circle the answer that best describes how you felt over the past week.
Score 1 point for each bolded answer. A score of 5 or more suggests depression.

1.	Are you basically satisfied with your life?	yes	no
2.	Have you dropped many of your activities and interests?	yes	no
3.	Do you feel that your life is empty?	yes	no
4.	Do you often get bored?	yes	no
5.	Are you in good spirits most of the time?	yes	no
6.	Are you afraid that something bad is going to happen to you?	yes	no
7.	Do you feel happy most of the time?	yes	no
8.	Do you often feel helpless?	yes	no
9.	Do you prefer to stay at home, rather than going out and doing things?	yes	no
10.	Do you feel that you have more problems with memory than most?	yes	no
11.	Do you think it is wonderful to be alive now?	yes	no
12.	Do you feel worthless the way you are now?	yes	no
13.	Do you feel full of energy?	yes	no
14.	Do you feel that your situation is hopeless?	yes	no
15.	Do you think that most people are better off than you are?	yes	no

Total Score: .....

Ref. Yes average: The use of Rating Depression Series in the Elderly, in Poon (ed.): Clinical Memory Assessment of Older Adults, American Psychological Association, 1986

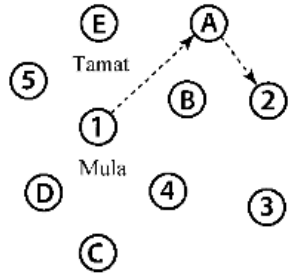
Figure 2.13: Geriatric Depression Scale (GDS) (short form)

MONTREAL COGNITIVE ASSESSMENT (MOCA) (MALAY VERSION)

Penilaian Kognitif Montreal (MoCA Bahasa Melayu)

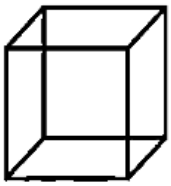
Nama :
Pendidikan:
Jantina :
Tarikh lahir:
Tarikh :

Visuospasial/ Eksekutif



[ ]

Lukis semula kuib



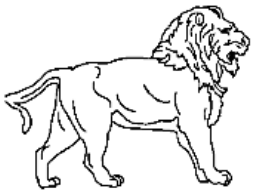
[ ]

Lukis jam
(Pukul sebelas sepuluh minit)
(3markah)

Bentuk [ ] Number [ ] Jarum [ ]

/5

Penamaan



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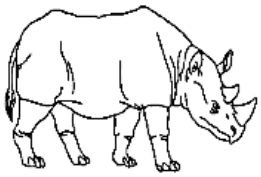

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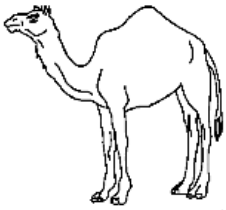

[ ]

/3

Ingatan
Bacakan senarai perkataan berikut, subjek dikehendaki mengulanginya.
Cuba sebanyak 2 kali. Ingatkan semula perkataan-perkataan tersebut selepas 5 minit.

	Muka	Batik	Masjid	Orkid	Merah
Cubaan1					
Cubaan 2					

No points

Tumpuan Perhatian
Bacakan digit-digit di sebelah (1 digit per saat)
Subjek dikehendaki mengulangi digit-digit ikut turutan 21854
Subjek dikehendaki mengulangi digit-digit secara songsang 742

/2

Bacakan huruf-huruf di bawah. Subjek dikehendaki mengetak meja dengan tangan bagi setiap huruf A yang dibaca. (Tiada markah jika ≥ 2 kesalahan)
[ ] FBACMNAAJKLBAFAKDEAAAJAMOFAAB

/1

Tolak 7 secara bersiri daripada 100 (Optional: RM10 - 70SEN, atau RM100 - RM7) [ ]93 [ ]86 [ ]79 [ ]72 [ ]65
4 atau 5 jawapan betul: 3 markah; 2 atau 3 jawapan betul: 2 markah; 1 jawapan betul: 1 markah; 0 jawapan betul: 0 markah

/3

Bahasa ulang: Yang saya tahu, hanya Ahmad sahaja yang datang (mem)bantu hari ini.
Kucing itu sentiasa (ber)sembunyi di bawah kerusi (apa)bila anjing berada (di) dalam bilik.

/2

Kefasihan/ Namakan sebanyak buah-buahan dalam satu minit [ ]_____ (n≥11)

/1

Abstrak Kesamaan antara pisang-limau=buah [ ] keretapi-basikal [ ] jam-pembaris

/2

Ingatan Bertangguh Markah diberi mengikut ingatan tanpa bantuan sahaja

	Ingat semula perkataan-perkataan tanpa bantuan	Muka [ ]	Batik [ ]	Masjid [ ]	Orkid [ ]	Merah [ ]
Ujian tambahan	Bantuan secara kategori					
	Bantuan pelbagai pilihan					

/5

Orientation [ ] Tarikh [ ] Bulan [ ] Tahun [ ] Hari [ ] Tempat [ ] Bandar/Daerah

/6

Jumlah: _____ Tuliskan jumlah tahun pendidikan: _____ (e.g. Form3 atau Form5 + diploma/kolej)
Dilengkapi oleh: _____ Normal ≥ 26/30

Abnormal < 22/30

Figure 2.14: Montreal Cognitive Assessment (MoCA) (Malay Version

FALL RISK INCREASING DRUGS (FRIDs)

PSYCHOTROPIC DRUGS

Type	Examples
Benzodiazepine	Alprazolam, lorazepam, diazepam, clonazepam
Z drug	Zolpidem, zopiclone
Tricyclic antidepressant (TCA)	Amitriptyline, imipramine
Selective serotonin reuptake inhibitor (SSRI)	Sertraline, fluvoxamine, fluoxetine, escitalopram
Serotonin-norepinephrine reuptake inhibitor (SNRI)	Venlafaxine, duloxetine
Other antidepressant	Mirtazapine
Antipsychotic (typical and atypical)	Haloperidol, chlorpromazine, risperidone, quetiapine, olanzepine, clozapine

CARDIOVASCULAR DRUGS

Type	Examples
Alpha-blocker	Prazosin, terazosin
Central-acting agent	Methyldopa
Thiazide diuretic	Hydrochlorothiazide, chlorthalidone
Loop diuretic	Frusemide, bumetanide
ACE inhibitor	Captopril, ramipril, enalapril, perindopril
Angiotensin-receptor blocker	Losartan, valsartan, telmisartan, irbesartan
Beta-blocker	Atenolol, metoprolol, propranolol, carvedilol, bisoprolol
Calcium channel blocker	Nifedipine, amlodipine, felodipine, diltiazem, verapamil
Nitrate	Isosorbide mononitrate/dinitrate, glyceryl trinitrate
Antiarrhythmic	Digoxin, amiodarone, flecainide

OTHER DRUGS

Type	Examples
Opioid	Morphine, oxycodone, dihydrocodeine, tramadol
Antiepileptic	Phenytoin, carbamazepine, sodium valproate, phenobarbitone, gabapentin, pregabalin, lamotrigine, levetiracetam, topiramate
Antiparkinson	Levodopa
Antiparkinson: dopamine agonist	Ropinirole, pramipexole
Antiparkinson: MAOI-B antagonist	Selegiline
Antiparkinson: anticholinergic	Benzhexol
Muscle relaxant	Baclofen
Antihistamine (especially first generation)	Chlorpheniramine, diphenhydramine, hydroxyzine
Drugs for BPH: alpha blocker	Terazosin, doxazosin, tamsulosin, alfuzosin
Drugs for overactive bladder: anticholinergic	Oxybutinin, trospium, tolterodine, solifenacin

Table 2.4: Fall Risk Increasing Drugs (FRIDs)

References:

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CHAPTER 3

POST COVID-19 RESPIRATORY MANAGEMENT PROTOCOL

1.0 Introduction

1.1 COVID-19 has spread rapidly over several months, affecting patients across all age groups and geographic areas. The disease has a diverse course; patients may range from asymptomatic to those with respiratory failure, complicated by acute respiratory distress syndrome (ARDS). The alarming severe outcome in these groups of patients is partly caused by a “cytokine storm”, which calls for means to mitigate the inflammation. One possible complication of pulmonary involvement in COVID-19 is pulmonary fibrosis, which leads to chronic breathing difficulties, long-term disability and affects patients' quality of life. There are no specific mechanisms that lead to this phenomenon in COVID-19 [1,2,3], but some information arises from previous severe acute respiratory syndrome (SARS) or Middle East respiratory syndrome (MERS) epidemics [4,5].

1.2 In retrospect from the pulmonary fibrosis learnings observed in SARS and MERS epidemics, patients first develop atypical pneumonia, followed by acute lung injury (ALI) and acute respiratory distress syndrome (ARDS), which evolves into fibrosis. Fibrosis occurs more often amongst the older population and patients with a severe course of the disease[6]. Fibrosis is correlated with disease duration; however, it may resolve spontaneously[7]. This observation however is not robustly studied for COVID-19 and it remains unclear why certain individuals are able to recover from such an insult, whereas others develop accumulation of fibroblasts and myofibroblasts and excessive

deposition of collagen resulting in progressive pulmonary fibrosis[8]. With the pattern of thoracic imaging abnormalities and growing clinical experience in COVID-19 studies, it is envisaged that interstitial lung disease, organizing pneumonia and pulmonary vascular disease are likely to be the most important respiratory complications.

2.0 Scope & Objective

The scope of respiratory assessment is to look for the following conditions:

a. Persistent lung fibrosis or Post COVID-19 organising pneumonia
b. Pulmonary embolism
c. Undiagnosed respiratory illness
d. Post viral hyper reactive airway / cough
e. De-conditioning / dysfunctional breathing
f. Follow up for underlying pre-existing respiratory condition that may be obscured by COVID-19 infection
g. Post intubation complication

3.0 Symptoms

The COVID-19 infection is a heterogeneous disease with majority experiencing asymptomatic, mild illness with spontaneous recoveries but there are groups who require hospitalization for pneumonia and medical support.

4.0 Assessment (Clinical assessment & Investigation)

Follow up patient post discharge should be done at the nearest healthcare facilities/clinic and easy access based on patients' localities (**Table 3.1**). For patients with prior regular follow-up, they may be followed up by their regular primary physician clinic post-discharge.

Category 1-3	**Self-report to nearest clinic/healthcare facilities if symptomatic**
Category 4&5	**Post COVID-19 Clinic by multidisciplinary team:** • **General Physician** • **Respiratory Physician** • **Rehabilitation physician** • **Physiotherapist**

Table 3.1: Post COVID-19 follow-up

A full clinical assessment includes exploring for both respiratory and non-respiratory symptoms as in Table **3.2**, **3.3** and **3.4**.

Questions	Yes/No
Do you still have symptoms? ● Symptoms ● Full recovery	
Are you more breathless than before? ● More than you expected ● Back to before COVID illness	
Any fatigue feeling? ● More than you expected ● Back to before COVID illness	
Any cough? How is your physical strength? ● Weak ● Back to before COVID illness	
Do you have myalgia?	
Do you have anosmia?	
Have you lost your sense of taste?	
Is your sleep disturbed?	
Any nightmares or flashbacks?	
Do you feel low mood/lack of motivation?	
Do you feel more anxious than before?	
Have you lost weight since COVID illness?	
Any other symptoms – please list	

Table 3.2: Modified Medical Research Council (mMRC) Scale for Dyspnoea and Post COVID-19 Functional Status (PCFS) Scale.

Questions	Yes/No
Diagnostic tests	Pulse oximeter (Category 3-5) CXR (Category 3-5) CT scan (Category 4-5) Blood test (Category 4-5) ● ABG (discharged with oxygen concentrator) ● D-Dimer (if suspected new onset PE)

Questions	Yes/No
	• RF and ANA (for persistent lung fibrosis on radiology series) Lung function test (Category 4-5) • Spirometry (with single use filter) • Static lung volume if persistent fibrosis • Diffusion capacity if indicated Walking test • 6-minute walking test and oxygen level monitoring or the 1-minute sit-to-stand test Consider additional test: Sputum culture if suspect infection ECG and ECHO

Table 3.3: Post COVID respiratory assessment should include the following Investigations

Assessment of continuation oxygen support	Refer management
Requirement for pulmonary rehabilitation	Refer accordingly
Continuation treatment for provoked VTE during COVID-19 illness	
Palliative care management where required	
Psychosocial assessment	
Consideration of specific post-intensive care unit complications such as sarcopaenia, cognitive impairment and post-traumatic stress disorder.	

Table 3.4: Other assessment

CXR = Chest X-Ray
CT = Computed Tomography
HRCT = High resolution Computed Tomography
CTPA = Computed Tomography Pulmonary Angiography
ABG = Arterial blood gas
PE = Pulmonary embolism
VTE = venous thromboembolic

Human resources need for patients' follow-up and care

Type	Examples
Primary care clinic / Private general clinic	Medical officer Primary care physician Medical Assistant/Staff Nurse (clinic, spirometry)
Hospital	Medical Officer Internal Medicine Specialist Respiratory Physician Rehabilitation physician Physiotherapist Occupational therapist Medical Assistant/Staff Nurse (clinic, spirometry)

5.0 Management

5.1 Algorithm management Post COVID-19 respiratory follow up discharge requirement from hospital:

5.2 Referral letter (details of ward admission to include category of COVID-19 infection, oxygen requirement, treatment received, result of blood test and status of patient upon discharge). Hard/soft copy radiology images (chest radiograph and computed tomography scan)

5.3 For patients with prior regular follow-up, they may be followed up by their regular primary physician clinic post-discharge.

5.4 Physician to decide to adjust the tapering dose of steroid according to the latest symptom and radiological. For patient with COVID category 3 who upon discharge has persistent symptoms or persistent CXR changes, they are to be given clinic appointment according to algorithm as in **Figure 3.1**.

5.5 For patient with COVID category 4 or 5 to be followed up at the clinic according to algorithm as in **Figure 3.2**.

ALGORITHM POST COVID-19 STAGE 3

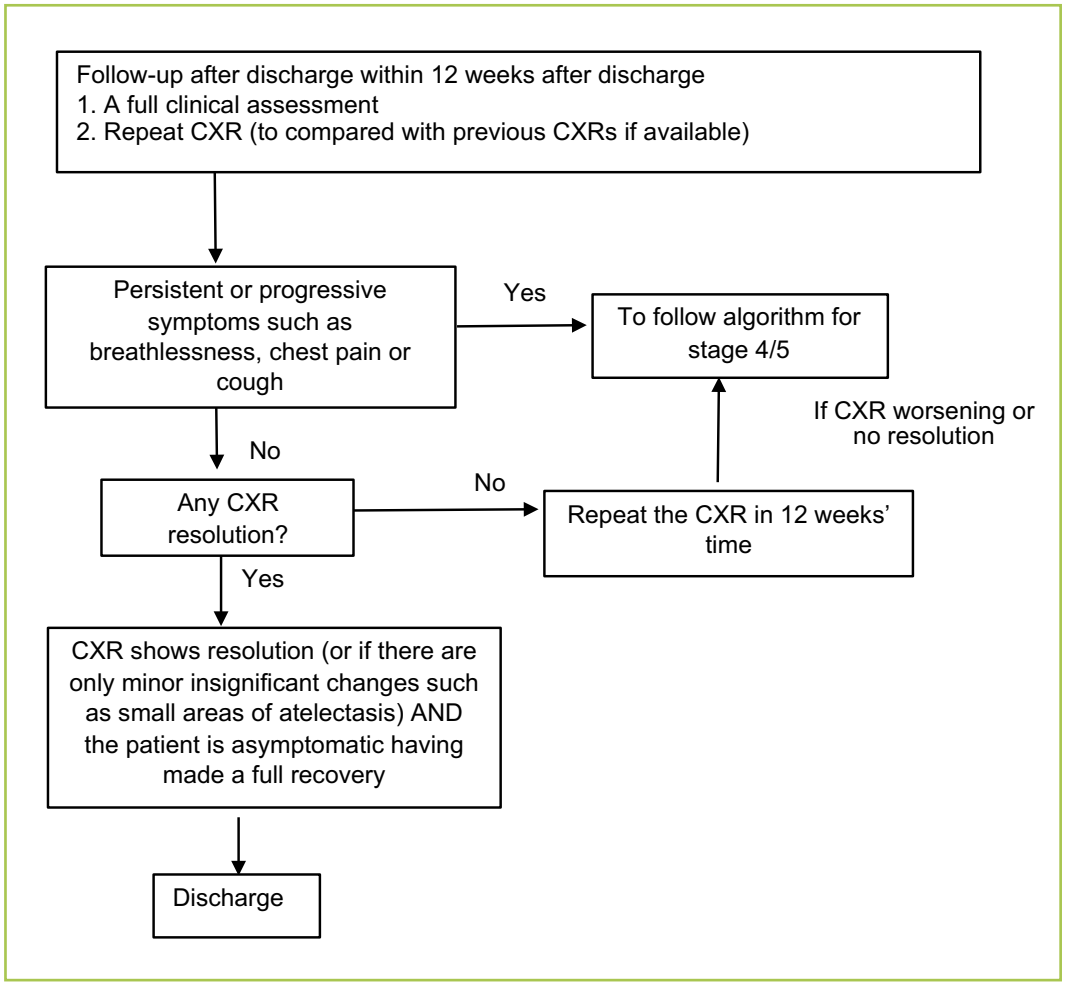


Figure 3.1: Algorithm Post COVID-19 Stage 3

ALGORITHM POST COVID-19 PATIENT WITH SEVERE DISEASE (STAGE 4&5) (INCLUDING PATIENT DISCHARGED WITH PREDNISOLONE COURSE)

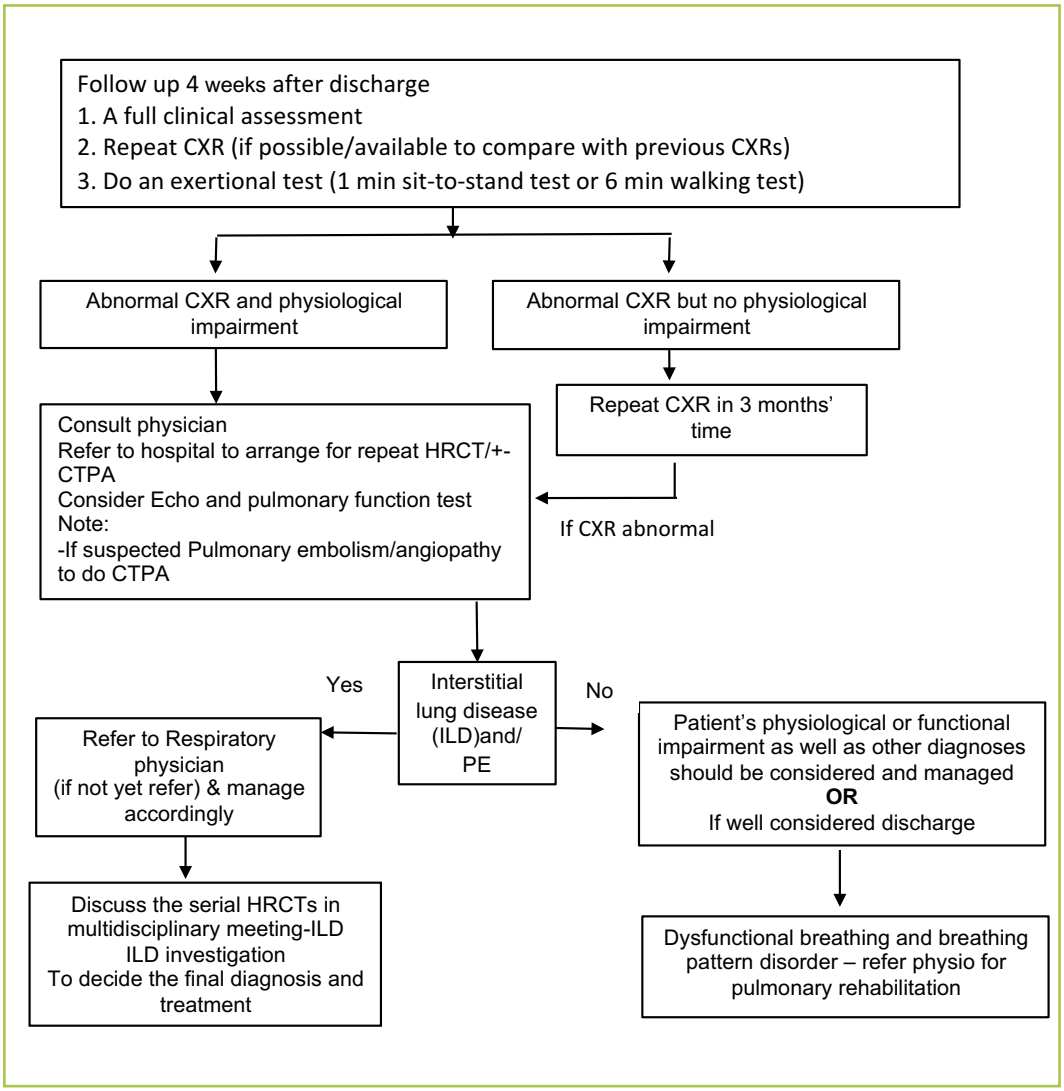


Figure 3.2: Algorithm Post COVID-19 Patient with Severe Disease (Stage 4&5) (including patient discharged with prednisolone course)

5.6 Respiratory test follows up

Spirometry +/- DLco (if test available)	Baseline (if available) for comparison During first appointment 6th month post COVID 12th month post COVID
6-minute walk test or 1 minute sit-to-stand test	Baseline (if available) for comparison During first appointment 6th month post COVID 12th month post COVID

5.7 Long term oxygen therapy (LTOT)

LTOT may improve outcome measures other than mortality, including quality of life, cardiovascular morbidity, depression, cognitive function, exercise capacity, and frequency of hospitalization.[8-12] The LTOT should be prescribed only when there is evidence of persistent hypoxemia in a clinically stable patient who is receiving otherwise optimal medical management (**Table 3.5**)

General Indication
PaO_2 ≤55 mmHg (7.32 kPa) or SaO_2 ≤88 percent
In the presence of cor-pulmonale
PaO_2 ≤59 mmHg (7.85 kPa) or SaO_2 ≤89 percent ECG evidence of P pulmonale Haematocrit >55 percent Clinical evidence of right heart failure
Specific situation
PaO_2 ≥60 mmHg (7.98 kPa) or SaO_2 ≥90 percent with lung disease and other clinical needs such as sleep apnoea with nocturnal desaturation not corrected by CPAP. If the patient meets criteria at rest, O_2 should also be prescribed during sleep and exercise, and appropriately titrated. If the patient is normoxemic at rest but desaturates during exercise (PaO_2 ≤55 mmHg [7.32 kPa]), O_2 is generally prescribed for use during exercise. For patients who desaturate (PaO_2 ≤55 mmHg [7.32 kPa]) during sleep, further evaluation with polysomnography may be indicated to assess for sleep-disordered breathing.

Table 3.5: Indication to continue or to initiate LTOT

5.6 Medical treatment

a. Inhaled medication:
   i. For hyper reactive airway triggered by COVID-19
   ii. Newly diagnosed COPD
   iii. Newly diagnosed bronchial asthma

b. Oral medication:
   i. Refer Post COVID-19 organising pneumonia recommendation
   ii. Adjustment on prednisolone tapering dose
   iii. Anti-fibrotic medication for progressive fibrosing lung disease

5.7 Pulmonary rehabilitation

For indicated patient (refer rehabilitation recommendation)

6.0 Patient outcome & assessment tool

6.1 Patient outcome:

a. Recover to baseline
b. Persistent lung fibrosis
c. Requiring long term oxygen therapy
d. Requiring anti fibrotic treatment for progressive fibrosing lung fibrosis (long term follow up)
e. Death

6.2 Assessment tool:

Patient self-report method for the Post COVID-19 functional status scale14

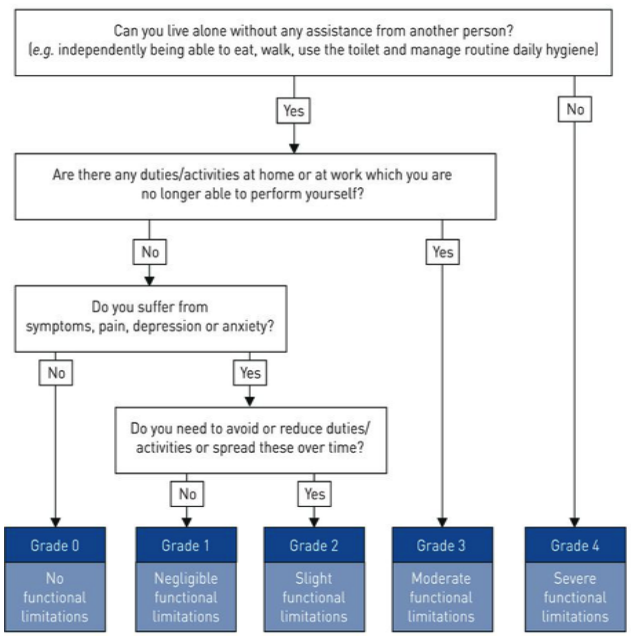
a. Flow chart
b. Patient questionnaire

Table 3.6: Modified medical research council scale for dyspnoea

Grade of dyspnoea	Symptoms
0	Not troubled by breathlessness except on strenuous exercise
1	Short of breath when hurrying or walking up a slight hill
2	Walks slower than contemporaries on the level because of breathlessness or has to stop for breath when walking at own pace
3	Stops for breath after walking 100m or after a few minutes on the level
4	Too breathless to leave the house or breathless when dressing or undressing

POST COVID-19 FUNCTIONAL STATUS SCALE

a)



b)

How much are you currently affected in your everyday life by COVID-19? (Please indicate which one of the following statements applies to you most)	Corresponding PCFS scale grade
I have no limitations in my everyday life and no symptoms, pain, depression or anxiety related to the infection.	0
I have negligible limitations in my everyday life as I can perform all usual duties/ activities, although I still have persistent symptoms, pain, depression or anxiety.	1
I suffer from limitations in my everyday life as I occasionally need to avoid or reduce usual duties/activities or need to spread these over time due to symptoms, pain, depression or anxiety. I am, however, able to perform all activities without any assistance.	2
I suffer from limitations in my everyday life as I am not able to perform all usual duties/ activities due to symptoms, pain, depression or anxiety. I am, however, able to take care of myself without any assistance.	3
I suffer from severe limitations in my everyday life: I am not able to take care of myself and therefore I am dependent on nursing care and/or assistance from another person due to symptoms, pain, depression or anxiety.	4

Figure 3.3: Post COVID-19 Functional Status Scale

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CHAPTER 4

ORGANIZING PNEUMONIA IN COVID-19

1.0 Introduction

1.1 Organizing Pneumonia (OP) is increasingly described as a potential consequence or evolution of COVID-19 pneumonia in moderate to severe COVID-19 patients. Organizing pneumonia is a corticosteroid-responsive inflammatory lung disease[1] and has been reported to appear as the viral load of Coronavirus-19 decreases.[2]

1.2 Organizing pneumonia in COVID-19 is regarded as secondary OP which may occur from direct lung injury from the COVID-19 virus itself or due to the hyperinflammatory state as postulated by the cytokine release syndrome (CRS) hypothesis. The figure below shows the evolution of COVID-19 pneumonia with OP as a potential sequalae.[3] (See **Figure 4.1**)

1.3 Organizing pneumonia histological findings such as intraluminal loose connective tissue within the alveolar ducts and bronchioles associated with the fibrinous acute injury have also been reported in post-mortem biopsy of late COVID-19 death (around 20 days after symptoms).[4]

1.4 Although the gold standard in OP diagnosis requires histological confirmation, typical radiological findings is sufficient to make a confident diagnosis of OP in COVID-19 as lung biopsy is invasive and should be avoided. [5] A good inter-observer concordance has also been described between imaging and histopathological findings for OP in COVID-19 patients.[6]

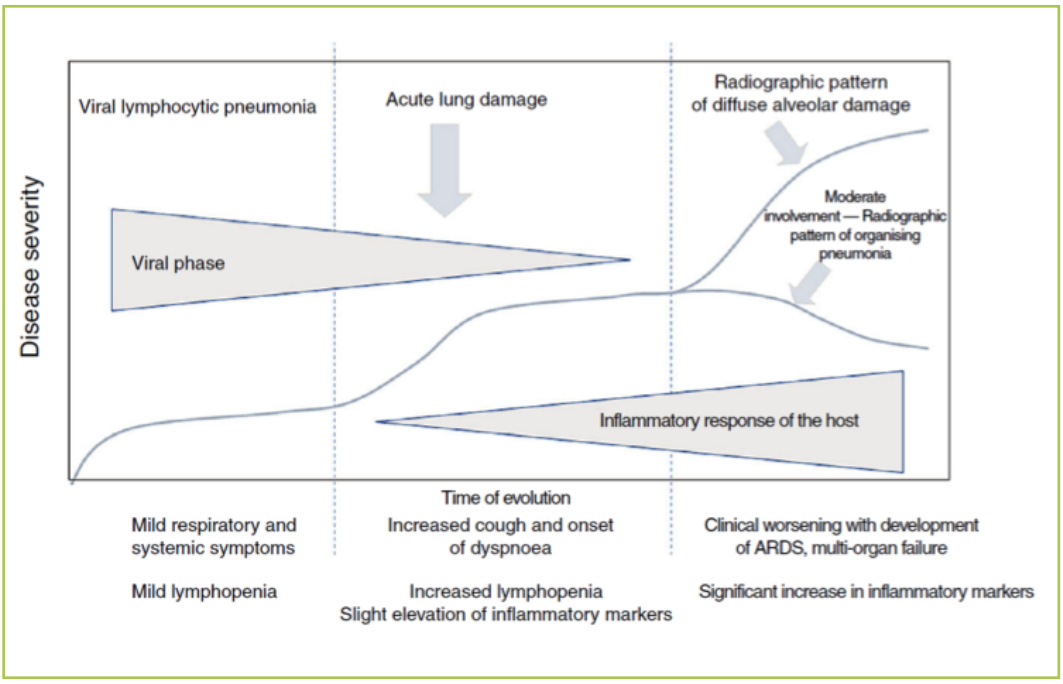


Figure 4.1: Clinical course of COVID-19

Source: Parra Gordo ML, Weiland GB, García MG et al. Radiologic aspects of COVID-19 pneumonia: outcomes and thoracic complications. Radiologia; 2021

1.5 Common radiological features on chest computer topography (CT) are arched consolidation bands (arcade-like) with shaded margins distributed around the structures of surrounding secondary pulmonary lobules followed by ground glass opacities (GGOs) with irregular lines changes predominantly in bilateral and multifocal distributions.[5] In a case series of 106 patients, 74.5% of OP cases were non-severe and 97.1% cases had good prognosis with recovery.[7]

2.0 Scope

2.1 The scope of the guideline is:

a. Patients who are still admitted in hospital with confirmed COVID-19 reverse transcription polymerase chain reaction (RT-PCR) and
b. suspected or confirmed organizing pneumonia diagnosis.

2.2 The general COVID-19 and Post COVID-19 respiratory guideline should be followed in the management of patients who are not admitted and have mild COVID-19 symptoms or patients who are discharged Post COVID-19.

3.0 Signs and Symptoms

3.1 Symptoms of OP may vary from mild cough and dyspnoea to severe acute respiratory distress. A high index of suspicion is needed in mild

symptoms. For patients who are not responding to COVID-19 treatment, OP should be suspected after ruling out other differential diagnosis.

3.2 A British cohort of 837 patients followed up found that 39% of patients were symptomatic at four weeks and 4.8% of these patients had organizing pneumonia assessed by CT scan.[8]

3.3 Clinical assessment of suspected COVID-19 OP patients should be specialist driven. Physical findings are non-specific and may not be distinguished from other acute respiratory illness. In severe cases, patients may have respiratory distress with varying degrees of hypoxia. Patient with COVID-19 OP typically manifests a subacute disease behaviour without apparent lung fibrosis.[2]

3.4 COVID-19 OP should be suspected in patients with:

a. Persistent or new onset of symptoms
   i. Dyspnea (including exertional dyspnea)
   ii. Cough
   iii. Pleuritic chest pain

b. Persistent hypoxia or increasing requirement of supplemental oxygen

c. Worsening or persistent chest radiographic abnormality

3.5 Differential diagnosis:

a. Secondary bacterial or fungal pneumonia

b. Pulmonary embolism

c. Pulmonary oedema / cardiomyopathy / myocarditis

d. Pneumothorax

e. Acute coronary syndrome

4.0 Investigation

4.1 Laboratory

There are no specific laboratory investigations to diagnose OP in COVID-19. Investigations such as electrocardiogram, C-reactive protein, blood cultures, echocardiogram and CT pulmonary angiogram (CTPA) should be done to rule out the differential diagnosis.

4.2 Imaging

Chest radiograph should not be used to diagnose COVID-19 OP. High resolution chest CT (HRCT) thorax is recommended as the imaging modality of choice in patients suspected with COVID-19 OP. (See **Figure 4.2** and **4.3**)

High resolution chest CT should be requested in patients who remains symptomatic and show signs of deterioration despite initial therapy (see Algorithm) as overlapping radiological features between covid pneumonia and OP have been reported. This is also in accordance to WHO guideline.[9]

The most common and dominant findings of OP is the presence of GGOs with or without consolidation in a sub-pleural distribution.[7] Other HRCT findings can include:[3]

a. Ground-glass opacities and mixed ground-glass and consolidation opacities
b. Peri lobular distribution pattern
c. Linear subpleural opacities
d. Reticular pattern
e. Inverted halo or atoll sign

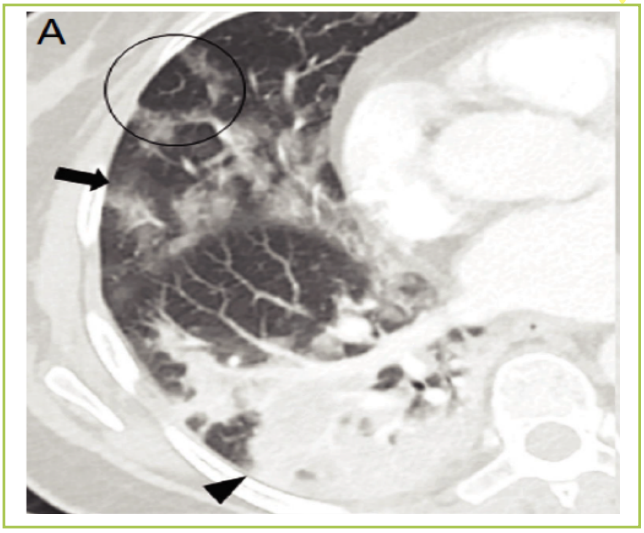
Due to the variability of OP findings in imaging, the diagnosis should be made by an experienced radiologist.

5.0 Diagnosis

The diagnosis of OP should follow a multidisciplinary discussion involving the treating physician, the radiologist and the respiratory physician.

Figure 4.2: HRCT showing patchy areas of subpleural consolidation showing peri lobular distributions (arrow) with associated reticular opacities (arrowhead)

Source: Parra Gordo ML, Weiland GB, García MG et al. Radiologic aspects of COVID-19 pneumonia: outcomes and thoracic complications. Radiologia; 2021



Source: Parra Gordo ML, Weiland GB, García MG et al. Radiologic aspects of COVID-19 pneumonia: outcomes and thoracic complications. Radiologia. 2021

Figure 4.3: CTPA image showing mixed ground glass (arrow) and consolidation (arrow tip) opacities with linear margins and peri lobular opacities (circle)

6.0 Treatment & Management

6.1 Aim of treatment

Organizing Pneumonia cases of COVID-19, fortunately have a favourable prognosis. The main aim of treatment is to prevent functional disabilities and irreversible lung fibrosis.

a. Corticosteroids

i. Corticosteroids are currently the mainstay of treatment for most patients. A significant minority of patients may have mild disease and may not show progression. This group of patients may not benefit from corticosteroid therapy and surveillance should suffice to study disease behaviour. In these patients, the imaging findings may represent ongoing recovery.

ii. Evidence regarding the treatment of OP in COVID-19 is mainly from case reports and expert opinions.[10,11,12,13,14,15] The decision on the dosage and duration of corticosteroids should preferably follow a multidisciplinary consensus including input from a respiratory physician.

iii. Prior to initiation of high dose corticosteroids, patients should be assessed for any significant infection including tuberculosis. While on treatment with corticosteroids, patients should be assessed and monitored for complications such as secondary bacterial and fungal infections, hyperglycemia and gastrointestinal bleed.

iv. In non-critically ill patients, prednisolone (0.5-1mg/kg/day, maximum 60mg per day) should be initiated.

v. Lower doses of prednisolone may be considered in patients with:
   - high risk of complications (e.g., elderly, immunosuppressed group, poorly controlled diabetics, multiple comorbidities)
   - less extensive CT changes
   - extensive CT changes but with high risk of complications

vi. Duration of treatment varies between one to three months. Prednisolone may be titrated down by 5 mg every five days until first clinic follow-up visit.

vii. Dosage of intravenous Methylprednisolone and oral prednisolone in critically ill patients should be individualised.

6.2 Other treatment strategies

Pulmonary rehabilitation is part of non-pharmacological, inpatient management of COVID-19 OP. This should be continued upon hospital discharge.

7.0 Follow up

7.1 Patients are recommended to be followed up at a specialist clinic in 4–6 weeks after discharge. The follow up review should include:

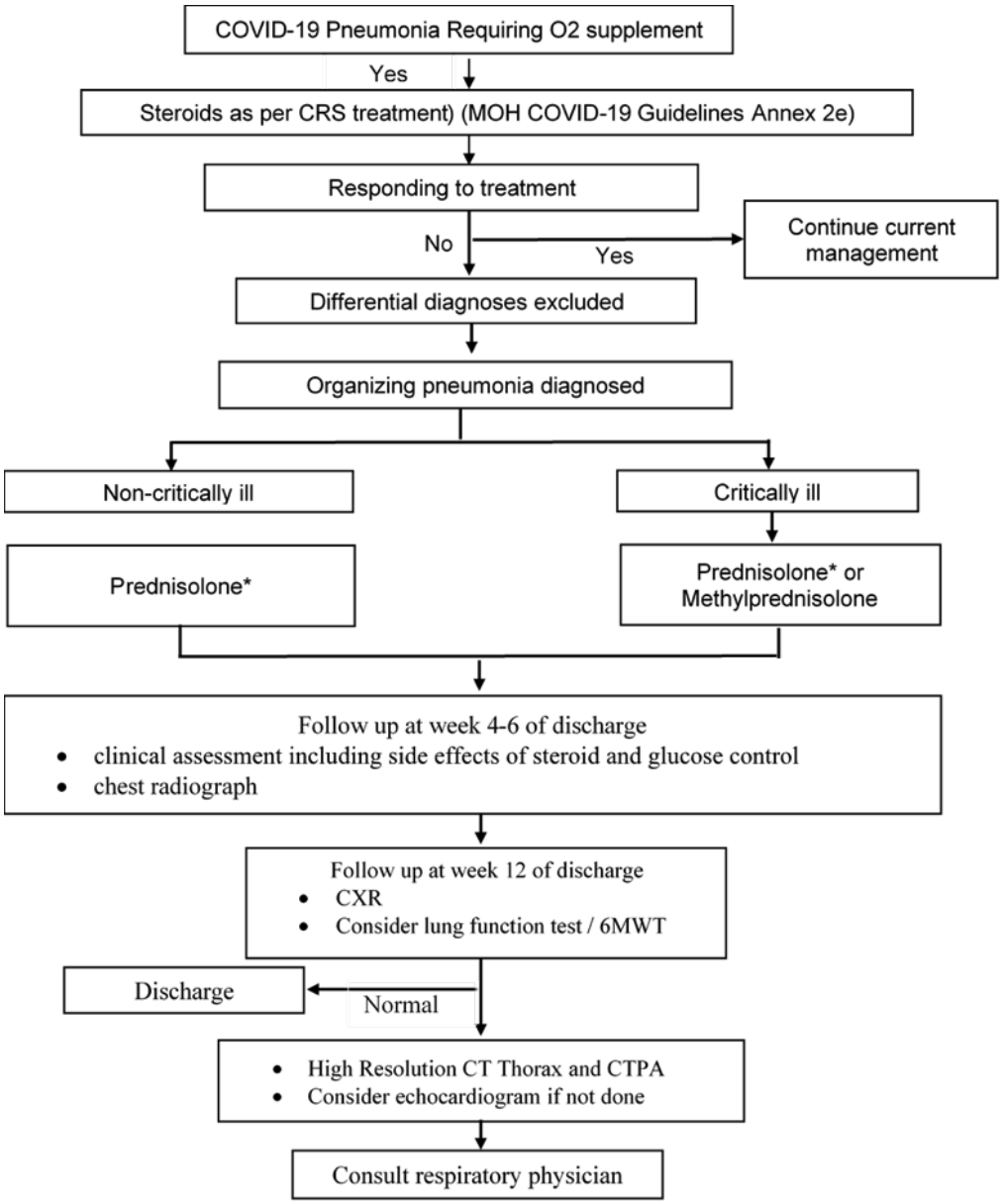
a. assessment of side effects of corticosteroid uses and
b. chest radiograph

7.2 Subsequent follow up should be at 12 weeks after discharge. Assessment should include:

a. chest radiograph
b. pulmonary function test and 6-Minute Walking Test (6MWT) may be considered

7.3 Patients who develop side effects of corticosteroid therapy and those with persistent or worsening symptoms should be followed up earlier. A HRCT with or without CTPA and an echocardiogram is warranted in patients with persistent chest radiograph changes, abnormal pulmonary function tests or 6MWT desaturation. A respiratory physician should then be consulted regarding further management.

POST COVID-19 FUNCTIONAL STATUS SCALE



*Prednisolone

- decision to start steroids should be done following a multi-disciplinary consensus
- dose 0.5-1mg/kg/day (maximum 60mg per day)
- titrate by 5mg every 5days until first follow up review
- steroids should be commenced after ruling out significant infection including tuberculosis

Figure 4.4: Algorithm on Management of Organizing Pneumonia in COVID-19

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CHAPTER 5

POST COVID-19 MANAGEMENT PROTOCOL FOR IMMUNOCOMPROMISED PATIENT ON IMMUNOSUPPRESANT / CHEMOTHERAPY

1.0 Introduction

1.1 This is a general recommendation for management of patients on immunosuppressants during and after COVID-19 infection. High-quality evidence regarding the effects of stopping or maintaining medications for systemic rheumatic diseases in the setting of COVID-19 exposure is lacking. In the absence of established treatment of COVID-19 infection most professional society have issued recommendation to reduce or withheld immunosuppressant to a level that are considered safe and aim at balancing the risk of infection against disease control.

1.2 Cellular immunity is key in determining the course and outcome of COVID-19 infection. However, cellular immunity is compromised in patient taking immunosuppressants. Generally, there are four groups of patients who are taking long-term immunosuppressant:

a. Patients with autoimmune diseases, moderate to severe chronic dermatological conditions (psoriasis, eczema, autoimmune blistering diseases, chronic spontaneous urticarial etc.)

b. Solid organ transplant recipients

c. Hematopoietic stem cell transplant recipients

d. Solid organ tumours and haematological malignancy patients receiving chemotherapy.

1.3 Lymphopenia has been shown to be negatively associated with COVID-19 severity. Patient who are critically ill COVID-19 patients has been shown to have high level of cytokines especially IL-6 and this suggest that hyper inflammation may contribute to morbidity and mortality.

1.4 Immunosuppressive agent used in the management of the above patients typically causes lymphopenia and impairs lymphocyte functions.

2.0 Autoimmune Diseases

In patients with auto-immune diseases, there are 3 clinical situations:

a. Patients who newly diagnosed or relapsing disease.
In this group of patients, Initiation of immunosuppressants should be considered is there is life threatening disease (e.g., rapidly progressive glomerulonephritis, life threatening lupus flare, active autoimmune blistering diseases).

b. Patients on the maintenance phase of immunosuppressant diseases.
In this group of patients, an individualized risk-benefit evaluation is necessary to assess the risk of immunosuppressants versus risk of disease relapse.

c. Patients in remission on tapering dose of immunosuppressant.
In this group of patients, continued tapering of immunosuppressants may be considered. However, treatment decision should be made on a case-to case basis. Discussion with primary care team is important

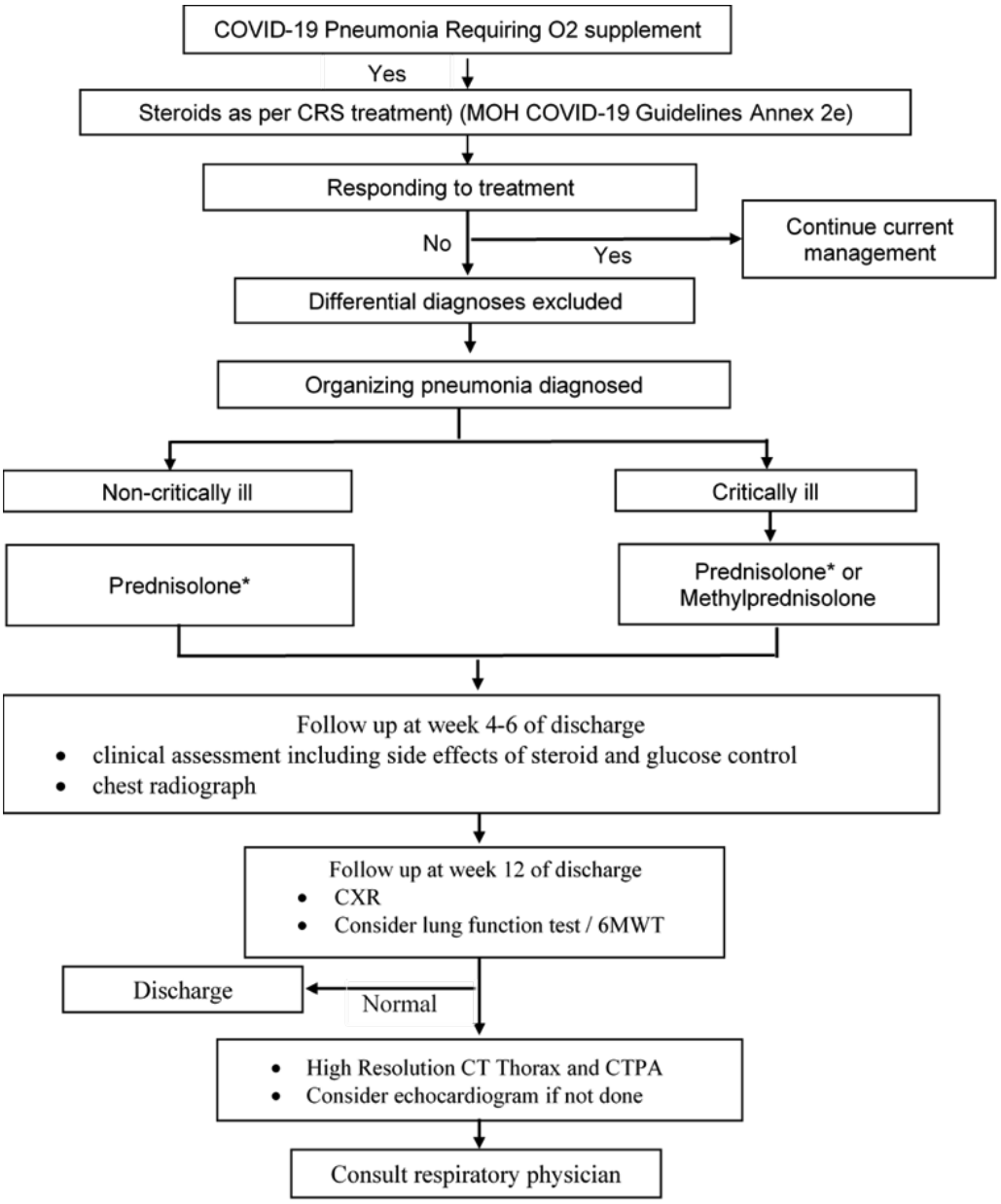
CATEGORY	DRUGS	COMMENTS
1. Corticosteroids		
		Uncomplicated COVID-19 patients on long term steroids for the underlying disease should be continued on the steroid maintenance dose prior to admission. Patients requiring high dose steroids due to COVID-19 related complications or underlying disease flare should be tapered accordingly by respective physician.

2. Solid organ transplant		
Calcineurin inhibitors	Cyclosporine Tacrolimus	Please consult with transplant physician regarding immunosuppressant during and after COVID-19 infection. Please be noted on the drug-drug interaction with transplant medication prior to starting new medications to avoid transplant rejection.
Anti-proliferative	Cyclosporine Tacrolimus	Please consult with transplant physician regarding immunosuppressant during and after COVID-19 infection.
Mammalian target of Rapamicin inhibitors (mTORi)	Everolimus Sirolimus	Please consult with transplant physician regarding immunosuppressant during and after COVID-9 infection. Please be noted on the drug-drug interaction with transplant medication prior to starting new medications to avoid transplant rejection.
3. Haematopoetic stem cell transplant		
		Most immunosuppressants in transplanted patients should be continued. Please consult with transplant physician regarding immunosuppressants during and after COVID-19 infection.
4. Autoimmune and Inflammatory Rheumatic and Dermatological Diseases		
Immunosup-pressants	Cyclophosphamide Mycophenolate Mofetil Azathioprine Tacrolimus Cyclosporin	Regardless of COVID-19 severity all the immunosuppressants, biologics, DMARDS and JAK Inhibitors should be stopped during active COVID-19 infection. However, HCQ and SSZ maybe continued in stable patients. IL-6 may be continued in selected cases of COVID-19 associated with heightened immune response. Reinitiating treatment: 1. Positive PCR but asymptomatic • Can be started 10-17 days after PCR test was reported. 2. Uncomplicated COVID-19 (mild or no pneumonia and treated in Ambulatory Care or self-quarantine): • Restart within 7-14 days of symptom resolution 3. Severe COVID-19: • Reinitiating's treatment should be made by the treating physician.
Biologics	e.g., Anti-TNFα, IL-6, IL-17 inhibitors, IL-12/23 inhibitor, IL-23 inhibitor, Rituximab, Omalizumab	
JAK Inhibitors	Tofacitinib, Baricitinib	
DMARDS	Hydroxychloroquine Sulphasalazine Leflunomide	

	Methotrexate	*Reference: ACR guidelines, NICE guidelines, Up To Date*
Anti-inflammatory	Dapsone	
Vitamin A derivatives	Isotretinoin, acitretin	
5. Oncology		
Haematological malignancy	Chemotherapy	Acute haematological malignancy chemotherapy should be withheld. However, in life threatening situation, less intensive chemotherapy can be given. In general, chronic haematological malignancy patients may continue with the chemotherapy.
Solid organ tumours	Chemotherapy	All chemotherapy is withheld during acute phase of infection. Re-initiate therapy at least 24 hours after fever resolution without anti-pyretic, and there is improvement of symptoms (cough, dyspnoea). For asymptomatic patients who are not immunocompromised, chemotherapy can be considered at least 10 days after initial positive test, and 20 days if immunocompromised.

Table 5.1: Immunosuppressants in Transplant, Autoimmune and Inflammatory Conditions, and Oncology in Post COVID-19 Management

MANAGEMENT FLOW CHART FOR POST COVID-19 PATIENTS ON IMMUNOSUPPRESSANT POST DISCHARGE FROM HOSPITAL/INSTITUTIONS



* Prednisolone

- decision to start steroids should be done following a multi-disciplinary consensus
- dose 0.5-1mg/kg/day (maximum 60mg per day)
- titrate by 5mg every 5days until first follow up review
- steroids should be commenced after ruling out significant infection including tuberculosis

Figure 5.1: Management Flow Chart for Post COVID-19 Patients on Immunosuppressant Post Discharge from Hospital/ Institutions

3.0 Solid Organ Transplant

Solid organ transplant recipient requires lifelong maintenance immunosuppressant. Therapeutic drug monitoring is the standard of care to balance prevention of allograft rejection and increased risk of infection. However, there is no data on the degree of immunosuppressant reduction that is effective to contain COVID-19 infection. Special precautions have to be considered in drug interactions especially with calcineurin inhibitors and mTOR inhibitors in post-transplant recipients.

4.0 Haematology

4.1 Patients with haematological malignancies do not have higher incidence of COVID-19 than non-cancer patients. However, patients with haematological malignancies tend to have more significant COVID-19 complications than non-cancer patients or patients with solid tumours. Mortalityrate reached 62% that is 2-3-fold higher than general non haematology patients and 2 times higher than solid organ tumour.

4.2 Haematological malignancy patients have prolonged persistence of viral RNA up to a median of 32.7 days.

4.3 Worse outcomes have been reported in acute leukaemias and lymphoid malignancies like lymphoma, multiple myeloma and chronic lymphocytic leukaemia.

4.4 Risk factors for severe COVID-19 in haematological malignancies patients are similar to normal healthy adults e.g., Hypertension, Diabetes Mellitus, Obesity and old age. In addition, haematological malignancies patients with acute leukaemias, lymphoid malignancies (lymphoma, multiple myeloma and chronic lymphocytic leukaemia), lymphopenia (<0.5 x 109/l), uncontrolled haematological malignancy, ECOG score of 3/4 and neutropenia (< 0.5 x 109/l) have higher risk to developed severe COVID-19.

4.5 All haematological malignant with confirm COVID-19 must repeat RT-PCR for COVID-19 x 2, 24 hours apart, < 72 hours prior to starting chemotherapy.

4.6 The decision for starting chemotherapy in these patients will be based on the risk level of disease progression, RT-PCR COVID-19 results and clinical judgement of individual patient.

Type of Malignancy	Recommendations
Aggressive Non-Hodgkin Lymphoma (NHL)	**Front line therapy** • Rituximab, Cyclophosphamide, Doxorubicin Hydrochloride, Oncovin, Prednisolone (R-CHOP) as standard of care. SC Rituximab is recommended to reduce time in hospital • R-mini CHOP with Granulocyte Colony Stimulating Factor (G-CSF) support for the elderly • Dose-adjusted Etoposide, Prednisone, Oncovin, Cyclophosphamide, Doxorubicin Hydrochloride, Rituximab (DA-EPOCH-R) for Primary Mediastinal Large B-Cell Lymphoma (PMBCL) and triple/double hit lymphoma (R-CHOP + radiotherapy in some PMBCL cases) • Intrathecal Methotrexate (IT-MTX) instead of High Dose Methotrexate (HD-MTX) for Central Nervous System (CNS) prophylaxis **Relapsed / refractory (R/R) disease** • High Dose Therapy/Autologous Stem Cell Transplant (HDT/ASCT) in eligible patients, Chimeric Antigen Receptor T-Cell Therapy (CAR-T) cells if available • Consider Bendamustine (Treanda) and Rituximab (Rituxan) (BR) or lenalidomide based regime
Indolent NHL and Mantle cell Lymphoma	• In patients with borderline indications, treatment deferral should be considered • Rituximab, cyclophosphamide, Vincristine and Prednisone (R-CVP) or R-CHOP are preferred over bendamustine due to immunosuppressive properties • In view of adverse impact of hypogammaglobulinaemia, treatment with single agent Rituximab is discouraged as with maintenance rituximab • Venetoclax is discouraged due to frequent hospital visits on initiation of treatment • In MCL, consolidation with HDT/ASCT is controversial • Ibrutinib is a preferred option in Waldenstrom Macroglobulinemia (WM) and relapsed MCL
Chronic Lymphocytic Leukemia (CLL)	• Defer therapy if possible during outbreak • Oral therapy preferred over intravenous therapy • Avoid therapy with monoclonal antibodies • In COVID-19 patients with mild symptoms, Beta Cell Receptors Inhibitors (BCRi) may be continued but monoclonal antibodies and/or venetoclax should be withheld
Hodgkin's lymphoma	**Front line therapy** • Early stage: Adriamycin, Bleomycin, Vinblastine and Dacarbazine (ABVD) with radiotherapy, omitting bleomycin after negative interim Positron Emission Tomography-Computed Tomography (PET CT) • Advance stage: ABVD with interim PET CT preferred

Type of Malignancy	Recommendations
	R/R disease • Gemcitabine-based or Bendamustine-based regimens preferred • HDT/ASCT is recommended with maintenance brentuximab vedotin post-treatment • Routine use of G-CSF recommended
Multiple Myeloma (MM)	**Front line therapy** *Transplant-eligible patients* • Preferred induction protocol: Velcade, Revlimid and low dose Dexamethasone (VRd), Velcade, Thalidomide and low dose Dexamethasone (VTd) or Daratumumab, Velcade and Dexamethasone (Dara-VD) • Administered for extended period for up to 6-8 or even 12 cycles • Consider delay ASCT or preserving after first relapse • VRD for 6-12 cycles followed by Lenalidomide is an option. In high risk patients, Bortezomib can be added every 2 weeks • Stopping maintenance therapy is not recommended *Transplant-ineligible patients* • Lenalidomide (Revlimid) and Dexamethasone (Rd) is recommended in unfit patients, addition of bortezomib or daratumumab considered in high-risk patients • Whenever possible, weekly or oral regimen preferred • Weekly bortezomib and carfilzomib might be considered instead of biweekly; monthly daratumumab by omitting bi-monthly phase • Daratumumab may be safely administered in 90 min under close supervision *Smouldering MM* • Monitor without active intervention • Virtual consultation **R/R disease** • Delay treatment for biochemical relapse • Daratumumab every 4 weeks after Very Good Partial Response (VGPR) Patients with MM and symptomatic COVID-19 should interrupt antimyeloma treatment until recovery. Asymptomatic patients should undergo 14 days quarantine. Patients receiving bisphosphonates should be changed to every 3 months.
Acute Lymphocytic Leukemia (ALL)	**Front line therapy** *Philadelphia chromosome negative Acute Lymphoblastic Leukemia (Ph' – ALL)* • Proceed with standard curative induction; reduction of

Type of Malignancy	Recommendations
	daunorubicin (50%) and pegasparginase (1000IU/m2) should be considered in patients with high risk for complications. *Philadelphia chromosome positive Acute Lymphoblastic Leukemia (Ph'+ALL)* • Tyrosine Kinase Inhibitors (TKI) with minimal steroid exposure is preferred over aggressive multi-agent therapy for initial treatment. Dasatinib to be used with caution as it causes pleural effusion. • Individualized decision for transplant in high risk patients • Maintenance therapy: 50% reduction of steroids and omit Vincristine; continue 6-Mercaptopurine (6MP) and Methotrexate (MTX) COVID-19 infection, maintenance should be withheld till symptoms resolved for 14 days. **R/R disease** • Allogeneic Stem Cell Transplant (AlloSCT) despite pandemic in patients achieving Complete Remission 2 (CR2) is recommended
Acute Myeloid Leukemia (AML)	**Front line therapy** • Intensive induction therapy should be offered to all eligible patients • Consolidation/post-remission therapy is recommended for patients in Complete Remission (CR). Decreasing the number of cycles from 4 to 3 and/or lowering cytarabine dose from 3gm/m2 to 1.5gm/m2 should be considered • Individualized decision for AlloSCT; in high-risk patients' procedure should not be delayed **R/R disease** • Standard salvage regimes are recommended • Targeted therapy recommended if available **Acute promyelocytic leukemia (APL)** • Arsenic trioxide and all-trans retinoic acid (ATRA) and ATO cause prolonged neutropenia, ATRA and Idarubicin (Ida) preferred
Chronic Myeloid Leukemia (CML)	• TKI therapy should not be modified. • Dasatinib may cause pleural effusion and during COVID infection, interruption of treatment may be considered • Less frequent Polymerase chain reaction (PCR) monitoring may be considered individually. • Treatment Free Remission (TFR) should be postponed until regular monitoring is possible. Patients started on TFR < 1 year, without access to regular Breakpoint cluster

Type of Malignancy	Recommendations
	region gene. Abelson proto-oncogene (BCR-ABL) monitoring should consider restarting TKI • TKI should be continued in patients with mild symptoms of COVID-19. Decision on TKI in patients with severe COVID-19 should be taken individually, considering drug interaction with antiviral.
Myeloproliferative neoplasm	• Cytoreduction with Hydroxyurea, Alpha interferon (α-IFN) and anagrelide should continue • Janus kinase inhibitors (JAK 2) inhibitors should continue for responding patients and who infected by COVID-19. Not recommended to commence new treatment for new patients. • Optimal aspirin or intermediate dose Low-molecular-weight-heparin (LMWH) to be considered for patients with COVID-19 for Venous thromboembolism (VTE) prophylaxis
Myelodysplastic syndrome (MDS)	*High risk (Revised International Prognostic Scoring System (IPSS-R) score ≥3.5)* • Therapy should be started without delay or dose adjustment *Low risk (IPSS-R score≤3.5)* • Erythropoiesis Stimulating Agents (ESA) and Luspatercept are strongly recommended
Hematopoietic stem-cell transplantation (HSCT)	• Cellular therapy can be safely administered during pandemic • Delay HSCT for candidate with positive COVID-19 for at least 14 days or longer depends on o Severity of COVID-19 o Underlying disease o Status of malignancy o Risk of cancer relapse and progression o Patients' age and co-morbids o Type and intensity of treatment o Adverse effects of treatment regimen o Goals of therapy • Consider reduced intensity conditioning regimen

Table 5.2: Recommendations for treatment of hematological malignancies during COVID-19 pandemic

MANAGEMENT OF MALIGNANT HAEMATOLOGY PATIENTS WITH COVID-19 RECEIVING CHEMOTHERAPY

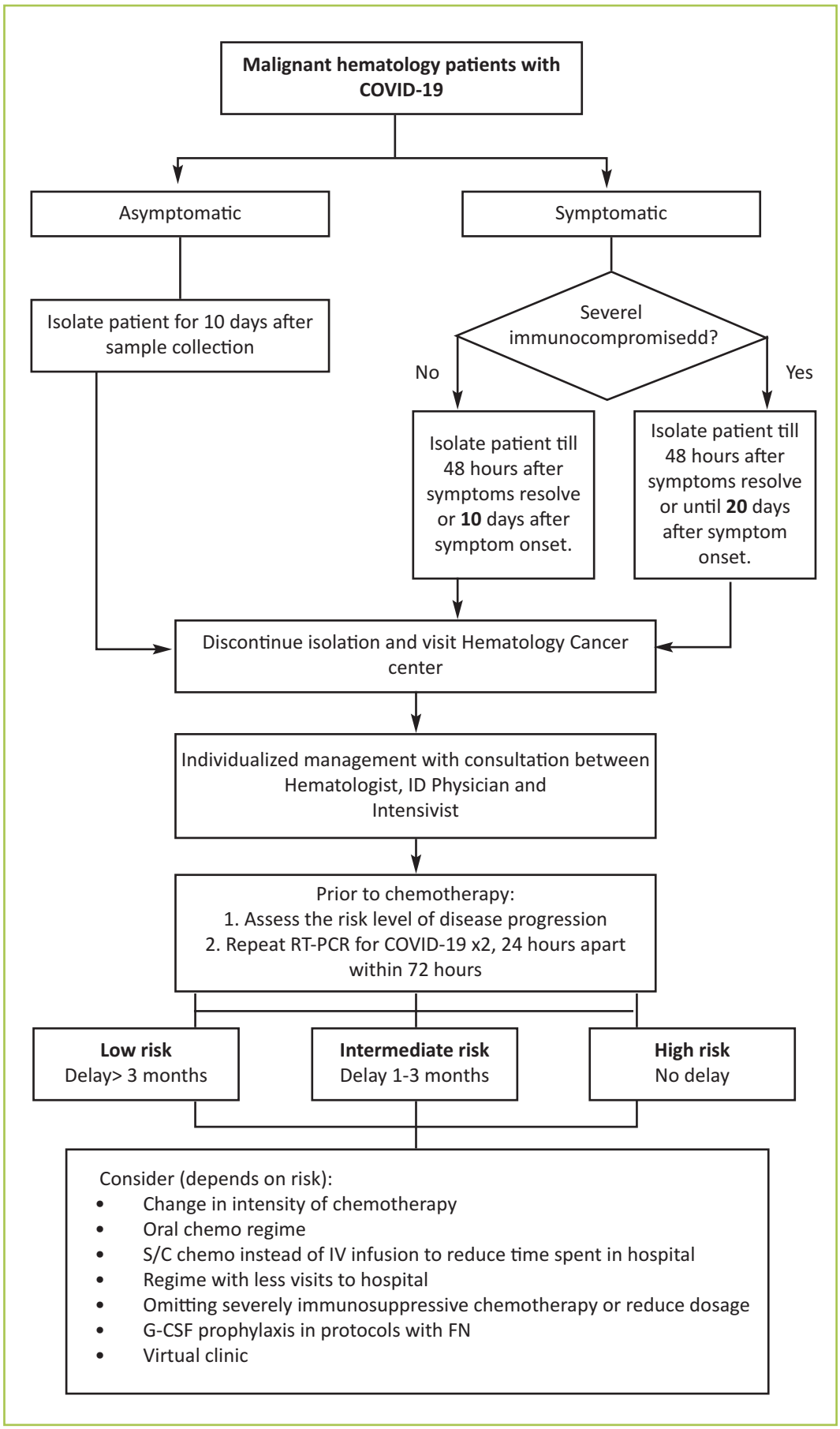


Figure 5.2: Management of Malignant Haematology Patients with COVID-19 Receiving Chemotherapy.

5.0 Oncology

There are a few studies showed increased risk of complications and mortality for cancer patients if they are diagnosed with COVID-19 compared to the general populations. In general, patients on cancer treatment, regardless chemotherapy or radiotherapy, will be withheld from the treatment during the acute phase. The patients will be transferred to medical ward or ICU care, if required. Once they have been treated, they will be referred back to oncology ward for further management.

Immunosuppressive drug	Virus	Number of studies			Summary of results	
		In-vitro	Animal	Human	Viral load and viral replication	Clinical outcome
Corticosteroids	SARS-CoV-2	0	0	18	Cohort studies have different results. 5 cohort studies found that steroid use had no effect on SARS-CoV-2 clearance time. 3 cohort studies report that steroid use associated with longer SARS-CoV-2 clearance time. All studies have a high risk of confounding (by indication).	One RCT found that dexamethasone use was associated with lower 28-day mortality rate, shorter length of hospital stay and lower prevalence of mechanical ventilation. Limitations: open-label. Observational studies have different results: 6 cohort studies found that steroids have a beneficial effect, 2 cohort studies conclude that steroids have a detrimental effect and 1 cohort studies report that steroids have no effect on mortality. The risk of confounding (by indication) is high in all studies. 3 cohort studies report that higher steroid dose is associated with death, but they have a significant risk of confounding by indication.
	SARS-CoV	0	0	18	One RCT found that steroid use had no effect on SARS-CoV clearance time, but the risk of confounding was high. One autopsy study found that steroid use was not associated with viral load in lung tissue, but this study may have been underpowered.	Cohort studies have different results: 2 cohort studies found that steroids have a beneficial effect, 7 cohort studies conclude that steroids have a detrimental effect and 3 cohort studies report that steroids have no effect on mortality. Moreover, the risk of confounding (by indication) is high in all studies. Neither can we draw conclusions on the ideal timing of steroid administration or the ideal steroid dose. Cohort studies report conflicting results and have high risk of confounding (by indication).
	MERS-CoV	0	0	2	One cohort study in ICU patients found that steroid use was associated with longer MERS-CoV clearance time. There is a high risk of confounding (by indication).	One cohort study found that steroid use was associated with higher mortality. The risk of bias could not be assessed because of incomplete baseline characteristics. In 1 cohort study in ICU patients had no clear conclusion, because several statistical methods provided different results.
Calcineurin inhibitors	SARS-CoV-2	0	0	0	*No evidence available*	
	SARS-CoV and MERS-CoV	6	0	0	CsA inhibits the replication of SARS-CoV and MERS-CoV *in-vitro*. TAC inhibits the replication of SARS-CoV *in-vitro*.	*No evidence available*
Mycophenolic acid	SARS-CoV-2	2	0	0	MPA inhibits SARS-CoV-2 replication *in-vitro*.	*No evidence available*
	SARS-CoV	2	0	0	MPA does not inhibit the proteolytic activity of SARS-CoV PL^{pro} or SARS-CoV replication *in-vitro*.	*No evidence available*
	MERS-CoV	5	1	1	MPA inhibits the proteolytic activity of MERS-CoV PL^{pro} or MERS-CoV replication *in-vitro*.	One cohort study found that MMF use was associated with a lower mortality rate, but there is significant risk of confounding by indication.
Thiopurine analogues	SARS-CoV-2	0	0	0	*No evidence available*	
	SARS-CoV	3	0	0	6MP and 6TG inhibit the proteolytic activity of MERS-CoV and SARS-CoV PL^{pro}.	*No evidence available*
	MERS-CoV	0	0	0	*No evidence available*	
mTOR inhibitors	SARS-CoV-2	0	0	0	*No evidence available*	
	SARS-CoV	0	0	0	*No evidence available*	
	MERS-CoV	1	0	0	Sirolimus and everolimus reduce MERS-CoV titers *in-vitro*.	*No evidence available*
Anti-TNF-α agents	SARS-CoV-2	0	0	0	*No evidence available*	

Immunosuppressive drug	Virus	Number of studies			Summary of results	
		In-vitro	Animal	Human	Viral load and viral replication	Clinical outcome
	SARS-CoV	0	1	0	*No evidence available*	In an animal study, administration of anti-TNF-α monoclonal antibody had no effect on the mortality rate, but the onset of symptoms was somewhat delayed.
	MERS-CoV	0	0	0	*No evidence available*	
Anakinra	SARS-CoV-2	0	0	1	*No evidence available*	In one cohort study in patients with COVID-19, ARDS and hyperinflammation, anakinra use was associated with a lower 3-week mortality rate, but a longer duration of mechanical ventilation. The study has a significant risk of confounding.
	SARS-CoV	0	0	0	*No evidence available*	
	MERS-CoV	0	0	0	*No evidence available*	
Tocilizumab and other IL-6 inhibitors	SARS-CoV-2	0	0	9	*No evidence available*	One retrospective cohort study found that treatment with tocilizumab in patients with COVID-19 is associated with a higher mortality rate, but this study has a high risk of confounding. Four observational studies found no effect of tocilizumab or sarilumab in patients with COVID-19. Four other retrospective cohort studies found that mortality and ICU admission rate were lower in patients treated with tocilizumab compared to controls.
	SARS-CoV	0	0	0	*No evidence available*	
	MERS-CoV	0	0	0	*No evidence available*	

6MP, 6-mercaptopurine; 6TG, 6-thioguanine; ARDS, acute respiratory distress syndrome; AZA, azathioprine; CNI, calcineurin inhibitor; COVID-19, coronavirus disease 2019; CsA, cyclosporin A; MERS, Middle East respiratory syndrome; MMF, mycophenolate mofetil; MPA, mycophenolic acid; mTOR, mammalian target of rapamycin; SARS-CoV, severe acute respiratory syndrome coronavirus; TAC, tacrolimus; TNF-α, tumor-necrosis-factor-α.

Table 5.3: Summary of Results

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CHAPTER 6

POST COVID-19 MANAGEMENT PROTOCOL FOR KIDNEY DISEASES

1.0 Introduction

Kidney disease has been recognized to be associated with severe COVID-19. Severe acute kidney injury (AKI) requiring renal replacement therapy (RRT) occurs especially in critically ill patients with acute COVID-19, particularly those with severe infections requiring mechanical ventilation. Follow-up for patients after recovered from acute COVID-19 infection as well as those with Post COVID-19 syndrome is required.

2.0 Scope

2.1 This guide contains information for healthcare workers who are providing care for patients previously tested positive to COVID-19 with underlying kidney disease and renal complication.

2.2 This is a living document and it will be updated from time to time as new evidence becomes available.

3.0 Symptoms

3.1 Nephrology diagnosis in patient with history of acute COVID-19

a. Patients with underlying end stage kidney disease (on kidney transplantation, haemodialysis or peritoneal dialysis).

b. Patients with chronic kidney disease:
   i. With evidence of acute kidney injury base on Kidney Disease Improving Global Outcomes (KDIGO) definition of acute kidney injury
      - Dialysis dependent
      - Not dialysis dependent
   ii. With no evidence of acute kidney injury base on KDIGO definition of acute kidney injury

c. Patients with normal kidney function who developed acute kidney injury base on KDIGO definition of acute kidney injury
   i. Dialysis dependent
   ii. Not dialysis dependent

d. Patients with normal kidney function or chronic kidney disease who become dialysis dependent after acute COVID-19

e. Patients with proteinuria and/or hematuria

3.2 Symptoms:

a. Non-renal related symptoms that suggestive of ongoing symptomatic COVID-19 or Post COVID-19 syndrome: refer to **Chapter 1**, **Figure 1.1**: Possible common symptoms after acute COVID-19 (but are not limited to).

b. Mental health, refer to **Chapter 1**, **Figure 1.1**: Possible common symptoms after acute COVID-19 (but are not limited to).

c. Renal related:
   i. Raised serum creatinine
   ii. Asymptomatic hematuria/proteinuria
   iii. Uremic symptoms
   iv. Symptoms of nephrosis
   v. Hypertension

4.0 Assessment (clinical assessments & investigation)

4.1 All COVID-19 patients with renal disease or renal complications will be given appointment to nephrology clinic upon discharge. See **Figure 6.1**, **6.2** and **6.3** for referral and Discharge Check list.

4.2 Post COVID-19 patients with no known renal complications during acute COVID-19 should have baseline renal profile and urinalysis done if they present to primary care or other specialty for COVID-19 or non-COVID-19 related illnesses.

4.3 Patients who have no renal disease/renal complications from acute COVID-19 and subsequently noted abnormal kidney function or urinary abnormalities by primary care or other teams to be referred to nephrology team for early appointment.

4.4 Use a holistic, person-centered approach to assess all cases. This includes a comprehensive clinical history and appropriate examination that involves assessing physical, cognitive, psychological and psychiatric symptoms, as well as functional abilities.

4.5 Include these points in the comprehensive clinical history: (**Table 6.1**)

a. History of suspected or confirmed acute COVID-19 including date of onset and severity.
b. The nature and severity of previous history of other health conditions and current symptoms.
c. Timing and duration of symptoms since the start of acute COVID-19.
d. History of other health conditions.
e. Establish history of other causes that could contribute to renal injury:
    i. medication history including prescribed medications, over the counter medications, supplements, traditional medications
    ii. other renal causes of renal injury including other form of glomerulonephritis, exposure to contrast media
    iii. other pre-renal causes of renal injury including dehydration Post COVID-19, other superimpose infection, other events that contribute to hemodynamic instability
    iv. other post-renal causes of renal injury

4.6 Appropriate examinations must be tailored to history taking findings.

a. Blood pressure
b. Pulse rate
c. Body weight
d. Fluid status
e. Other specific examinations

4.7 Relevant Investigations

a. Full blood count
b. Renal profile
c. Urinalysis
d. Quantification of proteinuria with UPCI or 24 hours urine protein (if indicated)
e. Imaging (if indicated)
f. Renal biopsy (if indicated)

REFERRAL LETTER TO NEPHROLOGY CLINIC

_____
_____
_____
_____
_____

Nephrologist,
Nephrology Clinic Hospital_____ Date: _____

Re: Nephrology Follow up Post COVID-19 Infection
Name: _____
IC/ MRN: _____

Thank you for seeing the above named patient who had confirmed COVID - 19 Infection.
He was admitted to: _____

Date Positive COVID-19 PCR:
CT value:
COVID-19 category:
Highest oxygen requirement:
RRT Mode during Hospitalization (if any):

Renal profile Upon Discharge (Date:)
Urea: Sodium: Potassium: Creatinine:

Urinalysis (Date:) Protein Blood

Medications:
Antiviral (Yes/ No): Please state: _____
Steroids (Yes/ No): Please state: _____
Biologics (Yes/ No): Please state: _____
Antibiotics (Yes/ No): Please state: _____

Discharge Medications:
1._____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

Indication for referral: _____

Thank you

Yours sincerely

_____
( )

- Please kindly attach a copy of COVID-19 result and serial renal profile (if available).

Figure 6.1: Referral Letter to Nephrology Clinic

DISCHARGE CHECKLIST

Patient's name:
MRN/IC:

Referral letters
( ) 1. _____ Appointment date: _____
( ) 2. _____ Appointment date: _____
( ) 3. _____ Appointment date: _____

( )Discharge summary / note

( )Review patient medications
*Restart patient's own medications if not contraindicated

( )Supply adequate medications
*Postal service if needed

Figure 6.2: Discharge checklist

LIST OF NEPHROLOGY CLINICS

1. Nephrology clinic, Hospital Tuanku Fauziah Kangar, Perlis
2. Nephrology clinic, Hospital Abdul Halim Sungai Petani, Kedah
3. Nephrology clinic, Hospital Sultanah Bahiyah Alor Setar, Kedah
4. Nephrology clinic, Hospital Kulim, Kedah
5. Nephrology clinic, Hospital Pulau Pinang
6. Nephrology clinic, Hospital Seberang Jaya, Pulau Pinang
7. Nephrology clinic, Hospital Bukit Mertajam, Pulau Pinang
8. Nephrology clinic, Hospital Taiping, Perak
9. Nephrology clinic, Hospital Raja Permaisuri Bainun Ipoh, Perak
10. Nephrology clinic, Hospital Selayang, Selangor
11. Nephrology clinic, Hospital Tengku Ampuan Rahimah Klang, Selangor
12. Nephrology clinic, Hospital Serdang, Selangor
13. Nephrology clinic, Hospital Ampang, Selangor
14. Nephrology clinic, Hospital Kajang, Selangor
15. Nephrology clinic, Hospital Kuala Lumpur, Wilayah Persekutuan
16. Nephrology clinic, Hospital Putrajaya, Wilayah Persekutuan
17. Nephrology clinic, Hospital Melaka
18. Nephrology clinic, Hospital Tuanku Jaafar Seremban
19. Nephrology clinic, Hospital Sultanah Aminah Johor Bahru, Johor
20. Nephrology clinic, Hospital Sultanah Fatimah Muar, Johor
21. Nephrology clinic, Hospital Tengku Ampuan Afzan Kuantan, Pahang
22. Nephrology clinic, Hospital Sultan Haji Ahmad ShahTemerloh, Pahang
23. Nephrology clinic, Hospital Raja Perempuan Zainab II Kota Bharu, Kelantan
24. Nephrology clinic, Hospital Sultanah Nur Zahirah Kuala Terengganu,Terengganu
25. Nephrology clinic, Hospital Queen Elizabeth Kota Kinabalu, Sabah
26. Nephrology clinic, Hospital Umum Kuching, Sarawak
27. Nephrology clinic, Hospital Miri, Sarawak

Figure 6.3: List of nephrology clinics

NEPHROLOGY POST COVID-19 CLERKING SHEET

Name		Age	
MRN/IC		Gender	
Referred from		Date	

COVID-19 history			
Date positive COVID-19 PCR		Medications	
CT value		Antiviral	
COVID-19 category		Steroid	
Highest oxygen requirement		Biologics	
RRT mode (if any)		Antibiotics	

Co-morbidities:

Medication (prescribed/OTC/traditional/supplements

Risk factors for CKD	
	Diabetes mellitus
	Hypertension
	Obesity
	Family history of kidney disease
	Age
	Smoking

Symptoms	
	Cough
	shortness of breath
	Palpitations
	Chest pain
	Tiredness
	Reduce appetite
	Diarrhea
	Vomiting
	Muscle weakness
	Joint pain
	Anxiety
	Depression
	Sleep disturbances
	Brain fog
	Leg swelling - unilateral/bilateral
	Frothy urine
	Hair loss
	Rashes
	Others_____

Diabetes mellitus	
Blood pressure	
Pulse rate	
Respiratory rate	
Temperature	
SPO2	
Pain score	
Systemic examination	

Investigations	
FBC	
Renal profile	
UFEME	

Diagnosis
1
2
3

Plan
1
2
3
4
5

Table 6.1: Nephrology Post COVID-19 Clerking Sheet

5.0 Managements

5.1 All patients who are at risk of chronic kidney disease need to be screened for kidney function with baseline renal profile and urinalysis.

5.2 Risk factors for kidney disease:

a. Hypertension
b. Diabetes mellitus
c. Nephrotoxic drugs
d. Smoking
e. Obesity
f. Family history of kidney disease
g. History of AKI
h. Proteinuria / haematuria

5.3 All patients with kidney disease or kidney complications require long term follow up with nephrologists following acute COVID-19.

5.4 Suggested follow up schedule (**Table 6.2** and **6.3**)

For long term COVID-19 follow, schedule should be at least at month 3, 6 and 12. First follow up will be depending on the underlying condition. Subsequent follow up can be more frequent depending on the clinical condition.

Diagnosis	Suggested follow up schedule
End stage kidney disease	6-8 weeks after discharge from acute COVID-19 infection 3-6 monthly afterwards
CKD with no AKI	6-8 weeks after discharge from acute COVID-19 infection 3-6 monthly afterwards
CKD with AKI, no dialysis required	4-6 weeks after discharge from acute COVID-19 infection Frequent follow-up 4-6 weekly if renal function not stabilized 3-6 monthly once renal function stabilized
CKD with AKI, acute dialysis required	2-4 weeks after discharge from acute COVID-19 infection Frequent follow-up 4-6 weekly if renal function not stabilized 3-6 monthly once renal function stabilized
AKI, no dialysis required	4-6 weeks after discharge from acute COVID-19 infection Frequent follow-up 4-6 weekly if renal function not stabilized 3-6 monthly once renal function stabilized
AKI, acute dialysis required	2-4 weeks after discharge from acute COVID-19 infection Frequent follow-up 4-6 weekly if renal function not stabilized 3-6 monthly once renal function stabilized
AKI or CKD who became dialysis dependent	Continuous assessment by nephrology team to assess progression from acute kidney disease (AKD) to chronic kidney disease
Proteinuria and/or hematuria	2-4 weeks if nephrotic range proteinuria 6-8 weeks if asymptomatic hematuria/proteinuria

Table 6.2: Suggested Follow-up Schedule for Long COVID-19 with Nephropathy

Diagnosis	W2	W4	W6	W8	W12	W18	W24	W30	W36	W52
End Stage Kidney Disease										
CKD with no AKI										
CKD with AKI, no dialysis required										
CKD with AKI, acute dialysis required										
AKI, no dialysis required										
AKI, acute dialysis required										
AKI or CKD who became dialysis dependent										
Proteinuria and/or hematuria (nephrosis)										
Proteinuria and/or hematuria (asymptomatic)										

	First appointment
	Compulsory visits
	If clinically indicated

Table 6.3: Follow Up Schedule

5.5 Patients who were previously on angiotensin converting enzyme inhibitors (ACEi) or angiotensin receptor blockers (ARB) should be continued if no contraindication.

5.6 Immunosuppressants for transplant patient generally should be reduced (antimetabolite) or maintained.

5.7 Patients are preferred to be managed by multidisciplinary team comprising of pulmonologist, rehabilitation physician, cardiologist, dietician, physiotherapist, psychiatrist, psychologist, primary care physician, neurologist, nephrologist, endocrinologist and rheumatologist.

5.8 Give advice and information on self-management to people with ongoing symptomatic COVID-19 or Post COVID-19 syndrome, starting from their initial assessment. This should include:

a. Ways to self-manage their symptoms, such as setting realistic goals

b. Who to contact if they are worried about their symptoms or they need support with self-management

c. Sources of advice and support, including support groups, social prescribing, online forums and apps

d. How to get support from other services, including social care, housing, and employment, and advice about financial support

e. Information about new or continuing symptoms of COVID-19 that the person can share with their family, carers and friends

5.9 Develop a management plan with the person addressing their main symptoms, problems, or risk factors, and an action plan. Consider individual factors and access issues in determining location for further treatment plans.

5.10 Management plan is depending on clinical need and local pathways:

a. Support from integrated and coordinated primary care, community, rehabilitation and mental health services

b. Referral to an integrated multidisciplinary assessment service

c. Referral to specialist care for specific complications.

d. Think about the overall impact their symptoms are having on their life, even if each individual symptom alone may not warrant referral

e. Look at the overall trajectory of their symptoms, taking into account that symptoms often fluctuate and recur so they might need different levels of support at different times.

5.11 When discussing with the person the appropriate level of support and management:

5.12 Encourage patients to gather COVID-19 information via official channel eg: KKM website/Facebook

6.0 Patients' outcome and assessment tools

a. Recover to baseline

b. Progression to chronic kidney disease

c. Dialysis dependent

d. Death

Process Item	Work Process	Standard	Requirement
1.0 Hospitalized COVID-19 patients	Institutions involved: - COVID-19 hospital - COVID-19 hybrid hospital - Quarantine center		Annex 3 MOH Guidelines of COVID-19: Senarai Designated Hospital Bagi Pengendalian Kes COVID-19
2.0 Hospitalized COVID-19 patients who were referred to nephrologist			
3.0 COVID-19 patients with - Acute kidney injury (AKI)	Definition: a. Increase in SCr by ≥26.5 µmol/l within 48 hours; or increase in SCr to ≥1.5 times baseline, which is known or presumed to have occurred within the prior 7 days; or urine volume < 0.5ml/kg/h for 6 hours b. ICD-10: Diagnosis captured in casemix	KDIGO criteria of AKI 2012	

Process Item	Work Process	Standard	Requirement
- Chronic kidney disease (CKD)	Definition a. eGFR <60ml/min/ 1.73m2 that is present > 3 months with or without evidence of kidney damage; or evidence of kidney damage that is present > 3 months with or without eGFR <60ml/min/ 1.73m2 b. Diagnosis captured in casemix	CPG Management of Chronic Kidney Disease MOH 2018	
- Kidney replacement therapy (KRT)	Definition - Haemodialysis - Peritoneal dialysis - Kidney transplantation		
- Proteinuria/ hematuria	Definition Proteinuria Hematuria	CPG Management of Chronic Kidney Disease MOH 2018	
4.0 Refer to nephrology clinic upon discharge	- Discharge summary/ referral letter to nephrology clinic - Discharge checklist		Figure 6.3: List of nephrology clinic Figure 6.1: Referral letter to nephrology clinic Figure 6.3: Discharge checklist
5.0 Assessment in nephrology clinic	5.1 Clinical a. COVID-19 specific significant sequelae (RCGP)	Chapter 1: Table 1.2 (COVID-19 specific significant sequelae)	Post COVID-19 Management Protocol for Kidney Diseases

Process Item	Work Process	Standard	Requirement
	b. Mental health c. Risk of kidney disease - Hypertension - Diabetes mellitus - Nephrotoxic drugs - Smoking - Obesity - Family history of kidney disease - History of AKI - Proteinuria/ - hematuria 5.2 Laboratory - Renal profile - eGFR - Urinalysis for proteinuria/ hematuria - Imaging (if indicated)	Chapter 1: Table 1.2 (COVID-19 specific significant sequelae)	Post COVID-19 Management Protocol for Kidney Diseases
6.0 Nephrology diagnosis/ outcome 6.1 Presence of non-renal related symptoms 6.2 Presence of symptoms of mental health problem	- Resolved AKI - AKI progressed to CKD - Stable CKD - Worsened CKD - ESKD - Proteinuria/ haematuria - Kidney transplantation Refer to respective team Refer to psychiatric team		

Process Item	Work Process	Standard	Requirement
7.0 Patients not referred to nephrologist as inpatient	If seen in other Post COVID-19 follow up clinic Laboratory assessment - Renal profile - eGFR - Urinalysis for proteinuria/ hematuria		
8.0 Follow up plans and report to National Renal Registry	Any abnormality, refer to 4.0		Table 6.3: Follow up schedule Table 6.1: Nephrology Post COVID-19 Clerking Sheet

Table 6.4: Post COVID-19 Management Protocol for Kidney Diseases: Work Process

POST COVID-19 MANAGEMENT PROTOCOL FOR KIDNEY DISEASES

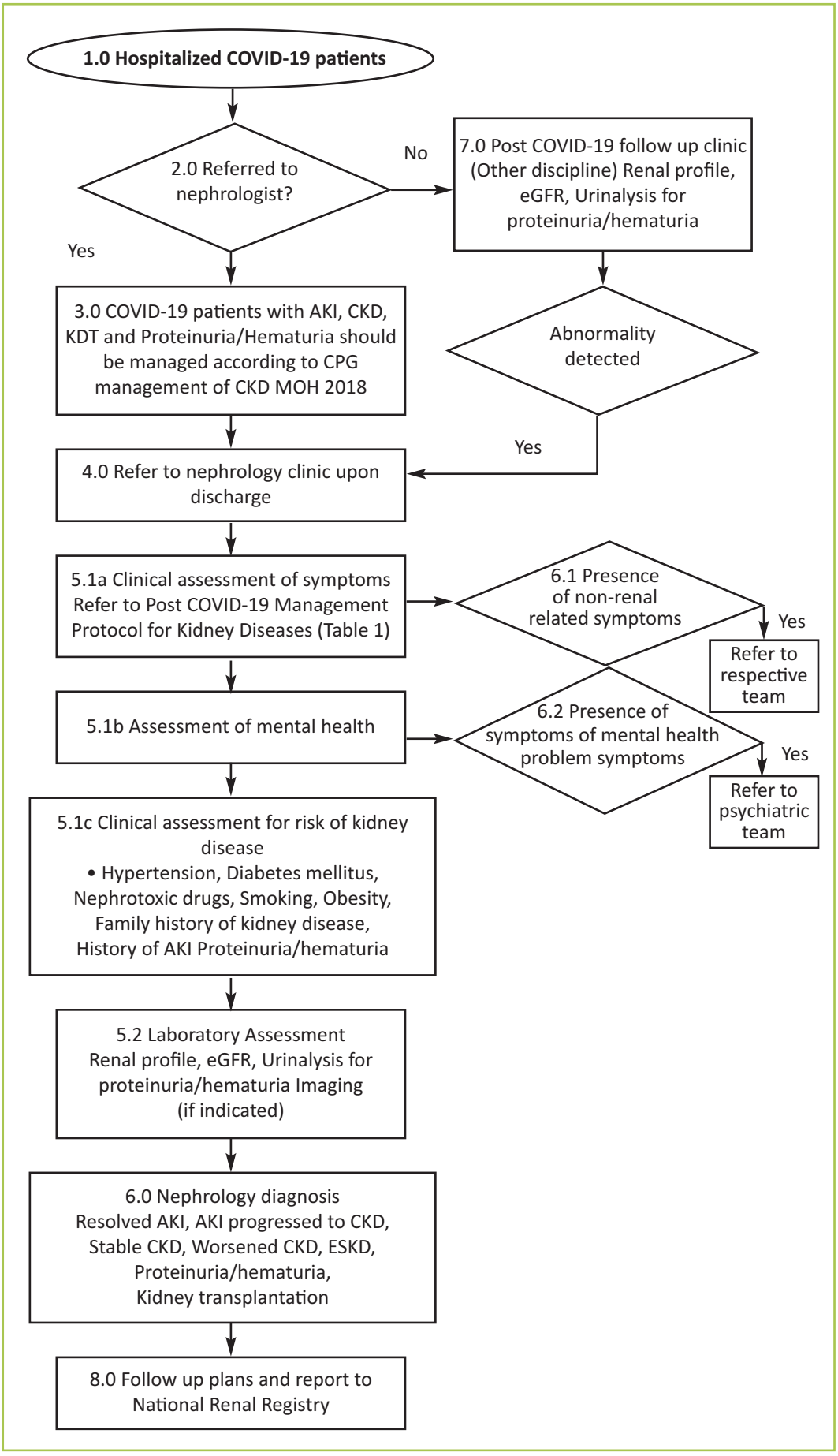

Figure 6.4: Post COVID-19 Management Protocol for Kidney Diseases

References:

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4. ERA-EDTA Council and the ERACODA Working Group. Chronic kidney disease is a key risk factor for severe COVID-19: a call to action by the ERA-EDTA. Nephrol Dial Transplant (2021) 36: 87–94 doi: 10.1093/ndt/gfaa31
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CHAPTER 7

POST COVID-19 MANAGEMENT AND PROTOCOL IN OBSTETRICS PATIENT

1.0 Introduction

Pregnancy is a dynamic condition where each stages of pregnancy carries a multitude of issues and challenges. COVID-19 infection during and after pregnancy requires specific and targeted action plans to suit each phase.

2.0 Scope

2.1 A source of information and guidance to healthcare workers who are caring for pregnant women, who have been tested positive to COVID-19 and are at risk of having Post COVID-19 sequelae.

2.2 This guide covers plan of actions and recommendations for:

a. Acute COVID-19 infection during antenatal period
b. Acute COVID-19 infection during peripartum period
c. Acute COVID-19 infection during puerperium
d. Pre-pregnancy care for Post COVID-19 patients

2.3 This document will be updated accordingly as new evidence becomes available.

3.0 Objective

This guideline provides a platform for a comprehensive and coordinated treatment approach to COVID-19 aftercare throughout pregnancy.

4.0 Plan of action

4.1 Following Acute COVID-19 infection during antenatal period

No	Phase	Plan of Action
1	Diagnosis of COVID-19 and Admission	• All women with suspected, probable or confirmed COVID-19 infection diagnosed during pregnancy should be managed as per MOH guidelines and admitted to appropriate healthcare facility according to MOH guidelines([1, 2]). • Management by a multidisciplinary team involving (ID physician, Intensivist, Anaesthetist and Obstetrician) • Start VTE prophylaxis in all pregnant women with active COVID-19([2]). • Pregnant woman who fulfils criteria for home quarantine are of low-risk group. VTE risk assessment must be carried out routinely as for any pregnant woman at every encounter with HCW. • If the home quarantined woman requires thromboprophylaxis, she should then be admitted to health facility (as her risk is now increased). • All home quarantined women should be advised to do ambulate and to stay hydrated to reduce the risk of VTE. They should also be educated on the signs and symptoms of VTE.
	Post-discharge antenatal follow-up	• Upon discharge, a definitive follow-up plan should be clearly stated by the O&G team. • Stage 1-2 – Respective MCH Clinic • Stage 3-5 – Respective O&G Clinic (and other discipline follow up) • Review after discharge in the respective clinic should be no later than 2 weeks. • All COVID-19 patients should be discharged to their respective MCH Clinic with a high-risk discharge notification. • Post-discharge / off-tag, all pregnant women should continue their routine antenatal care as per their pregnancy colour coding follow-up, unless specified otherwise by the discharging facility. • VTE prophylaxis should be given for at least 10 days post discharge / off-tag and may continue up to 3 weeks depending on patient's morbidity.

No	Phase	Plan of Action
	Post discharge COVID-19 follow-up and assessment	• Assessment during clinic visit should be according to respective Post COVID-19 Guidelines according to discipline. • Routine antenatal care should be performed according to patient's colour coding. No additional monitoring or intervention other than routine obstetric care is needed. • If patient presents with recurrence of symptoms within 90 days, where no alternative aetiology can be readily identified, then a consultation with an ID physician is recommended and re-testing for COVID-19 can be considered([3]).
2	Delivery	• Delivery is best delayed beyond 14 days of a positive diagnosis of COVID-19 unless there is an obstetric indication. • Generally may allow post-date, unless there is obstetric indication to deliver earlier([2]). • Delivery as per obstetric indication
3	Postpartum a. VTE prophylaxis b. Mental health assessment.	• COVID-19 is a transient risk factor. • VTE scoring should be done according to Malaysian Obstetrics Guidelines([4]). • Two Questions On Depression and One Question on Help (TQWHQ) should be used to assess patients' mental health prior to discharge and an onward referral to the psychiatrist needs to be made when necessary.

4.2 Following Acute COVID-19 infection during peripartum period

No	Phase	Plan of Action
1	Antenatal	• All women with suspected, probable or confirmed COVID-19 infection diagnosed during pregnancy should be managed as per MOH guidelines and admitted to appropriate healthcare facility according to MOH guidelines ([1]). • Management by a multidisciplinary team involving (ID physician, Intensivist, Anaesthetist and Obstetrician) • There is no need for additional obstetric monitoring or interventions such as frequent ultrasound monitoring apart from those done for the usual obstetric indications. • Antiviral medications are not contraindicated in pregnant patients. Initiating therapy should be done in consultation with the ID physician.

No	Phase	Plan of Action
		• Corticosteroid is recommended for treating COVID-19 patients who require supplementary oxygen. • All mothers (with no evidence of imminent delivery) admitted should be started on thromboprophylaxis provided there are no contraindications. If they progress into labour, anticoagulants should be withheld.
2	Delivery	• Delivery is best delayed beyond 14 days of a positive diagnosis of COVID-19 unless there is an obstetric indication, any respiratory issues that warrants a resuscitative hysterotomy or any medical conditions that warrant an earlier delivery. • If patient spontaneously progresses into labour, vaginal delivery is not contraindicated if she is in imminent delivery. Delivery in negative pressure room (if available) or designated isolation room. • Intrapartum fetal monitoring as per high risk cases. • Women in labour should wear a surgical mask. • All staff attending women in labour should wear adequate PPE and practice hand hygiene at all times[5]. o Refer paediatric team in advance: infant should be managed according to the current MOH guidelines on Management of COVID-19 in Neonates.
3	Postpartum a. VTE prophylaxis	• VTE prophylaxis should be restarted for all women if there are no contraindications. • VTE prophylaxis should be given for at least 10 days post discharge / off-tag and may continue up to 3 weeks depending on patient's morbidity.
	b. Breastfeeding	• Breastfeeding is not contraindicated, the risk of transmission from an asymptomatic mother is extremely rare. If the baby is isolated from the mother, expressed breast milk feeding is encouraged if possible. Refer to MOH Annex 39 for further guidance if a mother opts to breastfeed or room-in with her baby[6].
	c. Contraception	• All women should be given adequate postnatal contraception advice based on the MEC guidelines after a thorough risk assessment • During active infection combined hormonal contraception should be avoided [7-9].
	d. Mental health assessment	• Two Questions On Depression and One Question on Help (TQWHQ) (**Table 7.1**) should be used to assess patients' mental health prior to discharge and an onward referral to the psychiatrist needs to be made when necessary [10, 11].

No	Phase	Plan of Action
4	Post-discharge follow-up	• Upon discharge, a definitive follow-up plan should be clearly stated by the O&G team. • Stage 1-2 – Respective MCH Clinic • Stage 3-5 – Respective O&G Clinic (and other discipline follow-up) • Review after discharge in the respective clinic should be no later than 2 weeks. • All COVID-19 patients should be discharged to their respective MCH Clinic with a high risk discharge notification. • Postnatal care should be continued as per Perinatal Care Manual[11].

4.3 Following Acute COVID-19 infection during puerperium

No	Phase	Plan of Action
1	Mother with baby	• Acute COVID-19 infection in puerperium (within 6 weeks of delivery) should be admitted for in-patient management. • Patient will be managed according to severity as per MOH guideline. • Baby has to be tested for COVID-19 infection. • Breastfeeding is not contraindicated. If baby is isolated from the mother, expressed breast milk (EBM) feeding is encouraged if possible[6]. • All postpartum women should undergo a documented assessment of risk factors for VTE upon diagnosis of COVID-19. • VTE prophylaxis should be started for all women if there are no contraindications and should be continued for 10 days post discharge / off-tag and may continue up to 3 weeks depending on patient's morbidity[12-14]. • Vaccination for prevention of COVID-19 is recommended. Breastfeeding is not contraindicated for vaccination.
2	Mother without baby	• Acute COVID-19 infection in puerperium (within 6 weeks of delivery) should be admitted for in-patient management. • Patient will be managed according to severity as per MOH guideline. • EBM feeding is encouraged if baby is separated from mother. • All postpartum women should undergo a documented assessment of risk factors for VTE upon diagnosis of COVID19.

No	Phase	Plan of Action
		• VTE prophylaxis should be started for all women if there are no contraindications and should be continued for 10 days post discharge / off-tag and may continue up to 3 weeks depending on patient's morbidity[12-14]. • Vaccination for prevention of COVID-19 is recommended.
3	Contraception	• All women should be given contraception according to MEC guideline after a thorough risk assessment. • During infective period, combined hormonal contraception should be avoided.
4	Post discharge follow-up	• Upon discharge, a definitive follow-up plan should be clearly stated by the O&G team. • Stage 1-2 – Respective MCH Clinic • Stage 3-5 – Respective O&G Clinic (and other discipline follow-up) • Review after discharge in the respective clinic should be no later than 2 weeks. • All COVID-19 patients should be discharged to their respective MCH Clinic with a high risk discharge notification. • Postnatal care should be continued as per Perinatal Care Manual[11].

Question	Content	Response	Score
Q1	Dalam tempoh sebulan yang lalu, adakah anda sering diganggui dengan perasaan murung, sedih atau tiada harapan? *During the past month, have you often been bothered by feeling down, depressed or hopeless?*	Tidak / No Ya / Yes	0 1
Q2	Dalam tempoh sebulan yang lalu, adakah anda sering kehilangan minat atau keseronokan dalam melakukan kerja-kerja? *During the past month, have you often been bothered by having little interest or pleasure in doing things?*	Tidak / No Ya / Yes	0 1
Q3	Jika YA kepada satu ataupun kedua-dua soalan ini, adakah anda memerlukan bantuan dengan masalah anda ini? *If YES to either or both of these 2 questions, do you want help with this?*	Tidak / No Ya, tetapi bukan hari ini / Yes, but not today Ya / Yes	0 1 2

Patients with a positive score (score of 2 or more) on TQWHQ, should then complete the PHQ-9 (37, 53) or be evaluated further (54).

Table 7.1: Two Questions on Depression and One Question on HELP (Malay Version)

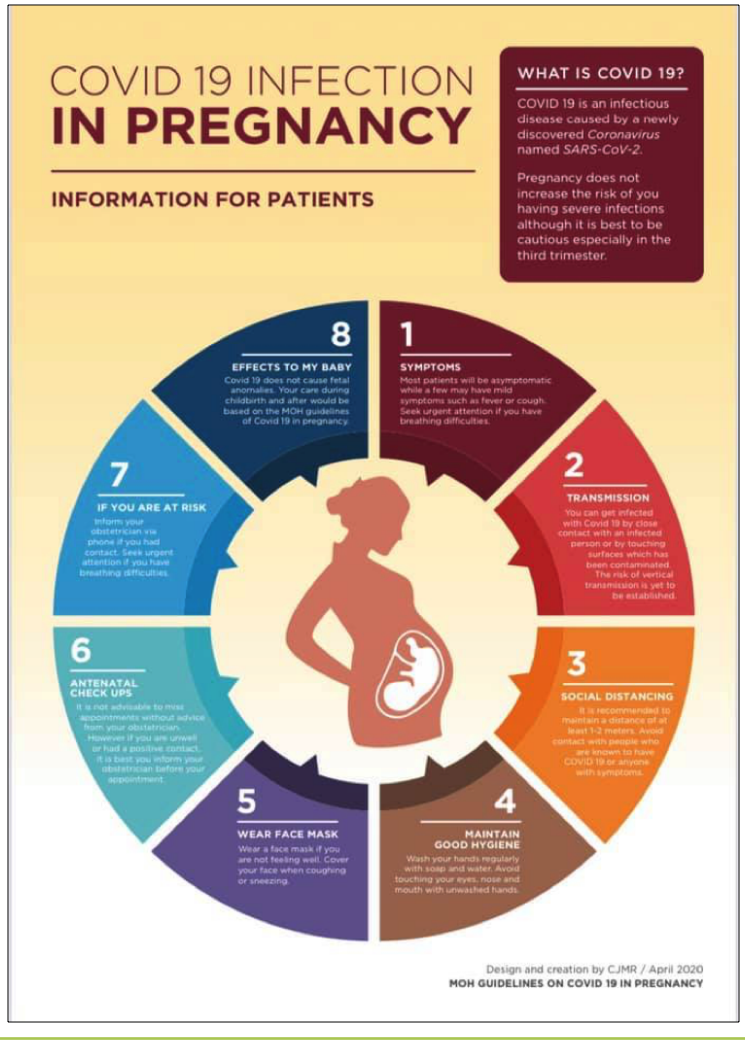

Figure 7.1: Covid-19 Infection in Pregnancy Information for Patients

References:

1. Kementerian Kesihatan Malaysia. Kemaskini Kes Definisi Dan Garis Panduan Pengurusan Kes COVID-19 di Malaysia. http://COVID-19mohgovmy/garis-panduan/garis-panduan-kkm. 2020.
2. Dr. Ravichandran Jeganathan DMG, Datuk Dr. Soon Ruey, Dr. Yogeeta Gunasagran, Dr. Tan Gi Ni. Guidelines On the Management Of COVID-19 In Obstetrics and Gynaecology. COVID-19 Guideline MOH. 2021;Annex 23.
3. Centre of Diease Control. Interim Guidance on Duration of Isolation and Precautions for Adults with COVID-19. https://wwwcdcgov /coronavirus/2019-ncov/hcp/duration-isolationhtml. 2021.
4. Bahagian Pembangunan Kesihatan Keluarga. A Training Manual of Prevention & Treatment of Thromboembolism in Pregnancy & Puerperium 2nd Edition, 2018. 2018;MOH/K/ASA/87.17(HB)(2nd edition).
5. Kementerian Kesihatan Malaysia. Infection, Prevention and Control (IPC) Measures in managing person under surveillance (PUS), Suspected, probable or confirmed Coronavirus Disease (COVID-19). COVID-19 Guideline Malaysia. 2020;Annex 8.
6. Kementerian Kesihatan Malaysia. Guidelines to baby friendly hospital initiative (BFHI) implementation and breastfeeding practices during COVID-19 pandemic. COVID19 guideline Malaysia. 2020;Annex 39.
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9. World Health Organization. Medical eligibility criteria for contraceptive use - Executive summary. 2015;5th edition.
10. Family Medicine Specialists Association of Malaysia. Consensus Guide to Adult Health Screening for General Population Attending Primary Care Clinics. ISBN 978-967-11389-2-2. 2015.
11. Bahagian Pembangunan Kesihatan Keluarga. Perinatal care manual 2013;3rd edition.
12. Joshua P. Vogel BT, Michelle Giles, Clare Whitehead. Clinical care of pregnant and postpartum women with COVID-19: Living recommendations from the National COVID-19 Clinical Evidence Taskforce. Aust N Z J Obstet Gynaecol 2020; 60: 840–851. 2020(DOI: 10.1111/ajo.13270).
13. Vincenzo Berghella, Brenna Hughes. COVID-19: Pregnancy issues and antenatal care. UpToDate. 2021:Topic 127535 Version 131.0.
14. Royal College of Obstetricians and Gynaecologists. Coronavirus (COVID-19) Infection in Pregnancy. 2021;Version 13.
15. Dr Suraihan Sulaiman, Dr Mohamad 'Ariff Fahmi Ahmad Zawawi. Post-COVID-19 Follow Up Recommendations for Primary Care Jabatan Kesihatan Negeri Sabah. 2020(First Edition).

CHAPTER 8

POST COVID-19 MANAGEMENT AND PROTOCOL IN CHILDREN

1.0 Introduction

1.1 As the COVID-19 pandemic evolves, persistent symptoms are being reported amongst COVID-19 survivors, including individuals who experienced mild illness. The UK office for National Statistics' latest report estimates that 12.9% of UK children aged 2 to 11, still have symptoms five weeks after their first infection1-2. Data elsewhere is scarce.

1.2 The Post COVID-19 Syndrome are signs and symptoms that develop following an infection consistent with COVID-19 which continue after 12 weeks and are not explained by an alternative diagnosis (refer to **5.1 Chapter 1**).

2.0 Scope

The present protocol aims to:

a. Assist in identification and management of Post COVID-19 syndrome in children

b. Provide a follow-up plan for children who have had severe acute (moderate to severe disease), post-acute COVID-19 and chronic COVID-19 infection.[3]

3.0 Symptoms

In recognizing symptoms in the paediatric age group, the clinician should be aware that their patients range from neonate (age less than 1 month) to adolescent age group hence both pre-verbal to verbal clues need to take into consideration.

System	Symptom
General	Fatigue Fever Pain
Respiratory	Cough Rhinorrhea, nasal congestion Sore throat Tachypnea / dyspnea
Cardiovascular	Chest pain Palpitation Reduced effort tolerance
Neurological	Headache Tinnitus Ageusia / Anosmia Sleep disturbances Cognitive impairment / school performance deterioration
Gastrointestinal	Abdominal pain Nausea / Vomiting / Diarrhea Loss of appetite Poor weight gain
Musculoskeletal	Myalgia Joint pain
Dermatological	Rashes Anxiety
Psychological	Depression

Table 8.1: Symptoms of Post COVID-19 in Peadiatrics

4.0 Assessment

4.1 Any child with persistent symptoms, previously diagnosed with or suspected with COVID-19 (any stage), should be referred to hospitals with paediatricians for assessment.

4.2 The pediatrician or referring clinician may find the Paediatric Clerking Sheet for Post COVID-19 syndrome (See **Figure 8.4**) useful in identifying areas of concern.

4.3 The investigations should be tailored according to clinical presentation and exclude relevant differential diagnoses e.g., FBC (looking for anemia), renal profile (for hypokalemia), CaPO4, thyroid function test among others.

5.0 Management

5.1 Likewise, the management of a child presenting with Post COVID19 syndrome depends on their clinical presentation. Referrals should be made to specific sub-specialties as indicated (**Figure 8.3**).

5.2 An important distinction should be made between symptoms due hospital related complications of prolonged stay (including nosocomial infection), sequelae of organ damage (post infection hyperactive airway, acquisition of other viral infections) and non-specific social isolation since children are sometimes separated from their primary care givers during this pandemic (nutritional anaemia, muscle wasting, vitamin D deficiency, hypothyroid etc.)

5.3 This document will be updated from time to time as new evidence become available.

FLOW CHART FOR FOLLOW-UP OF ACUTE COVID-19 INFECTIONS IN PAEDIATRICS (MILD DISEASE)

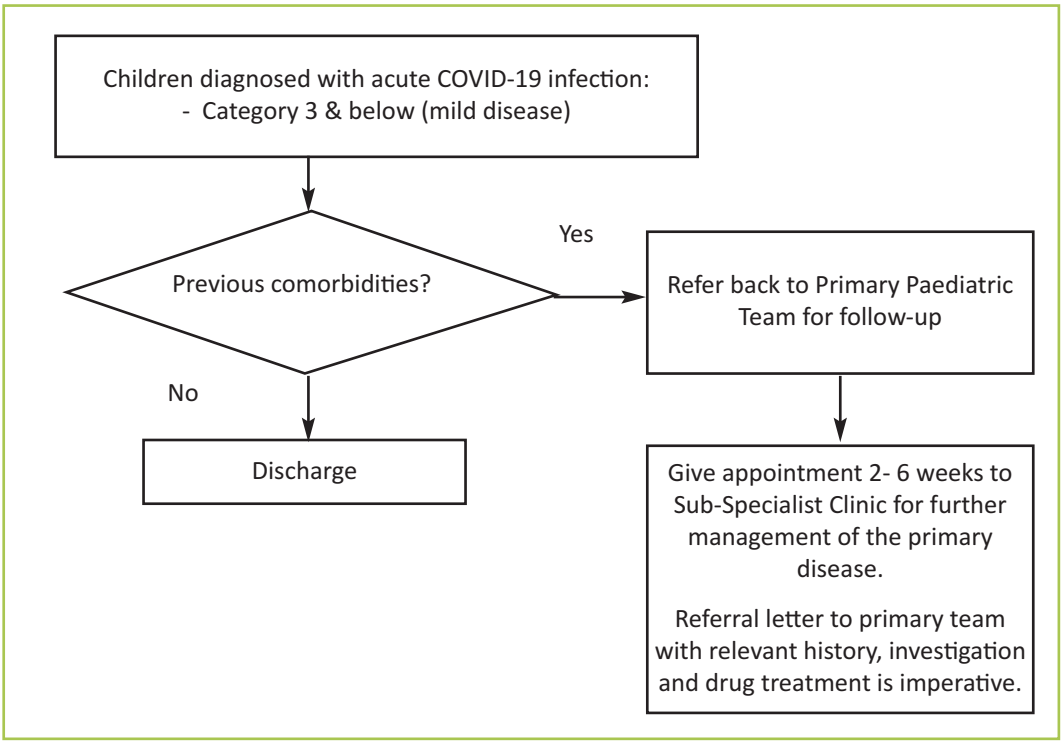


Figure 8.1: Flow Chart for Follow-Up of Acute COVID-19 Infections in Paediatrics (Mild Disease)

FLOW CHART FOR FOLLOW-UP OF ACUTE COVID-19 INFECTIONS IN PAEDIATRICS (MODERATE-SEVERE DISEASE)

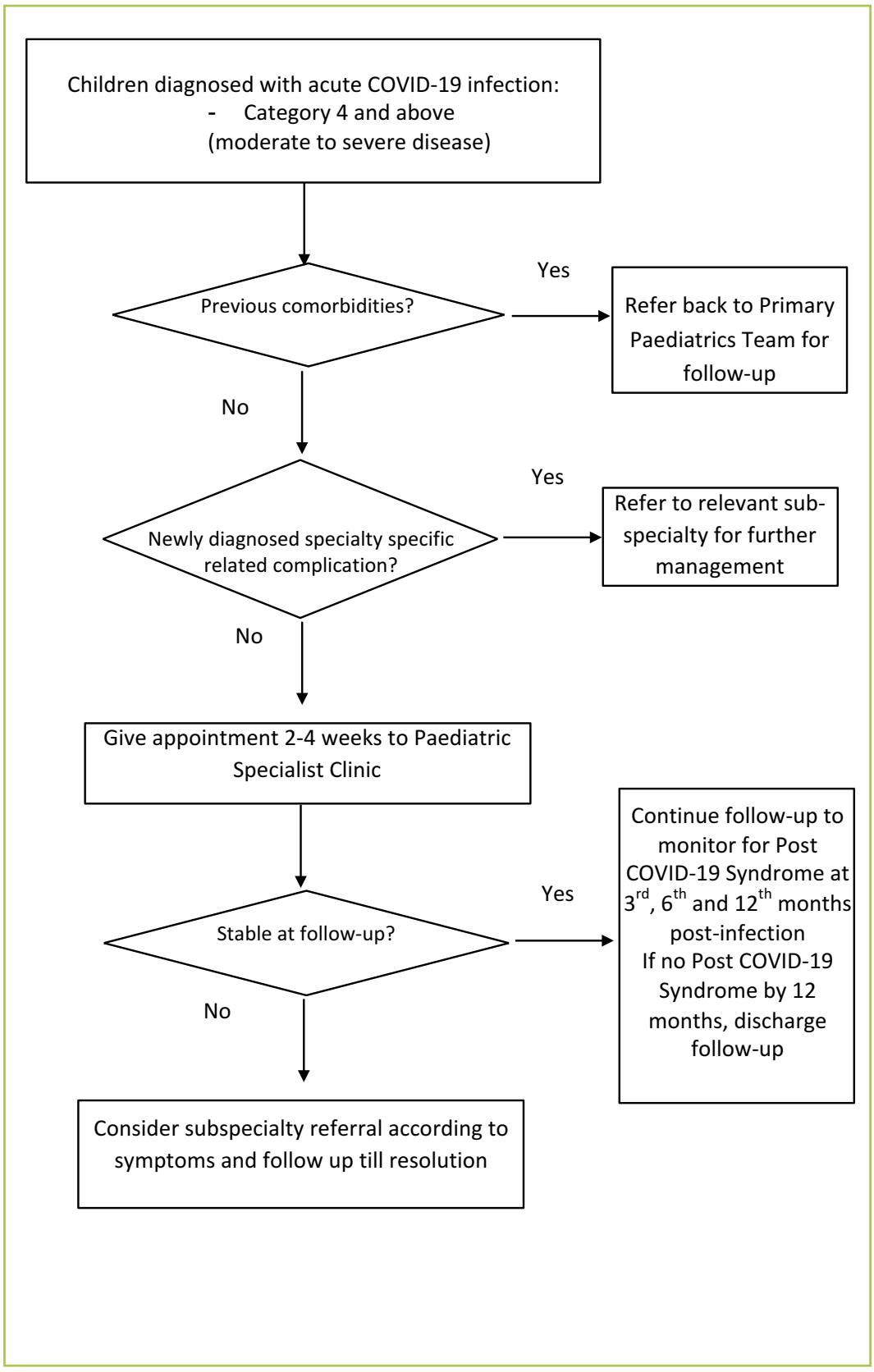


Figure 8.2: Flow Chart for Follow-Up of Acute COVID-19 Infections in Paediatrics (Moderate-Severe Disease)

Children who present with symptoms of Post COVID-19 syndromes regardless of their clinical stage at presentation should be referred to a pediatrician for further evaluation.

FLOW CHART FOR POST COVID-19 SYNDROME MANAGEMENT FOR PAEDIATRICS

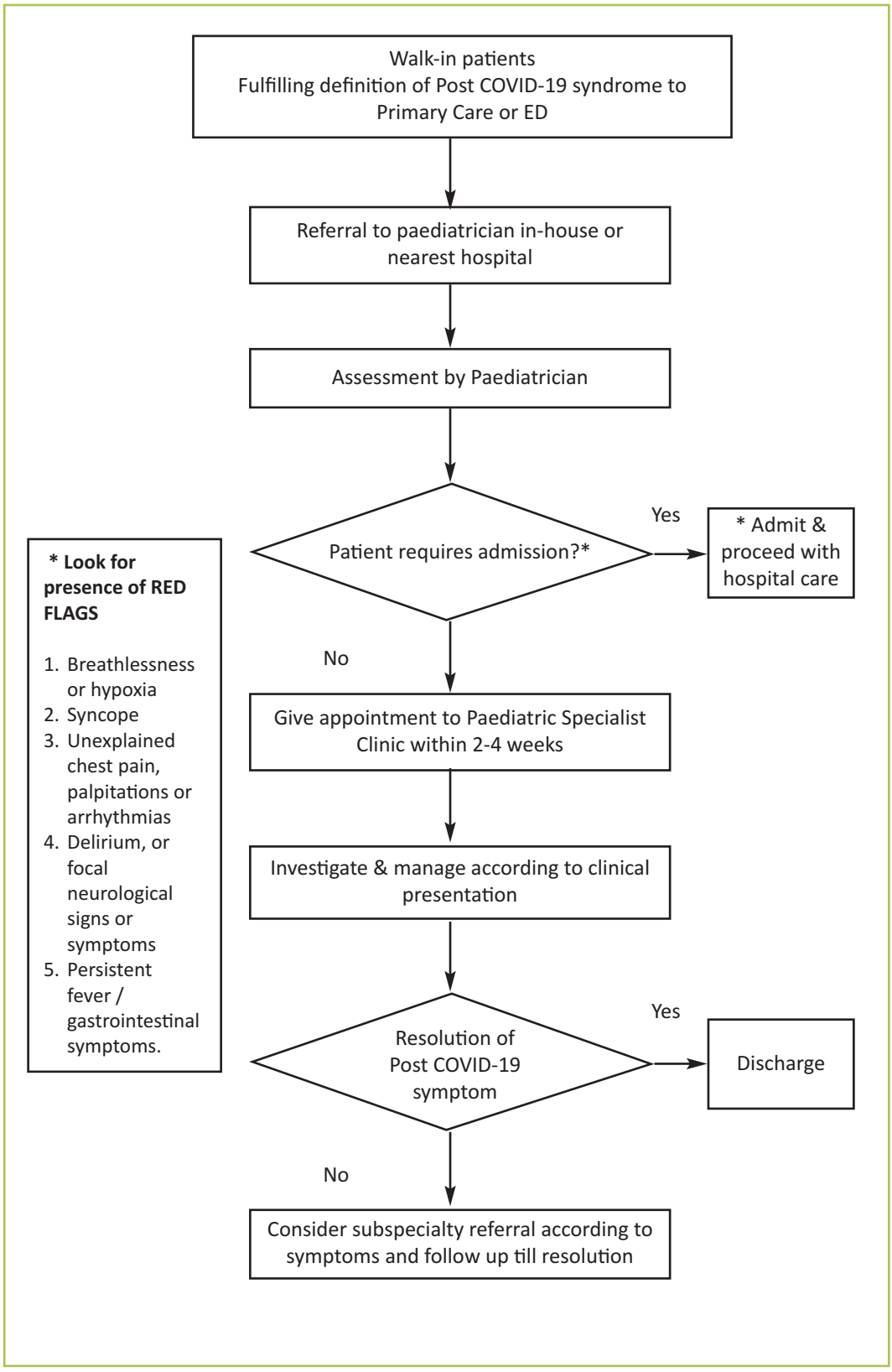


Figure 8.3: Flow Chart for Post COVID-19 Syndrome Management for Paediatrics

POST COVID-19 SYNDROME PAEDIATRIC CLERKING SHEET

Name:	IC No. / Passport no.:
Age:	Nationality:
Weight: Height:	Contact no.:
Address:	
Date of admission:	Date of discharge:
Type of COVID test: RTK PCR	Date of test:
COVID Category: 1 2 3 4 5	Initial symptoms:

Past Medical / Surgical History:	
Any medications?	
Any allergies? ☐ Yes ☐ No	Details:
Vaccination up to age? ☐ Yes ☐ No	Details:

Current complaint:

- ☐ Fatigue
- ☐ Fever
- ☐ Pain
- ☐ Cough
- ☐ Rhinorrhea/Nasal congestion
- ☐ Sore throat
- ☐ Dyspnea/tachypnea
- ☐ Chest pain
- ☐ Palpitations
- ☐ Reduced effort tolerance
- ☐ Headache
- ☐ Tinnitus
- ☐ Ageusia/Anosmia
- ☐ Sleep disturbances
- ☐ Cognitive impairment / school performance deterioration
- ☐ Abdominal pain
- ☐ Nausea
- ☐ Vomiting
- ☐ Diarrhea
- ☐ Loss of appetite
- ☐ Poor weight gain
- ☐ Myalgia
- ☐ Joint pain
- ☐ Rashes
- ☐ Anxiety
- ☐ Depression
- ☐ Others: specify

_____

_____

_____

Examination findings:

Management Plan:

Attending doctor: _____ **Date:**_____

Figure 8.4: Post COVID19 Syndrome Paediatric Clerking Sheet

References:

1. Coronavirus (COVID-19) Infection Survey, UK. Office for National Statistics.
2. Bhopal BS. BMJ 2021; 372: n157
3. COVID-19 Rapid Guideline: Managing the long-term effects of COVID-19. The National Institute for Health and Care Excellence (NICE) Guidelines, 18 December 2020.
4. *Red flag symptoms* are based on Australian guideline (references from Organising pneumonia protocol) & adapted to this guideline's use.
5. Annex 2e : Clinical Management Of Confirmed COVID-19 Case In Adult & paeditrics (updated 3 November 2020) .

CHAPTER 9

POST COVID-19 FOLLOW UP REHABILITATION RECOMMENDATIONS

1.0 Introduction

1.1 COVID-19 has led to an increasing burden of disease and disability throughout the globe and it is expected to continue to do so in the next few years. It has brought many challenges and has caused major impacts to existing ministration including the rehabilitation services.[1,2] Comparable to the aftermath of any other major illness or injury, many COVID-19 survivors require rehabilitation services to facilitate them back to normal function or in some cases to adapt to living with residual disability.[3] Due to its novelty, the full spectrum of post-discharge impacts in COVID-19 survivors remains unknown.[1-3]

1.2 Experience with previous outbreaks of coronaviruses have been associated with persistent pulmonary function impairment, muscle weakness, pain, fatigue, depression, anxiety, vocational problems, and reduced quality of life to various degrees.[4,5] Severe COVID-19 survivors who have required prolonged intensive care are expected to experience greater degree of impairments and shall require wider physical, cognitive, functional and psychological health support needs following discharge from the acute settings.[1-5]

2.0 Justification

2.1 World Health Organization (WHO) defined rehabilitation as a set of measures that assist individuals who experience, or are likely to

experience disability to achieve and maintain optimal functioning in interaction with their environment. Its main goals are to prevent loss of function; slow the rate of loss of function; improve and restore function; compensate for the loss of function and maintenance of current function.[6]

2.2 Considering the multi-systems impairment often associated with severe COVID-19,[1-5] complex rehabilitation needs are anticipated, hence access to its services are required. This aims to facilitate the COVID-19 survivors towards recovery and optimal functioning or in severe cases to adapt to living with disability; with the ultimate aim for full re-integration into society.[1-5]

2.3 These goals are best achieved through a patient centred multi-disciplinary approach involving Infectious Disease Physician, Respiratory Physician, Geriatric Physician, Psychiatrist, Rehabilitation Physician, Physiotherapist, Occupational Therapist and others allied healthcare personnel as the need arises.[1-3,5] With this approach; the diagnosis, management and prognostication of complex medical impairments and disabilities are comprehensively made. Hence, a realistic rehabilitation program shall be formulated based on the individual patients needs with the balances of input from the other multi-disciplinary team members.[1-3,5]

3.0 Scope

3.1 This guide contains information for healthcare workers who are providing COVID-19 aftercare and rehabilitation services.

3.2 This is a living document and it will be updated from time to time as new evidence becomes available.

4.0 Objectives

4.1 This guideline provides a basis for a comprehensive, coordinated and structured rehabilitation management approach to COVID-19 aftercare by multidisciplinary teams.

4.2 It makes recommendations for COVID-19 survivors with persistent symptoms and/or delayed or long-term complications beyond the initial acute hospital discharge requiring rehabilitation intervention.

5.0 Follow-up locations

Follow-up centers include:

a. Government Healthcare facilities/centers preferably with Family Medicine Specialist
b. Private General Practice
c. Hospitals preferably with Rehabilitation Physician (government and private)

6.0 Symptoms of Post COVID-19 patients

Recent literature reported commonly observed Post COVID-19 symptoms, timeline of its occurrence and specific sequelae are as illustrated in Chapter 1 (**Figure 1.1-1.6** and **Table 1.2**).

7.0 Assessment

7.1 Use a holistic, person-centered approach to assess all cases. This includes a comprehensive clinical history and appropriate examination that involves assessing physical, cognitive, psychological and psychiatric symptoms, as well as functional abilities. [2,3,5,7,8]

7.2 Include in the comprehensive clinical history: [2,3,5,7,8]

a. History of suspected or confirmed acute COVID-19.
b. The nature and severity of previous and current symptoms.
c. Timing and duration of symptoms since the start of acute COVID-19.
d. History of other health conditions.
e. Course of acute admission, complications and its management including treatment rendered.
f. Multi-systems impairments identification and its functional impacts especially pertaining to respiratory function.
g. Home and community environment.
h. Psychosocial support evaluation.

8.0 Identify phases of Post COVID-19 cases

Identify the phases of Post COVID-19 patients as described in **Chapter 1** for effectively diagnose, treat and manage the conditions.

9.0 Investigation

9.1 All Post COVID-19 patients must undergo investigations based on clinical indications and availability of tests at the healthcare facilities.

9.2 Establish red flag symptoms that could indicate the need for emergency assessment for serious complication of COVID-19. Red flag symptoms include severe, new onset, or worsening of:[9]

a. Breathlessness or hypoxia,
b. Syncope,
c. Unexplained chest pain, palpitations or arrhythmias,
d. Delirium, or focal neurological signs or symptoms.
e. Multisystem inflammatory syndrome (in children).

10.0 Management

10.1 Develop a management and an action plan with patients; addressing their main symptoms, problems and risk factors. Consider individual factors and access to healthcare facilities issues in determining location for further treatment or rehabilitation e.g., home-based, telehealth or face-to-face options. Refer to the tertiary center if needed. [1-3,5,7-10,12]

10.2 Multi-systems impairments shall be identified and intervened accordingly to optimize the COVID-19 survivors' return to their best functional level or in severe cases to adapt to living with residual disabilities. [1-3,5,7-10] Comparable to the other specialised rehabilitation medicine services, the ultimate aim of rehabilitation medicine response in COVID-19 is for full re-integration of the survivors back into society. [2,3,5,10,12,16]

10.3 The principal goal of rehabilitation is to optimize functioning and reduce disability. Rehabilitation should be targeted to the specific goals of patient, however in general, rehabilitation for multi-system impairmentaims to:[1-3,5,7-10,11]

a. Empower the patient and their family to understand the impairment and how to manage it in their daily lives
b. Improve function; and
c. Compensate for deficits in functioning.

10.4 The following areas should be targeted in a rehabilitation programme that addresses difficulties in lung functioning which are the primary impairment in COVID-19. Many of these apply known pulmonary rehabilitation concepts and principles.[11]

a. Increasing ventilation
b. Airway clearance
c. Education for breathlessness
d. Returning to everyday activities
e. Physical exercise and fitness

10.5 The process of referral and its management principle at different spectrum of rehabilitation process as described in **Table 9.1**. and **Figure 9.1.**

Spectrum	Process	Personnel
Pre-discharge	Referral shall be made to the respective rehabilitation services such as Physiotherapy and/or Occupational Therapy for identified elementary impairment and rehabilitation need. Referral shall be made for Rehabilitation Medicine services for multi-system medical impairment with complex rehabilitation needs requiring for comprehensive multi-system evaluation; identification of impairments and complex rehabilitation needs; implement initial rehabilitation program; provision and facilitation of early supported discharge.	Referral by primary team Specialist / Medical Officer
At discharge	Schedule date for outpatient physical review at 1 month • All COVID-19 survivors Category 4 and 5 • All other COVID-19 categories with identified rehabilitation needs • All patient with existing rehabilitation needs whom acquire COVID-19 infection.	Referral letter to be provided by primary team Medical Officer. Ward nurse to obtain the appointment date
2 weeks post discharge: Tele-consultation	Tele-consultation surveillance checklist questions for general multi-system medical impairment and functional limitation screening (**Table 9.2**).	Rehabilitation Medical Officer
1-month post-discharge: Comprehensive physical review	(1) Clinical evaluation • Surveillance checklist questions for general multi-system medical impairment and functional limitation (**Table 9.2**). • Focused physical examination • Imaging, laboratory, treatment, lung function and all others related review as available. • Consultation with other relevant specialties if indicated.	Rehabilitation Physician and Medical Officer
	(2) Comprehensive multi-system medical impairment and functional evaluation using standardized outcome measure: [2,3,5,10,12,13,16]	Rehabilitation Physician and Medical Officer; Physiotherapist; Occupational Therapist

Spectrum	Process	Personnel
	• **Cognitive:** Brief Mental State Examination (BMSE); Mini Mental State Examination (MMSE) if impaired BMSE. • **Psychological**: Depression Anxiety Stress Scale (DASS-21). • **Nutrition**: Body Mass Index (BMI) • **Respiratory**: Oxygen Saturation (SPO2); Respiratory Rate (RR); Lung Auscultation; Modified Medical Research Council Dyspnoea Scale (mMRC); 6-Minute Walking Test (6MWT); Peak Expiratory Flow Rate/Peak Cough Flow • **Cardiovascular**: Blood Pressure (BP) and Heart Rate (HR); 6-Minute Walking Test (6MWT) with SPO2 and HR monitoring. • **Musculoskeletal**: Medical Research Council (MRC) muscle strength grading; Joint range of motion (ROM); Analogue Fatigue Severity Scale (AFSS); • **Aerobic exercise capacity**: 6-minute Walking Test (6MWT) with SPO2 and HR monitoring; 1-minute Chair Rising Test	and Rehabilitation Nurse
	(3) Assessment of activities of daily living (ADL) • **Generic**: Modified Barthel Index (MBI)[1-3,5,10-14,16] • **Disease Specific**: Post COVID-19 Functional Scale (PCFS)[4,12] • **Additional**: Return to Drive (RTD); Return to Work (RTW); Return to school/education as applicable.	Occupational Therapist
	(4) Assessment of Quality of Life (QOL)[1,2] • World Health Organization Disability Assessment Scale (WHODAS) 2.0	Occupational Therapist

Spectrum	Process	Personnel
1-month post-discharge: Comprehensive rehabilitation intervention and prescription	(1) Patient education / empowerment strategies • Individual or group education / demonstration and training of skills involving patients and caregivers as available. These are adapted using the World Health Organization (WHO) Support for Rehabilitation Self Management for COVID-19 related illness.[14] Home-based rehabilitation can be a useful and equivalently effective alternative to an out-patient hospital based rehabilitation program.[15] • Enhanced with brochures/ pamplet/ video/ website-internet resources or any other educational material to enhance understanding of rehabilitation importance and its specific strategies; healthy lifestyle education; encourage patients to participate in family and social activities. [3,10-15]	Rehabilitation Physician and Medical Officer; Physiotherapist; Occupational Therapist and Rehabilitation Nurse
	(2) Prescription of rehabilitation program customized to the comprehensive assessment findings. [2,3,5,12-14] • **Symptom Relieving Positions**[11,14]: (**Table 9.2**) Post COVID-19 symptoms such as dyspnoea may be relieved by adopting various positions. The patient should be encouraged to try each of these suggested positions to identify which may be beneficial to them. Patient also should be encouraged to combine dyspnoea relieving positioning with pursed lip breathing technique for more effectiveness. • **Breathing training**: (**Table 9.3**) Guided by patient symptoms such as dyspnoea, cough, difficulty with sputum expectoration. Breathing techniques training included deep breathing exercises; thoracic mobility exercise, diaphragmatic breathing, purse lips breathing,	Rehabilitation Physician and Medical Officer; Physiotherapist. * Whenever required for more intensive institutional based program, the individuals are referred to their most logistically convenience facilities with available resources. **Access for tele-consultation are provided for those on complete home-based program. ***Exercise / activity diary are advised for compliance checks of therapy.

Spectrum	Process	Personnel
	spirometer, inspiratory muscle trainer.[2,5,11-14] • **Cough and sputum expectoration techniques**: Breathing techniques as above; reducing energy consumption during sputum clearance such as huff cough methods; use of cough assist devices such as positive expiratory pressure (PEP)/oscillatory PEP. [2,5,11-14] • **Muscle strength training**: (**Table 9.4**) Progressive and graded resistance training is recommended for strength training with a frequency of 2 to 3 times per week, with a training period of 6 weeks and a weekly increase of 5% to 10%.[2,5] • Balance training: Including hands-free training and balance training using a device if applicable under the guidance of a physiotherapist. [2,5] • **Aerobic exercise**: Advised patients for safe gradual progression of walking, brisk walking, jogging, cycling, stairs climbing, threadmill based on the comprehensive evaluation findings. This shall begin from low intensity, gradually increasing the intensity and duration: 3 to 5 times per week for 20 to 30 minutes each time. Intermittent exercise and pacing of activities are advocated in those affected by fatigue. [2,5,11-14] • **Specific exercise prescription**: To include frequency (times per day; times per week); intensity (Borg Rating of Perceived Exertion scale and/ or heart rate response); time (duration per exercise) and type (specific anaerobic; aerobic exercise). Intensity is an important parameter as it relates to safe exercise performance.[11,12,14]	****Self-monitoring and documentation of heart rate response and oxygen saturation during physical exertion are advised for additional safety during home exercise.
	(3) Activities of Daily Living (ADL) training are provided tailored to the comprehensive evaluation findings: [1-3,5,10-14] (**Table 9.8**)	Occupational Therapist * Whenever required for more intensive institutional based

Spectrum	Process	Personnel
	• Basic activities of daily living (BADL) such as transfer, grooming, toileting, bathing, feeding. • Instrumental activities of daily living (IADL) such as cooking, laundry management, safety aspects; finance. • Return to driving as indicated. • Return to work program as indicated. • Identify obstacles in life task participation, and conduct targeted intervention such as energy conservation techniques, pacing, relaxation techniques. • Identify needs for home aids and environmental adaptations such as safety bar, reacher, sock aids.	program, the individuals are referred to their most logistically convenience facilities with available resources.
3 months post-discharge	Assessment for ongoing rehabilitation needs. Customized intervention and / or multidisciplinary specialty referral if indicated.	Rehabilitation Physician and Medical Officer; Physiotherapist; Occupational Therapist and Rehabilitation Nurse
6 months post-discharge	Assessment for ongoing rehabilitation needs. Customized intervention and/ or multidisciplinary specialty referral if indicated.	
12 months post-discharge	Assessment for ongoing rehabilitation needs. Customized intervention and/ or multidisciplinary specialty referral if indicated.	
*Access to other multi-discipline specialties such as infectious disease, respiratory, psychiatry, emergency services are available whenever indicated at any spectrum of rehabilitation services		

Table 9.1: Referral process and management principle of rehabilitation process

WORKFLOW FOR REHABILITATION REFERRAL UPON INITIA ACUTE DISCHARGE

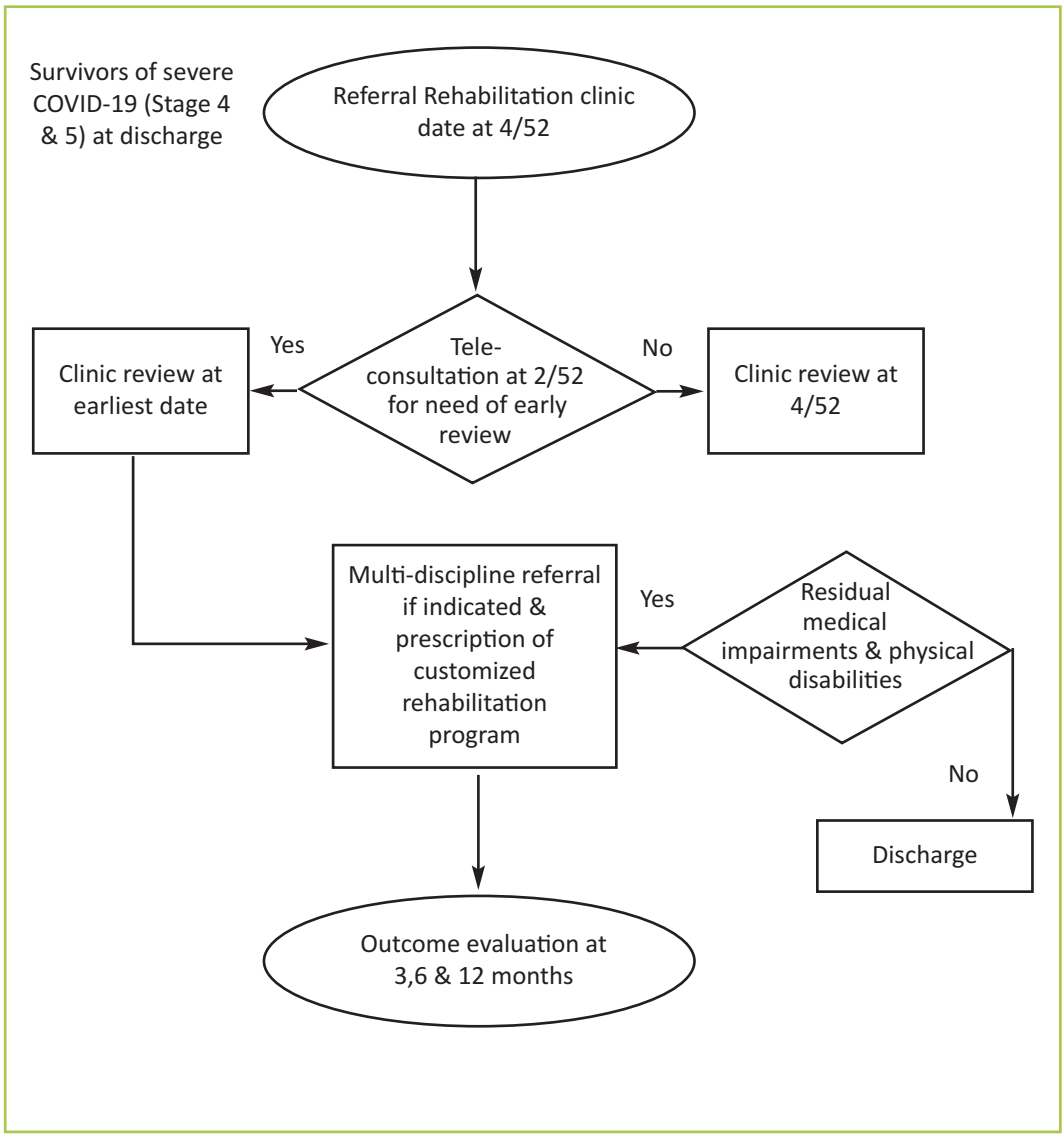
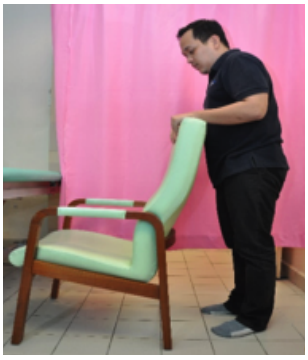


Figure 9.1: Workflow for Rehabilitation Referral upon Initial Acute Discharge

SYMPTOM RELIEVING POSITIONS

Position	Instructions
High side lying 	• The patient lies on his side with knees slightly flexed. • The head and neck are propped up by pillows.
Forward lean sitting 	• The patient sits at a table, leaning forwards from the waist with the head and neck resting on a pillow. • The arms may remain resting on the table.
Forward lean sitting, without table 	• The patient sits on a chair, leaning forwards with the arms resting on his thighs or on the armrests of the chair.
Forward lean standing 	• While standing, the patient leans forwards onto a windowsill, chairback or any other stable surface.

Position	Instructions
Standing with back support 	• The patient leans with his back against a wall and hands at his sides. • His feet should be about one foot away from the wall and placed slightly apart.

Table 9.2: Symptom Relieving Positions

Breathing techniques may also be taught to patients as a method to improve lung capacity, respiratory muscle efficiency, to facilitate airway clearance and to reduce symptoms such as dyspnoea.

BREATHING TECHNIQUES

Technique	Instructions
Diaphragmatic Breathing 	• The patient sits in a comfortable, relaxed and supported position • One hand is placed on the chest while the other is on the abdomen • The patient is asked to breathe in slowly through the nose and then to breathe out through the nose • With each breath, the patient should appreciate the hand over the abdomen rising more than the hand over the chest. • The patient is advised to use as little effort as possible and to ensure breaths are slow, relaxed, and smooth. • Perform __repetitions per set and do __ sets per day
Thoracic Mobility Exercise (TME) 	• The patient sits in a comfortable, relaxed and supported position • The patient slowly takes a deep breath while raising his arms towards the ceiling. • The patient is then instructed to hold his breath for 3 seconds. • The arms are slowly brought down to the lap while breathing out through the mouth with a pursed lip. • Perform__ repetitions per set and do __ sets per day.
Pursed Lips Breathing 	• The patient sits in a comfortable, relaxed and supported position • Ensure that the neck and shoulder muscles are relaxed. • The patient breathes in through the nose slowly for 2 counts, while keeping the mouth closed. • The lips are pursed as if about to whistle or gently flicker the flame of a candle. • The patient is then asked to breathe out slowly through pursed lips while counting to 4.

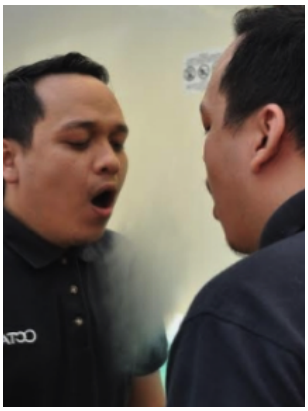
Technique	Instructions
	• These steps are repeated until breathing normalizes. • This technique may be used in combination with the symptom relieving postures to ease dyspnoea. • Perform__ repetitions per set and do __ sets per day
Huffing Technique 	• Huffing technique is a cycle of deep breathing, thoracic expansion and huff with the purpose of airway clearance. • Huffing occurs through forced expiration with an open mouth. • A huff is an active breath out with an open throat, like a sigh, as if trying to fog up a mirror. • The patient is asked to perform a sequence of 2-3 deep breaths then 1-2 huffs, followed by a cough to clear any sputum. • Perform__ repetitions per set and do __ sets per day

Table 9.3: Breathing techniques

1 Exercise Precautions

a. Exercising safely is important, even if the patient was pre-morbidly independent with his mobility. Additional precaution should be taken with patients who are at a higher risk of complications, such as the following:
   i. Impaired mobility pre-morbidly
   ii. History of falls before or during hospital admission
   iii. Co-morbidities that may put them at risk during exercise (heart disease, musculoskeletal injury)
   iv. Discharged from hospital with home oxygen therapy

b. Patients who fall in the above listed categories will require close supervision during their exercise sessions. The following advice should be given to these patients to ensure safety during exercise.
   i. Stretching and warm up sessions should be performed before exercising, whereas cool down sessions are to be done after exercising
   ii. Clothing used for exercise should be loose and comfortable, while shoes should be stable and supportive

iii. Exercises should be performed at least one hour after a meal
iv. Patients should drink adequate amounts of water
v. Outdoor exercises should be avoided during hot weather

c. Exercise should be terminated if the patient develops the following symptoms:
i. Nausea
ii. Dizziness or light headedness
iii. Severe shortness of breath
iv. Clamminess or sweating
v. Chest tightness
vi. Increased pain

In the event of the above symptoms, the patient is advised to contact their healthcare professional.

2. Warm Up Exercises

a. Warming up prepares the body for exercise and helps to prevent injury. Warm up exercises should last for approximately 5 minutes, and it should result in the patient feeling slightly breathless. These exercises may be done in sitting or standing positions. If the warm up exercises are done in the standing position, the patient should hold on to a stable surface for support as needed.

b. Each movement is repeated 2 to 4 times.

Examples of warm up exercises are given below.[11,14]

Exercise	Instructions
Shoulder Shrugs 	• The shoulders are lifted slowly towards the ears and then down again

Exercise	Instructions
Shoulder Circles 	• As the patient's arms are kept relaxed by the side or resting on the lap, the shoulders are slowly moved around in forward circle. • This is then repeated in a backward circle.
Side Bends 	• The patient's body is kept straight with the arms hanging down on either side. • One arm is slid down towards the floor while bending the body laterally and then returned to the start position. • This is repeated for the other arm.
Knee Lifts 	• The patient's knees are lifted up and down slowly one at a time, without exceeding hip height.

Exercise	Instructions
Ankle Taps 	• While seated on a chair, the patient taps his toes followed by his heel on the ground in front of him. • This is done in an alternating, repetitive sequence with the other foot.
Ankle Circles 	• While seated, the patient uses his toes to draw circles in the air • This is repeated with the other foot.

Table 9.4: Warm Up Exercise

3. Types of Exercises

a. Aerobic exercises (Fitness Training)

These exercises aim to improve overall endurance and fitness. Any physical activity that leaves the patient slightly breathless may be considered aerobic training.

Aerobic exercises should be timed and gradually increased over time according to the patient's tolerance. Increases may be done in periods of 30 to 60 seconds at a time.

These exercises should be done for 20-30 minutes per day, 5 days per week.

Examples of aerobic exercises are given below:

Exercise	Instructions
Marching on the Spot 	• The patient is in standing position, holding on to a stable surface or chair for support if necessary. A chair for resting should be placed nearby. • The knees are lifted one at a time • For exercise progression, the knees may be lifted higher, aiming to reach hip height if possible • This exercise may be indicated if the patient is unable to walk for long distances without rest or if the patient if unable to go outside for walking exercises.
Step-ups 	• The patient stands at the bottom step of a flight of stairs. A chair for resting should be placed nearby. • The handrail may be held for support if necessary. • The patient begins by stepping up and down, changing the leg he started with every 10 steps. • For exercise progression, the height of the step or the speed of stepping may be increased. Once the patient has achieved good balance, this exercise may be done without holding on to handrails. Eventually it may also be done while carrying weights. • This exercise may be indicated if the patient is unable to walk for long distances without rest or if the patient if unable to go outside for walking exercises.

Exercise	Instructions
Walking	• Assistive aids such as walking frame, crutches or walking stick may be used if necessary. • Selected routes for walking should be relatively flat. • For exercise progression, the speed or distance of walking may be increased. If possible, uphill routes may also be included. • This exercise may be indicated if the patient is able to go outdoors for exercise. Distance of walking: ____in 20 minutes
Jogging or cycling	• Jogging or cycling should only be prescribed if it is medically safe for the patient. • This exercise may be indicated if the patient was already able to cycle or jog pre-morbidly and if walking is not adequately exertive.

Table 9.5: Aerobic Exercises

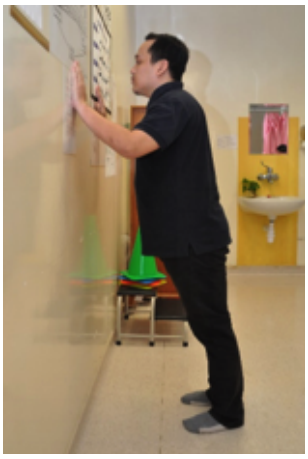
b. Strengthening Exercises

These exercises are also known as resistance training exercises and aim to improve muscle strength. Muscles may atrophy and become weaker due to deconditioning following Post COVID-19 infection. Hence these exercises should be incorporated into the patient's program.

Strengthening exercises should be performed repetitively with regular pauses in between. However, they are not recommended to be done on consecutive days due to the risk of muscle soreness and fatigue.

These exercises may be done three times in a week, on non-consecutive days.

Examples of strengthening exercises are given below:

Exercise	Instructions
Bicep Curl 	• The patient stands with arms to the side, while holding a weight in each hand. • Forearms are supinated so that the palms face forward. • The shoulder and proximal arm are kept stationary while the patient gently lifts the weights by flexing bilateral elbows. The weights should be brought up to the chest level. • This exercise may be done in sitting or standing position.
Wall Push Off 	• The patient stands facing a wall with his hands placed flat against it at shoulder height. • Fingers should be pointing upwards and the feet should be placed one foot away from the wall. • With the patient's body always kept straight, the elbows are flexed slowly to lower the body towards the wall. • The patient should then gently push away from the wall again until bilateral elbows are extended again. • This exercise is repeated ___ times, over ____ cycles.
Arm Raises to The Side 	• The patient stands with arms to the side, holding a weight in each hand and with the palms facing inwards. • Both arms are abducted to shoulder level (not beyond this) and slowly lowered back down. • This exercise may be done in sitting or standing. • This exercise is repeated ___ times, over ____ cycles.

Exercise	Instructions
Sit to Stand  	• The patient sits on a chair with the feet placed hip-width apart. • With the arms kept at the side or crossed over the chest, the patient slowly stands up, holding the end position for 3 seconds. • The patient then slowly lowers himself back into sitting position on the chair. • The patient's feet should be kept on the floor throughout this exercise. • If the patient is unable to rise from the chair without using his arms, a higher chair may be used. If he is still unable to rise, then he may push up with his arms. • This exercise is repeated ___ times, over ____ cycles. • For exercise progression, the movement should be done as slowly as possible. Alternatively, a lower chair may be used or the patient may hold a weight close to chest while performing this exercise.
Knee Straightening 	• The patient sits in a chair with feet together. • One knee is extended and the leg is held straight for a moment before it is slowly lowered. • This is repeated with the other leg. • This exercise is repeated ___ times, over ____ cycles. • For exercise progression, the time with the leg held in extension may be increased. Alternatively, the exercise may be performed with an ankle weight.

Exercise	Instructions
Squats 	• The patient stands with his back against a wall or any other stable surface, feet placed slightly apart. • The feet are moved about a foot away from the wall. • Alternatively, the patient may rest his hands on the back of a stable chair. • While keeping the back against the wall or holding on the chair, the knees are slowly and slightly flexed, allowing the back to slide down the wall. Hips should be maintained at a higher height than the knees. • The end position is maintained for a moment before knees are extended. • This exercise is repeated ___ times, over ____ cycles. • For exercise progression, the amount of knee flexion or the duration of maintaining the end position may be increased.
Heel Raises 	• In standing position, the patient's hands rest on a stable surface for balancing support. Leaning on the hands is not allowed. • The patient then slowly raises himself to stand on tiptoes before lowering himself down again. • This exercise is repeated ___ times, over ____ cycles. • For exercise progression, the time spent on tiptoes may be increased or the patient may stand on one leg at a time.

Table 9.6: Strengthening Exercises

4. Cool Down Exercises

Cool down exercises are indicated at the end of an exercise session. These allow the body to return to a more physiological state in a gradual manner before terminating an exercise session.

Cool down exercises should be performed for approximately 5 minutes.

Examples of cool down exercises are given below:

Exercise	Instructions
Slow Walk/ Gentle March	• The patient may walk at a slower pace or gently march on the spot, for approximately 2 to 5 minutes.
Repetition of Warm Up Exercises	• The recommended exercises for the warm up session may be repeated as cool down exercises, with the aim of mobilizing the joints. • These may be done in sitting or standing.
Muscle stretches	• Stretching of the muscles may help to reduce any soreness the patient may feel over the next few following exercise (DOMS- delayed onset muscle soreness). • Each stretch should be performed gently, and should be held for 15-20 seconds each. • Examples of muscle stretches are given below.
	**Shoulder:** • The patient's arm is placed in front and then brought across the body to the opposite shoulder. • The other hand is now used to press the arm against the chest. • The patient should feel a stretch around the postero-lateral shoulder joint. • The patient now returns to starting position and the same exercise is repeated on the opposite side.

Exercise	Instructions
	**Back of Thigh (Hamstring):** • The patient sits at the edge of a chair with the back straight and the feet flat on the ground. • One leg is placed in front with the heel resting on the ground. • The hands may be placed on the other thigh for support. • While sitting as tall as possible, the patient bends slightly forwards at the hips until a slight stretch may be felt along the posterior aspect of the stretched-out leg. • The patient now returns to starting position and the same exercise is repeated on the opposite side.
	**Lower Leg (Calf):** • The patient sits at the edge of a chair with the back straight and the feet flat on the ground. • One leg is placed in front with the heel resting on the ground. • The hands may be placed on the other thigh for support. • While sitting as tall as possible, the patient bends slightly forwards at the hips until a slight stretch may be felt along the posterior aspect of the stretched-out leg. • The patient now returns to starting position and the same exercise is repeated on the opposite side.

Exercise	Instructions
	**Front of Thigh (Quads):** • The patient stands with the feet apart and leans forward onto a wall or something sturdy for support. • One knee is flexed behind the patient and if he is able to reach it, the patient uses the hand on the same side to grip the ankle or the back of the leg. • The foot is then brought up to the level of gluteal muscles. • The patient should feel a stretch along the anterior aspect of the thigh. • The knees should be kept close together and back maintained in a straight position. • The patient now returns to starting position and the same exercise is repeated on the opposite side.

Table 9.7: Cool Down Exercises

Description	Cognitive function is a broad term that refers to mental processes involved in the acquisition of knowledge, manipulation of information, and reasoning. Cognitive functions include the domains of perception, memory, learning, attention, decision making, and language abilities. People undergoing crises may experience temporary or permanent loss of cognitive function. Early interventions offered for this impairment will facilitate recovery of optimal cognitive function.
Assessment	Mental State Examination (MSE) is a simple assessment tool that is used to screen cognitive function and helps to determine suitable interventions that may assist patients in regaining cognitive recovery.
Intervention	1. Patient education Both the patient and the family members should be educated on the possibility of cognitive impairment following COVID-19 as well as prolonged hospital stays. Awareness, tolerance and patience are important in creating an ideal environment for the ongoing rehabilitation process. Family members should accommodate the patient's impairment by allowing the patient to have more time for response and processing time. 2. Examples of strategies: (i) Using orientation boards to train patients with impaired orientation  (ii) Using external aids like notebooks, smartphones or calendars to do listing, setting alarms or writing notes for patients with impaired memory 3. Using internal memory strategies like mnemonic strategies, visualizing concepts or organizing information to enhance memory 4. Breaking down activities into individual steps to help patients with impaired executive function

Table 9.8: Managing Cognitive Issues

Description	The COVID-19 pandemic has been a source of stress and anxiety for many patients. These impairments may largely impact a patient's function and quality of life.
Assessment	DASS is a standard general assessment which is easily available and accessible for everyone. DASS evaluates the stress, anxiety and depression levels of a patient and helps to decide on further management when necessary.
Intervention	1. Patient education It is important to provide the right information for patients who have recovered from COVID-19 infection to alleviate the stress and anxiety to promote recovery. Suitable coping techniques can be adopted by patients at home and support from family and friends will be helpful. 2. Relaxation techniques (i) Progressive muscle relaxation - By slowly contracting and relaxing each muscle group in order, patients will be aware of the various physical and sensory feedback. - The patient is made to contract the muscle for 5 seconds and relax it for 30 seconds and this is then repeated for other muscle groups. - The patient may either start from the distal to proximal muscles (toes to neck) or proximal to distal muscles (neck to toes). (ii) Relaxation breathing - The patient can practice relaxation breathing technique by sitting comfortably on a chair or lying on a bed. By slowly contracting and relaxing each muscle group in order, the patient will become more aware of the physical feedback.

Relaxation: Sitting position

Relaxation: Lying position

3. The patient is advised to be physically active by gradually increasing their physical activities in a safe manner

(i) Initiate routine activities
- Start by performing dressing, simple cooking, slow walking.

Outdoor walking

(ii) Explore new activities
- Planning a new leisure activity will help in managing stress and improving mood.

Playing the words scramble board game

Composing flowers/ simple home decoration

Gardening

Table 9.9: Managing Stress and Emotional Health

Description	Fatigue or tiredness is used to describe an overall feeling of lack of energy. Following COVID-19 infection, patients experience physical fatigue as well as emotional fatigue. This subsequently results in a 60% reduction in the ability to perform basic ADL compared to their pre-morbid status.
Assessment	Analogue Fatigue Score Scale (AFSS) is a simplified tool which is used to evaluate fatigue severity. It is a self-report scale which reflects global fatigue on a scale of 1-10.
Intervention	1. Patient education Education on awareness of fatigue offers a better understanding for patient to self-manage their symptoms at home and boost the patient's confidence when performing daily activities. 2. Energy conservation technique (i) Planning - Organize daily activities at the start of the day - Utilize modified aids and equipment where possible (ii) Prioritize - Identify important tasks and complete that first - Eliminate non-essential tasks (iii) Pacing - Avoid rushing through tasks - Break down larger tasks into smaller portions and distribute them throughout the day - Stop for breaks before becoming tired 3. Introducing physical exercise Gradually introducing physical exercise including aerobic exercise into daily routine will help to cope with fatigue.

Table 9.10: Managing Fatigue

Description	Returning to independent function is closely interlinked with the patient's quality of life. Maintaining independence in performing self-care and social activities is particularly important in preserving dignity. This leads to self-satisfaction and optimized quality of life. Post COVID-19, these patients may need assistance due to physical and mental deterioration.
Assessment	1. Modified Barthel Index (MBI) is a suitable assessment used to assess the patient's independence in performing ADL. It is also easily accessible and performed by therapists, being used as an indicator of baseline function as well as to monitor progress. 2. WHODAS is a general assessment consisting of 36 items including cognitive function, mobility, self-care and social interaction.[2]
Intervention	1. Patient education It will be beneficial to advice patients to become active again during the recovery period. Simple tasks may require more effort than before and patients will become tired more easily. Advise patients to set small goals and progress gradually to meet their expectations while also allowing others to help them when the tasks become too strenuous for them. 2. Modifications in performing activities of daily living (i) Perform tasks while sitting down whenever possible to save energy  Sitting on high chair during grooming

(ii) Choose lighter equipment during activities

Using lighter cooking pan during meal preparation

(iii) Use adaptive devices to facilitate activities and prevent excessive body movements.

3. When the patient is ready to return to work, work simplification techniques will be useful in the workplace for the patient to gradually resume their work at full capacity.
   (i) Prepare and plan the activity
   (ii) Minimize hand and body motions during activity
   (iii)Organize the workplace and required tools
   (iv)Change to more appropriate tools
   (v) Change the method of tool utilization

Table 9.11: Managing Activities of Daily Living and Improving Quality of Life

10.6 Patients shall be considered for enrollment in a hospital-based outpatient pulmonary rehabilitation program if they are able to actively participate in therapy and able to attend the weekly Physiotherapy and Occupational Therapy sessions of 1 hour respectively for total duration of 8 weeks.[13] Refer **Figure 9.2** (Workflow Algorithm for Outpatient based Post COVID-19 Pulmonary Rehabilitation (PCPR) Program).

WORKFLOW ALGORITHM FOR OUTPATIENT BASED POST COVID-19 PULMONARY REHABILITATION (PCPR) PROGRAM[13]

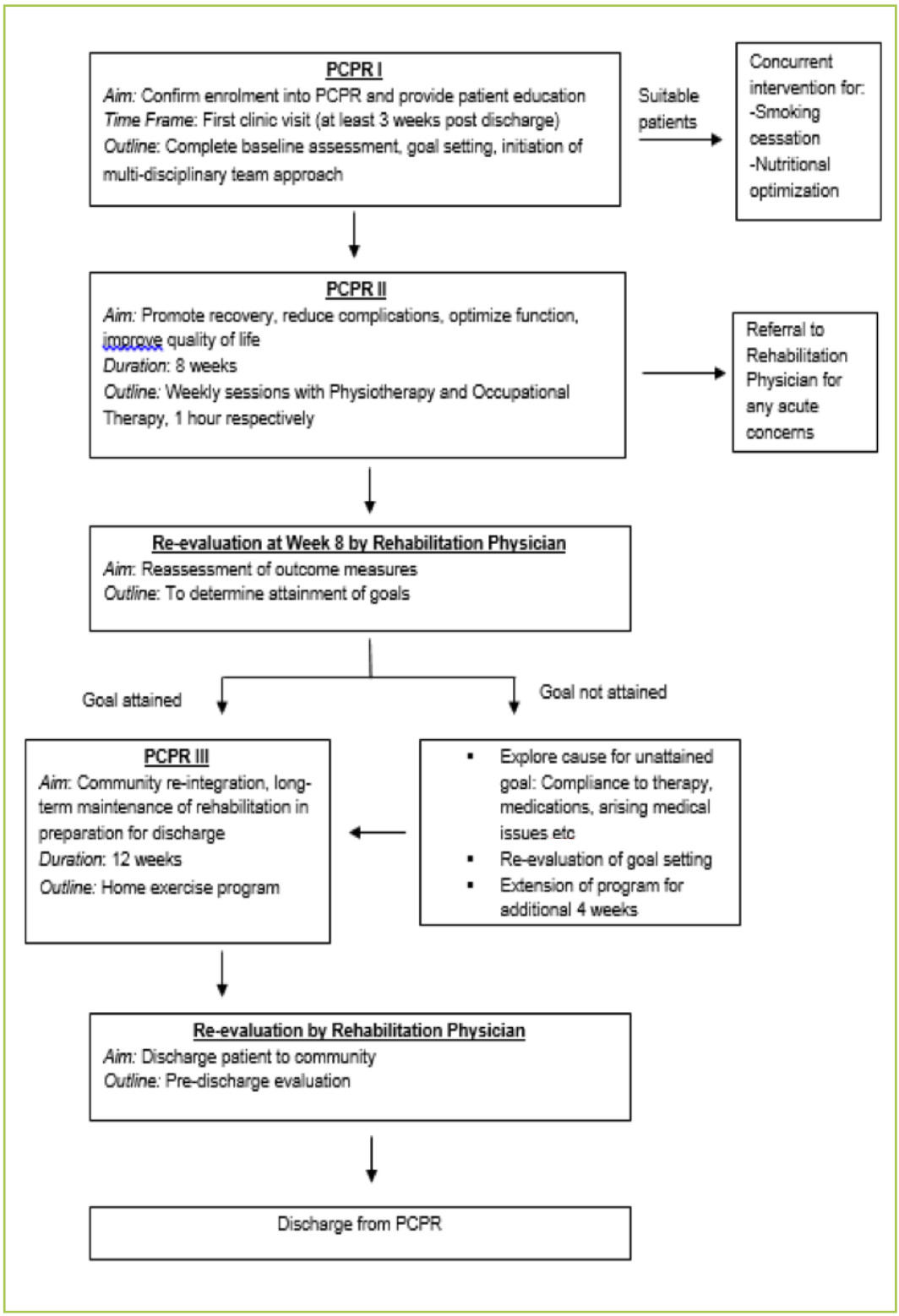


Figure 9.2: Workflow Algorithm for Outpatient based Post COVID-19 Pulmonary Rehabilitation (PCPR) Program

11.0 Monitoring and Evaluation / Surveillance

General surveillance checklist questions adapted from literature review framework[2,3] for multi-system medical impairment and identification of rehabilitation needs shall be used. Suggested surveillance checklist questions for multi-system medical impairment and identification of rehabilitation needs for COVID-19 survivors applicable during teleconsultation as in **Table 9.9** (Suggested Surveillance Checklist Questions). This framework may also be applied throughout the spectrum of rehabilitation process physical review.

Domain	Questions	Remark
Opening question	Introduction - name, designation, hospital; reason for enquiry for post-discharge progress, issues and planning for intervention if required.	Initial open ended question
	Do you experience any new symptoms or problems that concerns you compared to before you had COVID-19?	
Bodily structure & function. Post COVID-19 common symptoms enquiry	Do you still experience persisting or new problems commonly associated with post COVID-19 symptoms such as:	Based on some of the common symptoms reported in literature[2-4,7-10] and identified in the CROSS[12] database.
	▪ Abnormality of smell?	
	▪ Abnormality of taste?	
	▪ Overly tired?	
	▪ Breathing difficulties?	
	▪ Cough?	
	▪ Muscle weakness?	
	▪ Difficulty sleeping?	
	▪ Slow thinking process?	
	▪ Forgetful?	
	▪ Pain?	
	▪ Abnormal sensations?	
	▪ Mood disturbance?	
	▪ Dysfunctional bladder and bowel?	
	▪ Skin problems?	
	Any other problems concerning you?	
Activity & Participation	Are you able to perform, if you wishto and at your level of expectation:	Based on the common activity & participation challenges reported in literature[2-4,7-10] and identified in the CROSS[12] database.

Activity & Participation	Are you able to perform, if you wishto and at your level of expectation: ▪ Self care? ▪ Household and domestic activities? ▪ Swallowing, eating, drinking? ▪ Communicating? ▪ Walking within the house including the stairs? ▪ Walking outside the house? ▪ Transportation / driving? ▪ Activities related to your leisure? ▪ Activites related to your job? ▪ Do you use any adaptive/ assistive devices?	Based on the common activity & participation challenges reported in literature[2-4,7-10] and identified in the CROSS[12] database.
Ending questions	Is there any other challenges in your daily life that concerns you? Thank you for the information given. You may contact our healthcare facilities shall you have any new concerns. Otherwise we shall review you at the scheduled appointment date.	End with general advice and positive encouragement for recovery.
Note: To be applied whenever applicable as per judgement of attending clinician		

Table 9.12: Suggested Surveillance Checklist Questions

Name: Registration number:
Date begins: Date end:
Week:

Day	Breathing exercise	Strengthening exercise	Duration	Aerobic activity	Duration	Intensity	HR/SPO_2 before	HR/SPO_2 during	HR/SPO_2 after
1.									
2.									
3.									
4.									
5.									
6.									
7.									

Note: Upon completion of the 8 weeks program, please bring this diary along at your next appointment with the doctor.

Table 9.13: Home Exercise Diary and Monitoring Log

<table>
<tr><th>Methods</th><th>Scale</th></tr>
<tr><td>Borg Scale[11,14]
Monitoring of exercise intensity is done using the Borg scale and may assist patients to exercise at their optimal levels.
• Reassure the patient that feeling breathless whilst exercising is normal and is not harmful or dangerous.
• The Borg scale can help patients rate how much effort is required to complete the prescribed exercise, hence help them to monitor the progress of their fitness level.
• Start at lower intensities (scale 2-3) especially during the initial 6 weeks following COVID-19, and gradually progress to moderate intensities (scale 4-5) and high intensities (scale 6-7) as tolerance.</td><td><table><tr><th>Intensity</th><th>Scale</th><th>Description</th></tr><tr><td></td><td>0</td><td>Nothing at all</td></tr><tr><td></td><td>0.5</td><td>Very, very slight</td></tr><tr><td></td><td>1</td><td>Very slight</td></tr><tr><td>Low</td><td>2</td><td>Slightly</td></tr><tr><td></td><td>3</td><td>Moderate</td></tr><tr><td>Moderate</td><td>4</td><td>Somewhat severe</td></tr><tr><td></td><td>5</td><td>Severe</td></tr><tr><td>High</td><td>6</td><td></td></tr><tr><td></td><td>7</td><td>Very severe</td></tr><tr><td></td><td>8</td><td></td></tr><tr><td></td><td>9</td><td>Very, very severe</td></tr><tr><td></td><td>10</td><td>Maximal</td></tr></table></td></tr>
<tr><td>Heart rate prescription[17]
Exercise intensity may be prescribed by allowing a specific increment of the heart rate over the resting heart rate (RHR).
• For patients at higher risk, a limited increment is allowed during exercise sessions.
• Patients may be taught this method to monitor their home program as it is simple assessment that does not require tools.</td><td>Increment over resting heart rate (RHR + intensity)
Low intensity: 10-25 bpm above RHR
Moderate intensity: 20-35 bpm above RHR
High intensity: 30-55 bpm above RHR</td></tr>
</table>

Table 9.14: Monitoring Exercise Intensity

COVID-19 REHABILITATION DATABASE TEMPLATE					
Name:	IC:		Age:	Gender:	
Education status:			Race:	Occupation:	
COVID-19 Category: ☐ Category 1 ☐ Category 4 ☐ Category 2 ☐ Category 5 ☐ Category 3				Complication: ☐Organizing Pneumonia ☐Pulmonary Fibrosis ☐Stroke ☐Pulmonary Embolism ☐Myocardial Infarction ☐Myocarditis ☐Deep Vein Thrombosis ☐AKI ☐Acute Liver Injury ☐Pressure Injury ☐Others:	
Date of admission:				Date of discharged:	
Length of stay:				Tracheostomy: Yes / No	
ICU / HDW admission: Yes / No				LOS in ICU / HDW:	
Days of intubation:				LTOT requirement:	
Medical co-morbidities:					
COVID-19 treatment: Steroid ☐ Antiviral ☐					
Residual symptoms at 2/52 post-discharge tele-consultation:					
Assessment & Outcome Measure	**Predischarge**	**1 month**	**3 months**	**6 months**	**12 months**
Residual symptoms	☐Cough ☐SOB ☐Fatigue ☐Pain ☐Muscle weakness ☐Others:	☐Cough ☐SOB ☐Fatigue ☐Pain ☐Muscle weakness ☐Others:	☐Cough ☐SOB ☐Fatigue ☐Pain ☐Muscle weakness ☐Others:	☐Cough ☐SOB ☐Fatigue ☐Pain ☐Muscle weakness ☐Others:	☐Cough ☐SOB ☐Fatigue ☐Pain ☐Muscle weakness ☐Others:
mMRC Dspnoea					
VAS (Pain)					
AFSS					
BMI					
PEFR / PCF					
6MWT					
1-Minute Chair Rising Test					
Brief MSE					
MBI					
DASS					
PCFS					
RTD (Yes / No)					
RTW (Yes / No)					
WHODAS 2.0					
mMRC- Modified Medical Research Council Dyspnoea Scale; VAS- Visual Analogue Scale; AFSS- Analogue Fatigue Scale Score; BMI - Body Mass Index; 6MWT – 6-minute Walking Test; Brief MSE – Brief Mental State Examination; MBI- Modified Barthel Index; DASS- Depression Anxiety Stress Scale; PCFS- Post Covid-19 Functional Status Scale; PEFR- Peak Expiratory Flow Rate; PCF- Peak Cough Flow; RTD- Return to Drive; RTW- Return To Work; WHODAS- World Health Organization Disability Assessment Scale.					

Table 9.15: COVID-19 Rehabilitation Database Template

12.0 Standardized Outcome Measures

12.1 The standardized outcome measures and assessment tools in **Table 9.12**, Table **9.13** and Table **9.14** shall be used. These include (but not limited to) 6 Minute Walk Test, 1 Minute Chair Rise; Depression Anxiety Stress Scale; Analogue Fatigue Scale Score; Modified Medical Research Council Dyspnoea Scale; Modified Barthel Index; Brief Mental State Examination; Mini Mental State Examination; Post Covid-19 Functional Status Scale; Peak Expiratory Flow Rate/ Peak Cough Flow; Return To Work; Return to Drive; Visual Analogue Scale; World Health Organization Disability Assessment Scale 2.0). [1-5,12]

12.2 These standardised outcome measures for the specific multi-system domains shall be used for monitoring of quality rehabilitation intervention;to standardize the reporting of rehabilitation outcomes; to facilitate data analysis especially pertaining to functional based research, and to improve the comparability of evidence-based data. [1-5]

13.0 Conclusion

13.1 Rehabilitation needs of individuals with COVID-19 exist during the acute, sub-acute and throughout the long-term phases of care. It is often amplified patients with underlying medical co-morbidities, decrements in health associated with ageing process and indirectly by pandemic containing measures.

13.2 Rehabilitation services play an important integral role alongside other healthcare professionals in providing comprehensive care of COVID-19 survivors towards optimal medical and functional recovery, hence successful re-integration back into community.

13.3 In the community, emphasis shall be made specifically for patient and their caregivers empowerment, increase their confidence level in self-management, improve their overall function hence their quality of life.

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CHAPTER 10

MANAGEMENT OF PSYCHOLOGICAL ISSUES IN POST COVID-19 INFECTION

1.0 Introduction

1.1 Pandemic COVID-19 has been living a huge impact on the psychology of the mass population. It is not only in Malaysia but all over the world. Till date, we are still accumulating more data pertaining to the impact to psychological wellbeing of the population and at the same time the direct psychological impact to everyone affected by the illness itself. By middle of March 2021, there were more than 300,000 were affected by the illness and more than 1,200 have succumbed to it.

1.2 With these large number of survivors of the illness, we will start to see the emergence of psychological effects of it directly or indirectly. During the initial part of the pandemic, experts were discussing the impact based on the knowledge of the psychological impacts during and post disaster. However, we are more interested to know what will be the direct sequelae of the illness to the survivor and how we can offer our services to them.

1.3 There are 5 identified mental health related issues that might lead to mental health problem or mental illness. It is worth to discuss all these one by one for us to gauge the management level and intervention that need to be introduced in order to optimize the service that we provided. In view of majority of the cases will end up in primary care as their first point of contact post discharge, it is imperative for us to make sure that there will be a guideline to help them managing or referring the case accordingly.

1.4 These are **5** identified domains of mental health issue Post COVID-19:

5 DOMAINS OF MENTAL HEALTH ISSUES POST COVID-19

Figure 10.1: 5 Domains of Mental Health Issues Post COVID-19

2.0 Trauma Related Issue

2.1 Trauma related issues associated with COVID-19 occur in a spectrum ranging from psychological distress to a more severe symptomatology fulfilling the criteria of diagnosing a psychiatric disorder.

2.2 While some may be more resilient, others might be more vulnerable due to multiple factors such as genetic factors, personality traits, underlying co morbidities, psychosocial factors etc. Thus, early recognition of symptoms is important in order to provide necessary care.

A. Adjustment disorder

a. This pandemic causes an unprecedented impact on the economy, health, social and political sectors worldwide. The majority are not 'threatened' per se by this illness like in post-traumatic stress disorder, but experience a huge life stressor due to financial insecurities, social restriction, future uncertainties etc., which some may present with significant emotional or behavioural symptoms.

b. According to DSM-5, to diagnose adjustment disorder, there has to be distressing symptoms which are out of proportion to the severity and intensity of the stressor which occur within 3 months of the onset of stressor. It also causes impairment in functioning. The symptoms resolve within 6 months after the stressor, or its consequences have ceased.

c. Psychological intervention is the treatment of choice and should be tailored to the patient. For example, providing supportive psychotherapy by enhancing coping and problem-solving skills to deal with life stressors, behaviour approaches to manage maladaptive behaviour etc. Medication may be prescribed to alleviate symptoms.

d. Patients should be referred to a psychiatric unit when there is presence of suicidality, causes significant impairment in function or diagnosis of a more severe psychiatric disorder is suspected.

B. Post-traumatic stress disorder (PTSD) & acute stress disorder (ASD)

a. Looking at past infectious disease outbreaks (Middle East respiratory syndrome (MERS) & severe acute respiratory syndrome (SARS), there would be increased prevalence of post-traumatic stress symptoms and post-traumatic stress disorder (PTSD) among COVID-19 survivors. Current available data on prevalence of PTSD symptoms in MERS outbreak were 36%, SARS 18% and COVID-19-19 9%. Among those, healthcare workers had the highest prevalence, followed by infected cases, and the general public.

b. Extreme stressors associated with COVID-19 include treatment of the disease (e.g., fear of death from life-threatening illness, pain from medical interventions such as endotracheal intubation, limited ability to communicate, and feelings of loss of control), witnessing severe illness or death of close family members.

c. Diagnosing PTSD (based on DSM-5) requires:

i. Exposure to the threat
ii. Having intrusive symptoms (e.g., distressing memories/ dreams/ having flashbacks/ psychological distress or marked reactions when exposed to cues)
iii. Avoidance of stimuli associated with the traumatic event (distressing memories, thoughts, or feelings/ external reminders)
iv. Negative alterations in cognitions and mood (e.g., dissociative reactions/ exaggerated negative beliefs/ persistent negative emotions/ marked reduced in interest/ feelings of detachment/ inability to experience positive emotions)
v. Marked alteration in arousal and reactivity (irritability/ recklessness/ hypervigilance/ exaggerated startle response/ poor concentration/ sleep disturbance)

d. These symptoms were present at least for a month and cause significant distress and impairment in functioning.

e. Meanwhile, acute stress disorder (ASD) is diagnosed when symptoms were present between 3 days to 1 month post traumatic event exposure.

f. Risk factors which may contribute to increased risk of developing PTSD and chronic psychological distress:

   i. Socio-demographic factors (e.g., gender - female, age – older adults)
   ii. Exposure-related factors (e.g., living in highly affected areas, knowing, or having a close relationship with someone infected with COVID-19, becoming infected with COVID-19, being quarantined, or hospitalized for COVID-19, and working on the front line of the COVID-19 pandemic)
   iii. Loss of a loved one
   iv. Pandemic-related worries and stressors (e.g., fear of being infected, concerns about family members' health and safety, financial losses, job loss, housing problems, social isolation, and lack of support)

g. In addition, some populations, such as individuals with certain disabilities may experience unique challenges.

h. It is important to have a high index of suspicion to be able to detect the symptoms early and referral should be made to a psychiatric unit for a formal evaluation and early intervention. Treatment consists of trauma-based psychotherapy and/or pharmacotherapy i.e., selective serotonin reuptake inhibitors or serotonin norepinephrine reuptake inhibitors.

3.0 Grief & Loss

3.1 Assessment can be based on the 5 stages of grief by Kubler Ross, it is an objective assessment of grief stages that can be used especially when none of the psychiatric diagnosis criteria can be fulfilled during initial assessment at primary care. What are the stages?

   a. Denial: Patient will experience a mixture of emotion and behavior such as avoidance behavior of treatment and follow up, confusion of situation, inappropriately elated, shock and fear
   b. Anger: Frustrated patient, easily irritated and anxious
   c. Bargaining: Struggling to find meaning and reaching out to others
   d. Depression: Overwhelmed and helpless
   e. Acceptance: Exploring options to move forward

3.2 Grief and loss can be managed by counsellors who are trained in grief work or a clinical psychologist where available. To refer to these 2 services in tertiary centers, it must be done thru the psychiatry clinic and need to be discussed with psychiatrist of the respective hospital.

4.0 Underlying Mental Health Issues

4.1 There is patient under primary care follow up and there will be patient who come to primary care for other issues but has underlying mental illness which was previously stabile. The main concern in this cohort of the patient is the emergence of relapse symptoms that can be triggered by many reasons including non-adherence to psychiatry medication during quarantine or admission, the use of steroid that might increase risk of relapse or emergence of new psychiatric symptoms or neurological sequelae of COVID-19.

4.2 Management of relapses can be managed as usual unless there are suspicion of other coexist or comorbid issues.

5.0 Stigma & Isolation

5.1 Infectious diseases are known to bring about stigma - an attribute linking a person to a set of negative or undesirable characteristics, leading them to be prejudiced or discriminated against9. In this context, people are labelled, stereotyped, discriminated against, treated separately, and/or experience loss of status because of a perceived link with a disease (e.g., COVID-19)[10]. The psychological sequelae of COVID-19 commonly seen in COVID-19 survivors, health care workers and other frontliners include grief, fear, depression, anxiety, post-traumatic stress disorder and stigma, [11,12]. Stigma or 'Hidden threats' in the form of fear of seeking medical care would lead to underreporting and under testing of cases, compromising efforts to provide effective health care, thus increasing the spread, morbidity and mortality of COVID-19 cases [12,13].

5.2 Why is there Social Stigma?

Due to reports of COVID-19 being associated with severe morbidity and mortality, there is a fear of being infected or being in contact with those potentially affected [10,11]. Studies have found that misinformation, false news and rumors related to COVID-19 circulating through social media caused unfounded fears and confusion amongst the people[14].

5.3 Approaches in Combating Stigma

Several approach can be done by the Family Medicine Specialists (FMS) and people from various agencies to combat this.

5.4 COVID-19 survivors

a. COVID-19 survivors go through a different kind of loneliness and isolation after being quarantined and recovering from COVID-19[15]. These survivors are at times accused of being negligent and

ignorant, thereby held responsible for contracting the virus, causing them to discriminated by society[16]. People keep their distance from them in fear of contracting the infection from them[15].

b. The issues that are commonly seen among the survivors are[17], confusion about COVID-19 information and its vague prognosis, the fear of imminent mortality, the psychological distress in isolation (dull isolation days), psychological problems among family members, the psychological burden of being a carrier and fear of transmitting the disease or being rejected[16].

c. Screening these survivors for grief, depression and anxiety would be of benefit. Using screening tools like the Depression Anxiety Stress Scale 21 (DASS-21) would be useful to assess the current condition of the survivor. Allow these people to speak about their feelings by providing them a safe space and time when talking about their feelings[14]. Monitor their emotional states regularly. Assure them that their feelings are a normal reaction to adversity and uncertainties[14]. At all times, confidentiality must be maintained.

d. Psychological interventions like grounding, relaxation techniques and mindfulness would help these patients concentrate on being in the present ('here and now').

e. Peer emotional groups, psychological support, counselling or social engagement would proof beneficial and helpful[14]. COVID-19 survivors can share their experiences and issues with the public. Stigma can be reduced by highlighting and praising survivors who adhere to the government protocol. By educating the public, stigma and discrimination towards these survivors can be reduced.

f. However, if these survivors do not improve, they should be guided to seek help from counsellors or the Mental Health and Psychological Support Services (MHPSS), a hotline that delivers psychosocial services available to everyone[14].

5.5 Advocate for COVID-19 survivors[10]

a. Awareness through all forms media platform should be done with caution without increasing fear. For example: Use appropriate terms like COVID-19 or people who may have COVID-19, speak accurately about the risk of COVID-19 using evidence-based research and talk positively while emphasizing the effectiveness of prevention and treatment measures

b. Encourage responsible handling of information via social media while challenging myths and stereotypes

c. Providing emotional support to affected people during different stages of isolation/treatment can help them overcome the psychological impact of stigma

5.6 There is no health without mental health. Therefore, if the individual needs further assistance with regards to mental health, it is imperative that said individual be referred to the nearest psychiatric department for further assessment and treatment.

6.0 Emergence of Mental Health Disorder

6.1 Anxiety Disorders (Generalized Anxiety Disorder, Panic Disorder, Specific Phobia)

The diagnostic criteria of the said diagnoses are not changed despite its onset are post COVID-19 infection. However, working diagnoses of the said disorders should be enough to trigger the management of the patient.

6.2 Somatic Symptoms & Related Disorders (Somatic Symptoms Disorder, Illness Anxiety Disorders, PFAOMC)

a. These are a set of mental disorders that is not familiar in primary care and usually diagnosed in consultation liaison (CL) setting. In view of limited numbers of CL psychiatrist in Malaysia, the diagnosis and management of the illnesses can be done with the local psychiatrist. Diagnoses and managements are more complicated.

b. The diagnoses are usually related to and will influence patient behavior towards treatment, adherence and possible disease complication

6.3 Major Depressive Disorders

a. This is one of the identified mental illness post COVID-19 with more data emerged from other countries. The management is the same as per Clinical Practice Guideline of Major Depressive Disorder that is available. There is new recommendation for managing Post COVID-19 depression and this can be discussed with the psychiatrist

6.4 Neuropsychiatric Sequelae of COVID-19

a. Central Nervous System manifestation of COVID-19 can be debilitating with possible short- and long-term neuropsychiatric sequelae. Among the identified CNS manifestation are headache and dizziness, cerebrovascular events, meningoencephalitis and encephalopathy and seizures.

b. These sequelae might end up with multiple psychological and behavioral manifestation that needs psychiatric intervention in short term or long term. These cohort of patients need to be referred to psychiatry based on several red flags in order for us to not miss anything during regular follow up in primary care. What are the red flags?

c. History of intensive care unit admission and/or prolonged ventilation

d. History of delirium/ disorganized behavior/psychosis

e. Cognitive issues including poor memory and concentration Post COVID-19 infection

7.0 Psychiatry conditions that require Psychiatry Referral

Patient may present to primary care facilities with nonspecific psychological and/or behavioral issues. The symptoms may or may not fulfil any specific psychiatric diagnosis but it is very important to discuss with the nearest psychiatrist in order to stratify care and management of the patient as the following. However, patients who come with delirium or disorganised behaviour (red flag symptoms) require urgent referral to the nearest hospital.

a. Prolonged and persistent mood and/or behavioral changes for more than 2 weeks
b. History of intensive care unit admission and/or prolonged ventilation
c. Relapse of the underlying psychiatric disorder
d. Sleep disturbance: difficulty to initiate sleep, difficulty maintaining or early morning awakening
e. Cognitive issues including poor memory and concentration in non-geriatric population
f. Background history of steroid use during COVID-19 management

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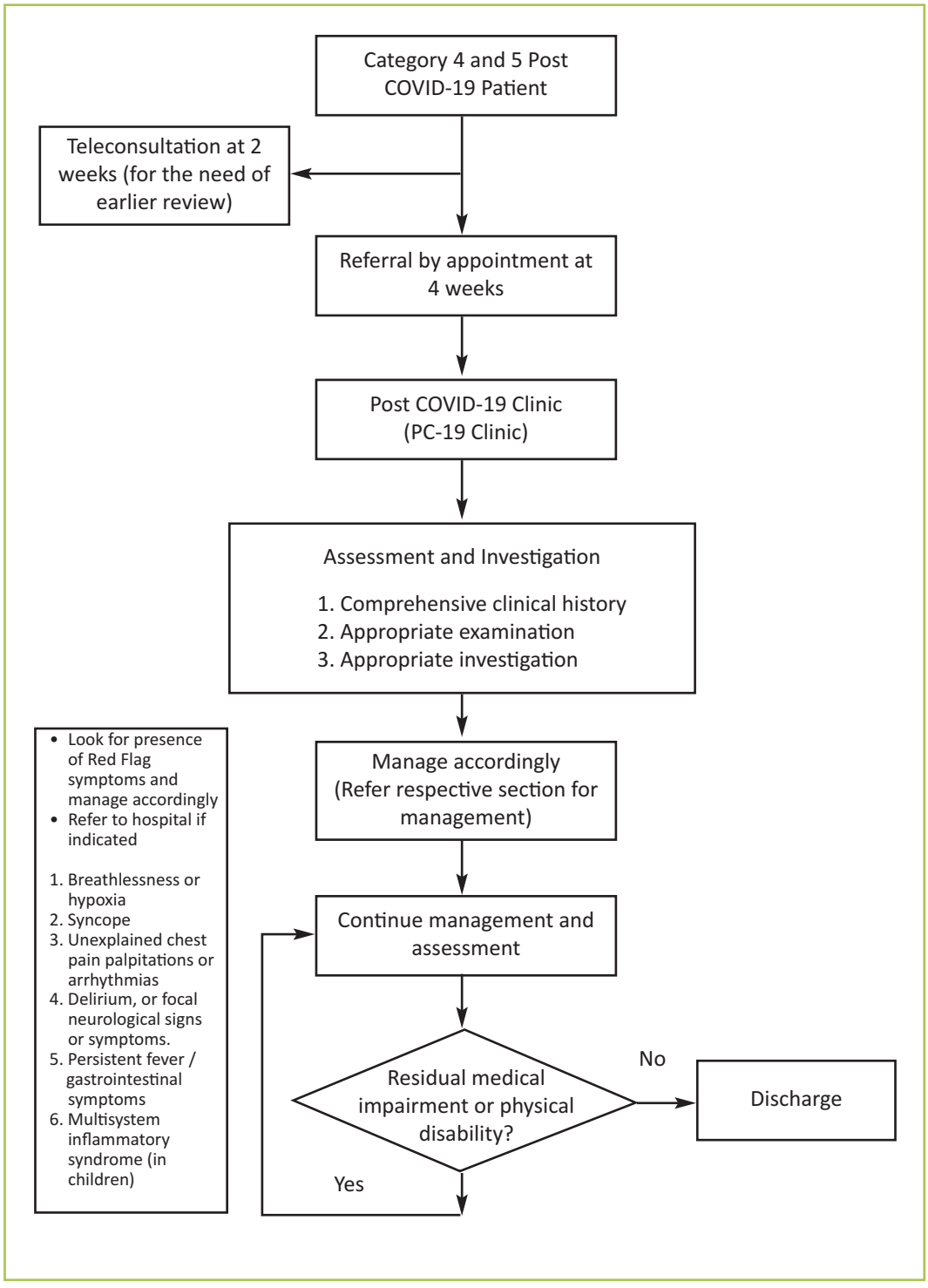
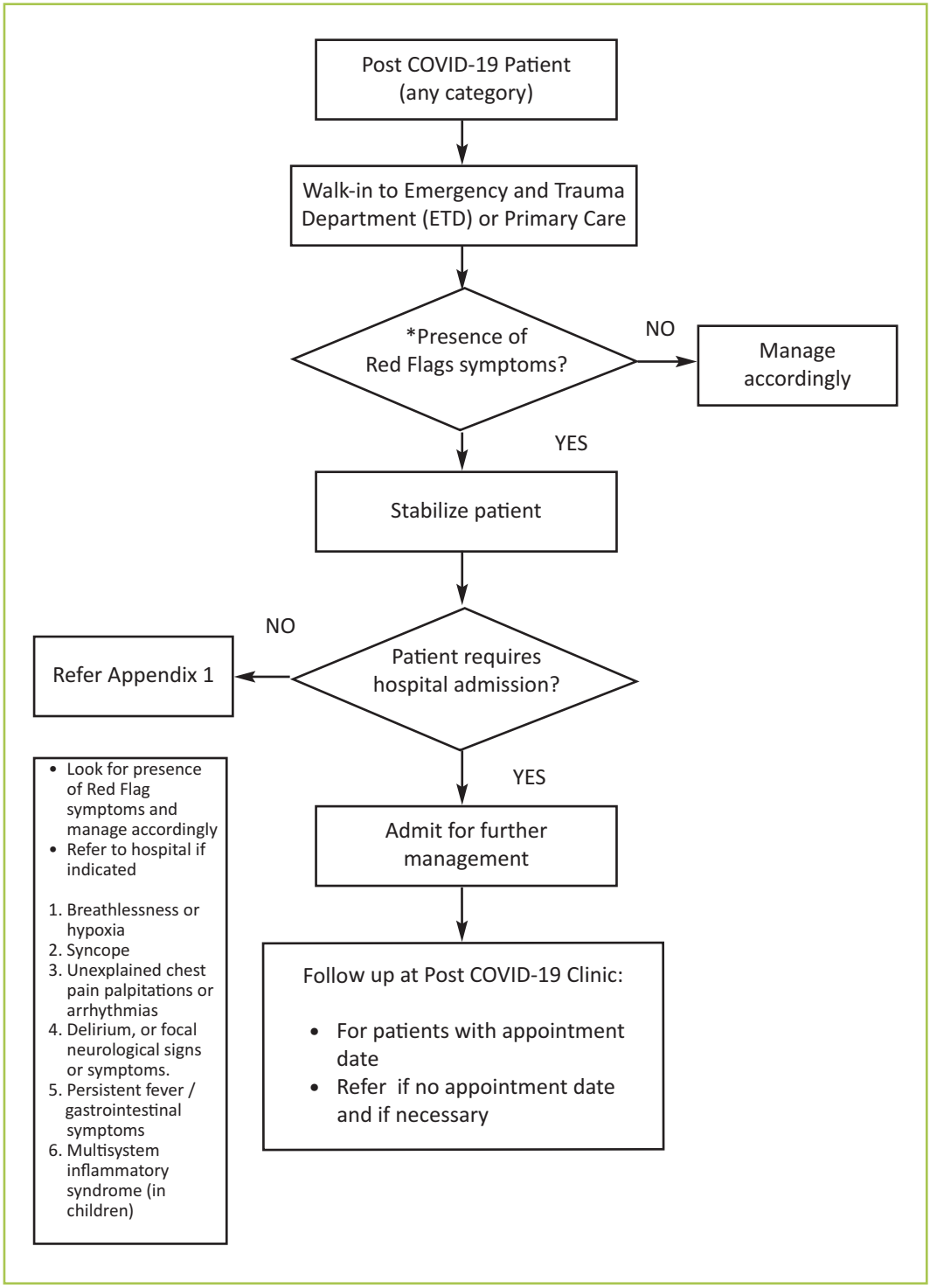
Appendix 1

POST COVID-19 (CATEGORY 4 AND 5) MANAGEMENT FLOW CHART AT HOSPITALS/INSTITUTIONS



Appendix 2

MANAGEMENT FLOW CHART FOR WALK-IN POST COVID-19 PATIENTS



Appendix 3

KEMENTERIAN KESIHATAN MALAYSIA
COVID-19 PATIENT DISCHARGE NOTE / NOTA DISCAJ PESAKIT COVID-19
Hospital/PKRC_____

1. NAME/ NAMA:	**2. AGE/ UMUR:**
3. IC NO. / PASSPORT/NO. KP:	**4. GENDER/ JANTINA:**
5. DATE OF ADMISSION/TARIKH KEMASUKAN	**6. DATE OF DISCHARGE /TARIKH DISCAJ:**

7. FINAL DIAGNOSIS/ DIAGNOSA AKHIR:
Comorbid: _____
Complication: _____
Highest Category: _____
Date of Positive Swab Taken: _____
Date of 1st Symptoms, if any: _____

8. NOTE FOR FOLLOW UP, IF ANY / CATATAN UNTUK RAWATAN SUSULAN, JIKA PERLU

8.1 Follow up / Rawatan susulan

a. Hospital /Health Clinic/ Panel Clinic
Hospital / Klinik Kesihatan/ Klinik Panel: _____

b. TCA PRN/Rawatan susulan bila perlu

8.2 Summary of Management & Medications During Admission / Ringkasan Rawatan & Ubat di Wad

8.3 Discharge Medication List (if any)/ Senarai Ubat Discaj (jika ada):

Note/ Nota

- Patients are eligible to return to work after Medical Certificate (MC) period has ended/ Pesakit layak untuk kembali bekerja setelah tamat tempoh Sijil Cuti Sakit (MC)
- The risk of spreading the infection to other people is considered minimal or nil once patients have completed the isolation period as advised by the doctor/Risiko jangkitan kepada orang lain dianggap minimum atau tiada setelah pesakit menamatkan tempoh isolasi seperti yang dinasihatkan oleh doktor.

9. MC NO. / NO. SIJIL CUTI SAKIT:

10. DETAILS OF ATTENDING PHYSICIAN/BUTIRAN PEGAWAI PERUBATAN
Signature/Tandatangan: _____
Name of Attending Physician/Nama Pegawai Perubatan: _____
Official Stamp/ Cop Rasmi:
Date/ Tarikh: _____

Please bring this "Discharge Note" during follow up/Sila bawa bersama 'Nota Discaj' ini semasa rawatan susulan
This "Discharge Note" is not to be used in Court /"Nota Discaj" ini bukan untuk kegunaan Mahkamah

Ministry of Health Malaysia
Updated on 28 May 2021

Appendix 4

MINISTRY OF HEALTH MALAYSIA
POST COVID-19 REFERRAL LETTER/ SURAT RUJUKAN POST COVID-19

1. NAME/ NAMA:	2. AGE/ UMUR:
3. IC NO. / PASSPORT/NO. KP:	4. GENDER/ JANTINA:
5. PHONE NO/ NO. TEL:	6. RN:
7. DATE OF ADMISSION/TARIKH KEMASUKAN:	8. DATE OF DISCHARGE /TARIKH DISCAJ:

9. NOTES FOR REFERRAL / NOTA RUJUKAN

10. FINAL DIAGNOSIS/ DIAGNOSA AKHIR:

Highest Category: Please circle - CAT 1/ CAT 2 / CAT 3 / CAT 4/ CAT 5

Comorbid:

Complications:

Discharge medication:

Date of Positive Swab Taken:

Date of 1st Symptoms /onset, if any:

1. RELEVANT INVESTIGATION RESULTS/ KEPUTUSAN UJIAN YANG BERKAITAN
(*please attached recent relevant results)

2. LATEST RADIOLOGICAL FINDINGS / KEPUTUSAN RADIOLOGI TERBARU
a. Date:
b. Findings:

3. LAST DATE OF QUARANTINE / TARIKH AKHIR KUARANTIN: _____
( ) Home Quarantine ( ) Healthcare facility

14. DETAILS OF ATTENDING PHYSICIAN/ BUTIRAN PEGAWAI PERUBATAN

Signature/Tandatangan: _____

Name of Attending Physician/Nama Pegawai Perubatan: _____
Official Stamp/ Cop Rasmi:

Referral Facility / Fasiliti yang Merujuk: _____

Date/ Tarikh: _____

Appendix 5

CLERKING SHEET FOR POST COVID-19 PATIENTs

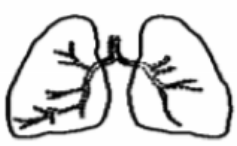
NAME		GENDER & RACE	
IC/PASSPORT		OCCUPATION	
AGE		ADDRESS	
HP NO			

DATE OF DIAGNOSIS		SYMPTOMATIC	IF YES:
DATE OF DISCHARGE		CLINICAL STAGE	1 / 2 / 3 / 4 / 5
PLACE & DURATION OF ADMISSION		COMPLICATIONS	
CO-MORBIDITIES		CURRENT MEDICATIONS	

History:

- ☐ Cough
- ☐ Difficulty in breathing
- ☐ Chest pain
- ☐ New onset of fever
- ☐ Persistent tiredness/musculoskeletal pain
- ☐ Poor appetite
- ☐ Headache
- ☐ GI upsets (diarrhea/nausea/vomiting)
- ☐ Skin manifestations
- ☐ Depression/Anxiety/Insomnia
- ☐ Cognitive impairment
- ☐ Other symptoms;
- ☐ Active smoker
- ☐ LMP for female:

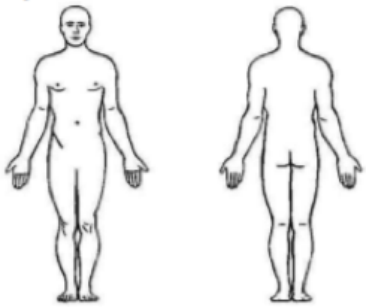
CXR findings (if indicated):



Vital signs;

BP…….. PR……
RR…….. SPO2……..
Temp…….. Pain score……
BMI……

Physical examinations:



MMSE (if indicated):

DASS (if indicated):

Other Investigations:

Follow up/ Management:

(1) ……
(2) ……
(3) ……
(4) ……
(5) ……

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