

# Approach to the patient with Covid disease

## CLINICAL FEATURES

- Symptoms: fever, dry cough, lack of appetite, muscle pain, taste/smell changes, pneumonia, low finger oxygen saturation, diarrhea, sepsis, ARDS.
- Predisposing conditions: hypertension, diabetes, obesity, cardiac diseases, malignancy, male sex, non smokers.

## BLOOD CHEMISTRIES AND COUNTS

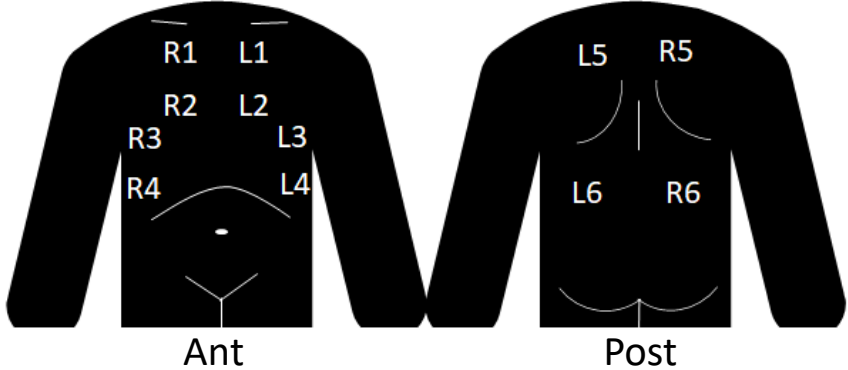
- Low WBC and platelet count, decreased % lymphocytes, ↑ C reactive protein (CRP), LDH, CPK, GOT, GPT, d-dimer, ferritin, IL-6. Normal Pro-calcitonin (PCT).
- Arterial blood gases (ABG): PaO<sub>2</sub> and PaCO<sub>2</sub> decreased.

## WORK-UP

- Nasal&pharyngeal stick (both nares, stick advanced to the pharyngis and rotated).
- Blood cell count with differential, CRP, PCT, LDH, CPK, GOT, GPT, d-dimer, IL-6, ferritin.
- Pneumplus on excrete. Legionella and pneumococcus antigens in urine. Antibodies to HIV-1&2, HCV, HBV.
- ECG

## ECHOGRAPHY

- B-lines** (E-H) mostly present in lateral and basal lung sections:  
B0 (normal, B lines < 3/rib space)  
B1 (mild, B lines 3-7/rib space)  
B2 (moderate, black and white lung)(E-G)  
B3 (severe, white lung)(H)
- Irregular, thickened pleural line** (E-L).
- Sub-pleural areas of consolidation** (I-L), scarcely vascularized, mostly at medial and inferior lung regions.  
C0 Pleural line thin, regular, continuous.  
C1 Pleural line irregular and broadened, sub pleural consolidations few millimeters in diameter.  
C2 consolidations <10 mm diameter  
C3 consolidations >10 mm diameter.
- White lung areas alternating with normal lung** (zebra sign) (G).
- Scant, if any, pleural effusion.
- Extension and increased number of B lines, appearance of B lines in sub-clavicular regions, increasing diameter of consolidations are associated with evolution towards ARDS and poor prognosis.
- Ecographic signs may be present in patients with stick negative or normal chest XR.



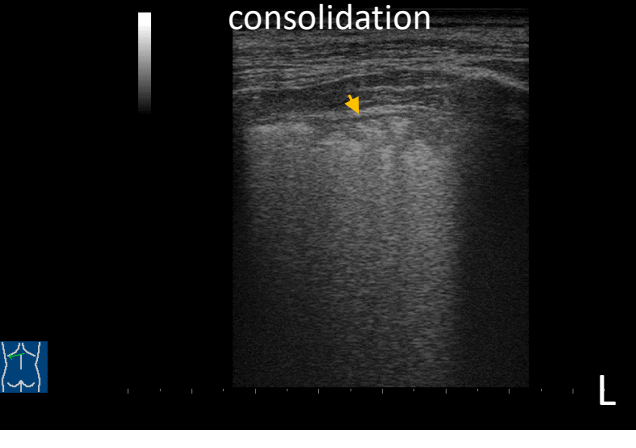
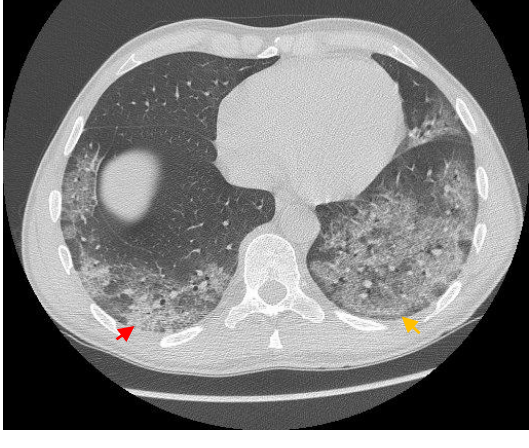
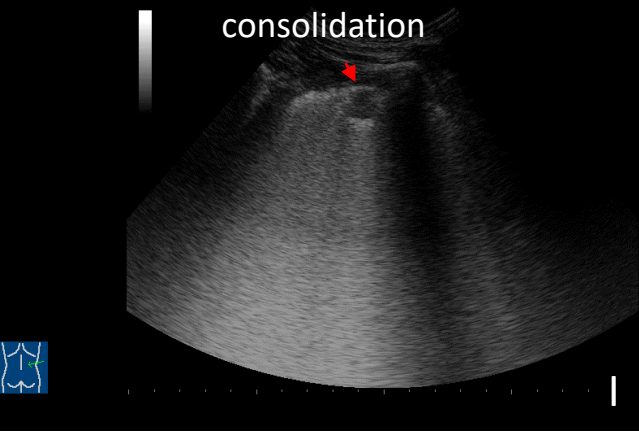
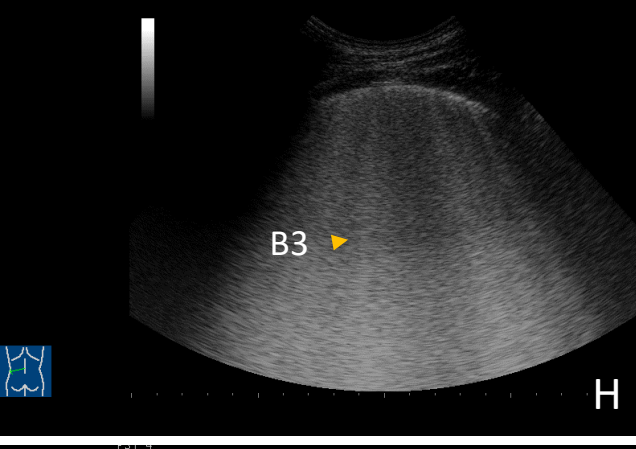
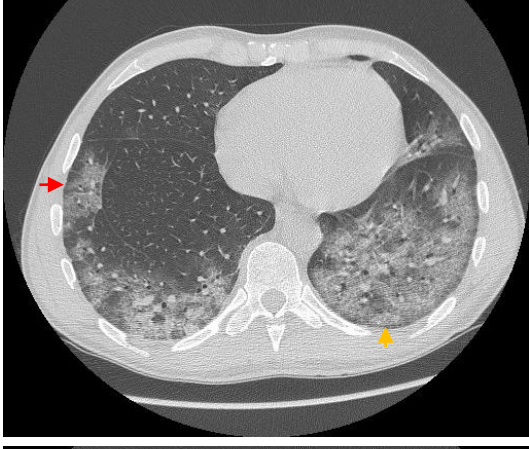
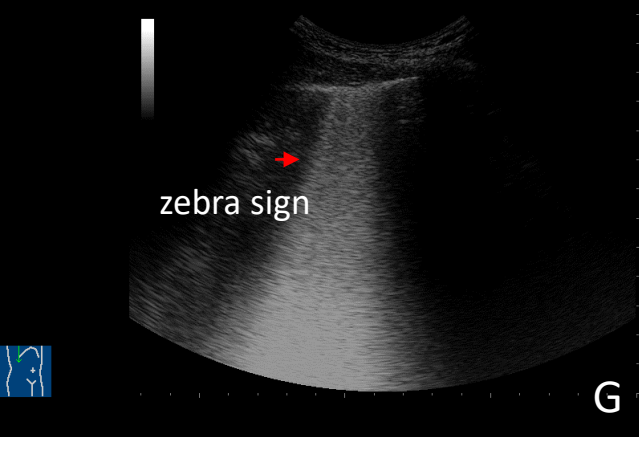
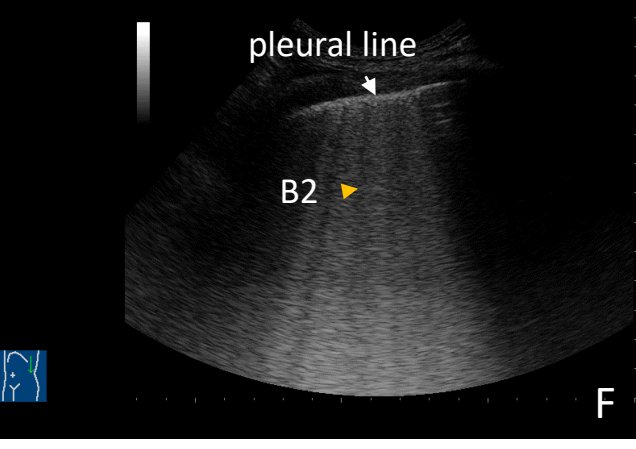
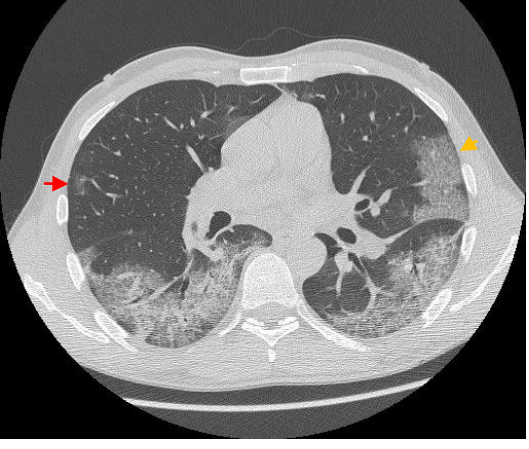
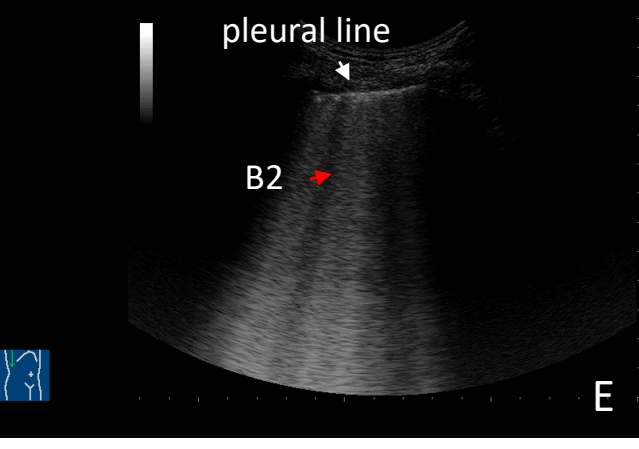
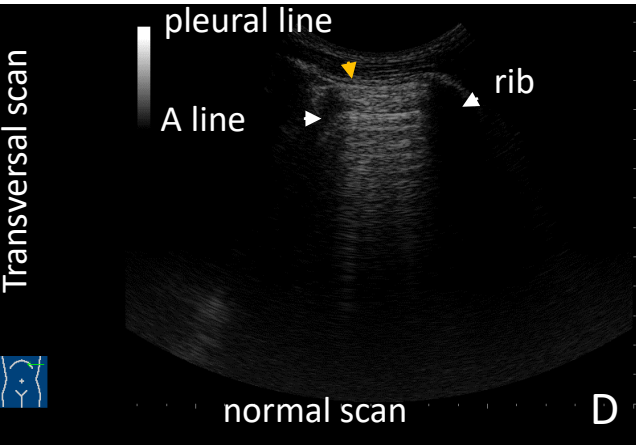
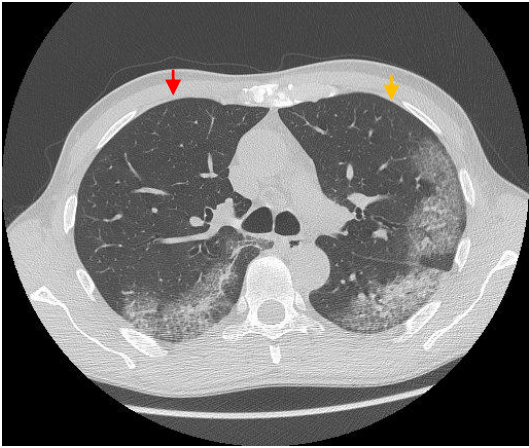
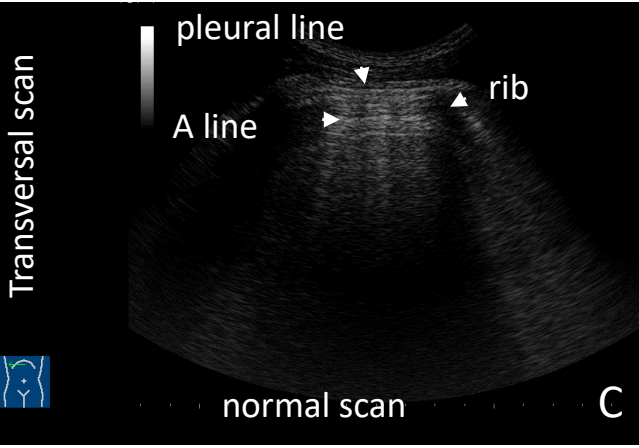
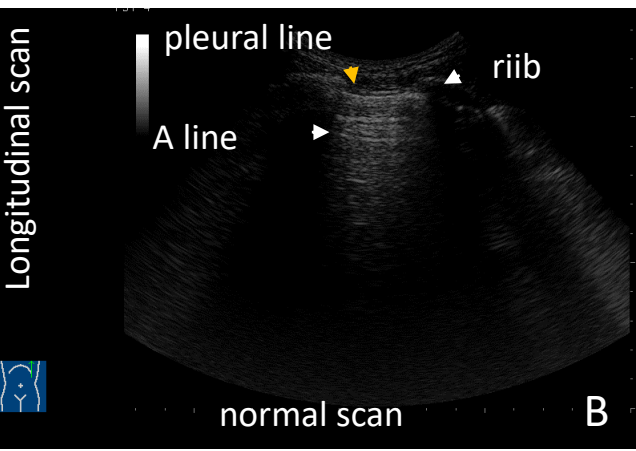
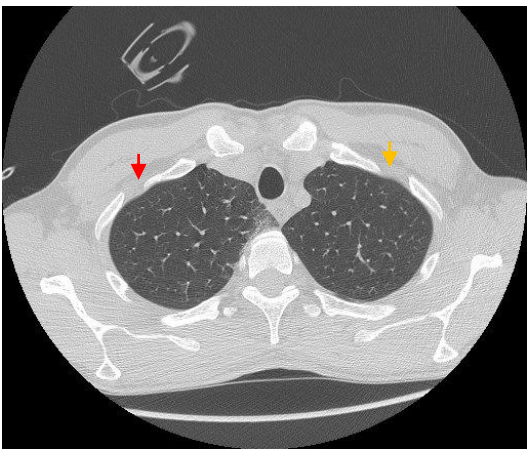
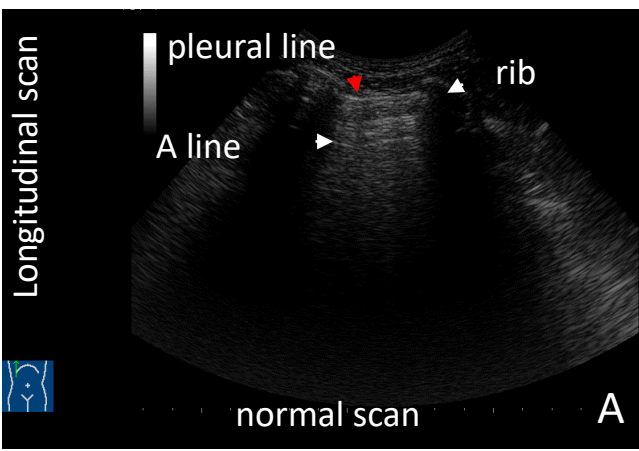
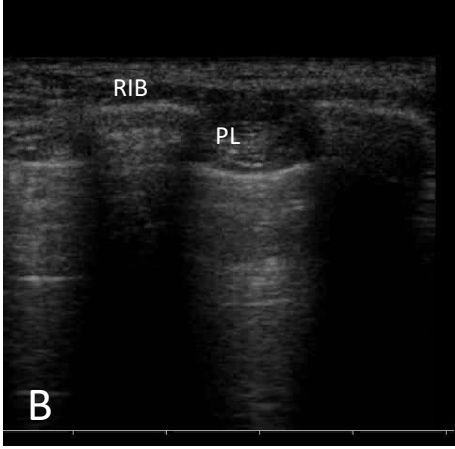
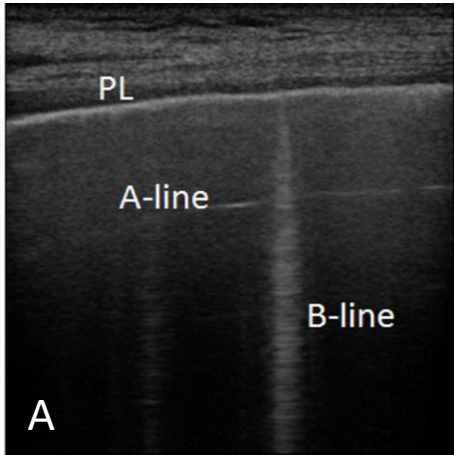
### CHEST REGIONS TO SCAN

RIGHT LUNG (R)			LEFT LUNG (L)		
R1 upper ant	B	C	L1 upper ant	B	C
R2 lower ant	B	C	L2 lower ant	B	C
R3 upper axilla	B	C	L3 upper axilla	B	C
R4 lower axilla	B	C	L4 lower axilla	B	C
R5 upper post	B	C	L5 upper post	B	C
R6 lower post	B	C	L6 lower post	B	C

### Norma lung US



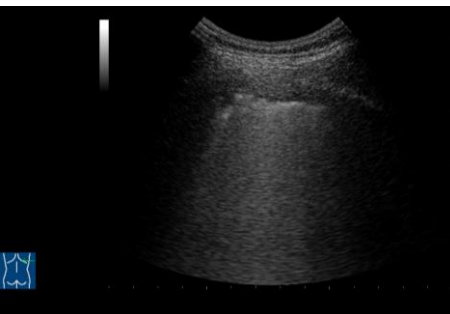
US analysis of a normal lung (transversal scan A, longitudinal scan B), showing a smooth and continuous pleural line (PL). A-lines and B-lines are hyperechoic artefacts. The motion of the PL with respiratory movements is called SLIDING SIGN. B-LINES area rare in normal lung.



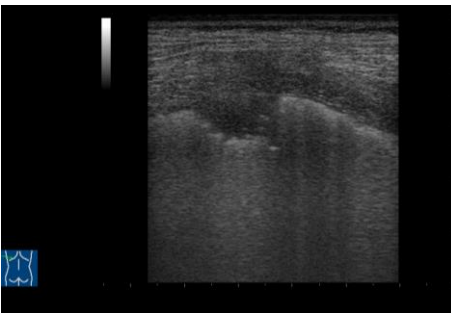
### HRCT (ground glass opacity GGO) in COVID and corresponding US

P.Agostinis, MD

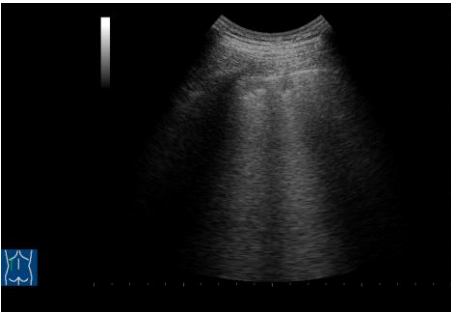
### Types of consolidation



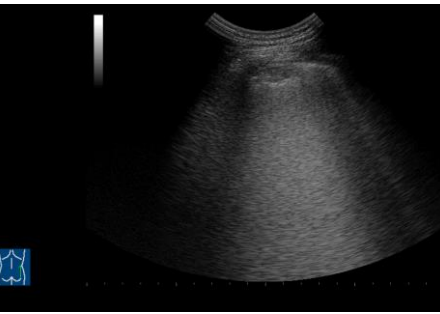
Thick-irregular pleural line



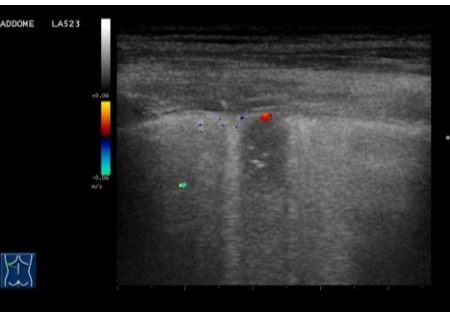
Pneumonia-like



In pairs



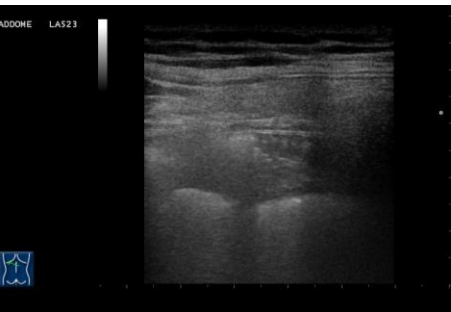
Single



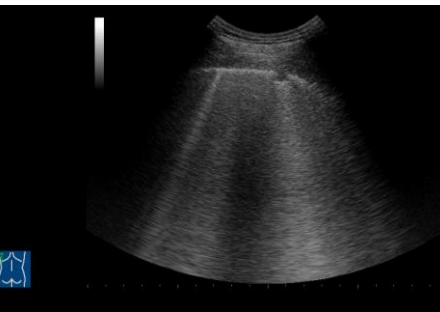
No posterior ehancement



Mouse bite areas



Complex consolidation



Miliar type

### Disease types and treatment decisions

- Fever, normal blood gases, negative walking test, no US signs of lung involvement (**MILD PHASE**): home confinement with treatment.
- Fever, abnormal blood gases, abnormal US (**MODERATE PHASE**): HRCT and recovery in COVID structure.
- Severe respiratory insufficiency, ARDS (**SEVERE PHASE**): recovery in ICU.

### Patients stick-negative with high suspicion of being COVID

- Keep patient isolated.
- Repeat stick after 24 hrs.
- If second stick is negative, but suspicion is high, look for US signs and search virus in excrete/BAL/tube rinsing.

### Good practice

- Materials in COVID AREA (meant to stay there): echographer, manometer, phonendoscope, thermometers, writing material.
- Preference for once a day drug administration.
- Concentrate procedures so that they can be done during one visit.
- Dressing/undressing supervised

### Oxygen therapy:

target spO<sub>2</sub> > 94% (92% in COPD)

#### a) P/F > 250 Venturi mask

- Blu 24% 2 l/min
- White 28% 4 l/min
- Orange 31% 6 l/min
- Yellow 35% 8 l/min
- Red 40% 8 l/min
- Pink 50% 12 l/min
- Green 60% 15 l/min

#### b) P/F < 250 (CPAP PEEP 7-10 cmH<sub>2</sub>O or AIRVO - high flow nasal cannula oxygen therapy –if not CPAP tolerance).

#### c) P/F < 150 (UIC)

P/F < 250

CPAP (7-10 cm H<sub>2</sub>O)  
ABG 1-2 h

stable ABG

CPAP  
Airvo if not CPAP tolerance

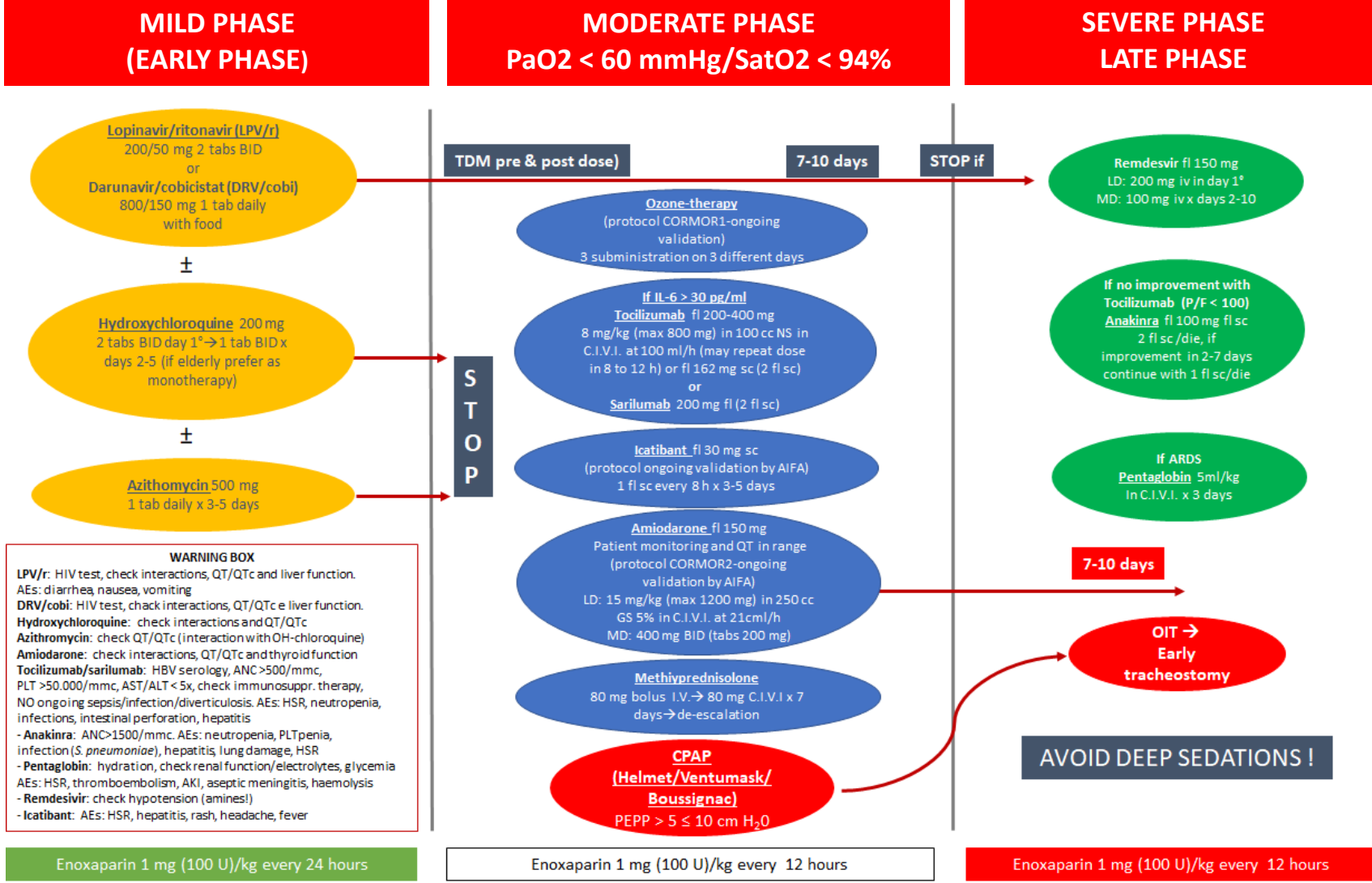
Mobilize the patient in armchair

worsening ABG (P/F < 150)

UIC

### THERAPEUTIC PROTOCOL ASUFC Clinic of Infectious Diseases

The protocol could be modified based on ongoing clinical trial and scientific evidence



### Alarm criteria

- RF > 28/min, worsening S/F or P/F
- Worsening B lines with involvement of apical anterior areas.
- HRCT moderate-severe.

### General practitioner in EARLY MILD PHASE

Give Hydroxychloroquine and Azithromycin, monitor patient by phone two times a day, admitt in COVID area if fever, desaturation, walking test positive, signs of Covid on lung US.