**Addressing Vaccine Administration Errors Webinar**  
Washington State Department of Health  
Transcript from 4/27/2022

- So I know folks are still trickling in, but we've got about a hundred folks right now. So I'm just gonna get started here. So welcome to the Washington State Department of Health's Addressing Vaccine Administration Errors webinar. Hope you all are having a great Wednesday. So I'm gonna go over some ground rules and stuff before we start, or just kind of how the webinar is run. So I'm Phil Wiltzius. I'm a health educator at the Washington State Department of Health, and I'm gonna be moderating the webinar today. So everybody who is watching the webinar, we have you muted and you won't be able to chat. However, if you do have any questions about the presentation, you can ask them in the Question and Answer box. And when we finish the presentation, we will get to questions at the end. Just please note: try to keep your questions on topic to the webinar. Any questions not related to that, we won't be answering those. We do offer continuing education for nurses, medical assistants, pharmacists and pharmacy techs. And so I will have some more information about that at the end of the webinar, but basically make sure that you've registered for this webinar, you watch it, and then you complete the evaluation at the end. And this is all posted on our Webinar webpage. And I'm just gonna show you real quickly. I think we will have the webinar slides linked to you in Zoom here shortly, but I wanted to just give you like a really easy way of accessing our Training webpage. So if you're on our doh.wa.gov website, if you search for Immunization Training, we have just this giant page to help you with all sorts of immunization trainings. And on the left column here on that page is our Addressing Vaccine Administration Errors webinar, where you can find the slides and we'll have the recording posted probably in the next week as well. So you can still watch it if you miss this webinar. This is just some more information about continuing education credit. So we're doing one hour of continuing education credit. So some quick disclosures. So the planners and speakers of this activity have no relevant financial relationships with any commercial interests pertaining to this activity. And as I mentioned before, I'll talk a little bit more about continuing education at the end of the webinar. So I'm gonna introduce our presenter here. So Sarah Schillie is the team lead for the Education Team within the CDC's Immunization Services Division. Dr. Schillie is a graduate of the University of Missouri School of Medicine. She completed her pediatrics residency training at Pennsylvania State University and her Preventive Medicine residency training at SUNY Stony Brook. She received her MPH from Columbia University and her MBA from Long Island University. Dr. Schillie served as a Director of Performance Improvement for the Suffolk County Department of Health Services in New York from 2003 to 2007 and has been with the CDC for the past 15 years since joining as an epidemic intelligence service officer in 2007. So thank you, Sarah. We're very excited to have you, and I'm going to turn it it over to you.

- Great. Thank you so much. I'm happy to be here with you virtually this afternoon to talk about vaccine administration errors. Next slide. So a couple of disclosures, I'm a federal government employee. I have no financial conflict of interest to disclose. As with all of our CDC presentations, this presentation does not necessarily represent the official position of CDC. And then lastly, some of this discussion may be considered off-label use as some COVID vaccines and some uses are not yet licensed under a BLA, but rather are authorized for use under an EUA. Next slide. So the objectives of this presentation are: to identify common vaccine administration errors and strategies to prevent these errors, to describe ways to address vaccine administration errors and to describe relevant resources to prevent vaccine administration errors. Next slide. So what is a vaccine administration error? A vaccine administration error can be defined as any preventable event that may cause or lead to inappropriate use or to patient harm. And these events may related to practice issues to immunization products or to the ancillary supplies, errors related to storage, or dispensing, or vaccine administration. Next slide. And vaccine administration errors can impact for patient safety and vaccine efficacy. So examples of errors affecting safety would include: inadvertent administration of a vaccine to someone younger than the authorized age for whom safety data was lacking, inadvertent administration into the bursa of the shoulder or too deep past the deltoid muscles, we call that SIRVA or shoulder injury related to vaccine administration, or too large of a dose. Examples related to efficacy that may impact vaccine efficacy could include: inadvertent subcu administration of a vaccine that's actually intended for IM administration. It's related to the properties of the subcutaneous fat and a better immune response is usually achieved when vaccine is administered into the muscle, as opposed to the fat. Using an incorrect diluent might affect vaccine efficacy and also too small a dosage, and some errors can affect both safety and efficacy. Next slide. We have a couple of poll questions interspersed throughout this presentation. So the first one is: all of the following practices help to ensure safe medication administration, except in... I should add, for the purposes of this presentation, we're considering vaccine to be analogous to a medication. So all the following practices help ensure safe medication or vaccine administration except: A, use of protocols, B, use of checklists, C, relying on memory, or D, differentiating sound-alike products.

- [Phil] I'm gonna launch this poll question here. So we've launched a poll question, so you can answer using the Zoom poll. I would say we've got about a hundred people have voted out of the 140 we have so far. I'm gonna end the poll here in about five seconds. So if you haven't answered, please feel free. All right, I'm gonna end the poll and share the results. So 93 said relying on memory.

- Great job, and I'll discuss that a little bit more on the next slide. So if you can go to the next slide. So yes, preventing medication errors or preventing vaccine administration errors, the Institute of Medicine recommends these proven medication safety practices. So reducing reliance on memory, as most of you got right. Institute of Medicine also recommends standardization and use of protocols and checklists, differentiating look-alike and sound-alike products. That's especially relevant for vaccines. For example, there's the pediatric Hepatitis B vaccine dose and the adult Hepatitis B vaccine, and Hepatitis B sounds like hib or HPV sound. There's a lot of potential with vaccines for look-alike and sound-alike products. And then also IOM recommends monitoring error frequencies and implementing systems-based approaches to prevent errors from occurring. Next slide. So in the next couple slides, I'll go over some vaccine administration errors that have been reported in the literature. Next slide, please. So this vaccine administration error occurred in New Jersey at a work site and basically the work site contracted with a health services company to administer flu vaccine to their employees. And the vaccine administrator was supposed to use prefilled syringes of flu vaccine, but in actuality, she had flu vaccine doses at her house that were not stored properly and that were not monitored for temperature. And she used vaccine from those vials and one of the participants or one of the recipients at this work site clinic noticed that the vaccine administrator was using the same syringe for multiple patients. Now, when she was questioned, she said she alcohol-ed off the syringe between patients and that she used a different needle, but of course, one should never use the same syringe for multiple patients, and also the patients received incorrect dosage of the vaccine. So multiple errors happened here in this setting. There was potential for exposure to bloodborne pathogens. So probably a lot of anxiety amongst the vaccine recipients and the nurse who performed these actions ended up voluntarily surrendering her license shortly after this event. Next slide, please. Here's another fairly common error related to Menveo. So basically Menveo vaccine comes in a lyophilized component, which is the MenA component. And then it comes with a separate diluent, which is the MenCWY component. And there have been errors associated with administering the diluent alone, and one can sort of see how that error could happen. However, whenever this happens, the patient does not receive protection against the MenA component. Now in the United States, MenA is actually fairly rare. So if there's actually no chance that this patient might travel internationally, it might not be necessary to readminister this dose, but this should be sort of made in consultation with the patient's healthcare provider. Next slide, please. There's also been multiple reports of injecting rotavirus vaccine. So rotovirus vaccine, it's an oral vaccine, should be administered orally, but we do know that there have been multiple reports of the vaccine inadvertently being injected instead of administered orally. And about half of that patients experienced an adverse event, such as some reactogenicity at the injection site. Next slide, please. And then there's actually been multiple reports worldwide of inadvertent insulin administration instead of influenza vaccine administration. There's a little bit of an issue of a sound-alike name here and insulin is fairly commonly used. So just a note of caution that insulin should not be kept in the same area as vaccines. And with these multiple reports that have occurred, there actually have been some deaths due to hypoglycemia here. Next slide, please. And then now I'll switch gears a little bit and talk about some recent inquiries NIP-INFO has received regarding vaccine administration errors. And for those of you who aren't familiar with NIP-INFO, NIP-INFO is CDC's immunization inquiry service. So if you have a question about vaccines, you can email us and I have our address at the end of this presentation, and we will get back with you with an answer usually within 24 or hours, sometimes a little longer if we have to check with one of our experts. We're primarily a service for healthcare providers and health department staff, but we take questions from anyone, including lay persons, as long as the question is vaccine related. So these are questions we received in the past couple of months, just to give you a sample of the administration errors that have happened recently. So here's one: "An infant was born to a mother who's Hepatitis B surface antigen positive, and the infant received Hep B vaccine and HBIG within 12 hours of birth as recommended. However, both the vaccine and the HBIG were administered at the same anatomic injection site." And it's actually recommended that Hep B vaccine and HBIG be administered in separate limbs. There's a theoretical concern that the immune globulin could bind the vaccine and make either ineffective as a post-exposure prophylaxis. So in this case, it was recommended to repeat the vaccine and the HBIG in separate limbs. Ideally we want to do this within 12 hours of birth, but there's still probably some protection if these vaccines could not be administered or readministered in that timeframe, although certainly the sooner after birth, the better for these situations. Next slide, please. Here's another one: "Multiple pediatric vaccines," and these are inactivated vaccines, "were stored at too cold temperatures" and the inquirer had already contacted the vaccine manufacturers, which is typically the first step that we recommend in these storage deviations. "And the vaccine manufacturers advised that the vaccine is no longer viable." So in this case here, because we're dealing with inactivated vaccines and the vaccine manufacturer does not have data to support the stability of these vaccines, the recommendation is to go ahead and repeat these vaccines as soon as possible. If it were a live vaccine, we would typically say, wait at least four weeks before repeating the dose. So here's a situation in which the patients needed to be revaccinated. Next slide, please. Here's another one: "We use Hiberix in our office and it comes with its own diluent. However, we used a different diluent from another vaccine to reconstitute Hiberix." So again, in this case, we would usually recommend revaccination again, because it is an inactivated vaccine revaccination can occur as soon as possible. If it were a live vaccine, we would say to wait four weeks. And it's always a good idea to contact the manufacturer because sometimes they do have data that might support the stability or the viability of the vaccine in these situations, but here, that was not the case. Next slide. Here's an example of a sort of sound-alike name mix up. So here is an 11-year-old patient received a dose of Men B rather than Men ACWY. And they're asking, "What is the recommendation on completion of the Men B series? Do we wait until they are 16 years old?" So in this particular situation, Men B is recommended for a 16 year old based on shared clinical decision. So there's a couple of different options here. If it's felt that the patient does need Men B protection at 16 years of age, then it would be appropriate to vaccinate the patient then. It might be reasonable to count this dose that was administered at 11 years of age as dose number one, and then this other dose that they would get when they're 16 years old as dose number two, a little bit of sorta shared clinical decision-making on the course of action to take here. Next slide. And then here, the person is asking, "I have a question about any precautions needed if a third dose of Rotateq was mistakenly given only two weeks after the second dose." And here it's a case of the vaccine being administered at a shorter-than-recommended interval. And so when it's a shorter-than-recommended interval, it needs to be repeated. And the spacing of the repeat dose needs to be based on the minimum interval. So in this case, we recommended repeating that inadvertent dose, but waiting at least four weeks from the invalid dose to administer the repeat dose. And with Rotateq vaccine, we also don't wanna give that last dose at an age greater than eight months. So that was another caveat that was unique to this situation. Next slide, please. And then here's another name sound-alike error. "I have a 12-month-old patient who is inadvertently given HPV instead of Hep A as a nursing error." We're not aware that any sort of adverse effect would occur for this patient. Although this is a vaccine administration error and we try to prevent such errors from occurring, certainly that HPV dose will not count as the adolescent dose. So when the child reaches adolescence, they'll still need HPV vaccine, that it won't count as any of the HPV doses. Next slide. And then here is a six-month-old patient who was given Hib vaccine, PedvaxHiB in error. And the inquirer is wanting to know: "How do we proceed? Do we just ignore the dose? Does the child still get the booster dose at 12 to 15 months of age?" So PedvaxHiB is typically recommended as a three-dose series at 2 months, 4 months and 12 to 15 months. The other Hib vaccines are typically on a four-dose series with an additional dose at six months. So again, you can see how it's relatively easy for an error like this to occur. However, for this patient, that six-month dose does not count. And yes, they basically just ignore this dose and the child still needs PedvaxHiB between 12 and 15 months of age. Next slide. And now I'm gonna switch gears a bit and talk about some of the errors specific to COVID vaccine that we have received. So next slide. So early during COVID vaccine roll-out, we did an analysis of some of the inquiries we at CDC received. So these are inquiries coming into NIP-INFO or CDC Info and their inquiries related to COVID vaccine administration error. And we looked at the two-and-a-half-month time period at the very start of COVID vaccine roll-out. So between December 14th, 2020 through February 28th, 2021. And altogether during this two-and-a-half-month timeframe, CDC received 324 inquiries related to COVID vaccine administration error. Some of these inquiries represent errors affecting more than one patient, such as errors at a mass vaccination clinic related to storage excursions. And also, we certainly don't expect that every time a COVID vaccine administration error occurs that someone necessarily makes an inquiry in the CDC about that error. So this number is likely a fairly gross underestimate of the actual number of COVID vaccine administration errors. Next slide. So here is a breakdown of those 324 errors. If you look down to the fourth row, you can see that the most common error at this part of vaccine roll-out was actually a lower-than-authorized dose volume administered. We received several reports of, for whatever reason, the syringe must not have been attached tightly to the needle and the needle became disconnected from the syringe, part of the dose leaked out, or the recipient pulled away and the dose leaked out. So about a third of these inquiries were related to a lower-than-authorized dose volume administered. The next most common category was administration to a person younger than the authorized age. So at this point in vaccine roll-out, this was administration of the Pfizer vaccine to someone less than 16 years of age or someone under 18 years of age for the Moderna vaccine. I think sometimes parents maybe intentionally misstated their child's age to get them vaccinated or there was a variety of scenarios that happened that resulted in vaccine administration to a person younger than the authorized age. And then other frequent categories of COVID vaccine administration errors included inadvertent administration by the subcutaneous route instead of by the intramuscular route. That could be from using a needle that's too short. We also received some errors about administration at an incorrect anatomic site. So typically the deltoid muscle in the shoulder will be used for the site of COVID vaccine administration. We are aware that for some persons that have had a mastectomy, that their surgeon might advise them to avoid vaccinations in the deltoid muscle and vastus lateralis muscle of the anterolateral thigh is an acceptable alternate vaccination site. So that would not have been deemed an incorrect anatomic site, but the gluteal muscle, the buttock however would be considered an inappropriate IM vaccination site. And then there were a couple of instances in which someone maybe received the Pfizer vaccine for their first dose and the Moderna for their second or vice versa, and then some situations in which the second dose was administered earlier then the recommended interval. Next slide, please. For some COVID vaccine administration errors, we do not recommend repeating the dose. So errors in which it's not recommended to repeat the dose include a dose administered at an incorrect site or a dose administered by an incorrect route, also when vaccine is administered after the recommended interval, and then when a higher than authorized dose volume is administered. So let's talk a little bit about the first two bullets. For routine vaccines, so non-COVID vaccines, there definitely are some routine vaccines that we would recommend readministering that vaccine if it were administered at an incorrect site or by an incorrect route. So Hepatitis B vaccine is an example of a routine vaccine. If that were administered at an incorrect anatomic site, so the gluteus muscle or the buttock, it would be recommended to repeat that dose. Similarly, if the Hepatitis B vaccine was administered subcutaneously, instead of as recommended, intramuscularly, it'd be recommended to repeat that dose, but for COVID vaccines, we don't recommend repeating a dose administered at an incorrect site or by an incorrect route. The third sub bullet, vaccine administered after the recommended interval. So as with the routine vaccines, there is no such thing as a maximum interval. There are minimum intervals that need to be heeded, but it's generally not a problem to extend that interval and to administer subsequent doses at a longer-than-recommended interval. Again, it's the minimum intervals that we are most concerned about. There's typically not a worry with a maximum interval. So as with routine vaccines, when a COVID vaccine is administered at a longer-than-recommended interval, we don't recommend repeating it. And then we also don't recommend repeating a higher-than-authorized dose volume that was administered. Next slide, please. So repeating the dose is recommended for some errors. And for this, we generally would recommend repeating the dose as soon as possible, but preferably in the opposite arm, just to be able to assess for any local reactogenicity. So when a lower-than-authorized dose volume is administered when the vaccine is mixed with too much diluent, and then when only diluent is administered. And then I have some more examples of this later on in the presentation. There are some other situations as well. Next slide, please. So we do frequently get inquiries related to improper storage and handling of COVID vaccine or use of an incorrect diluent for COVID vaccine. And for these errors, the first thing we ask is that the manufacturer be contacted, and this is true with routine vaccines, as well as COVID vaccines, because sometimes the manufacturer has data that we're not aware of that might support or not the stability of the vaccine under those temperature excursions. So we always ask for the manufacturer to be contacted first. And as a general rule, if the manufacturer says, "We don't have data to support the viability of the vaccine under these temperature conditions," it's generally recommended that the vaccine doses be repeated. We do have sort of a small group of folks that tend to handle a lot of these complex storage and handling errors. So you can always feel free to email us and we will loop in our experts to assist you with the appropriate action to take in these situations. Next slide, please. So again, getting back to errors that impact vaccine efficacy and errors that impact vaccine safety. So speaking to the COVID vaccines specifically, data for the mRNA COVID vaccines are limited, but as a general rule, IM vaccine administration optimizes immunogenicity, just due to the properties of the muscle and antigen processing. And also IM administration minimizes local adverse reactions, such as the swelling or redness of the arm after vaccine. Some vaccines, such as the example I mentioned earlier with Hepatitis B vaccine, when some vaccines are inadvertently administered subcutaneously, we do recommend readministration intramuscularly. However, as I mentioned previously, readministration by the intramuscular route is not recommended for a COVID vaccine that was inadvertently administered subcutaneously. Now on the flip side, and this relates to routine vaccines, there are some routine vaccines that are intended for subcutaneous administration, such as MMR vaccine or varicella vaccine. And if those vaccines that are intended for subcutaneous administration are inadvertently administered intramuscularly, we do not recommend readministering those vaccines because the immune response is not likely to be affected by that inadvertent intramuscular administration. Next slide, please. And then speaking to errors affecting vaccine safety, there's not a lot of data regarding the COVID vaccines and administration errors. So for example, if someone younger than the authorized age inadvertently received a COVID vaccine, there could be safety concerns in the situation. Similarly, administering a second dose earlier than a four-day grace period could be associated with some safety considerations. And we are aware of several reports of SIRVA or shoulder injury related to vaccine administration that occurred following inappropriate COVID vaccine administration. So basically the needle was too long and went past the deltoid muscle and entered the underlying tissues around the shoulder joint and the bursa, and basically the patients experienced limited mobility of their shoulder joint and pain in the shoulder. Next slide, please. This is another analysis we did of NIP-INFO inquiries. So this analysis was not looking at vaccine administration errors, but this analysis rather looked at the inquiries NIP-INFO received regarding children in the 5 through 11-year-old age group. We wanted to characterize these inquiries to inform and prepare vaccination providers for the younger children COVID vaccine roll-out. So it wasn't intended at all to look at vaccine errors, but of the inquiries regarding children age 5 through 11 years old received by NIP-INFO, 16% were related to a vaccine administration error. So it just sort of speaks to the frequent nature that these errors tend to occur. Next slide, please. I'm gonna review the clinical considerations. So the next few slides are taken from Appendix C in the Clinical Considerations. And this is I think probably a resource that we all look at many times a day and there's some really useful guidance in this document for many aspects of COVID vaccine administration and including for actions to take when a COVID vaccine administration error occurred. So I'll review those on the next few slides. So the first part here in the red box, I mentioned this earlier, but whenever a COVID vaccine is administered at an incorrect site, so a site other than the deltoid muscle or other than the vastus lateralis muscle of the anterolateral thigh, we do not recommend repeating that dose, and that's in contrast to some routinely recommended vaccines. And similarly, when a COVID vaccine is inadvertently administered by the incorrect route, so subcutaneous administration, again, we don't recommend repeating that dose. And again, that's in contrast to some of the routinely recommended vaccines. Next slide, please. Then we have guidance when the vaccine is inadvertently administered to someone younger than the authorized age group. I should also note that there are footnotes and I'll review those in a minute, but there are footnotes with this table that are also important to consider, but here the first row is when a COVID vaccine is administered to someone younger than the authorized age group. We don't recommend giving another dose. We don't recommend completing the series in this person. Whenever, for example, a Moderna vaccine is administered to someone 5 to 11 years of age, we would recommend the age appropriate Pfizer dose for that person, at least 28 days after the Moderna vaccine. If the inadvertent administration was the Janssen vaccine, the efficacy of that vaccine in this age group is unknown. So similarly, it's recommended that this patient would receive a Pfizer dose at least 28 days after the Janssen dose. And then there's similar guidance in that last row for persons age 12 through 17 years of age. And I would suggest that folks refer to this table because there are some nuances and I guess it's one of the situations in which we should reduce our memory because there are so many nuances. So I feel like just always referring to this table is a good practice. Next slide, please. We received quite a few inquiries about formulation and dosage errors. So the first row, if a 5 to 11-year-old child was administered the 12 and older Pfizer formulation, depending on the dosage amount, we generally recommend not repeating it. However, there is some room for clinical judgment, and you can see many different scenarios outlined in this table. I'll talk about this in several more slides, but there is a footnote that I think is really important and it speaks to readministration. And we do have some language in that footnote that cautions about the risk of myocarditis if, for example, a repeat dose is administered too soon. So it might be that, especially if you're dealing with a male who is a teenager or a young adult, that it might be prudent to administer a repeat dose at a longer interval than one would otherwise readminister that dose. And I have some more on that in an upcoming slide. Next slide, please. So storage and handling errors. So after a temperature excursion or when a vaccine is administered after the expiration or the beyond-use date, the first step that we ask is that the manufacturer be contacted to see if they have information on the viability of the vaccine. If they don't, we typically recommend repeating the dose at no minimum interval, but again, that footnote, which I'll talk about in a few slides does recommend thinking about the risk of myocarditis and it might be prudent to extend that interval, especially for males who are in the age group most at risk for myocarditis. And folks are always welcome to contact us at CDC if they're trying to manage these errors. Sometimes there are some nuances and we're always happy to help them think through the best way to approach management of these administration errors. Next slide, please. So errors regarding intervals. So the first line here, whenever we're talking about an mRNA primary series administered prior to the recommended interval, we recommend repeating that dose. And there are some spacing considerations here to use, at least the minimum interval to space that. The guidance changes depending on if it's a booster dose or part of the primary series. And then if you look at the third row, any COVID vaccine dose administered at a longer interval is not recommended to be repeated. So some of this is very analogous to the recommendations for routine vaccines in that there are minimum intervals that must be heeded, but there are no maximum intervals. So as with routine vaccines, a vaccine administered too short of an interval is typically recommended to be repeated, but there really is no such thing as a maximum interval. So it's not necessary to readminister a vaccine if it were administered past a certain interval. Next slide, please. Here are some diluent errors. So if only diluent was administered, the appropriate action is to administer the authorized dose immediately. If the diluent error resulted in a higher-than-authorized dose, we would not recommend repeating that. If an incorrect diluent is used, we ask that the manufacturer be contacted for stability information, and then you can see other scenarios here related to errors of diluent and vaccine administration. Next slide, please. So this slide is the footnotes that belonged to the slides from tables for the past five or six slides. I won't go over them in great detail, but it is always important to read the table with the accompanying footnotes. So I'll just highlight a few of them. The second footnote here is when a higher-than-authorized dose is administered, usually we still say it's fine to administer the subsequent dose at the recommended interval, but there is some room for clinical judgment. So if the person experienced some unusual reaction from that higher-than-authorized dose, there might be a decision on a case-by-case basis to delay a subsequent dose. The last bullet here, people who turn from 11 years of age to 12 years of age between their two Pfizer doses can get either formulation and an error related to that does not need to be reported to VAERS. Next slide, please. And then this first footnote here, I do feel like that's a really relevant footnote and that's that footnote accompanies a lot of the cells on the earlier table related to repeating a dose and specifically those cells related to repeating a dose as soon as possible. So I do wanna call out that some experts do suggest delaying the repeat dose for eight weeks after an invalid dose, based on the reactogenicity and the risk of myocarditis. And this is specifically most relevant for males in the 12 to 39-year-old age group. Next slide, please. So for all COVID vaccine administration errors, we recommend informing the recipient of the error. And then we recommend that the vaccination provider consults with the state immunization program or the IIS to determine how to inventory document that dose and all COVID vaccine administration errors are required to be reported to VAERS or the Vaccine Adverse Event Reporting System. There are a couple of very, very rare exceptions, but for the most part, all COVID vaccine administration errors, regardless of whether or not they are associated with patient harm are required to be reported to VAERS. That's in contrast to routine vaccine administration errors, which are encouraged to be reported to VAERS, but they're not required to be reported to VAERS unless they are associated with an adverse patient outcome. Next slide, please. Also CDC recommends that when an error occurs, that actions are taken to determine how the error occurred and implement strategies to prevent the error from happening again. And we have some resources that address that, such as the Pink Book and some resources on vaccine administration. Next slide, please. A couple of resources here. Next slide, please. So to prevent vaccine administration errors, it's important to have knowledgeable staff and staff that are well trained. This was especially relevant during the initial phases of COVID vaccine roll-out, when a surge vaccination provider workforce was used. So prior to administering vaccines, all vaccination providers should have competency-based training and should have their skills validated. And the training should be integrated into new staff orientation and into continuing education requirements. And there should be ongoing education whenever vaccine administration guidelines are updated or when new vaccines are added to a facility's inventory. And then it's also important to not forget about temporary staff. Next slide, please. So infection control. That example I used at the beginning with the work site in New Jersey, where 67 persons were administered flu vaccine with reusing the same syringe, I mean, that had significant infection control implications. So hand hygiene should always be performed before preparing and administering vaccines as well as between patients and anytime hands become soiled. When administering injectable vaccines gloves are not required to be worn unless there's a likelihood that the vaccine provider's gonna come into contact with body fluids. If gloves are worn, they do need to be changed between patients and hand hygiene needs to be performed even if gloves are worn. When vaccine providers are administering oral or intranasal vaccines, they should wear gloves. Next slide, please. And vaccines are like medications. It's important to maintain proper infection control practices, such as preparing the vaccine in a clean medication preparation area. And then the vaccine supplies should be disposed of, in a puncture-proof biohazard container. Next slide, please. So CDC has some resources on safe injection practices. So professional standards for medication administration should be adhered to when administering vaccines. The manufacturer's specific guide... A swab should be used to disinfect the vial stopper before entering the vaccine. And then it's always important to just reemphasize that a single-dose vial is intended to be used only for a single patient or a single injection. I know sometimes folks don't like to waste vaccine or to waste medicine, but it's inappropriate to use leftover product that's remaining in a single-dose vial. It shouldn't be combined with leftover product from other vials. It shouldn't be used. It has to be discarded. A single-dose vial should be used only for a single patient and for a single injection. Next slide, please. It's also important to have current resource materials for your vaccine provider staff. So for example, this is Table 3-2 from the ACIP General Best Practice Guidelines for Immunization that has the minimum intervals between the doses of a vaccine. So staff can check this table to make sure they're adhering to the correct dosing intervals. And then again, making sure staff are trained about vaccines that are in the facility's inventory and using your state's immunization information system as appropriate. Next slide, please. Some strategies to prevent errors include looking at the storage of vaccines. So storing vaccines on separate shelves if they have sound-alike names or storing like the pediatric version of the vaccine on a separate shelf from the adult version. And then CDC has these vaccine storage labels that are depicted here that might help to prevent vaccine administration errors related to storage of vaccines. Next slide, please. We recommend that persons only administer vaccines that they have prepared and triple checked. And then we always recommend using the standard ACIP abbreviations, and then standing orders such as standing order depicted on this slide from immunize.org or formerly the Immunization Action Coalition might help to prevent vaccine administration errors as well. Next slide, please. This is CDC's Vaccine Storage and Handling Toolkit and there's a lot of good guidance in here related to vaccine storage and handling. We recommend that a primary vaccine coordinator be designated for a facility and that also a backup or secondary coordinator be identified as well. And it's recommended to use a continuous temperature monitoring device, specifically digital data loggers, and this document also contains guidance on the frequency with which temperatures need to be checked. And the electronic reviews need to be reviewed at least once a week. And then if there is a temperature excursion, it might be possible that that vaccine is actually still viable. But if there is a temperature excursion, we recommend separating that vaccine from other vaccines in the inventory and clearly labeling it, do not use, and then contacting the manufacturer because it could be that the manufacturer has data that says that that vaccine is still stable, but it might be that they would shorten the expiration date, for example. So we ask that the vaccine not be discarded, unless the manufacturer just verifies that it is no longer viable, but we don't want that vaccine being inadvertently administered either, until we can get verification on its viability. Next slide, please. A little bit about multidose vials. So if the multidose vial has been and handled properly, it can be used more than once. It's recommended to check the package insert or information on beyond-use dates or dose limits. So some vaccines in a multidose vial might say only 10 doses for example, can be drawn out of the vial. Once dose number 10 is withdrawn, the vaccine has to be discarded, or there might be a beyond-use date that occurs so many days after that vial is first entered. So if the vaccine has a beyond-use date, that date, if earlier than the expiration date, then would supersede the expiration date. So the beyond-use date should be noted when first starting to use vaccine from a particular vial. So examples of vaccines with beyond-use dates include reconstituted vaccine that have a limited period of use once the vaccine is reconstituted with the diluent or multidose vials. For example, the package insert may state that the vaccine must be discarded 28 days after it is first entered. And then I mentioned this previously, but sometimes manufacturers will shorten the expiration date when a vaccine was stored under inappropriate temperature conditions. Next slide, please. So we also recommend screening for contraindications and precautions every time vaccines are administered. Here is a standardized form from immunize.org and these procedures can be incorporated into regular office flow. Next slide, please. We also have resources and immunize.org has resources as well on injection site and needle size based on age of the patient, as well as gender. Next slide, please. Next slide, please. So just a few more slides to finish it out. So regarding reporting vaccine administration errors, the first step is to foster a culture that values reporting errors as part of the risk management policies or the quality improvement program at the facility. Next slide. And then if a vaccine error occurs, it's recommended to inform the patient or the parent of the error, and then know how to correct the error. So always feel free to contact NIP-INFO or the state or local health department or the vaccine manufacturer for guidance. And I do wanna emphasize, not all errors need revaccination. So sometimes that can be reassuring, and then there's some consultation that's needed to determine how to document these doses in the IIS, and then the procedures of the facility should be followed as far as looking into systems to prevent such errors from recurring. Next slide, please. Oh, another poll question. Which of the following is not required to be reported to VAERS? So is it A, half of the COVID vaccine dose leaked out and was not administered to a patient when the syringe became disconnected from the needle, B, someone had an anaphylactic reaction immediately following their HPV vaccine dose, C, a patient received COVID vaccine, which was prepared with the incorrect diluent, or D, an adult patient inadvertently received the pediatric Hepatitis B vaccine.

- [Phil] And we do have an active poll question. So you all can vote on Zoom if you'd like to participate. So we got about 50 people. Wait a little bit longer, then we'll close it. Five more seconds. I'm closing it. Sharing results.

- Okay. Okay, interesting. So in this question here, the correct answer is D, D as in Delta. So basically any COVID vaccine administration error regardless of whether or not it results in patient harm needs to be reported to VAERS, but for routine vaccines, we always encourage reporting administration errors to VAERS, but if there was no patient harm, it does not... I see we're sort of at time here or past time. So this is what I mentioned earlier, and it's always great to report to VAERS. Even if something doesn't need to be reported to VAERS, it should, I mean, it could be reported to VAERS. So VAERS accepts all reports. Next slide, please. And then next slide. I'll just quickly highlight, this summer, starting in July, we are starting with our 2022 Pink Book webinar series. They are gonna be prerecorded because of the pandemic. So folks can listen in at their convenience. The 14th edition of the Pink Book is out. If folks want a paper copy, it can be purchased from the Public Health Foundation or electronic versions of it are available free of charge on the CDC website. And next slide, please. We have a variety of training modules and net conferences for which continuing education is available and are free of charge. Next slide. And that's it. And that's the NIP-INFO address. Always feel free to now.

- [Phil?] Great. Thanks, Sarah. We had just a couple of like small spots where you kinda cut off, but I think everything is okay. So I'm gonna cover a couple of things real quick. And then if you do have any questions you wanna ask, please put it in the Question and Answer box. Right now we only have one question. So if we don't have much more, it should be pretty short. So to get continuing education for this webinar, just... Well, obviously for those of you here, if you've watched it, that's great. There will be a evaluation that will pop up at the end of this webinar as well. If you don't get that, you'll also receive an email tomorrow that'll have that evaluation. You just need to take that, and then we will send out certificates to folks via email a couple weeks after that. Just please be mindful that our admins get the request and it just takes them a little bit of time for us to process that. If you do have any questions, you can email me or you can email Trang Kuss, and her email is listed right there. And then I just need to give just a really brief plug for the Power of Providers Initiative for Washington state providers. So if you're interested in signing up for the POP Initiative, and it's basically just encouraging providers to talk about COVID-19 vaccination with their patients and empower them in getting vaccinated, you can sign up at doh.wa.gov/pop. And I believe we have, I can't remember, but like maybe close to 50,000 or more healthcare providers signed up, so. So I'm gonna get to the questions. We have another question. So here's the first question. "How detrimental is shaking or flipping a syringe that contains a COVID vaccine? I worked at mass clinics and saw this all too often, although everyone was advised not to shake the vaccine in any way. Could this common behavior be the cause for all these breakthrough COVID infections?"

- So, great question. We've always worked under the premise that these mRNA COVID vaccines are very fragile and it was always recommended to not shake these syringes or flick them or do any vigorous activity with the syringes. I know early on in vaccine roll-out we had conversations with the manufacturers, which said that at that time they didn't have data that verified the stability of an mRNA vaccine if the syringe was sort of vigorously shaken. We don't have any specific guidance for how to handle these situations. I mean, we recommend that they're not shaken, but I would say feel free to email NIP-INFO if you're encountering these situations and we can loop in our experts. I don't know that this would be the cause for the breakthrough cases we're seeing. Interesting point to look at, and I'll take this back to the experts, thank you.

- [Phil] Okay, and the only other question we have is, "Do you need to report an adverse reaction that a patient reports to you if they state that their healthcare provider has already reported it?"

- So it only needs to be reported once. So if their healthcare provider has reported it, you wouldn't need to report it again. I mean, it's never a problem to report it again. VAERS can sort that out and deduplicate things, but it's also not necessary. And similarly, if there's like one particular error that affected multiple patients, we usually have a discussion with the VAERS team, but usually they don't need for example, a hundred reports of this temperature excursion error that affected a hundred patients. I mean, we like to sort of loop them in and make sure they are okay with that, but usually they can work with just one error report.

- [Phil] Great. Thanks. And it looks like we are a little bit over time. We don't have any other questions. So I think now is a good time to wrap up. So I wanted to thank you again, Dr. Schillie for helping to present and thanks everybody for attending. And if you have any questions, you should receive a follow-up email with my email address. So you can always email me. So thank you everybody and I hope you have a great week.