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

Link to the most current version →

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Nomenclature

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

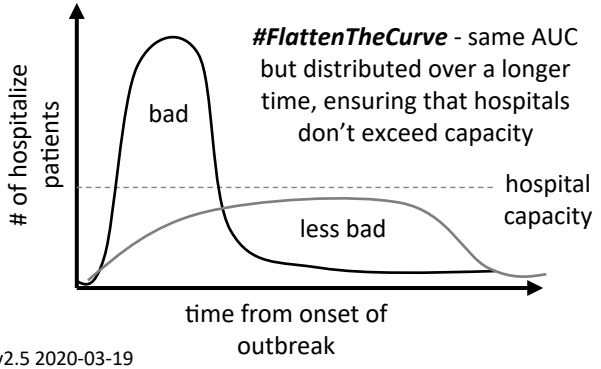
Biology

- 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 ***droplet nuclei***
  - CDC/WHO recommend AIRBORNE isolation
- 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% (China)
- R_0 = 2-4
- Case fatality rate (CFR) = 2.3% (China)
- Incubation time = 3-14 days (up to 15 days)
- Viral shedding – median 20 days (max 37 days)
- Breakdown of disease severity
  - **80%** Non-severe (mild pneumonia)
  - **15%** Severe (hypoxia, respiratory distress)
  - **5%** Critical (respiratory failure)

Disease clusters: SNFs, Conferences, other
Strategies: contact tracing, screening, social distancing



#FlattenTheCurve - same AUC but distributed over a longer time, ensuring that hospitals don't exceed capacity

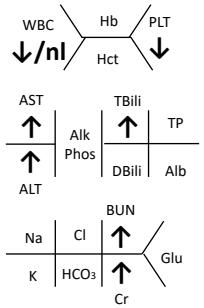
Diagnosis/Presentation

Symptoms

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

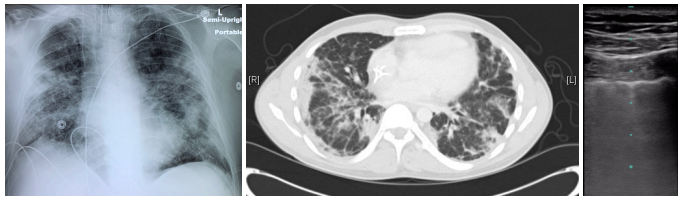
Labs

- 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 *



Imaging – (imaging is NOT diagnostic)

- 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; ***ideally*** airborne)
- 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
- Avoid NSAIDS; use acetaminophen/paracetamol for fever
- ± empiric antibiotics
- Intubate early under controlled conditions: **RSI**, no bagging, **VL**, have suction & capnography connected to avoid circuit breaks.
- 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; avoid nebulizers
- 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: consider clinical trial enrollment
  - Remdesivir - not approved; used investigationally
  - Hydroxychloroquine (HCQ) – available; limited evidence
  - Chloroquine (CQ) – available; limited evidence
  - Tocilizumab – available; investigational for pt in **shock**
  - Lopinavir/ritonavir – available; recent negative RCT
  - Oseltamivir - **not** recommended (no evidence of efficacy)
  - Corticosteroids – **not** recommended (? harmful)

Prognosis

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