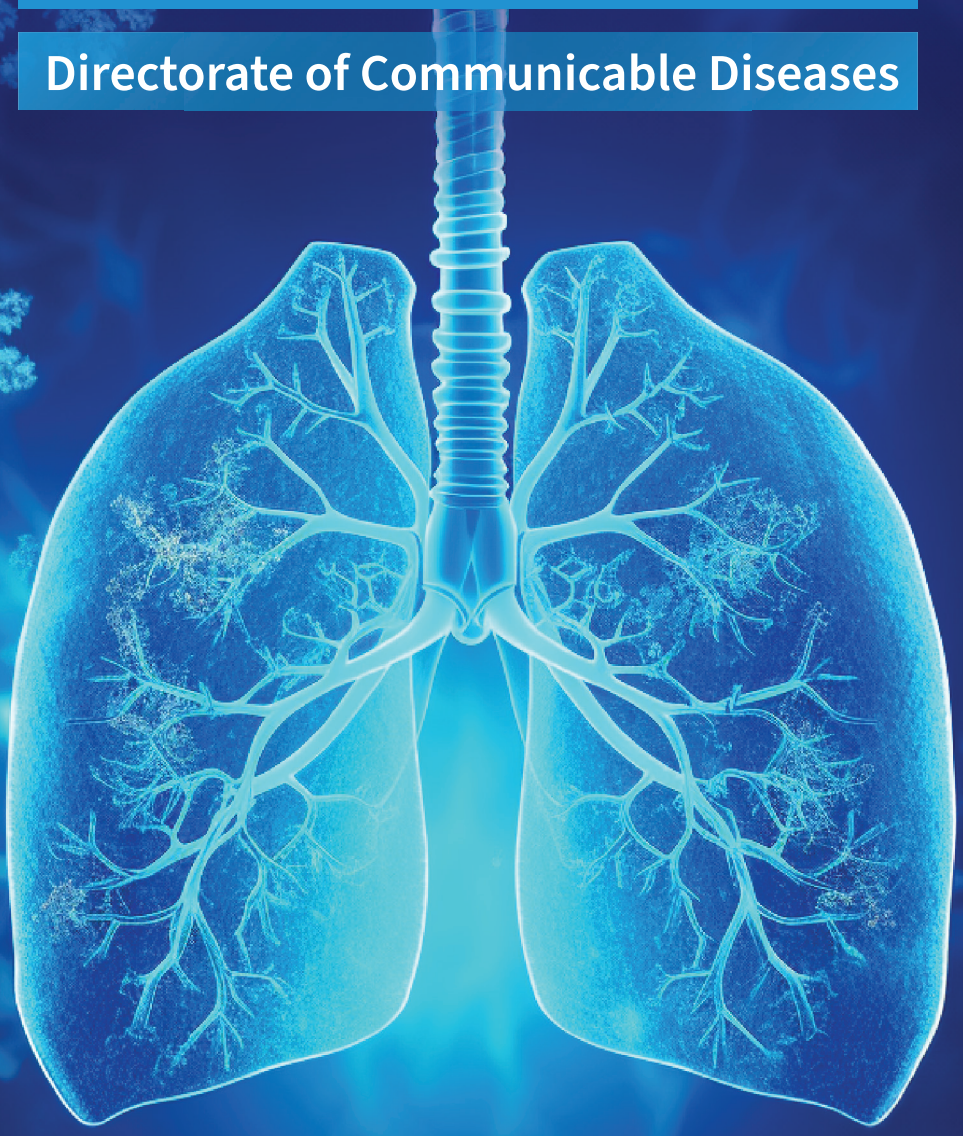
Jordanian Ministry of Health

World Health Organization
Jordan

THE NATIONAL INTEGRATED PRIORITY RESPIRATORY INFECTIONS CASE MANAGEMENT PROTOCOL

Epidemics Administration

Directorate of Communicable Diseases



October 2023

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FOREWORD

It with immense joy that we present this important and pioneering work in Jordan.

Acute respiratory infections consistently rank among the top causes of morbidity and mortality worldwide. It is responsible for more than 4 million deaths each year globally and is the third most common cause of mortality among all age groups, particularly in lower income settings.

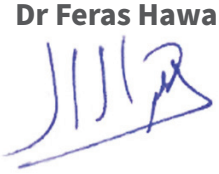
Common bacterial and viral pathogens causing severe respiratory infections, such as pneumococcal pneumonia and seasonal influenza are a constant threat. Emerging respiratory infections, such as COVID-19 and MERS-CoV is a concern for global health security. There are substantial consequences to suboptimal clinical management of these diseases.

Considering the significance of these respiratory infections, the Ministry of Health has developed an integrated priority respiratory infection practical guidance for evidence-based clinical management of COVID-19, Seasonal Influenza, MERS-CoV, Community Acquired Pneumonia and Tuberculosis.

I would like to express my sincere gratitude and appreciation to the team who made this practical guidance a reality. This work could not have been accomplished without the generous support from the World Health Organization, to which I extend special thanks and appreciation.

God bless our Country, Jordan, under the Hashemite leadership of His Majesty King Abdullah ll.

Minister of Health
Dr Feras Hawari



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ABBREVIATIONS

AGEP	Acute generalized exanthematous pustulosis
ALT	Alanine Transaminase Test
AMR	Antimicrobial Resistance
ARDS	Acute Respiratory Distress Syndrome
ARI	Acute Respiratory Infection
AST	Aspartate Transaminase Test
BiPAP	Bilevel Positive Airway Pressure
CAP	Community Acquired Pneumonia
CDD	Communicable Diseases Directorate
COPD	Chronic Obstructive Pulmonary Disease
CPAP	Continuous Positive Airway Pressure
GFR	Glumerular filtration rate
HDL	High-density cholesterol
HFNO	High-Flow Nasal Oxygen
ILI	Influenza-like infection
IPC	Infection Prevention and Control
JMoH	Jordanian Ministry of Health
LDL	Low-density cholesterol
MERS-CoV	Middle East Respiratory Syndrome coronavirus
NSAID	Non-steroidal anti-inflammatory drugs
PCR	polymerase chain reaction
PPE	Personal Protective Equipment
PPROM	Preterm Premature Rupture of Membranes
RDT	Rapid Diagnostic Test
RR	respiratory rate
SARI	Severe Acute Respiratory Infection
SCAR	Severe Cutaneous Adverse Reactions
SIADH	Syndrome of Inappropriate Antidiuretic Hormone Secretion
SLE	Systemic lupus erythematosus
TB	Tuberculosis
ULN	Upper Limits of Normal
WHO	World Health Organization

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1.BACKGROUND:

ACUTE RESPIRATORY INFECTION (ARI)
has been referred to as the “forgotten pandemic”.
It is responsible for more than
4 MILLION
DEATHS EACH YEAR GLOBALLY.

ARI can range from mild infections, such as those often caused by rhinoviruses, to high case fatality diseases such as MERS-CoV. The National Integrated Priority Respiratory Infections case management protocol is designed for frontline healthcare workers for the development and refreshing and update of knowledge and practical approach in the recognition, initiation of management of priority respiratory infections. Through didactic instruction, use of integrated treatment algorithms, will enhance doctors’ knowledge and the basic concepts of how to respond to, diagnose, and treat priority respiratory infections. The goal of this protocol is to improve outcomes of respiratory infections through early recognition and interventions by trained healthcare workers.

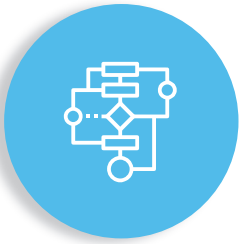
In November 2018, the Jordanian Ministry of Health (JMoH), in collaboration with the World Health Organization (WHO), conducted a WHO Emergency Care System Assessment and identified several actionable priorities for strengthening frontline care, including expansion of hospital triage using standardized national tool in emergency units and ensuring basic emergency care training for providers at the first aid hospitals.

To scale-up national capacity of health care providers JMoH adopted the initiative of developing a National Integrated Priority Respiratory Infections case management protocol.

A unified multi-disciplinary approach to care for patients with respiratory diseases, including those with mild, moderate, severe, and critical disease is needed. Strengthening frontline health care workforce capacity to deliver time-sensitive care for acute illness is more critical now than ever.

2.OBJECTIVES:

Understand the terminology specific to ARIs and SARI.



Apply the integrated algorithms in aiding diagnosis and management of priority respiratory infections.

Guide the selection of antimicrobial empiric therapy to reduce the antimicrobial resistance (AMR).

Recognize and initiate management of COVID-19, Influenza, Middle East Respiratory Syndrome coronavirus (MERS-CoV) infection, Community Acquired Pneumonia (CAP) and Tuberculosis (TB).

Review evidence-based guidelines and recommendations on the clinical management of sepsis, septic shock and Acute Respiratory Distress Syndrome (ARDS).

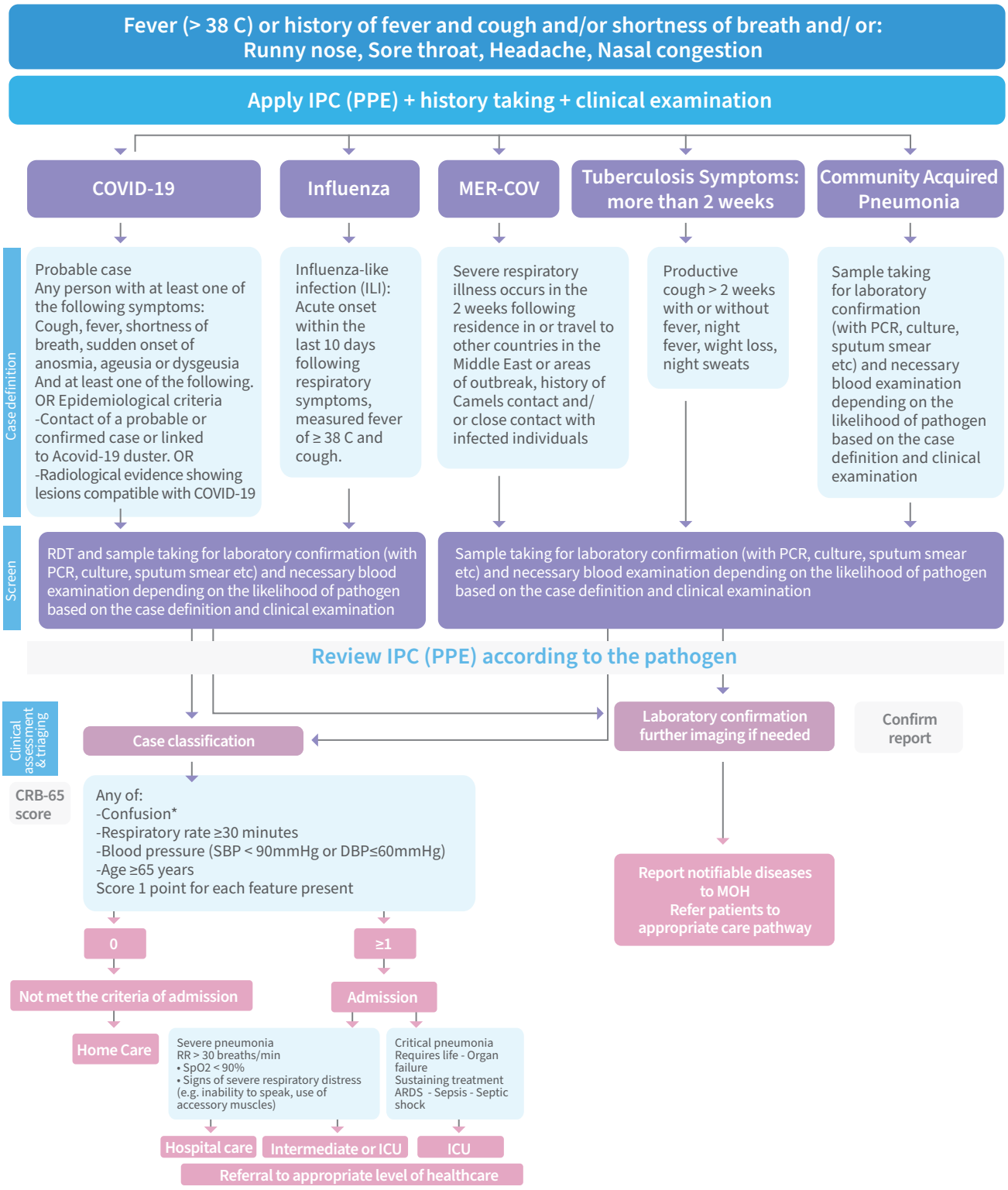
Review the use of oxygen and management of acute exacerbation of COPD and acute asthma.

Link the epidemiological case definitions with the clinical practice to raise the awareness of notifiable diseases and the surveillance.

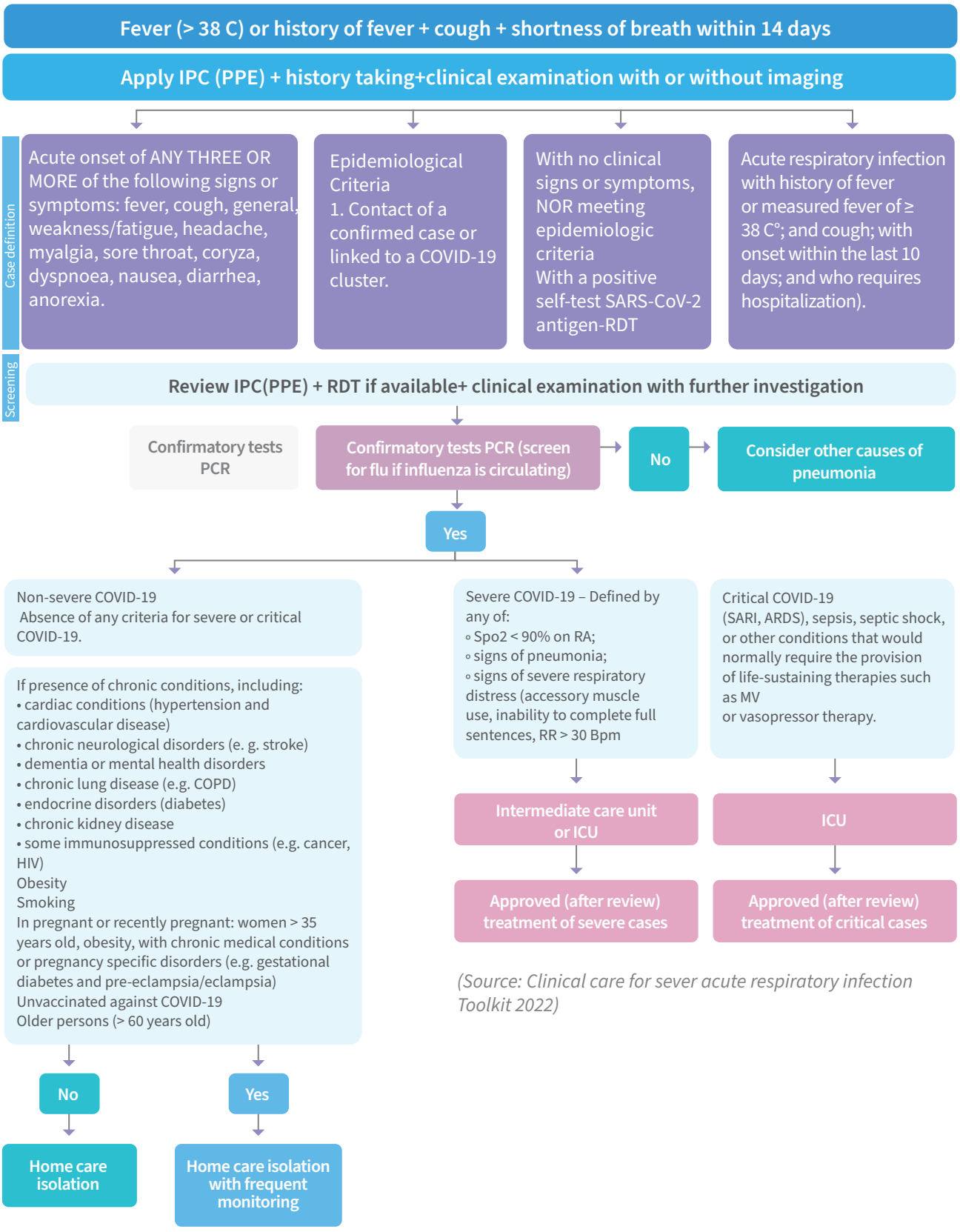
Emphasize the importance of IPC while dealing with patients with respiratory infections.

3.ALGORITHM

3.1 Overall algorithm: Jordanian treatment protocol for priority infectious respiratory diseases



3.2 Case Management protocol for COVID-19



(Source: Clinical care for sever acute respiratory infection Toolkit 2022)

3.2.1 Therapy and Therapeutics for COVID-19

- **Mild and moderate cases:**
- **Severe/Critical**

Location of care	Manage patients in a healthcare facility, in a community facility, or at home. Home isolation can be considered in most patients. telemedicine or remote visits as appropriate infection prevention and control measures and other requirements can be met (e.g., basic hygiene, adequate ventilation) adequate support (e.g., food, supplies, psychological support)	
Monitor	Closely monitor patients with risk factors for severe illness, and counsel patients about signs and symptoms of deterioration or complications that require prompt urgent care (e.g., difficulty breathing, chest pain. Pulse oximetry monitoring at home is recommended in symptomatic patients with risk factors for progression to severe disease who are not hospitalised.	
Supportive care	Adequate nutrition and appropriate rehydration. Improve air circulation by opening a window or door. Provide basic mental health and psychosocial support for all patients	
Symptom management	**Fever and pain**	Paracetamol: adults: 500-1000 mg orally every 4-6 hours when required, maximum 4000 mg/day Ibuprofen: adults: 300-600 mg orally (immediate-release) every 6-8 hours when required, maximum 2400 mg/day
	Cough	Advise patients to avoid lying on their back as this makes coughing ineffective. Use simple measures first (e.g., a teaspoon of honey in patients aged 1 year and older) to help cough, antitussive.
	Olfactory dysfunction	Consider treatment (e.g., olfactory training) if olfactory dysfunction persists beyond 2 weeks

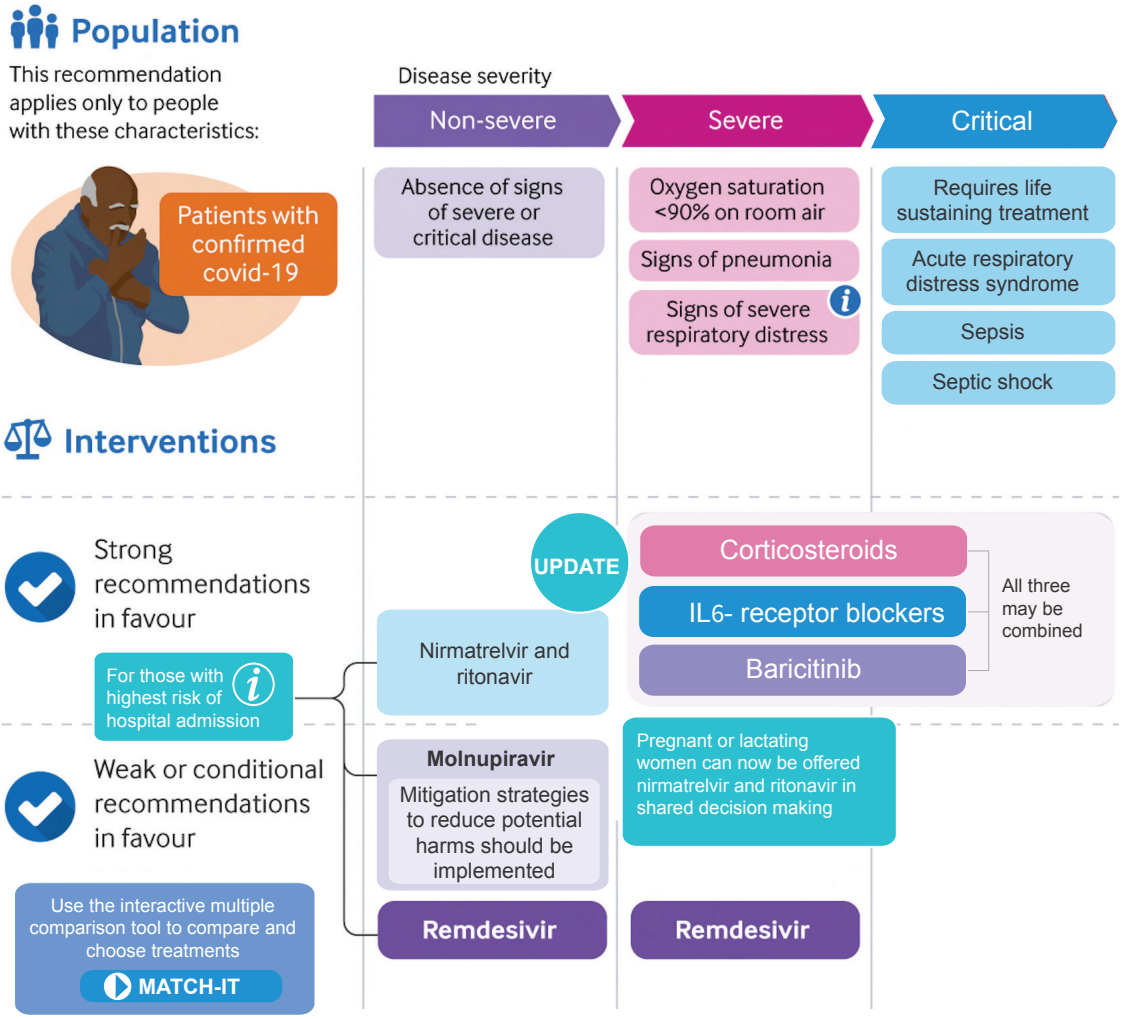
Antivirals	**Nirmatrelvir/ Ritonavir**	Dose: 300 mg (two 150 mg tablets) of Nirmatrelvir and 100 mg of Ritonavir every 12 hours daily for 5 days. It should be initiated as soon as possible after diagnosis, ideally within 5 days of symptom onset In renal insufficiency (GFR 30–59 mL/min), the dose reduction is 150 mg of Nirmatrelvir and 100 mg of ritonavir every 12 hours daily for 5 days. It is not recommended in pregnant and breastfeeding women or children Side effects: diarrhoea and dysgeusia significant and complex drug-drug interactions
	Molnupiravir	800 mg tablet every 12 hours daily for 5 days. It should be initiated as soon as possible after diagnosis, ideally within 5 days of symptom onset. It is not recommended in pregnant and breastfeeding women, or children Potential side effects: Genotoxicity, Emergence of resistance, Emergence of new variants
	Remdesivir	Children ≥12 years of age and ≥40 kg and adults: 200 mg intravenously as a loading dose on day 1, followed by 100 mg every 24 hours for 2 days Remdesivir should be administered as soon as possible after onset of symptoms, ideally within 7 days. Adverse effects include nephrotoxicity and hepatotoxicity, Hypersensitivity reactions.
Antibiotics	Consider empirical antibiotics only if there is a reasonable clinical suspicion of secondary bacterial infection.	
Discontinuing transmission-based precautions (including isolation)	5 days after positive test (asymptomatic patients), or 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms (symptomatic patients).	

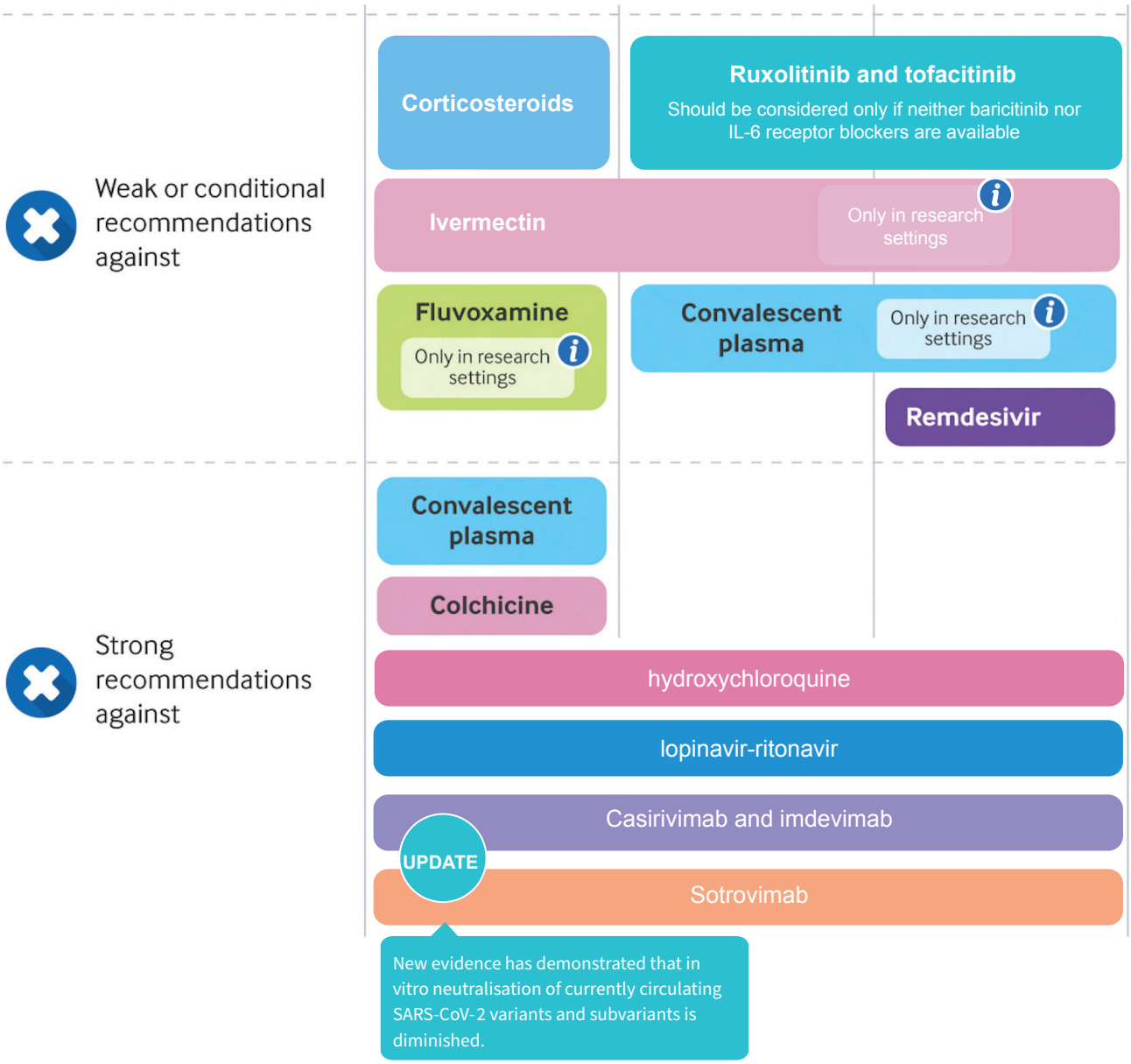
Hospital admission	Admit patients with suspected or confirmed severe disease to an appropriate healthcare facility under the guidance of a specialist team as these patients are at risk of rapid clinical deterioration. Admit or transfer patients with critical disease (i.e., presence of acute respiratory distress syndrome, sepsis, or septic shock) to an intensive/critical care unit under the guidance of a specialist team	
Consider oxygen therapy	Start supplemental oxygen therapy immediately in any patient with emergency signs (i.e., obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma and/or convulsions), or any patient without emergency signs and SpO_2 <90% Target SpO_2 to ≥94% during resuscitation. Once the patient is stable, a target SpO_2 >90% in children and non-pregnant adults, and ≥92% to 95% in pregnant women. Monitor patients closely for signs of progressive acute hypoxaemic respiratory failure	
Corticosteroid	**Dexamethasone:**	6 mg orally/intravenously once daily for 7-10 days
	or hydrocortisone:	50 mg orally/intravenously every 8 hours for 7-10 days
	or prednisolone:	40 mg/day orally given in 1-2 divided doses for 7-10 days
	Monitor patients for adverse effects (e.g., hyperglycaemia, secondary infections, psychiatric effects, reactivation of latent infections) and assess for drug-drug interactions.	
Consider high-flow nasal oxygen or non-invasive ventilation	Consider a trial of (HFNO) or [CPAP] or [BiPAP]) in selected patients with mild ARDS. HFNO is not suitable in patients with hypercapnia, haemodynamic instability, multi-organ failure, or abnormal mental status. Airborne precautions are recommended for these interventions.	
Awake prone positioning	for 8-12 hours/day, broken into shorter periods over the day) in severely ill patients who require supplemental oxygen ,HFNO or non-invasive ventilation	
Consider invasive mechanical ventilation	Considered in patients who are acutely deteriorating despite advanced oxygen/ non-invasive ventilatory support measures. lung-protective, low tidal volume/low inspiratory pressure ventilation strategy Consider prone ventilation in patients with severe ARDS for 12 to 16 hours per day.	

Extracorporeal membrane oxygenation		Consider extracorporeal membrane oxygenation (ECMO) according to availability and expertise if the above methods fail. There is a risk of neurological complications (e.g., intracranial haemorrhage, ischaemic stroke, and hypoxic ischaemic brain injury)
Management of sepsis/ septic shock		As per guidelines
Symptom management and supportive care	**Fluids and electrolytes**	Use cautious fluid management Correct any electrolyte or metabolic abnormalities, such as hyperglycemia or metabolic acidosis
	Cough	Advise patients to avoid lying on their back as this makes coughing ineffective. Use simple measures first (e.g., a teaspoon of honey in patients aged 1 year and older) to help cough. Short-term use of a cough suppressant may be considered in select patients (e.g., if the cough is distressing to the patient) provided there are no contraindications.
	Breathlessness	Keep the room cool, and encourage relaxation, breathing techniques, and changing body positions. Identify and treat any reversible causes of breathlessness (e.g., pulmonary oedema, pulmonary embolism, COPD, asthma).
	Anxiety, delirium, and agitation	Identify and treat any underlying or reversible causes (e.g., offer reassurance, treat hypoxia, correct metabolic or endocrine abnormalities, address co-infections, minimise use of drugs that may cause or worsen delirium, treat substance withdrawal, maintain normal sleep cycles, treat pain or breathlessness) Low doses of haloperidol (or another suitable antipsychotic) can be considered for agitation.
	Mouth care	An important part of overall patient care in hospitalised patients who are ventilated or non-ventilated and those undergoing step-down or end-of-life care.
	Mental health symptoms	Provide basic mental health and psychosocial support for all patients, and manage any symptoms of insomnia or depression as appropriate

Venous thrombo-embolism prophylaxis	Low molecular weight heparin, unfractionated heparin, or fondaparinux are the recommended options for standard thromboprophylaxis. Monitor patients for signs and symptoms suggestive of thromboembolism and proceed with appropriate diagnostic and management pathways if clinically suspected Continue until hospital discharge
Antibiotics	Consider empirical antibiotics if there is clinical suspicion of secondary bacterial infection Give within 1 hour of initial assessment for patients with suspected sepsis or if the patient meets high-risk criteria (or within 4 hours of establishing a diagnosis of secondary bacterial pneumonia) De-escalate empirical therapy on the basis of microbiology results and clinical judgement

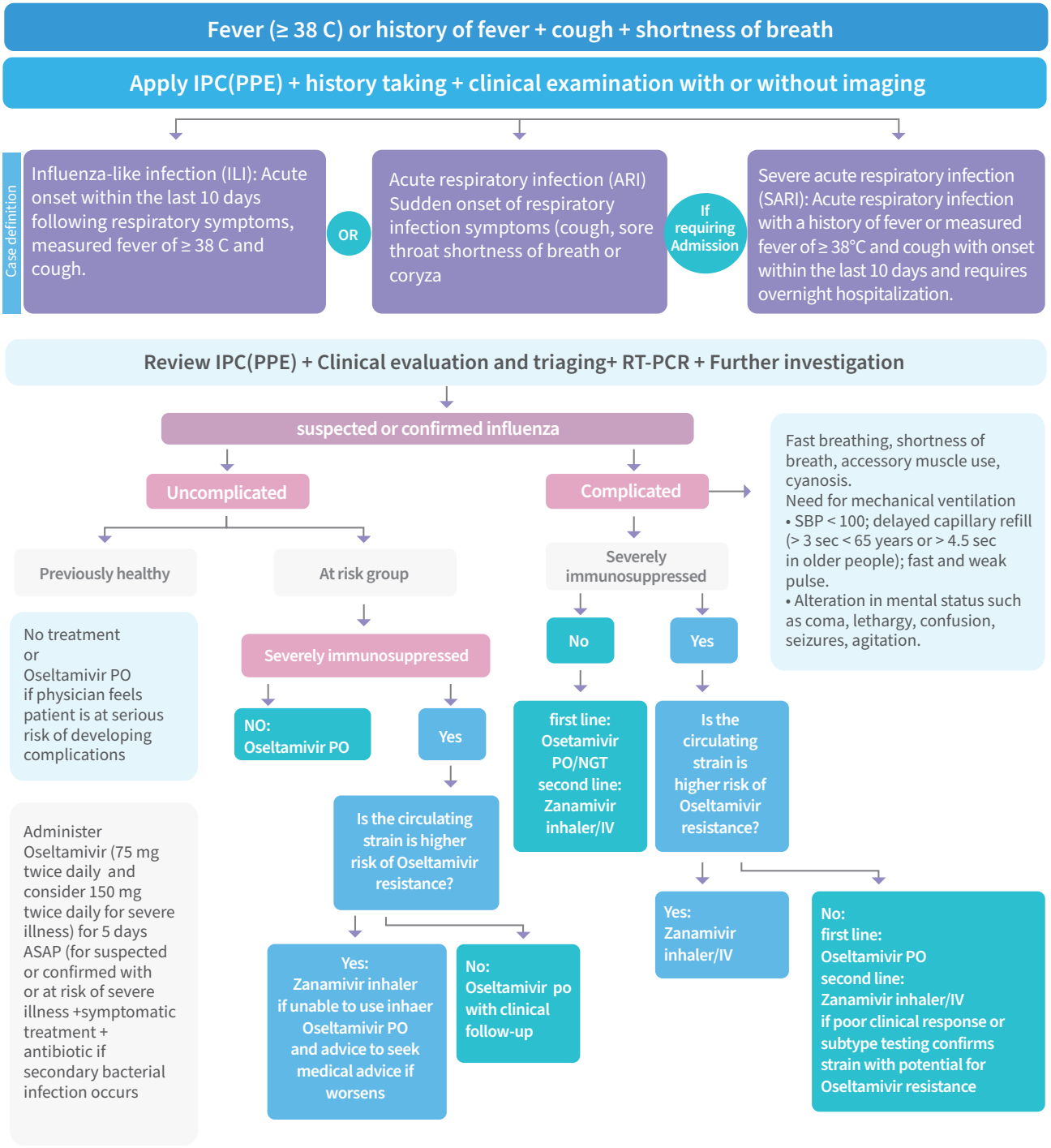
3.2.2 Therapeutics and COVID-19 living guideline





(Source: Therapeutics and COVID-19: living guideline - World Health Organization (WHO) 13 January 2023)
(Source: Clinical care for sever acute respiratory infection Toolkit 2022)

3.3 Seasonal/zoonotic Influenza



3.3.1 Safety considerations and side-effects

Safety profile: oseltamivir has not been associated with increased adverse effects in adult outpatients. However, oseltamivir has not been evaluated in severely ill patients, pregnancy or pediatric populations. Oseltamivir should be used with caution:

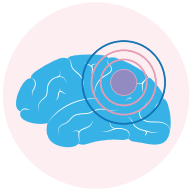
In patients with kidney disease: reduce dose to 75 mg daily if creatinine clearance is 10–30 mL/min.

In patients with liver disease: the safety and efficacy has not been evaluated, so dose reduction is not recommended now.

For pregnant or nursing mothers: oseltamivir is recommended as therapy in pandemic influenza (H1N1) virus as there is a high risk of severe illness in pregnant women and there is no evidence of adverse effects or birth defects.

Side-effects: side-effects are generally minor:

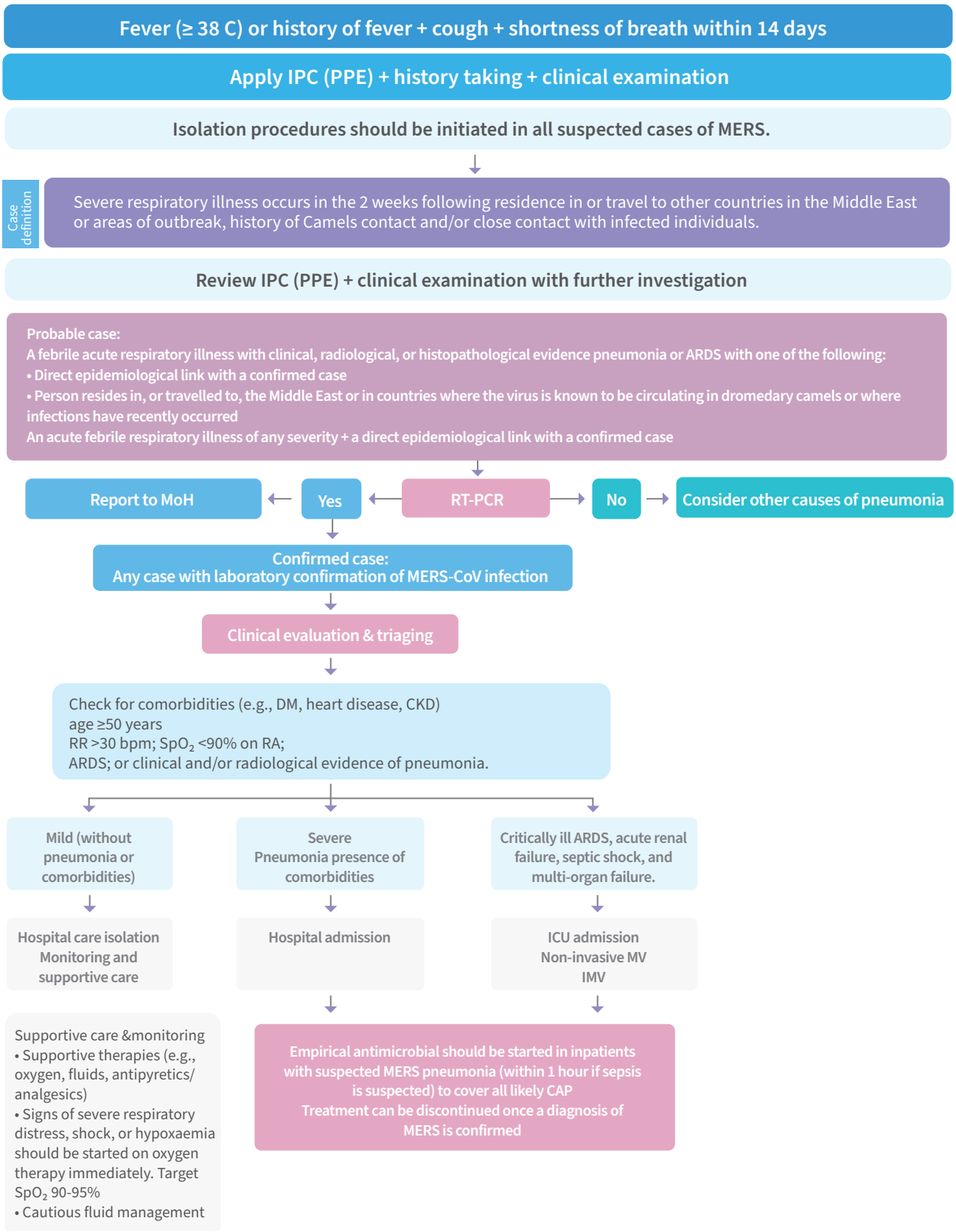
Gastrointestinal tract: nausea (mitigated by taking with food), vomiting.



Rare neuropsychiatric adverse events – association seen primarily in one country, causality has not been established.

(Source: Clinical care for sever acute respiratory infection Toolkit 2022)

3.4 MERS-CoV


Fever (≥ 38 C) or history of fever + cough + shortness of breath within 14 days
Apply IPC (PPE) + history taking + clinical examination
Isolation procedures should be initiated in all suspected cases of MERS.
Case definition
Severe respiratory illness occurs in the 2 weeks following residence in or travel to other countries in the Middle East or areas of outbreak, history of Camels contact and/or close contact with infected individuals.
Review IPC (PPE) + clinical examination with further investigation
Probable case:
A febrile acute respiratory illness with clinical, radiological, or histopathological evidence pneumonia or ARDS with one of the following:
• Direct epidemiological link with a confirmed case
• Person resides in, or travelled to, the Middle East or in countries where the virus is known to be circulating in dromedary camels or where infections have recently occurred
An acute febrile respiratory illness of any severity + a direct epidemiological link with a confirmed case
RT-PCR
Yes
Report to MoH
No
Consider other causes of pneumonia
Confirmed case:
Any case with laboratory confirmation of MERS-CoV infection
Clinical evaluation & triaging
Check for comorbidities (e.g., DM, heart disease, CKD)
age ≥50 years
RR >30 bpm; SpO2 <90% on RA;
ARDS; or clinical and/or radiological evidence of pneumonia.
Mild (without pneumonia or comorbidities)
Severe
Pneumonia presence of comorbidities
Critically ill ARDS, acute renal failure, septic shock, and multi-organ failure.
Hospital care isolation
Monitoring and supportive care
Hospital admission
ICU admission
Non-invasive MV
IMV
Supportive care &monitoring
• Supportive therapies (e.g., oxygen, fluids, antipyretics/ analgesics)
• Signs of severe respiratory distress, shock, or hypoxaemia should be started on oxygen therapy immediately. Target SpO2 90-95%
• Cautious fluid management
Empirical antimicrobial should be started in inpatients with suspected MERS pneumonia (within 1 hour if sepsis is suspected) to cover all likely CAP
Treatment can be discontinued once a diagnosis of MERS is confirmed

3.5 Community Acquired Pneumonia

Fever (> 38 C) or history of fever + cough + shortness of breath

Apply IPC(PPE) + history taking + clinical examination with or without imaging

Consider PCR if suspected notifiable diseases

CBC, CRP with or without (PCT, Imaging, and gram stain) and further investigation if needed

Consider sputum cx in severe pneumonia, ICU admissions, patients with structural lung disease, and hx of MDR

Clinical evaluation & triaging

Pneumonia Severity Index (PSI)

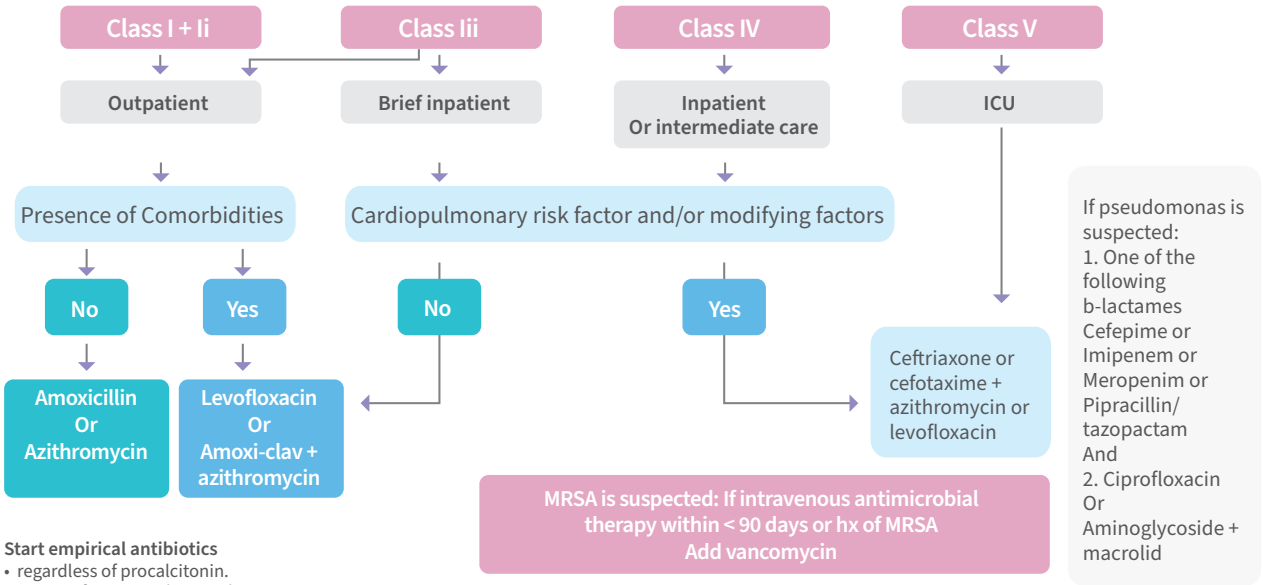
Demographics	
Age	
Male	Age in years
Female	Age in years -10
Nursing home resident	+10

CO-morbidities	
Neoplastic disease	30
Live disease	20
Congestive heart failure	10
Cerebrovascular disease	10
Renal disease	10
Sum	

Physical exam / vital signs	
Altered mental status	20
Respiratory rate >30/min	20
Systolic blood pressure <9OmHg	20
Temperature<35°c (95F) or >40c (104°F)	15
Pulse rate>125/ min	10
Sum	

Laboratory / imaging	
Arterial PH <7.35	30
Blood urea nitrogen >30mg/dl (11mmol/L)	20
Sodium<130mmol/L	20
Glucose>250mg/DI (14mmol/L)	10
Hematocrit<30%	10
Partial pressure of arterial oxygen <60mmHe	10
Pleural effusion	10
Sum	

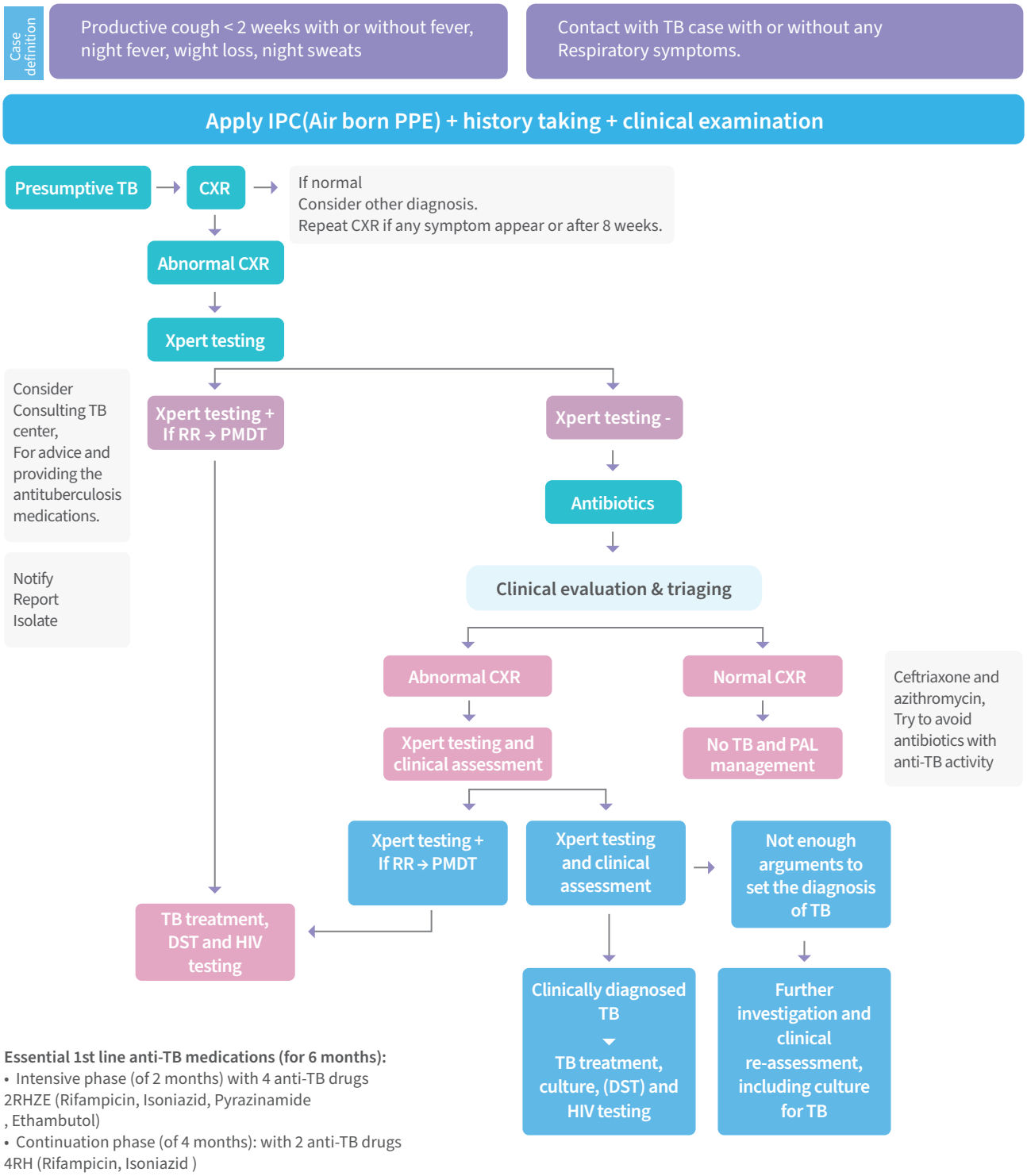
Risk class (points)	Mortality	Recommendation site of care
I (<50)	0.1	Outpatient
li (51-70)	0.6	Outpatient
lii (71-90)	2.8	Outpatient or brief inpatient
Iv (91-130)	8.2	Inpatient
V(>130)	29.2	Inpatient



Start empirical antibiotics
- regardless of procalcitonin.
- In case of sepsis within one hour.

In case of aspiration no need to cover anaerobes unless evidence of empyema or abscess.
Corticosteroids are not recommended unless other indication
(Source: Clinical care for sever acute respiratory infection Toolkit 2022)
(IDSA Guidelines revised 2022

3.6 Tuberculosis (TB)



Essential 1st line anti-TB medications (for 6 months):

- Intensive phase (of 2 months) with 4 anti-TB drugs 2RHZE (Rifampicin, Isoniazid, Pyrazinamide , Ethambutol)
- Continuation phase (of 4 months): with 2 anti-TB drugs 4RH (Rifampicin, Isoniazid)

4.Appendix

4.1 Appendix 1: Nationally approved and available therapeutics and antimicrobials

Medication family: Corticosteroid

Medication name: Dexamethasone

Contraindications:

PREGNANCY
Dexamethasone readily crosses the placenta.

Dose:

► Adult:
0.5–10 mg daily

Side effect:

► With oral use Hiccups. hyperglycaemia . hypotension . myocardial rupture (following recent myocardial infarction). protein catabolism

► With parenteral use Hypotension . perineal irritation (may occur following the intravenous injection of large doses of the phosphate ester)

Medication name: or hydrocortisone

Dose:

INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION
► Adult: 50 mg every 8 hours for 10 days, or until the day of discharge if this is sooner; may be continued for up to 28 days in patients with septic shock

Side effect:

► With oral use Dyslipidaemia . hypotension . myocardial rupture (following recent myocardial infarction). Oedema
► With parenteral use Hiccups .Kaposi's sarcoma . lipomatosis . myocardial rupture (following recent myocardial infarction)

Medication name: or prednisolone

Contraindications:

l CONTRA-INDICATIONS ► With rectal use Abdominal or local infection . bowel perforation . extensive fistulas . intestinal obstruction . recent intestinal anastomoses l
CAUTIONS ► With rectal use Systemic absorption may occur with rectal preparations ► With systemic use Duchenne's muscular dystrophy (possible transient rhabdomyolysis and myoglobinuria following strenuous physical activity). systemic sclerosis (increased incidence of scleroderma renal crisis with a daily dose of 15 mg or more)
PREGNANCY As it crosses the placenta 88% of prednisolone is inactivated.. l BREAST FEEDING Prednisolone appears in small amounts in breast milk but maternal doses of up to 40 mg daily are unlikely to cause systemic effects in the infant.

Dose:

Adult: 40 mg once daily for 10 days, or until the day of discharge if this is sooner

Side effect:

l SIDE-EFFECTS
► With oral use
Diarrhoea . dizziness . dyslipidaemia . lipomatosis . protein catabolism . scleroderma renal crisis

Monitoring:

l MONITORING REQUIREMENTS ► With systemic use Manufacturer advises monitor blood pressure and renal function (s-creatinine) routinely in patients with systemic sclerosis—increased incidence of scleroderma renal crisis.
Monitoring ► With systemic use Infant should be monitored for adrenal suppression if mother is taking a dose higher than 40 mg. Monitoring ► With systemic use Pregnant women with fluid retention should be monitored closely

Medication family: Antibiotics

Medication name: Amoxicillin + clavulanic acid

Contraindications:

amoxiclav-associated jaundice or hepatic dysfunction. history of penicillin associated jaundice or hepatic dysfunction

CAUTIONS GENERAL CAUTIONS Acute lymphocytic leukaemia (increased risk of erythematous rashes). chronic lymphocytic leukaemia (increased risk of erythematous rashes). cytomegalovirus infection (increased risk of erythematous rashes). glandular fever (erythematous rashes common). maintain adequate hydration with high doses (particularly during parental therapy) SPECIFIC CAUTIONS ► With intravenous use Accumulation of electrolytes contained in parenteral preparations can occur with high doses

PREGNANCY Specialist sources indicate not known to be harmful. Avoid in preterm prelabour rupture of the membranes (PPROM)—possible increased risk of necrotising enterocolitis in the neonate. l BREAST FEEDING Trace amount in milk, but appropriate to use. l HEPATIC IMPAIRMENT Manufacturer advises caution. Monitoring Monitor liver function in liver disease. l RENAL IMPAIRMENT Risk of crystalluria with high doses (particularly during parenteral therapy). ► With intravenous use Accumulation of electrolytes contained in parenteral preparations can occur in patients with renal failure.

Dose:

► BY MOUTH USING TABLETS ►► Adult: 500/125 mg 3 times a day for 5 days

► BY INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION ► Adult: 1.2 g every 8 hours

Side effect:

GENERAL SIDE-EFFECTS ► Common or very common Increased risk of infection ► Uncommon Dizziness . dyspepsia . headache ► Frequency not known Colitis haemorrhagic . crystalluria . hypersensitivity vasculitis . meningitis aseptic

SPECIFIC SIDE-EFFECTS ► With oral use Akathisia . black hairy tongue . cholangitis. Kounis syndrome, Hepatic events have been reported mostly in males and elderly patients

Medication name: Amoxicillin

Contraindications:

GENERAL CAUTIONS Acute lymphocytic leukaemia (increased risk of erythematous rashes). chronic lymphocytic leukaemia (increased risk of erythematous rashes). cytomegalovirus infection (increased risk of erythematous rashes). glandular fever (erythematous rashes common). maintain adequate hydration with high doses (particularly during parenteral therapy) SPECIFIC CAUTIONS ► With intravenous use Accumulation of sodium can occur with high parenteral doses

BREAST FEEDING Trace amount in milk, but appropriate to use. l HEPATIC IMPAIRMENT Manufacturer advises caution. l RENAL IMPAIRMENT Increased risk of convulsions. Accumulation of sodium from injection can occur in patients with renal impairment. Risk of crystalluria with high doses (particularly during parenteral therapy).

Dose:

500 mg 3 times a day for 5 days; increased if necessary to 1 g 3 times a day

Side effect:

GENERAL SIDE-EFFECTS ► Rare or very rare Colitis haemorrhagic . crystalluria . dizziness . hyperkinesia . hypersensitivity vasculitis . mucocutaneous candidiasis ► Frequency not known Jarisch-Herxheimer reaction SPECIFIC SIDE-EFFECTS ► Rare or very rare ► With oral use Black hairy tongue l

Medication family: Antibiotics

Medication name: Azithromycin

Contraindications:

l PREGNANCY Manufacturers advise use only if adequate alternatives not available.
l BREAST FEEDING Present in milk; use only if no suitable alternatives.
l HEPATIC IMPAIRMENT Manufacturer advises caution; consider avoiding in severe impairment (no information available). l RENAL IMPAIRMENT ► In adults g Use with caution if eGFR less than 10 mL/minute/1.73 m2 . M

Dose:

low to moderate severity ► BY MOUTH ► Adult: 500 mg once daily for 3 days, alternatively initially 500 mg once daily for 1 day, then 250 mg once daily for 4 days
, high severity ► INITIALLY BY INTRAVENOUS INFUSION ► Adult: Initially 500 mg once daily for at least 2 days, then (by mouth) 500 mg once daily for a total duration of 7–10 days

Side effect:

Common or very common ► With oral use Arthralgia ► Uncommon ► With oral use Numbness . oedema . photosensitivity reaction ► With parenteral use Numbness . oedema . photosensitivity reaction ► Frequency not known ► With oral use Acute kidney injury . aggression . akathisia . haemolytic anaemia . syncope ► With parenteral use Acute kidney injury . aggression . akathisia . haemolytic anaemia . syncope

Medication name: Levofloxacin

Contraindications:

Risk factors for QT interval prolongation (e.g. electrolyte disturbances, acute myocardial infarction, heart failure with reduced left ventricular ejection fraction, bradycardia, congenital long QT syndrome, history of symptomatic arrhythmias)
l BREAST FEEDING Manufacturer advises avoid. l RENAL IMPAIRMENT

Dose:

BY MOUTH ► Adult: 500 mg twice daily for 5 days ► BY INTRAVENOUS INFUSION ► Adult: 500 mg twice daily for 5 days, to be given over at least 60 minutes

Side effect:

► Common or very common ► When used by inhalation Bronchial secretion changes . dysphonia . haemoptysis . increased risk of infection . respiratory disorders . weight decreased ► Uncommon ► When used by inhalation Costochondritis . hyperbilirubinaemia . joint stiffness ► With intravenous or oral use Increased risk of infection ► Rare or very rare ► With intravenous or oral use Nephritis tubulointerstitial . paranoia . SIADH ► Frequency not known ► When used by inhalation Memory impairment ► With intravenous or oral use Anosmia . cardiac arrest. Clostridioides difficile colitis . diarrhoea haemorrhagic . ligament rupture . memory impairment. movement disorders. muscle rupture . pancytopenia .respiratory disorders. rhabdomyolysis . self-endangering behaviour

Medication name: Piperacillin + tazobactam

Contraindications:

l PREGNANCY Manufacturers advise use only if potential benefit outweighs risk. l BREAST FEEDING Trace amount in milk, but appropriate to use. l RENAL IMPAIRMENT

Dose:

BY INTRAVENOUS INFUSION ► Adult: 4.5 g every 8 hours; increased if necessary to 4.5 g every 6 hours, increased frequency may be used for severe infections

Side effect:

Common or very common Anaemia . candida infection . constipation . gastrointestinal discomfort. headache . insomnia ► Uncommon Flushing . hypokalaemia . hypotension . myalgia .thrombophlebitis ► Rare or very rare Epistaxis . stomatitis ► Frequency not known Eosinophilia . pancytopenia . pneumonia eosinophilic .renal failure .thrombocytosis

Medication family: Antibiotics

Medication name: Vancomycin

Contraindications:

l CONTRA-INDICATIONS ► With intravenous use Previous hearing loss
l CAUTIONS ► With oral use Systemic absorption may be enhanced in patients with inflammatory disorders of the intestinal mucosa or with Clostridioides difficile-induced pseudomembranous colitis (increased risk of adverse reactions) ALLERGY AND CROSS-SENSITIVITY g Caution if teicoplanin sensitivity. l PREGNANCY Manufacturer advises use only if potential benefit outweighs risk. BREAST FEEDING Present in milk—significant absorption following oral administration unlikely . l RENAL IMPAIRMENT Manufacturer advises serial monitoring of renal function. ► With intravenous use Manufacturer advises use with caution—increased risk of toxic effects with prolonged high blood concentration.

Dose:

Adult: 15–20 mg/kg every 8–12 hours (max. per dose 2 g) adjusted according to plasma-concentration monitoring, duration should be tailored to type and severity of infection and the individual clinical response—, in seriously ill patients, a loading dose of 25–30 mg/kg (usual max. 2 g) can be used to facilitate rapid attainment of the target trough serumvancomycin concentration

Side effect:

l SIDE-EFFECTS GENERAL SIDE-EFFECTS Agranulocytosis . dizziness . drug fever. eosinophilia . hypersensitivity . nausea . nephritis tubulointerstitial . neutropenia (more common after 1 week or cumulative dose of 25g). renal failure . severe cutaneous adverse reactions (SCARs). skin reactions . thrombocytopenia .tinnitus (discontinue). vasculitis . vertigo SPECIFIC SIDE-EFFECTS ► With intravenous use Back pain . bradycardia . cardiac arrest (on rapid intravenous injection). cardiogenic shock (on rapid intravenous injection). chest pain . dyspnoea . hearing loss . hypotension . muscle complaints . pseudomembranous enterocolitis .red man syndrome . wheezing Vancomycin is associated with a higher incidence of nephrotoxicity than teicoplanin.

Monitoring:

Plasma-vancomycin concentration monitoring essential to reduce risk of fetal toxicity.

Medication name: Cefepime

Contraindications:

l PREGNANCY Manufacturer advises caution—no data available but not known to be harmful in animal studies.
l BREAST FEEDING Manufacturer advises caution—present in milk in very low quantities . l RENAL IMPAIRMENT Manufacturer advises use with caution

Dose:

BY INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION, OR BY INTRAMUSCULAR INJECTION ► Adult (bodyweight up to 41 kg): 50 mg/kg every 12 hours (max. per dose 2 g), increased if necessary to 50 mg/kg every 8 hours (max. per dose 2 g), increased dose used for severe infections, intravenous route preferred in severe infections

Side effect:

l SIDE-EFFECTS ► Common or very common Anaemia ► Uncommon Gastrointestinal disorders . increased risk of infection ► Rare or very rare Constipation . dyspnoea . genital pruritus . paraesthesia . seizure .taste altered . vasodilation ► Frequency not known Anaphylactic shock . aplastic anaemia . coma . confusion . consciousness impaired . encephalopathy . haemorrhage . hallucination . myoclonus . nephrotoxicity .renal failure

Medication family: Antibiotics

Medication name: Imipenem

Contraindications:

l CAUTIONS CNS disorders . epilepsy

ALLERGY AND CROSS-SENSITIVITY g Avoid if history of immediate hypersensitivity reaction to beta-lactam antibacterials. Use with caution in patients with sensitivity to betalactam antibacterials. M l PREGNANCY Manufacturer advises avoid unless potential benefit outweighs risk (toxicity in animal studies). l BREAST FEEDING g Specialist sources indicate suitable for use in breast-feeding. k l RENAL IMPAIRMENT Manufacturer advises caution if creatinine clearance less than 90 mL/minute.

Dose:

BY INTRAVENOUS INFUSION ► Adult: 1 g every 6 hours

Side effect:

SIDE-EFFECTS ► Common or very common Diarrhoea . eosinophilia . nausea . skin reactions .thrombophlebitis . vomiting ► Uncommon Bone marrow disorders . confusion . dizziness . drowsiness . hallucination . hypotension . leucopenia . movement disorders . psychiatric disorder. seizure . thrombocytopenia .thrombocytosis ► Rare or very rare Agranulocytosis . anaphylactic reaction . angioedema . antibiotic associated colitis . chest discomfort. colitis haemorrhagic . cyanosis . dyspnoea . encephalopathy . flushing . focal tremor. gastrointestinal discomfort. haemolytic anaemia . headache . hearing loss . hepatic disorders . hyperhidrosis . hyperventilation . increased risk of infection . myasthenia gravis aggravated . oral disorders . palpitations . paraesthesia . polyarthralgia . polyuria .renal impairment. severe cutaneous adverse reactions (SCARs). spinal pain .tachycardia .taste altered . tinnitus .tongue discolouration .tooth discolouration . urine discolouration . vertigo ► Frequency not known Agitation

Medication name: Meropenim

Contraindications:

l ALLERGY AND CROSS-SENSITIVITY Avoid if history of immediate hyper-sensitivity reaction to beta-lactam antibacterials. Use with caution in patients with sensitivity to betalact-am antibacterials. l PREGNANCY Use only if potential benefit outweighs risk— no information available. l BREAST FEEDING Unlikely to be absorbed (however, manufacturer advises avoid)
l RENAL IMPAIRMENT

Dose:

► BY INTRAVENOUS INFUSION, OR BY INTRAVENOUS INJECTION ► Adult: 0.5–1 g every 8 hours

Side effect:

► Common or very common Abdominal pain . diarrhoea . headache . inflammation . nausea . pain . skin reactions . thrombocytosis . vomiting ► Uncommon Agranulocytosis . antibiotic associated colitis . eosinophilia . haemolytic anaemia . increased risk of infection . leucopenia . neutropenia . paraesthesia . severe cutaneous adverse reactions (SCARs).thrombocytopenia . thrombophlebitis ► Rare or very rare Seizure

Monitoring:

Manufacturer advises monitor liver function—risk of hepatotoxicity

Medication family: Antibiotics

Medication name: Ciprofloxacin

Contraindications:

CAUTIONS Acute myocardial infarction (risk factor for QT interval prolongation). avoid excessive alkalinity of urine (risk of crystalluria). bradycardia (risk factor for QT interval prolongation). congenital long QT syndrome (risk factor for QT interval prolongation). electrolyte disturbances (risk factor for QT interval prolongation). ensure adequate fluid intake (risk of crystalluria) . heart failure with reduced left ventricular ejection fraction (risk factor for QT interval prolongation). history of symptomatic arrhythmias (risk factor for QT interval prolongation) l PREGNANCY A single dose of ciprofloxacin may be used for the prevention of a secondary case of meningococcal meningitis. l BREAST FEEDING Amount too small to be harmful but manufacturer advises avoid. l RENAL IMPAIRMENT

Dose:

► BY MOUTH ► Adult: 500–750 mg twice daily ► BY INTRAVENOUS INFUSION ► Adult: 400 mg every 8–12 hours, to be given over 60 minutes

Side effect:

Common or very common Arthropathy (in children) ► Uncommon Akathisia . fungal superinfection . oedema . thrombocytosis . vasodilation ► Rare or very rare Antibiotic associated colitis . asthma . bone marrow disorders . crystalluria . erythema nodosum . haematuria . intracranial pressure increased . leucocytosis . migraine . muscle cramps . muscle tone increased . nephritis tubulointerstitial . oedema . olfactory nerve disorder. status epilepticus .thrombocytosis . vasodilation ► Frequency not known Mood altered . self-injurious behaviour

Medication name: Ceftriaxone

Contraindications:

GENERAL CAUTIONS History of hypercalciuria . history of kidney stones SPECIFIC CAUTIONS ► With intravenous use Concomitant treatment with intravenous calcium (including total parenteral nutrition containing calcium)
l PREGNANCY Manufacturer advises use only if benefit outweighs risk—limited data available but not known to be harmful in animal studies.g Specialist sources indicate suitable for use in pregnancy. k l BREAST FEEDING g Specialist sources advise ceftriaxone is compatible with breastfeeding—present in milk in low concentration but limited effects to breast-fed infant. k l HEPATIC IMPAIRMENT Manufacturer advises caution in severe impairment (no information available). l RENAL IMPAIRMENT

Dose:

BY INTRAVENOUS INFUSION, OR BY INTRAVENOUS INJECTION, OR BY DEEP INTRAMUSCULAR INJECTION ► Adult: 1–2 g once daily,

Side effect:

l SIDE-EFFECTS ► Uncommon Anaemia . coagulation disorder. fungal infection ► Rare or very rare Bronchospasm . glycosuria . haematuria . oedema ► Frequency not known Antibiotic associated colitis . cholelithiasis . hypersensitivity . nephrolithiasis . oral disorders . pancreatitis . seizure . vertigo

Monitoring:

Manufacturer advises to monitor full blood count regularly during prolonged treatment

Medication family: Antibiotics

Medication name: Gentamicn

Dose:

► BY INTRAVENOUS INFUSION, OR BY SLOW INTRAVENOUS INJECTION, OR BY INTRAMUSCULAR INJECTION ► Adult: 3–5 mg/kg daily in 3 divided doses, to be given in a multiple daily dose regimen, divided doses to be given every 8 hours, intravenous injection to be administered over at least 3 minutes ► BY INTRAVENOUS INFUSION ► Adult: Initially 5–7 mg/kg, subsequent doses adjusted according to serum-gentamicin concentration, to be given in a once daily dose regimen

Side effect:

SIDE-EFFECTS ► Rare or very rare Fanconi syndrome acquired ► Frequency not known Antibiotic associated colitis . blood disorder. depression . encephalopathy . hallucination . hepatic function abnormal . neurotoxicity . seizure . severe cutaneous adverse reactions (SCARs). stomatitis . vestibular damage

Monitoring:

With intramuscular use or intravenous use For multiple daily dose regimen, one-hour ('peak') serum concentration should be 5–10 mg/litre; pre-dose ('trough') concentration should be less than 2 mg/litre. For multiple daily dose regimen in endocarditis, one-hour ('peak') serum concentration should be 3–5 mg/litre; pre-dose ('trough') concentration should be less than 1 mg/litre. Serumgentamicin concentration should be measured after 3 or 4 doses, then at least every 3 days and after a dose change (more frequently in renal impairment). ► With intravenous use For once-daily dose regimen, consult local guidelines on monitoring serum-gentamicin concentration

Medication name: Amikacin

Contraindications:

l CONTRA-INDICATIONS ► When used by inhalation Myasthenia gravis (aminoglycosides may impair neuromuscular transmission) l CAUTIONS ► When used by inhalation History of reactive airway disease, asthma, or bronchospasm (pre-treat with a short-acting bronchodilator). known or suspected neuromuscular disorders . underlying pulmonary disease (discontinue if signs of exacerbation occur)
l PREGNANCY ARIKAYCE ® LIPOSOMAL NEBULISER DISPERSION ► When used by inhalation g Avoid—no information available. M l BREAST FEEDING ARIKAYCE ® LIPOSOMAL NEBULISER DISPERSION ► When used by inhalation g Avoid—no information available. M l RENAL IMPAIRMENT ► When used by inhalation g Avoid in severe impairment (no information available).

Dose:

► BY INTRAMUSCULAR INJECTION, OR BY SLOW INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION ► Adult: 15 mg/kg daily in 2 divided doses, increased to 22.5 mg/kg daily in 3 divided doses for up to 10 days, higher dose to be used in severe infections; maximum 1.5 g per day; maximum 15 g per course

Side effect:

l SIDE-EFFECTS GENERAL SIDE-EFFECTS ► Common or very common Arthralgia . balance impaired SPECIFIC SIDE-EFFECTS ► Common or very common ► When used by inhalation Dry mouth . dyspnoea . fatigue . myalgia .respiratory disorders . sputum increased .throat irritation . weight decreased ► Uncommon ► When used by inhalation Anxiety ► Rare or very rare ► With parenteral use Albuminuria . hearing impairment. hypotension . muscle twitching .tremor ► Frequency not known ► When used by inhalation Hypersensitivity . neuromuscular disorders . ototoxicity ► With parenteral use Apnoea . neuromuscular blockade . paralysis

Monitoring:

MONITORING REQUIREMENTS ► With intravenous use Multiple daily dose regimen: one-hour ('peak') serum concentration should not exceed 30 mg/litre; pre-dose ('trough') concentration should be less than 10 mg/litre. Once daily dose regimen: pre-dose ('trough') concentration should be less than 5 mg/litre. ► When used by inhalation g Auditory and vestibular function, and renal function should be monitored during treatment.

Medication family: Antibiotics

Medication name: Cefotaxime

Contraindications:

PREGNANCY Not known to be harmful. l BREAST FEEDING Present in milk in low concentration, but appropriate to use. l RENAL IMPAIRMENT

Dose:

► BY INTRAMUSCULAR INJECTION, OR BY INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION ► Adult: 1 g every 12 hours

Side effect:

► Uncommon Drug fever.Jarisch-Herxheimer reaction . renal impairment. seizure ► Frequency not known Arrhythmia (following rapid injection). bronchospasm . encephalopathy . fungal infection . hepatic disorders

Medication family: Antivirals

Medication name: Nirmatrelvir/Ritonavir (paxlovid)

Contraindications:

l CAUTIONS Hepatitis . liver enzyme abnormalities . preexisting liver diseases . uncontrolled or undiagnosed HIV-1 infection
PREGNANCY gAvoid.
l BREAST FEEDING g Avoid during treatment and for 7 days after last treatment.
l HEPATIC IMPAIRMENT g Avoid in severe impairment (no information available).
l RENAL IMPAIRMENT g Caution in moderate impairment; avoid in severe impairment (increased exposure).

Dose:

300 mg (two pink tablets) and 100 mg (one white tablet) twice daily for 5 days, to be initiated as soon as possible after SARS-CoV-2 positive result and within 5 days of symptom onset, for each dose, nirmatrelvir (pink tablets) and ritonavir (white tablet) to be taken together

Side effect:

l SIDE-EFFECTS ► Common or very common Diarrhoea .taste altered . vomiting

Medication family: Antivirals

Medication name: Remdesivir

Contraindications:

REGNANCY g Avoid unless potential benefit outweighs risk—no information available.. l BREAST FEEDING Specialist sources indicate use with caution—limited information. Minimal oral absorption expected, but monitor breast-fed infants for adverse reactions such as diarrhoea, rash, hypotension, liver and renal impairment (increased risk of accumulation due to long half-life). l HEPATIC IMPAIRMENT Manufacturer advises caution (no i nformation available)—treatment should not be started if ALT is 5 times the upper limit of normal. If ALT increases during treatment, remdesivir may need to be withheld, consult product literature for further information . l RENAL IMPAIRMENT Manufacturer advises avoid if eGFR less than 30 mL/ minute/1.73 m2

Dose:

Loading dose 200 mg daily for 1 dose, then maintenance 100 mg once daily for up to 5 days in total, treatment should be initiated within 10 days of initial COVID-19 symptoms, consider stopping treatment if no improvement after 48 hours, course may be repeated if readmitted with COVID-19

Side effect:

SIDE-EFFECTS ► Common or very common Headache . nausea .rash ► Rare or very rare Hypersensitivity . infusion related reaction ► Frequency not known Sinus bradycardia

Monitoring:

l MONITORING REQUIREMENTS ► Manufacturer advises monitor liver function at baseline and periodically during treatment as indicated. ► Manufacturer advises monitor eGFR at baseline and periodically during treatment as indicated—

Medication name: Oseltamivir

Contraindications:

l PREGNANCY Although safety data are limited, oseltamivir can be used in women who are pregnant when the potential benefit outweighs the risk (e.g. during a pandemic). l BREAST FEEDING Although safety data are limited, oseltamivir can be used in women who are breast-feeding when the potential benefit outweighs the risk (e.g. during a pandemic). Oseltamivir is the preferred drug in women who are breast-feeding. l RENAL IMPAIRMENT ► In adults Avoid for treatment and prevention if eGFR less than 10 mL/minute/1.73 m2

Dose:

(body-weight 24–40 kg): 60 mg twice daily for 5 days (10 days if immunocompromised) ► Adult (body-weight 41 kg and above): 75 mg twice daily for 5 days (10 days if immunocompromised)

Side effect:

l SIDE-EFFECTS ► Common or very common Dizziness . gastrointestinal discomfort. herpes simplex . nausea . sleep disorders . vertigo . vomiting ► Uncommon Arrhythmia . consciousness impaired (in adults). seizure . skin reactions ► Rare or very rare Angioedema . anxiety . behaviour abnormal . confusion . delirium . delusions . haemorrhage . hallucination . hepatic disorders . self-injurious behaviour. severe cutaneous adverse reactions (SCARs). thrombocytopenia . visual impairment

Medication family: ANALGESICS

Medication name: Paracetamol

Contraindications:

CAUTIONS Before administering, check when paracetamol last administered and cumulative paracetamol dose over previous 24 hours . body-weight under 50 kg . chronic alcohol consumption . chronic dehydration . chronic malnutrition . long-term use (especially in those who are malnourished)
PREGNANCY Not known to be harmful. l BREAST FEEDING Amount too small to be harmful. l HEPATIC IMPAIRMENT Manufacturer advises caution (increased risk of toxicity). l RENAL IMPAIRMENT g Caution in severe impairment

Dose:

BY MOUTH ► Adult: 0.5–1 g every 4–6 hours; maximum 4 g per day ► BY INTRAVENOUS INFUSION ► Adult (body-weight up to 50 kg): 15 mg/kg every 4–6 hours, dose to be administered over 15 minutes; maximum 60 mg/kg per day ► Adult (body-weight 50 kg and above): 1 g every 4–6 hours, dose to be administered over 15 minutes; maximum 4 g per day ► BY RECTUM ► Adult: 0.5–1 g every 4–6 hours; maximum 4 g per day

Side effect:

l SIDE-EFFECTS GENERAL SIDE-EFFECTS ► Rare or very rare Thrombocytopenia SPECIFIC SIDE-EFFECTS ► Common or very common ► With rectal use Anorectal erythema ► Rare or very rare ► With intravenous use Hypersensitivity . hypotension . leucopenia . malaise . neutropenia ► With rectal use Angioedema . liver injury . severe cutaneous adverse reactions (SCARs). skin reactions ► Frequency not known ► With intravenous use Flushing . skin reactions .tachycardia ► With oral use Agranulocytosis . bronchospasm . hepatic function abnormal .rash . severe cutaneous adverse reactions (SCARs) ► With rectal use Agranulocytosis . blood disorder

Medication name: Ibuprofen

Contraindications:

CONTRA-INDICATIONS ► With systemic use Active gastro-intestinal bleeding . active gastro-intestinal ulceration . history of gastro-intestinal bleeding related to previous NSAID therapy . history of gastro-intestinal perforation related to previous NSAID therapy . history of recurrent gastro-intestinal haemorrhage (two or more distinct episodes). history of recurrent gastro-intestinal ulceration (two or more distinct episodes). severe heart failure . varicella infection l CAUTIONS ► With systemic use Allergic disorders . cardiac impairment (NSAIDs may impair renal function). cerebrovascular disease . coagulation defects . connective-tissue disorders . dehydration (risk of renal impairment). elderly (risk of serious side-effects and fatalities). heart failure . history of gastro-intestinal disorders (e.g. ulcerative colitis, Crohn's disease). ischaemic heart disease . may mask symptoms of infection . peripheral arterial disease .risk factors for cardiovascular events . uncon

Dose:

► BY MOUTH USING IMMEDIATE-RELEASE MEDICINES ► Adult: Initially 300–400 mg 3–4 times a day; increased if necessary up to 600 mg 4 times a day; maintenance 200–400 mg 3 times a day, may be adequate ► BY MOUTH USING MODIFIED-RELEASE MEDICINES ► Adult: 1.6 g once daily, dose to be taken in the early evening, increased if necessary to 2.4 g daily in 2 divided doses, dose to be increased only in severe cases

Side effect:

l SIDE-EFFECTS GENERAL SIDE-EFFECTS ► Common or very common Gastrointestinal discomfort. skin reactions ► Uncommon Asthma . hypersensitivity ► Rare or very rare Dyspnoea SPECIFIC SIDE-EFFECTS ► Common or very common ► With intravenous use Constipation . diarrhoea . dizziness . fatigue . gastrointestinal disorders . haemorrhage headache . inflammatory bowel disease . insomnia . nausea . oral disorders . vertigo . vomiting ► Uncommon ► With intravenous use Acute kidney injury . anxiety . nephritis tubulointerstitial . nephrotic syndrome . oedema .tinnitus . vision disorders ► With oral use Headache . nausea .rash (discontinue) ► Rare or very rare ► With intravenous use Agranulocytosis . alopecia . anaemia . auditory disorder. confusion . depression . heart failure . hepatic disorders . hypersensitivity vasculitis . hypertension . hypotension . infection exacerbated . irritability . leucopenia . meningitis aseptic (patients with connective-tissue disorders such as systemic lupus erythematosus may be especially susceptible). myocardial infarction . neck stiffness .

Medication family: ANALGESICS

Medication name: Ibuprofen

Contraindications:

trolled hypertension ►
ALLERGY AND CROSS-SENSITIVITY g Contra-indicated in patients with a history of hypersensitivity to aspirin or any other NSAID—which includes those in whom attacks of asthma, angioedema, urticaria or rhinitis have been precipitated by aspirin or any other NSAID l PREGNANCY ► With systemic use Avoid unless the potential benefit outweighs the risk. Avoid during the third trimester (risk of closure of fetal ductus arteriosus in utero and possibly persistent pulmonary hypertension of the newborn); onset of labour may be delayed and duration may be increased. ► With topical use Patient packs for topical preparations carry a warning to avoid during pregnancy
l BREAST FEEDING ► With oral use Use with caution during breast-feeding. Amount too small to be harmful but some manufacturers advise avoid. ►. l HEPATIC IMPAIRMENT ► With systemic use for indications relating to pain or pyrexia g Caution in mild to moderate impairment; avoid in severe impairment.
l RENAL IMPAIRMENT ► With systemic use for indications relating to pain or pyrexia In general, for NSAIDs the MHRA advises to avoid where possible; if necessary, use with caution (risk of fluid retention and further renal impairment, including renal failure).g For ibuprofen, avoid in severe impairment.

Side effect:

palpitations . pancreatitis . pancytopenia . photosensitivity reaction . psychotic disorder.renal papillary necrosis .respiratory disorders . severe cutaneous adverse reactions (SCARs). shock . systemic lupus erythematosus (SLE).thrombocytopenia ► With oral use Acute kidney injury . agranulocytosis . anaemia . angioedema . constipation . diarrhoea . gastrointestinal disorders . haemorrhage . leucopenia . liver disorder. meningitis aseptic (patients with connective-tissue disorders such as systemic lupus erythematosus may be especially susceptible). oedema . oral ulceration . pancytopenia .renal papillary necrosis . severe cutaneous adverse reactions (SCARs). shock . thrombocytopenia . vomiting ► Frequency not known ► With oral use Crohn's disease .fertility decreased female . fluid retention . heart failure . hypertension . increased risk of arterial thromboembolism .renal failure (more common in patients with pre-existing renal impairment). respiratory disorders .respiratory tract reaction ►

Medication family: Venous thromboembolism prophylaxis

Medication name: Unfractionated heparin

Contraindications:

ALLERGY AND CROSS-SENSITIVITY g Caution in hypersensitivity to low molecular weight heparin. M l PREGNANCY Does not cross the placenta; maternal osteoporosis reported after prolonged use; multidose vials may contain benzyl alcohol—some manufacturers advise avoid. l BREAST FEEDING Not excreted into milk due to high molecular weight. l HEPATIC IMPAIRMENT Manufacturer advises caution; consider avoiding in severe impairment (increased risk of bleeding complications). BNF 84 Thromboembolism 147 Cardiovascular system 2 Dose adjustments Manufacturer advises consider dose reduction if used in severe impairment. l RENAL IMPAIRMENT gUse with caution

Dose:

► BY SUBCUTANEOUS INJECTION ► Adult: 5000 units every 8–12 hours

Side effect:

l SIDE-EFFECTS
Adrenal hypofunction . hypokalaemia . priapism .rebound hyperlipidaemia .thrombocytopenia

Medication family: Venous thromboembolism prophylaxis

Medication name: Low molecular weight heparin (ENOXAPARIN)

Contraindications:

CONTRA-INDICATIONS Mechanical prosthetic heart valve l CAUTIONS Low body-weight (increased risk of bleeding). Obesity (increased risk of thromboembolism) l ALLERGY AND CROSS-SENSITIVITY g Contra-indicated in hypersensitivity to unfractionated or low molecular weight heparin. l PREGNANCY Not known to be harmful, low molecular weight heparins do not cross the placenta. Multidose vial contains benzyl alcohol—avoid. l BREAST FEEDING Manufacturer advises suitable for use during breast feeding—passage into breast milk and absorption by the nursing infant considered to be negligible due to the relatively high molecular weight of enoxaparin and inactivation in the gastro-intestinal tract. l HEPATIC IMPAIRMENT Manufacturer advises caution—no information available. l RENAL IMPAIRMENT Risk of bleeding increased; use of unfractionated heparin may be preferable. Manufacturer advises avoid if creatinine clearance less than 15 mL/minute.

Dose:

► BY SUBCUTANEOUS INJECTION ► Adult: 40 mg every 24 hours

Side effect:

l SIDE-EFFECTS ► Common or very common Haemorrhagic anaemia . headache . hypersensitivity .thrombocytopenia . thrombocytosis ► Uncommon Hepatic disorders . injection site necrosis . intracranial haemorrhage ► Rare or very rare Cutaneous vasculitis . eosinophilia ► Frequency not known Acute generalised exanthematous pustulosis (AGEP)

Monitoring:

MONITORING REQUIREMENTS Routine monitoring of antiFactor Xa activity is not usually required during treatment with enoxaparin, but may be necessary in patients at increased risk of bleeding (e.g. in renal impairment and those who are underweight or overweight).

Medication family: Interleukin-6 receptor blockers for COVID-19

Medication name: Tocilizumab

Indication:

Patients with severe or critical COVID-19 requiring supplemental oxygen and/or mechanical ventilation AND corticosteroid treatment

Contraindications:

Prior hypersensitivity to the medication or any known ingredient in it.

Dose:

Tocilizumab 8 mg/kg (maximum dose of 800 mg) intravenous infusion administered over 60 minutes as a single dose.
• Avoid IV push or bolus.
• If clinical response is determined to be inadequate after 12–48 hours, a second dose may be considered.
• Renal dose adjustment is not warranted.
• Do not exceed maximum dose of 800 mg.

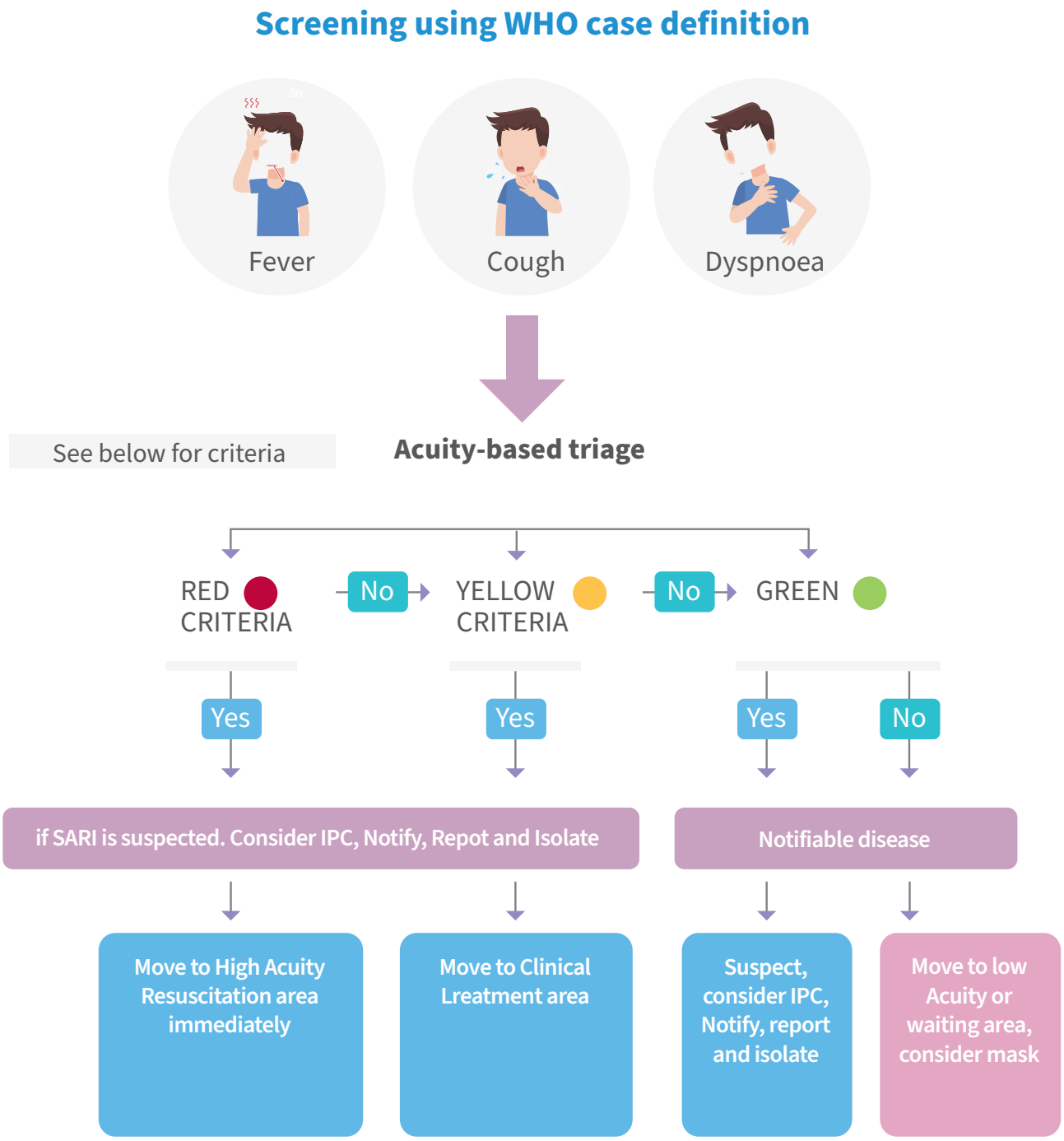
Side effect:

Acute severe infections: TB, bacterial, invasive fungal, viral and other opportunistic superinfections.
• Immunosuppression.
• Elevated liver function tests and lipid profile.
• Gastrointestinal perforation.
• Hypersensitive reactions, anaphylaxis.
• Important risks include:
– Serious infection
– Complications of diverticulitis
– Serious hypersensitivity reactions
– Neutropenia
– Hepatotoxicity
– Thrombocytopenia and the potential risk of bleeding
– Elevated lipid levels and the potential risk of cardiovascular and cerebrovascular events
– Malignancies
– Demyelinating disorders
– Immunogenicity.

Monitoring:

Neutrophil count (it is not recommended to initiate treatment in patients with neutropenia).
– Platelets count (it is not recommended to initiate treatment in patients with < 50 000/mL).
– Transaminases (it is not recommended to initiate treatment in patients with elevated transaminases ALT or AST above 1.5Å~ ULN. Discontinue infusion or do not give second dose in patients who develop persistent elevated ALT or AST above 3Å~ ULN or who develop ALT or AST above 5Å~ ULN).
– Lipid profile (LDL, HDL cholesterol, triglycerides) (possibility of elevated lipid profile after treatment).

4.2 Appendix 2: Triaging



1 CHECK FOR RED CRITERIA

Unresponsive

AIRWAY& BREATHING
- Stridor
- Respiratory distress or central cyanosis

CIRCULATION
- Capillary refill >3 sec
- Weak and fast pulse
- Heavy bleeding
- HR <50 or >150

OTHER
- High-risktrauma
- Poisoning/ingestion or dangerous chemical exposure
- Threatened limb
- Snake bite
- Acute chest or abdominal pain (>50 years old)
- ECG With acute ischaer (if done)
- Violent or aggressive

PREGNANTWITH ANYO
- Heavy bleeding
- Severe abdominal pain
- Seizures or altered mental status
- Severe headache
- Visual changes
- SBP 160 or DBP 110
- Active labour
- Trauma

DISABILITY
- Active convulsions
- Any two of:

-Altered mental status
-Stiff neck
-Hypothermia or feyer
- Headache
- Hypoglycaemia

2 CHECK FOR YELLOW CRITERIA

AIRWAY & BREATHING
- Any swelling/mass of mouth, throat or neck
- Wheezing (no red criteria)

CIRCULATION
- Vomits everything or ongoing diarrhoea
- Unable to feed or drink
- Severe pallor (no red criteria) • Ongoing bleeding (no red criteria)
- Recent fainting

OTHER
- New rash worsening over hours or peeling (no red criteria)
- Visible acute limb deformity, Open fracture, Suspected dislocation, Other trauma/burns (no red criteria).
- Known diagnosis requiring urgent surgical intervention.
- Sexual assault, Acute testicular/scrotal pain or priapism, Unable to pass urine.
- Exposure requiring time-sensitive prophylaxis (eg. animal bite, needlestick)
- Pregnancy, referred for complications

DISABILITY
- Altered mental status or agitation (no red criteria)
- Acute general weakness
- Acute focal neurologic complaint
- Acute visual disturbance
- Severe pain (no red criteria)

3 NO HIGH RISK VITAL SIGNS

- HR 60 - 130
- RR 10 - 30
- Temp 36°-39°
- Sp02 > 92%
- AVPU A (AVPU: A Alert, V response to verbal stemuli, P response to pain, U unresponsive)

4.3 Appendix 3: A.B.C.D.E .Assessment

	ASSESSMENT FINDINGS	IMMEDIATE MANAGEMENT
Airway 	Unconscious with limited or no air movement	If **NO TRAUMA**: head-tilt and chin-lift, use OPA or NPA to keep airway open, place in recovery position or position of comfort. If possible **TRAUMA**: use jaw thrust with c-spine protection and place OPA to keep the airway open (no NPA if facial trauma).
	Foreign body in airway	Remove visible foreign body. Encourage coughing. • If **unable** to cough: chest/abdominal thrusts/back blows as indicated. • If patient becomes unconscious: CPR.
	Gurgling	Open airway as above, suction (avoid gagging).
	Stridor	Keep patient calm and allow position of comfort. • For signs of anaphylaxis: give IM adrenaline. • For hypoxia: give oxygen.
Breathing 	Signs of abnormal breathing or hypoxia	Give oxygen. Assist ventilation with BVM if breathing NOT adequate.
	Wheeze	Give salbutamol. For signs of anaphylaxis: give IM adrenaline.
	Signs of tension pneumothorax (absent sounds/hyperresonance on one side WITH hypotension, distended neck veins)	Perform needle decompression, give oxygen and IV fluids. Will need chest tube.
	Signs of opiate overdose (AMS and slow breathing with small pupils)	Give naloxone.
Circulation 	Signs of poor perfusion/shock	If **no pulse**, follow relevant CPR protocols. Give oxygen and IV fluids.
	Signs of internal or external bleeding	Control external bleeding. Give IV fluids.
	Signs of pericardial tamponade (poor perfusion with distended neck veins and muffled heart sounds)	Give IV fluids,oxygen. Will need rapid pericardial drainage.
Disability 	Altered mental status (AMS)	If NO TRAUMA, place in recovery position.
	Seizure	Give benzodiazepine.
	Seizure in pregnancy (or after recent delivery)	Give magnesium sulphate.
	Hypoglycaemia	Give glucose if < 3.5 mmol/L or unknown.
	Signs of opiate overdose (AMS with slow breathing with small pupils)	Give naloxone.
	Signs of life-threatening brain mass or bleed (AMS with unequal pupils)	Raise head of bed, monitor airway. Will need rapid transfer for neurosurgical services.
Exposure 	Remove wet clothing and dry skin thoroughly	
	Remove jewellery, watches and constrictive clothing	
	Prevent hypothermia and protect modesty	
	Snake bite	Immobilize extremity. Send picture of snake with patient. Call for anti-venom if relevant.
If cause unknown, remember trauma: Examine the entire body and always consider hidden injuries [see also TRAUMA card]		
REMEMBER: PATIENTS WITH ABNORMAL ABCDE FINDINGS MAY NEED RAPID HANDOVER/TRANSFER. PLAN EARLY.		

NORMAL ADULT VITAL SIGNS

Pulse rate: 60–100 beats per minute
Respiratory rate: 10–20 breaths per minute
Systolic blood pressure > 90 mmHg
Oxygen saturation > 92%

Estimating systolic blood pressure
(not reliable in children and the elderly):
Carotid (neck) pulse → SBP ≥ 60 mmHg
Femoral (groin) pulse → SBP ≥ 70 mmHg
Radial (wrist) pulse → SBP ≥ 80 mmHg

SAMPLE History

Signs & symptoms
Allergies
Medications
PMH
Last oral intake
Events

SPECIAL CONSIDERATIONS IN THE ASSESSMENT OF CHILDREN

- Children have bigger heads and tongues, and shorter, softer necks than adults. Position airway as appropriate for age.
- Always consider foreign bodies.

- Look for signs of increased work of breathing (e.g. chest indrawing, retractions, nasal flaring).
- Listen for abnormal breath sounds (e.g. grunting, stridor, or silent chest).

AGE	RESPIRATORY RATE (breaths per minute)
< 2 months	40–60
2–12 months	25–50
1–5 years	20–40

- Signs of poor perfusion in children include: slow capillary refill, decreased urine output, lethargy, sunken fontanelle, poor skin pinch.
- Look for signs of anaemia and malnourishment (adjust fluids).
- Remember that children may not always report trauma and may have serious internal injury with few external signs.

AGE (in years)	NORMAL HEART RATE (beats per minute)
<1	100–160
1–3	90–150
4–5	80–140

- Always check AVPU (alert, verbal, pain, unresponsive).
- Hypoglycaemia is common in ill children.
- Check for tone and response to stimulus.
- Look for lethargy or irritability.

INFANTS AND CHILDREN HAVE DIFFICULTY MAINTAINING TEMPERATURE

- Remove wet clothing and dry skin thoroughly. Place infants skin-to-skin when possible.
- For hypothermia, cover the head (but be sure mouth and nose are clear).
- For hyperthermia, unbundle tightly wrapped babies.

DANGER SIGNS IN CHILDREN

- Signs of airway obstruction (unable to swallow saliva/ drooling or stridor).
- Increased breathing effort (fast breathing, nasal flaring , grunting, chest indrawing or retractions).
- Cyanosis (blue colour of the skin, especially at the lips and fingertips).
- Altered mental status (including lethargy or unusual sleepiness, confusion, disorientation).
- Moves only when stimulated or no movement at all (AVPU other than "A").
- Not feeding well, cannot drink or breastfeed or vomiting everything.
- Seizures/convulsions.
- Low body temperature (hypothermia).

ESTIMATED WEIGHT in KILOGRAMS for CHILDREN 1–10 YEARS OLD:

[age in years + 4] x 2

Source: WHO/IFRC/IFEM Basic emergency care (BEC): approach to the acutely ill and injured, quick cards (2018).

4.4 Appendix 4: Checklist for admission

CHECKLIST FOR ADMISSION

- [ ] Essential diagnostic tests obtained, e.g. complete blood cell count, chemistry panel, glucose, chest radiograph, upper respiratory tract specimens for viral testing (COVID-19 and during influenza season include influenza testing), blood sample for culture (when possible, before first dose of antimicrobials), but do not delay antimicrobials.
- [ ] Emergency treatments given and patient's response checked, e.g. oxygen therapy, insertion of peripheral IV (use appropriate antisepsis for the skin to prevent catheter-related infections), initial fluid therapy (and vasopressors if in shock).
- [ ] For patients with SARI and sepsis or septic shock: administer appropriate antimicrobials immediately for the suspected or confirmed pathogen, ideally within 1 hour of recognition (see Chapter 7).
- [ ] Give steroids (if suspected or confirmed severe or critical COVID-19).
- [ ] Documentation completed.
- [ ] Determined the level of care the patient needs, e.g. ICU, high dependency unit, general ward.
- [ ] Determined IPC measures and proper PPE health care workers need to manage the patient.
- [ ] Verbal communication with ward staff completed to ensure continuity of care.
- [ ] Patient prepared for safe transfer.

(Source: Clinical care for sever acute respiratory infection Toolkit 2022)

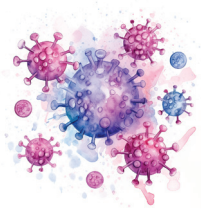
4.5 Appendix 5: Reporting and Transfer

CHECKLIST FOR TRANSFER

- [ ] Patient is stabilized.
- [ ] Adequate IPC measures and proper PPE needed, e.g. medical mask for patients with ARI.
- [ ] Everything secured: airway, NG tube, IV lines, monitors, endotracheal tubes, ventilator.
- [ ] Enough drugs: e.g. vasopressors, sedatives.
- [ ] Enough oxygen: adequate oxygen saturation (SpO2).
- [ ] Enough IV fluids: blood pressure adequate.
- [ ] Health care workers (e.g. transporters, receiving staff) and receiving unit/ward prepared.

4.6 Appendix 6 : Preventative measures for each disease

Prevention



COVID-19

For all individuals:

Proper hand washing techniques

Respiratory hygiene

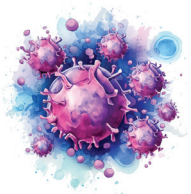
Social distancing and limiting contact with symptomatic individuals

are the main preventive measures (droplet and contact precautions)

Universal masking and targeted continuous use of medical masks are recommended in specific transmission scenarios such as crowded indoor spaces with poor ventilation and inability to maintain the correct social distancing; WHO current guidance is provided in Mask use in the context of COVID-19.

In health care settings:
Enhanced IPC measures are required when caring for patients with suspected, probable or confirmed COVID-19; including:

Appropriate use of PPE (gown, gloves, medical mask, eye protection), and addition of airborne precautions (N95/FFP2/3) when performing AGP.
See also WHO recommendations on mask use by health workers, in light of the Omicron variant of concern.



MERs COV

Proper hand washing techniques

Respiratory hygiene

Social distancing and limiting contact with symptomatic individuals

are the main preventive measures (droplet and contact precautions)

Prevention

MERs COV

When visiting areas where camels are present, use proper hand washing techniques.

Avoid contact with sick camels.

Avoid eating raw meat or unpasteurized milk.

In health care settings:
Enhanced IPC measures are required when caring for patients with suspected, probable or confirmed MERS-CoV including:

Appropriate use of PPE (gown, gloves, medical mask, eye protection), and addition of airborne precautions (N95/FFP2/3) when performing AGP.

TUBERCULOSIS

For all individuals:

Proper hand washing techniques

Respiratory hygiene

Social distancing and limiting contact with symptomatic individuals

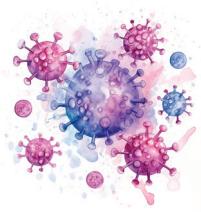
are the main preventive measures (droplet and contact precautions)

For health care workers:
Enhanced IPC measures are required when caring for patients with suspected, probable or confirmed MERS-CoV including:

Wear a respirator when visiting the home of a patient with infectious TB, disease or when transporting a patient with infectious TB, disease in a vehicle.

Collect specimens in a well-ventilated area, away from other house hold members.

Prevention



SEASONAL INFLUENZA VIRUSES

Infection prevention and control and public health interventions.
For all individuals:

Proper hand washing techniques

Respiratory hygiene

Social distancing and limiting contact with symptomatic individuals

are the main preventive measures (droplet and contact precautions)

In health care settings:
enhanced IPC measures are required when caring for patients with suspected, probable or confirmed influenza infection; including appropriate use of PPE (gown, gloves, medical mask, eye protection) with the addition of airborne precautions (N95/FFP2/3) when performing AGP.

Vaccines

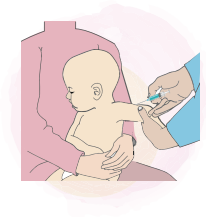
COVID-19

Vaccines to protect from COVID-19 are in available and clinical trials and further developments are ongoing.
See COVID-19 vaccines for the most up-to-date information.
• Prophylaxis: see WHO Living guideline: drugs to prevent COVID-19 for the most up-to-date recommendations for the use of drugs to prevent COVID-19.

Vaccines

MERs COV

Not available.



TUBERCULOSIS

•BCG has been shown to be effective in preventing severe forms of TB.

•BCG is strangely recommended for all newborn children and any children up to the age of 5 especially in refugee situations.

•The vaccination of new born should be incorporated into the immunisation programme for all children.

•Re-vaccination is not recommended.

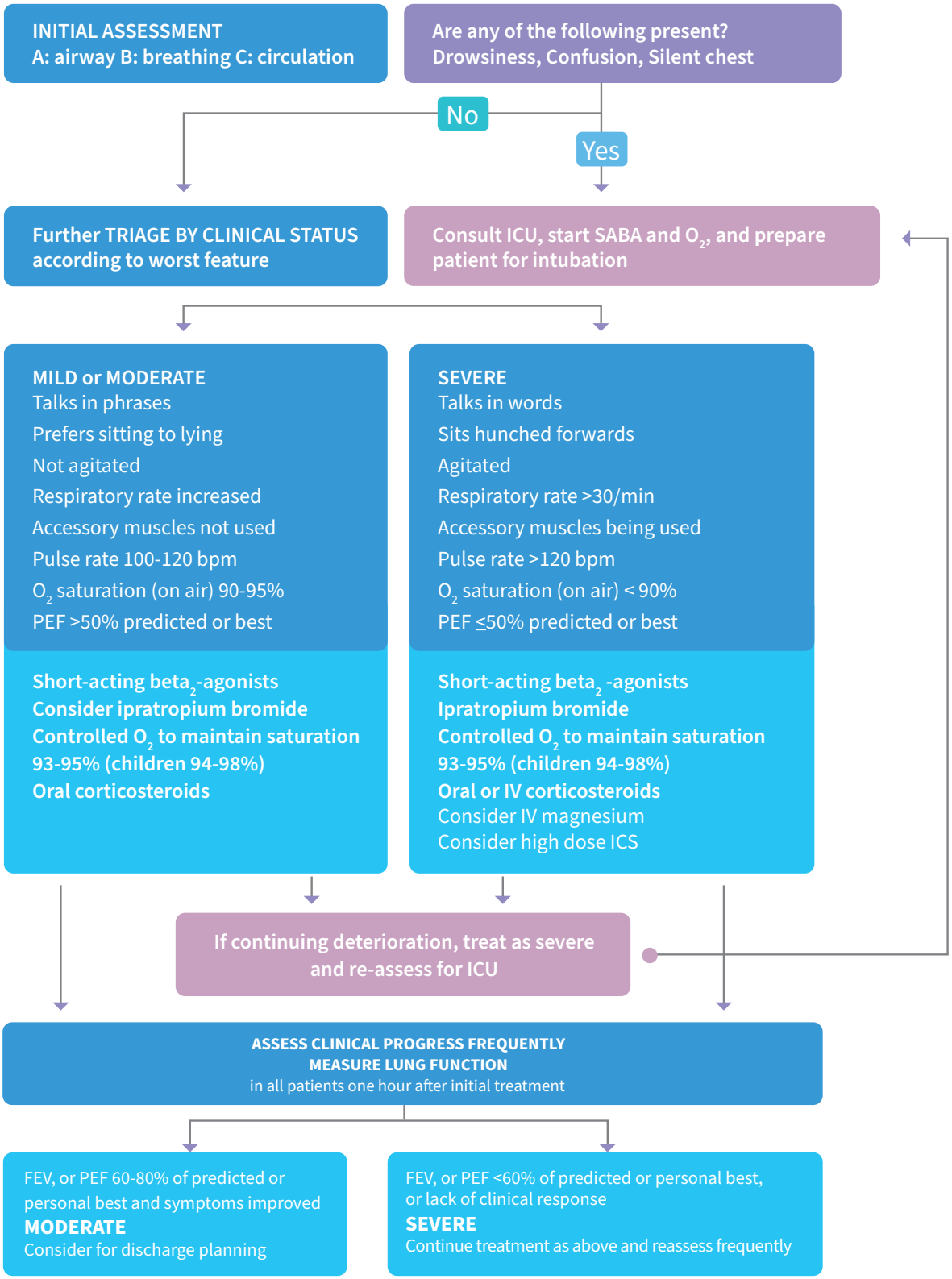
SEASONAL INFLUENZA VIRUSES

• Annual vaccination is recommended for pregnant women, children aged 6–59 months, older age (≥ 65 years), individuals with Chronic medical conditions and health care workers.

• No medication for prevention has been recommended.

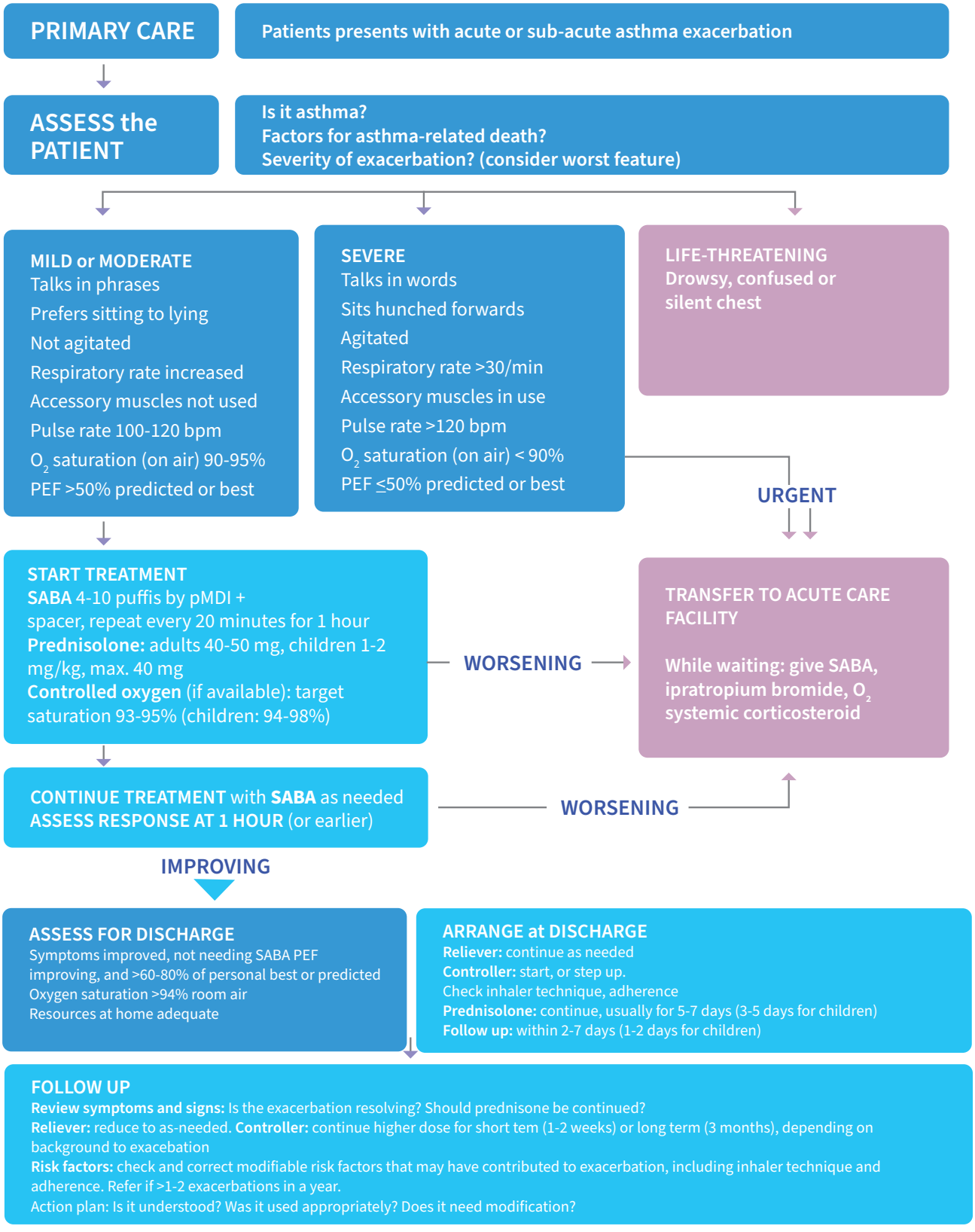
4.7 Appendix7: Asthma exacerbation(Global Initiative for Asthma Strategy 2023)

4.7.1 Management of asthma exacerbations in acute care facility



https://ginasthma.org/wp-content/uploads/2023/05/GINA-2023-Full-Report-2023-WMS.pdf

4.7.2 Management of asthma exacerbations in primary care



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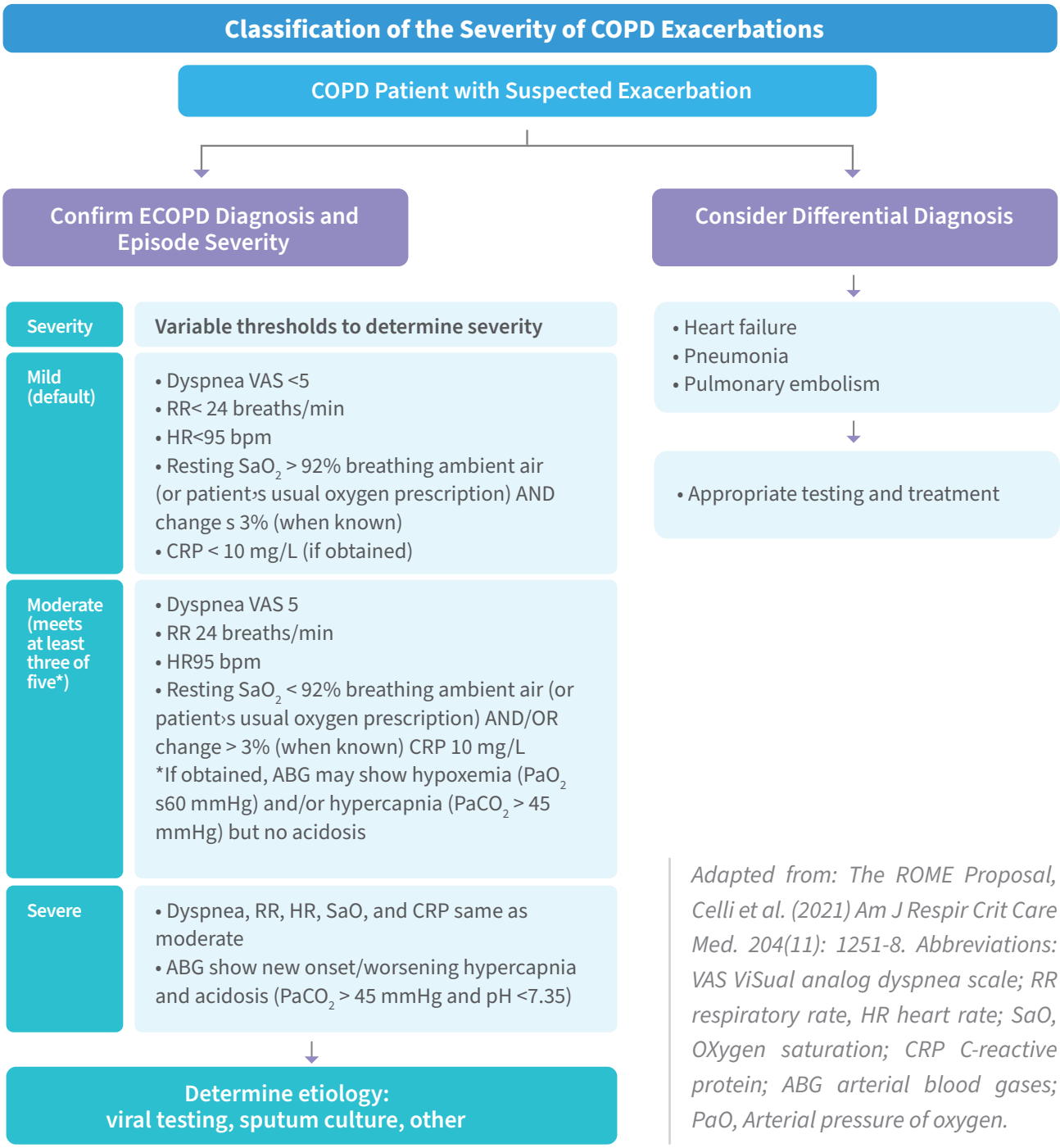
4.8 Classification of the severity of COPD Exacerbations



Adapted from: The ROME Proposal, Celli et al. (2021) Am J Respir Crit Care Med. 204(11): 1251-8. Abbreviations: VAS ViSual analog dyspnea scale; RR respiratory rate, HR heart rate; SaO, OXygen saturation; CRP C-reactive protein; ABG arterial blood gases; PaO, Arterial pressure of oxygen.

An exacerbation of COPD is defined as an event characterized by dyspnea and/or cough And sputum that worsen over < 14 days. Exacerbations of COPD are often associated with Increased local and systemic inflammation caused by airway infection, pollution, or other Insults to the lungs.

- As the symptoms are not specific to COPD relevant differential diagnoses should be Considered, particularly pneumonia, congestive heart failure and pulmonary embolism.
- The goals for treatment of COPD exacerbations are to minimize the negative impact of The current exacerbation and to prevent subsequent events.
- Short-acting inhaled beta2-agonists، with or without short-acting anticholinergics، are Recommended as the initial bronchodilators to treat an exacerbation.
- Maintenance therapy with long-acting bronchodilators should be initiated as soon as possible. In patients with frequent exacerbations and elevated blood eosinophil levels Addition of inhaled corticosteroids to the double bronchodilator regimen should be considered.
- In patients with severe exacerbations, systemic corticosteroids can improve lung function (FEV1), oxygenation and shorten recovery time including hospitalization duration. Duration of therapy should not normally be more than 5 days.
- Antibiotics، when indicated، can shorten recovery time، reduce the risk of early relapse، Treatment failure and hospitalization duration. Duration of therapy should be 5 days.
- Methylxanthines are not recommended due to increased side effect profiles.
- Non-invasive mechanical ventilation should be the first mode of ventilation used in COPD Patients with acute respiratory failure who have no absolute contraindication because it Improves gas exchange, reduces work of breathing and the need for intubation, decreases Hospitalization duration and improves survival.
- Exacerbation recovery time varies، taking up to 4-6 weeks to recover، with some patients Failing to return to the pre-exacerbation functional state.

4.8.1 Potential Inductions for Hospitalization Assessment*

- ☐ Severe symptoms such as sudden worsening of resting dyspnea, high respiratory rate, decreased oxygen saturation, confusion, drowsiness
- ☐ Acute respiratory failure
- ☐ Onset of new physical signs (e.g., cyanosis, peripheral edema)
- ☐ Failure of an exacerbation to respond to initial medical management
- ☐ Presence of serious comorbidities (e.g heart failure, newly occurring arrhythmias, etc)
- ☐ Insufficient home support

**Local resources need to be consige rMTERIAL*

4.8.2 Key point for the Managements of Exacerbations

- ☐ Short-acting inhaled beta$_2$-agonists, with or without short-acting anticholinergics, are recommended as the initial bronchodilators to treat an acute exacerbation **(Evidence C)**
- ☐ Systemic corticosteroids can improve lung function (FEV1), oxygenation and shorten recovery time and hospitalization duration. Duration of therapy should not normally be more than 5 days **(Evidence A)**
- ☐ Antibiotics, when indicated, can shorten recovery time, reduce the risk of early relapse, treatment failure, and hospitalization duration. Duration of therapy should normally be 5 days **(Evidence B)**
- ☐ Methylxanthines are not recommended due to increased side effect profiles **(Evidence B)**
- ☐ Non-invasive mechanical ventilation should be the first mode of ventilation used in COPD patients with acute respiratory failure who have no absolute contraindication because it improves gas exchange, reduces work of breathing and the need for intubation, decreases hospitalization duration and improves survival **(Evidence A)**

https://goldcopd.org/2023-gold-report-2/

Jordanian Ministry of Health

World Health Organization

Jordan