

Harrison's Principles of Internal Medicine, 21e >

Chapter 3: Vaccine Opposition and Hesitancy

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INTRODUCTION

Vaccines have been recognized as one of the top public health achievements of the twentieth century. Dramatic declines in the morbidity and mortality of vaccine-preventable diseases have been observed, and the contribution of vaccines to the elimination, control, and prevention of infectious disease cannot be overstated. However, opposition and hesitancy to vaccines exist and are not new. Vaccine hesitancy has existed since Edward Jenner introduced the first vaccine against smallpox in the eighteenth century. So why did the World Health Organization rank these attitudes as one of the ten greatest threats to public health in 2019? Are current opposition and hesitancy any different from what has been seen before? Many sociologists, public health experts, and health care providers (HCPs) argue yes. Recent social and cultural trends, combined with new communication formats, have converged to create a particularly potent form of hesitancy and what some have labeled a crisis of confidence. This crisis manifests as a lack of trust in specific vaccines, vaccine programs, researchers, HCPs, the health care system, pharmaceutical companies, academics, policymakers, governments, and authority in general. (See “**Focus: COVID-19 Vaccine Hesitancy**,” below.)

The roots of modern vaccine hesitancy and opposition—defined as delay or rejection of vaccines in spite of availability—vary depending on the place and the population. For some individuals and communities, pseudoscience and false claims about the safety of existing vaccines (e.g., an unsupported link between measles vaccine and autism) have driven fears, increased hesitancy, and decreased acceptance. For others, real safety events, such as the association of narcolepsy with a specific pandemic influenza vaccine (Pandemrix), have justified concerns. In a few locations (e.g., Ukraine, Pakistan), vaccine hesitancy is the result of failed health systems or even state failures. Finally, for some groups, including some fundamentalist religious groups and alternative-culture communities, vaccine hesitancy and opposition reflect exclusion from and rejection of mainstream society and allopathic health care and manifest as a deep distrust of these institutions and their HCPs. Although the genesis of modern vaccine hesitancy is multifactorial, its outcomes are uniform: a decrease in vaccine demand and uptake, a decrease in coverage by childhood and adult vaccines, and an increase in vaccine-preventable diseases, outbreaks, and epidemics of disease. Addressing this crisis and moving people from vaccine hesitancy and refusal to acceptance and active demand require intervention at multiple levels: the individual, the health system (including public health), and the state.

This chapter will define vaccine hesitancy and briefly describe its determinants and effects in North America (the United States and Canada). Physicians and other HCPs are well positioned to address the crisis of confidence many patients feel toward HCPs and the health care system. Studies demonstrate that an unambiguous, strong recommendation by trusted HCPs is most often the reason that patients, including those who are vaccine hesitant, choose to vaccinate. Strategies for counseling vaccine-hesitant and vaccine-resistant patients will be presented and examples of strong vaccine recommendations provided. Presenting strategies to increase vaccine demand at a system and policy level is beyond the scope of this chapter. While some physicians may have roles that allow them to act at this level, all physicians can act and influence their individual patients. Strategies to create active vaccine demand at the individual level alone will not solve vaccine hesitancy, but vaccine hesitancy cannot be addressed without these efforts. **For further discussion of immunization principles and vaccine use, see Chap. 123.**

VACCINE COVERAGE AND OUTBREAKS

The epidemiologic data from measles outbreaks over the past 10 years provide an interesting illustration of the effects of vaccine opposition and hesitancy. **For further discussion of measles, see Chap. 205.**

North America

Herd immunity occurs when enough individuals in a population become immune to an infectious disease, usually through vaccination, that transmission of the infection stops. The level of immunity (or level of vaccine coverage) required to confer herd immunity varies with the specific

infectious disease. Because measles is a highly contagious virus, a coverage rate of 93–95% must be achieved for vaccination to confer herd immunity and interrupt measles transmission. National coverage estimates place one-dose measles vaccine coverage rates in 2-year-old children at 92% in the United States and 88% in Canada. In spite of these relatively high levels of coverage in young children, numerous measles outbreaks have occurred in both countries since 2010 ([Table 3-1](#)).

TABLE 3-1

Measles Outbreaks in North America

YEAR/PLACE	NO. OF CASES	REASON
2010/Canada	70	An infected traveler to the 2010 Winter Olympics transmitted infection to an under- and unvaccinated local population in British Columbia.
2011/Canada	776	Disease was imported from France by an unvaccinated returned traveler to Quebec. The outbreak spread in a nonvaccinating religious community and outside that community. A majority of cases occurred in under- and unvaccinated persons.
2011/United States	118	Of 118 cases, 46 were in returned travelers from Europe and Asia/Pacific regions; 105 cases (89%) occurred in unvaccinated persons.
2013/United States	58	Disease was imported by a returned unvaccinated traveler from Europe. The outbreak spread in a nonvaccinating religious community in New York.
2014/Canada	433	Disease was imported from the Netherlands. The outbreak spread in a nonvaccinating religious community in British Columbia.
2014/United States	383	The outbreak occurred in nonvaccinating religious communities in Ohio.
2015/United States	147	A multistate/multicountry outbreak was linked to Disneyland amusement park. More than 80% of cases occurred in unvaccinated persons.
2015/Canada	159	Disease was imported from the United States (part of the Disneyland outbreak) by an unvaccinated traveler. The outbreak spread in a nonvaccinating religious community in Quebec.
2017/United States	75	The outbreak occurred in an under-vaccinated community in Minnesota; 95% of patients were unvaccinated.
2018/United States	375	Disease was imported by returned unvaccinated travelers from Israel. The outbreak spread in nonvaccinating religious communities in New York and New Jersey.
2019/Canada	31	Disease was imported from Vietnam by a returned traveler to British Columbia. The outbreak spread throughout local area schools in under- and unvaccinated persons and resulted in a province-wide measles mass immunization campaign for schoolchildren.
2019/United States	1282	Outbreaks occurred in 10 states; 73% of cases (~935) were linked to outbreaks in nonvaccinating religious communities in New York.

Source: Centers for Disease Control and Prevention and Public Health Agency of Canada.

The vast majority (>80%) of measles cases described in Table 3-1 occurred in under- or completely unvaccinated individuals. Of note, many of these outbreaks highlight pockets of significantly under- or unvaccinated individuals that are not apparent in national vaccine coverage statistics. Moreover, many of the outbreaks listed in Table 3-1 were ignited by unvaccinated returned travelers from areas with existing outbreaks or epidemics, who spread disease into an unvaccinated or under-vaccinated community. Many of the outbreaks were contained within the nonvaccinating community, but

several spread to other under-vaccinated communities geographically contiguous with the outbreak community. More concerning still are the cases and outbreaks originating in communities that had not previously been identified as nonvaccinating. These cases likely highlight pockets of unvaccinated individuals who object for cultural rather than religious reasons. In the past, these nonvaccinating individuals did not exist in large enough clusters to sustain the spread of measles. Of further concern is the number of individuals included in outbreak statistics who have had one or sometimes even two doses of vaccine and who were thought to be protected but who still end up with the disease. The assumption is that one or two doses provide full disease immunity, but this is not always true. Often, individual level characteristics (age, immune compromise, etc.) affect the individual's response to the vaccine and their level of protection. In other instances, vaccine protection can wane over time, thus leaving fully immunized individuals susceptible to infection. In fact, when herd immunity breaks (i.e., the level of immunity in a community becomes too low to prevent transmission of disease), the occurrence of cases even in fully immunized persons is seen, as reflected in outbreak statistics. As a result of decreased vaccination rates and the resulting disruption of herd immunity, these individuals may become more identifiable as non-immune.

Outside North America

Although overall coverage rates may still be high in North America, they are lower in other parts of the world. In Samoa, for example, measles–mumps–rubella (MMR) vaccine coverage before a recent outbreak was 31%; in the Philippines, it was 67%. Twenty years ago, vaccine coverage was sufficiently high in some parts of the world, including Europe, that an unvaccinated traveler from a nonvaccinating community to most regions would have been protected by herd immunity at their destinations. Today that is not the case: such travelers are likely to become infected in a country with active measles transmission and return home to spread the infection into their communities and possibly beyond. Thus active measles transmission, whether at home or abroad, places individuals who rely on herd immunity (e.g., immunocompromised persons and young infants) at increased risk.

FACTORS IN VACCINE HESITANCY

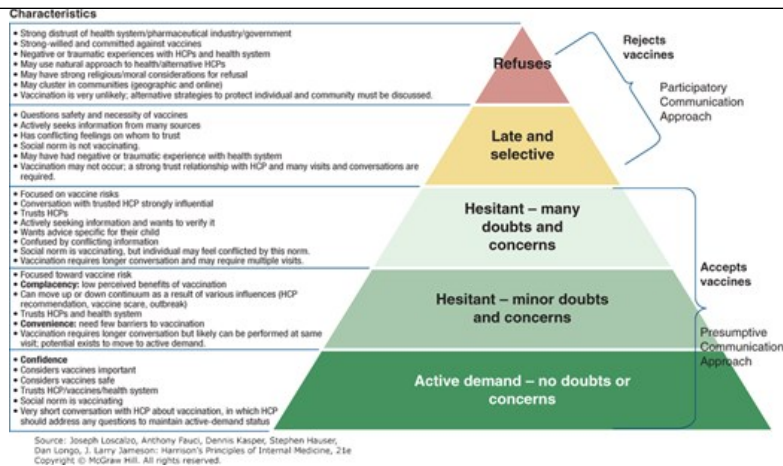
Vaccination coverage rates provide an estimate of the proportion of children or adults in the population who have been vaccinated, but they do not indicate the proportion of individuals who are vaccine hesitant. An individual may be fully vaccinated but still be hesitant about the safety and effectiveness of vaccines, or an individual may be unvaccinated as a result of access issues but may not be hesitant. Therefore, in attempts to understand a patient's lack of vaccination, it is important to distinguish persons who are hesitant and refuse vaccines from those who need assistance to access the health care system and successfully complete vaccination. To this end, an understanding of vaccine hesitancy and its determinants is needed.

Vaccine hesitancy and opposition are defined by the World Health Organization's SAGE Working Group on Vaccine Hesitancy as a "delay in acceptance or refusal of vaccines despite availability of vaccination services." The SAGE group describes vaccine hesitancy as "complex and context specific, varying across time, place, and vaccines."

It is useful to frame vaccine acceptance as a continuum pyramid, with active demand for all vaccines representing the largest group at the bottom of the pyramid and outright refusal of all vaccines depicted in the smallest group at the top. In the middle lies vaccine hesitancy, in which the degree of vaccine demand and acceptance varies. Fortunately, for disease control efforts, most individuals fall within the active-demand category or, if they are hesitant, still accept all vaccines. Hesitancy can be influenced by complacency, convenience, and confidence (**Fig. 3-1**).

FIGURE 3-1

Vaccine acceptance continuum. HCPs, health care providers. (Adapted from J Leask et al: *BMC Pediatrics* 12:154, 2012; AL Benin et al: *Pediatrics* 117:1532, 2006; and E Dubé, NE MacDonald: *The Vaccine Book*, 2016, pp. 507–528.)



Complacency is self-satisfaction when accompanied by a lack of awareness for real dangers or deficiencies. Complacency exists in communities and individuals when the perceived risks of vaccine-preventable diseases are low and vaccination is not deemed a necessary preventive action. This attitude can apply to vaccination in general or to specific vaccines, such as influenza vaccines. Actual or perceived vaccine efficacy and effectiveness contribute to complacency. Patients who are complacent about vaccine-preventable diseases prioritize other lifestyle or health factors over vaccination. These individuals can be influenced toward vaccination by a strong recommendation from a trusted HCP or a local influenza outbreak. They can be influenced away from vaccination by a vaccine scare or misinformation on social media. Finally, the real or perceived ability of patients to take the action required for vaccination (i.e., self-efficacy) influences the role complacency plays in hesitancy and willingness to seek vaccination.

Convenience is determined by the degree to which conversations about vaccination and other services can be provided in culturally safe contexts that are convenient and comfortable for the individual. Clearly, convenience varies by community, health clinic, and even patient. Persons who are criticized or scolded for not vaccinating themselves or their children may not feel comfortable or safe accessing health services. Factors such as affordability, geographic accessibility, language, and health literacy are important considerations when evaluating the convenience of existing clinical care. Any of these factors can affect vaccine acceptance and can push a patient who has some hesitancy toward vaccinating or not vaccinating.

Confidence is based on trust in the safety and efficacy of vaccines, in the health care system that delivers vaccines (including HCPs), and in the policymakers or governments who decide which vaccines are needed and used. A continual erosion of confidence around vaccination, health systems, and governments drives today's hesitancy and has been amplified by larger social and cultural trends in medicine, parenting, and information availability.

SOCIAL AND CULTURAL TRENDS

Individualized Health Care

Over the past 30 years, the focus of medicine and health care has shifted to patient-oriented, individualized care, with an increasing emphasis on treatment and prevention options tailored to the individual patient. In vaccination programs, this shift has manifested as requests for individualized vaccine recommendations and customized immunization schedules. The increasing personalization of medicine, while positive overall, has forced public health away from a focus on the community and its common good and has created tension between individual rights and community health.

Parenting Trends

The desire for an individualized approach to medicine and vaccination reflects broader cultural trends concerning individual risk management: accordingly, the individual is to blame for bad outcomes, and public institutions cannot be trusted to manage technological (i.e., vaccine-related) risks. This viewpoint is directly linked with cultural shifts in parenting and social norms defining what it means to be a "good parent." The image of a good parent has been reframed to refer to someone whom several investigators have described as "a critical consumer of health services and products, accounting for their own individual situation as they see it with little regard for the implications of their decision on other children." The archetypal good parent no longer unquestioningly trusts HCPs and other authorities and experts. According to this social norm, "good parents" should seek individual medical advice that is tailored for their child and specific to that child's needs. While in essence not a bad thing, this norm can conflict directly with public health vaccine recommendations and schedules that are organized to maximize community health and to facilitate efficient

provision of care at a community level.

Traditional Media

Newspapers, radio, and television have been criticized for their coverage of vaccines and in particular their coverage of the alleged link between MMR vaccine and autism. By offering equal coverage throughout the early to mid-2000s for both the scientific evidence and unproven claims of MMR vaccine harms, traditional media outlets provided a forum and a megaphone for the spread of pseudoscience. Equal coverage leads to false equivalencies. Celebrity advocates further amplified the message via this channel. The boost that traditional media provided to active vaccine resistance and, less directly, to vaccine hesitancy has not been adequately measured but must be considered in any discussion of vaccine hesitancy. After headlines about multiple outbreaks of measles and other vaccine-preventable diseases and continued direct criticism of the equal-coverage approach, some traditional media now reject and attempt to discredit pseudoscience. The effect this stance will have on increasing vaccine confidence is unknown.

The Internet and Social Media

Approximately 90% of Americans and 91% of Canadians use the Internet, and 80% of Americans and 60% of Canadians have a social network profile. Widespread access to social media can be empowering, but it is also problematic. The Internet and social media require users to select their information sources, creating an environment described as an “echo chamber” in which individuals choose information sources harboring beliefs or opinions similar to their own and thereby reinforcing their existing views. This situation has created a new platform for further spread of vaccine *misinformation* (inaccuracies due to error) and *disinformation* (deliberate lies) and has provided a forum for vaccine-resistant individuals, including celebrities, to organize and raise funds to support their efforts. The harmful effects of Internet and social media use on vaccine hesitancy have been well documented. Vaccine hesitancy increases for parents who seek their information from the Internet. Unfortunately, public health and health care institutions have been slow to adapt to this new communication medium and to recognize its influence and impact. In this medium, personal stories and anecdotes are now viewed as data and disproportionately influence vaccine decision-making, while traditional, more authoritative, fact-based information sources are deemphasized. Centralized monitoring by jurisdiction of vaccine misinformation and disinformation, with summaries of the relevant discourses and rebuttals provided to HCPs, has been proposed as a potential way to counter the influence of social media on vaccine hesitancy. While such strategies have been applied in single jurisdictions and appear to have had some success, their applicability to a broader context is unknown. Moreover, the resources for such a coordinated response have not been made available, and individual HCPs have been left to counter popular, shifting, viral communications on their own, patient by patient.

As with traditional media, the social media landscape appears to be shifting. In 2019, the proliferation of anti-vaccination information combined with measles outbreaks in North America and increasing pressure from health leaders led large social media companies (Facebook, Instagram, Pinterest) to deemphasize anti-vaccination information by removing relevant advertisements and recommendations and decreasing their prominence in search results. While it is too soon to determine the effects of these measures, critics are skeptical that they will have the intended result of reducing vaccine misinformation and disinformation. Early evidence shows that misleading content is still widely available, with anti-vaccine advertisements now using the term “vaccine choice” to avoid censorship. More disturbingly, public health advertisements in support of vaccination have been included in social bans and removed from social media sites.

In a more grassroots effort, providers and vaccine supporters have united on social media to provide online support and evidence-based facts to providers and others who support vaccines when they are attacked digitally by anti-vaccine supporters. For example, Shots Heard Round the World (www.shotsheard.com) is an effort led by two U.S. pediatricians to provide advice and support for HCPs who speak out about the importance of vaccines. Such efforts harness the power of social media in ways similar to those used by vaccine opponents and may prove successful in combating vaccine hesitancy.

Given these social and cultural trends, no one should be surprised when individuals now question vaccination, express confusion about conflicting information and information sources, and feel unsure whom to trust. Their broader social context is telling them they should question everything and trust no one. This message is reinforced via misinformation and disinformation on social media. Recent vaccine-preventable disease outbreaks illustrate that effective engagement with individuals cannot be accomplished through one-way, top-down information provision (which still is often the de facto choice for health system communication), but rather requires a dialogue that takes into account the social processes surrounding individual vaccination decisions. It is at the interface between the individual and the health system in which conversations between HCPs and their patients can have the greatest impact. It is critical for all HCPs to discuss vaccines and provide strong vaccine recommendations—including HCPs who do not administer vaccines but who have established trust with their patients.

Approach to the Patient

An ideal vaccine-hesitancy intervention would result in full compliance with vaccination, the patient's satisfaction with the health care encounter, and sustained trust in the HCP's recommendations. On a programmatic level, vaccine-hesitancy interventions should be multicomponent, dialogue based, and tailored to specific under-vaccinated populations.

Communicating with vaccine-hesitant individuals can be challenging and time-consuming. HCPs may feel that vaccine-hesitant patients cast doubt on their personal and professional integrity, their authority as medical experts, and their competence as communicators. Some HCPs may be reluctant to initiate conversations about vaccination because of concerns that discussing a sensitive topic may compromise their clinical rapport with their patients. Other HCPs may believe that they have not received sufficient training to confidently recommend vaccines and answer questions. Discussing vaccines with hesitant patients, while not always easy, provides an opportunity to honor the principles of patient-centered care by demonstrating an interest in patients' opinions, engaging in dialogue, and ideally increasing patients' confidence in vaccine recommendations.

Factors in Effective Vaccine Recommendations

Vaccine recommendations ideally should be made within an established, trusting patient-provider relationship in which patients are comfortable asking questions and voicing concerns, even if their views on vaccines contradict the HCP's recommendations. Recommending vaccines requires both provision of information and effective communication. There is no single "best practice" for how providers should approach recommending vaccines to vaccine-hesitant individuals. In general, all vaccine recommendations should be (1) strong, making it clear that the provider supports and recommends vaccination; (2) tailored, acknowledging the vaccine attitudes and potential concerns of individual patients; (3) transparent and accurate, highlighting the benefits of vaccines while also communicating the risks; (4) supported by trustworthy information resources that patients can access and review after the clinical encounter; and (5) revisited, with repetition and reinforcement during follow-up health care encounters.

Strength of the Recommendation

HCPs should make it explicit (in the absence of medical contraindications) that vaccination based on the recommended schedule is the best option. While HCPs should take time to elicit patients' questions and address concerns, the recommendation for vaccination should be made in clear and unambiguous terms.

Tailored Communication

Vaccine hesitancy occurs on a continuum (Fig. 3-1). Therefore, it is helpful for HCPs to have some understanding of their patients' attitudes toward vaccination at the start of the health care appointment. Unfortunately, vaccine-hesitancy surveys for use as part of vaccine consultation visits have not been validated on a large scale. However, the following are some examples of questions that can be asked, depending on the setting. (1) Did you have a chance to review the vaccine leaflet we provided? Did you have any questions about it? (2) Have you ever been reluctant or hesitant about getting a vaccination for yourself or your child? If so, what were the reasons? (3) Are there other pressures in your life that prevent you from getting yourself or your child immunized on time? (4) Whom/what resources do you trust the most for information about vaccines? Whom/what resources do you trust the least?

Communication style and content for patients in the active-demand category for vaccination will be different from those for individuals who are hesitant, late and selective, or strongly inclined to refuse vaccines. Two communication styles have been proposed for vaccine recommendations. Evidence shows that a *presumptive/directive* approach ("Your child is due for MMR vaccination.") results in higher rates of vaccine uptake than a *participatory/guiding* approach ("What are your thoughts about the MMR vaccine?"). However, adopting a strictly presumptive/directive approach may alienate some patients, especially those who are higher up on the hesitancy pyramid and who may feel that they are being pressured into vaccination before their concerns have been heard and addressed. Adopting a participatory/guiding approach and clarifying receptivity to vaccines may be more suitable for hesitant individuals with many doubts and concerns, persons with a late or selective attitude, and those who are strongly inclined to refuse vaccines. In addition, a participatory/guiding approach provides an opportunity for ongoing clinical rapport and dialogue between unvaccinated or under-vaccinated patients and their HCPs, even when it does not result in immediate vaccine uptake. Regardless of which approach is used, a strong vaccine recommendation should be made at each encounter.

Transparency and Accuracy

Vaccine recommendations should be transparent, should include accurate information about both the benefits and the risks of the vaccine, and should emphasize why the benefits outweigh the risks. For example, when evidence supports an association between a vaccine and an adverse event, the occurrence of the adverse event is often very rare and the event quickly resolves (**Chap. 123**). U.S. Federal law (under the National Childhood Vaccine Injury Act) requires HCPs to provide a copy of the current Vaccine Information Statement from the Centers for Disease Control and Prevention (CDC), which describes both benefits and risks of vaccines to an adult patient or to a child's parent/legal representative before vaccination.

CDC Vaccine Information Statements should not replace a discussion with the HCP. Depending on the provider and the patient, a description of benefits and risks may include words and numbers, graphics, and personal anecdotes (e.g., why the provider vaccinates his or her own children). Personal anecdotes are powerful, and many hesitant patients seek and are influenced by them.

A discussion of benefits and risks provides an opportunity to address specific misconceptions about a particular vaccine or about vaccines overall. For example, patients may be concerned about adverse events following vaccination that are not supported by evidence, such as autism following MMR vaccination or myocardial infarction following influenza vaccination in the elderly.

Most adults—even those whose children are fully immunized—still have questions, misconceptions, or concerns about vaccines that should be addressed. A risk/benefit discussion allows HCPs to describe the vaccine safety monitoring systems in place. Providers should emphasize that vaccines are developed and approved through a highly regulated process that includes precirculatory clinical trials, review and approval by designated regulatory authorities (e.g., the U.S. Food and Drug Administration, Health Canada), strict manufacturing regulations, and ongoing postmarketing safety surveillance.

Support from Accessible Information Sources

All vaccine recommendations should be supported by additional information sources patients can assess after the health care encounter. HCPs play an important role as information intermediaries for their patients. They can navigate information (and misinformation) about vaccines and direct patients toward reliable, appropriate resources. HCPs should consider what resources will be suitable for a patient or patient population. Vaccine information resources are available in different media formats and use a combination of images and text to communicate the information to various audiences. See “**Further Reading**,” below, for suggestions or refer to resources provided by local health authorities.

Revisiting and Reinforcement of Vaccine Recommendations

All health care encounters offer an opportunity to revisit and reinforce vaccine recommendations. Vaccine-hesitant individuals who do not accept vaccines but are willing to review information should be offered a follow-up appointment to reinforce previously made recommendations and address further questions. Vaccine-hesitant patients who accept vaccines should be seen at a follow-up appointment to confirm and document vaccine receipt (if vaccine is not given at the point of care), ascertain whether the vaccine was well tolerated, and reinforce the message about vaccine safety and effectiveness. Patients who actively demand vaccines usually do not require much follow-up other than to confirm and document the receipt of vaccine (if it is not given at the point of care) and to address additional questions or concerns arising subsequent to vaccination. Often this follow-up can be covered without an office visit.

What to Say to Vaccine-Hesitant Patients

Engaging vaccine-hesitant individuals requires confidence, knowledge, skills, time, and creativity to tailor the approach to each individual patient. Examples for each part of the vaccine recommendation are listed in **Table 3-2**.

TABLE 3-2

Sample Vaccine Conversations

STRONG VACCINE RECOMMENDATION

“We are headed into the flu season. Getting flu vaccine not only protects you, but it helps protect other people around you who can get very sick from flu. I strongly recommend you get your flu shot. Do you know where to get it?”

“You will be turning 50 next year. This means you will be eligible for a vaccine that prevents shingles, and I strongly recommend you receive it. Have you heard about this vaccine before? Can I answer your questions about it?”

“I know you are not comfortable getting vaccinated today. I do want to make it clear that I recommend vaccines because I am convinced they are the best way to protect you from some serious diseases. Is there something that would lead you to think about getting vaccinated in the future?”

TAILORED COMMUNICATION

“I recommend that children and adults stay up to date on recommended vaccines. I see from your vaccine record that you’ve had your childhood vaccines, but you haven’t gotten any adult vaccines. I wanted to clarify whether this is because you decided not to get vaccines or something else prevented you from getting vaccinated.”

“I understand that you are here for your pneumococcal vaccine. This is the best way to protect yourself and those around you from pneumonia. Do you have any questions before I give you the vaccine?”

“I understand you have some concerns about vaccines. What are you most concerned about? Would you like me to explain why I recommend giving your child these vaccines?”

TRANSPARENCY AND ACCURACY

“Serious side effects can develop after MMR vaccination but are very rare. On average, 3 out of 10,000 children who get MMR vaccine will have a febrile seizure/convulsion in the days after vaccination. Febrile seizures can be frightening, but nearly all children who have a febrile seizure recover very quickly and without any long-term consequences. On the other hand, 1 out of 1000 children who get measles will develop encephalitis (brain inflammation) that not only causes seizures but can also lead to permanent damage.”

“About 10 out of every 10,000 Americans who do not get vaccinated against flu die because of influenza every year, and many more are hospitalized. While flu vaccine does not prevent all cases of influenza, it is the most effective vaccine we have. By getting the vaccine, you also help protect people around you from getting sick.”

“You are correct, aluminum is used in some vaccines to help the body’s immune system respond. However, aluminum is also present in food and drinking water. In fact, the amount of aluminum present in vaccines is similar to or less than what is present in breast milk or infant formulas.”

SUPPORT FROM ACCESSIBLE INFORMATION SOURCES

“Your child and other boys and girls his age will be eligible for the human papillomavirus vaccine this coming school year. Have you heard about this vaccine before? What questions do you have about it? Here’s a list of websites for parents and teenagers that explain what it is about.”

“There’s a lot of information about vaccines on the internet, and a lot of that information is not based on facts. Here is a list of websites that have been reviewed by health care professionals and accurately describe benefits and risks of each vaccine. The information is written in lay language and includes helpful illustrations.”

REVISITING AND REINFORCEMENT OF THE RECOMMENDATION

“During our last visit, we talked about MMR vaccine for your son and some of the concerns you had about potential side effects. Have you had a chance to look at the take-home information I gave you? Was there anything else you would like to ask about? I recommend that we vaccinate your child today.”

“During our last visit, we talked about receiving a pertussis booster during pregnancy and where you can get vaccinated. Have you had a chance to get your pertussis vaccine?”

“I see that you got your vaccines at the public health clinic last week. How did it go? Did you have any questions?”

“It’s possible that the symptoms you experienced after receiving the vaccine were an adverse reaction to the vaccine. I will report this to the health authority. Let’s discuss what we can do next time to prevent symptoms from occurring again.”

Note: Specific vaccine recommendations, vaccine eligibility guidelines, and statistics used to communicate benefits and risks will vary with the health jurisdiction and the country. Several sample statements here are adapted from the Australian National Centre for Immunisation Research and Surveillance website (www.talkingaboutimmunisation.org.au). For patient vaccine information resources, see also the Immunization Action Coalition website for the public developed in partnership with the CDC (vaccineinformation.org).

OTHER CONSIDERATIONS DURING CLINICAL ENCOUNTERS

Missed Opportunities

The World Health Organization defines a missed opportunity for vaccination as “any contact with health services by an individual (child or person of any age) who is eligible for vaccination (e.g., unvaccinated or partially vaccinated and free of contraindications to vaccination), which does not result in the person receiving one or more of the vaccine doses for which he or she is eligible.” HCPs who do not offer point-of-care vaccination frequently miss the opportunity to recommend vaccines to their patients. Missed opportunities for recommending and providing vaccines during routine health care encounters contribute to under-vaccination. Studies show that up to 45% of under-vaccinated children could be up to date with all age-appropriate vaccines and up to 90% of female adolescents could be up to date with human papillomavirus (HPV) vaccination if all opportunities to vaccinate were taken.

Vaccine counseling and vaccination should be incorporated into clinical care for individuals of all ages, not just young children. Because many adolescents and adults do not have regular health care follow-up, providers need to take advantage of every health care encounter to recommend and provide vaccines. For example, a visit to an emergency department, a routine follow-up visit at a diabetes clinic, or a visit planning for elective orthopedic surgery offer opportunities to inquire about the patient’s vaccination status and to recommend vaccines.

HCPs should make preemptive vaccine recommendations (e.g., initiating discussions about infant vaccines during pregnancy, informing parents about HPV vaccine before their child becomes eligible). Such advance discussions may be especially helpful in identifying vaccine-hesitant patients and ensuring that they have enough time to ask questions and make decisions before vaccines are due.

HCPs should ensure that a vaccine recommendation is followed by vaccination. Providers who recommend vaccines but do not vaccinate at the point of care should inform patients where they can be vaccinated. This discussion may include information about public health clinics, travel clinics, and pharmacies or a referral to another provider. HCPs should follow up with their patients at subsequent appointments to confirm that they were vaccinated.

Adverse Events Following Vaccination

Although rare, adverse events ([Chap. 123](#)) may influence vaccine acceptance and willingness to be vaccinated in the future. It is important for providers to identify and follow up with all patients who experience an adverse event, regardless of the patients’ vaccine attitudes prior to the event. Adverse events following vaccination should be reported to the relevant vaccine monitoring system: the U.S. Vaccine Adverse Event Reporting System or the Canadian Adverse Event Following Immunization Surveillance System.

Addressing Inequities In Vaccine Access

Discrepancies in access to health care services create inequitable access to vaccines for children and adults and contribute to under-vaccination. A U.S. study found that socially disadvantaged individuals were more likely than other persons to be under-vaccinated, in part because of a lack of access to health care services. HCPs must recognize that socially disadvantaged individuals and populations are often at greater risk of vaccine-preventable diseases (e.g., as a result of crowded living conditions, limited access to sanitation, poor nutrition, or substance abuse) and also at greater risk of being under-vaccinated because they have limited access to health care services. In addition, specific vaccines may be recommended for some socially disadvantaged populations or communities. For example, in the wake of several outbreaks of hepatitis A among the U.S. homeless population, the CDC now recommends that everyone >1 year of age experiencing homelessness receive hepatitis A vaccine.

Depending on the setting and the patient, some recommended vaccines may not be covered through public funding or private insurance coverage. HCPs should be aware of alternative funding models, such as the Vaccines for Children Program, which provides free vaccines for U.S. children (<19 years of age) with financial barriers to vaccine access. When vaccines are not publicly funded or covered by private insurance and patients perceive that

they cannot afford a vaccine, HCPs should not withhold a vaccine recommendation. The risks and benefits of vaccination still need to be communicated, with a strong recommendation, and the patient should be provided the opportunity to decide whether they can afford the vaccine.

Further Communication With Patients Who Refuse Vaccines

Fortunately, the proportion of people who completely refuse all vaccines and are not willing to talk to their HCP is small. Nevertheless, in some cases, attempts to initiate discussion and address vaccine refusal may be futile. When possible, HCPs should focus on the common goals of care and preserve the therapeutic relationship. Vaccine refusal should be well documented in the patient's chart. The HCP should continue with tailored communication and be open to future discussions. Vaccine demand and vaccine refusal are rarely static over time. (See **"Focus: COVID-19 Vaccine Hesitancy,"** below.)

CONCLUSION

In summary, vaccine hesitancy is complex and context specific. It varies with time, place, patient, and vaccine. HCPs are well positioned to address vaccine hesitancy and should develop the skills, knowledge, and confidence to make strong vaccine recommendations to their patients.

FOCUS: COVID-19 VACCINE HESITANCY

As COVID-19 vaccines are used to control SARS-CoV-2, some individuals will have concerns about these vaccines and a proportion of the population will reject them. While worrisome, hesitancy about COVID-19 vaccines is not unexpected; it mirrors public concerns expressed about past pandemic influenza vaccines and other newly introduced vaccines. It has been established that the newness of any vaccine, be it a pandemic influenza vaccine or a COVID-19 vaccine, raises concern in a large percentage of the population. Politicization of COVID-19 vaccines raises additional issues for some patients.

Past Experience with New Vaccines

Past experience with new vaccines, including the H1N1 pandemic influenza vaccine in 2009 and the human papillomavirus vaccine in the early 2000s, provides a guide to topics that need to be addressed with regard to COVID-19 vaccines. While resistance is often framed as uncertainty about a vaccine's "newness," further discussion translates this uncertainty into concern about the new vaccine's safety. This concern encompasses both short- and long-term side effects. Frequent, acute adverse effects can be captured in clinical trial data, whereas worries about rare and long-term side effects can be addressed only by direct evidence after the initiation of a new vaccination program. In addition to queries about the overall safety of the vaccine, HCPs can expect specific questions regarding the safety of individual ingredients included in the vaccine, whether or not these ingredients are new and whether or not relevant safety data are available. Information on the incidence of common or expected health events in an unvaccinated population (i.e., background rates) over a 4-week period is helpful in distinguishing what is normal and expected from a point of concern. Studies that have examined this issue with regard to other vaccines can be used as a basis for presenting background rates of expected events in the context of COVID-19 vaccines for some groups; however, it is important to ensure that more specific background-rate information is available to HCPs with regard to the individual groups being vaccinated. HCPs, public health programs, and vaccine manufacturers can anticipate these questions and should develop answers and information to respond to them.

Specific Concerns about COVID-19 Vaccines

While some concerns can be anticipated on the basis of past experience with new vaccines, several characteristics of COVID-19 vaccines require new approaches to adequately address individual concerns, and HCPs need to educate themselves in several specific areas. First, an overwhelming amount of attention has been paid to the speed of development of COVID-19 vaccines, with some jurisdictions even skipping the usual clinical-trial steps in an effort to provide vaccine more rapidly to their populations. This situation directly increases concerns about the "newness" of the vaccine and its safety and, unfortunately, raises questions about the entire vaccine development process. Education is required to explain how a process that normally requires 5–10 years was condensed to this degree. (See Lurie et al [2020] for an excellent explanation of the COVID-19 vaccine development process.) In addition, transparency with regard to clinical trial data is required to enable scientists, HCPs, and consumers to read and understand the development and evaluation processes. The usually shrouded, proprietary development process is unsuitable if the final vaccine product is to garner public trust. Education on existing vaccine-safety monitoring systems also needs to be provided. HCPs must familiarize themselves with the vaccine development

process and safety monitoring systems if they are to present this information to their patients.

Second, several newer vaccine platforms that are being used for COVID-19 vaccines (e.g., nucleic acid–based vaccines, viral vector) have not been used in the past. This novelty exacerbates public concern about the unfamiliarity of new vaccines and further heightens misgivings about vaccine safety and the potential for long-term adverse effects. Again, HCPs need to familiarize themselves with the new technology and develop effective messaging for their patients. Public health officials have developed resources to address this issue (see www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence.html), but, even in the absence of such resources, HCPs can anticipate questions about the new technology involved and become comfortable explaining it.

Third, clinical trial safety and efficacy data were lacking for all groups initially prioritized to receive the vaccine. For example, long-term-care residents were prioritized for vaccine receipt, but clinical trial data were not available for the range of chronic health conditions that exist in older adults. While observational studies have filled some of these gaps, HCPs need to extrapolate on the basis of available evidence in considering individual patients and must make a recommendation without knowing all the answers.

Fourth, some minority and marginalized communities who have been disproportionately affected by COVID-19 express hesitancy or reject COVID-19 vaccines. For some Black, Indigenous, Latinx, and other communities, COVID-19 hesitancy stems directly from systematic discrimination, racism, and mistreatment in the health care system. Black and Indigenous communities also share a horrific legacy of unethical medical experimentation,¹ which, when combined with current discrimination and overt racism, creates a powerful climate of mistrust in HCPs, the medical system, and science.

Social and Cultural Trends

The social and cultural trends already discussed in this chapter—in particular, traditional media, the Internet, and social media—are exerting influence and pressure that did not affect the introduction of older vaccines, even the H1N1 pandemic vaccines. The media attention given to the development of transverse myelitis in one clinical-trial participant following receipt of COVID-19 vaccine is but one example of the intense media scrutiny of the vaccine development process. Unfortunately, in the United States, efforts to control COVID-19, including vaccine development, have become highly politicized. This degree of politicization has not occurred with past vaccines, so HCPs are in uncharted territory in terms of how to address it or even to understand its potential influence on vaccine acceptance. Again, individual HCPs need to navigate complex conversations with their patients and possibly their communities. Below are some suggestions that may prove helpful in formulating these conversations.

Tips for Discussion of COVID-19 Vaccines

Address Concerns about “Newness”

HCPs need to understand and be able to explain the newer vaccine platforms (mRNA, DNA, and viral vector vaccines) and to provide examples of other, older vaccines that have been developed by similar techniques. This information makes COVID-19 vaccines more familiar.

Address Concerns about Vaccine Safety

HCPs need to understand and explain how vaccines are evaluated before being approved for use and how vaccine safety is monitored after vaccines are used in the population. It is important to be honest and state that potential rare and long-term effects are not yet known, but then to speak to what is from the animal and clinical trial data and to comment on background rates for rare events. Placing potential vaccine risks in the context of known COVID-19 disease risks is helpful for some patients.

Depending on the context, explain why specific high-risk groups may have been prioritized to receive the vaccine. Patients who have been prioritized may still need a strong recommendation from an HCP to accept the vaccine. An HCP recommendation is as important here as it is for acceptance of routine vaccines. As with other vaccines, many patients' decision to accept a COVID-19 vaccine rests upon whether their HCP recommends it.

Address implicit or overt racism and systemic discrimination in the medical system and create culturally safe health care spaces. HCPs need to be aware of the legacy of discrimination, racism, and medical experimentation and the distrust it fosters in some communities. While SARS-CoV-2 has critically highlighted fractures in our health care system for minority and marginalized communities, addressing these underlying issues goes beyond addressing vaccine hesitancy and is clearly needed for all types of medical care in these communities.

Emphasize the Importance of Keeping up to Date with Other Routine Vaccines during the COVID-19 Pandemic

These vaccines include but are not limited to seasonal influenza vaccine and the childhood primary vaccination series.

¹The Tuskegee Syphilis Study is the most infamous example of medical experimentation in Black communities in the United States. (See Brandt [1978] for details.) Numerous examples of medical experimentation on Indigenous peoples are available. For example, a 12-year trial of an experimental bacille Calmette-Guérin vaccine for tuberculosis was conducted on Cree and Nakoda Oyadebi infants in Saskatchewan during the 1930s. (See Lux [2016] for details.)

FURTHER READING

Vaccine Hesitancy

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