

COVID-19 Nursing Education

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COVID-19: The Virus

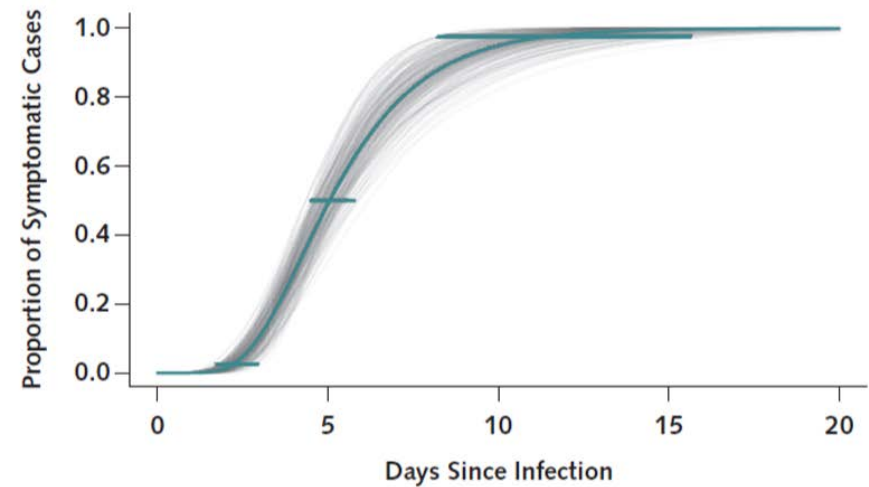
“Enhanced Droplet Precautions”

- Spreads through droplets but high contagion factor
- It is most contagious first three days after onset of symptoms
- Spread may be possible in asymptomatic carriers



Incubation: 5 days mean
Onset to medical visit 6 d

Median incubation period is 4-5 days (range: 2-14 days)

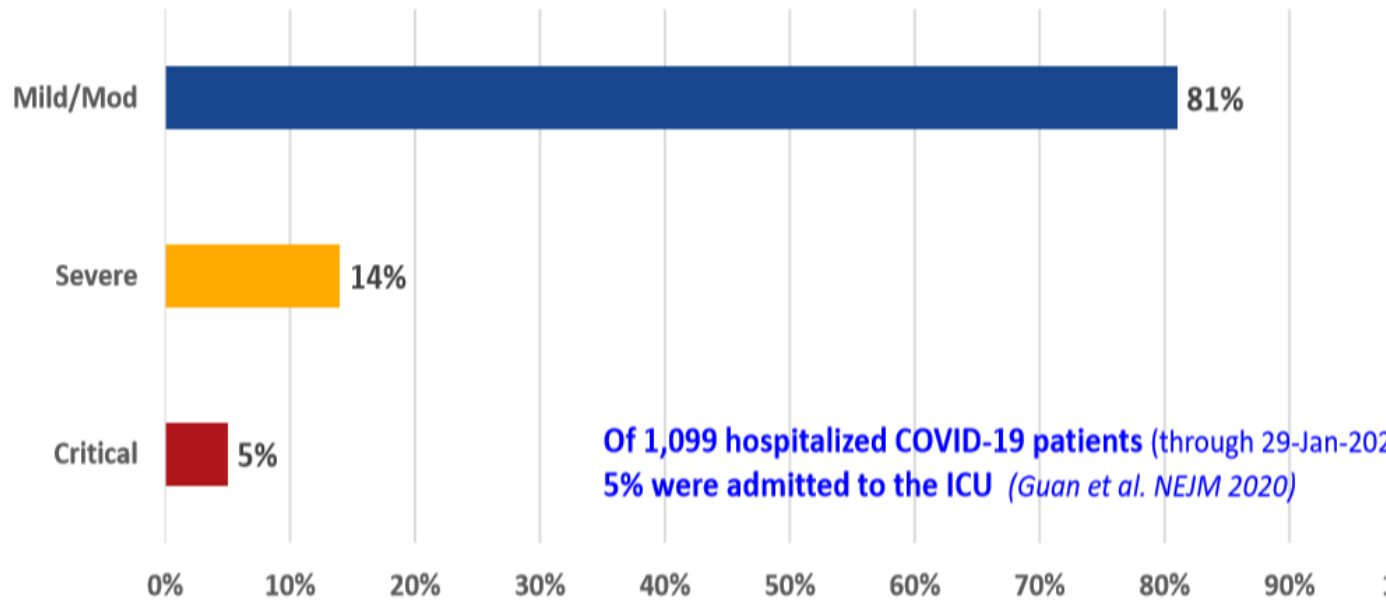


Links: [Lauer Ann Intern Med 2020](#), [Xu BMJ 2020](#), [Guan NEJM](#)

SARS-CoV2: The Illness

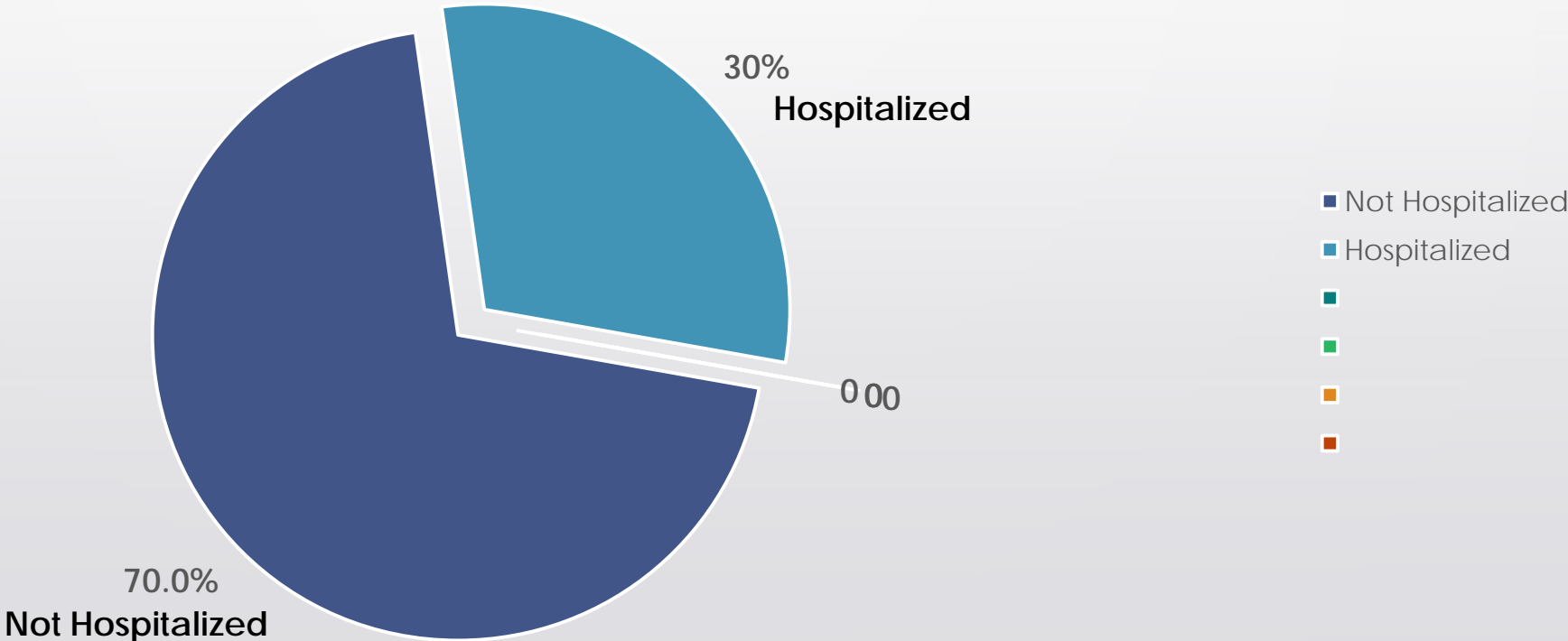
Most patients had mild to moderate disease, but nearly 20% had severe or critical illness

COVID-19 - China through 11-Feb-2020 (N=44,415)

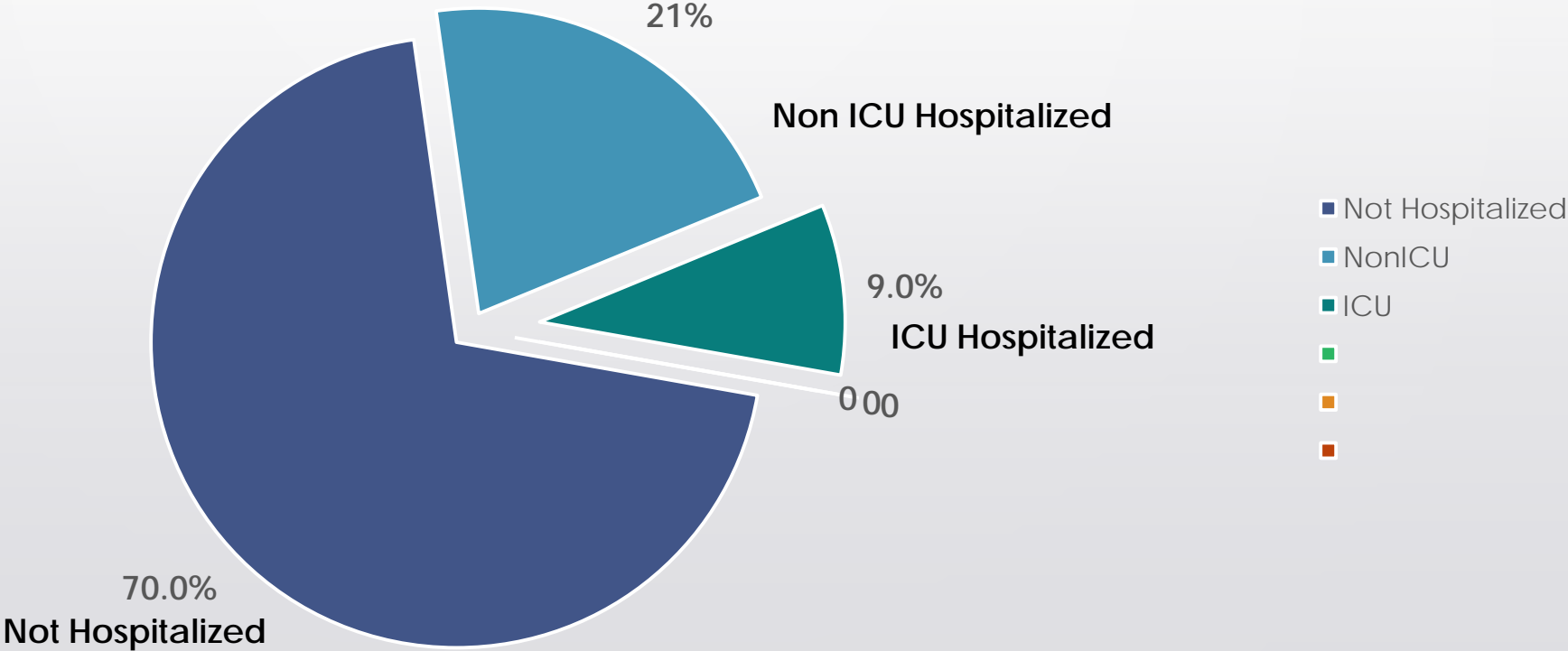


COVID-19: Wide Spectrum of Disease	
Mild Illness	Uncomplicated URI
Moderate Pneumonia	Pneumonia without need for oxygen
Severe Pneumonia	Pneumonia with dyspnea, Respiratory distress, SpO ₂ < 93%, P/F ratio < 300
Critical Illness	Respiratory failure, shock, MOSF

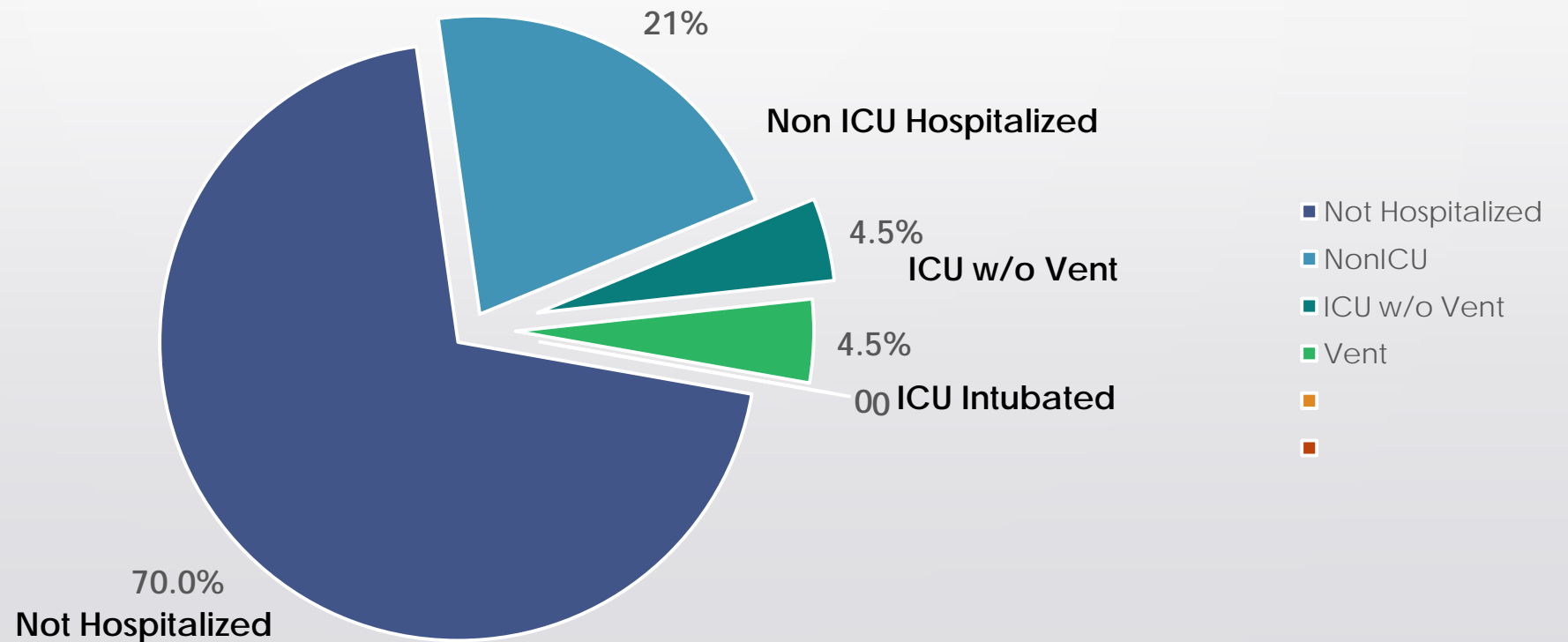
Distribution of Symptomatic COVID-19 In China



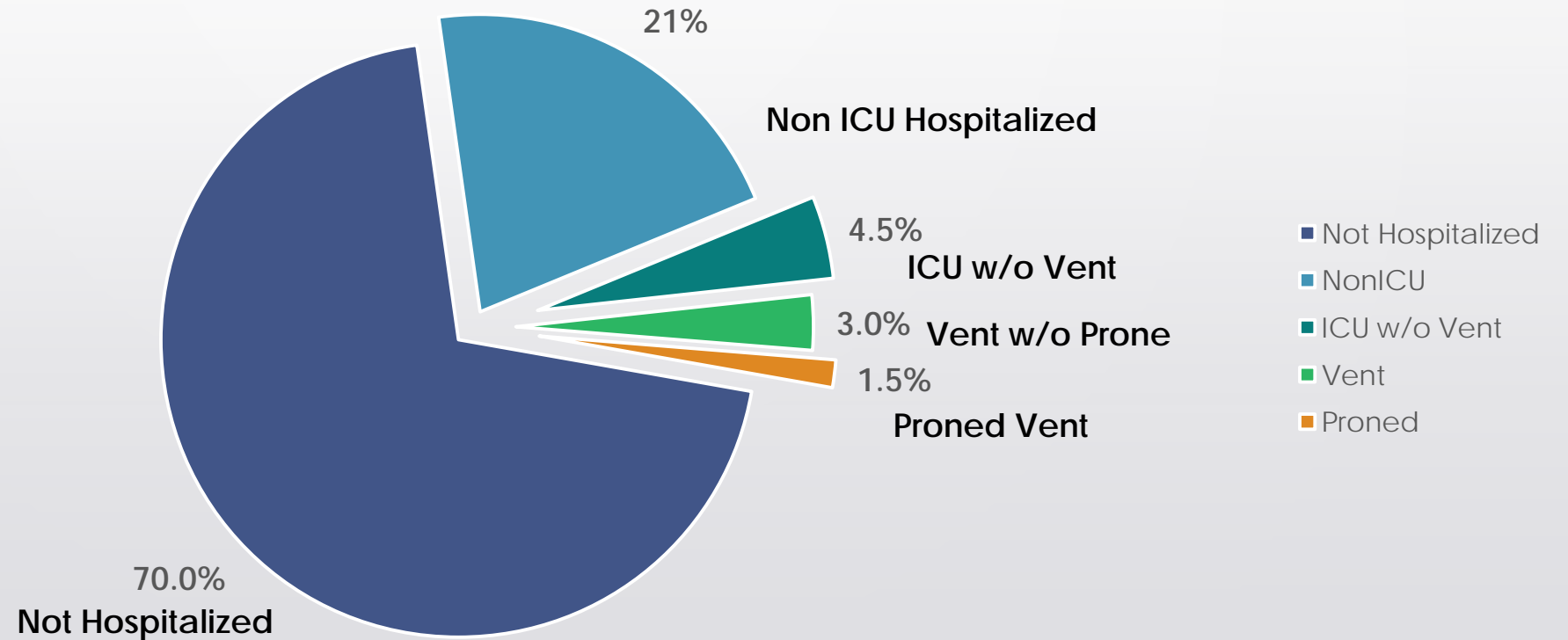
Distribution of Symptomatic COVID-19 In China



Distribution of Symptomatic COVID-19 In China



Distribution of Symptomatic COVID-19 In China





SARS Cov-2 Critical Illness

Complications

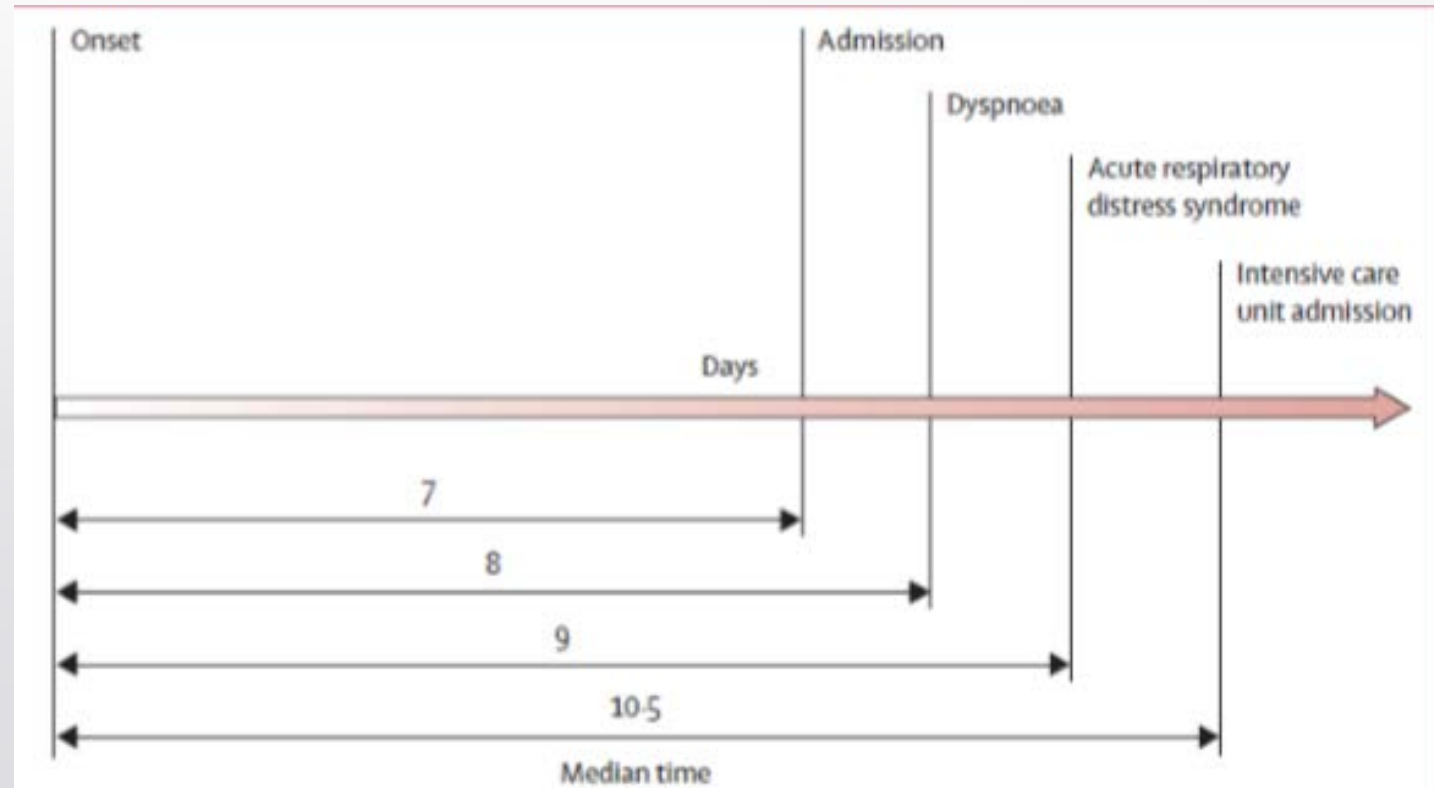
- Pneumonia
- Critically ill
 - ARDS 30%
 - Septic Shock
 - Renal Failure 20%
 - Liver failure
 - Cardiomyopathy 30%
 - Arrhythmia 15%
- Bacterial co-infection is low

Labs

- Low lymphocytes, high neutrophils, low platelets
- High LFTs
- High LDH, CRP, Ferritin
- Low Procalcitonin
- High IL-6 (proinflammatory)
- Highest mortality seen with High D-Dimer and lymphopenia

ARDS

Mortality 50-60%
**EARLY GOAL
CLARIFICATION**



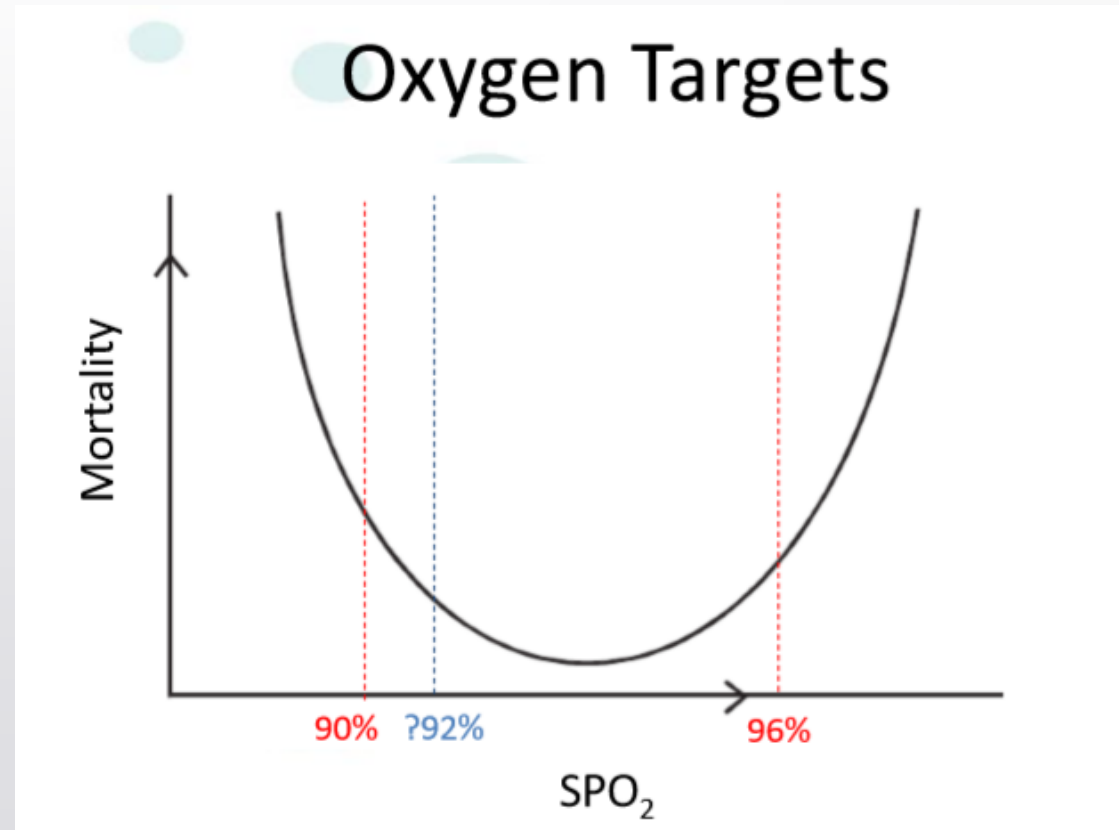


Care of the ICU Patient

The Enemy of Good is Perfect

Goal saturations
90-96%

No higher than
96%



Oxygen Therapy

- Conventional NC
- [High Flow Nasal Cannula]
- Dry Venti Mask
- BiPAP to be avoided
 - High rate of failure
 - Aerosol Generating
- Early Intubation



Inconclusive Evidence for Role of
Helmet Oxygen Therapy

What is an "Aerosol Generating Procedure"?





CAMCs Mitigations for AGPs

Intubations	Intubation Team with Least number in the room Avoiding BMV if able (preoxygenate with NRB) Intubation Box Ventilated Procedure Room
BiPAP	Avoiding BiPAP if able with Early Intubation If not able, N95 for caregivers Special filters on circuits
Nebulizers	Using MDIs in unintubated patients, Self directed If unable to coordinate, then Self administered neb If unable to coordinate, the Neb with RT N95 RT Evaluate and Treat: All Respiratory Therapy Protocols
Bronchoscopy	Avoid if possible Least number in the room



Intubation: An Aerosol Generating Procedure

- Early Intubation
 - For escalating O₂ requirements >4-6L or hypercapnea pH <7.32
 - High risk of failure >60% VM
- Intubation SBAR
 - Allow time for PPE
 - Notify anesthesia of Covid Status
 - Discuss pertinent labs
 - Vent set up and ready in room
- Plan for Self-Extubation
 - Discuss sedation plan and Hang prior to start of procedure
- Limit Exposure
 - 3-4 people: RT, RN, 1-2 Anesthesia
- Most Experienced in the room
 - Anesthesia team preferably (teams at all hospitals, all shifts-x PM TVH)
 - In emergency, No residents intubating
- First Pass Success
 - True RSI with paralytic
 - Glidescope
 - Backup of LMA if failure
- Limiting Emitting Aerosols
 - Inflate cuff before bagging
 - Clamp ETT when disconnecting circuit for shortest amount of time
 - Tape hemostats to ventilator at bedside

Ventilator Management

- ARDSnet management
- Low Vt 4-8 ml/kg of Ideal Body Weight (need height)
 - Average Males 500ml, Females 350ml
- Keep Pplat <30cmH20
- High PEEP
- Recent Medscape article from NY EM-CC doc to treat like HAPE?
 - Podcast after 9 days of experience
 - No evidence to support or refute

Lower PEEP/higher FIO2

FiO₂	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7
PEEP	5	5	8	8	10	10	10	12

FiO₂	0.7	0.8	0.9	0.9	0.9	1.0
PEEP	14	14	14	16	18	18-24

Higher PEEP/lower FIO2

FiO₂	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5
PEEP	5	8	10	12	14	14	16	16

FiO₂	0.5	0.5-0.8	0.8	0.9	1.0	1.0
PEEP	18	20	22	22	22	24

Adjuvants

Proning

- Daily time 12-18hrs
- Manual preferred
 - Less complications
 - More comfortable
 - Less resource utilization
 - Easier to assess
 - Education 10d ago



Paralysis

- Intermittent boluses recommended over infusion
 - Less complications
 - Less utilization
- If a drip is needed
 - Lowest possible dose for vent synchrony
 - Daily Paralytic Holiday
 - Up to 48hrs



Adjuvants

Dry Lungs Are Happy Lungs

- AVOID FLUIDS AS MUCH AS POSSIBLE
- Risk of ARDS and worsening hypoxia
- Give No Fluids over Boluses over MIV Fluids
- Give Lasix to promote net diuresis

PUMP U UP

- Steroids in Viral ARDS have no mortality benefit
- May increase risk of mortality as seen in SARS CoV-1, influenza, MERS
 - Promote viral replication vs slow clearance
- One study specifically in Covid-19
 - 83 patients with ARDS
 - HR 0.38 (0.20-0.72)
- Final recs: Consider giving if another reason
 - AECOPD (40mg pred x5d)
 - ARDS (High Meduri 2/kg vs Lower Meduri 1/kg)
 - Septic Shock (HC 50q6h)



Good Supportive Care

- Limit Sedating Agents
 - Particularly Benzos
 - Daily SATs-Stop infusion and start ½ rate. Use PRNs over drips
- High incidence of arrhythmia
 - Keep K>4, Mag >2
 - Avoid QTc Prolonging medications
- Monitor for CHF
 - Dry Lungs
- Glycemic control
 - Goals <180
- Chemical DVT prophylaxis
 - High Ddimers ?Risk
 - Lovenox over Heparin
 - Ensure dosed for BMI
- Early Enteral Nutrition
 - ASPEN recommends early TF even if prone/paralyzed/ECMO
- Early de-escalation of antibiotics
 - Guide by Procalcitonin
- Address GOALS of care EARLY
- Assess for trach potential d10-12



Specific Drugs???

- Hydroxychloroquine
 - Azithromycin
- Immunomodulators
- Convalescent Plasma
 - Lopinavir/Ritonavir
 - IVIG
 - Ivermectin

We Can Do It!

