Slide 2:

- All children with confirmed COVID 19 infection should be assessed for severity of infection
- The severity of COVID-19 infection can be defined on the basis of the clinical features, laboratory finding and chest radiograph finding
- Assessment of severity also includes risk factors for severe disease
- Assessment for warning signs is important in the management of these children

Slide 3: Severity of COVID 19 can be graded as ; mild, moderate ,severe and critical.Asymptomatic infection is most common

Slide 4: In different earlier case series mild and asymptomatic infections are most common

Slide 5: In a review moderate infection was most common

Slide 6: Mild infection is characterised by symptoms of mild upper respiratory infection as Fever,

Fatigue, Myalgia, Cough, Sore throat, Runny nose, and Sneezing. May have mild GI symptoms. Examination shows congestion of pharynx. There will not be any auscultatory abnormalities on chest.

Slide 7: Clinical signs of pneumonia (Fever, Cough, Fast breathing, Mild chest retractions)

No signs of severe pneumonia and SpO_2 > 90- 94%

Presence of pneumonia on chest X ray and CT chest also signify moderate disease

Age	Respiratory rate/min
< 2 months	>60
2-11 months	>50

1-5 years	>40
5-10 years	> 30
> 10 years	> 24

Slide 8: Severe disease in adolescent is defined as Adolescent with clinical signs of pneumonia (fever, cough, dyspnoea, fast breathing) ***plus one*** of the following: tachypnea, severe respiratory distress and SpO2< 90% on room air

Slide 9 :Severe disease in children is defined Child with clinical signs of pneumonia with ***one or more*** of the following: central cyanosis, Severe respiratory distress (Fast breathing, grunting, very severe chest in drawing), General danger sign (inability to breastfeed or drink, lethargy or unconsciousness, or convulsions), Fast breathing (age defined cuff off)

Slide 10 :Critical disease is defined when children have one or more of the following: ARDS, sepsis and shock. Other manifestations include acute myocardial dysfunction ,arrhythmia acute kidney injury ,multi System Inflammatory Syndrome(MISC),acute pulmonary embolism and disseminated intravascular coagulation(DIC)

Slide 11: ARDS is defined in children by Pediatric ARDS guidelines from Pediatric acute lung injury consensus conference (PALICC).Requires clinical/radiological and oxygenation criteria. Oxygenation Index and Oxygenation saturation index in intubated patients and PaO_2/FiO_2 ratio in non intubated patient is used to assess the severity of ARDS.

Oxygenation index is calculated as **MAP x FiO_2/PaO_2** ,Oxygenation saturation index is defined as MAP xFiO_2/SpO_2

Slide 12: ARDS is defined as follows process that originates within 1 week , respiratory failure not fully explained by cardiac failure or fluid overload. X-ray shows opacities not fully explained by volume overload ,lobar or lung collapse or nodules. oxygenation index shows OI of < 5

Slide 13:Grading of ARDS can be made based on OI,OSI in intubated patients and P/F and S/F ratio in unintubated patients and graded as follows:

▶ In Invasively ventilated patients	▶ Mild	▶ 4 ≤ OI < 8 ▶ 5 ≤ OSI < 7.5
	▶ Moderate	▶ 8 ≤ OI < 16 ▶ 7.5 ≤ OSI < 12
	▶ Severe	▶ OI ≥ 16 or OSI
▶ Bilevel (NIV or CPAP) ≥ 5 cm H_2O via full face mask: PaO_2/FiO_2 ≤ 300 mm Hg or		

Slide 14: sepsis is defined as suspected and proven infection with > SIRS based criteria

***The presence of at least two of the following four criteria, one of which must be abno leukocyte count:**

- Core temperature of >38.5°C or< 36°C.
- Tachycardia, defined as a mean heart rate >2 SD above normal for age in the absence chronic drugs, or painful stimuli; or otherwise unexplained persistent elevation over a 0

- Mean respiratory rate >2 SD above normal for age or mechanical ventilation for an acu
  not related to underlying neuromuscular disease or the receipt of general anesthesia

- Leukocyte count elevated or depressed for age or > 10% immature neutrophils

Slide 15: MIS-C is defined as Clinical manifestation specific in pediatric population

- ▶ Fever,
- ▶ Laboratory evidence of inflammation, and
- ▶ Evidence of clinically severe illness requiring hospitalization, with multisystem (>2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological)

AND

- ▶ No alternative plausible diagnoses; ***AND***
- ▶ Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms

Slide 16: shock is defined as hypotension (SBP < 5th centile or > 2 SD below normal for age) ***OR***
Two or more of the following Children: any hypotension (SBP < 5th centile or > 2 SD below normal for age) or two or three of the following: altered mental status; bradycardia or tachycardia (HR < 90 bpm or > 160 bpm in infants and heart rate < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or weak pulse; fast breathing; mottled or cool skin or petechial or purpuric rash; high lactate; reduced urine output; hyperthermia or hypothermia

Slide 17: X-ray and CT can help diagnosing pneumonia and stratifying the illness severity Chest X-ray : Help in making the diagnosis of pneumonia and look for complications identify complications, CT chest: CT chest can indicate severity of COVID 19 infection consolidation ,ground glass opacity

Slide 18: on chest xray we can see consolidation b/l,CT shows GGO and consolidation

Slide 19: these are different laboratory markers that can stratify severe disease Reduced Lymphocyte count

Thrombocytopenia /thrombocytosis

Elevated Erythrocyte sedimentation rate and C reactive protein

Low albumin

Elevated Lactate dehydrogenase

Elevated prothrombin time and fibrinogen

Elevated d- dimer

Elevated cardiac enzymes and troponin

Abnormal Electrocardiogram and Echocardiography

Slide 20: assessment should also include risk factors for severe disease: Reduced Lymphocyte count

- Thrombocytopenia /thrombocytosis
- Elevated Erythrocyte sedimentation rate and C reactive protein
- Low albumin
- Elevated Lactate dehydrogenase
- Elevated prothrombin time and fibrinogen
- Elevated d- dimer
- Elevated cardiac enzymes and troponin
- Abnormal Electrocardiogram and Echocardiography

Slide 22: They should also be assessed for warning signs :

- Difficulty in breathing
- Persistent pain/ pressure in the chest

- ▶ Mental confusion or inability to arouse
- ▶ Developing bluish discoloration of lips
- ▶ Decreased urine output
- ▶ General danger signs (inability to breastfeed or drink, lethargy or unconsciousness, or convulsions)
- ▶ For children > 5 years , six minute walk test can be as an warning sign

Slide 23:

a.Patients with **severe and critical disease** are required to be admitted to Hospital preferably in COVID dedicated hospital

b. Children with **moderate disease** are required to be admitted in Dedicated COVID Health centre(DCHC)
c. Treatment of mild symptoms in absence of risk factors for severe disease can be treated at home or COVID care centre
d. Mild cases with high risk may be offered home care if monitoring can be done at home otherwise admission may be offered

Slide 24: General decision pathway of managing COVID 19 in children can be summarised as

a. If they have mild infection should be assessed for risk factors for severe disease and should be admitted if present.If don't have risk factors for severe disease shold be assessed for feasibility of home care.IF feasibility of home care is present should be taken care at home/COVID care centre .If ne feasility of home care admisssion
b. Moderate disease and severe disease should be admitted

Slide 25: COVID 19 infection in children can be graded as mild, moderate, severe and critical

a.Most of the infected children are asymptomatic. Remaining, usually have only mild and moderate presentation

b.Risk factors for severe disease has to be considered along with severity of presentation

c.Mild and moderate disease without risk factors for severe disease can be managed at home with close monitoring for warning signs