



Vaccines and Related Biological Products
Advisory Committee meeting
October 14, 2021

Moderna COVID-19 Vaccine
Application for Emergency Use Authorization
of a booster dose

Applicant: ModernaTX Inc.,

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Background Outline

- Moderna COVID-19 Vaccine and EUA Request for Booster Dose
- Considerations for EUA of a COVID-19 Vaccine Booster Dose
- COVID-19 Vaccines Available for Use in the U.S.
- Overview of Today's Agenda
- Voting Question for the Committee

Moderna COVID-19 Vaccine

- Emergency Use Authorization: December 18, 2021
- Indication and Usage: Active immunization to prevent COVID-19 caused by SARS-CoV-2 in individuals 18 years of age and older
- Dosing Regimen: Two doses administered one month apart
 - Third dose at least one month after the second dose authorized August 12, 2021, for use in certain immunocompromised individuals
- Each 0.5 mL dose contains 100 mcg of a nucleoside-modified messenger RNA (mRNA) encoding the viral spike glycoprotein of SARS-CoV-2 (Wuhan strain) formulated in lipids.

Moderna COVID-19 Vaccine Booster Dose Amendment

- Submission Date: September 3, 2021
- Proposed use of booster dose under EUA: a **50 mcg dose (0.25 mL)** to be administered at least 6 months after completing a primary series to individuals:
 - 65 years of age and older,
 - 18 through 64 years of age at high risk of severe COVID-19, and
 - 18 through 64 years of age whose frequent institutional or occupational exposure to SARS-CoV-2 puts them at high risk of serious complications of COVID-19 including severe COVID-19.
- The clinical package includes safety and immunogenicity data from 171 clinical trial participants who received a 50 mcg booster dose of Moderna COVID-19 Vaccine approximately 6 months after completing the Moderna COVID-19 Vaccine two dose (100 mcg) series.

Rationale for COVID-19 Booster Doses

- The emergence of the highly transmissible Delta (B.1.617.2) variant of SARS-CoV-2 has led to considerations of the potential need for booster doses for fully vaccinated individuals.
- Data from post-authorization effectiveness studies conducted suggest that the currently U.S. authorized, or licensed vaccines remain effective in protecting against severe disease; however, some data suggest that effectiveness may be waning against mild disease and against severe disease in elderly individuals.
- Concerns have been raised that declining neutralizing antibody titers or reduced effectiveness against symptomatic disease may herald significant declines in effectiveness against severe disease.

Emergency Use Authorization

- FDA may issue an Emergency Use Authorization (EUA) of an unapproved medical product following an EUA declaration, if the following statutory requirements* are met:
 - The agent referred to in the EUA declaration can cause a serious or life-threatening disease or condition
 - The medical product may be effective to prevent, diagnose, or treat the serious or life-threatening condition caused by the agent
 - The known and potential benefits of the product outweigh the known and potential risks of the product
 - No adequate, approved, and available alternative to the product for diagnosing, preventing, or treating the disease or condition

*Section 564 of the FD&C Act (21 U.S.C. 360bbb-2)

COVID-19 Vaccines Available for Use in the U.S.

Pfizer BioNTech

FDA approved as COMIRNATY:

- 2-dose primary series, individuals ≥ 16 years of age

Available under EUA as Pfizer-BioNTech COVID-19 Vaccine:

- 2-dose primary series, individuals ≥ 12 years of age
- 3rd primary series dose, certain immunocompromised individuals
- Booster dose at least 6 months after completion of primary series:
 - Individuals ≥ 65 years of age
 - Individuals 18 through 64 years of age at high risk of severe COVID-19
 - Individuals 18 through 64 years of age whose frequent institutional or occupational exposure to SARS-CoV-2 puts them at high risk of serious complications of COVID-19 including severe COVID-19

Moderna

Available under EUA:

- 2-dose series, individuals ≥ 18 years of age
- 3rd dose, certain immunocompromised individuals

Janssen

Available under EUA:

- Single dose, individuals ≥ 18 years of age

Benefit/Risk Considerations for Booster Doses

- Available data should support the effectiveness of a booster dose, specifically against currently circulating SARS-CoV-2 variants.
 - Benefit of the booster dose should be considered relative to the benefit provided by previous vaccination with a primary series.
- Available data should at minimum characterize the most common adverse reactions associated with the booster dose.
 - Uncertainties regarding risks (e.g., myocarditis) are also considered and would be further evaluated during post authorization surveillance..
- FDA's evaluation of the safety and effectiveness data of a booster dose of the Moderna COVID-19 vaccine, and additional input from the VRBPAC, is essential for weighing the known and potential benefits and risks.

Overview of Today's Agenda

- **FDA Introduction (30 min)**
 - Introduction of the Topic (10 min)**
Peter Marks, M.D., Ph.D., Center Director, CBER, FDA
 - Background (15 min)**
Sudhakar Agnihothram, Ph.D., Review Committee Chair, DVRPA, OVRR, CBER, FDA
 - Q/A - 5 min

- **Presentation of Data Relevant to the Need for Boosters (60 Min)**
 - Presentation of Updated Israeli Vaccination Data (40 Min)**
Speaker 1: Sharon Alroy, M.D., M.P.H, M.B.A., Director of Public Health Services, Ministry of Health Israel
Speaker 2: Ron Milo, Ph.D., Professor, Weitzman Institute, Israel
 - Q/A - 20 min

- Break (15 min)**

Overview of Today's Agenda, cont.

- **Sponsor Presentation (45 min)**
Safety and Immunogenicity of a 50 µg Booster Dose of mRNA-1273 (Moderna COVID-19 Vaccine)
 Jacqueline Miller, M.D., ID Therapeutic Area Head, Moderna Therapeutics

- **FDA Presentations (45 min)**
 Tina Mongeau, M.D., M.P.H., Medical Officer, OVRP, CBER, FDA
 Hui-Lee Wong, Ph.D., Associate Director for Innovation, OBE, CBER, FDA

- Q/A 10 min

- **Lunch (30 min)**
- **Open Public Hearing (60 min)**
- **Break (15 min)**
- **Additional Q & A Session regarding the Sponsor and FDA presentations**
- **Committee Discussion and Voting (120 min)**

Voting Question for the Committee

Do available data support the safety and effectiveness of Moderna COVID-19 Vaccine for use under EUA as a booster dose (50 mcg mRNA-1273) at least 6 months after completion of a primary series in the following populations:

- Individuals 65 years of age and older,
- Individuals 18 through 64 years of age at high risk of severe COVID-19, and
- Individuals 18 through 64 years of age whose frequent institutional or occupational exposure to SARS-CoV-2 puts them at high risk of serious complications of COVID-19 including severe COVID-19.

Non-Voting Discussion Question

Considering the information presented today and at the meeting of the VRBPAC on September 17, 2021, including updated information on effectiveness of mRNA COVID-19 vaccines, please discuss whether available data support use of a mRNA COVID-19 vaccine (Pfizer-BioNTech or Moderna) booster dose administered at least 6 months after completion of the same mRNA COVID-19 vaccine primary series in the general population of adults in an age group less than 65 years.

- For the purposes of this question, age groups below 18 years should not be considered



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Thank you!