



COVID-19 Hot Topics

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Disclosures

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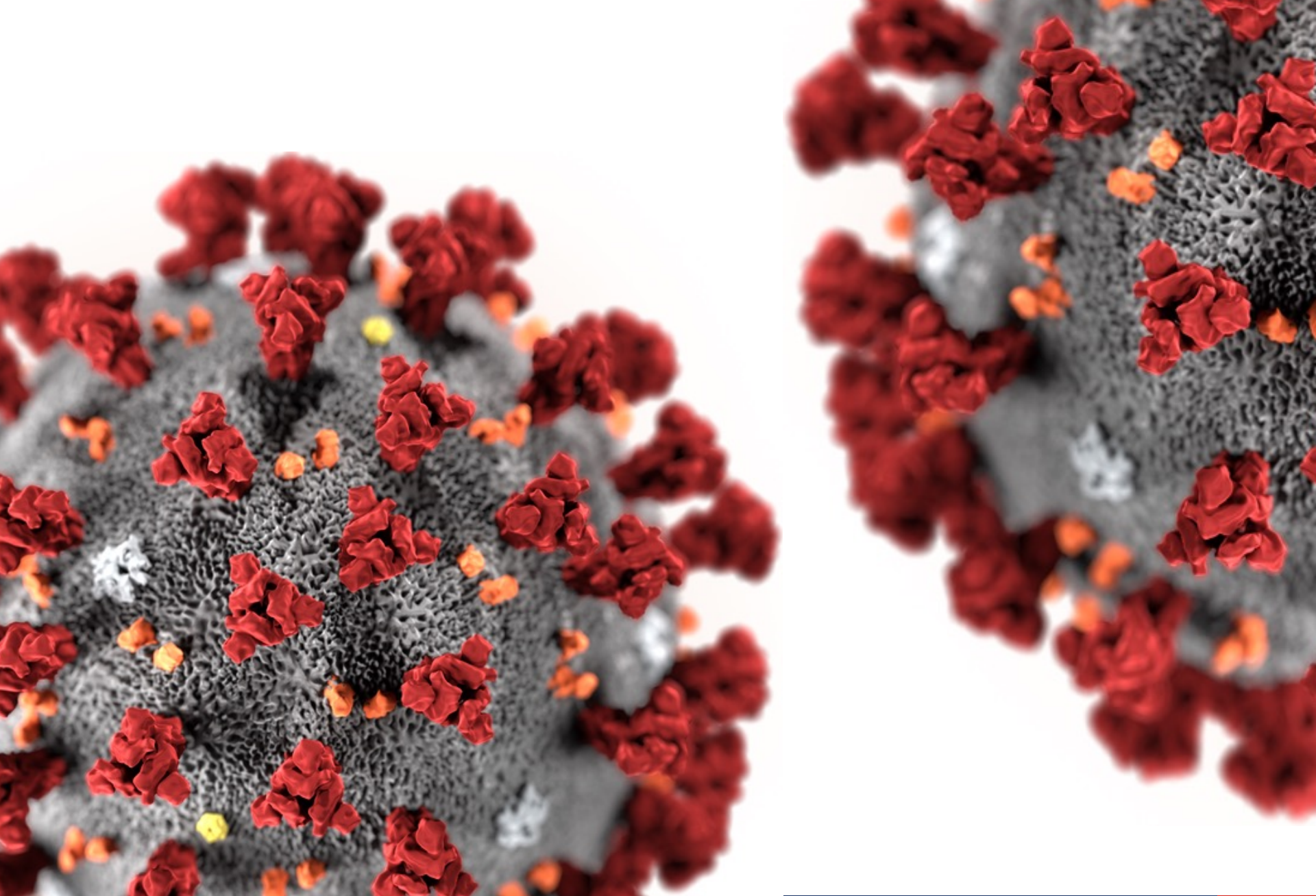
Disclosures

I have no disclosures.

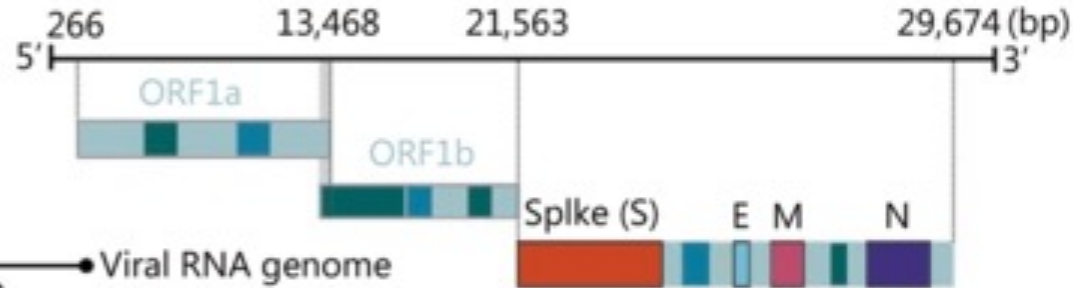
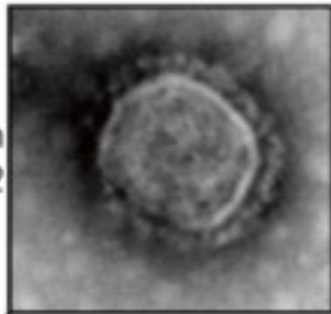
Learning Objectives

By the end of the presentation, listeners will be able to:

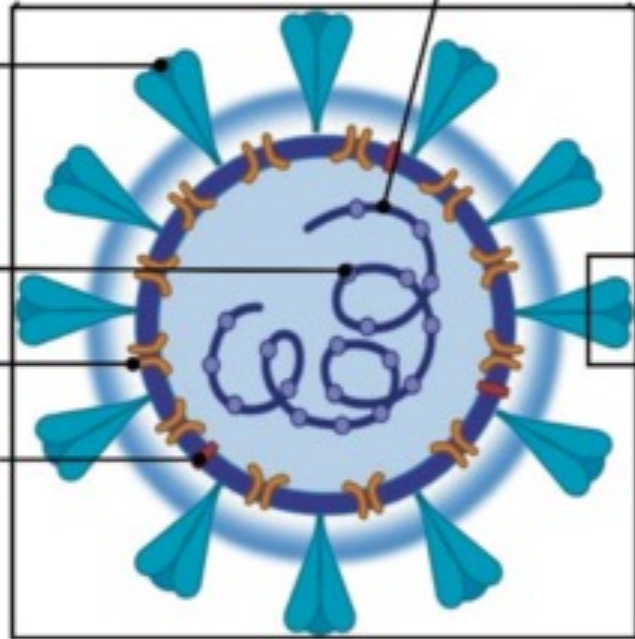
- Describe SARS-CoV-2 and its role in causing COVID-19, including pathogenesis, therapeutic targets, current circulating variants.
- Discuss the management and prevention of COVID-19, including vaccines, monoclonal antibodies, and antiviral medications, and an approach to selecting therapies.
- Discuss the new and evolving landscape of COVID-19 treatments.



Electron micrograph of SARS-CoV-2



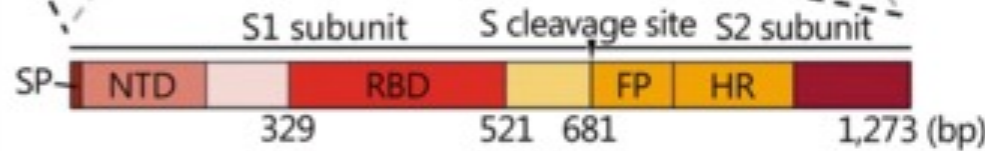
Spike (S)

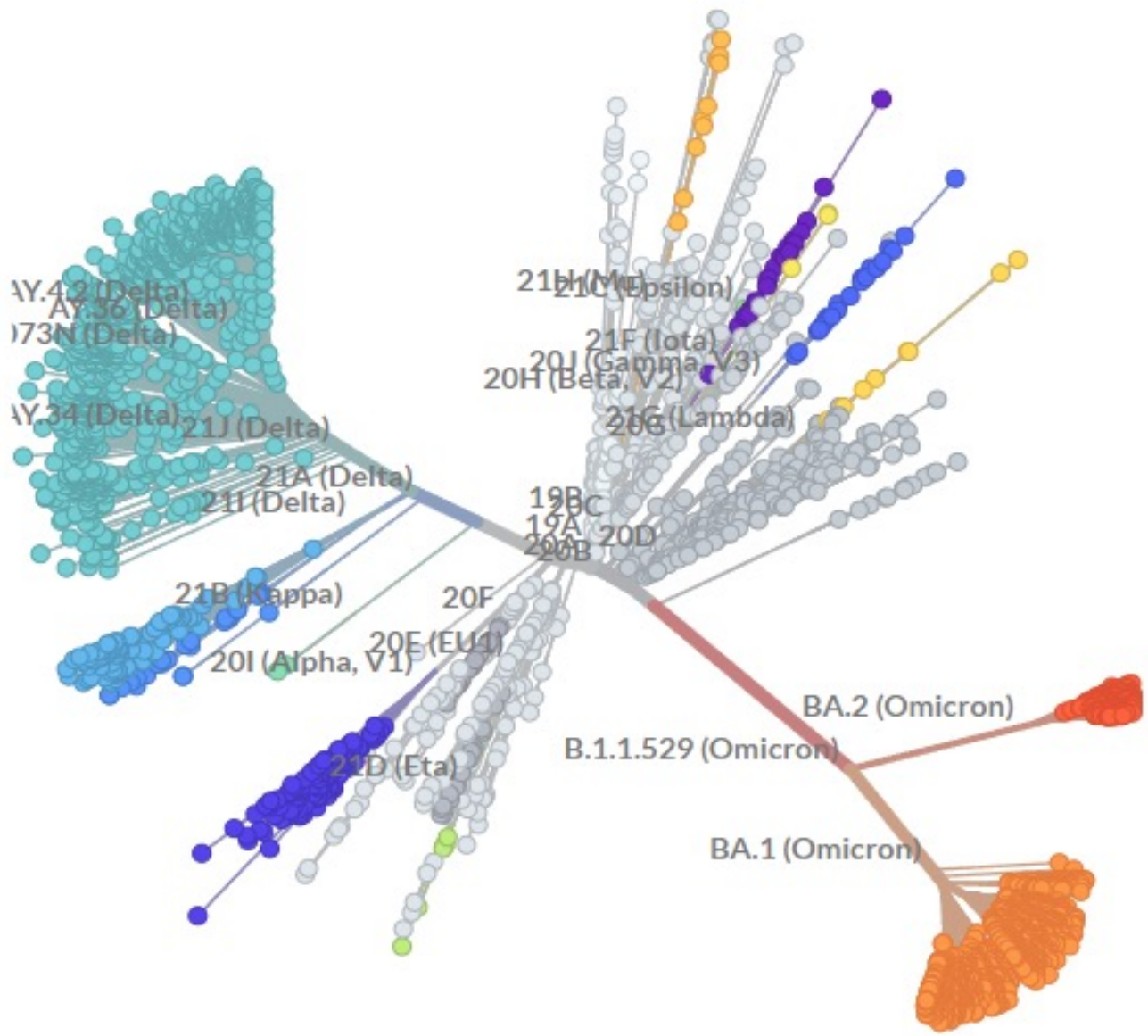


Nucleocapsid (N)

Membrane (M)

Envelope (E)

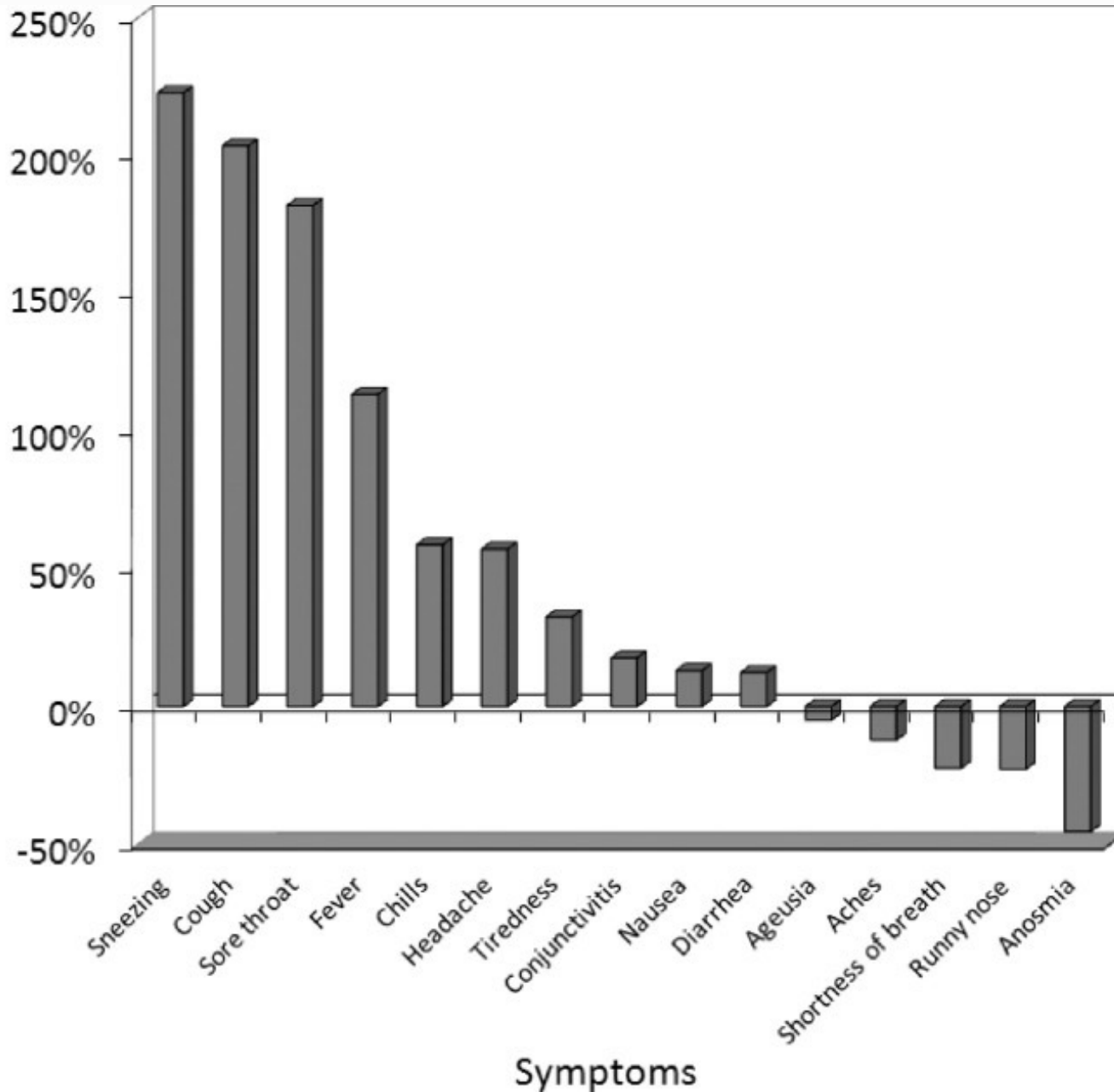


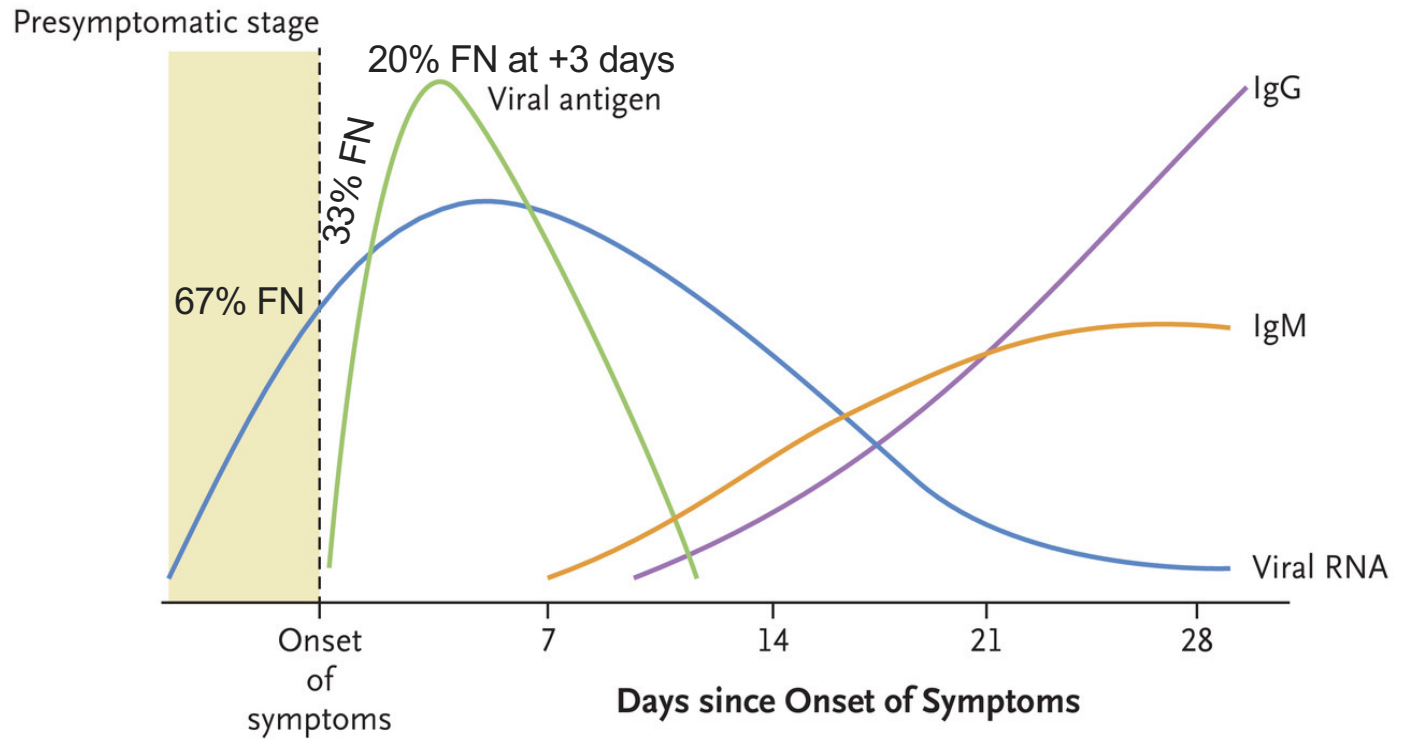






2022-2021 Variation





**Culturable Virus
(correlate of infectiousness)**



Positive RT-PCR Test



Positive Antigen Test



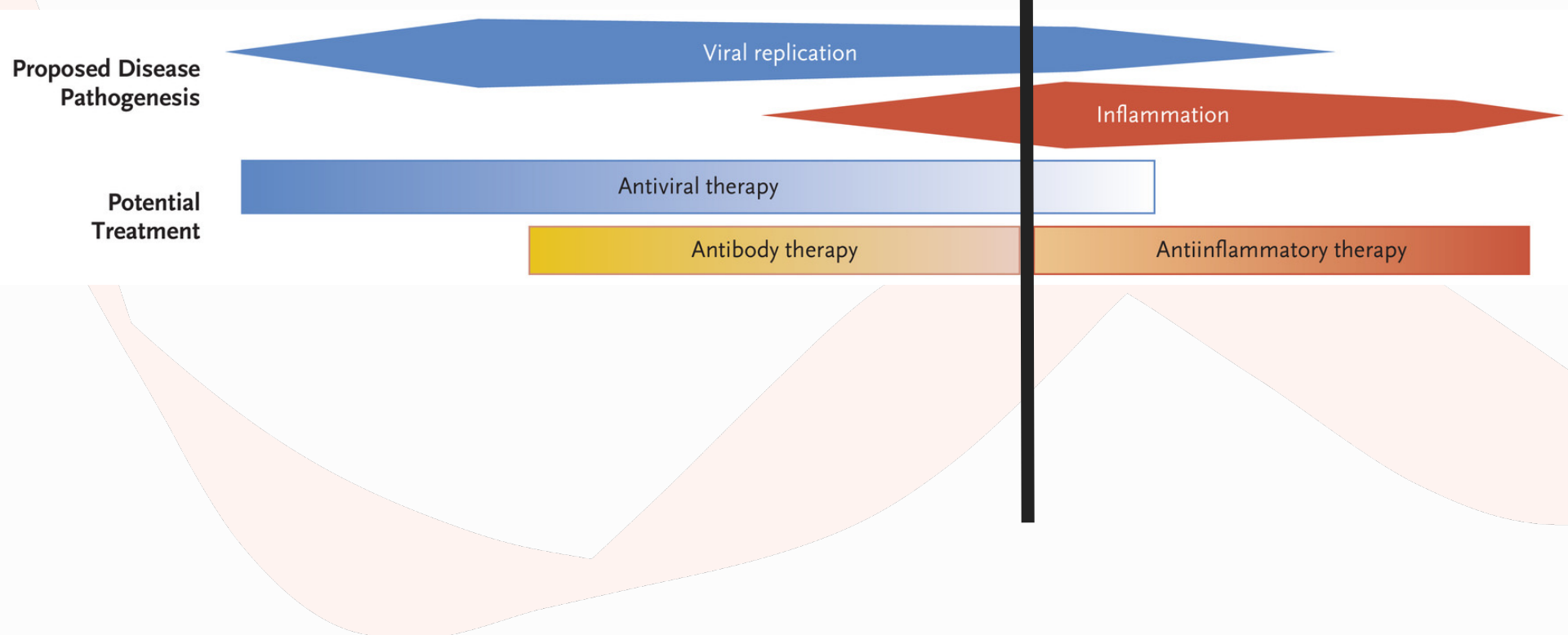
**High IgG and Total
Antibody Titers**

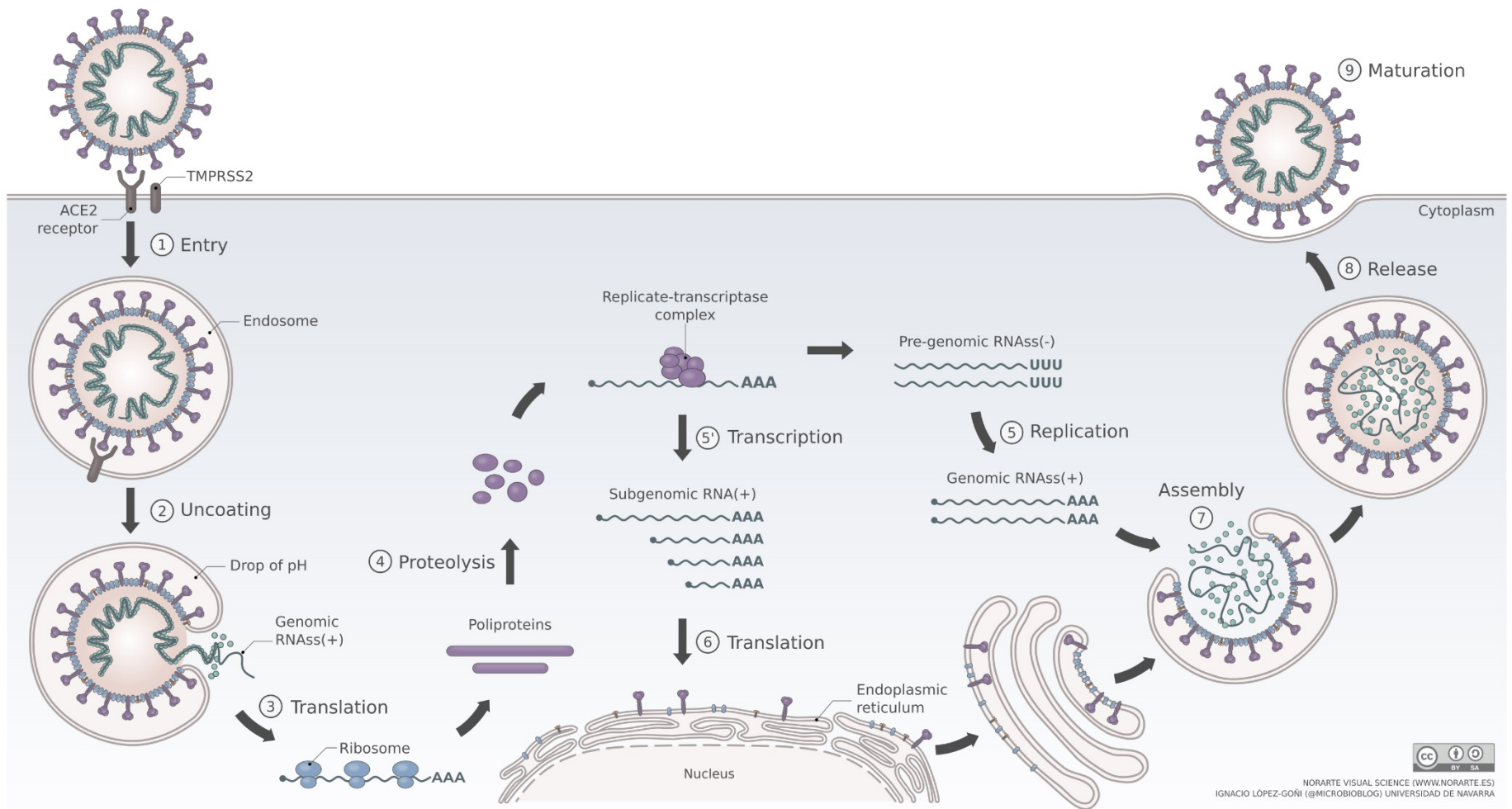


About 7-12 days

Outpatients (typically)

Hypoxia requiring Hospitalization (typically)

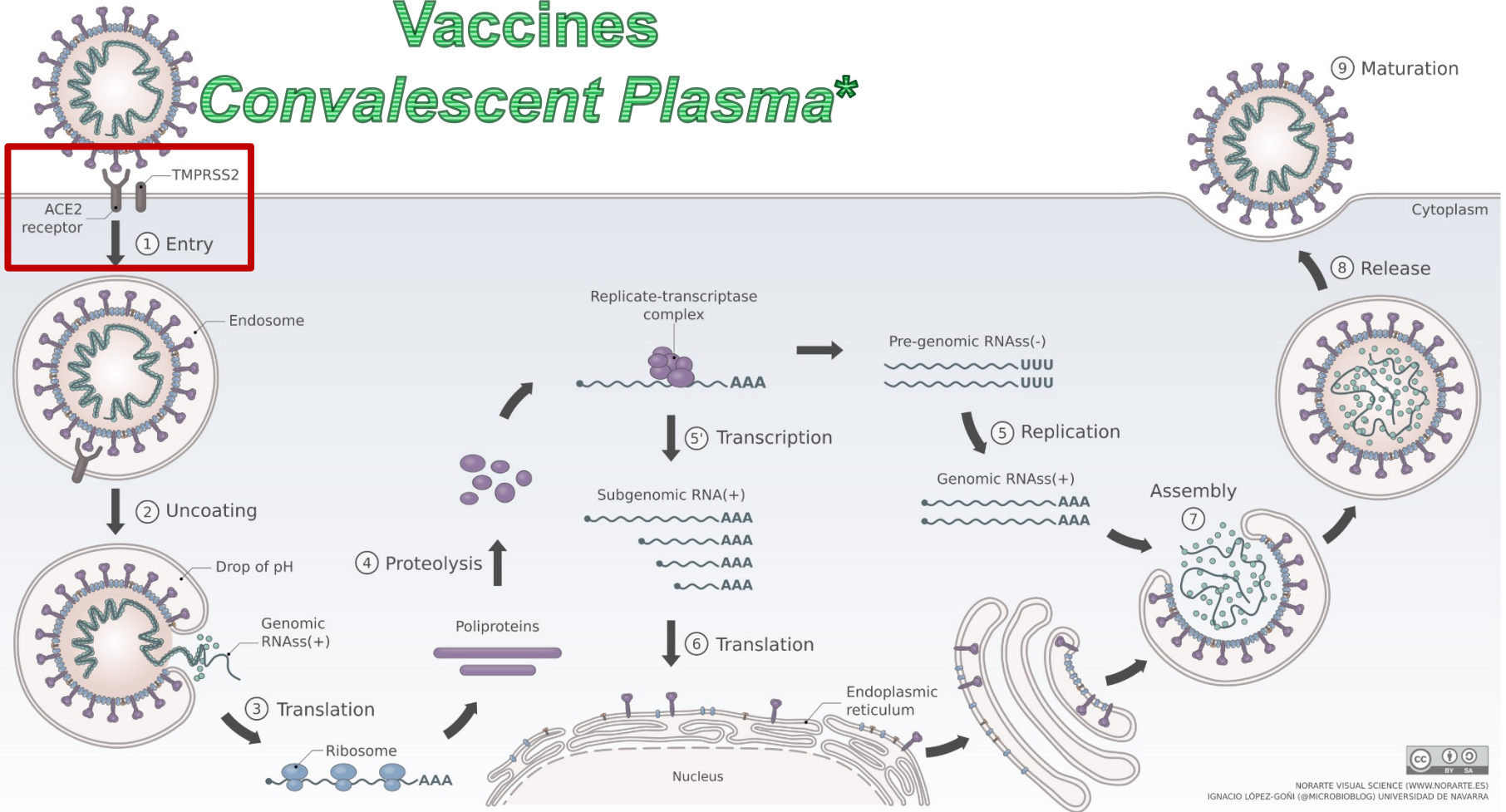




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IGNACIO LÓPEZ-GOÑI (@MICROBIOBLOG) UNIVERSIDAD DE NAVARRA

Anti-spike: MABs Vaccines

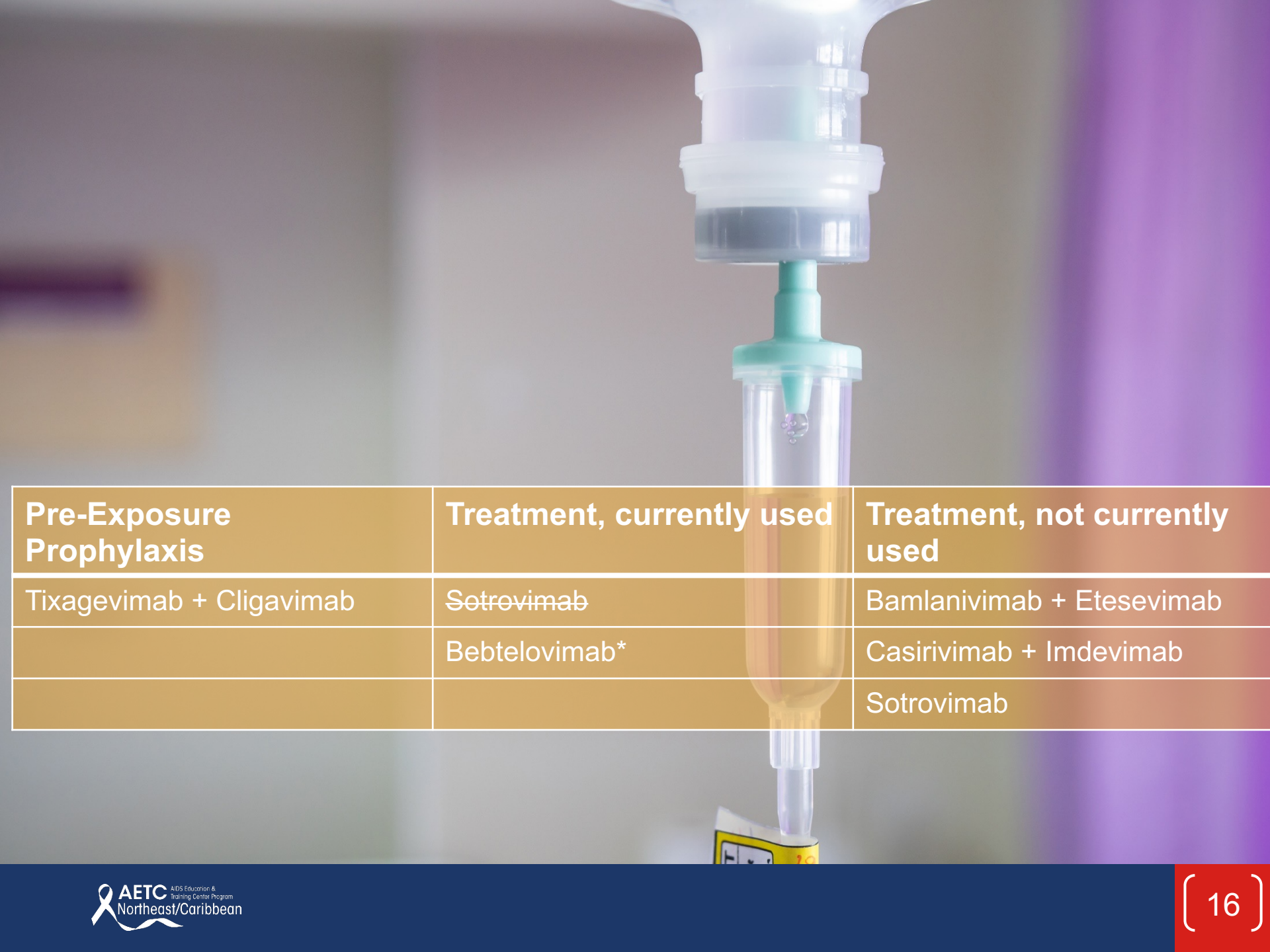
Convalescent Plasma*



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**Vaccine: 66%
prevention of
symptomatic disease
in Omicron**

**99% reduction in
serious illness or
death**



Pre-Exposure Prophylaxis	Treatment, currently used	Treatment, not currently used
Tixagevimab + Cligavimab	Sotrovimab	Bamlanivimab + Etesevimab
	Bebtelovimab*	Casirivimab + Imdevimab
		Sotrovimab

Indications for Pre-Exposure Prophylaxis with tixagevimab + clogavimab (EvuSheld, Astra Zeneca)

- Age > 12 and more than 40kg, **AND**
- **Not** currently infected with COVID-19, **AND EITHER**
 - Moderate to severe immune compromise due to a medical condition or receipt of immunosuppressive medications or treatments and may not mount an adequate immune response to COVID-19 vaccination, **or**
 - Vaccines are not recommended due to a history of severe adverse reaction (e.g., severe allergic reaction) to a COVID-19 vaccine(s) and/or COVID19 vaccine component(s).

Tixagevimab + cligavimab is not a substitute for vaccination!

Indications for Treatment with bebtelovimab (Eli Lilly)

- Age > 12 and more than 40kg, **AND**
- Is currently infected with COVID-19 within 7days of onset, **AND:**
- Has at least 1 high risk factor for severe disease, which can include:
 - Age > 65
 - Obesity
 - Hypertension
 - Diabetes
 - Chronic kidney disease
 - Cardiovascular disease, including congenital
 - Pregnant
 - Sickle cell disease
 - Immunocompromised/immunosuppressed
 - Chronic lung disease such as COPD or moderate to severe asthma
 - Dependence on a medical device
 - Congenital metabolic or genetic syndromes
 - Race

Monoclonal antibodies of unclear benefit

- Bamlanivimab + etesevimab (no brand name, Eli Lilly)
- Casirivimab + imdevimab (Ronapreve, Regeneron)
- Sotrovimab (Xevudy, GSK)

Pros and Cons of MABs

■ Pro:

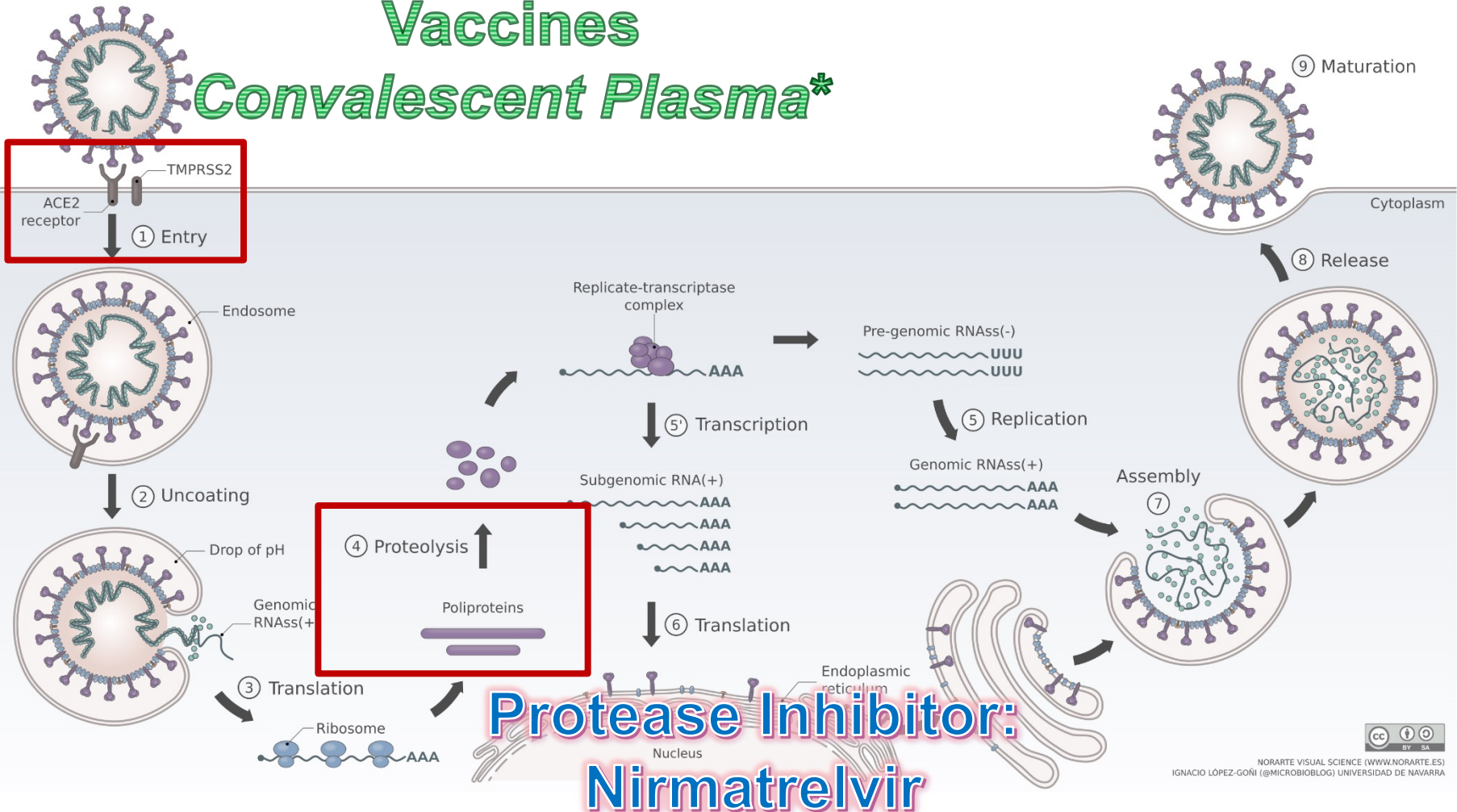
- + Very effective at reducing hospitalization or death
- + Slightly reduces symptom duration
- + Duration of protection is about 90 days (180 days with tix/clig)

■ Con:

- Very expensive (>\$2000/dose + infusion costs)
- Requires infusion infrastructure
- Very limited supplies
- May interfere with long-term immunity after infection
- No data to support benefit in BA.2

Anti-spike: MABs Vaccines

Convalescent Plasma*



**Protease Inhibitor:
Nirmatrelvir**



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Nirmatrelvir/ritonavir (Paxlovid, Pfizer)

Nirmatrelvir 150mg BID
Ritonavir 100mg BID



Indications for Treatment with nirmatrelvir + ritonavir (Paxlovid, Pfizer)

- Age > 12 and more than 40kg, **AND**
- Is currently infected with COVID-19 within 5 days of onset, **AND:**
- Has at least 1 high risk factor for severe disease (not specified in the EUA)

Pros and Cons of nirmatrelvir + ritonavir

■ Pro:

- + Very effective at reducing hospitalization or death
- + More accessible than MABs as an oral drug
- + Relatively cheap (\$500 for 5 days)

■ Con:

- Must be started within 5 days of symptom onset
- Ritonavir has substantial and sometimes serious drug-drug interactions
- **MABs + nirmatrelvir do not seem to work**
- Can be hard to find at times
- Needs renal adjustment:
 - GFR 30-59: 150mg nirmatrelvir BID + 100mg ritonavir BID
 - GFR <30: not recommended

Anti-spike:

MABs

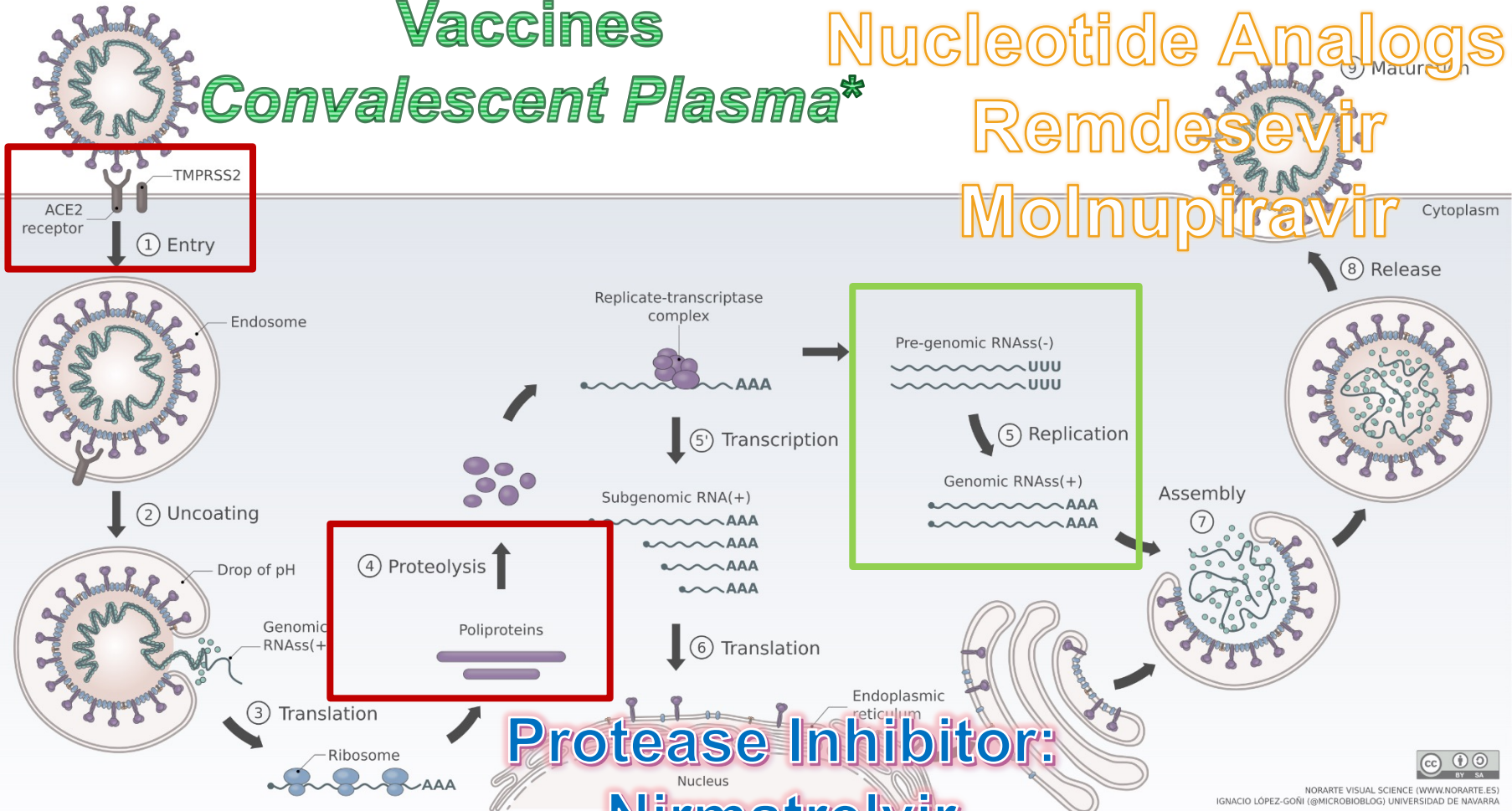
Vaccines

Convalescent Plasma*

Nucleotide Analogs:

Remdessevir

Molnupiravir



Protease Inhibitor: Nirmatrelvir

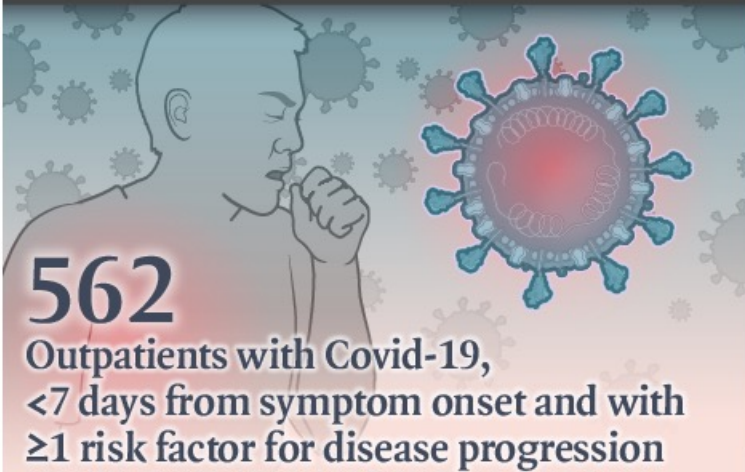


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Early Remdesivir to Prevent Progression to Severe Covid-19

DOUBLE-BLIND, RANDOMIZED, CONTROLLED TRIAL



562
Outpatients with Covid-19,
<7 days from symptom onset and with
≥1 risk factor for disease progression

**Covid-related hospitalization
or death from any cause
by day 28**

N=279



**Intravenous
Remdesivir, 3 days**

0.7%
(2 patients)

N=283



Placebo

5.3%
(15 patients)

HR, 0.13; 95% CI, 0.03–0.59 (P=0.008)

**Remdesivir resulted in an 87% lower risk of Covid-related hospitalizations
or death than placebo and had an acceptable safety profile.**

Indications for Treatment with outpatient remdesivir (Veklury, Gilead)

- Age > 12 and more than 40kg*, **AND**
- Is currently infected with COVID-19 within 7 days of onset, **AND:**
- Has at least 1 high risk factor for severe disease

* Patients under 12 were not studied, however observational data exists for pediatric inpatients at 5mg/kg load and 2.5mg/kg daily maintenance

Pros and Cons of Outpatient remdesevir

■ Pro:

- + Very effective at reducing hospitalization or death
- + Better supply than EUA drugs
- + Good safety profile
- + Only treatment available for patients under 12 years old or <40kg
- + Appears safe with MABs

■ Con:

- Must be started within 7 days of symptom onset
- Repeated IV only formulation is logistically difficult
- Relatively expensive (about \$2000 for four 100mg vials)
- ? Unclear if effective with MABs

Molnupiravir (Legavio, Merck) 800mg BID



Indications for Treatment with molnupiravir (Legavio, Merck)

- Age > 18 and more than 40kg*, **AND**
- Is currently infected with COVID-19 within 5 days of onset, **AND:**
- Has at least 1 high risk factor for severe disease

Pros and Cons of molnupiravir

■ Pro:

- + Moderately effective at reducing hospitalization or death
- + Relatively good supply
- + Good safety profile
- + Relatively cheap (\$500 for 5 days)

■ Con:

- Must be started within 5 days of symptom onset
- May be teratogenic
- May be unsafe in pediatrics
- ? Unclear if effective with MABs

How Do I Decide What to Give?

- Not high risk
 - Vaccinate!

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- Not high risk
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- High risk, Pre-exposure, not symptomatic
 - Vaccinate!
 - Tixagevimab/cligavimab (Evusheld) injections every 6 months

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 - Vaccinate!
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- High risk, COVID-19 +, Symptoms \leq 5 days, adults
 - No CI to ritonavir: Nirmatrelvir/ritonavir
 - CI to ritonavir: MAB referral
 - Consider molnupiravir if other drugs are not available

How Do I Decide What to Give?

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- High risk, COVID-19 +, Symptoms \leq 7 days, pediatrics
 - Consider remdesevir

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- High risk, COVID-19 +, Symptoms \leq 5 days, pediatrics
 - Consider remdesevir
- High risk, COVID-19 +, Symptoms 5-7 days, adults
 - Consider MAB

How Do I Decide What to Give?

- Not high risk
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 - CI to ritonavir: MAB referral
 - Consider molnupiravir if other drugs are not available
- High risk, COVID-19 +, Symptoms \leq 5 days, pediatrics
 - Consider remdesevir
- High risk, COVID-19 +, Symptoms 5-10 days, adults
 - Consider MAB
- More than 10 days of symptoms
 - Supportive care only

Drug Availability

- <https://covid-19-therapeutics-locator-dhhs.hub.arcgis.com/>

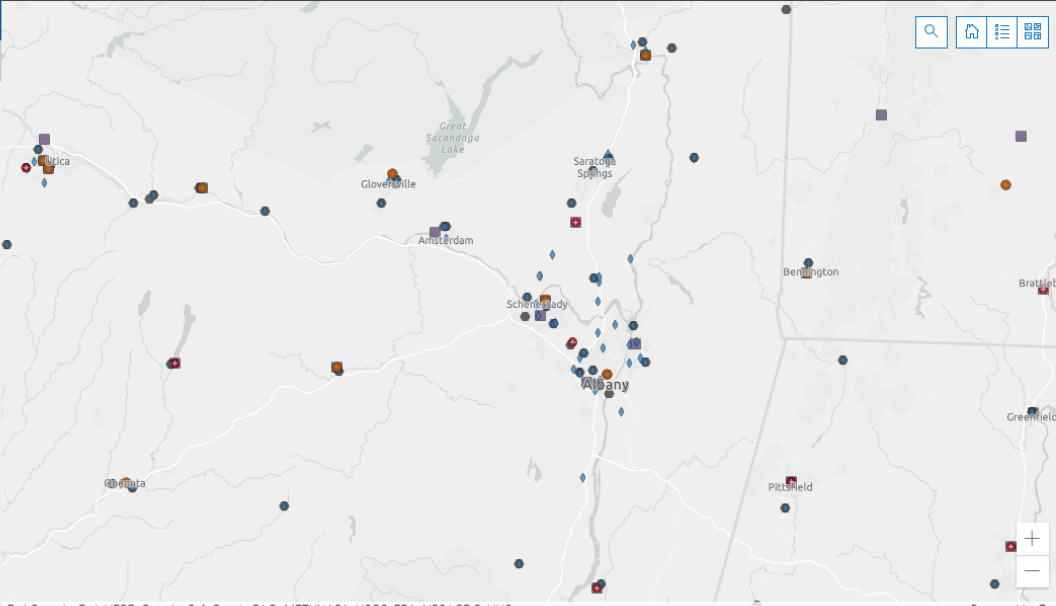

Search Sign In

Therapeutic Distribution Locator for Provider Use
State, Territory, or Jurisdiction: All
Therapeutic Selector: All

Locations

210

Use search glass below to find locations near an address.



+ Evusheld Available: 864

◆ Molnupiravir Available: 5,565

⬢ Paxlovid Available: 1,909

● Bebtelovimab Available: 256

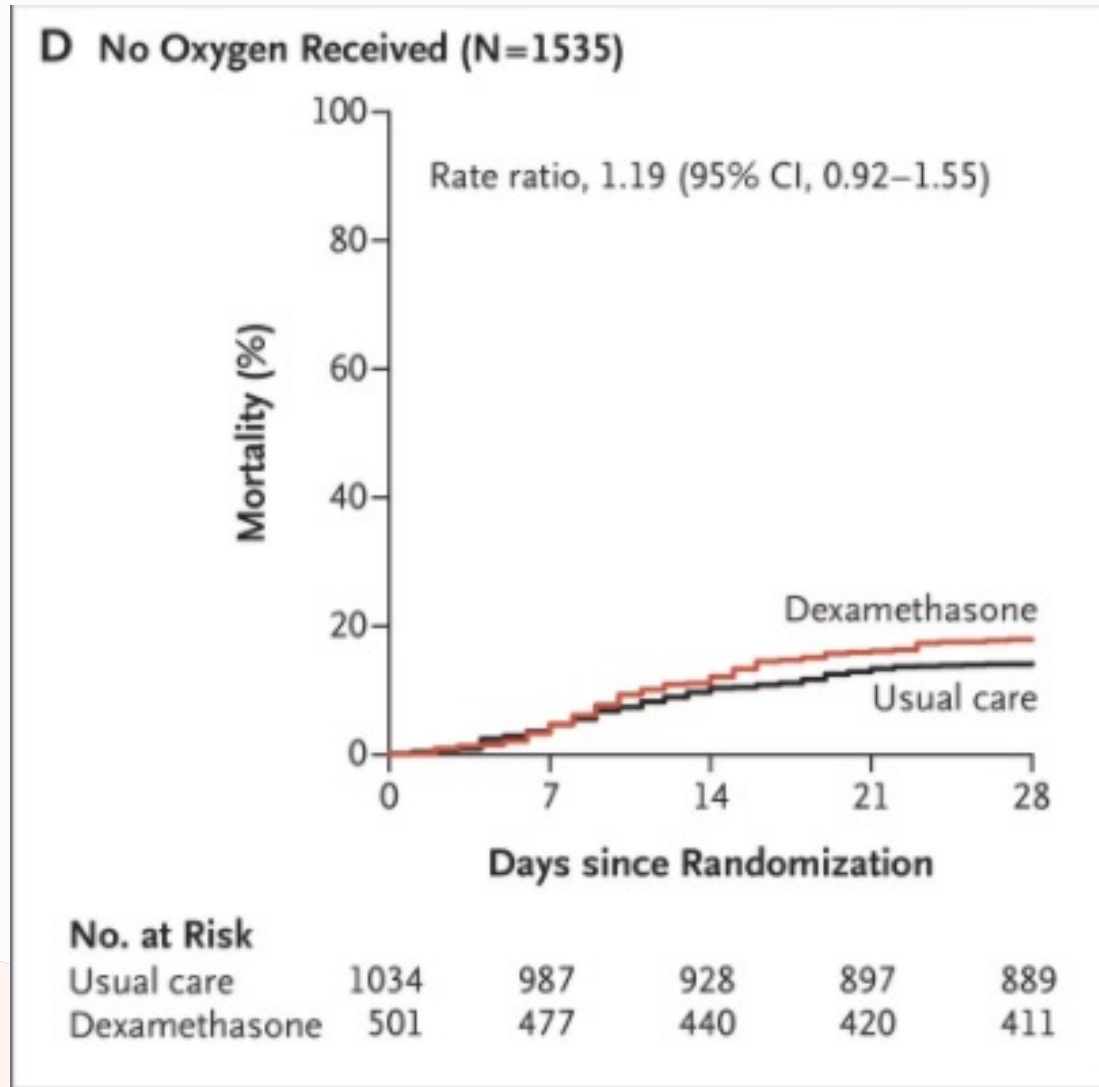
■ Sotrovimab Available: 776

ANY MEDICAL CENTER HOSPITAL 43 NEW SCOTLAND AVENUE, MAIL CODE 34, ALBANY, NY 12208 Sotrovimab, Product #00173-0901-86 36 Available	AURELIA OSBORN FOX MEMORIAL HOSP One Norton Avenue, Oneonta, NY 13820 Evusheld, Product #00310-7442-02 22 Available	AURELIA OSBORN FOX MEMORIAL HOSP One Norton Avenue, Oneonta, NY 13820 Bebtelovimab, Product #00002-7589-01 5 Available	Bassett Cobleskill Hosp 178 Grandview Dr, Cobleskill, NY 12043 Evusheld, Product #00310-7442-02 27 Available	Bassett Cobleskill Hosp 178 Grandview Dr, Cobleskill, NY 12043 Bebtelovimab, Product #00002-7589-01 5 Available	Bassett Medical Center OP Pharmacy One Atwell Road, COOPERSTOWN, NY 13326 Molnupiravir, Product #00006-5055-06 198 Available	Bassett Medical Center OP Pharmacy One Atwell Road, COOPERSTOWN, NY 13326 Evusheld, Product #00310-7442-02 77 Available
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Evolving Landscape of Therapies

- Outpatient steroids?
- What is the role of antibiotics?

Should I give outpatients systemic steroids?



PMID: 32678530

Should I give outpatients inhaled steroids?



Should I give outpatients steroids?

- Probably no role for oral steroids
- Maybe for inhaled steroids... but better treatments exist

What is the role of antibiotics?

- ...put another way, “what is the incidence of bacterial pneumonia in COVID-19?”

What is the role of antibiotics?

4%

Bacterial co-infection at time of admission

What is the role of antibiotics?

- Probably none, unless there is a change in sputum production, or the patient has had prolonged hospitalization

Take Home Points

- Nirmatrelvir and molnupiravir are beneficial at preventing serious disease in high risk patients
- Consider bebtelovimab when other drugs are not available
- There is little role for antibiotics in outpatient COVID-19 management

Questions?

OUR NEW GUIDANCE:
FULLY VACCINATED
PEOPLE CAN GATHER
PRIVATELY WITH NO
MASKS OR DISTANCING,
AND CAN VISIT WITH
UNVACCINATED LOW-
RISK PEOPLE IN ONE
HOUSEHOLD.

ANY QUESTIONS?

CDC



IF MY NEIGHBORS AND I
ARE ALL VACCINATED,
CAN I VISIT THEM
UNMASKED AND DRINK
MILK DIRECTLY FROM THE
JUG IN THEIR FRIDGE?

I...YOU CAN VISIT, YES.
AND THE JUG THING?

...NEXT QUESTION?



I'M FULLY VACCINATED.
CAN I RIDE MY BIKE IN MY
SISTER-IN-LAW'S HOUSE?

IN HER HOUSE?
LIKE, DOWN THE STAIRS.

I GUESS? YOU SHOULD AT
LEAST WEAR A HELMET.

EVEN IF SHE'S
NOT HIGH-RISK?

ANY OTHER QUESTIONS?



I'M TWO WEEKS PAST
MY SECOND DOSE.
CAN I GET A HORSE?

THANK YOU ALL
FOR COMING.

WHAT IF I
WEAR A MASK?

WHAT IF THE
HORSE DOES?



MEETING ENDED
BY HOST