Vaccine Confidence & Hesitancy: How did we get here? Where do we go next?

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Interim Chief Value Officer
Chief of Primary Care
Disclosure

• I have no financial interest or other relationship with any manufacturer of any commercial products which may be discussed at this activity, but I will discuss a bunch of commercial products (indiscriminately, I hope)

• I am a passionate advocate for vaccination!
• 12mo boy presents for well child check-up
• Review of vaccine record shows that he has never received any vaccines
• Both parents are present and express the family’s adamant opposition to all vaccines
  • Against their religious beliefs, do not give specifics
  • Do not trust Big Pharma
  • Concerned about autism, multiple sclerosis, mercury, aluminum, fetal tissue
  • Prefer naturopathic options
• How do you handle this family?!?
  • As a provider? As a medical system? As a society?
Case Vignette #2

• 11yo girl presents for sports physical
• Review of vaccine record shows she is due to Tdap, HPV, Menactra, and Influenza
• Her mother would like Tdap and Menactra, but does not want HPV because it is not “required,” and doesn’t want the flu vaccine because everyone in their family gets sick after the flu shot
  • You look for a wall to bang your head against
• How do you handle this family?
Case Vignette #3

• 7yo girl comes to your office for a follow-up visit for ADHD
• After masterfully managing her pharmacotherapy, you encourage the family to give her the COVID-19 vaccine
• Both parents reveal that they have gotten the vaccine themselves, but do not want to give it to their daughter
  • Concern that the vaccine was not studied long enough to understand long-term complications
  • Concern about fertility
  • Concern about myocarditis
• How do you handle this family?
Objectives

• Review the recommended childhood immunization schedule
• Understand common and uncommon side effects of vaccines
• Discuss vaccine confidence, hesitancy, and refusal
• Discuss the impact of the COVID-19 pandemic on vaccine confidence and hesitancy
• Illustrate ways to improve vaccine confidence
• Review research on COVID-19 hesitancy in Delaware
## Table 1: Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are shaded in gray.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mo</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>9 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>19-23 mos</th>
<th>2-3 yrs</th>
<th>4-6 yrs</th>
<th>7-10 yrs</th>
<th>11-12 yrs</th>
<th>13-15 yrs</th>
<th>16 yrs</th>
<th>17-18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
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<tr>
<td>Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)</td>
<td></td>
<td></td>
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<td></td>
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<td>1st dose</td>
<td>2nd dose</td>
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<tr>
<td>Diphtheria, tetanus, acellular pertussis (DTaP&lt;7 yrs)</td>
<td></td>
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<td></td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td>Haemophilus influenzae type b (Hib)</td>
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<td>1st dose</td>
<td>2nd dose</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td></td>
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<td>1st dose</td>
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<td>2nd dose</td>
<td></td>
<td></td>
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<tr>
<td>Inactivated poliovirus (IPV&lt;18 yrs)</td>
<td></td>
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<td></td>
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<td>3rd dose</td>
<td>4th dose</td>
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<tr>
<td>Influenza (IV)</td>
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<tr>
<td>Influenza (LAIV4)</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td>See Notes</td>
<td>1st dose</td>
<td>2nd dose</td>
<td></td>
<td></td>
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<tr>
<td>Varicella (VAR)</td>
<td></td>
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<td>1st dose</td>
<td>2nd dose</td>
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<tr>
<td>Hepatitis A (HepA)</td>
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<td>See Notes</td>
<td>2-dose series</td>
<td>See Notes</td>
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<tr>
<td>Tetanus, diphtheria, acellular pertussis (TdP&lt;7 yrs)</td>
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<tr>
<td>Human papillomavirus (HPV)</td>
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<tr>
<td>Meningococcal (MenACWY-D ≤2 mos, MenACWY-CRM ≤2 yrs, MenACWY-TT ≥2 yrs)</td>
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<tr>
<td>Meningococcal B</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Notes
- Annual vaccination 1 or 2 doses
- Annual vaccination 1 dose only
- Tdap
- See Notes
- No recommendation/applicable

### Colors
- Range of recommended ages for all children
- Range of recommended ages for catch-up immunization
- Range of recommended ages for certain high-risk groups
- Recommended based on shared clinical decision-making or
- *can be used in this age group*
## Table 2: Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who Are More than 1 month Behind, United States, 2021

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child’s age. Always use this table in conjunction with Table 1 and the notes that follow.

### Children age 4 months through 6 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for</th>
<th>Minimum Interval Between Doses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dose 1 to Dose 2</td>
<td>Dose 2 to Dose 3</td>
<td>Dose 3 to Dose 4</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Birth</td>
<td>4 weeks</td>
<td>Minimum age for the final dose is 24 months.</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>6 months</td>
<td>4 weeks</td>
<td>8 weeks and at least 4 weeks after first dose.</td>
</tr>
<tr>
<td>Diptheria, tetanus, and acellular pertussis</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>Minimum age for third dose is 12 months.</td>
</tr>
<tr>
<td>Influenza A</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>No further doses needed if first dose was administered before the child’s 2nd birthday.</td>
</tr>
<tr>
<td>Influenza B</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>No further doses needed if first dose was administered before the child’s 2nd birthday.</td>
</tr>
<tr>
<td>Pneumococcal conjugate</td>
<td>6 weeks</td>
<td>No further doses needed if first dose was administered at age 24 months or older.</td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, tetanus, and acellular pertussis</td>
<td>6 months</td>
<td>4 weeks</td>
<td>If first dose was administered before the child’s 2nd birthday.</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td>If first dose was administered at the child’s 1st birthday.</td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>3 months</td>
<td>If first dose was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>N/A</td>
<td>6 months</td>
<td>If first dose of DTaP/DT was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>4 weeks</td>
<td>If first dose of DTaP/DT was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>4 weeks</td>
<td>If first dose was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>4 weeks</td>
<td>If first dose was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Varicella</td>
<td>N/A</td>
<td>3 months</td>
<td>If first dose was administered before the child’s 1st birthday.</td>
</tr>
</tbody>
</table>

### Children and adolescents age 7 through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for</th>
<th>Minimum Interval Between Doses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Menanglese ACWY</td>
<td>Not applicable (N/A)</td>
<td>8 weeks</td>
<td>If first dose of DTaP/DTP was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>7 years</td>
<td>4 weeks</td>
<td>If first dose of DTaP/DTP was administered before the child’s 1st birthday.</td>
</tr>
<tr>
<td>Human papillomavirus</td>
<td>9 years</td>
<td>Routine dosing intervals are recommended.</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>N/A</td>
<td>6 months</td>
<td>A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>4 weeks</td>
<td>A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.</td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>4 weeks</td>
<td>A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>4 weeks</td>
<td>A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.</td>
</tr>
<tr>
<td>Varicella</td>
<td>N/A</td>
<td>3 months</td>
<td>If first dose of DTaP/DTP was administered before the child’s 1st birthday.</td>
</tr>
</tbody>
</table>
Table 3  Recommended Child and Adolescent Immunization Schedule by Medical Indication, United States, 2021

Always use this table in conjunction with Table 1 and the notes that follow.

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>Pregnancy</th>
<th>Immunocompromised status (excluding HIV infection)</th>
<th>HIV infection CD4+ count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;15% and total CD4 cell count of &lt;200/mm³</td>
<td>≥15% and total CD4 cell count of ≥200/mm³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kidney failure, end-stage renal disease, or on hemodialysis</td>
<td>Heart disease or chronic lung disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSF leak or occult implant</td>
<td>Asplenia or persistent complement component deficiencies</td>
</tr>
</tbody>
</table>

- Hepatitis B
- Rotavirus
- Diphtheria, tetanus, and acellular pertussis (DTaP)
- Hemophilus influenzae type b
- Pneumococcal conjugate
- Inactivated poliovirus
- Influenza (IIV6)
- Influenza (LAIV4)
- Measles, mumps, rubella
- Varicella
- Hepatitis A
- Tetanus, diphtheria, and acellular pertussis (Tdap)
- Human papillomavirus
- Meningococcal ACWY
- Meningococcal B
- Pneumococcal polysaccharide

**Additional information**

**COVID-19 Vaccination**

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biological License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/.

- Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For information on contraindications and precautions for the use of a vaccine, consult the General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For calculating intervals between doses, 4 weeks – 28 days. Intervals of ≥4 months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered ≥4 days before the minimum age or interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum age or minimum interval should not be counted as valid and should be repeated as age appropriate. The repeat dose should be spaced after the invalid dose by the recommended minimum interval. For

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1 For additional information regarding HIV laboratory parameters and use of live vaccines, see the General Best Practice Guidelines for Immunization, “Altered Immunocompetence” at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html and Table 4-1 [footnote D] at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html.
2 Severe Combined Immune Deficiency
3 LAIV4 contraindicated for children 2–4 years of age with asthma or wheezing during the preceding 12 months
## Table 1: Recommended Adult Immunization Schedule by Age Group, United States, 2021

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza inactivated (IV) or</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Influenza live, attenuated (LAIV)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Tdap or Td)</td>
<td>1 dose every 10 years</td>
<td>1 dose every 10 years</td>
<td>1 dose every 10 years</td>
<td>1 dose every 10 years</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td>2 doses (if born 1980 or later)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Zoster recombinant (ZV)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Human papillomavirus (HPV)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Hemophilus influenzae type b (Hib)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
</tbody>
</table>

## Table 2: Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2021

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Medical Condition</th>
<th>Other Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV or IV/4</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>MMR</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>VAR</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>RZV</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>HPV</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>PCV13</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>PPSV23</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>HepA</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>HepB</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>MenACWY</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>MenB</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>Hib</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
<tr>
<td>Hemophilus influenzae type b (Hib)</td>
<td>Immuno-compromised (including HIV infection)</td>
<td>HIV infection CD4 count &lt;200 mm³ or ≥350 mm³</td>
</tr>
</tbody>
</table>

1. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
2. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
3. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
4. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
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18. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
19. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
Efficacy

• Most vaccines have >90% efficacy
  • <5% non-responders to Hepatitis B
  • Polio and Measles >99%
  • Varicella 98%

• Vaccines are imperfect
  • DTaP not as immunogenic as DTP was, waning immunity is significant concern
  • Mumps <90%
  • Influenza varies yearly depending on similarity between vaccine viruses and those circulating, as well as on the age and immunocompetence of the recipients; often 30-70%
Side Effects

- Vaccines are safe.
- Local reactions
  - Pain
  - Bleeding or bruising
  - Redness or swelling
  - Lump at site of injection
- Systemic reactions
  - Fever
  - Crying/crankiness
  - Fatigue/sleepiness
  - Poor appetite
  - Myalgia/arthralgia
  - Headache
  - Syncope (adolescents)
  - Rash (measles or varicella)
- Rare Reactions
  - Anaphylaxis
  - Febrile seizures
  - Others
    - Brachial neuritis (DTP)
    - Hypotonic-hyporesponsive syndrome (DTP)
    - Vaccine-Associated Paralytic Poliomyelitis (OPV)
    - Intussusception (Rota)
    - Transient Thrombocytopenia (MMR)
    - Herpes Zoster (VZV)
    - Guillain-Barré Syndrome (Adult flu)
    - Myocarditis (COVID-19)
- NOT AUTISM
Measles, Mumps, Rubella

- Found in MMR and MMRV, live attenuated, SQ
- Efficacy/Effectiveness
  - Measles
    - Antibodies develop in 95-98% after first dose and is lifelong, but up to 5% lose protection over time
    - After two doses, >99% develop serologic evidence of immunity
  - Mumps: post-licensure data show effectiveness of 78% after one dose and 88% after two doses
  - Rubella: one dose confers long-term immunity in >90%
- Recommended for two doses, typically given at 12-15mo and again at 4-6yo
  - Can be given at 6-11mo for international travel
**Human Papillomavirus**

- Found in one vaccine in US, IM
  - 9-valent (HPV9) for types 6, 11, 16, 18, 31, 33, 45, 52, 58 for 9-26yo
  - No longer available: Quadrivalent (HPV4)

- **Immunogenicity**
  - >97% of recipients develop HPV antibodies

- **Efficacy**
  - Highly effective at preventing cervical cancers, genital warts, anal cancer/precancer
  - Impact on oropharyngeal cancers not yet known
  - In US, prevalence of vaccine-type HPV decreased ~60% in 14-19yo girls within first 6 yrs after HPV vaccination program began in 2006
  - Offers no protection against HPV acquired prior to immunization

- In June 2020, FDA approved new indication: for prevention of oropharyngeal and other head and neck cancers (based on effectiveness for anogenital disease)
• Two forms of vaccine
  • Inactivated Influenza Vaccine (IIV), previously IM or intradermal, available in trivalent (IIV3) and quadrivalent (IIV4) formulations; now just IM and IIV4
  • Live-Attenuated Influenza Vaccine (LAIV), intranasal, only quadrivalent
    • Was not available for use during 2016-17 and 2017-18 seasons due to poor effectiveness against the H1N1 component, but came back in 2018-19

• Strains selected for inclusion in the seasonal influenza vaccine may vary yearly based on the anticipated predominant influenza strains expected to circulate in the US in the upcoming season
  • The quadrivalent formulation for 2021-22 includes two antigenically distinct lineages of influenza B viruses (Victoria and Yamagata) as well as influenza A (H3N2) and A (H1N1)
    • The influenza A H3N2 and H1N1 components are new in 2021-22
    • In 2020-21, the H3N2, H1N1, and B Victoria components were new
    • In 2019-20, the H3N2 and H1N1 components were new
    • In 2018-19, the H3N2 and B Victoria components were new
    • In 2017-18, the H1N1 component was new
Influenza

- Efficacy/Effectiveness
  - Varies yearly depending on similarity between vaccine viruses and those circulating, as well as on the age and immunocompetence of the recipients
  - Influenza vaccine typically provides better protection against H1N1 and B strains than H3N2
    - In 2018-19, effectiveness was 29%
    - In 2019-20, 39% against all flu; 30% against H1N1; 45% against B/Victoria
  - Antibody titers wane up to 50% of their original levels 6 to 12 months after immunization
COVID-19

- Found in three vaccines authorized by the FDA for emergency use in the US (as of 8/6/21): Pfizer-BioNTech, Moderna, and Janssen
  - Mechanism
    - Pfizer and Moderna utilize mRNA to encode the spike protein
    - Janssen uses an Adenovirus vector
  - Differences
    - Pfizer: two formulations
      - 12 years and up, 2 shots three weeks apart
      - 5-11 years, 2 shots three weeks apart
    - Moderna: 18 years and up, 2 shots four weeks apart
    - Janssen: 18 years and up, 1 shot
  - Booster: all three vaccines now recommended for booster in 18+ population
  - Efficacy
    - Pfizer: 95%
    - Moderna: 94.1%
    - Janssen: 66% moderate/severe disease, 85% severe/critical
  - Side effect profile similar to flu: pain at injection site, fatigue, headache, myalgias, chills, arthralgias, fever
    - Myocarditis?
Herd Immunity

- **Not immunized but still healthy**
- **Immunized and healthy**
- **Not immunized, sick, and contagious**

1. **No one is immunized.**
   - Contagious disease spreads through the population.

2. **Some of the population gets immunized.**
   - Contagious disease spreads through some of the population.

3. **Most of the population gets immunized.**
   - Spread of contagious disease is contained.
Vaccine Antigen Counts Over Time

- **1960**: Smallpox, Polio, Diphtheria, Tetanus, Pertussis
  - 3217 antigens
- **1980**: MMR replaced Smallpox, DTP, Polio (OPV)
  - 3041 antigens
  - The complete vaccine schedule from birth to 18 years totaled 15,096 antigens
- **Today**: DTaP/Tdap, MMR, Varicella, IPV, Hib, PCV13, Hep A and B, MCV4, HPV9, Rota, Influenza
  - 177 antigens (16 vaccine preventable diseases)
  - The complete vaccine schedule from birth to 18 years totals 653 antigens (less than one dose of DTP, which was used until 1997)
  - Now we can add COVID-19!
History

- **Smallpox**
  - Edward Jenner’s smallpox vaccine led to Anti Vaccination League and Anti-Compulsary Vaccination League in England in 1800s
  - Turn of 19th century saw smallpox outbreaks in US leading to vaccination campaigns
    - Anti Vaccination Society of America founded in 1879
    - 1902: Cambridge, Mass mandated smallpox vaccination during an outbreak; Supreme Court ruled in favor of the city’s mandate

- **Cutter Incident**
  - 1955: 200 people paralyzed and 10 deaths after contracting polio from the Salk polio vaccine that was not inactivated despite the manufacturers’ adherence to government standards
    - Many lawsuits against vaccine manufacturers

- **DPT**
  - 1970s and 1980s: increase in lawsuits against vaccine manufacturers due to unsubstantiated concerns about neurologic damage due to DPT
    - By 1984, only one US company still manufactured DPT
• 1986: National Childhood Vaccine Injury Act (NCVIA)
  • Vaccine Information Statements (VIS), NVICP, VAERS

• National Vaccine Injury Compensation Program (NVICP, started in 1988)
  • Intended to prevent liability suits from driving vaccine manufacturers from the market (no-fault system)
  • Funded by tax on each vaccine dose
  • Those claiming vaccine injury cannot sue the manufacturer without first filing a claim with NVICP
  • There is a table with known adverse events and a formula for claim reimbursement for the known event

• Vaccine Adverse Events Reporting System (VAERS, started in 1990)
  • Voluntary reporting system, anyone can make report
  • CDC then investigates the event
  • However, this is limited by under-reporting and reporter bias
Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastrointestinal, neurological, and developmental assessment and review of developmental records. Endoscopy and biopsy sampling, magnetic resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were undertaken under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

Findings Onset of behavioural symptoms was associated with the parents, with measles, mumps, and rubella vaccination in eight of the 12 children, with measles infection in one child, and dates media in another. All 12 children had intestinal abnormalities ranging from lymphoid nodular hyperplasia to a fluid distension. Histology showed patchy chronic inflammation in 11 children and reactive immune lymphoid hyperplasia in seven, but no granulomas. Conclusive disease included autism (nine), disintegrative disorders (one), or possible postviral or post-infective gastroenteritis (five). There were no focal neurological abnormalities and liver and ECG tests were normal. Abnormal laboratory results were significantly raised urinary neopterin levels (6.5) in addition to enterocolitis in children.

Conclusion There is an association with gastrointestinal disease and regressive developmental disorder in a group of patients. A possible environmental trigger, which was generally associated in time, is possible environmental triggers.


Go to Nemours Children’s Health

Introduction

We saw several children who, after a period of apparent normality, lost acquired skills, including communication. They had all had gastrointestinal symptoms, including abdominal pain, diarrhoea, and vomiting, and, in some cases, food intolerance. We considered clinical findings, and gastrointestinal features of these children.

Patients and methods

12 children, consecutive referred to the department of paediatric gastroenterology, with a history of a pervasive developmental disorder and loss of language skills and intestinal symptoms, together with abdominal pain, bloating and food intolerance, were investigated. All children were admitted to the ward for a week, accompanied by their parents.

Clinical investigations

1. Taking history, including details of immunisations and contact to infections, diseases, and assessed the children. In 11 cases, the history was obtained by the senior clinician (P-H-W). Neurological and psychiatric assessments were done by consultant psychiatrist (W-M) with HAM-A criteria. Developmental assessment included a review of prospective developmental records from parents, health visitors, and general practitioners. Four children did not undergo psychiatric assessment in hospital, and had all been assessed professionally elsewhere, so these assessments were used as the basis for their behavioural diagnoses.

After bowel preparation, ileocoloscopy was performed by SHM under sedation with midazolam and pethidine. Paired frozen and formalin-fixed mucosal biopsy samples were taken from the terminal ileum, ascending, transverse, descending, and sigmoid colon, and from the rectum. The procedure was recorded by video or still images, and were compared with images of the previous seven consecutive paediatric colonoscopies (four normal colonoscopies and three on children with ulcerative colitis), in which the physician reported normal appearances in the terminal ileum. Barium follow-through radiography was possible in some cases.

Also under sedation, cerebral magnetic resonance imaging (MRI), electroencephalography (EEG) including visual, brain stem auditory, and motor evoked potentials (where compliance made these possible), and lumbar puncture were done.

Laboratory investigations

Thyroid function, serum long-chain fatty acids, and cerebrospinal-fluid lactate were measured to exclude known causes of developmental delays.
A MOTHER'S MISSION
McCarthy & Carrey Search for Autism Answers

GREEN OUR VACCINES

“As a nurse, I was never taught vaccines can kill until my son was a victim.”

Nicholas Catone
Sept. 8, 2015 - May 12, 2016

www.LearnTheRisk.org
#FlyHighNicholas

Social Media

Facebook
Google
Twitter
YouTube
Instagram
WhatsApp
Pinterest
Email

NEMOURS CHILDREN'S HEALTH
Anti-Vaccine Celebrities

- Jenny McCarthy
- Jenna Elfman
- Jim Carrey
- Alicia Silverstone
- Charlie Sheen
- Kirstie Alley
- Selma Blair
- Mayim Bialik
- Billy Corgan
- Lisa Bonet
- Aidan Quinn
- Rob Schneider
- Miranda Bailey
- Erin Brockovich
- Juliette Lewis
- Holly Robinson Peete
- Bill Maher
- Kristin Cavallari
- Alex Jones
- Michele Bachmann
- Robert F. Kennedy, Jr
- Donald J. Trump
Pro-Vaccine Celebrities

- Chelsea Clinton
- Salma Hayek
- John Oliver
- Kristen Bell
- Kim Kardashian
- Jennifer Garner
- Bill Gates
- Sarah Michelle Gellar
- Jennifer Lopez
- Kristi Yamaguchi
- Michelle Obama
- Amanda Peet
- Marc Anthony
- Julie Bowen
- Keri Russell
- Ewan McGregor
- Jon Stewart
- Lenny Kravitz
- David Beckham
- Serena Williams
- Stephen Colbert
2015: Disneyland Measles Outbreak

AT DISNEYLAND, SMILES ARE CONTAGIOUS!

...SO IS MEASLES.
School Exemptions from Vaccination

• All states allow medical exemptions
• 44 states allow religious and/or personal belief exemptions
• West Virginia, Mississippi, California, Maine, New York, and now Connecticut do not allow religious or philosophical exemptions
• Delaware allows medical and religious exemptions, but not personal belief exemptions, PA allows all
• Individuals with exemptions can be excluded from school during outbreaks
Non-Medical State Exemptions from School Immunization Requirements, 2021

- Religious Exemption
- Personal Belief Exemption

NEMOURS CHILDREN’S HEALTH
Weaponized Health Communication: Twitter Bots and Russian Trolls Amplify the Vaccine Debate

David A. Broniatowski, PhD, Amelia M. Jamison, MAA, MPH, SiHua Qi, SM, Lubnaa AlKulaib, SM, Tao Chen, PhD, Adrian Bention, MS, Sandra C. Quinn, PhD, and Mark Dredze, PhD

Objectives. To understand how Twitter bots and trolls ("bots") promote online health content.

Methods. We compared bots' to average users' rates of vaccine-relevant messages, which we collected online from July 2014 through September 2017. We estimated the likelihood that users were bots, comparing proportions of polarized and antivaccine tweets across user types. We conducted a content analysis of a Twitter hashtag associated with Russian troll activity.

Results. Compared with average users, Russian trolls ($\chi^2(1) = 102.0; P<.001$), sophisticated bots ($\chi^2(1) = 28.6; P<.001$), and "content polluters" ($\chi^2(1) = 7.0; P<.001$) tweeted about vaccination at higher rates. Whereas content polluters posted more antivaccine content ($\chi^2(1) = 11.18; P<.001$), Russian trolls amplified both sides. Unidentifiable accounts were more polarized ($\chi^2(1) = 12.1; P<.001$) and antivaccine ($\chi^2(1) = 35.9; P<.001$). Analysis of the Russian troll hashtag showed that its messages were more political and divisive.

Conclusions. Whereas bots that spread malware and unsolicited content disseminated antivaccine messages, Russian trolls promoted discord. Accounts masquerading as legitimate users create false equivalency, eroding public consensus on vaccination.

HOW ANTIVAX PACS HELPED SHAPE MIDTERM BALLOTS
New Measles Update: Number Of Confirmed, Suspected Cases Climbs Past 100

The number of confirmed and suspected measles cases in Rockland County has climbed past 100 for the first time. As of Monday, Dec. 17, Rockland County Department of Health offici...
More than 20,000 people infected in measles outbreak in Madagascar

In a country like Madagascar, where they are battling a deadly outbreak and vaccines are in short supply, the US and European anti-vax movement influs...
Anti-vax Movement Listed by World Health Organization as One of the Top 10 Health Threats for 2019

The anti-vax movement has been listed by WHO as one of its top 10 health threats for 2019.

"Vaccine hesitancy" has been identified as one potential factor contributing to the 30 percent increase in measles cases around the world.

newsweek.com
How Facebook and YouTube help spread anti-vaxxer propaganda

Companies have acknowledged the problem and are taking modest steps to discourage misinformation

theguardian.com
Hundreds protest for right not to vaccinate children in Washington during ongoing outbreak of measles [link](https://hil.cm/H8d1tTX)
“Unvaccinated people living in select ZIP codes will be required to receive the measles, mumps and rubella vaccine, known as MMR, to curtail the outbreak and protect others” #VaccinesWork #measlesoutbreak

New York City declares a public health emergency amid Brooklyn me...

New York City has declared the measles outbreak affecting the Orthodox Jewish community in Williamsburg to be a public health emergency, Mayo...
U.S. measles outbreak hits 'completely avoidable' 25-year-high: officials

NEW YORK (Reuters) - The number of measles cases in the United States has reached a 25-year peak, propelled by the spread of misinformation about the vaccine that can prevent the disease, federal health officials said on Monday.
Dr. Sean Gallagher @TheKidKidDoc · Jul 3
This year, the number of states in the US allowing only medical exemptions from vaccination nearly doubled (from 3 to 5.)

Mississippi, West Virginia, California, Maine, and New York: thank you for putting kids first! #VaccinesWork #PutKids1st

How California made a 'dramatic' impact on kindergartners getting va...
The rate of kindergarteners in California without an up-to-date vaccination status rose fell from 9.84% in 2013, before interventions took place, to 4.8...
Important data on the measles outbreak. 89% of cases were unvaccinated, undervaccinated or vaccine status unknown (85% of cases occurring in insular communities with lower vaccine uptake). Genotyping revealed 100% of samples tested were strains B3 or D8 (not vaccine related).

U.S. reports the most #measles cases in 25 years. Keeping high coverage of #MMRvaccination is key to prevent measles cases and outbreaks. Learn more: bit.ly/MMWR_Measles_U...
As COVID-19 dominates the news, flu deaths continue
Effects of the COVID-19 Pandemic on Routine Pediatric Vaccine Ordering and Administration — United States, 2020

Jeanne M. Samuels, MD; Megan C. Lindley, MPH; Malini B. DeSilva, MD; Elyse O. Kharbanda, MD; Matthew F. Daley, MD; Lisa Gallaway,1; Julianne Coo, MPH; Mick Geyer2; Ben Herren3; Victoria Kane, MPH; Paul J. Lewis, MS; Cameron Noble, MPH; Jeanne Towner, MPH, MS, MBA;

FIGURE. Weekly changes in Vaccines for Children Program (VFC) provider orders4 and Vaccine Safety Datalink (VSD) doses administered1 for routine pediatric vaccines — United States, January 6–April 19, 2020

4 VFC data represent the difference in cumulative doses of VFC-funded noninfluenza and measles-containing vaccines ordered by health care providers at weekly intervals between Jan 7–Apr 21, 2020, and Jan 6–Apr 19, 2020.

1 VSD data depict weekly measles-containing vaccine doses administered by age group (age <24 mos and >24 mos–18 yrs).
I’m so proud of our team at @Nemours for creating innovative solutions for providing safe preventive care for kids in a way that also promotes social distancing and keeps our staff safe! #VaccinesWork #ImmunizationStation #DriveByShooting
The Anti-Vax Movement’s Radical Shift From Crunchy Granola Purists to Far-Right Crusaders

The transition is supercharged by Trump and the coronavirus.

Kiera Butler  June 18, 2020
From anti-vax to anti-mask: School districts brace for parent resistance

By MACKENZIE MAYS | 07/02/2020 08:01 AM EDT

3:06 PM · Aug 19, 2020 · Twitter Web App
Jonathan Miller MD @DrJMiller8 · Aug 27, 2020

Here’s a story that is not getting nearly enough attention: Polio has been eradicated on African continent mercurynews.com/who-polio-has-...

#VaccinesWork

WHO: Polio has been eradicated on African continent

“Today we come together to rejoice over a historic public health success, the certification of wild poliovirus eradication in the African region,” ... mercurynews.com
Vickie Freeman, a registered nurse at Nemours duPont Hospital for Children was the first Nemours associate to receive the #COVID19 #vaccine. “I feel like I’m a pioneer. I did not get a chance to be in the military, so I feel like I am a soldier and I’m fighting this virus.”
Great news: US FDA authorizes Pfizer’s #Covid19vaccine for use in people ages 12 to 15. Time to get to work promoting confidence!
@Nemours

US FDA authorizes Pfizer's Covid-19 vaccine for use in people ages 12 ...
The FDA on Monday expanded the emergency use authorization for Pfizer's Covid-19 vaccine to include people ages 12 to 15.
apple.news
Parental Perspectives on Immunizations: Impact of the COVID-19 Pandemic on Childhood Vaccine Hesitancy

Kaldi He¹, Wendy J. Mack², Michael Neely¹, Laura Lewis³, Vikram Anand¹

Accepted: 14 July 2021
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Abstract
Childhood vaccine hesitancy has been studied extensively before the COVID-19 pandemic. The pandemic presented new barriers to pediatric vaccinations. Furthermore, the development of COVID-19 vaccines has complicated factors underlying vaccine hesitancy. We performed a cross-sectional mobile phone-based survey at Children’s Hospital Los Angeles querying parents regarding perspectives on vaccines before and during the pandemic. Our primary aim was to understand the impact of the pandemic on routine childhood vaccine hesitancy. Secondly, we examined intent to vaccinate, COVID-19 vaccine hesitancy, and key contributing demographic factors. Among 252 participants, we found overall increased childhood vaccine hesitancy (p = 0.006), increased risk perception (p = 0.006), and unchanged vaccine confidence during the COVID-19 pandemic. Increased hesitancy did not translate into decreased intent to vaccinate with routine childhood vaccines or influenza vaccines. During the pandemic, households with higher income (50–99 K, > 100 K) correlated with decreased routine childhood vaccine hesitancy, while Hispanic ethnicity and African American race had increased risk perception. For COVID-19 vaccine hesitancy, households with higher income (> 100 K) correlated with decreased hesitancy, while non-White ethnicity and race had increased risk perception. We found that routine childhood vaccine hesitancy increased during the COVID-19 pandemic, mainly due to increased risk perception. Key contributing demographic factors behind both childhood vaccine hesitancy and COVID-19 vaccine hesitancy included household income and race. Understanding factors behind routine childhood vaccine hesitancy is crucial to maintaining pediatric vaccination rates and promoting vaccine confidence during and after the COVID-19 pandemic.
COVID-19 Enterprise Update: Mandatory Vaccination

Important Message for All Associates

Nemours Now
Friday, August 6, 2021

Dear Associate,

As we face the challenges of a troubling resurgence of COVID-19 across the nation and learn that the highly transmissible Delta variant is responsible, we need to do everything we can do to keep our patients and associates safe. We have strongly encouraged vaccination for all associates since the first vaccine for COVID-19 was approved for Emergency Use Authorization by the U.S. Food and Drug Administration. To date, approximately 37% of our associates remain unvaccinated and all patients under 12 years of age are still ineligible for vaccination, leaving them at risk for serious morbidity. The best way to protect people and to save lives is through vaccination of those who are eligible.

Having carefully weighed personal choice with our responsibility to protect our vulnerable patients, families, and associates from the growing risk of COVID-19 infection, the COVID-19 Task Force and Employee Health with full support of Dr. Larry Moss and the Executive Cabinet now believe it is imperative to require COVID-19 vaccination for all associates.
The Relationship Between the COVID-19 Pandemic and Vaccine Hesitancy: A Scoping Review of Literature Until August 2021

Matilde de Albuquerque Veloso Machado 1, Elise Roberts 2, Brian Li Han Wong 3,4, Robin van Kessel 1,5,6 and Elias Mossialos 1,2,4

1 Department of International Health, Copenhagen School of Global Health, Copenhagen, Denmark. 2 Medical Research Council Unit for Lifelong Health and Ageing (MRC UHLH), London, United Kingdom. 3 University of Oxford, Oxford, United Kingdom. 4 Research Committee, Global Health Workforce Network (GHWN) Youth Hub, World Health Organization, Geneva, Switzerland. 5 Department of Health Policy, London School of Economics and Political Science, London, United Kingdom. 6 Institute of Global Health Innovation, Imperial College London, London, United Kingdom.

Background: Vaccines have been contributing to eradicate or drastically reduce the incidence of common diseases. Simultaneously, vaccine hesitancy is considered among the top ten global health threats. The COVID-19 pandemic has caused a tremendous impact on health, economics, and society worldwide, while also reinforcing faulty beliefs about the necessity of vaccine programs as a whole. This study aims to synthesise evidence on the impact of the COVID-19 pandemic on vaccine hesitancy.

Methods: A scoping review of literature between 1 January 2020 and 1 August 2021 was performed.

Results: COVID-19 vaccine acceptance decreased from more than 70 to <50% in 8 months starting from January 2020. Healthcare professionals demonstrate higher rates of vaccine receptivity than the public which was more influenced by (social) media. The circulation of misinformation was associated with increased fear of side effects related to COVID-19 vaccines. Regarding other vaccines, coverage, parents' intentions to vaccinate their children against influenza increased 15.8% during the COVID-19 pandemic so far. Nonetheless, the number of vaccines administered decreased, influenced by factors like fear of being exposed to the virus at healthcare facilities and restrictions.

Conclusions: Several efforts should be undertaken to improve vaccine acceptance and coverage now and beyond the pandemic to optimal population protection.

Keywords: COVID-19, immunization, media, vaccines, vaccine hesitancy, vaccine uptake, vaccine confidence
California will require all schoolchildren to get a COVID vaccine once fully approved

October 1, 2021 - 3:27 PM ET

The Associated Press

SAN FRANCISCO — California Gov. Gavin Newsom on Friday announced the nation’s first coronavirus vaccination mandate for schoolchildren, requiring that all elementary through high school students get the shots once the vaccine gains final approval from the U.S. government for different age groups.

California Gov. Gavin Newsom (shown here Tuesday) has announced a COVID vaccine mandate for all of the state’s schoolchildren.

Arin Grillo/AP
Figure 1
Three In Ten Parents Say They Will Definitely Not Get Their 5 To 11 Year Old Vaccinated

Thinking about your child between the ages of 5 and 11, once there is a COVID-19 vaccine authorized and available for your child’s age group, do you think you will get them vaccinated...?

- Right away
- Wait and see
- Only if required
- Definitely not

<table>
<thead>
<tr>
<th></th>
<th>Right away</th>
<th>Wait and see</th>
<th>Only if required</th>
<th>Definitely not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct ‘21</td>
<td>27%</td>
<td>33%</td>
<td>5%</td>
<td>30%</td>
</tr>
<tr>
<td>Sept ‘21</td>
<td>34%</td>
<td>32%</td>
<td>7%</td>
<td>24%</td>
</tr>
<tr>
<td>July ‘21</td>
<td>26%</td>
<td>40%</td>
<td>9%</td>
<td>25%</td>
</tr>
</tbody>
</table>

NOTE: Among parents or guardians of children ages 5-11. See topline for full question wording.
SOURCE: KFF COVID-19 Vaccine Monitor • Download PNG
## Long-Term Effects, Serious Side Effects, And Impacts On Fertility Are Among The Top Concerns Parents Have About Vaccinating Their 5-11 Year Old Child

Percent of parents of children ages 5-11 who say they are **very** or **somewhat concerned** about each of the following:

<table>
<thead>
<tr>
<th>Concern</th>
<th>Concerned Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough is known about the long-term effects of the COVID-19 vaccine in children</td>
<td>76%</td>
</tr>
<tr>
<td>Their child might experience serious side effects from the COVID-19 vaccine</td>
<td>71%</td>
</tr>
<tr>
<td>The COVID-19 vaccine may negatively impact their child’s fertility in the future</td>
<td>66%</td>
</tr>
<tr>
<td>Their child might be required to get the COVID-19 vaccine even if they don’t want them to</td>
<td>53%</td>
</tr>
<tr>
<td>They might need to take time off work to bring their child to get vaccinated or to care for them if they experience side effects</td>
<td>35%</td>
</tr>
<tr>
<td>They won’t be able to get the vaccine for their child from a place they trust</td>
<td>25%</td>
</tr>
<tr>
<td>They might have to pay an out-of-pocket cost to get the COVID-19 vaccine for their child</td>
<td>25%</td>
</tr>
<tr>
<td>They will have difficulty traveling to a place to get their child vaccinated</td>
<td>19%</td>
</tr>
</tbody>
</table>

**NOTE:** Among parents or guardians of children ages 5-11. See topline for full question wording.  
**SOURCE:** KFF COVID-19 Vaccine Monitor (October 14-24, 2021) • Download PNG
Large Gaps In Vaccine Uptake Remain Across Partisans, Educational Attainment, Age, And Community Type

Have you personally received at least one dose of the COVID-19 vaccine, or not? As you may know, an FDA authorized vaccine for COVID-19 is now available for free to all adults in the U.S. Do you think you will…?

- Already received at least one dose
- Get vaccinated ASAP
- Wait and see
- Only if required
- Definitely not

Democrats: 90%
Ages 65 and older: 86%
College graduates: 83%
Individual w/serious health condition: 80%
Urban residents: 75%
Women: 75%
HH Income $30k+: 74%
Suburban residents: 73%
Black adults: 73%
Ages 50-64: 72%
White adults: 72%
Total: 72%
HH Income <$40k: 72%
Hispanic adults: 70%
Independents: 68%
Insured under age 65: 69%
Ages 18-29: 69%
No serious health condition: 66%
Men: 66%
HH Income $40-89k: 66%
Adults without a college degree: 67%
White Evangelical Christians: 65%
Ages 30-45: 64%
Republicans: 61%
Uninsured under age 65: 58%
Rural residents: 58%

NOTE: See table for full question wording.
SOURCE: KFF COVID-19 Vaccine Monitor (October 14-24, 2021) • Download PNG
FDA authorizes first Covid vaccine for kids ages 5-11

The CDC's vaccine advisers are scheduled to meet Tuesday to evaluate the shot, and are expected to vote in favor of its use.

This October 2021 photo provided by Pfizer shows boxes of kid-size doses of its Covid-19 vaccine. | Pfizer via AP

By LAUREN GARDNER and KATHERINE ELLEN FOLEY
10/29/2021 03:19 PM EDT
Updated: 10/29/2021 04:23 PM EDT

The Food and Drug Administration on Friday authorized the Pfizer-BioNTech Covid-19 vaccine for children ages 5-11.
'Vaccination a Curse,'
And a Menace to Personal Liberty.

By J. M. Peebles, A. M., M. D., Ph. D.

Eczema from Vaccination.

An Innocent Victim of the Vaccinator's Lance

Compulsory Vaccination and the Result.
Types of Vaccine Hesitant Parents

1. No specific objection to vaccines but concerned due to media and word-of-mouth rhetoric
2. Concerned about specific vaccines (i.e. MMR)
3. Concerned about the timing of the recommended vaccine schedule
4. Opposed to all vaccines without exception (including religious or philosophical reasons)
Vaccine Controversies

- MMR and Autism
  - Evidence is strong that MMR does not cause autism

- Thimerosal and Neurodevelopmental Disorders
  - Evidence is strong that Thimerosal does not increase the risk of autism or other neurodevelopmental disorders

- Vaccines and Guillain-Barré Syndrome
  - GBS has been inconsistently found to be associated with Influenza vaccination, but the increase in risk is small and less than the increase in risk following natural Influenza infection

- Vaccines and Autoimmunity
  - No evidence linking autoimmune disease and vaccines
Vaccine Controversies

• Fetal Tissues
  • Varicella, Rubella, Hepatitis A, and one form of Rabies vaccine are made by growing viruses in fetal embryo fibroblast cells first obtained in early 1960s
  • Vatican statement on immunization allows for use of these vaccines

• HPV Vaccine Safety
  • Several studies support the safety of this vaccine

• Aluminum in Vaccines
  • Evidence supports safety of aluminum adjuvants in vaccines

• Too Many Too Soon
  • Immune system of infants is quite capable of handling the number of antigens in vaccines
  • Studies have not found increased risk of adverse outcomes related to number of vaccines or antigens received early in life
Ethics of Vaccine Hesitancy and Refusal

• Autonomy
  • Parental Preference
  • Patient vs Parent (adolescents and HPV)

• Beneficence
  • Best interest of Patient
  • Best interest of Society
  • Best interest of the Practice

• Non-maleficence
  • Who is at risk of harm?

• Justice
  • Protection of the vulnerable
  • Distribution of resources
Under-Immunized Children: A Vulnerable Population

- Caregivers are making inadvisable medical decisions (at least regarding immunization)
- Child has relative immuno-deficiency compared with peers
  - At risk for serious, life-threatening, old-school diseases (measles, pertussis, varicella) and severe preventable diseases such as meningitis and influenza
  - At higher risk for cancer (HPV, Hep B)
  - Protected by herd immunity only
- Decreased access to adequate medical care due to significant increase in pediatric providers dismissing these families
  - Leads to clustering in “vaccine friendly” practices
  - Families seek alternatives to modern medicine
  - Further erodes trust in the healthcare system
Options

• Document refusal and continue Doctor-Patient Relationship
  • Refusal to Vaccinate Form

• Legal intervention?
  • Imposing care against the wishes of parents has not been successful with regard to vaccines
  • There is a legal right in US to refuse vaccinations; this is based on common and statutory law

• Dismiss the patient
Characteristics Of Physicians Who Dismiss Families for Refusing Vaccines (O’Leary 2015)

• Objectives: assess pediatrician and family practice physician experience with and response to vaccine refusal, and association of this response with state exemption laws

• Methods: nationally representative survey of AAP and AAFP members

• Results:
  • 51% often required parents to sign a refusal to vaccinate form
  • 21% of pediatricians and 4% of FPs often dismissed families for refusing a vaccine
  • Pediatricians who dismissed families were more likely to be in private practice, from the South, and reside in a state WITHOUT personal belief exemption law
Dismissing the Family: Pros and Cons

• Pros
  • Reduces number of unvaccinated children in the office (waiting room)
  • Teaches the family the importance of vaccines
  • Physician is not comfortable working with families with substantial differences in values and beliefs
  • Physician is not comfortable working with families that reject their professional advice

• Cons
  • Forces these patients to see another doc, often a “vaccine-friendly” physician that serves many vaccine hesitant families
  • Access to other physicians may be limited, leading to increasing health inequities and vulnerable status
  • Missed opportunity for continued education about vaccination
  • Missed opportunity for preventive counseling in the event of disease exposure or outbreak
  • Dismissal does not result in getting the child vaccinated
  • “As provider tolerance decreases, hesitant children become more clustered in a smaller number of practices and eventually are not able to find a practice that will accept them.” (Buttenheim 2013)
Continuing DPR

• Pros
  • Continued opportunity for education
    • Studies have shown that continued communication can lead to favorable outcomes
  • Can keep track of unvaccinated children and provide preventative counseling in case of outbreak or exposure
  • Maintains family’s trust in the medical establishment to not abandon them when there is a disagreement

• Cons
  • Condones poor choices by parents
  • Exposes our vulnerable patients to vaccine-preventable diseases
Approach to Hesitant Families

- Establish rapport, trust, therapeutic alliance
- Listen carefully and respectfully to the parents’ concerns
  - Elicit the reasons for their concerns about vaccines
- Educate the family about what is and is not known about the risks and benefits of immunization
  - Correct misperceptions and misinformation
  - Compare the risks of the vaccine with the risk of being unimmunized
  - Provide resources
  - Share real life stories
- Work with the family
  - If they have concern about a specific vaccine or giving many vaccines at once, despite your best efforts, consider giving less shots at once
- Don’t give up
  - Continue to discuss immunization at future visits; with time and trust, many families change their minds
Evidence-Based Techniques

• Presumptive Approach
  • “Zuri is due for her vaccines today” versus “What do you think about doing vaccines today?”

• Motivational Interviewing
  • Not paternalistic
  • Technique to guide conversations in non-confrontational manner to lead patients and caregivers to their own decisions to follow vaccine recommendations

• Persistence
  • Persistence after initial resistance
  • Persistence over time

<table>
<thead>
<tr>
<th>Components</th>
<th>Definition</th>
<th>Sample Question/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership</td>
<td>We avoid being the “expert,” assuming the role of a partner and validating concerns. We work “for” and “with” patients and parents; we don’t lecture “to” or “at” them. After hearing parental concerns, we ask permission to share information with them.</td>
<td>“It makes sense that you’re worried about vaccine safety. All parents want to keep their children safe. Could I share a few things I’ve learned about vaccine safety with you?”</td>
</tr>
<tr>
<td>Acceptance</td>
<td>We affirm the absolute value of our patients or parents, accepting them as fellow humans. We highlight their autonomy to make decisions, although we are free to disagree with them.</td>
<td>“I strongly recommend this vaccine, but the choice is yours. Thank you for continuing to have this hard conversation with me. I’m happy to continue talking with you at our next visit.”</td>
</tr>
<tr>
<td>Compassion</td>
<td>We seek the good and well-being of others. We recommend vaccines because we believe they help others, not out of self-interest.</td>
<td>“I want you to consider the measles vaccine because I care about your child’s health. I also think it’s really important in order to protect babies who are too young to get the measles vaccine.”</td>
</tr>
<tr>
<td>Evocation</td>
<td>Positive ideas about and reasons for vaccination come from the patient or parent, not us. We reflect on patient or parental ideas and demonstrate how they align with the benefits of vaccination.</td>
<td>“You’ve shared a lot of worries with me. Would you tell me more about what’s important to you? […] I hear protecting your child is important to you. May I share how vaccines would work to protect your child?”</td>
</tr>
</tbody>
</table>
Upstream Approaches

• State Level (advocacy!)
  • Eliminate non-medical exemptions
  • Add vaccines to public school mandate (i.e. HPV, COVID-19, Influenza)

• Practice Level
  • Protocol for Under-Immunized Patients
  • Maintain registry of under-immunized patients to notify in the event of a regional outbreak (i.e. MMR)
  • When sick, these patients should be masked and brought directly to exam room (or triaged in parking lot)
  • Mandate regular well visits, no walk-in visits
  • Refusal to Vaccinate Form
  • Quality Improvement initiatives to improve vaccination coverage
    • Registries to identify Gaps in Care; Standing orders; Vaccinate at all opportunities
References

- www.historyofvaccines.org
Thank You!