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COVID-19 Updates

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Remdesivir *(Veklury)* in High-Risk Outpatients with COVID-19

The IV antiviral drug remdesivir (*Veklury* – Gilead) has been available for treatment of COVID-19 in hospitalized patients since 2020.[1] Now, the FDA has approved remdesivir for treatment of mild to moderate COVID-19 in outpatients ≥12 years old who weigh ≥40 kg and are at high risk for progression to severe disease, including hospitalization or death; they also issued an Emergency Use Authorization (EUA) allowing its use in any other high-risk outpatient who weighs ≥3.5 kg.[2,3]

CLINICAL STUDIES — FDA approval of remdesivir for use in outpatients was based on the results of a double-blind trial in 562 nonhospitalized, SARS-CoV-2-positive adults who had developed symptoms of COVID-19 ≤7 days previously and had one or more risk factors for progression to severe COVID-19 (e.g., age ≥60 years, obesity, hypertension, diabetes). Patients were randomized to receive 3 days of IV treatment with remdesivir (200 mg on day 1 and 100 mg on days 2 and 3) or placebo. Hospitalization related to COVID-19 by day 28 occurred significantly less often with the active drug (0.7% vs 5.3% with placebo; HR 0.13 [95% CI 0.03-0.59]; NNT 21.8). No deaths occurred by day 28 in either group.[4]

No clinical trial data are available on use of remdesivir in patients aged <12 years or weighing <40 kg. Authorization of the drug for use in such patients was based on extrapolation of clinical and pharmacokinetic data from studies in adults.[5]

DOSAGE AND ADMINISTRATION — The recommended dosage of remdesivir in high-risk outpatients weighing ≥40 kg is 200 mg IV on day 1 and 100 mg IV on days 2 and 3. For patients weighing <40 kg, the recommended dose is 5 mg/kg on day 1 and 2.5 mg/kg on days 2 and 3. The drug should be infused over 30-120 minutes. Treatment should be started within 7 days of symptom onset. Patients receiving remdesivir should be monitored for hypersensitivity reactions during administration of the drug and for 1 hour after completion of each infusion. Remdesivir is not recommended for use in patients with an eGFR <30 mL/min (or, in full-term neonates 7-28 days old, a serum creatinine level ≥1 mg/dL).[5]

RECOMMENDATIONS — The NIH recommends a 3-day course of IV remdesivir as a third-line option for treatment of mild to moderate COVID-19 in high-risk outpatients ≥12 years old who weigh ≥40 kg; it should be used if *Paxlovid* (nirmatrelvir/ritonavir) and sotrovimab are inappropriate or unavailable. Remdesivir is the only drug that is currently authorized by the FDA for treatment of COVID-19 in persons aged <12 years or weighing <40 kg.[6,7]

1. Remdesivir (Veklury) for COVID-19. Med Lett Drugs Ther 2020; 62:186.
2. FDA News Release. FDA takes actions to expand use of treatment for outpatients with mild-to-moderate COVID-19. January 21, 2022. Available at: https://bit.ly/3AwPkj9. Accessed January 28, 2022.
3. CDC. Underlying medical conditions associated with higher risk for severe COVID-19: information for healthcare providers. October 14, 2021. Available at: https://bit.ly/3tWR8Rg. Accessed January 28, 2022.
4. RJ Gottlieb et al. Early remdesivir to prevent progression to severe Covid-19 in outpatients. N Engl J Med 2022; 386:305.
5. FDA. Fact sheet for health care providers. Emergency Use Authorization (EUA) of Veklury (remdesivir) for the treatment of coronavirus disease 2019 (COVID-19) in pediatric patients. January 2022. Available at: https://bit.ly/35ok8aw. Accessed January 28, 2022.
6. NIH. The COVID-19 Treatment Guidelines Panel's statement on therapies for high-risk, nonhospitalized patients with mild to moderate COVID-19. January 19, 2022. Available at: https://bit.ly/3fYk4jC. Accessed January 28, 2022.

7. COVID-19 updates: NIH outpatient treatment guidelines. Med Lett Drugs Ther 2022; 64:32.

NIH Outpatient Treatment Guidelines

NIH guidelines[1] now recommend that high-risk outpatients with mild to moderate COVID-19 who are ≥12 years old and weigh ≥40 kg receive antiviral treatment with (in order of preference) a 5-day course of oral nirmatrelvir with ritonavir *(Paxlovid)*,[2] a single IV infusion of the monoclonal antibody sotrovimab,[3] a 3-day course of IV remdesivir *(Veklury)*,[4] or (in adults) a 5-day course of oral molnupiravir.[5] Nirmatrelvir/ritonavir and sotrovimab are preferred to remdesivir mainly because of logistical concerns associated with IV infusion of remdesivir on 3 consecutive days. Molnupiravir should only be used when *Paxlovid*, sotrovimab, and remdesivir are inappropriate or unavailable because it is less effective than these preferred alternatives. The monoclonal antibody combinations casirivimab plus imdevimab *(REGEN-COV)* and bamlanivimab plus etesevimab are not currently authorized for use in the US because they lack activity against the Omicron variant of SARS-CoV-2.[6]

1. Remdesivir (Veklury) for COVID-19. Med Lett Drugs Ther 2020; 62:186.
2. Paxlovid for treatment of COVID-19. Med Lett Drugs Ther 2022; 64:9.
3. An EUA for sotrovimab for treatment of COVID-19. Med Lett Drugs Ther 2021; 63:97.
4. COVID-19 updates: Remdesivir (Veklury) in high-risk outpatients with COVID-19. Med Lett Drugs Ther 2022; 64:31.
5. Molnupiravir for treatment of COVID-19. Med Lett Drugs Ther 2022; 64:10.
6. FDA Statement. Coronavirus (COVID-19) update: FDA limits use of certain monoclonal antibodies to treat COVID-19 due to the omicron variant. January 24, 2022. Available at: https://bit.ly/3GVGsWR. Accessed January 28, 2022.

Moderna COVID-19 Vaccine *(Spikevax)* Gains Full Licensure

The FDA has licensed the mRNA-based COVID-19 vaccine manufactured by Moderna *(Spikevax)* for use as a 2-dose primary series to prevent COVID-19 in adults.[1,2] It is the second COVID-19 vaccine to receive full licensure in the US; the mRNA-based vaccine manufactured by Pfizer/BioNTech *(Comirnaty)* was licensed in 2021.

Spikevax remains available under an FDA Emergency Use Authorization (EUA) for use as a 3-dose primary series in immunocompromised adults and for booster immunization.[3] A summary of indications for *Spikevax* can be found in Table 1.

Table 1. Indications and Dosage Regimens for *Spikevax*

Indication[1]	Dosage
Primary immunization[2]	100 mcg (0.5 mL) IM at 0 and 4 weeks
Additional primary dose for immunocompromised persons[3]	100 mcg (0.5 mL) IM ≥4 weeks after second primary dose
Booster dose after a Moderna or Pfizer/BioNTech primary series[3]	50 mcg (0.25 mL) IM ≥5 months after last primary dose
Booster dose after a Johnson & Johnson primary dose[3]	50 mcg (0.25 mL) IM ≥2 months after primary dose

1. *Spikevax* is indicated for use in adults.
2. FDA-licensed for this indication.
3. Available under an FDA Emergency Use Authorization (EUA) for this indication.

1. FDA News Release. Coronavirus (COVID-19) update: FDA takes key action by approving second COVID-19 vaccine. January 31, 2022. Available at: https://bit.ly/3L3RIIq. Accessed February 3, 2022.
2. FDA authorizes Moderna COVID-19 vaccine. Med Lett Drugs Ther 2021; 63:9.
3. FDA. Fact sheet for healthcare providers administering vaccine (vaccination providers). Emergency Use Authorization (EUA) of the Moderna COVID-19 vaccine to prevent coronavirus disease 2019 (COVID-19). January 31, 2022. Available at: https://bit.ly/3nosylA. Accessed February 3, 2022.

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