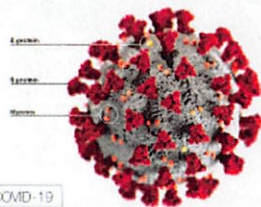


ED GUIDE TO COVID-19



Nomenclature:

Virus: SARS-CoV-2

Infection: COVID-19

Types: 1. L Type (70%) – More aggressive

2. S Type (30%) – Less aggressive

(Note: This is currently being disputed)

* Thought to originate from Bat or Pangolin

Epidemiology:

Attack rate = 30-40%

$R_0 = 2.2 - 3.1$ (SARS 2-5, MERS 0.3-0.8, Measles 12-18, Ebola 1.5-2.5)

Case fatality Rate = 1 – 2% (For medically attended patients)

Incubation time = 3 – 14 days (mean 5.1; outliers 19 – 27 days)

Disease Severity: 80% mild; 15% severe

(hypoxic/hospitalized); 5% Critical (ICU/Ventilated)

Age: 0-14 (1%); 15-49 (55%); 50-64 (28%); >65 (15%).

Transmission:

Droplet and fomites. Airborne plausible; NOT confirmed.

? oral-fecal. 12 – 23% of transmission asymptomatic or presymptomatic.

Infectious period up to 10-14 d. NO evidence of re-infection after recovery.

HCW risk of Infection:

China (3.5 – 7%); Italy (20%).

Disease Course:

Stage 1 (Viral Response Phase) – Viral incubation and replication. Mild Symptoms (fever, cough, malaise)

Stage 2 (Pulmonary Phase) – Adaptive immune response. Hypoxia/Dyspnea. Abnormal labs/CXR. Admission.

Stage 3 (Hyperinflammation Phase) – Disregulated cytokine storm. ARDS, DIC, multiorgan failure, Shock.

Day 1 – Fever, cough

Day 6-7 – Dyspnea

Day 9-10 – Sepsis

Day 10-12 – ARDS

Day 16 – Death

Day 26 – Recovery/discharge (severe disease)

Risk Factors for Increased Case Fatality Rate:

Age > 60, Male, HTN, DM2, CKD, CVD, CAD, COPD,

Cancer, immunocompromised. (Smoker small ↑ risk).

Age	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Italy %	0	0	0	0.3	0.4	1.0	3.5	12.8	20.2
China %	0	0.2	0.2	0.2	0.4	1.3	3.6	8.0	14.8

Resources:

Emcrit, RebelEM, Onepageicu.com, References on request.

Symptomatology:

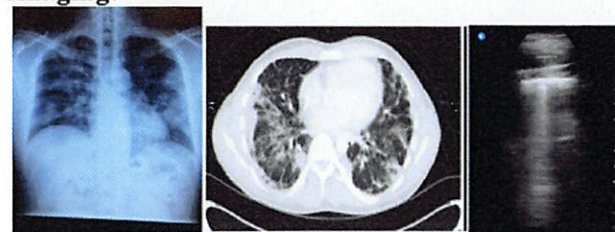
Severe vs Non-Severe (%): Fever (88/81), cough (71/66), fatigue (60/44), dyspnea (44/6), sputum production (38/28), SOB (36/13), myalgias (26/13), Chills (26/11), dizzy (16/12), headache (11/13), sore throat (8/10), N/V (6/6), diarrhea (6/6), rhinorrhea (3/5).

Up to 57% of patients have NO fever at triage.

RR can often be normal due to maintenance of lung compliance. Consider walk challenge to identify exertional hypoxia.

Other symptoms include altered mentation, hemoptysis, anorexia, anosmia, aguesia.

Imaging:



CXR – Hazy, bilateral, peripheral opacities (rare unilateral)

CT – Peripheral ground glass opacities

US – B-lines, pleural thickening, consolidations.

Labs:

Labs	WBC	PMN	LMN	Plt	CRP	LDH	Trop
Results	N/↓	↑	↓	↓	↑	↑	↑
Labs	CK	Creat	Fibr	Ferr	Alb	AST/ALT	D-d
Results	↑	↑	↓	↑	↓	↑	↑

Affects T cells. Usually ↓ Lymphocytes (83%). Can have normal WBC. Neutrophil:lymphocyte ratio > 3 predicts severe illness. CRP/Ferr ↑ with severity. Troponin ↑ starting day 4(? myocardial injury). ↑CRP/LDH/D-d predictor of severity/death. DIC =(↑D-d/INR, ↓Fibr).

Diagnosis:

RT-PCR – Sensitivity ~ 75%. (Single negative test does NOT rule out COVID-19). Sensitivity 97% if combined with CT Chest.

Treatment:

Early identification of severe disease. Mainly supportive.

O2 – Pulse ox targets: Resp disease 88-92% (92-95% if drop below 85% on exertion). No disease 93 – 96%. If >4L O2 consider ICU. If >6L O2 consider intubation.

Fluids – Conservative fluid strategy. RL > NS.

Antibiotics – If septic (Ceftriaxone+Azithromycin). Avoid Vanco to ↓ AKI risk. Consider Linezolid if MRSA risk.

Pressors – Norepi (1st-line). Target MAP 60-65. Add Vasopressin - refractory. Add Dobutamine - cardiac shock.

CPR:

Defibrillation – Droplet only. CPR – Airborne PPE, secure airway then start CPR.

Intubation:

Negative pressure room. Airborne PPE. Most experienced intubator. Airway team ≤ 3 in room. Passive pre-oxygenation. Use VL. Viral filter. RSI. Ketamine (1mg/kg) or Etomidate (0.3mg/kg; avoid in septic shock). Rocuronium (1.5mg/kg). Early pressors (norepi). Push dose pressors ready (phenyl).

PPE:

AGMPinED (Intubation, NIPPV, BVM, CPR, nebs, open suction, ? > 6L O2 NC) – Airborne precautions (N95/PAPR). Virus airborne for up to 60 min post intubation. Direct patient care – Droplet precautions. Includes defib.

Vent Settings:

ARDSnet.org (just in case)
Lung compliance maintained but atelectasis and drowning of alveoli. ARDS = PaO2/FIO2 <300. ARDS ventilation – AC control (paralyzed)/support (spont.). RR=continue baseline minute ventilation (RRmax <35). IFR 60-80L/min. Vt 4-8ml/kg (start 6ml/kg). I:E ratio (I duration ≤ E duration). Pplat ≤ 30cmH2O. High PEEP. SPO2 goal 88-96%. Consider permissive hypercapnea (pH ~ 7.15)

FiO2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PEEP	5-14	14-16	16-20	20	20	20-22	22	24

Disposition:

1. Mild – Consider d/c: mild symptoms. Normal labs/CXR. O2 >93%. Consider swab if risk factors. Self isolate. Other considerations: age, ADLs/supports, 3rd trimester, HCW.

2. Moderate – Consider admission: Signs of COVID19 + hypoxic (at rest or exertion). RF for ↑ CFR. Abnormal CXR (bilat patchy)/labs (↓LMN; ↑N/Lratio, dd, crp, ldh, trop).

3. Severe – Consult ICU – refractory hypoxemia (4L O2 = 93%), resp acidosis (pH<7.2), clinical resp failure, hypotension (SBP<90). Consider intubation if 6L O2 = <93%. Watch for myocardial injury/VT/VF. Consider appropriate care based on age, frailty scale, cognitive function, comorbidities, severity of disease, goals of care.

Pediatric Considerations:

Mild or asymptomatic (6% severe). <5y/o most vulnerable. M > F. AVOID intubation (use HFNC/Bipap). Consider 2^o PNA. MDI for asthma. Adult size teen = Adult Treatment. Unknown low risk (?ACE2 receptor maturity vs immunity).

Return to work (BC CDC):

10 days from onset of symptoms (and asymptomatic).

Common Questions:

NSAIDs – Are SAFE but Acetaminophen first line antipyretic.

ACEi/ARBs – Continue use even if COVID-19 +.

Chloroquine/Hydroxychloroquine – NOT recommended (yet).

Steroids – NOT recommended (may have role in refractory shock) unless medically necessary (asthma/copd).

IVIg – MAY have role in severe cases.

Safety of HFNC – Controversial. Likely has a role but need negative pressure room. Use supported by SSC/ANZICS/WHO.

Vertical Transmission – NO evidence.