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Swimming Through the Pandemic: Current COVID Operations and Treatment Strategies

Disclosures

I have no relevant relationships with ineligible companies to disclose within the past 24 months.

(Note: Ineligible companies are defined as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.)

Objectives

Explore	Explore current COVID vaccination guidelines.
Examine	Examine pandemic operational considerations within the community.
Discuss	Discuss Long COVID and treatment guidelines.

How many vaccination options are currently FDA approved for adult patients?

1

2

3

4

*

Current COVID

Vaccination Guidelines

*I got my covid-19 vaccine! Centers for Disease Control and Prevention. https://stacks.cdc.gov/view/cdc/98738. Published December 11, 2020. Accessed July 2, 2022.

Primary Vaccination Options

1) Pfizer, Inc., and BioNTech BNT162b2
   - FDA approved on August 23, 2021 for patients ≥ 16 yrs old. [1,2]
   - Emergency Use Authorization (EAU) for patients 6 months - 15 yrs old. [1,2]

2) ModernaTX, Inc., mRNA-1273
   - FDA approved on January 31, 2022 for patients ≥ 18 yrs old. [1,2]
   - Emergency Use Authorization (EAU) for patients 6 months - 17 yrs old. [1,2]

3) Janssen Ad.26.COV2S or JNJ-78436725
   - EUA approved on February 27, 2021, single shot vaccine[1,2]
   - Patients ≥ 18 yrs old.

EAU Vaccination Option 2

1) Novavax COVID-19 Vaccine, Adjuvanted
   - Emergency Use Authorization (EAU) for patients ≥ 18 yrs old. [1,2]
   - FDA authorized July 13, 2022
   - Two dose primary series

Booster Guidelines- Adults

- Six months post primary vaccination series of the Moderna COVID-19 Vaccine or Pfizer-BioNTech COVID-19 Vaccine [1,2]

- Two months after completion of primary vaccination with the Janssen COVID-19 Vaccine. [1,2]

EAU for Pediatric Patients

Two-dose Moderna COVID-19 vaccine series:[3]

- (25µg each) for ages 6 months - 5 yrs
- (50µg each) for ages 6 - 11 yrs
- (100µg each) for adolescents, ages 12 - 17 years

Third-dose of age-appropriate Moderna COVID-19 Vaccine: [3]

- 6 - 17 y.o. with moderate to severe immunocompromise post- two-dose Moderna COVID-19 primary
- Minimum of 28 days

EAU for Pediatric Patients

- Three-dose Pfizer-BioNTech COVID-19 vaccine series: [3]
  - (3µg each) is recommended for children ages 6 months - 4 years

Vaccination Risks- Adults[4]

1. Anaphylaxis
2. Thrombosis with Thrombocytopenia Syndrome
3. Myocarditis and Pericarditis
4. Guillain-Barré Syndrome (GBS)

Vaccination Risks- Pediatrics

Pericarditis and Myocarditis[4,5]

- Moderna COVID-19 Vaccine- males 18 -24 y.o.
- Pfizer-BioNTech COVID-19 Vaccine- males 12-17 y.o.

Our Current Healthcare State

Pandemic Operations

Variants of Concern (VOCs)[6]

- Alpha (B.1.1.7)
- Beta (B.1.351)
- Gamma (P.1)
- Delta (B.1.617.2)
- Omicron (B.1.1.529)
- Epsilon (B.1.427 and B.1.429)

Variants of Interest (VOIs) [6]

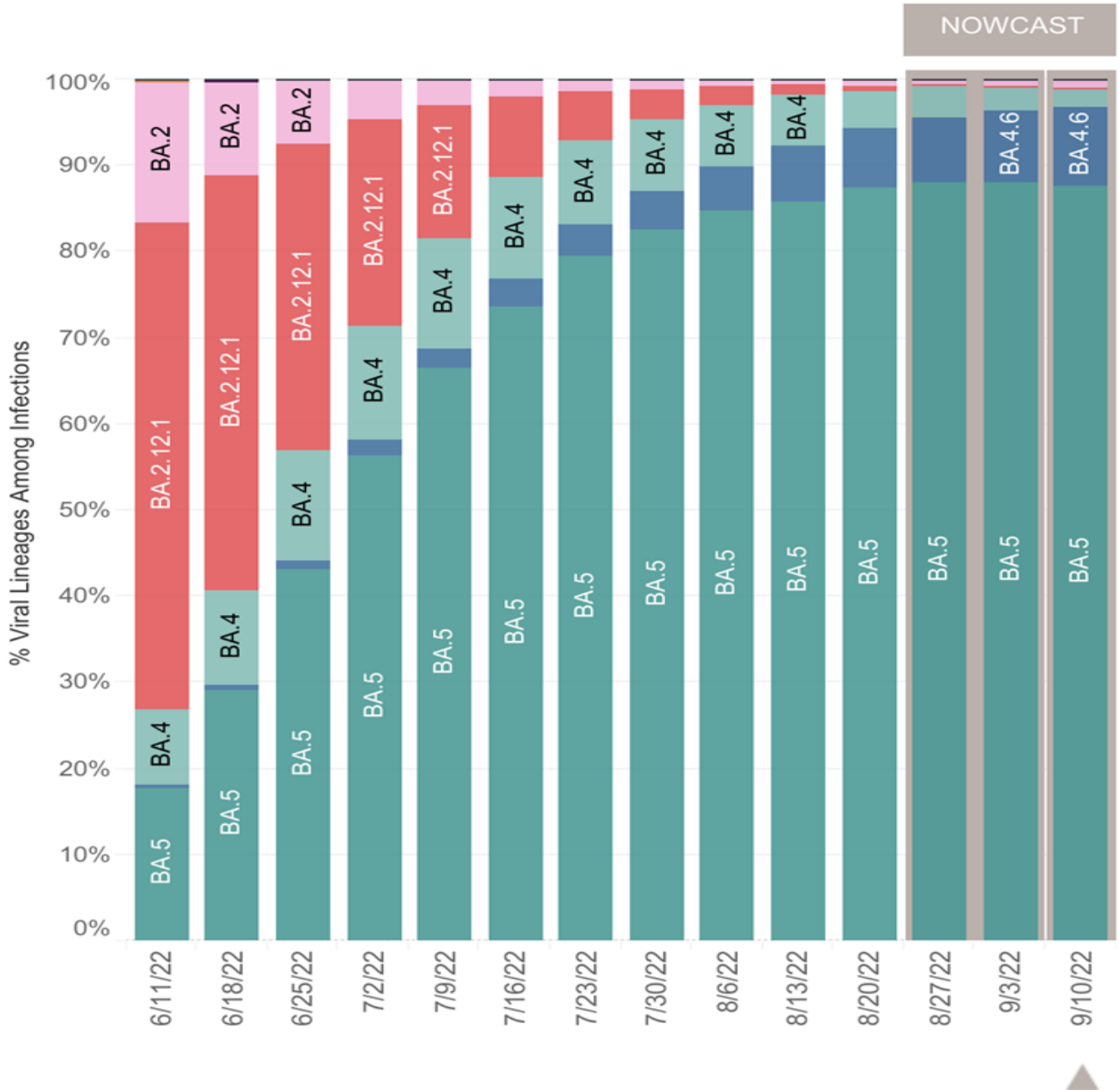
- Zeta (P.2)
- Eta(B.1.525)
- Theta (P.3)
- Iota (B.1.526)
- Kappa(B.1.617.1)
- Lambda(C.37)
- Mu (B.1.621)

In our hospital system, we are short staffed:

Definitely still a problem

Never had this problem

United States: 6/5/2022 – 9/10/2022



United States: 9/4/2022 – 9/10/2022 NOWCAST

USA

WHO label	Lineage #	US Class	%Total	95%PI
Omicron	BA.5	VOC	87.5%	86.2-88.7%
	BA.4.6	VOC	9.2%	8.1-10.4%
	BA.4	VOC	2.2%	2.1-2.4%
	BA.2	VOC	1.0%	0.6-1.7%
	BA.2.12.1	VOC	0.1%	0.1-0.1%
	B.1.1.529	VOC	0.0%	0.0-0.0%
	BA.1.1	VOC	0.0%	0.0-0.0%
Delta	B.1.617.2	VBM	0.0%	0.0-0.0%
Other	Other*		0.0%	0.0-0.0%

* Enumerated lineages are US VOC and lineages circulating above 1% nationally in at least one week period. "Other" represents the aggregation of lineages which are circulating <1% nationally during all weeks displayed.

** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates

\# AY.1-AY.133 and their sublineages are aggregated with B.1.617.2. BA.1, BA.3 and their sublineages (except BA.1.1 and its sublineages) are aggregated with B.1.1.529. For regional data, BA.1.1 and its sublineages are also aggregated with B.1.1.529, as they currently cannot be reliably called in each region. Except BA.2.12.1, BA.2

Community Considerations[7,8]

- Infection Fatality Ratio (IFR)
- Level of pre-existing immunity to COVID-19 in the community
- Viral Transmissibility
- Inpatient structures
  - Staffing shortages
  - Bed shortages

Wellness Considerations

Personal wellness and balancing inpatient medicine is a challenge.

Definitely True

Somewhat True

Not Really

Definitely Not, I got this!

Current Guidelines

Treatment

There are multiple forms of FDA approved treatment modalities for coronavirus to include

- Veklury (remdesivir)
- Paxlovid (nirmatrelvir and ritonavir)
- Oxygen
- All of the above
- Both Veklury (remdesivir) and Paxlovid (nirmatrelvir and ritonavir)

How many PAs and NPs have encountered patients with "Long COVID"?

I have!

Not yet!

Veklury (remdesivir): FDA-approved

- Intravenous Infusion x 3 days[9]

- Fact Sheet for Providers

Emergency Use Authorization: PAXLOVID™

- 12/2021: EPIC-HR (randomized, double-blind, placebo-controlled clinical trial) [9]

- Oral:
  - 300 mg nirmatrelvir (two 150 mg tablets) with 100 mg ritonavir (one 100 mg tablet) taken together (3 tablets) BID for 5 days. [9]

- Fact Sheet for Providers

PAXLOVID™ Sample Drug Interactions:

Drug Class	Drugs within Class	Effect on Concentration	Clinical Comments
Antiarrhythmics	amiodarone, dronedarone, flecainide, propafenone, quinidine	↑ antiarrhythmic	Co-administration contraindicated due to potential for cardiac arrhythmias [see Contraindications (4)].
Anticoagulants	warfarin rivaroxaban dabigatran[a]	↑↓ warfarin ↑ rivaroxaban ↑ dabigatran	Closely monitor INR if co-administration with warfarin is necessary. Increased bleeding risk with rivaroxaban. Avoid concomitant use. Increased bleeding risk with dabigatran. Depending on dabigatran indication and renal function, reduce dose of dabigatran or avoid concomitant use. Refer to the dabigatran product label for further information.

Fact sheet for healthcare providers: Emergency use authorization for … Fact Sheet For Healthcare Providers: Emergency Use Authorization For Paxlovid. https://www.fda.gov/media/155050/download. Published June 28, 2022. Accessed July 2, 2022.

PAXLOVID™ Sample Drug Interactions:

Drug Class	Drugs within Class	Effect on Concentration	Clinical Comments
Anti-gout	colchicine	↑ colchicine	Co-administration contraindicated due to potential for serious and/or life-threatening reactions in patients with renal and/or hepatic impairment [see Contraindications (4)].
Corticosteroids primarily metabolized by CYP3A	betamethasone, budesonide, ciclesonide, dexamethasone, fluticasone, methylprednisolone, mometasone, triamcinolone	↑ corticosteroid	Co-administration with corticosteroids (all routes of administration) of which exposures are significantly increased by strong CYP3A inhibitors can increase the risk for Cushing's syndrome and adrenal suppression. However, the risk of Cushing's syndrome and adrenal suppression associated with short-term use of a strong CYP3A4 inhibitor is low. Alternative corticosteroids including beclomethasone, prednisone, and prednisolone should be considered.
HMG-CoA reductase inhibitors	atorvastatin, rosuvastatin	↑ atorvastatin ↑ rosuvastatin	Consider temporary discontinuation of atorvastatin and rosuvastatin during treatment with PAXLOVID. Atorvastatin and rosuvastatin do not need to be held prior to or after completing PAXLOVID.

Fact sheet for healthcare providers: Emergency use authorization for ... Fact Sheet For Healthcare Providers: Emergency Use Authorization For Paxlovid. https://www.fda.gov/media/155050/download. Published June 28, 2022. Accessed July 2, 2022.

Post-COVID Conditions

Long COVID

How many PAs and NPs have encountered patients with "Long COVID"?

I have!

Not yet!

Post Acute Sequalae of SARS-CoV-2 infection [14,15,16,17,18]

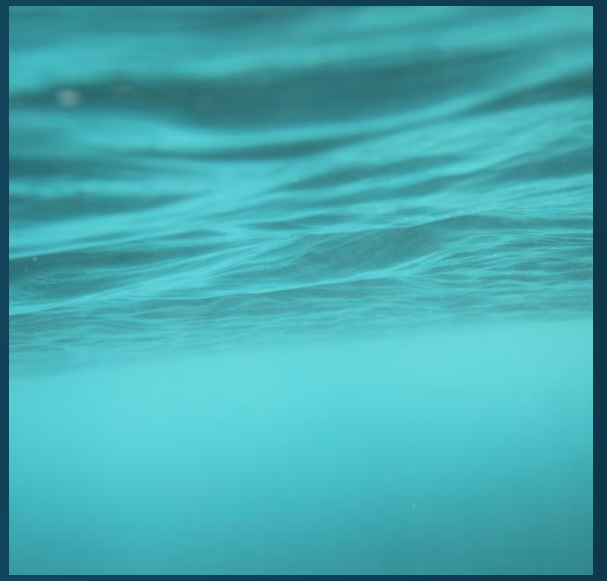
- >4 weeks post Covid infection
- Exhibit pulmonary, cardiac, neurocognitive, and psychiatric complications.
- Post-ICU patients
- Higher risk in older patients, obesity, comorbid psychiatric and other chronic medical conditions
- Social disparities and ethnic minorities
- “20% of cases are in adults ages 18 to 34 with no chronic medical conditions.” [16]

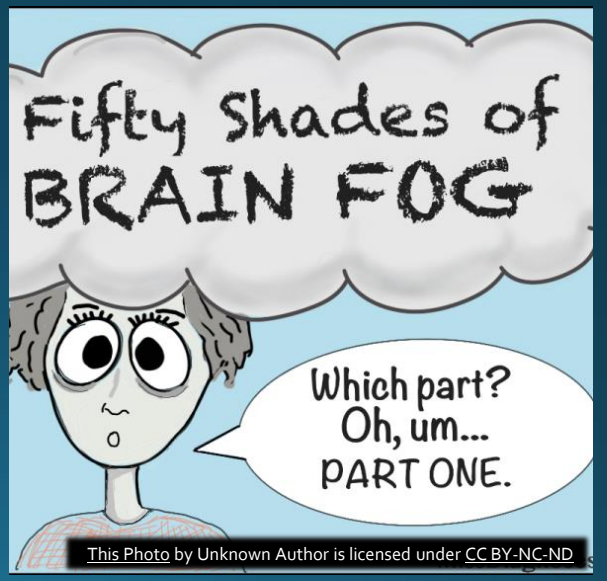
What is it?

- Persistent hyperinflammatory state [16]
- Hypercoagulable state
- Dysautonomia

PACS Top Symptoms [14,15,16,17,18]

- Fatigue
- Dyspnea
- Joint Pain
- Chest Pain
- Cough
- Difficulty concentrating, “Brain fog”

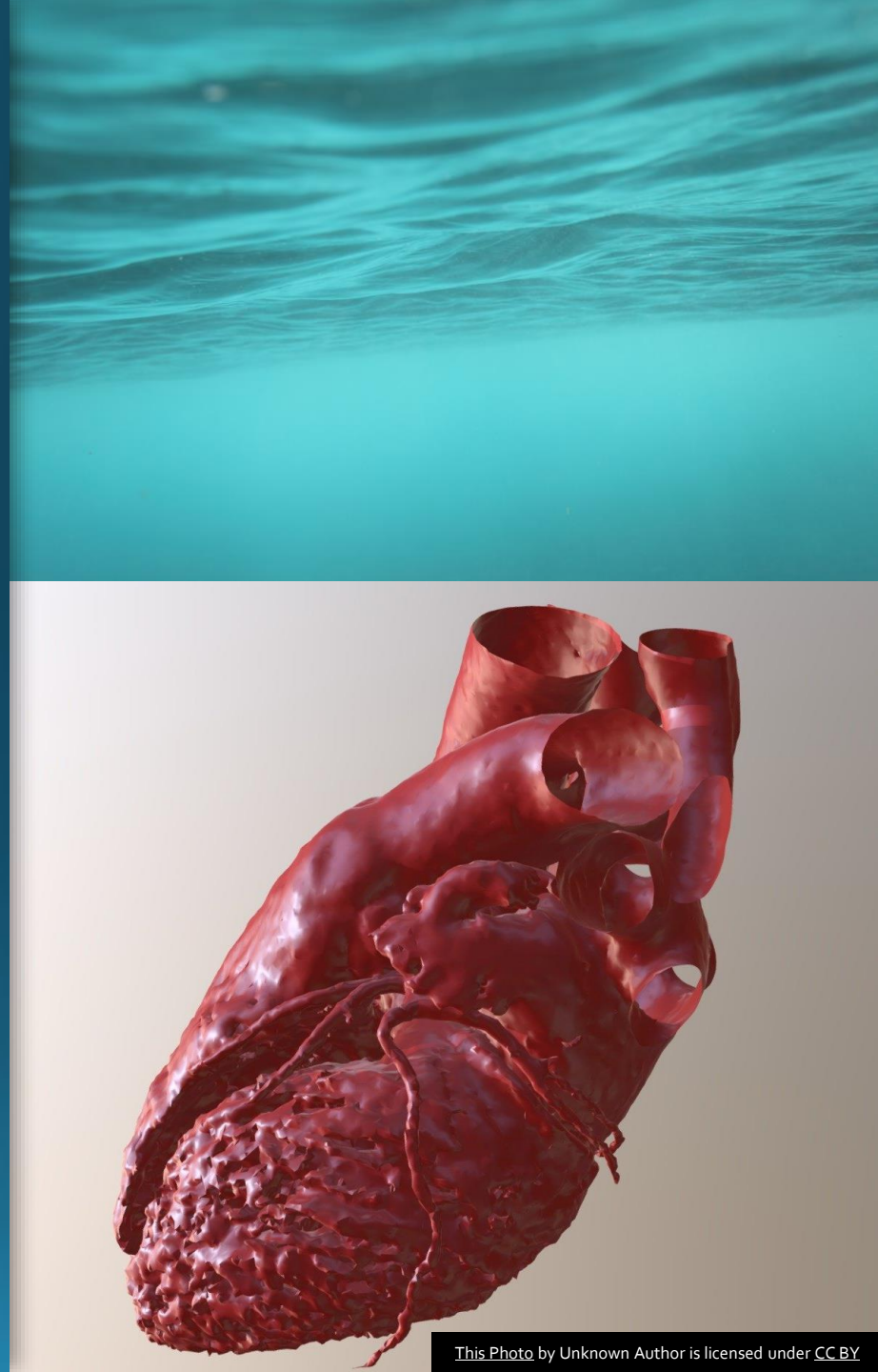




Disability:

- " A person with long COVID has a disability if the person's condition or any of its symptoms is a "physical or mental" impairment that "substantially limits" one or more major life activities."[14]

- Pulmonary, Cardiac, Nephrological, Hematological, Emotional, Mental impairments



Management

- Comorbidities
- Symptoms- supportive care
- Pulmonary Rehab

- Post- Covid-19 Clinic
- Multidisciplinary approach: cardiac, pulm, neuro screening
- Vaccination

Take Home Points

Vaccinations, Variants, Viral Transmissibility

Wellness

Treatments: Remdesivir & Paxlovid™

Post Acute Sequalae of SARS-CoV-2 infection

- Long-term symptom management

Pulmonary, Cardiac, Nephrological, Hematological, Mental/Cognitive impairments

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Questions?

Thank you!

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