

# A Seattle Intensivist's One-pager on COVID-19

## Nomenclature

**Infection:** Coronavirus Disease 2019 a.k.a. COVID-19  
**Virus:** SARS-CoV-2, 2019 Novel Coronavirus  
 NOT "Wuhan Virus"

## Biology

- **30 kbp, +ssRNA**, enveloped coronavirus
- **Likely zoonotic infection**; source/reservoir unclear (Bats? / Pangolins? → people)
- Now spread primarily **person to person**;
  - **Can be spread by asymptomatic carriers!**
- Viral particles **enter into lungs via droplets**
- **Viral S spike binds to ACE2** on type two pneumocytes
- **Effect of ACE/ARB is unclear; not recommended** to change medications at this time.
- Other routes of infection (contact, enteric) possible but unclear if these are significant means of spread

## Epidemiology

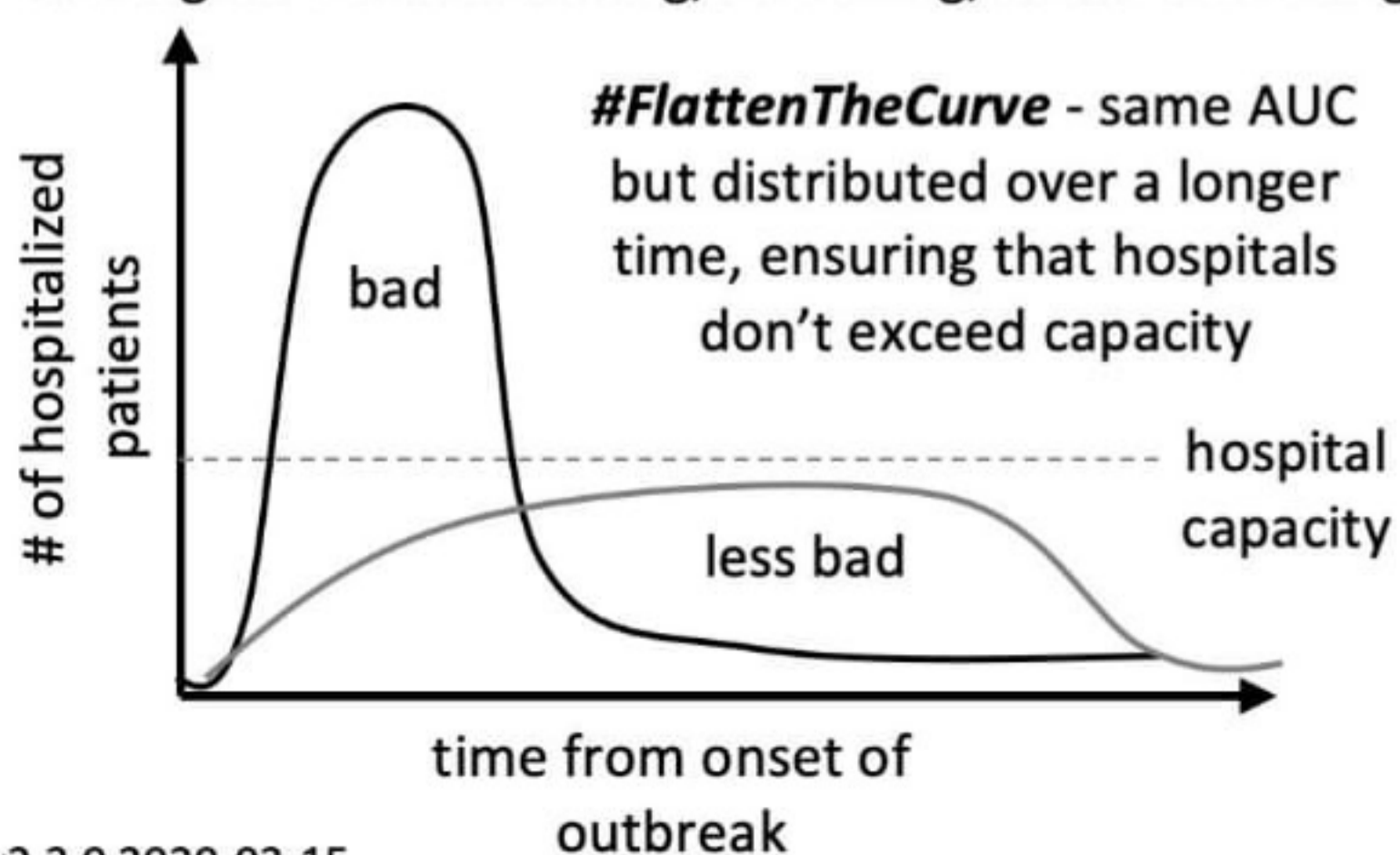
- Attack rate = 30-40%
- $R_0 = 2-4$
- Case fatality rate (CFR) = **3.4%** (worldwide numbers)
- Incubation time = **4-14 days (up to 15 days)**
- Viral shedding – **median 20 days** (max 37 days)

## Timeline:

- **China notifies WHO** 2019-12-31
- **First US case in Seattle** 2020-1-15
- **WHO Declared pandemic** 2020-3-11
- **National emergency** 2020-3-12

Disease clusters: SNFs, Conferences, other

Strategies: contact tracing, screening, social distancing



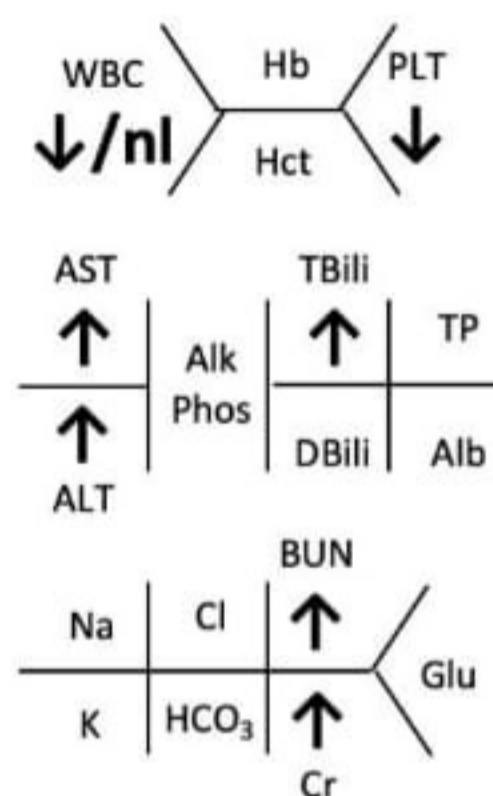
## Diagnosis/Presentation

### Symptoms

- 65-80% **cough**
- 45% **febrile** on presentation (85% febrile during illness)
- 20-40% dyspnea
- 15% URI symptoms
- 10% GI symptoms

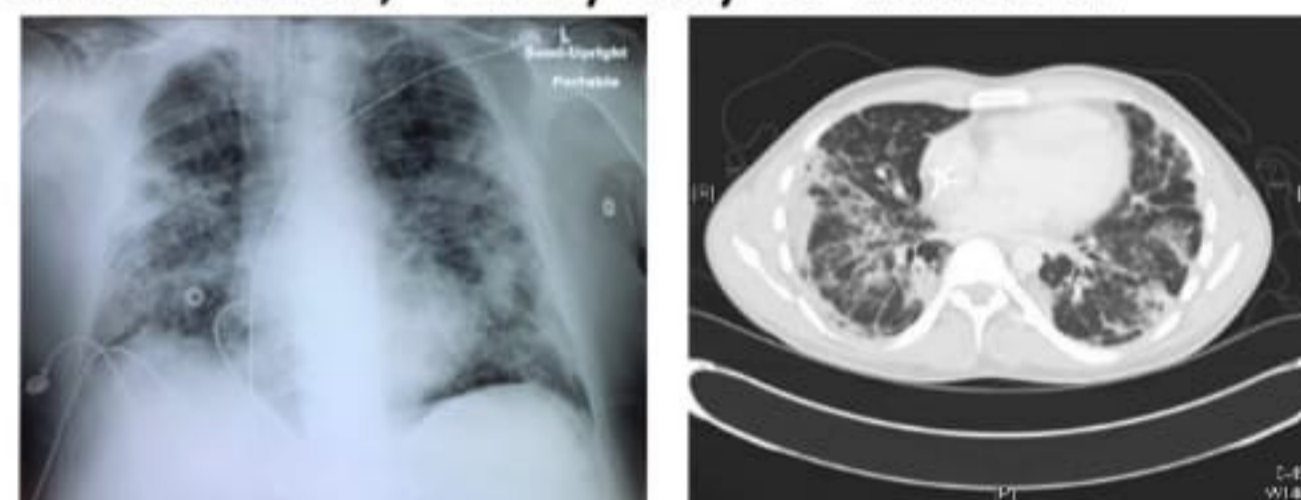
### Labs

- CBC: **Leukopenia** & **lymphopenia** (80%+)
- BMP: **↑BUN/Cr**
- LFTs: **↑AST/ALT/Tbili**
- **↑ D-dimer, ↑ CRP, ↑ LDH**
- **↑ IL-6, ↑ Ferritin**
- **↓ Procalcitonin**
- \*PCT may be high w/ superinfxn (rare)\*



### Imaging

- **CXR:** hazy **bilateral, peripheral** opacities
- **CT:** **ground glass opacities** (GGO), crazy paving, consolidation, \*rarely may be unilateral\*



- **POCUS:** numerous B-lines, pleural line thickening, consolidations w/ air bronchograms

### Isolation

- Phone call is the best isolation (e.g. move to telemed)
- Place patient in mask, single room, limit/restrict visitors

### Precautions

- **In correct sequence: STANDARD + CONTACT** (double glove) + either **AIRBORNE** (for aerosolizing procedures: intubation, extubation, NIPPV, suctioning, etc) or **DROPLET** (for everything else)
- N95 masks must be fit tested; wear eye protection
- PPE should be donned/doffed with trained observer
- Hand hygiene: 20+ seconds w/ soap/water or alcohol containing hand gel

## Treatment

- Isolate & send PCR test early (may take **days** to result)
- GOC discussion / triage
- Notify DOH, CDC, etc
- **Fluid sparing** resuscitation
- ± empiric antibiotics
- Intubate early under controlled conditions if possible
- Avoid HFNC or NIPPV (aerosolizes virus) unless **individualized** reasons exist (e.g. COPD, DNI status, etc); consider **helmet mask** interface (if available) if using NIPPV
- Mechanical ventilation for ARDS
  - **LPV** per ARDSnet protocol
  - 7 P's for good care of ARDS patients: e.g. **PEEP/Paralytics/Proning/inhaled Prostacyclins**, etc
  - ? High PEEP ladder may be better
  - ? ECMO in select cases (unclear who)
- Consider using POCUS to monitor/evaluate lungs
- Investigational therapies:
  - Remdesivir --| block RNA dependent polymerase
  - Chloroquine --| blocks viral entry in endosome
  - Oseltamivir --| block neuraminidase
  - Lopinavir/ritonavir --| protease inhibitor
  - Tocilizumab --| block IL-6 (reduce inflammation)
  - Corticosteroids --| block T-cells (reduce inflammation)
- None of these investigational therapies is proven, but literature is evolving quickly.

## Prognosis

- **Age** and **comorbidities (DM, COPD, CVD)** are significant predictors of poor clinical outcome; admission **SOFA** score also predicts mortality.
- Lab findings also predict mortality
  - **↑ d-dimer,**
  - **↑ ferritin**
  - **↑ troponin**
  - **↑ cardiac myoglobin**
- Expect prolonged MV
- Watch for complications: Secondary infection (VAP), **Cardiomyopathy**

