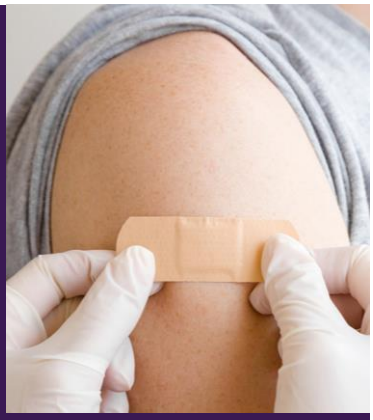
Vaccinations, Immunotherapy, and Medications for COVID-19



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Disclosure

This study is sponsored by Dakota Geriatrics, a Geriatric Workforce Enhancement program. Dakota Geriatrics is supported by funding from the Health Resources & Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling 3.75M with 15% financed with nongovernmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by HRSA, HHS, or the U.S. Government.

Objectives

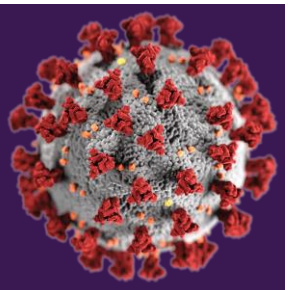
- Understand the benefits and recommendations for COVID-19 vaccination in the geriatric population
- Recognize when a patient with COVID-19 qualifies for outpatient treatment
- Become familiar with treatment options for nonhospitalized adults with COVID-19

Note

The information is this presentation is subject to change with new information

Watch for updates on the status of vaccine recommendations and treatment options from the CDC and state public health departments

COVID-19



- Severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2)
- Evolves over time, creating new variants
- Spread by person-to-person respiratory transmission
- Transmission potential highest in early course of illness
- Ranges from asymptomatic infection to fatal

Diagnosis

- Suspicion: new-onset fever and/or respiratory symptoms
  - Cough, shortness of breath, sore throat, runny nose, nasal congestion
  - **Smell or taste disturbances**, myalgias, diarrhea
- Rapid tests: usually nasal, results 15-30 minutes, may be less reliable
- Laboratory tests: nasal swab/saliva, results 1-3 days, more reliable

COVID-19 Vaccines

- Recommended for everyone ages 5 and older
- mRNA vaccines: Pfizer-BioNTech (Comirnaty) and Moderna (Spikevax)
- Viral vector vaccine: Johnson & Johnson
- mRNA > viral vector
- Additional dose: additional dose of vaccine given to those who are less likely to mount a protective immune response to initial vaccine
- Booster dose: additional dose of vaccine to enhance/restore protection which may have waned over time
- Mix and match: recommended for booster, not primary series

COVID-19 Vaccination Schedule

Manufacturer	Age	Primary Series	Booster	1st and 2nd dose interval	Primary and Booster Interval
Pfizer-BioNTech	5–11 years	2	NA	3 weeks	NA
Pfizer-BioNTech	12 years and older	2	1	3-8 weeks	At least 5 months
Moderna	18 years and older	2	1	4-8 weeks	At least 5 months
Johnson & Johnson	18 years and older	1	1	NA	At least 2 months

8-week interval: may be preferred for non-immunocompromised 12-64 years old, especially males 12-39 years (lower risk of myocarditis)

Second Boosters?

- Adults ages 18-49 years: J&J for primary series and booster-mRNA booster dose at least 4 months after J&J booster
- Adults ages 50 years and older: may **choose** to receive a second booster dose at least 4 months after the first booster
  - Medical conditions, live with immunocompromised individual, occupational risk, high community spread

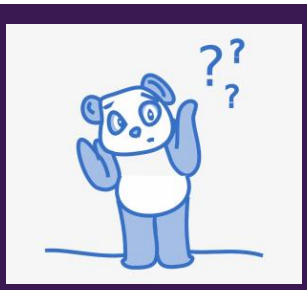
Immunocompromised People

- Active treatment for solid tumor and hematologic malignancies
- Receipt of solid-organ transplant and taking immunosuppressive therapy
- Receipt of chimeric antigen receptor (CAR)-T-cell therapy or hematopoietic cell transplant (HCT) (within 2 years of transplantation or taking immunosuppression therapy)
- Moderate or severe primary immunodeficiency
- Advanced or untreated HIV infection
- Medications: high-dose corticosteroids, alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, chemotherapeutic agents, TNF blockers, and immunosuppressive biologic agent

COVID-19 Immunocompromised Vaccination Schedule

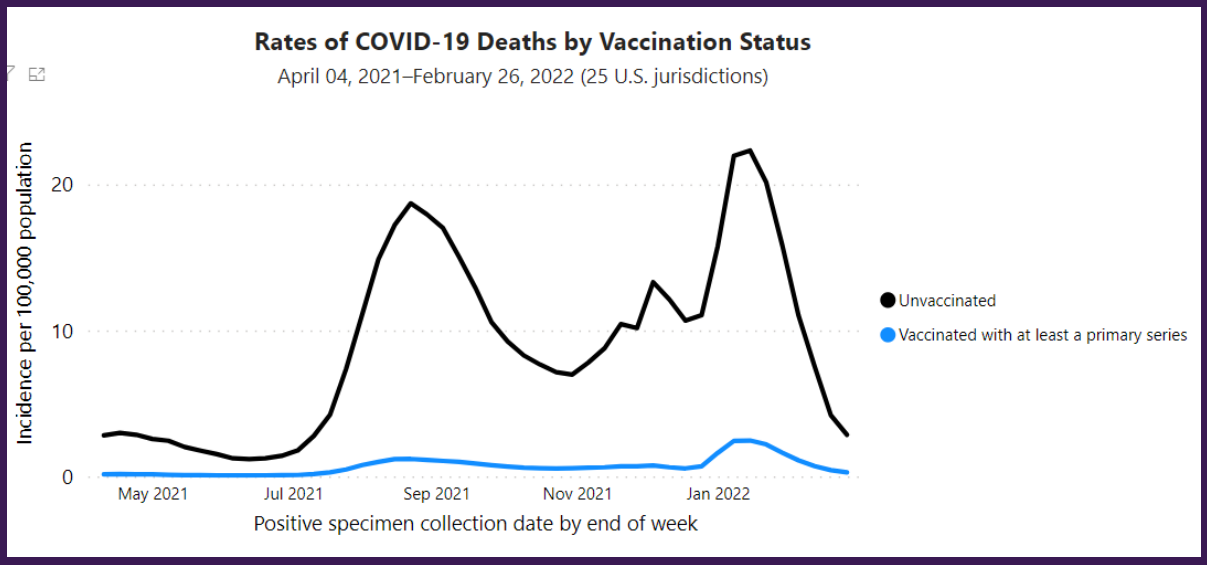
Manufacturer	Age group	Primary Series	Booster	1st and 2nd dose interval	2nd and 3rd dose interval	3rd and 4th dose interval
Pfizer-BioNTech	5–11 years	3	NA	3 weeks	At least 4 weeks	NA
Pfizer-BioNTech	12 years and older	3	1	3 weeks	At least 4 weeks	At least 3 months
Moderna	18 years and older	3	1	4 weeks	At least 4 weeks	At least 3 months
Johnson & Johnson	18 years and older	1, followed by 1 mRNA	1	4 weeks	At least 2 months	NA

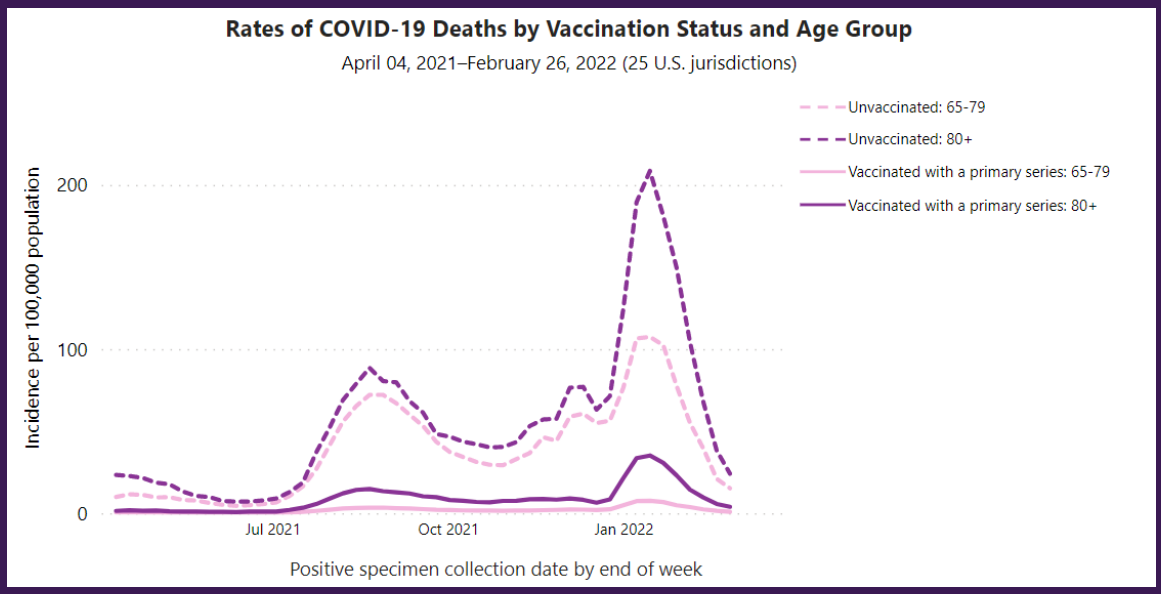
Second Boosters in Immunocompromised?



- People who are moderately or severely immunocompromised **might** consider getting the second booster dose as soon as possible (4 months after their first booster dose)
- Consider degree of immunosuppression and immunosuppressive therapy timing issues

Kaiser Family Foundation study: June 2021-March 2022, at least **234,000** American vaccine preventable deaths





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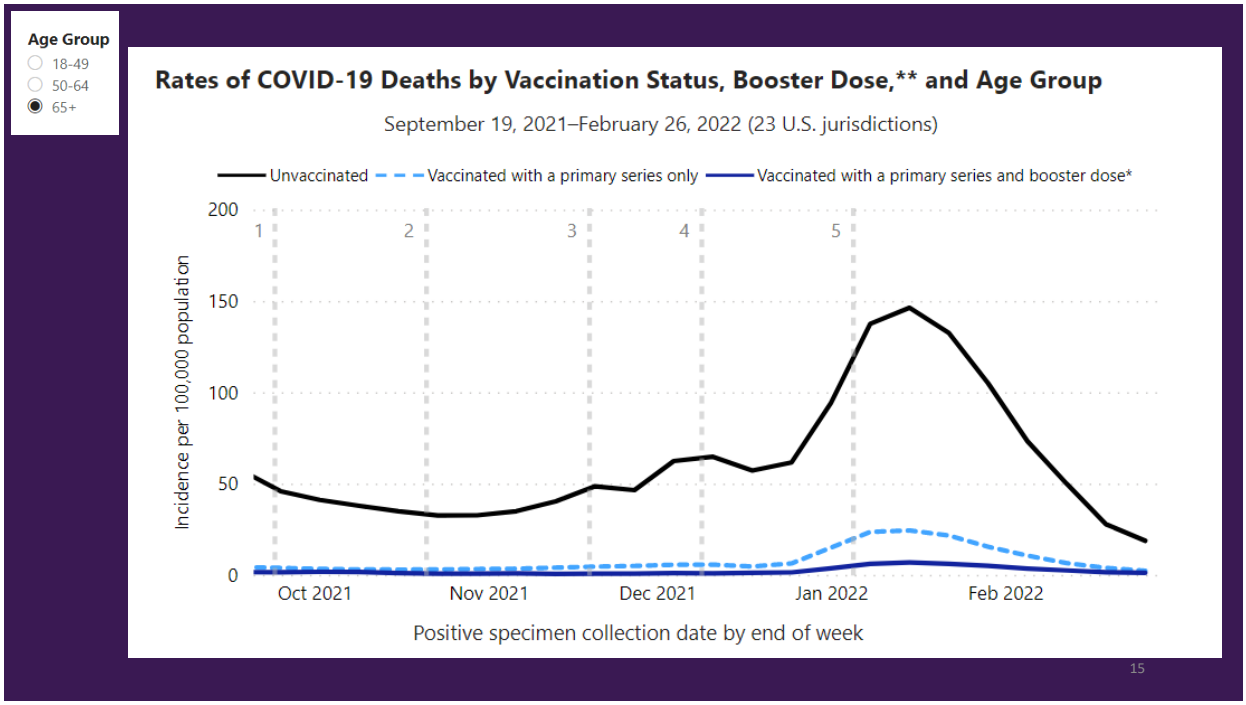

COVID Vaccine Safety and Side Effects

- Standard preclinical and clinical stages of development with stringent safety criteria
- Accelerated pace due to global attention
- Side effects are common, local and systemic
  - Acetaminophen (Tylenol) and NSAIDs (ibuprofen, Advil) after reaction develops
- Rare serious side effects

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COVID Vaccine FAQ

- Breakthrough infections: no vaccine is 100% effective
- Coverage vs. different variants: still largely effective
- Vaccination after COVID-19 infection: once recovered
- Myocarditis and pericarditis: lower risk than COVID-19 infection

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Vaccine Skepticism

- 82.4% of people 5+ in the United States have received one dose
- Listen, but don't judge
- Have information and resources available
- Don't politicize
- Ally with community "influencers"
- ALWAYS be respectful
- Be prepared to play the long game

COVID-19 Outpatient Management

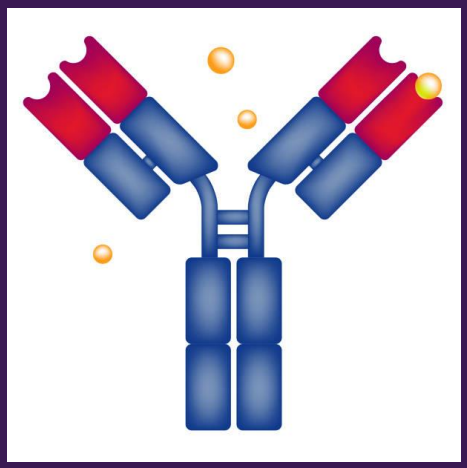
- About 80% of people with COVID-19 have a mild illness that does not require medical intervention or hospitalization
- No fixed criteria for hospital admission
- In-person evaluation: dyspnea, hypoxemia, chest pain/tightness, dizziness, confusion/mental status changes
- Supportive care, COVID-19 specific therapies, isolation
  - Manage symptoms, ensure adequate nutrition, pay attention to risks of social isolation
- **Therapies work better earlier in the course of the disease**

COVID-19 Outpatient Medications

- PrEP: Tixagevimab/cilgavimab (Evusheld)
- Nonhospitalized Adults Treatment
  1. Nirmatrelvir/ritonavir (Paxlovid)
  2. Remdesivir (Veklury)
  3. Bebtelovimab
  4. Molnupiravir
- Prior treatments: bamlanivimab/etesevimab, casirivimab/imdevimab (Regen-COV), sotrovimab

Monoclonal Antibodies (mAbs)

- Antibodies are proteins used by the immune system to identify and neutralize foreign objects in the body
- Monoclonal: made by cloning a unique white blood cell
- mAbs are designed to specifically bind certain substances



Evusheld (tixagevimab/cilgavimab)

- mAbs that bind to the spike protein on SARS-COV-2
- Pre-exposure prophylaxis for moderate to severely immunocompromised people 12 years and older
- Should be given ≥2 weeks after vaccination
- IM: 300 mg tixagevimab and 300 mg cilgavimab as a single dose in 2 separate syringes
- Previously approved dose 150 mg, repeat with 2nd dose of 150 mg if initial dose was >3 months ago
- Timing of repeat dosing not available due to uncertainty

Paxlovid (nirmatrelvir/ritonavir)

- Mechanism of action
  - Nirmatrelvir: protease inhibitor-can't process proteins, incapable of replication
  - Ritonavir: CYP-450 inhibitor-increases concentration of protease inhibitor by blocking metabolism
- Reduces the risk of hospitalization or death by **88%** vs. placebo in clinical trials
- Must be started **within 5 days of symptoms**

Paxlovid (nirmatrelvir/ritonavir)

- Dose: 300 mg nirmatrelvir with 100 mg ritonavir twice a day for 5 days
- 2 pink nirmatrelvir tablets + 1 white ritonavir tablet in the morning and evening
  - 3 AM pills/3 PM pills; 6 pills/day; 30 pills total
- Significant and complex **drug-drug interactions**
- Adjusted dosing for renal function

Remdesivir

- Broad-spectrum antiviral, nucleoside analogue-terminates RNA synthesis
- Shorter duration of treatment than inpatient (3 days vs 5-10 days)
- 3 days of remdesivir had an **87%** reduction in risk of hospitalization or death vs. placebo in clinical trials
- Must be started within **7 days of symptoms**
- IV infusion: 200 mg day 1, 100 mg day 2 and 3

Remdesivir

- Must be administered in a setting where severe hypersensitivity reactions can be managed
- Each infusion is 30-120 minutes
- Patients must be monitored for 1 hour after the infusion
- Logistical considerations vs. other treatments

Bebtelovimab

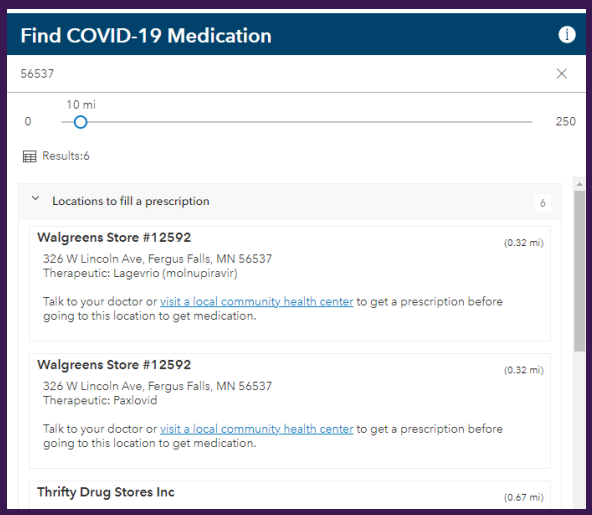
- mAb that binds to the spike protein on SARS-COV-2
- Data mostly comes from in vitro studies
- Must be started within **7 days of symptoms**
- **ONLY** if none of the preferred therapies are available, feasible to deliver, or clinically appropriate
- 175 mg IV push over ≥30 seconds
- Administered in a setting where severe hypersensitivity reactions can be managed
- Patients must be monitored for 1 hour after the infusion

Molnupiravir

- Antiviral: nucleoside analogue-promotes mutations in viral RNA
- Reduce the risk of hospitalization or death by **30%** vs placebo in clinical trials
- Must be started within **5 days of symptoms**
- **ONLY** if none of the preferred therapies are available, feasible to deliver, or clinically appropriate
- 800 mg twice daily for 5 days (4 x 200 mg pills twice a day, 8/day, 40 total)

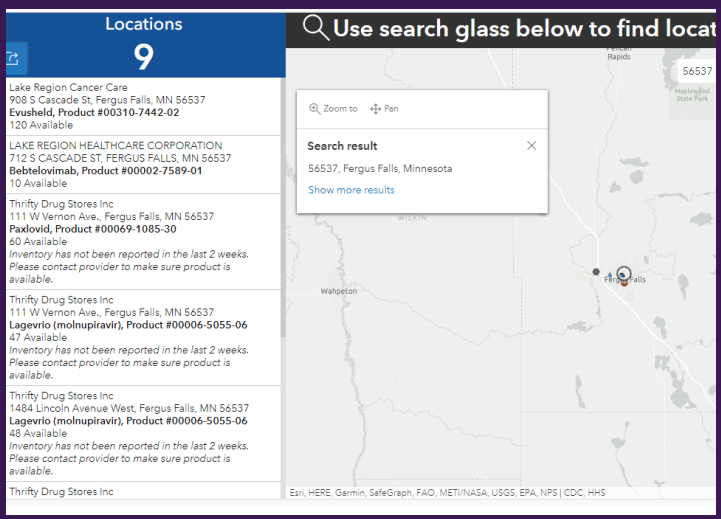
Locating Outpatient Medications

- Paxlovid and molnupiravir
- COVID-19 Test to Treat Locator: https://covid-19-test-to-treat-locator-dhhs.hub.arcgis.com/
- Need help finding a place to get medication? Call 1-800-232-0233 (TTY 888-720-7489)



Locating Outpatient Medications

- Paxlovid, bebtelovimab, molnuprivair, Evusheld
- COVID-19 Therapeutics Locator https://covid-19-therapeutics-locator-dhhs.hub.arcgis.com/



Long COVID

- Physical and psychological symptoms are common following COVID-19
- Include fatigue, dyspnea, chest pain, cough
- Can have psychologic and/or cognitive symptoms
- Most people recover in about 2 weeks, longer recovery more common in those with severe disease (a few months or longer)
- No specific therapies available for post-COVID symptoms
- Refer and treat as usual
- Olfactory training for persistent lost of taste/smell

Summary

- Recommend everyone over 5 years old to get their primary COVID-19 vaccine series and booster (especially older adults)
- 2nd boosters are available for certain populations, no concrete recommendations
- Deal with vaccine skepticism with patience and compassion
- There are antiviral and mAb treatments available for nonhospitalized adults with COVID-19
- These treatments are ranked in order of preference, but each has their own pros and cons
- Availability of these treatments varies widely by your location and demand

Patient Case

- A 71-year-old female calls your clinic stating she did a home COVID test today and it was positive
- Her symptoms started yesterday and included chills, sweating, sore throat, and body aches
- Patient's PMH includes atrial flutter (**warfarin, diltiazem**), COPD (inhalers), heart failure (beta blocker, diuretic), and hypertension
- Remdesivir is not available in your area

Patient Case

- A 31-year-old female contacts your hospital about receiving a mAb infusion for COVID-19
- Her symptoms started four days ago and include congestion/runny nose, cough, fatigue, headache, muscle pain/body aches
- Patient's risk factor for severe disease: obesity
- Remdesivir is not available in your area

Questions?