COVID-19 booster doses have been approved by the FDA for Pfizer (September 2021) and more recently for Moderna and Johnson & Johnson (October 2021) vaccines for certain populations. This document will 1) provide detail on the differences between the vaccines in terms of booster dose volume, timing, and eligibility, and 2) discuss the newly approved mix-and-match strategy of boosting people with different vaccines. It also lays out key considerations and unknowns for public health departments and community-based partners.

**Booster Doses Across Authorized Vaccines**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Date FDA Authorized</th>
<th>Booster Dose Volume</th>
<th>Booster Dose Timing</th>
<th>Eligible Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pfizer</td>
<td>9/22/21</td>
<td>30 μg (same as each dose of primary)</td>
<td>*At least 6 months after primary series completion</td>
<td>*Anyone 65+ Certain groups ages 18-64 who are susceptible to severe disease or at high risk of exposure</td>
</tr>
<tr>
<td>Moderna</td>
<td>10/20/21</td>
<td>50 μg (half of each dose of primary)</td>
<td>*At least 6 months after primary series completion</td>
<td>*Anyone 65+ Certain groups ages 18-64 who are susceptible to severe disease or at high risk of exposure</td>
</tr>
<tr>
<td>Janssen/J&amp;J</td>
<td>10/20/21</td>
<td>0.50 mL (same as primary single dose)</td>
<td>At least 2 months after primary dose administration</td>
<td>Anyone who received a J&amp;J initial dose</td>
</tr>
</tbody>
</table>

*A note on the CDC’s guidance regarding third doses versus boosters: A third dose for those who are severely immunocompromised—technically not considered a booster, but rather as a part of the primary series for this group for whom vaccine effectiveness is significantly lower than those who are not immunosuppressed—may be given at least four weeks after the second dose of Pfizer or Moderna (at the dosing volume of the primary series). At this time, there is not enough data to determine the effectiveness of the J&J vaccine for those who are immunocompromised with an additional dose of the J&J vaccine, and thus the FDA’s EUA amendment only applies to mRNA COVID-19 vaccines for this population.

**Considerations and Unknowns**

- Different dosing for the Moderna booster (versus the Moderna primary series) could present confusion if patients incorrectly report which dose they are receiving, or if medical records are unavailable, incorrect, or incomplete.
- During FDA presentation, Moderna noted that it intends to distribute dosing information to providers, including a “Dear Healthcare Provider” letter, a 24-hour call center to answer incoming questions, and information on their website.
  - However, most of this planned outreach is aimed at primary care providers, who up until now, have not played a large role in vaccine distribution—especially among adults who would be eligible for booster doses.
  - Public health departments and community partners should consider whether outreach and informational materials for correct Moderna dosing for primary series vs. booster shot, as well as eligibility criteria, are provided for the full diverse array of vaccine providers (not just primary care physicians) at different types of vaccine sites, including pharmacies, mobile sites, etc.

**Mixed Doses (Heterologous or “Mix-and-Match” Strategy)**

On October 20, 2021, FDA authorized providers to boost people with a different vaccine from the one they initially received, known as a heterologous or “mix-and-match” strategy. However, the FDA did not recommend any one...
vaccine over another to be used as a booster, nor did they issue guidance on if consistent use of a single vaccine type is preferable for any of the available vaccines.

Mix-and-Match Dosing and Timing

When an FDA authorized mixed-and-matched dose strategy is followed, eligible recipients may receive a booster of any of the three vaccines at the recommended dosing interval for the booster dose of the vaccine used for primary vaccination.

- For example, those who received the single-dose J&J vaccine initially may receive a booster dose of either J&J, Pfizer, or Moderna at least two months after their initial vaccination with the J&J vaccine.
- For example, those who received Moderna or Pfizer vaccines as their initial vaccine series may receive a booster dose of Moderna, Pfizer, or J&J at least six months after their second dose from their primary series.

Considerations and Unknowns

- Public health departments and community partners should consider their recommended guidance if people who are ineligible (due to timing or vaccine ineligibility) present for booster doses.
- Communication of accurate timing information may be challenging, particularly for timing of mixed doses. Rely on trusted local messengers and clear, consistent informational materials to relay information.
- Just as regulatory agencies (including the FDA and CDC) have avoided recommending the use of one vaccine over any other, they have not recommended one boosting strategy over another. However, the data reviewed during FDA meetings that supported the recent authorization of mixed doses came primarily from those who initially received a J&J vaccine and then received a booster dose of one of the mRNA vaccines. However, data were not reviewed regarding a J&J booster for people who received a primary mRNA series; it is not known if this approach would be equivalent, inferior, or superior to receiving an mRNA booster dose. This lack of clear data could create the perception of vaccine inferiority for those who received the J&J vaccine, or could create a sense of “vaccine classes”—especially as some hard-to-reach populations (including some people experiencing homelessness and migrant workers) received the J&J vaccine for the primary vaccine due to logistical concerns.
- It appears as though personal preference and local supply chain may determine the type of booster dose a person receives. However, the exact details of if eligible vaccine recipients or vaccine providers will decide on administration of booster vaccine type is unclear. Once this fact is clarified, it should be clearly and consistently communicated to the public as soon as possible to avoid misplaced expectations.
- Given the lack of FDA guidance on vaccine preference or recommendations for vaccine consistency or mix-and-match for booster doses, it may be difficult to accurately predict individual vaccine preference for those eligible for and seeking out booster shots. This could create procurement difficulties or inefficiencies as eligible recipients attempt to “shop around” for their booster shot of choice.

Related Resources

- COVID-19 Update: FDA Take Additional Actions on the Use of a Booster Dose for COVID-19 Vaccines (FDA News Release)
- Mix-and-Match Covid Boosters: Why They Just Might Work (NYT)