Ask-the-Expert: COVID-19 & Vaccines

Vaccines and children with DM

Robert J. Graham, MD

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Vaccines and children with DM

- Please discuss vaccines and children.
- What do we know about vaccines in children with DM specifically? Is there any data or is anyone studying this?
- Are COVID-19 vaccines safe for children with DM?
  - If so, are any vaccines better/worse for children with DM?
  - When might a vaccine not be advisable for a child with DM?
- Are boosters safe/recommended for children with DM?
- If children receive the vaccine and/or booster, or have had COVID-19 before, should precautions change?

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Why is a PICU doc talking about vaccines?

- Acute COVID infections do happen in children
- MIS-C (Multisystem Inflammatory Syndrome in Children)
- Children with COVID-19 share with everyone
- Hospitals are full!
- Vaccines work and are safe

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- Guidon AC, Amato AA. COVID-19 and neuromuscular disorders. *Neurology*. 2020;94(22):959-969
- Dhont S, Callens R, Stevens D, et al. Myotonic dystrophy type 1 as a major risk factor for severe COVID-19? *Acta Neurol Belg*. 2021;121(6):1761-1765.

Table 2 Coronavirus 2019 (COVID-19) risk by neuromuscular disease

Disorder	Level of risk for COVID-19 or having severe COVID-19 disease course	Comments
Motor neuron disease	Moderate/high	Higher risk related to more advanced disease, use of ventilator or noninvasive ventilation, dysphagia, comorbid diseases
Neuropathies		
Inherited	All levels	Low with uncomplicated neuropathy High with autonomic involvement or cardiac involvement (e.g., amyloidosis), scoliosis with respiratory involvement
Immune-mediated	All levels	Related to degree of immunosuppressive therapy and respiratory/bulbar weakness
Idiopathic, nutritional, toxic	Low	No appreciable increased risks
NMJ		
LEMS	All levels	Consider underlying malignancy/chemotherapy
gMG	All levels	Risk related to bulbar and respiratory weakness, immunosuppressive therapy
CMS	All levels	Adult-onset, stable for >10 years without bulbar or respiratory weakness likely low risk Actual or possible (based on mutation) bulbar or respiratory muscle weakness higher risk
Muscle		
Inherited	All levels	Risk related to bulbar and respiratory weakness Related disease-specific comorbidities (i.e., diabetes, cardiac disease) influences risk
Inflammatory/ immune-mediated	All levels	IST determines risk

Abbreviations: CMS = congenital myasthenic syndromes; gMG = generalized myasthenia gravis; IST = immunosuppressive therapy; LEMS = Lambert-Eaton myasthenic syndrome; NMJ = *neuromuscular junction*.

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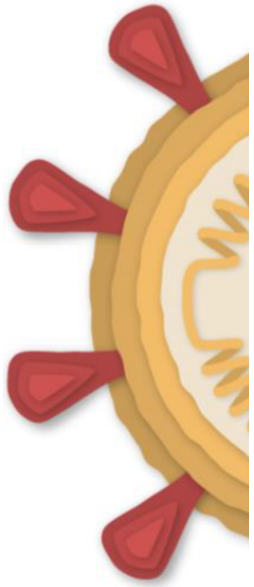
SARS-CoV-2 mRNA vaccines (Pfizer and Moderna)

1. Copy the genetic program for making spike protein 
2. Wrap it up in an oily envelope 
3. Inject it into the body 
4. The body's cells will then make spike proteins 
5. The immune system will learn how to fight the virus 



Images from nytimes.com

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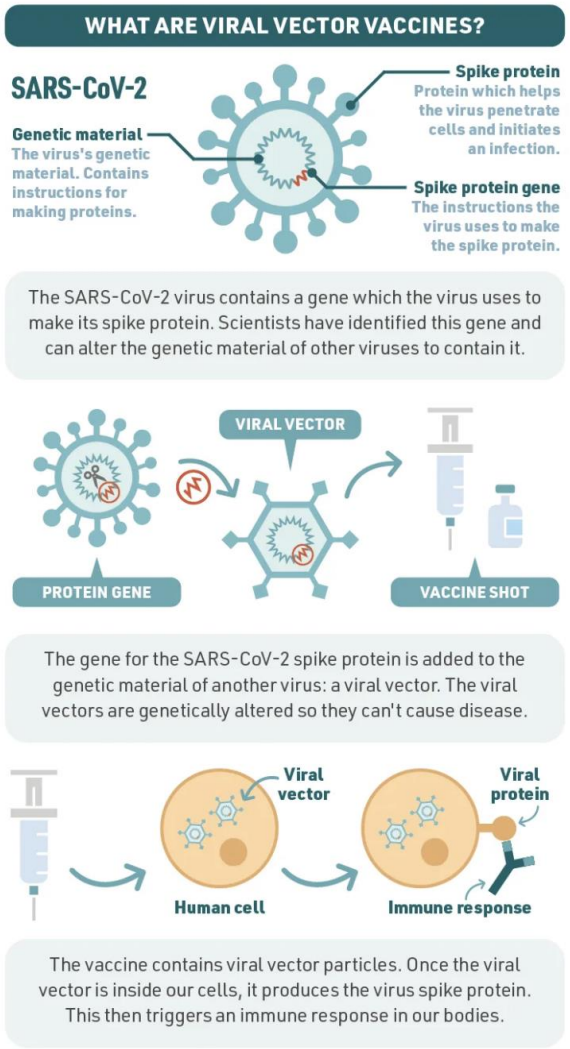
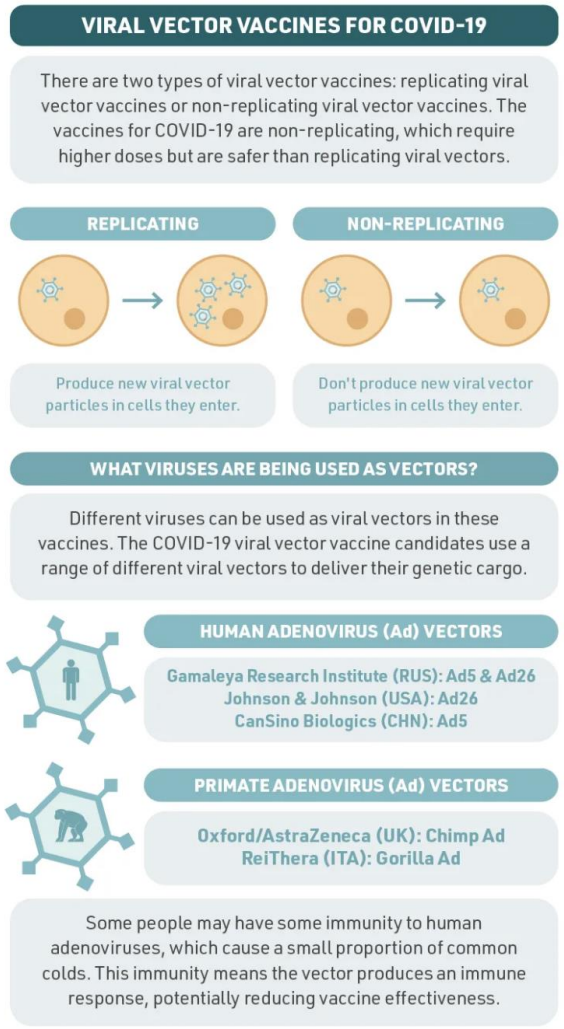
Adenovirus vector vaccines (J&J...AZ...)





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www.compoundchem.com

COVID-19, Before and Beyond

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The Best Defense is a Good Offense - Vaccinate

You / Your Child

Family & Friends

Town, City, State

The World

Rationale for Eventual Mandatory Pediatric SARS-Cov-2 Immunization

1. Although uncommon, severe COVID does occur in children in the form of MIS-C and pulmonary disease.	
2. Children do become infected and excrete virus that could infect parents, teachers, and other children.	
3. Because childhood infection is often asymptomatic, other precautions will not suffice.	
4. If strain change decreases long-lasting immunity, children will at least be primed for an accelerated response to infection or revaccination.	
5. Vaccination of children will be needed to reach high coverage and, potentially, herd immunity.	
6. Viral mutations are generating variants, such as the one from the United Kingdom, that are spreading more readily to children.	
7. Pediatric vaccination programs have a highly successful international track record in making major advances in reducing infectious diseases.	
8. There is a well-developed international infrastructure for pediatric immunization that will be a practical path to ensure global immunization against SARS-CoV-2.	
9. After immunizing teachers, pediatric vaccination will further accelerate opening of schools and normalizing children's activities key to their well-being and parental work productivity.	
10. As is the case for other vaccines, mandatory vaccination of children guarantees high coverage, as opposed to strictly voluntary vaccination.	

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Plotkin SA, Levy O. Considering Mandatory Vaccination of Children for COVID-19. *Pediatrics*. 2021;147(6).

Percent of People Receiving COVID-19 Vaccine by Age and Date Administered, United States

December 14, 2020 – December 02, 2021

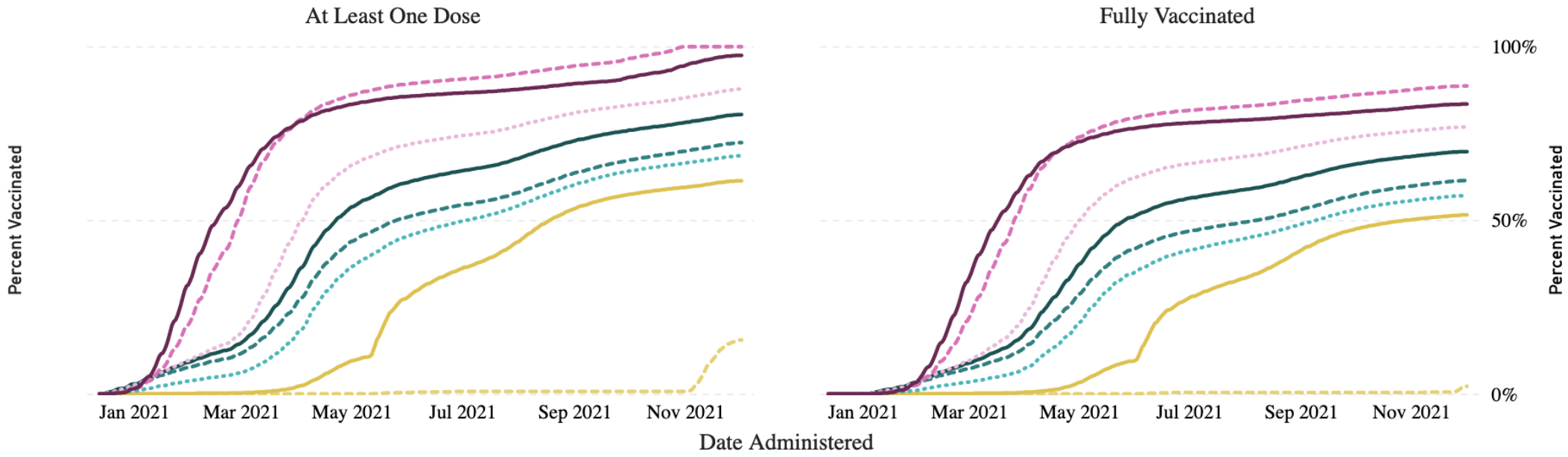
5-11 yrs | 12-17 yrs | 18-24 yrs | 25-39 yrs | 40-49 yrs | 50-64 yrs | 65-74 yrs | 75+ yrs

At Least One Dose	15.5%	61.3%	68.5%	72.3%	80.4%	87.7%	99.9%	97.4%
Fully Vaccinated	2.2%	51.5%	57.1%	61.4%	69.7%	76.8%	88.6%	83.4%

Age data were available for 99.9% of vaccinations.

Sex | Age

12/13/2020 | 12/2/2021



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Age Group	# Children at least 1 dose	# Children Full Vaccinated
5–11	4,461,075	643,954
12–17	15,514,175	13,030,990

Clinical Considerations: Myocarditis and Pericarditis after Receipt of mRNA COVID-19 Vaccines Among Adolescents and Young Adults

Summary

Since April 2021, increased cases of myocarditis and pericarditis have been reported in the United States after mRNA COVID-19 vaccination (Pfizer-BioNTech and Moderna), particularly in adolescents and young adults. There has not been a similar reporting pattern observed after receipt of the Janssen COVID-19 Vaccine (Johnson & Johnson).

In most cases, patients who presented for medical care have responded well to medications and rest and had prompt improvement of symptoms. Reported cases have occurred predominantly in male adolescents and young adults 16 years of age and older. Onset was typically within several days after mRNA COVID-19 vaccination, and cases have occurred more often after the second dose than the first dose. CDC and its partners are investigating these reports of myocarditis and pericarditis following mRNA COVID-19 vaccination.

CDC continues to recommend COVID-19 vaccination for everyone 12 years of age and older given the risk of COVID-19 illness and related, possibly severe complications, such as long-term health problems, hospitalization, and even death.

https://www.cdc.gov/vaccines/covid-19/clinical-considerations/myocarditis.html

https://vaers.hhs.gov/reportevent.html_Vaccine Adverse Events Reporting System

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Recognition and Thanks

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- Drs. Greg Priebe and Thomas Sandora

- FLU SHOTS, Too!!!

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Questions

For Dr. Graham about vaccines and children with DM .