COVID-19 Vaccine for Children
Safety/Side Effects of mRNA Vaccine vs
Dangers of COVID-19/MIS-C

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mRNA COVID-19 Vaccines & Children

• Pfizer-BioNTech COVID-19 vaccine received Emergent Use Authorization for use in Children 12 years and older: May 10, 2021

• CDC (7-7-21)
  • CDC recommends everyone ages 12 and older get vaccinated ASAP to help protect against COVID-19 and related, potentially severe complications

• AAP
  • Recommends COVID-19 vaccination for all children and adolescents 12 years of age and older who do not have contraindications
  • Supports coadministration of routine childhood and adolescent immunizations with COVID-19 vaccines for children and adolescents who are behind or due for routine immunizations
mRNA COVID-19 Vaccines & Children

- Pfizer-BioNTech COVID-19 vaccine received Emergent Use Authorization for use in Children 12 years and older: May 10, 2021
  - Statewide:
    - 28.9% of children 12-15 have had 1 vaccine dose
    - 24.2% of children 12-15 have completed vaccination
Safety of mRNA COVID-19 Vaccines

- Serious Adverse events of interest
  - Anaphylaxis: rare; 2-5 per million vaccinated in US
  - **Myocarditis and Pericarditis**: rare
    - As of 7-6-21, **971** cases of myocarditis or pericarditis in patients 30 years old and younger **reported to** Vaccine Adverse Event Reporting System (**VAERS**)  
    - Most associated with mRNA vaccines
      - 594 cases confirmed by CDC and FDA
  - Incidence:
    - Males:
      - 67/Million 2nd doses: 12-17 yrs old
      - 56/Million 2nd doses: 18-24 yrs old
      - 20/Million 2nd doses: 25-29 yrs old
    - Females: 9, 6, and 3, respectively.
Myocarditis and Pericarditis following mRNA COVID-19 Vaccination

- Confirmed cases
  - Mostly male adolescents & young adults
  - More often after 2\textsuperscript{nd} dose than 1\textsuperscript{st} dose
  - Typically within several days post mRNA vaccination
- Symptoms:
  - Chest Pain; Shortness of Breath; Palpitations.
  - Elevated cardiac enzymes, ST or T wave changes, and abnormal ECHO findings
- Most patients who require care respond well
- Patients can resume normal daily activities
  - Return to sports or exercise requires physician clearance
- CDC/AAP Recommendation: Cardiac risk of COVID-19 more severe
COVID-19 Risks

- Acute Infection
  - Hospitalization
  - Mortality
- Subacute/Post-Infection
  - Multisystem Inflammatory Syndrome in Childhood (MIS-C)
  - Long COVID
Multisystem Inflammatory Syndrome in Childhood (MIS-C)

- In April 2020, first temporal association between infection with SARS-CoV-2 and MIS-C
  - A post-infectious complication occurring 2-6 weeks after acute SARS-CoV-2 infection
- Symptoms:
  - Persistent Fever
  - Systemic Sx [Abdominal pain, Vomiting, Headache, Fatigue]
- Signs: Conjunctival hyperemia and rash
- Severe Cardiovascular involvement:
  - Multiorgan failure with shock
  - ECHO findings: decreased LV function & coronary artery aneurysms
  - Need for inotropic support, ventilatory support, rarely ECMO
Multisystem Inflammatory Syndrome in Childhood (MIS-C)

- Laboratory findings
  - Elevated C-reactive protein and ferritin
  - Cardiac markers: elevated troponin and N-terminal pro-B-type natriuretic peptide
  - Hematologic: Low Platelets, Hgb, and Lymphocytes
- Clinical Impact
  - Early reports: 60% inotropic support, 53% Myocarditis, 80% required ICU
  - US Data (DeBiasi RL, NEJM, July 1, 2021)
    - 4000 cases with 35 deaths
  - MI Data (April ‘20-July 1, ‘21) [MDHHS]
    - 155 cases and fewer than 5 deaths; 70% in ICU
Long COVID

• Most patients infected with COVID recover completely but some have lingering symptoms
  • Symptoms include: Fatigue, Headaches, Difficulty concentrating, Palpitations, Insomnia, & Loss of smell
  • Initial pediatric data from the UK Office of National Statistics*
    • 10% of children 2-11 years old and 15% of children 12-16 years old **still have symptoms 5 weeks post infection**
    • This 10-15% with persistent symptoms occur irrespective of disease severity at onset.
  • By contrast, adults 35-69 years old: 25% have Sxs 5 weeks later
  • More recent data: 4.4% of 1734 SARS-CoV-2 (+) school age children had symptoms > 4 weeks and 1.8% have symptoms > 8 weeks.^
    • Very few persisted after 8 weeks

*Osmanov, I. M. et al. Preprint at medRxiv
Questions?