COVID-19 Vaccine Safety Technical (VaST) Work Group

Objectives

- Review, evaluate, and interpret post-authorization/approval COVID-19 vaccination safety data
- Serve as the central hub for technical subject matter expertise from federal agencies conducting post-authorization/approval safety monitoring
- Advise on analyses, interpretation, and presentation of vaccine safety data
- Provide updates to the ACIP COVID-19 Vaccines Work Group and the entire ACIP on COVID-19 vaccine safety

https://www.cdc.gov/vaccines/acip/workgroups.html
VaST continues to review COVID-19 vaccination safety data from passive and active surveillance systems

- U.S. safety monitoring systems including Vaccine Adverse Events Reporting System (VAERS), Vaccine Safety Datalink (VSD), FDA BEST System,¹ Department of Veterans Affairs (VA), Indian Health Service (IHS), Department of Defense (DoD)

- International partners, including Public Health Agency of Canada, Global Advisory Committee on Vaccine Safety

- Special evaluations, including myocarditis case follow-up studies

VaST activities

- From December 21, 2020 through February 4, 2022
  - 45 independent meetings to review vaccine safety data
  - 12 joint meetings with ACIP COVID-19 Vaccines Work Group
  - 15 ACIP meeting presentations or reports with VaST assessments
VaST review, Moderna COVID-19 vaccine post-authorization safety data

- VaST has continued to review data from
  - CDC safety monitoring systems*
  - Other U.S. monitoring systems
  - International partners

*VAERS (a joint CDC/FDA effort), v-safe, VSD
Anaphylaxis following mRNA COVID-19 vaccination

- Anaphylaxis following mRNA COVID-19 vaccination identified Dec 2020
- Safety data and VaST assessments presented at January & March 2021 ACIP
- CDC and FDA recommended risk mitigation strategies, including:
  - Screening for risk prior to vaccination
  - Monitoring for symptoms post-vaccination
  - Early recognition and management of anaphylaxis on-site
  - Provider and patient education by CDC and partners
- Anaphylaxis following vaccination reviewed again August 2021 for Pfizer BLA
- No substantial change in benefit-risk balance with risk mitigation strategies

2https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-08-30/05-COVID-Lee-508.pdf
Myocarditis following mRNA COVID-19 vaccination

- Myocarditis following mRNA COVID-19 vaccination identified in May 2021
- CDC issued clinical guidance for myocarditis/pericarditis following mRNA vaccines, May 2021
- Data presented at the Vaccines and Related Biologics Products Advisory Committee (VRBPAC), June 10
- Data and VaST assessment presented at ACIP meeting on June 23 and MMWR published
- EUA fact sheets revised with warning added, June 25
- FDA approval of Pfizer BioNTech COVID-19 vaccine on August 23, 2021
  - Information on myocarditis/pericarditis in package insert
- FDA approval of Moderna COVID-19 vaccine on January 31, 2022
  - Information on myocarditis/pericarditis in package insert

**VAERS: Reporting rates (per 1 million doses administered) of myocarditis, days 0–7 after Moderna mRNA COVID-19 vaccination**

- Reporting rates exceed background incidence

| Ages (years) | Males | | | Females |
|--------------|--------|--------|--------|
| | Dose 1 | Dose 2 | | Dose 1 | Dose 2 |
| 18-24 | 5.8 | 40.0 | | 0.5 | 5.5 |
| 25-29 | 2.9 | 18.3 | | 0.3 | 5.8 |
| 30-39 | 3.3 | 8.4 | | 0.6 | 0.6 |
| 40-49 | 0.5 | 3.5 | | 0.8 | 1.6 |
| 50-64 | 0.7 | 0.9 | | 0.8 | 0.4 |
| 65+ | 0.2 | 0.6 | | 0.1 | 0.5 |

Males, N = 283; Females, N = 76; Data through January 13, 2022
Source: Shimabukuro, Feb 4, 2022 ACIP presentation
VSD: Confirmed myocarditis/pericarditis in 0–7-day risk interval among 18–39-year-olds compared with events in vaccinated comparators, Moderna vaccination

<table>
<thead>
<tr>
<th>Moderna COVID-19 vaccine</th>
<th>Adjusted rate ratio&lt;sup&gt;1&lt;/sup&gt; (95% CI)</th>
<th>2-sided P-value</th>
<th>Excess cases in risk interval (per million doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both doses</td>
<td>9.18 (4.12 – 22.89 )</td>
<td>&lt;0.001</td>
<td>18.8</td>
</tr>
<tr>
<td>Dose 1</td>
<td>3.46 (1.12 – 11.07)</td>
<td>0.031</td>
<td>6.9</td>
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<tr>
<td>Dose 2</td>
<td>18.75 (6.73 – 64.94)</td>
<td>&lt;0.001</td>
<td>31.2</td>
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<tr>
<td>Dose 2 males</td>
<td>16.96 (6.02 – 59.17)</td>
<td>&lt;0.001</td>
<td>61.8</td>
</tr>
<tr>
<td>Dose 2 females</td>
<td>NE&lt;sup&gt;2&lt;/sup&gt; (0.93 – ∞)</td>
<td>0.056</td>
<td>6.2</td>
</tr>
</tbody>
</table>

<sup>1</sup>Adjusted for VSD site, 5-year age group, sex, race/ethnicity, and calendar date

<sup>2</sup>NE = not estimable

Source: Shimabukuro, Feb 4, 2022 ACIP presentation; data through Jan 15, 2022
Myocarditis outcomes following mRNA COVID-19 vaccination

- **VAERS**
  - 359 reports meeting case definition among individuals ≥18 years in 0–7 days post-vaccination
  - 94% hospitalized
  - 69% recovered from symptoms at time of VAERS report

- **Follow-up surveys of myocarditis cases in VAERS**
  - 360 patients interviewed with ≥ 90 days of follow-up
  - 92% hospitalized
  - 380 providers contacted, 81% indicated patient fully or probably fully recovered

- **VSD (following Moderna vaccination)**
  - 38 chart confirmed cases among individuals aged 18-39 years
  - 79% hospitalized; 75% for 2 days or less
  - 100% discharged to home

Sources: Shimabukuro, Feb 4, 2022 ACIP presentation; Kracalik, Feb 4, 2022 ACIP presentation; Klein, Feb 4, 2022 ACIP presentation
VaST Assessment

- Data available to date show association of myocarditis with Moderna mRNA COVID-19 vaccination in adolescents and young adults.
- Risk is low overall, but highest in adolescent and young adult males, following dose 2.
- Data continue to show that most cases of post-COVID-19 vaccination myocarditis appear clinically mild.
- More data are being accumulated and analyzed to further define myocarditis clinical course and risk.
- At the present time, data do not suggest new safety concerns regarding Moderna vaccination among persons aged 18 years or older, beyond those previously identified.
VaST Next Steps

- Continue to review data on myocarditis from national safety monitoring systems and manufacturer post-marketing requirements
- Continue to review real-time monitoring of vaccine safety as vaccination efforts expand to younger age groups, boosters doses, and new vaccines
- Collaboration across U.S. federal agencies evaluating vaccine safety
- Collaboration with global vaccine safety colleagues on key issues that impact benefit-risk balance
- Continue to provide updates to the ACIP COVID-19 Vaccines Workgroup and the ACIP at future meetings
VaST Members

**VaST Members**
- Keipp Talbot (ACIP)
- Robert Hopkins (NVAC)
- Matt Daley
- Grace Lee
- Veronica McNally
- Kathy Edwards
- Lisa Jackson
- Jennifer Nelson
- Laura Riley
- Robert Schechter
- Patricia Whitley-Williams

**CDC Co-Leads**
- Lauri Markowitz
- Melinda Wharton

**Ex Officio and Liaison Representatives**
- Tatiana Beresnev (NIH)
- Karen Farizo; Hui Lee Wong (FDA)
- Valerie Marshall (OIDP)
- Jeffrey Kelman (CMS)
- Matthew Clark (IHS)
- Mary Rubin (HRSA)
- Fran Cunningham (VA)
- Limone Collins (DoD)

**Administrative Support**
- Jared Woo