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VACCINE SAFETY AND THE MILITARY VACCINE PROGRAM

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Good morning. I'm Dr. Engler, and I'm the Director of the new Executive Agency known as the Vaccine Healthcare Center, and I'm here to tell you about some issues that challenge all healthcare providers in regards to vaccine safety both pre- and post-deployment.

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The objectives for today are to introduce you to the Vaccine Healthcare Centers Network as a resource for you and for your patients, and how to reach us, and what we can do for you in partnership with improving the quality of immunization healthcare. We want to make you aware of the fact that all vaccines are prescription drugs, and like prescription drugs they have the potential despite their safety and efficacy and FDA approval for adverse events and that some of these adverse events are preventable and others are not but require special evaluation and treatment. Particularly deployment-related vaccines present some interesting challenges and vaccines such as anthrax and smallpox new challenges, and with 30 new vaccines coming in the future over the next five years, the entity of the Vaccine Healthcare Center is here, and it's staffed to help you to meet these new challenges and to acquire the knowledge and support that you may need.

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I'm also going to talk about VAERS and the fact both in the Department of Defense and in the nation healthcare providers need to improve their awareness of the vaccine adverse events reporting system and their use of it so that nationally we can understand rare adverse events better. We have tools that we have developed and are continuing to develop in partnership with you and your patients as needs arise.

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The World Health Organization in October of 1999 published from its Vaccine Safety Advisory Committee the following statement, "However it is also recognized that there is no vaccine completely safe or protective in all vaccinated individuals. Differences in the way individual immune systems react to a vaccine account for rare occasions when people are not protected following immunization or experience side effects." And one of the challenges is helping both patients and their families and all stakeholders in immunization healthcare to understand that these variations do exist and that although we give the same vaccine and the same dose to every vaccinee, there are actually going to be needs in the future to individualize certain requirements and recognize differences and that adverse events and our understanding of them are in need of quality improvement overall, and you are a very important partner in that mission.

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Immunization healthcare and standards of care for reducing practice variance is actually new despite the old age of immunizations. It was only in March of 2000 that the Morbidity Mortality Weekly Report published the minimum standards for quality immunization healthcare, and it was in 99 and 2000 when congressional hearings regarding immunizations addressed concerns regarding how service members are screened for vaccine administration, raised questions about barriers to medical exemptions when they were indicated and medical exemptions are what identifies an individual who may be at risk for a serious adverse events or who needs to have special handling in the administration of his or her vaccines. Also concerns were raised on how service members are treated in the setting of an adverse event beyond a side effect and what is the difference. Some people understood the message of "safe

and effective" as that there are no serious adverse events, but all drugs, no matter how safe whether they're aspirin which is over-the-counter or vaccines, can in rare individuals have serious adverse events, and on the other side, adverse events may have nothing to do with the vaccine but are a new disease or another problem that needs careful evaluation. The adequacy of that evaluation, treatment and follow up to document the outcomes of the adverse event are all challenges that we have to work together to improve on, and the final common pathway is part of the national surveillance for rare adverse events related to vaccines. We all have to be better partners with the Vaccine Adverse Events Reporting System or VAERS. The Vaccine Healthcare Centers Network grew out of some of these concerns and is a collaboration from within DoD with the Centers for Disease Control and Prevention to address some of these concerns and develop programs in partnership with healthcare workers and vaccine recipients to improve in these areas. And it was recognized also during these hearings that there is a lot of complexity and new challenges that really none of us were prepared for and that we're learning new things and we have to have a system in place to do that learning as an organization together and the healthcare workers are a critical component, the tip of the spear, of this new challenge.

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Vaccine adverse events that are rare but previously unrecognized may occur with prolonged negative impact on patient quality of life even if someone is not hospitalized, and in the past the criteria for VAERS was hospitalization or loss of duty, but in actual fact many people can have problems that require care and that impact on their function, but they will continue to go to work. So it is very important for providers to be aware of that and not use the old standard of hospitalization or days lost from work as a criteria for evaluation or reporting. Some of the adverse events are totally unexpected, and if some of you are involved with pediatric vaccines you know that the rotavirus vaccine which was introduced in the pediatric schedule, it went through all the approvals of the official national committees from the Advisory Committee on Immunization Practices and was widely utilized, and then a rare adverse event occurred known as intussuception. No one expected it. No one understood it. It's only years after the observation of this rare adverse event that we are understanding how it might occur. So the point is, despite all the knowledge in medicine and the advances, there's still a great deal we don't know, and the front line clinical observations in partnership with patients, our service members who have problems, contribute to national knowledge. So we are part of a national resource and effort to understand rare but serious adverse events and thereby improve public trust, not just service members' trust, but the entire national trust in vaccine safety by addressing these issues, learning ways to prevent them or treat them promptly, and reducing disability that may result out of them. And we need to validate strategies for vaccine adverse events management and rechallenge because just like if you have a serious life threatening infection that needs penicillin, you will get penicillin even if you've had a serious adverse event, and people like allergists and other doctors who specialize in adverse drug reactions have to work to give a drug despite the risks and find the best ways to do that, and we are all still in a learning curve for how to do that.

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So one of the challenges is how to recognize what's a side effect and what's a rare serious adverse event. Clearly if someone becomes ill within about 30-45 days of an immunization event, that is considered a temporal association in time. It doesn't prove or disprove that the vaccine is causally responsible for it. It is really our job in the clinical front lines to document carefully, to do what we do which is diagnose the problem and treat it if possible, follow it up and then file the VAERS whether or not you think or know for sure there's a causal linkage because it's not our job to determine whether causality is proven but part of a process to look for, identify new syndromes which will then trigger efforts and resources to prove causality, disprove it or find ways to manage it. So one of the things that I hope to do today in a short discussion is introduce you to the concept of clinical management principles for adverse drug reactions that we have applied to other drugs and medicine and we should apply to vaccines but that in the past has been a question, and then of course again and I'm going to harp on this because nationally all of us have been guilty of being poor in our use of the VAERS system to understand that there are no barriers and we should have a very low threshold to file a VAERS. If your patient feels strongly that their problem was caused by a vaccine even if you don't think that's true, be a partner with

your patient, file the VAERS, and let the review process that's in place deal with the question as to whether or not it is a new syndrome or not.

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This slide that you're going to see is a profile of side effects that are seen with common vaccines such as diphtheria-tetanus-pertussis**,** the Lyme vaccine which today is no longer available because of a rare adverse events concern, typhoid, hepatitis vaccine and then the well known anthrax. And as you can see, side effects like headache, fever, joint pains, fatigue occur in up to 30-40% and in some cases as high as 50% of vaccine recipients and I put on this slide what was called the Lyme placebo. So when the Lyme vaccine was studied they used a placebo which is basically salt water, but it did have what's known as an adjuvant of aluminum hydroxide which some might say is not a placebo, but the point is that any injection, any drug can have these types of side effects and although from our perspective these are quote "minor, not important". from the patient's perspective they may not be minor and in some cases if they last more then a few days, raise concerns and there is a range of severity of these side effects and the real challenge is to define the case definitions and the clinical guidelines that need further refinement as to when it is a problem and when it is not for future vaccination with that vaccine or other vaccines.

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Vaccine safety and adult immunization surveillance has really been the center of the storm in regards to trust about immunizations in general, and since the Department of Defense gives more adult vaccines than anyone else, a broader spectrum, it's a particular DoD challenge. And rare cases of adverse events such as with the influenza vaccine with pericarditis/myocarditis syndrome, is frequently never been heard of by providers, and I've talked to many groups including cardiologists and if they see a patient with pericarditis they don't ask them if they've had an immunization in the last 30 days and so we don't see this potential rare adverse event. It's been well documented. It's been reproducible. That means a person got a flu shot, got pericarditis, recovered. The next year got the flu shot, got it again which it raises the biologic plausibility of causality. We are really in our infancy in understanding some of these conditions, and we'll talk briefly at the end about the surprise adverse event with the smallpox program, myopericarditis as well, and how we were aware of that potential risk partly because of the influenza experience, but it is only with awareness that an immunization history is important when seeing patients with clinical disease that we're going to learn to segregate out what may be a vaccine factor versus another cause. There have been rare reports of deaths with yellow fever, now largely with very old patients and people who probably have immune deficiencies. The anthrax vaccine has been certainly a vaccine that has had many questions from pregnancy and birth defects which some of you may have seen or heard about in the news, and yet the evidence to support that the rate of birth defects in someone who has received an anthrax vaccine versus not having received an anthrax vaccine is not there to support a causal link, but there is still further investigation going on because the question was raised. Inflammation of the nerve in the eye is again a very, very rare question that has been raised and continues to be under review. People develop rashes after the anthrax vaccine. Most of them are mild and not a problem but some are more serious like erythema multiforme, and this would be an absolute contraindication to receiving future vaccines because it can become a more serious reaction with repeated dosing. These are just examples and inflammation of the nerve that goes to the hand, the ulnar nerve, are also problems that have arisen because of the inflammatory reaction of the anthrax vaccine, and we'll talk a little bit more about that. But there are many challenges, many questions and the big thing is keeping an open mind so that when your patient comes with a concern you don't misinterpret the message of "safe and effective" and "FDA-approved" as that they can't have a problem with the vaccine because they can.

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Now local reaction. Frequently providers don't think these are very important. They're usually mild, 30-50 mm, but sometimes people can get nodules after a vaccine, and this is most common with the anthrax vaccine. They can be moderate up to 12 cm and even extend below the elbow. Now for the patient that becomes a large local, and that can be very scary, and if the nerve is inflamed in association with this

large local, that becomes very distressing, and so it's important to treat these reactions because there are treatments available, and some of the complaints of our system were that when problems arose, people were told don't worry about, and they weren't even given treatment to treat the pain or to treat the inflammation, simple things like nonsteroidal anti-inflammatories, topical steroids and in some cases when it was very severe even oral steroids to control the inflammation and the long term implications of the inflammation. Numbness, tingling, weakness in the arm again are things people experience, and they are scary,usually resolve particularly with prompt treatment.

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But we have seen some patients through the Vaccine Healthcare Centers Network who have for several years persistent ulnar neuropathy following these large local reactions, and those patients get very irritated when they're told that these local reactions are no problem because it has impacted on their quality of life, and they're just asking for compassion and understanding of the impact this has had on their lives.

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Now in response to many of the challenges that arose, the Allergy Immunology Department at Walter Reed, and this is a specialty that deals with adverse drug reactions, try to capture for providers in beginning clinical guidelines a support resource which is available both on the Vaccine Healthcare Center website, Vacinfo.org, and it's also on the Military Vaccine Agency website, vaccines.mil, and we attempted to organize the kinds of problems and try to give people some guidance about when should an adverse event be considered a reason for at least a temporary medical exemption until further evaluation can be performed, and so you'll see the algorithm is in color. It is linked with tables that give further details with green being a go ahead, reassurance. We do not have time to get into the details of the algorithm, but the VHC staff, physicians, nurse practitioners, nurse educators are available all of the time by email, by phone to help you and in fact to help your patient directly to work with you and take some of the pressures off that can arise when some of these challenges demand more time to manage and to address. If the local reaction is what's expected and with no other associated problems, we proceed, but if they get very large, then there's caution and a plan perhaps to even pretreat people before the next vaccine dose, but that requires a complex risk communication assessment where the patient is a partner to that process. And again, there are resources that we are building throughout the DoD to help support you in this effort.

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This is a picture of a large local that was greater than 12 cm. Now what sometimes happens is a provider is not familiar with this reaction, thinks that this is an infection, cellulitis. So people have been hospitalized and given IV antibiotics that they really didn't need if they'd just been treated with nonsteroidal and topical steroids and in some cases again oral steroids. So there needs to be a careful assessment of that, and you can potentially save the patient the discomfort or the hospitalization and IV and the cost associated by recognizing these reactions. Again pictures can be sent to the Vaccine Healthcare Center Information Staff and Consultation Service to help you work through these cases and decide what's best to do.

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We have also had of course considerable challenges with large locals in relation to the smallpox vaccine, and here you see a picture of the pustule having ruptured and dark and necrotic and actually when a service member was seen in a civilian emergency room they were getting ready to take him to the operating room and debride this because they thought it was necrotic tissue. Fortunately they had the brochure and contacted us at the VHC, and we were able to prevent their OR from being contaminated, prevent the patient from having potentially serious scarring that was not necessary. Just leave it alone. You can have retained scabs and scars that look like necrotic areas for six to eight weeks, and the thing

to do is do no harm and leave it alone. So again these are some of the many examples of things that we can help with and that we need to improve understanding and knowledge of.

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Now side effects. The duration and impact needs to be documented. So please, you know, pay attention to writing that in your note. Are they short term with no impact on function or quality of life. Are they prolonged or severe with a reduction in the person's ability to do their activities of daily living. Are they getting worse from dose to dose because this raises a concern about it becoming something that can have long term impact with disability implications like I talked about with the ulnar neuropathy. For the things that we still don't understand, these are some of the criteria you can use to segregate whether it's an expected side effect, reassurance and just symptomatic treatment or whether some additional intervention or consultation is required.

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Again we don't have time to go into the in-depth mechanisms but from IGE to immediate hypersensitivity reactions can produce very dramatic immediate large locals. Some of the components of vaccines may activate mast cells to release mediators that cause the inflammation. One can have injury just from the trauma of a needlestick and mechanical injury and that's been well described again, rare. Technique and how vaccine is administered. The most recent guidelines for the anthrax vaccine because of the large locals is to not to give the shot in the usual traditional location over the triceps but rather shift to over the deltoid to prevent the ulnar neuropathy complication. We continue to have problems that people haven't heard about that and causing side effects and problems for service members that are preventable. And again in the guidelines there are alternative strategies that are outlined including changing the route if there has been a problem to the intramuscular that it can prevent some of these problems but still allow the appropriate immunization of the service member. You can see delayed local reactions like a tuberculosis skin test that's positive and these are what we call delayed hypersensitivity reactions that are usually T cell-mediated or when people have very high antibody levels, they're hyperimmunized. With the anthrax vaccine we are seeing some of that. They may get what we call Arthus reactions, and there's work being done to try to sort out whether really people need all of those doses in the six dose series. People can have bleeding, and they can have cellulitis or secondary infection. Some of the things to look for in your differential.

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Systemic adverse reactions can range from flu-like systemic symptoms that last a few days to immediate onset anaphylaxis, life threatening with difficulty breathing, with hives, with chest pain, and these are of course are extremely important to quickly address with giving adrenaline intramuscularly, not subcutaneously, which is a new guideline that we're trying to push out because of the evidence, and subcutaneous epinephrine gives no better blood levels than salt water injection. Anaphylaxis requires referral to a specialist to consider whether the next dose can be given because the CDC has listed as an absolute contraindication but sometimes for travel and other requirements we are still able through special handling to provide the vaccine. Serum sickness, a myriad of neurologic disorders, again we don't have time to talk about very very rare, many of which we don't know whether it's causally linked but the question is under review. Many different kinds of rashes, other systemic symptoms, and when we started the smallpox program in the DoD training we said "unexpected and ill defined things will occur". Expect the unexpected, and the truth is it's the clinicians at the front lines who are the Sherlock Holmes, the folks who raise the flags that later lead to progress and evolution and learning in our understanding and medical knowledge. So one of the things for the Vaccine Healthcare Center to do its mission is critically dependent on every healthcare provider involved in the immunization mission throughout DoD, and we're here to help you and to partner with you to learn and to do a better job for our service members. The CDC is actually recognized that many of these challenges represent a new clinical specialty in vaccine safety, and there's work going on to define a curriculum in that and potentially additional training. There is clearly growing complexity, and we talk about 30 new vaccines and new vaccine insertion. We know in other areas in medicine when you give multiple drugs together new

challenges arise, and we don't expect that it will be any different as we are challenged with vaccine issues.

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This is the rest of the colored algorithm on systemic adverse events, and this algorithm is only committed to non-live vaccines. We've had to do very different things for smallpox, and there's work going on in relation to other live vaccines. But as part of the VAERS quality improvement process of which we are a part, they've asked us to really define in detail what are the components of the systemic adverse event, respiratory components, gastrointestinal and in the red part of the algorithm are the things where there should be an absolute immediate medical exemption, further evaluation, in depth VAERS. And the other thing the Vaccine Healthcare Center is there for, we know it takes time to do this, and so we have nurse practitioner case workers for these rare complex cases who can partner with you to help to document, interview the patient, write down a very detailed history, kind of like we all learned how to do in medical school which then the patient reads and reviews and corrects and signs that it's accurate and that material will be fed back to you to help you in your management and the VAERS system then gets a better product with which to do assessments as there are patients that look similar. And we begin to build what are called case definitions of new rare adverse events. Those of you with an interest in rheumatology, this is what rheumatology had to do 30 years ago, and we're in the beginning of that journey so don't get frustrated if some of the feelings are hard to deal with because they're hard to deal with for the experts.

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Systemic adverse events with the clinical guidelines as I mentioned are really a challenge because they cross many specialty lines. So the clinical guidelines unlike many clinical guidelines are not heavily evidence-based because they are really based on empiric observation, and part of our challenge in the future is to gather the data to validate the guidelines, modify them as indicated. They are an ongoing work in progress, and input and things that don't fit or that need to be expanded is an interaction within DoD experience but also with the national effort. So we're very proud of the fact that we are part of a national system integrated with the CDC and the new entity known as the Clinical Immunization Safety Assessment Centers, which are the civilian counterpart of the Vaccine Healthcare Center within DoD. Outcomes data for degrees of severity of side effects and durations have not been well-defined in the medical literature, and there are many challenges and perceptions about what does "safe and effective" mean and what is "no serious reactions". Medical exemptions are really for reflection of the measure of provider concern about the safety of giving the next drug, and if you think about it when a patient comes in and complains about a reaction to penicillin or another drug you've given, you generally don't question that or question the patient's history. You don't tell them it's an FDA-approved drug and it's safe and effective, and that's part of the messaging that made people angry when they had a problem. So we acknowledge the experience and perception of the patient. We document and we try to work with it like other areas of medicine, and we measure the decision of giving the next dose of vaccine based on a risk assessment, and it is now DoD policy that service members have a right to a second opinion. So don't feel defensive, but rather encourage a second opinion so that you're not on the front lines if the patient is angry about what you're assessment is. So it's a shared process and a fair process weighing the knowledge that may or may not be available.

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And I just want to take a few minutes in regards to the anthrax vaccine because that was sort of the center of the storm, but really the issues are broader than anthrax. There was a study done at Tripler looking at 601 healthcare workers who were receiving anthrax, and there they actually made an attempt to define the severity of what we know as traditional side effects. People who have no symptoms, symptoms that can be ignored, symptoms that affect activity but can still perform their duties, symptoms that affect activity but require treatment and if they're treated they take care of the job like with Tylenol or non-steroidals, or symptoms that even when people try to medicate them are not relieved and interfere with performance. That particular study identified five more serious VAERS adverse events out of a total

of 3000 immunizations in the 601 vaccinees, and we don't have time to go into the details of those but again those define some of the challenges.

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But this slide sort of outlines that about 1-2% of people, male or female, their muscle aches, their fatigue, their headache, their joint aches are so bad that even with traditional non-steroidals or Tylenol they can't function, and the headaches in fact can be so severe that people have hospitalized. So again this doesn't make the vaccines bad. It just is part of the cost of doing business, and our challenge is to understand why this 1 or 2% have this problem, what can we do to treat it better, prevent it and in that context for the future as we learn these things, perhaps build better vaccines and incorporate that knowledge. It's really a relatively new focus in the 21st century to try to better understand immunization responses. In the past when people we were trying to prevent diseases like polio in millions and millions of people, there wasn't the time or effort to address the rare problems. Now that those disease are largely gone or not visible, optimizing vaccine safety has become a new focus because we are giving these vaccines to healthy people. And just like our service members put themselves in harms way of a bullet, in essence when they take all of the vaccines as part of their duties, they're also putting themselves in a very rare chance of harms way, and what they're asking and what was the focus of the hearings was to have when something happens, the best possible care and compassionate supportive care. When someone has an adverse event, they're not being disloyal, and most of the service members we see or talk to are not trying to get out of duty or work, they've really had a problem and they've really been scared by that problem, and they need knowledgeable support to manage through that.

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Just to finish up with the anthrax vaccine safety surveillance again in the context of all vaccines, over three and a half million doses have been given to over 960,000 people. In general local reactions are the most common, but it should also be noted that they are more common in women than in men, and most of the old literature did not address gender differences in vaccine responses, and we really now are trying to understand the gender differences. The immune system of women is different than the immune system of men, and when women were told, "oh you can't be having these problems" that made them kind of angry. So we can all just take a step back and acknowledge that there's still much we don't know, and in those programs where we don't have gender-specific data, take extra care to collect the information and respond to it and try to improve the way we do immunizations for women now and in the future. The lumps, we've had women where the lumps persisted for years, where they were painful, where they wanted them surgically removed. That in the patient's perception is not minor. So you have to understand that when you get the large top of the mountain epidemiologic picture of vaccine safety that has a certain role and is important and is the reason a vaccine is FDA-approved and not recalled, but it does not alter the fact that there are rare adverse events and that this is the clinician's front line challenge to manage those and to help people work through them.

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Again the National Academy of Sciences, the Institute of Medicine have looked at all this data and have said yes there are unknowns, there are rare adverse events, but overall there's no reason to stop the vaccination program, but please do keep looking and in fact the new guidelines from the FDA are that in the future all drugs have a phase 4 post-marketing surveillance mandate because it is only when you give drugs to millions of people that you begin to see and understand rare more serious adverse events, and it is again the clinician front lines having the sensitivity and awareness and appropriate responses that will help us to early identify those and protect people as best we can.

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There are critical elements to assessment and review of adverse events and as in all of medicine the most important is the history, its accuracy, its details like a medical student and I know all of us are

struggling with the productivity pressure in a fifteen minute appointment that just isn't enough to capture some of the details of the history, and that's another reason the Vaccine Healthcare Center was established to help support that effort in those rare cases where it can take you six hours to document the history. And we have again trained nurse practitioners available with medical directors now at four sites, Portsmouth Naval, at Walter Reed, at San Antonio Wilford Hall, and at Fort Bragg, but those centers serve all of DoD worldwide. Physical and laboratory data again needs to be detailed so that we rule out other causes for the problem. Sometimes when people are only treated symptomatically, we are left with a lot of confusion, and there is a risk that if someone keeps coming back or the adverse event persists that after the second visit probably should stop, reassess, consider referral to a specialist, adding them to the Vaccine Healthcare Center registry so they can be tracked because in rare case there've been some tragic events where people just kept getting symptomatic treatment, but they really had a serious disease process that later got them into more trouble than it needed to be if it had been more early identified and cared for. We have to always remember there's a differential diagnosis and focus on that and then process the evaluation systematically making sure that records of each evaluation go with the patient so that as they go to different components of the healthcare system they're not losing that historical work which again is a challenge in our system and in our network. Medical exemptions, any provider can grant a temporary medical exemption. If you have a concern, give the temporary medical exemption, do the consultations, do the follow up. You should not feel pressure when you have a concern in terms of taking the time to do it right. We have to provide good care to our service members and then use the resources. We have a 24-7 DoD Vaccine Call Center for initial up front help. They then refer to us if they can't do a simple solution on case management. Via email, via the web, via the telephone, there are resources there to help you.

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Now in regards to the smallpox program, the Vaccine Healthcare Center played a critical role in supporting this program and developing the standardized screening materials, the brochures, the educational material. And in the smallpox vaccine you all did a superb job because we were very concerned about adverse events that might be preventable that could scar or kill people, and in the preventable adverse events, I wanted to share with you the data of what we actually accomplished as an organization. As of 17 December 2003, the DoD screened over 600,000 people, vaccinated over 530,000. So met the president's mandate from 13 December with 71% being primary vaccinees, which is really a new population because the old experience was with children receiving their first primary vaccine, and those of you who see children know that children are not just little adults, their immune systems are different. So we knew there was going to be some new things even though this was an old vaccine. We granted exemptions to protect family members from secondary risk of infection as well as to protect those service members who had a high risk for a serious adverse event such as atopic dermatitis either in childhood or active. We immunized in a quality fashion. The take rate was over 95%, and we saw some people had side effects that resulted in sick leave days, but it was in an acceptable percentage with anywhere from a half to 3%, averaging one and a half days.

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We were very concerned about eczema vaccinatum, progressive vaccinia, which can kill and scar, and we have had none of those cases suggesting that our screening efforts and our response to service members was appropriate and was good. It worked. Talk about an outcome. This is one that you can all be proud of being a part of. Other things we don't have time to go into, but the surprise was myopericarditis. We're now at 66 cases and that's at a higher rate than was expected, largely in primary vaccinees. And we have to move ahead to get through these.

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Myopericarditis was really a new observation although rare cases had been described in the past, but those rare cases were attributed to a different vaccine strain. So it really was an old observation but observed in a new way and more frequently, and the Vaccine Healthcare Center has become the official registry group to support working with cardiology expert groups and others to track the patients who had

this adverse event, and we've had some interesting challenges including people who were being submitted as a medical board for coronary artery disease when actually they had this inflammatory immune reaction to the smallpox vaccine, and so far it looks like the majority of these people are recovering with no adverse effect on their heart function. So we've been involved in pulling those medical boards back. So if you have a young person presenting with heart problems or chest pain, please think to do a history of their immunizations particularly smallpox, although very very rarely it can occur with influenza, because these people are treated differently, and they may not have any need for a medical board because it's not a long term chronic illness. Frequently civilian cardiologists are not aware of the syndrome and need help. Again the VHC is available and the DoD Call Center to share the information that we have to date. We have case managers interviewing each of these cases, and we're trying to follow them long term over two years to assure there's no late onset problems. DoD guidelines have evolved over the last year. They're still again a work in progress, but they begin to define and standardize the evaluation and follow up and documentation with objective measures of recovery. When a young person has pericarditis, it's still important that they get the rest for six weeks, not go back to PT even if they look like they are healthy and normal so that full healing of the heart can occur.

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And in this next slide, just is the bird's eye view of the algorithm again available on the two web sites or just write the VHC, AskVHC@amedd.army.mil, and the staff there will send you an electronic copy of this table, the algorithm and the accompanying table. So we're trying to work very rapidly to standardize the clinical approach, the supporting evaluation management and long term follow up of myopericarditis per smallpox vaccination.

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The Vaccine Healthcare Center vision is to develop a network of regional VHCs that support continuous quality improvement of immunization healthcare delivery, education, research and case management of complex adverse events for all DoD beneficiaries. We have many civilian contract workers, employees, who require vaccines and who just like service members have issues if they have problems with those vaccines.

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We are here to partner with you to improve clinical educational research and quality assurance leadership for what we call "immune readiness". We have challenges with passive immune globulin as well that may be a requirement in the context of bioterrorism. All of our efforts and partnership with many different disciplines is to enhance vaccine safety, efficacy, knowledge and trust and recognizing that there is a lot of work involved and that support services are needed for the diagnosis and management of adverse events.

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Our goal in assuring quality and patient care of adverse events in a QI process is to give the right response to the patient, not belittling, not minimizing, not ignoring their complaints. The right way at the right time, promptly with the right education and VAERS, Vaccine Adverse Events Reporting, and the right access to care. If you're a reservist and you have reservists who are not actively drilling, they still have a right to access care if they've had an adverse event following an immunization, and it may be 30 days later. And we're trying to develop ways, there are certainly continued things administratively to challenge us, but the entire Department of Defense and Health Affairs is committed to working through those challenges, and the VHC tries to involve the people who we need to help solve those access to care problems, and we want to make sure that we manage exemptions in a way that meets the standards of care for any adverse drug reaction.

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We have lots of resources that we're working on. One of the things that nationally has been identified is the fact that basic knowledge about immunizations and what are known side effects and what are the standards of care are not well recognized, and so this immunization tool kit which grew out of our tri-service school for training of immunization personnel is exactly designed for service for the military healthcare system and the service member who's on the run. It fits in your pocket of your uniform particularly the BDUs. You can spill coffee on it. You can carry as many of the cards as you need. If you're only doing a limited mission, you can carry the ones that you actually need. This is available just through a simple email request. It actually has childhood, adult and military travel vaccines detailed and the new standards that we all need to focus on trying to provide in the context of both administration of immunizations and follow up afterwards. We have also available a distance learning tool with CME and CEU credits available through our web site called Project Immune Readiness. There are now 19 modules including anthrax and smallpox with pre- and post-testing available so that you can use the tool to meet your JCAHO requirement for competency testing. We're working on evolving the tools so the annual update testing requirements for immunization healthcare personnel can be met more easily. We're also available, each of the four regions I mentioned, on request to provide training outreach to your sites if you feel that you have a need. We're doing the best we can as we grow the resource to meet the demands, but the big message is that we're here to help. And there is an understanding that this mission has many challenges, it's very complex even for people who've been doing it for many, many years and you're not alone in trying to face it. And the Vaccine Healthcare Center takes great pride in being part of the larger deployment health effort to make healthcare the best that we can possibly do for all of our service members and frankly also the civilian component of our DoD that has the continued challenges of rapid response and mission service. So we're here to help, and we hope this is a good introduction for you to this new specialty of vaccine safety.

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Thank you for your time.