

Good afternoon. I'm Captain Ibad Khan, and I'm representing the Clinician Outreach and Communication Activity, COCA, with the Emergency Risk Communication Branch at the Centers for Disease Control and Prevention. I'd like to welcome you to today's COCA Call, Clinical Vaccination Guidance For Pregnant People.

All participants joining us today are in listen-only mode. Free continuing education is offered for this webinar, and instructions on how to earn continuing education will be provided at the end of the call. In compliance with continuing education requirements, all planners and presenters must disclose all financial relationships in any amount with ineligible companies over the previous 24 months, as well as any use of unlabeled product or products under investigational use. CDC, our planners, and presenters wish to disclose they have no financial relationships with ineligible companies whose primary business is producing, marketing, selling, reselling, or distributing healthcare products used by or on patients with the exception of Dr. Naima Joseph who would like to disclose that she is a coinvestigator on a Paxlovid in pregnancy study for Pfizer. All of the relevant financial relationships listed for these individuals have been mitigated. Content will not include any discussion of the unlabeled use of a product or a product under investigational use. CDC did not accept financial or in-kind support from ineligible companies for this continuing education activity.

At the conclusion of the session, participants will be able to accomplish the following: Discuss current CDC and ACOG recommendations for vaccination during pregnancy, with a focus on Tdap, influenza, and COVID-19 vaccines; Cite the current vaccination coverage for Tdap, influenza, and COVID-19 among pregnant people in the United States; Explain the burden of pertussis, influenza virus, and SARS-CoV-2 infections in pregnant people and infants; Describe the benefits of Tdap, influenza, and COVID-19 vaccination during pregnancy for both pregnant people and their infants; And review clinical considerations and best practices for making strong recommendations for vaccination and overcoming barriers to vaccination amongst pregnant people.

After today's presentations, there will be a Q&A session. You may submit questions at any time during today's presentation. To ask a question using Zoom, click the Q&A button at the bottom of your screen. Then type your question in the Q&A box. Please note that we receive many more questions that we can often answer during our webinars. If you're a patient, please refer your questions to your healthcare provider. If you're a member of the media, please contact CDC Media Relations at 404-639-3286. Or send an email to [media@cdc.gov](mailto:media@cdc.gov).

I would now like to welcome our presenters for today's COCA call. We're pleased to have with us Commander Tara Jatlaoui, Chief of the Applied Research Implementation Science and Evaluation Branch at CDC's National Center for Immunization and Respiratory Diseases; and Dr. Naima Joseph from the Division of Maternal Fetal Medicine in the Department of Obstetrics and Gynecology at the Beth Israel Deaconess Medical Center and Assistant Professor at Harvard Medical School. It is now my pleasure to turn it over to Commander Jatlaoui, Commander Jatlaoui, please proceed.

Thank you so much. And thanks to everyone for being here with us today. Next slide. And we can go the next slide.

So I wanted to first start with the recommended adult immunization schedule that was released earlier this year. The schedule includes vaccines to protect against 17 different pathogens, and you can find the schedule at the link at the bottom of the slide or by scanning the QR code that you see here. There's also an app you can find by searching CDC Vaccine Schedule, and that's been updated with the latest recommendations. Next slide.

Recommendations can be viewed by age, by medical condition, or other indications in two different tables. The schedule includes vaccine types, dosing frequencies and interval, considerations for special situations, and contraindications and precautions. In Table 2 shown here, the 'By indications' table, pregnancy is one of the conditions that is included. Recommended vaccines are in yellow; contraindicated are in red, and that includes why vaccines or those not recommended during pregnancy. Next slide.

And those in purple are recommended for adults with additional risk factors or another indication. For pregnancy, those include hepatitis A and meningococcal vaccines, which I'll not go into today. Vaccines recommended during pregnancy that are in yellow across these two slides include hepatitis B, COVID-19, influenza, and Tdap. And I want to first mention hepatitis B. New recommendations for screening and testing were released earlier this year. Screening is still recommended for all pregnant people during each pregnancy, preferably early in first trimester, regardless of vaccination status or testing history. Screening at a minimum consists of a hepatitis B surface antigen; however, adults 18 and over previously unscreened can be offered a triple panel. These results can help identify people who have a current or resolved infection and those who may be susceptible and need vaccination. Last year, ACIP voted to recommend Hep B vaccination for all adults aged 19 through 59 years so something to assess during pregnancy. Several formulations are available, and three are recommended during pregnancy. Why is this important? Well, risk factors for hepatitis B are not always disclosed. And so universal vaccination including during pregnancy will protect all persons against future infection and potential future perinatal transmission. Next slide.

I'll now move on to safety and how we monitor this during pregnancy. Next slide.

Vaccination during pregnancy is closely monitored and is an ongoing effort using multiple data streams to identify any safety signals of concern and to further investigate safety signals or examine safety or pregnancy related outcomes for vaccination during pregnancy. For all four vaccines recommended during pregnancy, vaccination is safe, effective, and beneficial. The ongoing safety data continue to be reassuring, and any side effects for pregnant people are generally the same as the public with mild and resolving symptoms such as injection site soreness or redness, headache, fever, muscle aches, nausea, and fatigue. Next slide.

I'm going to review vaccination coverage data that we have available for Tdap, influenza, and COVID-19. Next slide.

Our latest data from an internet panel survey includes preliminary data from the 2022 to 2023 flu season, asking pregnant women whether they received a Tdap vaccine during their pregnancy. Final estimates including race and ethnicity information for this last season will be published soon. These data show that, overall and for White women, coverage in 2022 to 2023 was higher

than 2021 to 2022. It's unclear whether the drop for last year was either a random variation in the data or a true drop that has rebounded. We can say that disparities persist, particularly for Black non-Hispanic women and Hispanic women compared with White women. Next slide.

For influenza, using that same internet panel survey, preliminary data indicate that coverage overall and by race ethnicity was similar to last season. Despite differences in point estimates across White, non-Hispanic Black, and Hispanic women, these were not significantly different. And this is likely due more to drops in vaccination coverage among White women in recent years and improvements among other groups, unfortunately. Dropping coverage greater than 10% is seen overall compared with the 2019 to 2020 -- the 2020 season. Next slide.

Our coverage data for COVID-19 vaccines is assessed among women who report being pregnant at the time of the survey and self-report previous COVID vaccination which may have occurred prior to pregnancy. While primary series completion does not demonstrate significant differences across race or ethnicity groups, the bivalent booster coverage is significantly less for Black non-Hispanic women than White women. And the rates indicate pregnant women are largely unprotected against COVID-19. Next slide.

In summary, Tdap vaccination coverage increased significantly overall almost 10 percentage points and among White women over 15 percentage points this season and is similar to that of 2019 to 2020 and 2020 to 2021 season. Although there are no significant differences in influenza vaccination coverage overall or by race and ethnicity between this season and last, compared to the 2019 to 2020 season, influenza vaccination coverage has dropped by over 10 percentage points. Next slide.

I'm now going to talk about Tdap vaccination during pregnancy. Next slide.

Pertussis or whooping cough is a highly contagious bacterial disease that is prevented by vaccination. Although pertussis can impact persons of all ages, infants are at highest risk for severe morbidity and mortality, especially during the early months of life before infant vaccinations begin. Pertussis is poorly controlled despite high vaccine uptake, which is primarily the result of waning immunity from currently available acellular Pertussis vaccine. Pertussis is a cyclic disease. And, in the US, we have observed a slow but steady increase in reported cases since the early 1990s up through the start of the COVID-19 pandemic with some large peaks in reported disease. In 2012, over 48,000 pertussis cases were reported. Next slide.

In late 2011, the United States introduced Tdap vaccination during pregnancy as a strategy to protect infants from pertussis during the first two months of life, which is when most pertussis-related deaths occur. The current ACIP recommendation states that a dose of Tdap should be given during each pregnancy, preferably in the early part of gestational weeks 27 to 36 to maximize the transfer of antibodies from mother to infant. However, Tdap can be safely administered at any point during pregnancy. Both Tdap products that are currently available in the US are FDA approved for use among pregnant people to prevent pertussis in infants less than two months of age. Next slide.

Numerous vaccine effectiveness studies conducted in the US and in other countries that have introduced maternal vaccination have found that the strategy is 69 to 93% effective at preventing infant pertussis. Additionally, Tdap vaccination during pregnancy has been associated with a 2.5 fold reduction in infant pertussis in the US. When infants do get pertussis, their infection is less severe if their mother receives Tdap during pregnancy. This vaccination strategy has been shown to reduce the risk of hospitalization or admissions to ICU among infants who do get infected with pertussis. Next slide.

Now let's talk about the importance of getting a flu vaccine during pregnancy. Next slide.

Influenza, or flu, is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and lungs. It can cause mild to severe illness and at times can lead to death. Pregnant people are at increased risk for hospitalization with influenza compared with nonpregnant people of reproductive age. Risk for hospitalization increases with increasing trimester. Some studies have also found an association between influenza or severe influenza and adverse pregnancy outcomes, such as preterm birth, stillbirth, and reductions in infant birth weight. Infants younger than 6 months of age have the highest rates of influenza-associated hospitalization of all children but are too young to receive influenza vaccines, which are licensed for use in children starting at 6 months of age. Next slide.

ACIP recommends that all persons aged 6 months and older receive an influenza vaccine annually. Persons who are or will be pregnant during influenza season are considered at higher risk for severe influenza and should be prioritized if vaccine supply is limited. There are now multiple different types of influenza vaccines licensed for different age groups and populations. Pregnant persons may receive any licensed age-appropriate quadrivalent inactivated or recombinant influenza vaccines. It's important to note that influenza vaccines may be safely given during any trimester of pregnancy. Influenza vaccine should be ideally offered in September or October with continued vaccination available throughout the influenza season. Starting with the recommendations for last season, the 2022 to 2023 influenza season, ACIP also recommended that early vaccination in July or August can be considered for pregnant people in their third trimester if vaccine is available at that time. The rationale for this guidance is to optimize protection of infants who will be born during the upcoming influenza season because infants younger than 6 months of age are ineligible for influenza vaccination. It's important to note this guidance allows for consideration of early vaccination of pregnant people in the third trimester if vaccines' available with the recognition that influenza vaccines for the upcoming season are not always available as early as July or August. Next slide.

Influenza vaccination is the most effective method of preventing influenza illness for pregnant people and their young infants younger than 6 months of age. Influenza vaccine effectiveness is similar for pregnant people compared with nonpregnant people of reproductive age. A key benefit of influenza vaccination is the opportunity to protect both the pregnant person and their young infants through prenatal vaccination. Many studies have shown that vaccinated pregnant people pass antibodies to the developing fetus that can help protect against influenza in the first few months of the infant's life. Influenza vaccination during pregnancy has also been shown in multi-season studies and meta-analyses to lower the risk of influenza hospitalization in pregnant

people by an average of 40% and an infant younger than 6 months of age by an average of 72%.  
Next slide.

So now we're going to do a self-knowledge check. Which of the following are reasons to encourage pregnant people to get an annual influenza vaccine? A, Pregnant people are considered at higher risk for severe influenza B, Prenatal influenza vaccination reduces the risk of influenza and influenza-associated hospitalizations among pregnant people. C, Prenatal influenza vaccination reduces the risk of influenza and influenza-associated hospitalizations among infants in their first few months of life. D, A and B only; or E, all of the above. And the answer is all of the above. And we're going to go to the next. Yep. And I'll give a minute for you to look at the answer there. Okay. And go to the next slide.

And we're going to transition to COVID-19 vaccination during pregnancy. Next slide.

COVID-19 during pregnancy is associated with more severe maternal health outcomes and adverse pregnancy outcomes. The risk of complications has been lower but is still elevated during the Omicron variant predominant period compared with the pre-Omicron period, which might be due to the impact of prior infection and vaccination. Most hospitalized pregnant persons with a positive SARS-CoV-2 test were not up to date with vaccinations. When considering COVID-19 in infants, COVID-19 associated hospitalization rates in infants ages zero to 5 months increased in the Omicron period and were higher relative to the pre-Omicron period with hospitalization rates similar to those seen in adults ages 65 to 74 years. The majority of infants ages zero to 5 months hospitalized with a positive SARS-CoV-2 tests or hospitalized with COVID-19-like symptoms and excluding birth hospitalizations, 20% of infants zero to 5 months of age with COVID-19 associated hospitalizations since June 2022 were admitted to the ICU, 20%. Next slide.

The good news is that several studies have shown that COVID-19 vaccines protect pregnant people from COVID-19, including from severe disease and hospitalization. These data are from a recent analysis in CDC's vision network and shows the vaccine effectiveness, or VE, against COVID-19 associated emergency department and urgent care encounters among pregnant people aged 18 to 45 years. The figure shows the vaccine effectiveness against COVID-19 associated emergency department and urgent care encounters for bivalent dose received during pregnancy was 61%. While we are not showing data for nonpregnant people in this presentation, the totality of the data show that the effectiveness of COVID-19 vaccines in pregnant people is similar to -- in nonpregnant adults, similar age. Next slide.

Additionally, COVID-19 vaccination of the mother during pregnancy can protect their infants during the first 6 months of life from being hospitalized with COVID-19. These data are from the CDC's Overcoming COVID-19 Network, which is a COVID-19 vaccine effectiveness platform that includes a network of children's hospitals nationally. This analysis examined the effectiveness of maternal vaccination during pregnancy in protecting infants less than 6 months of age from hospitalization due to COVID-19. Results here are looking at vaccine effectiveness against infant hospitalization during the first zero to 3 months of life on the top and during the first zero to 6 months of life on the bottom. COVID-19 vaccine doses given to pregnant people helped provide protection against infant hospitalization during both the first 3 and 6 months of

life. These analyses suggests that protection in infants from maternal vaccination may be highest in the first three months of life, although this difference wasn't statistically significant. Next slide.

Staying up to date with COVID-19 vaccinations is recommended for people who are pregnant, trying to get pregnant now or who might become pregnant in the future, and people who are breastfeeding. CDC recommends everyone aged 6 years and older should get one updated Pfizer BioNTech, or Moderna COVID-19 vaccine to be up to date. Next slide.

COVID-19 vaccines can be administered on the same day as other vaccines, including in pregnant people. Routine administration of all age-appropriate doses of vaccine simultaneously is recommended as best practice for people for whom no special contraindications exist at the time of the healthcare visit. Extensive experience with non-COVID-19 vaccines have demonstrated that immunogenicity and adverse event profiles are generally similar when vaccines are administered simultaneously as when they are administered alone. Therefore, providers should offer all vaccines for which a person is eligible at the same visit. Next slide.

So now let's talk about what's on the horizon for respiratory syncytial virus, or RSV, vaccination during pregnancy. Next slide.

RSV is the leading cause of hospitalization in infants. There are a couple of products on the horizon to prevent RSV in infants. On August 3, 2023, last week, an Advisory Committee on Immunization Practices, ACIP, Meeting was held to determine if one dose of Nirsevimab, which is a long-acting monoclonal antibody product, should be given to infants and some older infants for reducing the risk of severe disease from RSV. ACIP voted last week to recommend Nirsevimab to help protect all infants and some older babies at increased risk of severe illness caused by RSV. Specifically, CDC recommends one dose of Nirsevimab for all infants born during or entering their first RSV season, which is typically fall through the spring; and for a small group of children between the ages of 8 and 19 months who are at increased risk of severe RSV disease, such as children who are severely immunocompromised, a dose is also recommended in their second season. ACIP also voted to include Nirsevimab in the Vaccines for Children Program, which provides recommended immunizations at no cost to about half of the nation's children. Additionally, there is a Pfizer bivalent RSVpreF vaccine that is intended for use in pregnancy to protect infants after birth from RSV. Pfizer has submitted a biologics license application to FDA for use of their RSV vaccine in pregnant people to be given at 24 to 36 weeks gestation. An ACIP vote may be held at a future meeting if the vaccine is licensed by the FDA for use in pregnant people. Next slide.

Now I'm going to review some data for how to talk to patients and make a strong recommendation. Studies have consistently shown that a strong recommendation from a healthcare provider is a critical component to getting patients vaccinated. Next slide.

I know especially with COVID, healthcare providers are exhausted. Vaccine conversations have been challenging the last few years. And I want to give you some motivation to please keep going. This study captured how many times patients five years and up were offered COVID

vaccination prior to accepting the vaccine. Most patients accepted after declining once, and smaller proportions needed two to eleven times before agreeing to vaccination. Next slide.

We also know actually giving the vaccine or navigating to get the vaccine helps. Vaccination is consistently higher among pregnant people who reported receiving an offer or referral for vaccination compared with those who only reported a recommendation without offer or those who reported no recommendation or offer. And we see this both for flu shown on this slide and, next slide, similarly for Tdap as well. Next slide.

Over the next several slides, I'd like to share some findings from formative research CDC has conducted during COVID with pregnant people and in-depth interviews with healthcare providers. These are not nationally representative but can inform how we approach vaccine-related discussions and materials we share for patient education. First, safety concerns were raised by providers as a common concern among pregnant patients, particularly harm for pregnancy, worsening of short-term side effects, or unknown long-term side effects of vaccines. Access was also raised by pregnant participants as a barrier both to vaccination and prenatal care. Next slide.

Participants raised some preferences around language and tone of any vaccination-related material. Next slide.

Many appreciated question and answer format that aren't too long and provide links to additional information and can be easily shared. Next slide.

Participants suggested the use of diverse images with color. Some shared their dislike of illustrations and preferences for real-world -- real life images. And also shared logos may increase the credibility of information. Next slide.

Content may include information for each vaccine preventable disease and when to receive vaccines during pregnancy. Other suggestions include having information on breastfeeding antibody benefits, fertility concerns, and safety of the vaccine for baby as well as why vaccination is recommended. Next slide.

While we recognize vaccination protects maternal health, messages that tested well focused on how vaccines protect the baby. So including the benefits of vaccination for infant protection is recommended. Next slide.

Some summary tips from these findings include recommending and offering vaccines, which can maximize vaccination opportunities. Recognizing multiple conversations may be necessary, consider finding ways to engage your staff in your practice to answer questions and concerns. Provide the information often and early, possibly in the preconception period if possible. Pregnancy participants prefer the opportunity to review information. And, finally, remember, infant protection may be a strong motivator for vaccination and to include that in your counseling. I'll now pass it to Dr. Joseph.

Thank you, Dr. Jatlaoui. My name is Dr. Naima Joseph. I'm a maternal fetal medicine specialist and member of the Immunization Infectious Disease and Public Health Preparedness Workgroup for the American College of Obstetricians and Gynecologists. I'll be spending the next portion of the talk reviewing ACOG recommendations for vaccination in pregnancy and discussing clinical considerations and best practices for making strong recommendations for vaccination. Next slide, please.

I'd like to first review the rationale for vaccination during pregnancy. We know that pregnancy poses an increased risk for severe and adverse outcomes from infectious illnesses. Pregnancy is characterized by a combination of physiologic and immunologic changes that are important in terms of maintaining an immunologic tolerance of the fetus but unfortunately lead to enhanced susceptibility to infection as well as an increased risk that the disease itself has worse outcomes in the pregnant compared to the nonpregnant person. Next slide.

We also know that early infancy is characterized by what is called 'gap immunity', owing to several factors. One, is that the immune system is intentionally immature at this stage to prevent an exaggerated response from the neonate and newborn, but this does make infants more in equipped to effectively respond to new infections. Also, as was mentioned previously, there are restrictions on vaccine provision, and children under 12 months are precluded from receiving vaccines when living pathogen components. Next slide.

So, in essence, we know that vaccine induced immunity protects both the birthing person and the infant when compared especially against natural infection. Next slide.

Additionally, vaccination during pregnancy promotes long-term preventive care and wellness because of the several opportunities that we have as prenatal care providers to establish relationships with patients, and that can lead to effective vaccine counseling. Next slide.

And, ultimately, this promotion of lifelong health and well-being in the short- and long-term can contribute to reducing disparities in health outcomes, such as we've seen with the COVID-19 pandemic but also in terms of other infectious disease outcomes. Next slide.

So, ultimately, obstetric care providers can play a key role in improving vaccine uptake during pregnancy. We've already discussed the burden of infectious diseases on pregnant persons and their infants and the lagging immunization rates. But often, as we know as prenatal care providers, these decisions against vaccinations stem from concerns from the patient's health and that of the fetus. Next.

We can leverage the frequency of prenatal care to elicit concerns and to provide guidance, which is crucial to improving vaccine confidence during both pregnancy for the patient but for their children moving forward. Next. Next.

We can provide strong recommendations during vaccines during pregnancy. Next.

Because we know and as I'll go through this data more, we know that patients who receive strong recommendations from their OB provider are more likely to receive the vaccine. Next.



And, during this counseling, we can affirm the role of vaccines during -- towards long-term maternal and infant health outcomes. Next.

Which is especially beneficial to all patients and those specifically who are distrustful of the health healthcare system, may have had poor relationships in the past with their providers but have an opportunity to develop longitudinal relationships during their pregnancy. Next slide. Next.

I want to take a moment to review the vaccines that are recommended during pregnancy again. We can offer any of the effective bivalent COVID-19 mRNA vaccines for those who are eligible. Next.

Inactivated influenza vaccine during seasonal flu season. Next.

Hepatitis B vaccine for those who are eligible. And next -- I'm sorry. And the Tdap vaccine, which should be offered in every pregnancy. Next.

Specifically when discussing the recommendations for COVID-19 during pregnancy, it's important to note that COVID-19 vaccination is recommended for all unvaccinated persons; and pregnancy should not be an exclusion. Next.

At least one bivalent mRNA vaccine with either Moderna or Pfizer BioNTech is recommended. Next.

And just a reminder that the monovalent mRNA vaccines in the Johnson & Johnson vaccines are no longer available in the United States. We often are asked whether or not pregnancy represents an especially enhanced risk for those who might be a candidate for an additional dose. And this does require further counseling with the patient and eliciting their complete medical history to see whether or not they have conditions that might pose them in enhanced risk in addition to pregnancy. But the decision to offer a second dose solely on the basis of pregnancy can be made on an individual basis with that -- with the patient and her provider. Next slide.

Novavax COVID-19 monovalent vaccine may also be used for those who are unable or unwilling to receive an mRNA vaccine. Next slide.

As was discussed, the Tdap vaccine should be administered in each pregnancy between 27 and 36 weeks, ideally as early as possible in that window. Next slide.

It can be offered prior to 26 weeks, but this may be based on local outbreak or for exposure prophylaxis. Next slide.

And it also can be offered postpartum if it is known that the patient has not received the vaccine or if there is uncertainty regarding vaccination during the pregnancy. Next slide.

The inactivated quadrivalent or recombinant influenza vaccine should be administered annually during flu season, as was presented. Ideally, this is administered during September to October but can vary based on local transmission. Next slide.

It's important that the vaccination is provided for maternal and infant benefit but that you should not delay vaccination to the third trimester. Next slide.

And, as was discussed previously, the CDC does recommend hepatitis B vaccination amongst all adults aged 19 to 59 who have not been vaccinated, and pregnancy is not an exclusion. In fact, ACOG does encourage universal screening and vaccination during pregnancy, as this has been shown to be a safe, effective, and cost-effective strategy to reduce the burden of hepatitis B in the United States. Next slide.

Free vaccination testing, which includes testing for hepatitis B surface antigen, surface antibody, as well as core antigen can be performed during the initial prenatal lab set. Next slide.

And vaccination does consist of three intramuscular infections, administered one and six months after the first dose or accelerated, one and four months after the next dose. We know that vaccination as a strategy also reduces the risk of perinatal transmission, which is associated with increased morbidity of liver disease. Vaccination can be administered irrespective of trimester in pregnancy. Next slide.

Vaccines can still be offered in these scenarios, and there are a few contraindications to vaccines. They can be offered in the presence of low-grade fever or in persons with history of non-severe immunization reaction or history to allergy to eggs, neomycin, and streptomycin. Persons with Guillain-Barre Syndrome can be questioned regarding the timing of GBS onset in relation to vaccine. And, if within six weeks, they can be counseled that there is a low risk of recurrence, and they can still be offered vaccination. As was discussed, coadministration of vaccination is recommended. Next slide.

I would like to spend some time discussing how we engage with patients in vaccine counseling and what drivers of vaccine decision-making that are specific -- that are included and are specific in pregnancy. We know when we engage with patients of vaccine counseling that they do not make healthcare decisions in isolation. And this framework, the behavioral and social determinants of vaccination framework, illustrates the complex influences and motivators and barriers for vaccinations. Vaccine choices may be influenced by self-perceived risk and safety for themselves in their pregnancy; by the opinions of their partners, family, friends, and peer support networks; their relationship with their healthcare provider; as well as practical issues such as the ease of access and the availability of onsite vaccination. Next slide.

A review of pregnancy specific barriers to vaccination include, first, the risk of exposure to the disease; second, whether an infection poses special risks to the mother; third, whether an infection poses a special risk to the fetus; four, risk of vaccine safety and efficacy in pregnancy; and, next slide, five, whether or not there's support from their partner, family, and their community; six, whether or not they have easy access to the vaccine; and, finally, whether or not

they find their healthcare provider to be trustworthy. Ultimately, this may cause some patients to find that the risk for vaccination far outweighs the benefits. Next slide.

However, in the survey conducted by ACOG in which 900 pregnant patients responded, over 75% stated that the prenatal care provider was the most important source of vaccine information and that their recommendations outweighed those of their support networks in choosing whether to receive the Tdap, influenza, and COVID-19 vaccines. Next slide.

Additionally, respondents were asked the top three reasons they chose to receive the influenza, Tdap, and COVID-19 vaccines during their pregnancy. And the number one reason for each was because of the healthcare recommendations but also because of the motivation to protect their pregnancy and their baby and to protect their health. Next slide.

Self-knowledge check number 2: When counseling pregnant patients regarding vaccination, what is the most likely to impact the decision to get vaccinated? A, the patient's racial or ethnic background; B, the proximity of vaccine site to the provider's office; C, obstetric care provider's recommendations; or, D, cost. Next slide.

The correct answer is C. Data show that prenatal care providers are the most trusted source for vaccine information, and the healthcare provider recommendation is most likely to impact a patient's decision to be vaccinated. Next slide.

And so, essentially, these information were shared with you so that you understand that your recommendations matter and that your patients look to you as the most trusted information source in choosing whether or not to receive the vaccine. Additionally, other pregnancy specific facilitators to vaccination include: We discussed clinician recommendation; next.

Confidence in vaccine safety and effectiveness, their self-perceived risk of infection, and their risk of -- their self-perceived risk of the severity of infection; their understanding around -- regarding the benefits of vaccination; and, finally, whether or not they have access to vaccination sites, all of which can be discussed and engaged with during counseling. Next slide.

It is important when engaging with patients regarding the vaccination that we address the factors across the frameworks and especially those pregnancy specific facilitators of vaccination. So including external influences, such as peer, family, community influence, their own past experiences with vaccines and the health system, how that impacts their health-seeking behavior. It is important to address when engaging patients with vac -- regarding vaccine counseling. It's important to individualize your approach. And so being specific regarding patient's specific risk of infection and risk of disease severity and discussing the available data regarding not only the safety and effectiveness of the vaccine but also the available data regarding obstetric and perinatal outcomes in regards to infection. Individualize your approach. Listen to and validate concerns. Address misinformation, and address pregnancy specific data regarding safety and efficacy. Being transparent regarding the data, but knowing that we have high-quality data regarding safety and efficacy as well. And also it's important to remain knowledgeable regarding vaccine access. And, for instance, vaccines.gov does allow you to search closest locations for COVID-19 vaccines. Next.

One mnemonic that can help facilitate vaccine counseling is SHARE, which captures some of the best practices that I've described, as well as what was mentioned in Dr. Jatlaoui's discussion regarding tips and best practices. The SHARE approach asks you to, S, share your patient's -- seek your patient's participation; H, help your patient explore and compare treatment options; A, assess your patient's values and preferences; R, reach a decision; and, E, evaluate your decision. And, ultimately, the SHARE approach can help you communicate the dual benefit of vaccination for the birthing patient and their infant while allowing patients to feel comfortable and safe in engaging in decision -- in vaccine decision-making and choosing the option that meets -- that's best for them at the moment. Remembering that, through prenatal care, there is an opportunity to repeat these conversations, elicit concerns, and address -- and address questions when needed. Next slide.

I wanted to refer you to the ACOG website which has a number of resources to assist you in your practice and in vaccine counseling. The first thing is this immunization guide. Based on this talk, you know that Tdap is recommended every pregnancy, and pregnant persons are not excluded from recommendations for adult vaccination against influenza, hepatitis B, and COVID-19. This does provide a summary of those recommendations but also provides some guidance regarding other vaccines which you can reference, in addition to the CDC website. Next slide.

We've shown that patient education videos and infographics are helpful in engaging patients regarding vaccines. And the website does have four patient videos focused on communicating the importance of getting -- of getting your recommended vaccines for patients and that are tailored and specific for Tdap, influenza, and COVID-19. Next slide.

As well as infographics which can be shared to your patients or displayed in your office. Next slide.

And for COVID-19 specifically, there is a 90-minute training video called Inform to Empower, which does assist you in providing effective counseling regarding COVID-19 vaccine specifically. Next slide.

I'd like to share that across other media. We have podcasts that feature physicians and patients sharing their experiences with the COVID-19 pandemic and their experiences with vaccines. Next slide.

Tools to improve efficiency for vaccination in your practice. Next slide.

Practice advisories. Next slide. Patient Education Resources. Next slide.

And coding tips for immunization. Next slide.

I'll now turn this over to Mr. Khan. Thank you.

Presenters, thank you so much for providing this timely information to our audience. We will now go into our Q&A session. In addition to our presenters, I would like to welcome the following SMEs for the Q&A session. Joining us are Dr. Lakshmi Panagiotakopoulos, a medical

officer in CDC's National Center for HIV, Viral Hepatitis, STD, and TB prevention. From CDC's National Center for Immunization and Respiratory Diseases, we have Miss Tami Skoff; a senior pertussis epidemiologist, Dr. Fatimah Dawood, who's a pediatrician and a medical officer for the Influenza Prevention and Control Team; Dr. Katherine Fleming-Dutra, Team Lead of the Vaccine Effectiveness and Policy Team; and Lieutenant Commander Hilda Razzaghi, who is the Senior Epidemiologist COVID-19 Vaccine Data Lead and Acting Associate Director for Science. Also joining us from CDC's National Center for Emerging and Zoonotic Infectious Diseases are Dr. Pedro Moro, acting team lead for the VAERS Project and response team and vaccine safety subject matter expert for the Immunization -- excuse me -- Safety Office -- pardon me. And Captain Christine Olson, Co-lead for CDC's COVID-19 Vaccine Pregnancy Registry and medical officer for the Immunization Safety Office. Thank you, everyone. And we will now go into our Q&A session.

Our first question asks, Is the Tdap vaccination during pregnancy really that important? Everyone around the newborn is up to date with pertussis vaccinations.

Hi. This is Tami Skoff, and I'm happy to take that question. So this is a great question. And while it's important for everyone to be up to date on their pertussis vaccinations, Tdap vaccination during pregnancy is actually the only way to provide direct protection to young infants. And so, by vaccinating mom during pregnancy, passive antibodies are transferred directly to the infant. And these antibodies then protect the infant until the infant can receive their own vaccines at two months of age. This is really important to provide direct protection to the infant because numerous studies have found that, although pertussis in siblings are often source of pertussis infection in young infants, approximately 50% of the time, we don't know the source of an infection. So vaccinating around the infant can only be so effective. And we know that maternal vaccination during pregnancy is a very effective strategy at preventing disease in newborns. Thank you.

Thank you very much. We have multiple questions about timings of vaccinations based on the pregnancy. This question asks, what is the optimal time during pregnancy to administer the COVID-19 vaccine?

Hi. This is Katherine Fleming-Dutra. I'm happy to answer or to address that question. Really, the important piece is being up to date with COVID-19 vaccines. CDC recommends that all persons ages 6 months and older up -- you know, remain up to date with recommended COVID-19 vaccines. And this is especially important for pregnant people. It's because, if you're pregnant or were -- you are pregnant currently or recently pregnant, you're more likely to get very sick from COVID-19 compared to people who are not pregnant as Dr. Jatlaoui already reviewed in the presentation. And if you have COVID-19 during pregnancy, you're also at increased risk of complications that can affect your pregnancy and the developing baby. And so we want to really do everything in our power to keep both mom safe during their pregnancy and to protect themselves and their babies from severe complications, hospitalizations, and death. And the most important tool we have to do that is COVID-19 vaccination. So the bottom line is, people should stay -- pregnant people should stay up to date with COVID-19 vaccinations at all times, including getting that updated vaccine as soon as they're eligible.

Thank you very much. Along the same lines, we have other questions about timing. For example, is there a preferred gestational time period for giving flu vaccine to pregnant people?

Hey. This is Fatimah Dawood. I can answer that question. There is no preferred gestational timing for giving influenza vaccines. And as Dr. Jatlaoui pointed out earlier, the Advisory Committee on Immunization Practices recommends giving flu vaccines to pregnant people during any trimester of pregnancy. I think a follow-up point that's worth highlighting here is the goals of influenza vaccination for pregnant people are to both protect the pregnant person from influenza disease, as well as to protect their infant.

Thank you very much. And I think, in spirit of the sheer amount of questions we have on this topic, I think it would be fair to ask the presenters, if you could do sort of a summary statement or, you know, clarify the vaccine scheduling and administration for pregnant people, depending on the timing within the pregnancy. For example, we're seeing questions about receiving a vaccine and then perhaps getting pregnant again 12 to 15 months later. So if you can kind of summarize some of your recommendations, I think that'd be super helpful.

This is Tami Skoff. I'm happy to start off for pertussis. So, as we've discussed, we do recommend pertussis vaccination during every pregnancy. And this is because we know that antibody levels from Tdap wane substantially during that first year following vaccination. And so it was decided -- you know, we know that antibodies in one pregnancy aren't going to be sufficient to protect in subsequent pregnancy. Thank you.

Thank you very much. Our next question asks, you mentioned the recommendation for hepatitis B vaccination. Is there a similar recommendation for pregnant people for hepatitis A?

Hi. This is Lakshmi Panagiotakopoulos. I can answer that question. Hepatitis A vaccine is recommended during pregnancy if there is an indication for vaccination. So the difference between the recommendations for hepatitis A and hepatitis B is that hepatitis B vaccine is recommended for all persons in the United States through age 59, while hepatitis A is only recommended in adults for persons at risk of acquiring hepatitis A. So, for example, if you have a pregnant person who is traveling internationally, that would be an indication to receive hepatitis A vaccine during pregnancy.

Thank you very much. A similar question asks, Can you share your recommendations or rationale for using the two-dose hepatitis B vaccine versus the three-dose hepatitis B vaccine for pregnant people?

Sure. This is Lakshmi again. The two-dose hepatitis B vaccine, or Heplisav, is not recommended for use during pregnancy because of the lack of safety data about using this vaccine in pregnancy. So, in other words, there are no safety concerns about using the vaccine, but we just lack the data to have that recommendation. The vaccines for hepatitis B that are recommended during pregnancy are Engerix, Recombivax, and Twinrix vaccine, which are all three-dose vaccine series.

Thank you very much. Our next question asks about the recommendations for communicating effectively with strong recommendations for vaccination to pregnant people. Can you please explain as part of your acronym the evaluating your patient's decision element and what that would entail.

Sure. This is Naima Joseph again, responding to that question. So, essentially, after you've gone through the components of SHARE, the E part would be again to affirm the patient's decision either to get vaccinated or not get vaccinated and ask their permission to continue to readdress that choice if they've chosen against vaccination at the time or providing them with resources to either provide on-site vaccination or referring them to a place to get the vaccine that you've recommended.

Thank you very much. Our next question is asking more so for a clarification. And they want to know if the history of Guillain-Barre is no longer considered a contraindication for influenza vaccination for pregnant people as well.

This is Fatimah Dawood. I can take that one. So the recommendations for the general population in terms of contraindications apply here as well for pregnant people, sorry. To be clear, for pregnant people to answer the question.

Great. Thank you. And we have time for one more question. And the question asks, What are the most common hesitations or barriers to COVID-19 vaccination that you've seen for pregnant people. And, conversely, I would assume they also would like to know some recommendations for overcoming those hesitations or barriers.

This is Lieutenant Commander Hilda Razzaghi, and I can answer part of that question. Based on the surveys that were noted and in panel surveys, some of the main reasons that pregnant woman mentioned not receiving their bivalent booster dose was around safety. And that is safety and effectiveness of the vaccine, as well as being concerned about the side effects of the vaccine for themselves and their babies.

Great. Thank you very much for that.

Again, I want to thank all our presenters and our subject matter experts who joined us for the Q&A session for taking time to share their expertise with us today. I also want to thank all our audience for joining us and to share these continuing education directions with you.

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We invite you to join us Thursday, August 17, at 2pm Eastern for our next COCA call. The topic will be “We Must Maintain Measles Elimination in the United States: Measles Clinical Presentation, Diagnosis and Prevention”. You can visit [emergency.cdc.gov/coca](http://emergency.cdc.gov/coca) for more details about this COCA Call and other upcoming COCA Calls.

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Again, thank you for joining us for today's COCA Call. And have a great day.