Table 4e. Characteristics of Antiviral Agents, Including Antibody Products

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- This table contains drugs and products that have shown antiviral activity against SARS-CoV-2, including small-molecule antiviral drugs, CCP, and IFNs.
- RDV and RTV-boosted nirmatrelvir (Paxlovid) are approved by the FDA for the treatment of COVID-19.
- MOV and CCP have received EUAs from the FDA for the treatment of COVID-19.
- For drug-drug interaction information, please refer to product labels, EUA fact sheets, and Drug-Drug Interactions Between Ritonavir-Boosted Nirmatrelvir (Paxlovid) and Concomitant Medications.
- For the Panel's recommendations on using the drugs listed in this table, refer to Antiviral Agents, Including Antibody Products; Therapeutic Management of Nonhospitalized Adults With COVID-19; Therapeutic Management of Hospitalized Adults With COVID-19; Therapeutic Management of Nonhospitalized Children With COVID-19; Therapeutic Management of Hospitalized Children With COVID-19; and Pregnancy, Lactation, and COVID-19 Therapeutics.

Drug Name	Dosing Regimens	Adverse Events	Monitoring Parameters	Drug-Drug Interaction Potential	Comments
Anti-SARS-CoV-2 Antiviral Drugs (Small-Molecule Antivirals)					
Ritonavir-Boosted Nirmatrelvir (Paxlovid) *Approved by the FDA for use in adults and authorized under an FDA EUA for use in adolescents (aged ≥12 years and weighing ≥40 kg) for the treatment of mild to moderate COVID-19 in high-risk individuals.*	**FDA Prescribing Information/EUA Dose for COVID-19[1,2]** *eGFR ≥60 mL/min* • Nirmatrelvir 300 mg (two 150-mg tablets) with RTV 100 mg (one 100-mg tablet) twice daily for 5 days *eGFR ≥30 to <60 mL/min* • Nirmatrelvir 150 mg (one 150-mg tablet) with RTV 100 mg (one 100-mg tablet) twice daily for 5 days *eGFR <30 mL/min* • **Not recommended** (see comments) *Severe Hepatic Impairment (Child-Pugh Class C)* • **Not recommended**	• Dysgeusia • Diarrhea • Anaphylaxis, serious skin reactions, and other HSRs	• Boxed warning: Monitor for potential AEs due to drug-drug interactions with concomitant medications. Weigh potential benefits of treatment against potential risks of drug-drug interactions. • Use with caution in patients with pre-existing liver diseases, liver enzyme abnormalities, or hepatitis. • Monitor for HSRs.	• RTV-boosted nirmatrelvir has significant drug-drug interactions. Before prescribing RTV-boosted nirmatrelvir, carefully review concomitant medications, including OTC medicines, herbal supplements, and recreational drugs. • See Drug-Drug Interactions Between Ritonavir-Boosted Nirmatrelvir (Paxlovid) and Concomitant Medications for additional guidance on identifying drug-drug interactions.	• The FDA prescribing information and the EUA do not recommend using RTV-boosted nirmatrelvir in patients with eGFR <30 mL/min. See Ritonavir-Boosted Nirmatrelvir (Paxlovid) for more information. • Both nirmatrelvir and RTV tablets can be taken with or without food. • The FDA prescribing information and the EUA advise against crushing nirmatrelvir and RTV tablets. However, some data indicate that the tablets can be split or crushed if necessary.[3]

Drug Name	Dosing Regimens	Adverse Events	Monitoring Parameters	Drug-Drug Interaction Potential	Comments
Anti-SARS-CoV-2 Antiviral Drugs (Small-Molecule Antivirals), continued					
Remdesivir *Approved by the FDA for the treatment of COVID-19 in individuals aged ≥28 days and weighing ≥3 kg.*	**Dose for Adults and Children Weighing ≥40 kg** • RDV 200 mg IV on Day 1, then RDV 100 mg IV once daily from Day 2 **Dose for Children Aged ≥28 Days and Weighing 3 kg to <40 kg** • RDV 5 mg/kg IV on Day 1, then RDV 2.5 mg/kg IV once daily from Day 2 **Total Treatment Duration** *Nonhospitalized Patients or Patients Hospitalized for Reasons Other Than COVID-19* • 3 days *Hospitalized Patients* • 5 days or until hospital discharge • If a patient does not clinically improve, clinicians may extend the treatment course for ≤5 additional days, for a total duration of 10 days.	• Nausea • ALT and AST elevations • HSRs • Increases in prothrombin time • Bradycardia	• Monitor patients for infusion-related reactions during the infusion and observe them for ≥1 hour after the infusion as clinically appropriate. • Monitor renal function, hepatic function, and prothrombin time as clinically indicated. • Monitor heart rate.	• No clinically significant drug-drug interactions are expected with CYP3A4 inducers or inhibitors of OATP1B1, OATP1B3, or P-gp.	• Administer each infusion over 30–120 minutes. • RDV may be used without dose adjustment in patients with renal impairment, including those receiving dialysis.[4]

Drug Name	Dosing Regimens	Adverse Events	Monitoring Parameters	Drug-Drug Interaction Potential	Comments
Anti-SARS-CoV-2 Antiviral Drugs (Small-Molecule Antivirals), continued					
Molnupiravir *Authorized under an FDA EUA for the treatment of mild to moderate COVID-19 in high-risk individuals aged ≥18 years.*	**Dose Recommended in FDA EUA** • MOV 800 mg (four 200-mg capsules) PO every 12 hours for 5 days • MOV is not authorized for use in people aged <18 years due to potential effects on bone and cartilage growth.	• Diarrhea • Nausea • Dizziness • Per the EUA, the 5-day course of MOV has a low risk for genotoxicity.[5] See Molnupiravir for details.	• Before initiating MOV, assess the patient's pregnancy status as clinically indicated. • Monitor for potential AEs.	• Clinical drug-drug interaction studies of MOV have not been conducted. • Drug-drug interactions related to hepatic metabolism are not expected.	• People of reproductive potential who are sexually active should use effective contraception during and after treatment with MOV. • Pregnant patients should also be offered the opportunity to participate in the COVID-19 International Drug Pregnancy Registry. • Breastfeeding **is not recommended** while a patient is taking MOV and for 4 days after the last dose. • MOV can be taken with or without food. • The EUA provides instructions for preparing and administering MOV capsule contents through OG or NG tubes.[5]

Drug Name	Dosing Regimens	Adverse Events	Monitoring Parameters	Drug-Drug Interaction Potential	Comments
COVID-19 Convalescent Plasma					
High-Titer COVID-19 Convalescent Plasma *Authorized under an FDA EUA for the treatment of COVID-19 in patients who are immunocompromised or who are receiving immunosuppressive treatment.*	**Dose Recommended in FDA EUA** • Administer 1 high-titer CCP unit (about 200 mL) IV. Administer an additional CCP unit IV based on the prescribing provider's judgment and the patient's clinical response.	• TRALI • TACO • Allergic reactions • Anaphylactic reactions • Febrile nonhemolytic reactions • Hemolytic reactions • Hypothermia • Metabolic complications • Transfusion-transmitted infections[6] • Thrombotic events • Theoretical risk of antibody-mediated enhancement of infection and suppressed, long-term immunity	• Before administering CCP to patients with a history of severe allergic or anaphylactic transfusion reactions, consult a transfusion medicine specialist who is associated with the hospital's blood bank. • Monitor for transfusion-related reactions. • Monitor vital signs at baseline and during and after transfusion.	• Drug products **should not be added** to the IV infusion line for the blood product.	• In patients with impaired cardiac function and heart failure, it may be necessary to reduce the CCP volume or decrease the transfusion rate.
Interferons					
IFN Beta *Not approved by the FDA and not recommended by the Panel for the treatment of COVID-19.*	• Various doses and durations for IFN beta-1a and IFN beta-1b are being studied in clinical trials.	• Flu-like symptoms (e.g., fever, fatigue, myalgia) • Leukopenia, neutropenia, thrombocytopenia, lymphopenia • Liver function abnormalities (ALT > AST) • Injection site reactions • Headache • Hypertonia • Pain • Rash • Worsening depression • Induction of autoimmunity	• Monitor CBC with differential and liver enzymes. • Monitor for worsening CHF. • Monitor for signs of depression and suicidal ideation.	• Low potential for drug-drug interactions • **Use with caution** with other hepatotoxic agents. • Reduce dose if ALT is >5 times ULN.	• Inhaled IFN beta-1a is not approved by the FDA for use in the United States.

Drug Name	Dosing Regimens	Adverse Events	Monitoring Parameters	Drug-Drug Interaction Potential	Comments
Interferons, continued					
PEG-IFN Lambda *Not approved by the FDA and not recommended by the Panel for the treatment of COVID-19.*	**Dose for COVID-19 in Clinical Trials** • Single dose of PEG-IFN lambda 180 µg SUBQ	• Liver function abnormalities (ALT > AST) • Injection site reactions	• CBC with differential • Liver enzymes • Monitor for potential AEs.	• Low potential for drug-drug interactions • **Use with caution** with other hepatotoxic agents.	• PEG-IFN lambda is not approved by the FDA for use in the United States.

Key: AE = adverse event; ALT = alanine transaminase; AST = aspartate aminotransferase; CBC = complete blood count; CCP = COVID-19 convalescent plasma; CHF = congestive heart failure; CYP = cytochrome P450; eGFR = estimated glomerular filtration rate; EUA = Emergency Use Authorization; FDA = Food and Drug Administration; HSR = hypersensitivity reaction; IFN = interferon; IV = intravenous; MOV = molnupiravir; NG = nasogastric; OATP = organic anion transporting polypeptide; OG = orogastric; OTC = over-the-counter; the Panel = the COVID-19 Treatment Guidelines Panel; PEG-IFN = pegylated interferon; P-gp = P-glycoprotein; PO = oral; RDV = remdesivir; RTV = ritonavir; SUBQ = subcutaneous; TACO = transfusion-associated circulatory overload; TRALI = transfusion-related acute lung injury; ULN = upper limit of normal

References

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3. BC COVID Therapeutics Committee COVID Therapy Review and Advisory Working Group. Therapeutic brief: crushing nirmatrelvir/ritonavir (Paxlovid). 2022. Available at: http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID-treatment/Crushing_Paxlovid.pdf.
4. Remdesivir (Veklury) [package insert]. Food and Drug Administration. 2023. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/214787s019lbl.pdf.
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6. Food and Drug Administration. Fact sheet for health care providers: Emergency Use Authorization (EUA) of COVID-19 convalescent plasma for treatment of coronavirus disease 2019 (COVID-19). 2021. Available at: https://www.fda.gov/media/141478/download.