

Hello and welcome to the Check & Inject New York Training Program. I'm Jeremy Cushman, an EMS Physician and Medical Director for the Monroe-Livingston region. Today, I'll be sharing with you this important New York State demonstration program for BLS provider administration of the Syringe Epinephrine Kit. On behalf of the Check and Inject New York project team, I hope you find this training valuable and I thank you in advance for your participation in this important demonstration project.

CHECK & INJECT NY – DEMONSTRATION PROJECT

Check & Inject NY was developed and is being implemented as a New York State Demonstration Project. As required by 10 NYCRR Part 800.19, this project has approval of the SEMAC and the New York State Department of Health Commissioner, Howard Zucker, MD, JD.

Any EMS agency which currently utilizes epinephrine auto injectors in their treatment protocols is eligible to enroll in the Check & Inject NY Demonstration Project, which will run for a period of 18 months. The project data will then be reviewed by the SEMAC, who will make their recommendation to the Commissioner of Health for continued use.

The syringe epinephrine kits are not currently approved for use to agencies not enrolled in the Check & Inject NY Demonstration Project.

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Importantly, syringe epinephrine kits are not currently approved for use by agencies not enrolled in the Check & Inject demonstration project.



Through this video and the skills-based training that follows, I will share the rationale for the Check & Inject New York Program; review the triggers, signs, symptoms, and treatment of anaphylaxis including how to differentiate a localized allergic reaction from life threatening anaphylaxis; then we'll spend some time demonstrating intramuscular medication administration and how to assure we are safely drawing up, administering, and disposing of an intramuscular injection.



BLS providers have successfully shown through other demonstration programs such as naloxone and CPAP administration, that they are capable of providing what were previously considered advanced skills. The injection of intramuscular epinephrine is another such skill, that with the proper training, BLS providers can safely administer.

Although auto-injectors are one way to administer life-saving epinephrine to a patient with anaphylaxis, it is not the only way. The cost, and potential for self-injury are not insignificant and moving to a different delivery mechanism has the potential to save our EMS systems millions of dollars while maintaining the important ability to treat patients with anaphylaxis.





New York is not the first to explore this delivery route amongst its EMT's. King County Washington, began their program in 2014, and have demonstrated through hundreds of applications, that BLS providers were able to successfully administer epinephrine to a patient experiencing anaphylaxis. In some instances, treatment may have been aided by the use of the syringe epinephrine kit versus conventional epinephrine auto injectors. All these administrations were done safely, and without injury to providers.

Since that time, several other regions, in states across the country, have also successfully implemented similar programs. The Check & Inject program is modeled after these successful programs.



Let's start with a review of anaphylaxis. Anaphylaxis is a systemic reaction, meaning that it affects the entire body. It is typically characterized by shock and/or respiratory symptoms that are characterized by a rapid onset. It is not necessary for all of the individual components to be present for a patient to be in anaphylaxis. Important to remember is that a patient experiencing anaphylaxis, who is left untreated, will die.



Also important is that Anaphylaxis is not the same as an allergic reaction or seasonal allergies that many of us may have experienced. These may include an insect bite that itches, a runny nose, sneezing, or watery eyes. Although these are allergies, they do not have the rapid onset of systemic effects that are found with anaphylaxis.



So again, anaphylaxis is sudden, systemic, and life threatening. Although anaphylaxis is not the same as an allergic reaction, they are similar in that both result from an exposure to an allergen – an important point to consider when you are making your treatment decision.



An anaphylactic reaction is triggered by an allergen. An allergen can be just about any substance that a patient may come in contact with. We know that some substances are more likely to cause an anaphylactic reaction, and may also cause the reaction to be more severe or progress quicker.

Some of these allergens, and therefore causes of anaphylaxis, include certain foods, such as nuts, or shellfish; sensitivity to bees, wasps, and other insects, medications such as antibiotics, or even plants or latex.



The lifesaving treatment of anaphylaxis is very simple – patients need an intramuscular injection of epinephrine to improve respiratory distress, reduce any airway swelling, and counteract hypotension.

Additional interventions such as anti-histamines, nebulizers, and steroids may be given by advanced life support personnel, but nothing is more important than epinephrine.



In the first presentation, our patient is exposed to a likely or common allergen, but has not had a prior anaphylactic reaction. When that occurs, and the patient rapidly experiences signs or symptoms from any two categories listed, the provider should administer an injection of intramuscular epinephrine. So let's say we have a child that is eating peanut butter for the first time, and rapidly develops hives and difficulty breathing – this person would meet the definition of anaphylaxis as they have a potential exposure to an allergen, and both skin and respiratory symptoms. Alternatively, let's say a gentleman is stung by a bee, rapidly develops difficulty breathing and then passes out. You note him to have a very low blood pressure – this person would also meet the definition of anaphylaxis as he has been exposed to a likely or potential allergen and has both respiratory symptoms and a decreased blood pressure. Both of these patients have anaphylaxis and would be best treated with an intramuscular injection of epinephrine.

Slide 11 (continued)

In the second presentation, our patient has had a previous anaphylactic reaction and may even have an epinephrine auto injector prescribed to them as a result. Following the exposure, the provider should administer an injection of intramuscular epinephrine when signs or symptoms from any one category is present. So for example, a woman with a known shellfish allergy is exposed to crabmeat and has immediate shortness of breath – this person would also meet the definition of anaphylaxis as she is exposed to a known allergen and has respiratory symptoms.

These combinations of exposures, signs, and symptoms can help identify patients in anaphylaxis. However, anaphylaxis is not limited to just these specific algorithms. Each provider needs to assess each patient on a case by case basis to determine the presence of anaphylaxis and the need for an intramuscular injection of epinephrine. This chart is a convenient reference for many of the most common presentations, but all care decisions must ultimately be made within the scope of local or regional protocols, or with direction from a medical control physician.



Speaking of protocols, the Check and Inject demonstration program does not supersede your existing protocols for care of patients with anaphylaxis. For example, here is the protocol for Allergic Reaction and Anaphylaxis, taken from the 2014 Collaborative New York Protocols.

Taking a closer look at the EMT section of the protocol you will notice that the provider is directed to administer epinephrine in the setting of anaphylaxis after addressing airway management and oxygen therapy. The indications and ability to administer, and the requirements to contact medical control, if any, remain the same during your participation in the Check and Inject Program and you are directed to your local protocols which state-wide recognize the life-saving benefits of early epinephrine administration.



So now that we have reviewed the indications and importance of epinephrine in the anaphylactic patient, let's review a few cases.

Our first case involves a 15 year old girl that was stung by 'something' while she was at summer camp. Several minutes later, her eye began to swell and she walked to the nurse's office. Her exam is as depicted on the slide.

An ambulance was called for the patient to be evaluated. The patient walked to the ambulance where EMTs transported her to a local community hospital after speaking with parents via phone.

En-route, the crew monitored her for any airway swelling, difficulty breathing, or changes in mental status. She was delivered to the hospital ED without progression of her symptoms.

Slide 13 (continued)

In this case, our patient appropriately did not receive epinephrine. Although she was exposed to a potential allergen, she exhibited only skin findings and did not have respiratory symptoms or hypotension. Importantly, however, the EMT monitored the patient closely for any change in her condition, as sudden hypotension or respiratory symptoms would be an indication for epinephrine.



This next case involves an elderly woman who was out to dinner with family for a birthday celebration. Shortly after arriving home, she noticed this rash across her back, chest and face while getting ready for bed. As she has a known allergy to shellfish, she is typically very careful about what she eats, but believes she may have been exposed during dinner unknowingly. When she began to have difficulty breathing, she called 911.

When EMT's arrived, this patient was recognized to be suffering from an anaphylactic reaction after only a brief assessment and history of events. The patient has a rash and respiratory symptoms, in the setting of a likely allergen exposure. The EMTs immediately administered epinephrine in her left thigh as there are no contraindications to epinephrine in the setting of anaphylaxis. The patient was placed on oxygen, moved to the ambulance, and transport to the ED was begun.

Slide 14 (continued)

En-route, the patient reported resolution of her difficulty breathing and reassessment revealed easy ventilations and clear lung sounds. Advanced Life Support was met en-route, and the patient was closely monitored for reoccurrence of symptoms for the remainder of the transport.

In this case, our EMT's appropriately administered epinephrine to our patient with a known allergy history and respiratory symptoms.



Our final case involves a young three year old child that was at a family picnic with friends and relatives. The patient approaches her mother, carrying a large bowl of strawberries, her face appears covered in strawberries, and she is complaining that she doesn't feel well. The child crawls up into her mother's lap, resting her head against her, and appears to fall asleep.

10-15 minutes pass when a relative points out that the patient looks pale, and asks about the rash around her mouth. As the mother tries to wake the patient, she finds that she is unable to do so and EMS is requested.

EMT's arrive and recognize that despite the lack of more classic symptoms, this patient was experiencing an anaphylactic reaction. She has an exposure to a potential allergen, has signs of shock including delayed capillary refill and altered mental status, as well as poor respirations.

Slide 15 (continued)

The EMT's assist her ventilations, administer epinephrine, and begin transport as they should not delay on scene waiting for Advanced Life Support. Fortunately, the crew was able to intercept with ALS en route to the hospital. The patient became increasingly more alert and began crying forcefully at the time of their intercept, allowing the EMTs to discontinue the assisted ventilations.

This is certainly not a classic presentation of anaphylaxis, but our patient had a possible exposure and important to remember is that not all anaphylactic reactions have hives and swelling. These more subtle symptoms should not delay the administration of epinephrine, as it is lifesaving in this little girls case.



Now that we have reviewed the signs and symptoms of anaphylaxis and we know who we should be given epinephrine to, let's review how to give them that lifesaving epinephrine. Anytime a medication is given to a patient, it is important that several factors are verified before the actual medication administration occurs. Every time we must ensure that we have identified a need for the drug's administration, selected a proper route of administration, and verified both our drug and dosage before any administration occurs. We must then properly administer and document that administration as our care continues and is eventually transferred to another provider. EMTs are already familiar with many of these steps as in many regions, you routinely administer drugs such as albuterol, aspirin, nitroglycerin, and others as allowed.

This is the reference card contained in each Check & Inject kit. Let's take a minute to review each section as it pertains to the administration of intramuscular epinephrine for anaphylaxis.



So our first step is to verify the need for epinephrine.

As we discussed earlier, only a patient in anaphylaxis is going to receive an intramuscular injection of epinephrine. That determination comes from an exposure to an allergen, associated signs and symptoms of anaphylaxis, and guidance from your local or regional protocol. We discussed some common signs and symptoms earlier, and those are referenced here on the Check & Inject insert. This may serve as a useful reminder after you have opened the kit for administration.



Here we can see the Check and Inject Kit that you will be using as part of this demonstration program.

You can see that the syringe epinephrine kit is sealed, the label is intact, and the expiration date has not passed.

Opening the kit, we can inspect the individual components which are also listed on the cover. The kit includes:

- One vial of epinephrine
- One custom syringe
- One safety needle
- Two alcohol wipes
- One adhesive bandage
- One Check & Inject paper insert that I demonstrated earlier



Our second step is to select and prepare the site for injection.

The only site approved for use in the Check & Inject program is the upper lateral thigh. The site should be exposed so the injection can be given directly into the skin. This site will be cleaned with the alcohol preps included in your kit.



Ideally, any intramuscular injection should be administered in the bare skin that can be visualized by the provider. Once you have identified the proper site, as we have illustrated, the site should be cleansed with the alcohol pads that are in your Check & Inject kit. The site will have plenty of time to dry as you complete the next steps in the process. There is no need to blow on or fan the site once it has been cleansed.

If needed in only the most acute of settings, the Check & Inject kit may be administered through a layer of clothing; however our preference is the medication is administered to bare skin.



Our third step is to verify the drug.

When a drug is administered through the intramuscular route, the provider needs to ensure that they are administering the correct drug, the drug has not passed its expiration date, and that the contents of the vial are clear, and free of floating objects. Although the Check & Inject kit was sealed, check to make sure the vial of epinephrine is not expired and the fluid remains clear and free of debris.



Whenever you administer a drug, you should have an understanding of how that drug is intended to work, what side effects can be expected, and what complications may arise and how those should managed. As epinephrine is already being administered by BLS providers, we will limit our time here to a quick review.

You may recall, epinephrine is a manufactured form of adrenaline, which is naturally occurring in the body. Epinephrine works to stimulate the sympathetic nervous symptom of our body. In other words, it turns on our fight or flight response.



The onset of a drug is how long it takes for our body to respond. This time can vary greatly depending on the drug itself and the route by which it was administered to a patient. Some drugs may works in seconds, while others could take a half hour or more.

Epinephrine, administered through the intramuscular route, would typically begin working in as few as 90 seconds if it were administered to a healthy patient. Since we are administering epinephrine to a patient in distress, it may take as long as 3-5 minutes before the epinephrine begins to work. It is also possible that a single dose is not sufficient to treat a patient. By understanding the onset of the drug, we can also understand why we should be considering our second dose of epinephrine in as little as 5 minutes after the initial dose was administered.

Slide 23 (continued)

Once the provider begins to see improvement in the patient, the duration, or how long the drug will last, can be one to four hours. It can also be much shorter than that, and frequent reassessment is essential.



It is important to recognize that there are no contraindications to the administration of intramuscular epinephrine in a patient experiencing anaphylaxis.

When you practice this skill later on, you should have a copy of your local or regional protocol to reference. It is possible that protocol may restrict your ability to administer epinephrine in some situations. If that is the case, you MUST follow you protocols, despite the information that was presented here today.

Side effects of epinephrine are related to its effect on our fight or flight response. We can expect someone to have received epinephrine to potentially experience palpitations, high blood pressure, feeling anxious or jittery, having tremors, or experiencing a headache. All are known side effects of the medication, but these side effects are outweighed by the lifesaving effects of the drug.



Our fourth step is to verify the dosage and draw up the appropriate dose.

The Check & Inject project has made dosing simplified with the custom designed syringe. There are only two markings on the syringe – an adult and a pediatric dose.



The standard dose of epinephrine across most of New York State is 0.3 mL for adults, and 0.15 mL for pediatrics. The difference between adult and pediatric patients is made based on the weight of the patient, and not chronological age. Any patient weighing equal to or more than 30 kg or 66 lbs will receive an adult dose of intramuscular epinephrine.

There are some areas of New York State, where the protocol may indicate a different dosage. Those protocols are ALS level protocols and are not applicable to the EMT or the Check & Inject program. The syringe epinephrine kit project is intended only to evaluate the replacement of epinephrine auto injectors. The 0.3 mL and 0.15 mL doses correlate to that found in the adult and pediatric epinephrine auto injectors that are commercially available.



During the training process, we will be utilizing a training vial of epinephrine which should be clearly labeled. The vial differs slightly in appearance, and the contents are water, but the vial is otherwise identical to the actual epinephrine found in the syringe epinephrine kits. Providers should verify that they are administering the correct drug, the drug has not passed its expiration date, and that the contents are clear and free of debris.





Here you can see the custom designed syringe which we will use for all intramuscular epinephrine administrations. The top image highlights the marking for an adult dose while the image on the bottom highlights the marking for a pediatric dose.



Now let's take a minute to observe a short video of attaching the needle to the syringe and drawing up the medication. You will practice this process during the skills session of this training.



Once the drug is drawn into the syringe, our fifth step is to inject the medication.

The injection process is a skill that you will have an opportunity to practice. It is important to administer the injection correctly to ensure your patient receives the necessary medication, but also to understand safe handling practices of the needle to ensure the safety of you and your colleagues.





To inject, you want to align the syringe and needle above the injection site at a 90 degree angle to the skin. It is important that the needle reaches through the subcutaneous tissues, as it may take twice as long for epinephrine to have its life-saving effect if not injected directly into the muscle.



In these photos, you can see the needle is being held at 90 degrees to the surface being injected. The plunger can then be pushed completely to administer the entire dose.



Once the injection is complete and the needle removed, the safety mechanism is engaged. The entire syringe should be properly disposed of in a sharps container. It is never acceptable to leave the needle unattended or in any location outside of an approved sharps container after administration.



Let's take another minute to observe the intramuscular injection procedure that you will be practicing during the skills session.



Once the epinephrine has been administered, and the needle has been safely disposed of, reassessment of the patient should begin. Ideally, we want and expect our patient's signs and symptoms to improve. You should be observing for signs of improvement or side effects, begin transport, and recall that if the patient has not had any significant improvement after five or more minutes, that your protocol may allow a second dose of epinephrine. Whenever possible, please update your responding advanced life support agency, and if you are a transporting unit, do not remain on scene waiting for ALS. After your transfer of care, you will document and perform a debriefing process regarding your use of the Check and Inject kit.



There are several reasons we need good, accurate documentation. Remember that good documentation includes a thorough assessment both prior to, and following medication administration. That documentation should include the patient's condition and their response; as well as any side effects to treatment. Generally, you should be assessing and documenting that assessment every five minutes, if not even more frequently for the patient in anaphylaxis.



Following the appropriate transfer of patient care, it is required that the provider calls the oncall physician for the Check & Inject program to report the use and complete the debriefing process. The sooner that phone call

can be made, the greater the opportunities for your learning and our opportunity to improve this program.

A debrief with the on-call physician is required after the use of a Check and Inject kit, and once complete, will trigger a replacement kit to be shipped to your agency. Dial 844-EPI-CALL and your call will be routed to an EMS physician who will have a few questions for you. If the physician does not immediately answer, please leave a message and they will get back to you within thirty minutes to discuss the call with you. Again, this call should be made after you transfer patient care to the emergency department or other responder for transport. This number is only for physician debriefing. Administrative concerns or questions should be routed through your agency's Check and Inject Coordinator.



Now that we have discussed all the individual parts of the program, we are going to watch an example of how the entire process would occur during a typical EMS response. Pay particular attention to the individual components and how they incorporate those into the treatment of the patient.



We hope that scenario video was helpful in pulling this program together for you. Through this presentation we have discussed the rationale for the Check and Inject NY Program. We reviewed some of the triggers, signs, symptoms, and treatment of anaphylaxis, including how to differentiate a localized allergic reaction from life threatening anaphylaxis. We have discussed that BLS providers are capable of safely providing the injection of intramuscular epinephrine.

And in the skills session to follow, you will practice and then demonstrate the safe administration of intramuscular epinephrine injections under the supervision of an instructor. Keep in mind, during the practice injections, no providers or instructors are to be administered an intramuscular injection.



We hope you have found this training useful to reinforce the recognition and treatment of anaphylaxis, as well as the steps necessary to safely administer intramuscular epinephrine as a basic life support provider. Our thanks to King County Washington for so willingly sharing their program's experiences, and to our partners at Henrietta Ambulance and the New York State Department of Public Health, Bureau of EMS and Trauma for making this demonstration project a reality. This program was developed and produced by the University of Rochester Division of Prehospital Medicine, and we thank the entire project team, as well as your agency, your agency's Check and Inject Coordinator, and you, for your participation.

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