Adolescents, Young Adults, and Vaccine Hesitancy

Who and What Drives the Decision to Vaccinate?

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KEYWORDS

• Adolescents • Consent • Ethics • Law • Vaccine hesitancy • Young adults

KEY POINTS

- Vaccination rates among adolescents and young adults vary by vaccine and have been slow to reach levels close to those of infants and younger children.
- Complex factors—perceptions/knowledge, sociodemographic context, and misinformation—contribute to vaccine hesitancy for the adolescent and young adult age group.
- Parents and adolescents generally agree about the decision whether to vaccinate; healthcare providers have significant influence in the decision process.
- The legal framework for vaccination consent allows young adults to make the decision for themselves; parent consent is generally required but exceptions in law and policy allow minors to consent in some circumstances.

INTRODUCTION

Although vaccines are important for all age groups, issues of vaccine uptake and vaccine hesitancy have particular salience for the adolescent and young adult age group. This article reviews the importance of vaccination for adolescents and young adults, the variability in uptake of different vaccines, the reasons for vaccine hesitancy for this age group, and the legal framework for consent for vaccination.

IMPORTANCE OF VACCINATION

The importance of vaccination for primary prevention of infectious disease among human beings of all ages cannot be overstated. Development of vaccines is among the 10 most important public health achievements in the United States in the twentieth

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century.[1] Historically in the United States, immunization recommendations targeted infants and children. In 1996, the Centers for Disease Control and Prevention (CDC) created an immunization platform for ages 11 to 12 years, using the Td booster and "catch-up" hepatitis B vaccine as its anchors.[2] More vaccines are now recommended for adolescents and young adults because we are moving toward primary prevention of infectious diseases across the life span. In large part, due to the effectiveness of vaccines, infectious disease is not currently a top 10 cause of mortality among children and adolescents in the United States;[3] preventing disease with vaccination has a very high success rate and, when utilized, is an easy win against morbidity for adolescents.

VACCINE UPTAKE IN ADOLESCENTS AND YOUNG ADULTS

Vaccination rates among adolescents and young adults have been slow to reach levels close to those of infants and children for many reasons. One key reason is that adolescents do not access care as frequently as infants and children; they also have fewer preventive health-care visits. Young adults use office-based care at even lower rates than adolescents.[4]

Multiple factors contribute to reduced opportunities for health-care interventions with adolescents and young adults. As children enter adolescence, their developmental tasks shift toward separation and individuation from parents and guardians. They are busy creating independent identities, they can transport themselves, and they are less likely to do all they are asked to do. Prevention may seem less compelling if they perceive the risk of spending time away from higher stakes academic pursuits or activities with peers as more important than seeking preventive health care that may yield benefits far in the future. Adolescents' own schedules get busy, and busy parents may not remember adolescent immunization timelines.

The decision to vaccinate an adolescent is no longer solely within the purview of the parent; the adolescent also has input. Adolescents and young adults often look to their parents for health-care advice and usually agree with their parents on decisions regarding vaccination[5–8] but their fear of needles and concerns about vaccine side effects disrupting other activities can delay vaccination.

Vaccination Rates for Specific Vaccines

Rates of vaccination also differ based on the specific vaccine being considered. The vaccines now recommended for adolescents include Tdap, HPV, and MenACWY vaccines at age 11 to 12 years, and MenACWY and MenB vaccines at age 16 years. Influenza vaccine is routinely recommended annually, and COVID-19 vaccination recommendations continue to evolve. Vaccination rates among adolescents have slowly increased over time. Per the National Immunization Survey – Teen (NIS-Teen) for the year 2021,[9] the national rate of vaccination among those ages 13 to 17 years was as follows:

- Tdap: 89.6%
- HPV
  - 76.9% for at least one dose
  - 61.7% for up-to-date HPV vaccination status
- MenACWY
  - 89.0% for at least one dose
  - 60.0% for at least 2 doses
- MenB: 31.4%

The grossly lower rate of vaccination for MenB vaccine is likely secondary to MenB vaccine's shared clinical decision-making recommendation—a recommendation that

emphasizes discussion and vaccine decision-making based on patient circumstances and goals rather than a recommendation that should be applied to all adolescents.[10] Rates of influenza vaccination have recently been approximately 50% to 60% among children and adolescents aged 1 to 17 years.[10] Despite similar years of introduction and same age of recommended administration of the first dose, rates of vaccination of at least 1 MenACWY vaccine, first recommended in 2005, significantly exceed rates of at least 1 dose of HPV vaccine, first recommended for female adolescents in 2006 (the dosing interval for series completion differs too greatly for valid comparison). Even when looking specifically at female rates of at least 1 dose of HPV vaccination because this was the first group for whom the vaccine was recommended (78.5%), MenACWY vaccination rates have enjoyed far greater success.

REASONS FOR VACCINE HESITANCY

The differences in vaccination rates—and hesitancy—for different vaccines represent a complex constellation of considerations including:

- Perceptions/knowledge about the target disease including disease severity and judgment regarding mode of transmission
- Perceptions/knowledge about the available vaccines
- Available delivery systems
- Sociodemographic and cultural context of the patient

These factors also play a role in vaccine prioritization among patients, parents, and providers.

Perceptions and Knowledge Related to Diseases Targeted by Vaccines

The Tdap recommendation in 2005 generated little fanfare. The diseases against which the vaccine provides protection had well-known names; Tdap essentially replaced Td in the schedule for children aged 11 and 12 years, and pertussis vaccine has been given to children at a younger age for many decades. There was little controversy, and all states now require Tdap for school attendance.

Introduction of MenACWY in 2005 was not quite as smooth. Fewer people were familiar with the disease; it took time to educate parents regarding the disease and to overcome initial supply concerns related to unanticipated use outside of the initially recommended age recommendations. The threat of meningitis is frightening to most people; the disease is relatively uncommon but the potential devastation resulting from the disease prompts action. With increased communication about the hazards of the disease itself as well as an increasing number of states requiring the vaccine for school, rates of vaccination against meningitis have slowly but steadily increased.

Response to the recommendation for the HPV vaccine for adolescents was surprisingly complex in the United States. The HPV vaccine is the second vaccine released that serves as a prevention of cancer (hepatitis B vaccine was the first). It prevents acquisition of the virus that causes cervical, vaginal, and vulvar cancers; penile and anal cancers; and head and neck cancers with efficacy of greater than 90%.[11] Primary preventive strategies for cancer have been eagerly awaited for years but the HPV vaccine became controversial largely based on the mode of transmission of the target disease (**Box 1**). (See Daisy Y. Morales-Campos, and colleagues' article "Human Papillomavirus Vaccine Hesitancy in the United States," in this issue) Clinicians can help patients and parents focus on disease prevention and discourage distractions based on misinformation or unrelated details in their recommendations for vaccination.

Box 1
HPV vaccine: a lesson learned?

HPV is primarily a sexually transmitted virus. The fact that the HPV vaccine prevents disease and future cancer was overshadowed by concern about whether children were engaging in sex. Acceptability among providers and parents was less for younger than for older adolescents.[21–23] Public messaging failed *first* to convey the primary importance of stopping the disease with the effective means available and *then* to address the specific behavior of adolescents—a much more difficult task—as a distinctly separate issue. Rates of vaccination series completion among adolescents aged 13 to 17 years with this highly successful vaccine have just reached more than 60% in 2021, even after the number of doses required for series completion for healthy adolescents under 15 years of age dropped from 3 to 2 in 2016.[25] Moreover, providers significantly underestimate parents' valuation of the HPV vaccine for adolescents.[26] Because provider recommendation is the most important factor in determining vaccine acceptance,[27–30] a disconnect between parent and provider communication and missed opportunities for education have likely played a significant role in vaccine hesitancy related to the HPV vaccine.

Perception and Knowledge Related to Specific Vaccines

Although the decision to receive a specific vaccine may be affected by perceptions associated with the target disease, issues related to the vaccine itself can also become a reason to avoid or delay vaccination. There are those who are concerned about thimerosal (now found only in multidose vials of flu vaccine), various adjuvants, and use of fetal cells in vaccine development—none of which are associated with harm. Misinformation related to vaccine side effects for adolescents has been circulating since the hepatitis B vaccine was recommended for adolescents in the 1990s. When the vaccine was first released for use among adolescents, there were reports of hair loss, fatigue, and multiple sclerosis because of vaccination. These concerns were later quelled with research.[31]

By the time the HPV vaccine was released, social media were a common source of information for adolescents and families. The HPV vaccine was met not only with concerns about side effects but also with misinformation such as claims by politicians that the vaccine caused "mental retardation."[32] Although it is not always clear who benefits from this type of misinformation, anti-vaccine messaging has the potential to be a profitable commercial business for many people.[45]

Misconceptions often are related to misunderstanding of the safety protections in place after a vaccine is released to the market. Although safety is studied prelicensure, the CDC uses multiple vaccine safety systems postlicensure. The most recognized is the Vaccine Adverse Event Reporting System (VAERS). Few people understand that issues signaled by VAERS data—data that are publicly available—have not yet been rigorously studied (**Box 2**). Even fewer people are aware of the Vaccine Safety Datalink and the Clinical Immunization Safety Assessment Project that both allow for rigorous, ongoing monitoring, and proactive clinical research on vaccine safety. Becoming more familiar with the safety programs in place to protect patients and families may help providers more confidently recommend lifesaving vaccines.

Delivery Systems and Social Context: Examining COVID-19 Vaccine

The story of the most recently released vaccine, the COVID-19 vaccine, includes nearly all of the multifaceted plot elements that lead to vaccine hesitancy. Many of these factors have been important in the evolving rollout of the COVID-19 vaccine for adolescents and young adults.

Box 2
Strengths and weaknesses of VAERS

VAERS is a passive reporting system, designed to gather information from anyone and everyone in order to look for any patterns—or signals–related to vaccine side effects and adverse events. It is also a public reporting system; anyone can report problems (a young patient's second cousin twice removed could report a suspected vaccine side effect) and the list of these reported events is available to the public. Often, those quoting VAERS data fail to acknowledge that the adverse events reported may not have been verified and are not necessarily causally related to vaccination.[46] A young person could experience death by alcohol intoxication several hours after getting vaccinated, and it would be registered in VAERS as a death temporally related to vaccination; however, there is no causal relationship between the death and the vaccination.

There has been misinformation related to the disease and its severity. Although the risk of severe disease is lower among children and adolescents than older adults after contracting COVID-19 disease, from January 1, 2020 to May 11, 2022, 443 deaths from COVID-19 among adolescents aged 12 to 17 years had been reported to the CDC.[47] The disease accounts for 2.4% of deaths in this age group.[47] Many more have been hospitalized, and hospitalization rates are significantly lower among those who have been vaccinated.[47] With COVID-19, as with most diseases, young people also serve as vectors for infectious disease.

Misinformation about COVID-19 and the vaccine have been propagated not only by antivaccine groups but also by politicians. Although the twenty-first century has seen vaccination rates become increasingly associated with political affiliation,[48] COVID-19 disease and vaccination has become one of the most flagrantly politicized vaccination issues in recent history—all the way to the Office of the President. Messages on social media played an increasingly important role throughout the pandemic; a higher proportion of teens and parents reported concerns regarding what they were reading on social media about the safety of vaccines as the pandemic wore on.[5] There were also concerns with the new vaccination platform (mRNA technology). Vaccination rates among adolescents aged 12 to 17 years reached 60.5% as of August 31, 2022;[49] however, rates still differ based on sociodemographic factors including ethnicity (more Hispanic adolescents are vaccinated than non-Hispanic) and community type (more adolescents in urban and suburban areas are vaccinated than in rural areas).[47] More adolescents were vaccinated with COVID-19 vaccine outside of the medical home than with any other vaccine in recent years due to the need for speedy and efficient delivery; 48% of adolescents aged 12 to 17 years were vaccinated in a pharmacy.[47] Interestingly, during the course of the pandemic, attitudes regarding the disease and intention to vaccinate changed little both for parents of adolescents and for adolescents themselves; attitudes and vaccination patterns of adolescents and their parents were significantly aligned.[5] Vaccination rates may improve as clinicians further understand messaging that will help address the unique patient/parent concerns and access issues within the specific communities they serve.

WHO MAKES THE DECISION TO VACCINATE?

One important difference between vaccine hesitancy for adolescents and hesitancy for younger children or adults is the unique developmental, clinical, ethical, and legal

context in which the decision to vaccinate is made.[50] The legal baseline is that for adolescent minors, aged younger than 18 years, parent consent is generally required but state minor consent laws may create exceptions. Adolescents who are young adults, aged 18 years or older, are allowed to consent for themselves.

Vaccine Decision Process

As noted above, independent of who has the legal authority, the dynamic relationship between adolescents and their parents is a key element in adolescent vaccination; this dynamic is also influenced by the health-care provider.[51] Parents and adolescents influence each other in the process of deciding whether or not an adolescent will receive a particular vaccine. The adolescent–parent dynamic also is influenced by many factors including the evolving capacity of the adolescent to make decisions as well as the legal framework.

Concordance or discordance within the parent–adolescent dyad may affect vaccine hesitancy in varied ways. The parent may be hesitant and the adolescent eager, or conversely, the parent may be eager and the adolescent reluctant. Both may be eager, or both may be hesitant. Each of these situations require different skilled responses from the adolescent's health-care provider—to educate, counsel, and support in ways that preferably lead to a decision with which all parties are comfortable. The specific content of public health educational messages and individual counseling should be crafted with consideration of the sources and reasons for the parent and/or adolescent's vaccine hesitancy (see "Clinicals Care Points" section).

Recent research on COVID-19 vaccination looked at parents' perspectives with respect to how often they considered their adolescents' desires and how they perceived concordance and discordance between their own preferences and the desires of the adolescents.[52] Almost three-fifths—58%—of parents considered their adolescents' desires; those who did so were more likely to vaccinate.[52] The same proportion—nearly three-fifths—perceived concordance between their own desires and those of their adolescents; only 2.4% perceived discordance, with the adolescent desiring vaccination and the parent not willing to vaccinate.[52]

Before the COVID-19 pandemic, a study of young adolescents in middle school found that more than half perceived that vaccination decisions were made by their parents and the doctor; one-third by parents and adolescent together.[53] More than half thought their mothers had the biggest influence on whether they were vaccinated; about one-third thought the doctor had the biggest influence. Similar proportions—about 30%—wanted the doctor to decide, wanted their parent to decide, or wanted to decide for themselves.[53] These studies, along with other research, suggest the importance of involving youth in the decision to vaccinate.

Not only are parental influences important for adolescents who are minors but also for adolescents who are young adults. For clinicians, this underscores the need to educate both patients and parents whenever possible, even when the patients are aged older than 18 years. Many young adults continue to share health information with their parents, seek their advice about health care, and are influenced by their parents' views and behaviors.[54] This pattern may persist with the decision whether or not to be vaccinated. When young adults disagree with their parents, they can make the decision themselves. When adolescent minors disagree, the legal framework for vaccination consent must be considered (**Box 3**).

Legal Framework for Vaccination Consent

Consent for vaccination for adolescents takes place in the broader context of consent for health care generally. Consent requirements are determined primarily by

Box 3
COVID-19 focuses attention on adolescent consent for vaccination

During the COVID-19 pandemic, as vaccines became available and were authorized for the adolescent age group, increased attention focused on the question of whether and when adolescent minors should be allowed to give their own consent for vaccination. This type of attention was not new; it had also risen during a recent outbreak of measles.[55] Medical organizations also had previously issued opinions offering support for minors to be able to consent for vaccination.[56–58] During the COVID-19 pandemic health policy researchers identified patterns in current policies;[56] a plethora of lawyers, medical ethicists, health policy experts, and journalists provided analysis and recommendations.[59–61,12–16] These recent perspectives shed light on a longstanding issue that may continue to require attention as new infectious diseases emerge and pandemics develop.

state laws, which vary from state to state. Health-care providers must understand the legal framework for consent for health care in their state. For adolescents who are minors, aged younger than 18 years, parent consent is usually required. Alternatives to parent consent include consent by legal guardians, and sometimes by other adults who have custody of an adolescent and have been granted legal authority to consent. When youth are in state custody—in foster care or the juvenile justice system—parents may retain authority to consent. Courts also may have authority to grant consent for health care, or it may be delegated to a child welfare agency or other government official. Although states often do not have explicit laws requiring parent consent for vaccination, the general rule would apply unless there is a relevant exception. When parents legally may consent for an adolescent minor's vaccination, it is nevertheless clinically and ethically important to obtain the adolescent's assent.

Every state has laws defining the circumstances in which adolescent minors may consent for their own health care.[17,18] Some of these exceptions are relevant for vaccination.[50] Adolescent minors may be able consent for health care because they have a particular status or living situation or because they are seeking a specific service.

Groups of minors who may be able to consent for all or most of their own health care in one or more states include the following:

- Minors who have reached a specific age such as 15 or 16 years
- Minors legally emancipated by court order
- Minors who meet certain criteria of maturity such as having the capacity to give informed consent
- Minors who live apart from their parents and may be homeless
- Married minors
- Minor parents (for themselves and/or their child)
- Minors in active military service
- Incarcerated minors

Not all states have laws covering each of these categories. However, if authorized by state law to consent for their own health care, these minors would be able to consent for vaccination as well as other services.

Some or all states allow adolescent minors to give their own consent for a wide array of services including several sexual and reproductive health services, as well as care related to mental health and substance use.[17,18] Not all of these laws would necessarily authorize an adolescent minor to consent for vaccination. Laws directly related to the following services might encompass vaccination:

- Vaccination (generally or for specific diseases or conditions such as hepatitis B, HPV, or COVID-19)
- Prevention, diagnosis, and/or treatment of sexually transmitted disease or infection or venereal disease
- Prevention, diagnosis, and/or treatment of infectious, contagious, communicable, or reportable disease.[18–20]

A law that authorizes an adolescent minor to consent for "*diagnosis and treatment*" of sexually transmitted infections or infectious diseases would not necessarily allow them to consent for vaccination unless it had been interpreted to do so. When "*prevention*" is included, an adolescent minor should be able to consent for vaccination. In some states, adolescent minors are allowed to consent to a specific vaccine but not to other vaccines.

A small number of states have had laws such as this in place for many years; a few others have more recently enacted statutes or issued policies—or considered doing so—to create such authority.[18–20] Whether an adolescent minor is allowed to give their own consent for a vaccination depends on several factors:

- Specific vaccine and specific disease for which it is administered
- State or local jurisdiction where vaccination will take place
- Specific status of minor (eg, married or emancipated)
- Age of minor
- Capacity of minor to give informed consent

These factors, considered in the context of state or local laws and policies, must be carefully analyzed to determine whether an adolescent minor is authorized to consent for vaccination in a specific situation.

Consent Considerations in Specific Health Care Settings

Adolescents and young adults receive health care, including vaccinations, in a wide variety of health-care settings that are funded by varied federal, state, and local sources.[24] A few of these settings are subject to special regulations or policies that may affect the vaccination decision. Two such settings of particular importance are family planning clinics and school-based health centers (SBHCs).

In many communities, family planning clinics exist either as freestanding sites or operate as part of hospital ambulatory care systems, public health departments, federally qualified health centers (FQHCs), or other health systems. In most of these sites, the same consent rules would apply as in other health-care settings. However, family planning services that are funded by the federal Title X Family Planning Program are subject to specific rules.[33,34] Title X funded sites are permitted to offer "preventive health services that are considered beneficial to reproductive health such as HPV vaccination."[35] The Title X regulations provide that parental consent may not be required; notification of parents is not permitted without the permission of the minor.[36]

SBHCs are another venue in which many adolescents and some young adults receive health care, including vaccinations. SBHCs operate under the auspices of school districts, health departments, health systems and hospitals, and FQHCs; some receive Title X funding. In most SBHCs, the consent laws of the state in which they are located apply. However, SBHCs also generally have specific policies governing what is required for a student to enroll in the center and receive services. The consent forms vary among SBHCs; often the applicable policies are determined by the school district or health department, depending on the auspices under which the

SBHC is operating. Parental consent to use the services is almost always required for adolescent minors; young adults would be able to enroll independently. Some consent forms allow parents to "opt-in" or "opt-out" for their adolescent to receive specific services: sometimes the policy specifies that minors are allowed to consent and receive services confidentially consistent with applicable state and federal laws.[37,38]

PUBLIC POLICY RESPONSES

Efforts to increase vaccine uptake among adolescents and young adults and overcome vaccine hesitancy for this population have included many public policy responses. Notable among them are vaccine mandates, communication strategies, and improvements to the public health infrastructure.

Vaccine mandates have been put in place as school and college entry requirements and as conditions of employment in certain settings. The rationales for mandates related to vaccines for different diseases in different settings have been based, variously, on the disease's transmissibility; the setting as an opportunity for transmission, or risk of transmission; or the potential for significant public health disruption or cost. Particularly in recent years, substantial controversies have arisen regarding vaccine mandates as well as the scope of exemptions, especially with respect to certain vaccines. Initial efforts to incorporate HPV vaccine into school entry requirements foundered; and even longstanding mandates, such as for measles, encountered opposition; so did recent requirements for COVID-19 vaccination. Policies allowing exemptions for medical reasons and for religious or personal beliefs have been evolving in an arena increasingly characterized by both vaccine-related controversies and public health threats.[39] This is unfortunate; the effectiveness of vaccine mandates in increasing vaccination rates is well established.[40–42] Indeed, rates of vaccination with nonrequired vaccines among adolescents have been shown to increase when other adolescent vaccines are mandated; a 2010 report documented a nearly 5% increased initiation of HPV vaccine (42.9% vs 47.3%; $P = .004$) in states that had enacted mandates for Td/Tdap vaccine.[43]

Devising the most effective communication strategies—public health guidance and community outreach and education—for increasing vaccine uptake and overcoming hesitancy is especially challenging for the adolescent and young adult population. Part of the challenge has to do with the need to reach both adolescents and their parents, who receive and respond to messaging in different ways. Moreover, in recent years and especially during the COVID-19 pandemic, the dominant influence of the Internet, social media, and online forms of information, misinformation, and disinformation has complicated the task even further. (See Todd Wolynn, and colleagues' article "Social Media and Vaccine Hesitancy," in this issue)

In this context, generating youth-centered materials to address adolescents' concerns directly and provide assurances of safety and rationales for recommended vaccination is an important approach. This is not only helpful for patients and parents but clinicians strongly value having such educational materials available for themselves and patients.[44] Other related approaches might include better use by public health entities or media-trained providers of social media to refute misinformation and working with youth as social media influencers and ambassadors to their peers.

Finally, improving the public health infrastructure in ways that expand opportunities targeted at the adolescent age group may be an effective strategy. Increasing the availability of vaccination at schools and alternative sites is one potentially effective way of doing that.

SUMMARY

Vaccine hesitancy among adolescents and young adults is complex due to multiple factors: their developmental stage, the psychosocial and demographic context, the dynamic relationship in the adolescent–parent dyad, access to information and misinformation, accessibility of vaccines, and the legal framework that allows or disallows them to consent or assent to receive vaccines. Health-care providers are uniquely positioned to improve adolescent immunization rates by influencing the vaccination decision and advocating for ways to overcome vaccine hesitancy and other barriers for this age group. Ultimately, providing adolescent and young adult patients and their parents with evidence-based information to support them in making the decision affords maximal benefit in the process.

CLINICAL CARE POINTS

- Provider recommendation is the most important factor in family decisions about whether an adolescent or young adult will be vaccinated. Address both the patient and their parent/guardian.
- Be prepared for vaccine conversations with patients and families with 2 or 3 relevant facts pertaining to
  - The vaccine-preventable disease itself
  - The vaccine(s) available to prevent the disease (including safety and efficacy)
  - The reasons patients should get vaccinated
- Prepare messages designed to reach adolescents and young adults as well as parents.
- Directly refute vaccine myths with facts. Recommend the CDC.gov or immunize.org websites for further information.
- Know the laws in your state related to circumstances in which minors are allowed to consent to receive vaccines.
- When an adolescent minor is independently seeking vaccination, consider
  - Specific vaccine being sought
  - Status and age of minor
  - Capacity of minor to give informed consent

DISCLOSURE

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