Transcript -- Blazing Trails in Prehospital Care through Targeted Issues Grants

>> Welcome and thank you for standing by. All parties are in listen only mode. I would also like to inform all parties that this call is being recorded. I would now like to turn the call over to Diana Pilkey.

>> Thank you. Welcome to the webinar presentation for blazing trails in prehospital care through targeted issue grants. My name is Diana Pilkey . We are very excited to present these two issues grant projects. 23 test 2013 desk focusing solely on pediatric prehospital research and practice. This webinar will feature two of those issues. The Center for emergency services and trauma network for EMS and the pediatric evidence-based guidelines assessment of EMS system relation in states.

>> Just a couple of housekeeping items. All attendees have been muted. Please use the chat box to ask any questions. We will be opening the lines for questions after each speaker. Do not place your phone on hold. It will disrupt the webinar. The speakers will be answering questions at the end of each of their presentations. If you have any difficulties you can contact Aleta Grant.

>> The objectives are listed here. I will not read through them. I will leave it up here for you to review.

>> We are continuing education credits for EMS and nursing so I have slides to show you with some information that we are required to show. We are offering credits for EMS providers and I will show you some information shortly on how you can get those credits.

>> We are also offering nursing education credits. There are no conflicts of interest. This is not an endorsement of any product. There is no support and this activity has been provided by the Children's Hospital.

>> Let me tell you how you can get your credits for this. You have to attend the entire webinar. You sign in using the Adobe connect chat function with your name and city and state. You also need to complete an evaluation online. Then you print your contact certificate. Please note that all surveys close within seven days of the activity date so you need to do this within a week. They will also be posted on the EMS website. Let me introduce the speakers. The first one will be Tom Trimarco. He is an assistant professor of medicine. Is an attending physician at Hitchcock Medical Center? He is a principal investigator program director for innovating and improving the hospital pediatric care and roll New Hampshire and Vermont. He is the medical director at the medical center and the director for the Hitchcock response team and a member of the New Hampshire EMS control board and medical advisor.

>> Doctor Manish Shah is an associate professor and pediatrics. He is the principal investigator and program director for the PEGASUS project of EMS system utilization in states and the lead for the prehospital domain and state partnership domain for the innovation and improvement center as well as the program director for the emergency medical services for children state partnership grant in Texas and investigator for the Charlotte, Houston, and Milwaukee research. Finally, a physician member of the national EMS advisory Council.

>> Tom, I will turn it over to you.

>> Great. Thank you so much. Welcome, everybody, and good afternoon. I'm excited to talk about the project that we've been working on for the past three years. It is an honor to be here.

>> I am Tom Trimarco. Diane gave you the introduction. We will talk about what we call the CREST for EMS network.

>> I have no financial disclosures. I hope to have some disclosures in the future but to this point, nobody wants to pay me any money to talk. This project was supported given to us by a HRSA issue grants.

>> To start off just wanted to review a couple of things that led to this targeted issue grant. Most people that are listening are aware of the challenges of pediatric prehospital care. Here in New Hampshire and Vermont we have challenges given the nature of our states and this is not unique for northern New England. This is similar to many parts of the United States. Specifically from the pediatric side of things. Obviously, this is a very unique patient population. Pediatric patients have unique anatomy, physiology, all of which make it a bit more challenging and difficult for our EMS providers to evaluate, manage, and transport these patients.

>> Because of their overall numbers of patients and pediatric emergencies that happen in the EMS service where the average percentage of EMS patient can be anywhere from 5% to 15%. The initial and ongoing continue education opportunities tend to be limited. The national program through national Registry of EMTs only requires anywhere between two and a half and three hours of continuing education for magic issues. So unfortunately this leads to neglect of pediatric issues and many of our providers. The other thing that makes it challenging is given the fact that these are infrequent encounters to begin with. The sicker kids that are EMS colleagues have less care. And they could be high risk events. All of this makes a unique challenge for our EMS providers dealing with pediatric patients.

>> Here in New Hampshire and Vermont we have other specific challenges that are more due to the rural nature of her state. There is transportation barriers where we live. Even in good weather on a summer day our response time and transport time is to the scene and from a scene to the facility can be quite long. Where it will often utilize response times of somewhere

from eight minutes is a course and we can easily go 10, 15, 20 minute response times for the providers to get to a scene.

>> The -- they transport them from the scene. We have transports that are over half-hour up to an hour. We have significant medication barriers as well. There is not good communication because of the mountainous areas. Out coverage is spotty at best. All of this causes issues when our providers are facing difficult and challenging patients whether pediatric or adults. Unfortunately, have limited ability to reach out to control or other resources to gain some insight and some advice.

>> There are educational barriers. We've seen go from transportation barriers to services and to medical receiving facilities rolls over to the education side as well. While we often will offer educational opportunities here at our medical resource office, many of our providers have to travel by car to come and listen to a lecture for a couple of hours. The long distances that they travel for those opportunities just make it less likely that the providers are able to take advantage of the educational opportunities.

>> Medical direction is a bit spotty in rural areas. It is often due to a lack of funding or relations with medical directors and hospitals and other support agencies. Unfortunately, this limits the amount of quality feedback that agencies are getting for pediatric and adult patients. Unfortunately lit it limits the overall growth in rural areas.

>> This goes directly into a lack of competency assessment. We have plenty of providers in New Hampshire and Vermont. There has not been a very good way for most agencies to see Dutch say that providers are very much capable of dealing with significant pediatric emergencies or adult emergencies. There is very little if any to assessments being done at local agency levels. Attend to do with limited funding and limited time and resources and that becomes less.

>> Dealing with some of these challenges our group here decided to step desk set four goals that will focus on some of the unique challenges to the rural environment and pediatric environment. Goal 1's establishment of the CREST for EMS network. Development unable mentation of the knowledge and skill transitional toolkits. Go 3 was to improve communication and relationships between in-hospital providers and prehospital agencies. Goal 4 was the development and implementation of the competences assessment toolkit.

>> The first one is to create the network so the CREST network was funded and created by a HRSA funded grant about 10 years ago. It focused on providing educational opportunities for in-hospital providers and critical access hospitals. Desk create a network of EMS agencies in that same area and offer education for those rural agencies that have been limited with access to that type of service. Payment in doing so we tried to standardize educational goals amongst

the area. We attempt to share resources for multiple agencies so people are not working in silence. So it can be shared with multiple agencies with in the states and to develop an electronic infrastructure to make the sharing of that knowledge in those -- and those opportunities much easier. So our ability to streamline for educational sessions to WebEx and videoconference educational sessions, case reviews, and so one.

>> We try to develop a closer working relationship with EMS agencies. We invited members of EMS agencies, in-hospital providers, and other stakeholders to help guide us and make sure that we are meeting the needs of the EMS community here for pediatric emergencies.

>> We also try to increase the presence of pediatric education at the state level in northern new England by attending and delivering education at multiple EMS conferences throughout New Hampshire and Vermont.

>> Let's go to development and knowledge and skills translational toolkit. What this was is our ability to develop tools that not only we would be able to use during this grant but that could be utilized I EMS agencies across the country in the future for their ongoing education , training needs. We want to make sure that we were educated in the areas in which providers and agencies needed extra pediatric education. We did a need assessment early on. We did our due diligence with literature looking at areas such as provider comfort and provider confidence. Areas where care had been less than ideal from a pediatric standpoint. We had a provider online survey that was done before the rollout of any type of educational opportunities. Asking the providers in terms of what they felt they needed to learn more about or hear more about and what they felt uncomfortable with. We did structured provider focus groups where we had trained interviewers meeting with groups to get more details in terms of what would be beneficial for them to hear. We did this with supervisors as well. As well as in-hospital providers to identify witnesses in areas where we should focus our efforts.

>> Through this assessment we identified seven clinical topics that were consistently brought up of areas of weakness for providers in our area. These topics were respiratory distress, airway management, cardiac emergencies, anaphylaxis, seizure management, pain management and medication safety, and trauma.

>> With dust these are broad topics. So are toolkits were developed and focused on multiple different topics within each one. Just to give your brief idea of where the education was focusing for the different topics. I have some of these listed here. So we focused on the pediatric assessment triangle we talked about oxygenation and ventilation. We talked much about the difference between croup and asthma and bronchiolitis and the differences between all of those. You will hear and a little bit when my colleague speaks regarding the PEGASUS project but we were able to work with him and timing the rollout of his guidelines with our

education to make sure that we were educating towards the most up-to-date protocols and guidelines and able to incorporate the recommendations that he was making through the guidelines into our education.

>> We covered specifics regarding anatomy and we do touch here on special need children as well with the unique challenges that present for pediatric patients. We talked about skills such as BVM and the use of airways. We talk about -- as well and a low/high risk procedure. We are able to utilize the PEGASUS protocols.

>> Cardiac emergencies this is a pretty broad topic where we focused a fair amount on shock recognition and treatment of a cardiac arrest as well really utilizing more than high-performance CPR model. We cover topics such as --

>> Much of the education focus on the education and the treatment of anti-fluxes. Talking about the benefits and risk of autoinjector's versus syringes and also talking about the downstream complications of anaphylactic shock.

>> From a procedures temp or desk standpoint, hypoglycemic treatments and the management features with the push towards the evidence-based guidelines on focusing on the treatment with -- again utilizing this PEGASUS protocols.

>> Pain management medication administration really was a useful module that was developed to look at the strengths and weaknesses to look at other resources that provided [Indiscernible] when dealing with pediatric emergencies and calculating doses and measuring doses of medication. We focused on the utilization of pre-and post treatments. And then are not advanced providers we talked about our non-pharmacologic means of pain control.

>> In trauma, this was a pretty broad topic feet -- focusing on traumatic brain injury, burns, nonaccidental trauma and need for suspicion of nonaccidental trauma and shock due to neurogenic issues.

>> For each module a PowerPoint base presentation was developed that was given to be used in a didactic session. We developed multiple scenarios and or guides to essentially focus on the topic of choice for that particular module. They will be focusing on the important pieces of those simulations in the treatment of those presentations. We developed question banks for these topics as well so questions dealing with seizures, trauma, etc. that providers were able to take up relearning or preassessment or as a reminder an evaluation afterwards. Developed a summary sheet as well kind of a highlight sheet that we utilized after the delivery of the module to a particular agency or crew to help them keep these pediatric topics on their mind. The type of think that will be posted on a wall at the agency on the stall of the fire hazards.

>> In order to deliver this education they also funded the purchasing development of a simulation center so we were able to retrofit an ambulance to be able to perform a simulation within the back of it. This was helpful for us to be able to go to our EMS agencies when delivering the education and practice in an environment in the back of an ambulance. We also had the ability to set up our simulators in any setting that was most beneficial to the module. Wall we ran certain simulations we also run them in the training rooms and simulated bedrooms, living rooms, outside as well.

>> What we did was identify our local partner and transportation cash transporting agencies and focus on delivering all seven modules to the transporting agencies trying to get all of the providers through all the modules and look for improvement in the care of those patients.

>> Another aspect of the communications every ships between prehospital and in-hospital providers. We formed a referral process that providers, EMS agencies, parents, patients, and in-hospital providers could essentially identify a need with an individual agency or community of a particular patient that may benefit from targeted education to the services for an area for that patient. Also allow us to utilize what we call the exception protocol here in New Hampshire. There is a generic protocol in the state of New Hampshire that allows for specific protocols to be developed for EMS agencies sometimes dealing with specific patients for treatment of problems that are not typically covered within the general protocols. So there are restrictions and our providers are not practicing outside of the scope of practice but they are able to extend the protocols to cover medications or even procedures that are not in the standard protocol set for the state of New Hampshire and Vermont.

>> The EMS agencies were aware of special needs children within their environment and they asked to talk to us about dust we have a kid was his problem within this community and we have been interactive in the past and we expect to do so in the future. We want dust we went to local school nurses for the same reason and work with her in-hospital providers and especially clinic to identify children that may benefit from the development of these individual protocols or education programs for individual agencies.

>> To give an example of a protocol that was developed. They have an underlying significant disorder and the agency typically is a non-transporting agency. They work with a partner in transporting agencies. As a non-transporting agency they are not licensed at the paramedic level but they were looking for guidance and wanted to deliver the [Indiscernible] midazolam. We were able to work with the agency and the neurologist to develop a personalized EMS action plan for this patient. To deliver hands-on training -- and what to expect and it is worked very well from that standpoint.

>> [Captioners transitioning]-- usual management in the field a bit more challenging. This was recognized by the in-hospital staff. We were able to work with pediatric anesthesiologist with the Nick you need -- Nick unit. To develop a protocol that has a device that would provide the best success if and when this patient and wait needed to be managed in a more significant level.

>> The fourth goal is to develop an implementation of competency Seesmic toolkit. Again to get tools to agencies and medical directors in the future to assess their providers and recognize which providers are competent in performing at a high level and identify areas of weakness for providers that may need structured the Medici and plans and structured education. We developed further high fidelity simulation modules. That could be used for testing. This is a typical task checklists but also the utilization of a global ratings scale that allows for a semi-subjective evaluation of a provider's overall performance. This also tied in nicely with the question bank that was developed as well. This is an example of parts of a scenario that was developed you can see there are learning objectives for each scenario. A background that sets the stage for the scenario. Also past medical history, medication that is for the patient. We have our primary assessment, full physical exam that the facilitator has access to and that we would program the simulators to be able to express. We would set multiple simulation states to allow the transition from one state to another with intervention or lack of intervention so a particular simulation may have three 328 different simulation states depending on the complexity of the scenario and different parts of the scenario and anticipate with correct actions as well as incorrect actions. We would layout that scenario and becomes a adventure so the scenario would start and have anticipated actions that we would be looking for providers to do and based on whether they hit those anticipated actions or not, the scenario would then advance to a particular state either in a positive way or a negative way. We have our standard checklist for actions that we expect or are looking to be complete. Both complete our -- or did not complete and vertical criterions. [Indiscernible] was the utilization of a global rating scale so this comes out of evidence has been published in the past that has been validated with paramedics and has been shown to correctly identify a high functioning well equipped paramedics versus novice paramedics in dealing with situational awareness, history gathering, patient assessment, how well they communicate. The softer things that often separate a good practicing paramedic versus white that is a bit more novice. We would utilize those checklists and global rating scales to evaluate our providers during that simulations. How we did this was we would come into an agency to bring our new module. We would pretest them on simulation without having received any education or prompting of what the simulation will cover. We would record that. Deliver the education module and return in the future within -- we did this for different agencies and different ways but we would return in a month or so or quarterly and reevaluate the same provider under a similar presentation scenario again reporting its. Those recordings would be analyzed by blinded evaluators and graded utilizing the checklists in the global rating

scale. The idea is that the pre-and post-evaluations are being looked at now to see how our providers are improving and if they are so. The evaluation as a whole is trying to look at multiple things we are looking at the learner's reactions, assessment of learning and assessment of behavior change. For the learner's reaction we have an in-depth pre-survey that was performed for the providers involved with the survey that looks at their attitudes and comfort levels and in pediatric emergencies. It focuses on the question of whether a provider -- what they think about the pediatric training and going forward and how satisfied they were with the educational method and curriculum of the grant and how the training was delivered with the utilization of didactics mixed with simulation and emails and other follow-ups.

>> Our pre-survey has been complete. The module infatuations -- evaluations being complete. We still have a few outliers that I will touch on in terms of agencies they are still completing the full curriculum than the post-survey is being implemented here in the next several weeks for agencies as a complete the full seven modules.

>> The assessment of the learner's reaction utilize both the pre-survey as well as a pre-focus groups to get their reaction to pediatric emergencies early on. There is a post-survey and post focus group to meet with those providers to get their impression and look at the difference between pre-and post educational curriculums. As I mentioned, we focus a lot on the assessment of what is a bit learning and the measure that utilizing for this is the improvement in the simulated scenarios for the individual providers that are going through the modules. We have a catalog of over 200 videos that are being reviewed by our expert reviewers blinded even though they are pre-education and post education scenarios. The improvement will be shown on the overall evaluation of that data. Ultimately what matters is what happens with the patient. We are looking for an assessment of behavioral change. The easiest way to develop and identify the ability to look for that behavior change in actual practice is focused on the evaluation and treatment of pain management. This has been documented and well known to be an area of weakness for many EMS providers and agencies throughout the country and is an area of weakness here in our region. Our partnering agencies have gone through the module including the pain management administration module. We are looking for improvement in the recognition of appropriate pediatric assessments for pain. Appropriate treatment and transport those patients. We are currently doing our data analysis of the pre-data looking at a year of pediatric transports to our level I Trauma Ctr. which is level two pediatric level center in the pain management that happened [Indiscernible] and we look into another year after the grant -- module has been complete and looking for improvement from those individual agencies that took in the grant education.

>> Besides the development of this curriculum and other resources that we are excited to roll out to our EMS partners throughout the country, there are other lessons after the

implementation of this project. One of the biggest things that is rural providers are hungry for knowledge and training opportunities. Because it is so limited typically in their everyday practice and agencies, our agency has welcomed this with open arms and our providers have been accommodating and interested in continuing with their education. One of the things we saw in regards of our agency type or location throughout was that many areas -- mistakes being made on the pre-evaluation -- pre-competency assessment simulation work common throughout many of our agencies so this allowed us to modify and focus much of the training throughout the tactics and simulation to highlight these areas that repeatedly come up in our simulations as areas for improvement. We came across multiple challenges that hopefully as we are able to describe these challenges in a way that we are able to deal with them will benefit other agencies when trying to implement a training program or education network such as this. Some of those challenges had to deal with the difference between career-based agencies versus volunteer agencies. Fire-based versus the third as well. What we found was our busiest agency and busy is a relative term -- our busiest agencies are not as many of our urban counterparts. They normally are firebase EMS. They are most likely to be paramedic based. Also more comfort perceived pre-curriculum. Working with these agencies was much easier to be consistent with the trainings because the providers of the agency worked with the same cruise. They had a very pretty -- predictable rotation. They were more likely to obtain full curriculum and attempt of the educational modules within the curriculum. We also are likely to be interrupted during training. All the training was during on-duty training for the crew. Repeatedly we came up with a suggestion from providers that they would prefer off-duty training where they could be dedicated to the educational module and not be interrupted. Unfortunately this presents a funding issue for our smaller rural agencies that have limited budgets to begin with. Around volunteer agencies and third services had the same challenges. These were agencies that had lower levels of training/certification/licensors further providers. They tend to be less experienced and less comfortable with pediatric patients. If anything they tend to be the most enthusiastic learners regarding our pediatric curriculum. Unfortunately, because of the volunteer nature of the nature which they were scheduled even if they were paid they were less consistent with attending trainings. We focus on the basics with these providers and our modules were built to allow the development and education to get into multiple levels of providers but what we noticed bigger jumps in improvement. There was low hanging fruit that could be acquired from that more basic providers in our rural agencies especially from the volunteer agency.

>> This has been a great three years what we have learned a lot about the implementation project of this target issues grant. We are excited about finalizing the curriculum with many of the things that we learned with implementing this project over the last three years. We are excited to will out this curriculum without module and the resources for all of our EMS agencies and providers to be able to utilize. In the near future hopefully you and your agency will be able

to utilize our simulations that we developed whether for [Indiscernible] simulation or tabletop simulation. Our question banks and making it easier for you to deliver high-quality pediatric education on topics that are likely universally needed for further education. I would like to thank everyone in her shop and EMS children's program. I would be happy to take any questions about the project.

>> Thank you Dr. Tom Trimarco. We have time for just a few questions. Remember you can type in a question into the chat box on the lower right hand side of your screen. There is one from Jolene asking looking forward to access these resources. What might the timeline for accessing them?

>> In order to -- and looking for trying to prove the utility of the training curriculum, we have not released any of the educational resources that we developed as not to confound our current educators appear. Not all of our providers are through the curriculum just yet. The anticipation is that they will all be through the curriculum by August of this year. As soon as our last agency is through, we will be working with the EMS children's program and likely Dr. Shah and his group to be able to post these resources for open access.

>> If you would like to ask a question from the fomite it is start one and record your name.

>> I am showing no questions through the phone line at this time

>> We have another coming from Diana online.

>> Let's give her a second.

>> Diana types once the resources are least is it possible that the valuation tools both for knowledge and comfort will be available for agencies as well?

>> We would be more than happy to share that survey that we utilize pre-and post to help identify the needs as well as identify the current comfort levels and conscience levels of pediatric patients. That would be easy to do.

>> I think we will move on and people are welcome to type in the chat box during the presentation. There will be a chance for questions at the end. Dr. Shah?

>> Thank you. It's a pleasure to speak to you about the PEGASUS project and some of the successes and challenges that our team experienced in developing, lamenting and now in the process of setting prehospital-based evidence guidelines. I will be discussing the PEGASUS grant which is the most recent grant. Some of the work we did was related to a project grant that focused on implementation of evidence-based guidelines as well. I will be discussing that also.

>> Diane shared the objectives for the webinar earlier. In particular I want to focus on stakeholder selection with guideline development and factors to consider implementing multiple protocol changes in net EMS system and critical factors to consider when setting outcomes. To set the stage for this discussion, I want you to consider this patient. An ambulance arrived on scene to find this child who is having a seizure and if you take a look at local protocols after managing her airway there are a variety from one EMS agency to another with regard to what should be done next. Should it be starting an IV, check a blood glucose, give a rectal medication or by another route? This variation exists. Part of that variation in protocols exist because many protocols are developed through consensus. Some are based on the opinions of medical directors or other people in the EMS agency based on other clinical guidelines or how they were taught to practice medicine or other protocols that they have seen. Some may contradict evidence that exist while others may be in line with it. What we know is when we apply evidence to our practice that we can enhance the care that we provide to patients and I think that is true when it comes to prehospital protocols.

>> I want to give a preface on the discussion of evidence-based guidelines because I think any times when people think about guidelines they think of cookbook medicine. I like to cook and when I need new ideas I go to a cookbook. I may follow the recipe the first time I made modify after that to suit my own taste and style. Some steps are more crucial than others. For example if I am making rice and I decide not to boil it would to have crunchy rice. That is a critical step to making rice is to be able to boil it. If another step says to add peas to the rice and I decide to leave it out the rice is still good to eat and that's just a variation in the recipe. I think the same is true when it comes to evidence-based guidelines. Evidence-based guidelines is not intended to dictate the call content but provide freedom to integrate best practices. Those best practices may have to take into account provider skills and training, cost or local resources. Evidence-based guidelines is not intended to be implemented verbatim in every single system as they are written. The guideline gets translated into a protocol and it is necessary to consider local skills and training cost, resources when making the translation guideline into a protocol. The Institute of medicine now known as the national Academy of sciences, engineering and medicine back 10 years ago published three landmark reports that you are familiar with on the state of emergency care in the United States. One common theme that was present in all three of these reports was that need to enhance evidence-based practice into emergency care and one recommendation that was made in all three reports was to convene a multidisciplinary panel to establish a model for developing evidence-based protocols. Back in 2009 the national EMS advisory Council and federal interagency on EMS convened a panel of experts which proposed a model for development of evidence-based guidelines specifically for the prehospital setting. What you see on your screen is the eight steps in that model which has been published in academic emergency medicine. What it requires is input from the system to guide the initiation of a guideline development establishing priorities and then going through eight rigorous

process to create a guideline and disseminate, implemented and evaluate the effectiveness of it. Back in -- this is a brief history of the state of evidence-based guidelines in the prehospital setting over the past 10 to 15 years. That model process was created back in 2009 as I mentioned. Shortly thereafter the national Highway traffic safety ministration collaborated with EMS children program to test the model and a workgroup that I was fortunate to be on focused on the creation of a guideline for pediatric seizures. That collaboration between Nyssa and [Indiscernible] children created two more guidelines for the use of helicopter EMS and pain assessment and management in the setting of trauma. Shortly after or several years later, excuse me, those guidelines were published in January 2014 including a methodology paper that describes the processes to create all three guidelines. Back in 2010 EMS for children program granted the first [Indiscernible] rent and for that reason the process utilized in the joint collaboration between [Indiscernible] and EMS for children to use the upgrade system or grading of recommendation assessment.development and evaluation system to create an evidence-based guidelines for asthma, bronchiolitis and croup and implemented in the three urban systems in Texas. In addition this step had funded a project on a statewide basis on that paint guideline that had been created in several states. That was a project that Matt Scholl the state medical director of Maine and Pete [Indiscernible - name] lead. The PEGASUS grant was awarded in 2013. I think one thing that was fortunate in the whole process is that support with it so -- an eye TSA -- [Indiscernible] each one takes a process to make them the EMS community needed some model clinical guidelines for common conditions and the convened a workgroup to create model guidelines for 40 different conditions but with the intent as evidence-based guidelines were created that these guidelines would get integrated into that critical guideline resource which is available now. All the guidelines that I'm going to discuss our part of that clinical guideline document. Looking towards the future through funding a prehospital guideline has been established with collaboration from many different organizations within EMS to promote the development implementation and evaluation of guidelines across the country. The PEGASUS project started out with the intent of creating for guidelines. Airway management, allergic reaction, shock and spinal care. The intent was that these guidelines would be implemented in a local system in Houston and that only two of them would be chosen as an area of focus for implementation in New England. However as we embarked on the project recognizing that there are several other evidence-based guidelines that were previously created by other projects we had nine evidence-based guidelines available to us. Before that we created through PEGASUS in the five prior ones. It was an opportunity to use the implementation and effort for the implementation to implement all of them and to revise the ones that had been previously lamented. In October 2014, we implemented these night in Houston fire Department. Three of them had been implemented as part of the prior project but we did not update to the protocol-based on a look at the literature and for the Houston limitation did in person training with all 400 paramedics in the Houston fire

Department. In collaboration with the EMS for children state program managers and the state EMS medical directors in New England, we embarked upon implementation of these nine guidelines in many of the states and new in Gwinn. I will talk about the successes and challenges in New England as I go through some of the rest of the talk. In terms of guideline contributions when embarking on a evidence-based guidelines it supported to have all the key stakeholders there you also don't want to big of a group that makes it difficult to reach consensus as you review and discuss the evidence. For our project we sat out representation from the consumer so we had a parent who had a child with special needs who has used the EMS system frequently. We also were intentional about inviting EMS physicians and paramedics and not just from our local air in Houston but also from the new in Gwinn area since the contact was important to get their perspective of local providers. We had EMS physicians that were state medical directors were local EMS directors and paramedics from various systems throughout the region and from the city of Houston. We also ensured that we had emergency physicians both general emergency physicians and pediatric emergency physicians and through collaboration with the evidence-based outcome center at children's Hospital -- Texas hospital we had several research specialists that were part of our team and we also recruited the consultation of pharmacist as we develop guidelines to ensure we were making recommendations that were appropriate regarding dosing of medication. As I mentioned we had the EMS children state holders and that serve on the project and server identifying other key stakeholder organizations. As we went to the process as guideline development and disseminating drafts to get feedback from stakeholders. Then because implementation requires statewide education and also local education in the city of Houston we insured we had participation of educators from some of the EMS agencies as well as data managers who could help ensure and provide feedback in what we had planned for setting of outcomes. What to give you a brief overview of the timeline of the project. In the first year of the project we recognize we need to train people who had never been to the process of creating an evidence-based guideline and the estimate of what that involved so through our collaboration with the evidence-based outcome center we were able to offer that in person web-based training to get everyone on the same page about the process to use. As we did that we came up with clinical relevant questions to search the literature and then used our collaboration with our research specialists to find relevant articles that were divided among our team which was about 15 people plus the four staff of the evidence-based outcome center to read the articles and appraiser using the great methodology and then at our second in person meeting we discussed our appraisals and made recommendations and came to consensus on those recommendations have the literature of potentially address the question. We then sat stakeholder feedback and that stakeholder feedback was sought by sending drafts of the recommendations and algorithms out to 30 different organizations that are potential EMS stakeholders and received a lot of feedback from the EMS and pediatric emergency community. Based on that feedback we

went through each item of feedback and discuss them together as a guideline development committee. Made potential revisions we thought were necessary based on that feedback. In situations that did not work eight revision we chose to stick with our recommendation. Those guidelines were then finalized in May Those guidelines were then finalized in May 2014. Using those coming months leading up to the second year of the project our plan for implementation in Houston so as I mentioned we did in person training that was mandatory. It was three and half hours where we had every paramedic in the system attend one of the five trainings that were offered so that every paramedic in the system would be familiar with all nine of the protocol updates that were taking place. This training was done one to two weeks prior to the protocol change and in collaboration with the stakeholders in new England geared up to training. In states where we were able to have an in person presents and come to the state and possibly present the content of the guidelines and recommendations and evidence behind it at one of their estate white EMS conferences or to attend one of their protocol committees or medical control Board meetings and to be able to have it dialogue about why a recommendation was being made and discuss the evidence behind it, we were able to change the minds among stakeholders in the state who when they saw the recommendation may have not initially a great but after having a dialogue about them understanding the evidence then agreed that many of the recommendations that were proposed were worth while. In 2015 the first three states that I would say it were the early adopters were main, New Hampshire and Vermont. Moving forward the state of Connecticut which did not have state white protocols there was transition last year in the format of their protocols although they do not have mandatory protocols they didn't have recommended statewide protocols that they were able to put out so able to disseminate those in Connecticut also. The states of Massachusetts and Rhode Island have approved the protocols and are in various stages of implementation. What I will do is show you the essence of each of the nine guidelines. I have summarized each of them as dues and don'ts. For these if something is noted in green on the slide want to highlight a potential success and if something is noted in bread I will highlight a potential challenge that occurred in that implementation. One thing I want to highlight was the use of oral Texas Elsa Ramon -- [Indiscernible]. There was good evidence that giving steroids in the setting of asthma helps improve outcomes. This has been demonstrated in the emergency department and also when sewers are given earlier that the outcomes improve sooner. Using that logic our hope was if we initiate steroids in the prehospital setting that the same would apply. Since many of the stories used that are carried on impulses are in the IV I am formulation we were able to get the agreement of many EMS agencies to utilize the IV or I M of [Indiscernible] that is used and given orally since it's more highly concentrated and can be given orally. We were able to implement that in several systems. We are studying the impact of that on outcomes and there is a abstract on that specific issue that has been submitted to the pediatric Society meeting and we are awaiting a response on whether that abstract has been accepted. One thing that came

up as a challenge was based on the evidence that we recommended in the setting of respiratory failure to utilize CPAP. One challenge we noted there was concern in some of the EMS agencies on how to use CPAP in a child. Although many EMS agencies carry the CPAP equipment for adults they were unsure how to safely use that for children or they were concerned about cost implications in utilizing -- buying smaller site mask to use CPAP to give it to smaller children. What we had to work out with the EMS agencies was to use it if you have it available so that would be available for the teenage size patient. For smaller children if it was -- work cost implications to be able to purchase that equipment that would be something that would be optional.

>> For bronchiolitis, one of the successes was around the time we were implementing this the American Academy of pediatrics also released a statement about care of bronchiolitis guideline. It raised awareness about the issues and management so it was a good opportunity for us to address the situations where that management in that guideline should be the same or defer in the prehospital setting. One of the things where we differed slightly was because of the potential short-term relief that is demonstrated in the literature in giving inhaled epinephrine we recommended it to be used in the ambulance since there were no other interventions that could be given in the prehospital setting apart from CPAP which many of the EMS agencies did not have. One of the challenges was doing this project with the first target issues grant we did not involve a pharmacist. We realized our dosing for inhaled epinephrine since most EMS agency do not care in the hospital which is [Indiscernible] epinephrine we are recommending a dose for the 1 to 1000 of epinephrine and initial dose we recommended prior to the 2014 information was incorrect. Having the pharmacist on the project this go around helped us to optimize dosing. When it came to group I would say there were similar successes as we had with asthma in implementing oral dexamethasone. The CPAP availability for the small child and the dosing of inhaled epinephrine. When it comes to air weight management there is a lot of controversy over the literature regarding pediatric airway management in the field. Based on our review of the literature, we had recommended that a stepwise approach be utilized and when a child is in respiratory failure to initiate with back valve mask in a -- immolation and if that was not inadequate then proceed to placing a super glad airway and if that was not available or effective than to place an end to Terry Keel -- endotracheal tube. One of the successes and this was being able to implement a device that could be used for children down to the [Indiscernible] that was alternative to the endotracheal tube since there is a [Indiscernible]. There was a challenge in lag time especially in systems that had not stopped the super glad airway. There was lag time in the systems that took up to a year after we had made the protocol change for the device to be available on the ambulance.

>> When it comes to seizure management this one had been published previously. I think one of the successes was being able to optimize the dosing without affecting cost. Many of the

systems carried with as a lamb. They are recommending it be given rectally or intravenously and based on the literature we recommended given intranasal so that did not require that the agencies purchase any new medication. It was given by a different route. One of the challenges was changing that culture we found and studying this that although we've made the change in the guideline and we have seen an increase in the use of [Indiscernible] as the first route there still a lot of situations in that seizing child were IVs are being placed and with as a lamb -- with dazzle them is still the first choice of the provider. When it comes to allergic reactions when success was being able to emphasize the use of intramuscular epinephrine and clarify that is the appropriate route. One of the challenges we had with that is the expense of the auto injectors especially in the past year. Our review of literature has demonstrated that there are less dosing area when auto injectors are used. That needs to be weighed against the cost implications to the system when recommending that. In some systems the decision they made was that their life support provider since it's not in their scope of practice to calculate and draw up the medication they will continue to have them use the auto injectors that they carry. And if the autoinjector was on scene the ALS provider could use it but if the ALS provider was the only provider on scene and they don't normally carry the autoinjector they would be allowed to drop it up. That was a compromise we made in one of the systems to be able to be cost-conscious and the practical implementation of one of the guidelines. Another thing there was a evidence that supported the use of combination of H2O and H1 antihistamines for [Indiscernible] and pruritus. None of the EMS agencies carry the H2 blocker since pruritus in order to carry on its own are not life-threatening. We agreed the expense of adding that education that was not because they carried was not justify. I think that being able to have the guideline has changed my practice in the emergency department in using the H2 blocker and being able to share that information in the in-hospital setting with others in the field.

>> When it comes to shop, one of the successes was the emphasis of utilizing goal directed therapy and timely access in the setting of shock. Timely recognition in the timing of shock and early fluid administration. One of the challenges was disagreements over the use of pressers and which one is the best one to use for the child. There was controversy among stakeholder feedback so in that situation since the literature was not swing us one way or the other the feedback from the stakeholders -- we recommended that any of them could be used and we recommended appropriate doses for the condition.

>> For spinal care, one of the successes was able to provide clear guidance where it was lacking on when it was have the provider selectively decide whether or not to restrict motion of the spine. One of the challenges was changing the culture of the routine use of the spine for which is still an ongoing issue. When it comes to pain management one of the successes was being able to implement age-appropriate pain scales that could be printed in the protocol that were online and in paper and also in our local area of being able to provide a pain scale on a badge

based card that the provider could carry on them so when they were trying to assess pain in the younger child they could use something that was age-appropriate since prior literature shown one of the barriers to pain management is the inability to appropriately assess pain. One of the challenges was that concern of overdosing that child and the use of opiates and also being able to utilize medication by an alternative route like the nasal bout. And also a concern that I've access may be a concern when giving medication like that. What I show our potential quality metrics. One of the things we tried to do with the PEGASUS project was to suggest certain metrics that could be used based on the recommendations and also based on what is available in the electronic medical record and is potentially documented. For each of these our group propose potential metrics and vetted them through our data managers to get feedback from them on what could be potential gathered here on a local level or regional level in new England to assess compliance or actual outcomes. I show some of them here. With all of these there are challenges. There are challenges when you're trying to study and outcome because that requires data linkage with data in the hospital. That was something we did not think would be feasible from the outset to do in New England where there be many hospitals where the patient would be transported. If something we focus on in the Houston area since we did have access in-hospital records for 10 different hospitals that were part of two hospital systems. For some of these we will be studying actual patient outcomes in the hospital linking that data. In thinking about both projects I think there are lessons that I have learned when it comes to getting by in it's important to not just have the buy-in of the medical director. But really to have the body in -- by end of the end user consumer, educators, and data managers so that all of that is considered in the guideline development. With training I have learned that online training although it can be efficient inmate be as effective. Sometimes that may be the only option available if you are trying to train a large group of people across a broad region so we did do online training in New England. In Houston we decided we would have mandatory in-person training for the paramedic level provider. In terms of go live to make an isolated change in protocol is challenging. If you are changing one protocol or even nine but it's not synced with the rest of protocol updates in that system so having it coordinated with the timing when that system is planning to do a protocol update is essential. That also important to vet the data that you are planning to collect in advance so you're not collecting it all collecting what is valid.

>> In terms of current and future directions each of these will be written up. Many of them are already drafted. If you need to be. -- A few need to be. The recipe should be published in the coming year. In terms of implementation still a few more states to fully know life. In terms of the research I mentioned we are studying some of them regarding inpatient -- excuse me emergency department outcomes. We found it's important to be able to study something that is comment and easily identifiable if we are trying to study a patient-based outcome. We are trying to track more of a process measure over time many of those things could be steady on a recent white basis in New England. If you are interested in seeing more information all of the

content of these are in the NASD MSL model clinic EMS guidelines. In that document those are meant to be guidelines so they are in word format not in an algorithm all of the grading of the evidence has been removed to provide consistency among the rest of the guidelines. Each of the states in the city of Houston have their protocols in their books that are available for the public on the Internet. You can email me with questions. If you take home points. It's essential to use established frameworks and models like grade in the prehospital guidelines evidence-based guidelines process to create guidelines and also to use that framework when teaching others about guideline creation for EMS. You can create guidelines with novice, to disciplinary groups but requires structure and guidance. Having those research specialist are essential to the process. And periodic and in person presence contributes to success guideline implementation. When it's feasible to be there in the state to have a dialogue about the recommendations and to discuss them, those are the situations when implementation went smoothly. I will be happy to take any questions.

>> Thank you. We have a couple of questions in the chat box. One is for airway quality metrics do you include ET CO2? Suspect that is one of the things that I had brainstormed. I will scroll back seat can see those metrics for airway.

>> Another question, do you have any experience with nebulized fentanyl for pain management?

>> No. I do not. I will say for the pain guideline I was not part of that work group. That work was done between EMS and [Indiscernible] and I was not part of that group. We implemented the paint guideline. I don't know the background on the evidence that was reviewed for that one.

>> I think I got the questions in the chat box. Operator, can you open it up for any questions.

>> As a reminder if you would like to ask a question it is*one and board your name when prompted.

>> You can always type a question in the chat box.

>> While we are waiting to hear if there are any questions on blind I put up the slide for the continuing education evaluation and certificate. In the notes box there is participant valuation as well as for the survey monkey. These are posted on the EI IC website. The archive will be available for review -- I'm not sure. Maybe a week or two.

>> I am's showing -- I am showing no questions from the phone line at this time.

>> I think we are coming up on the time. I want to thank both of the speakers. These were great presentations and great projects. HRSA and EMC worked -- enjoyed working with you in the last few years. A reminder to everyone if you are interested in that CE the information is on the

slide. This will be posted in the EI IC website as well as the archived webinar which will be up in a few weeks. Thank you so much.

>> Thank you for your participation in today's conference. You may now disconnect at this time. Have a wonderful day.

>> [Event Concluded]