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**EMS SKILL**

MEDICATION ADMINISTRATION

**NALOXONE (NARCAN)**

**PERFORMANCE OBJECTIVES**

Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of intra-nasal, IM deltoid, and IM auto-injector Naloxone, which is a lifesaving medication used to reverse respiratory and central nervous system depression, a side effect from the use of opioids.

**CONDITION**

A simulated patient is unresponsive and has hypoventilation/agonal respirations. The student must suspect an opioid overdose. Necessary equipment will be adjacent to the simulated patient.

**EQUIPMENT**

Simulated patient, oxygen tank with a flow meter, bag-mask-ventilation device, blood pressure cuff, stethoscope,1, 3, 5 mL syringes, filter needle, 1-11/2” 21-23/gauge needle, 2mg/2mL or 1mg/1mL naloxone single dose, ampule of naloxone, nasal spray, naloxone auto-inject trainer, biohazard container, alcohol wipes, timing device, 2 X 2 sterile dressings, band aids (elastic bandages), forceps, clipboard, PCR forms, pen, goggles, masks, gown, gloves, and suction.

**PERFORMANCE CRITERIA**

• Items designated by a diamond (⧫) must be performed successfully to demonstrate skill competency.

• Items identified by double asterisks (\*\*) indicate actions that are required if indicated.

• Items identified by (§) should be practiced.

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| **PREPARATION** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Assess scene safety/scene size-up  ***\*\* Consider spinal motion restriction - if indicated*** | * Look for the presence of syringes and needles or any other   hazards you may encounter. |
| ⧫ Establishes body substance isolation precautions | • Mandatory personal protective equipment – gloves.  • Situational - goggles, masks, gowns. |
| ⧫ Perform a primary assessment   * General impression * Presence of life-threatening conditions * Assess mental status/stimulus response (AVPU) * Assess and manage the airway * Assess and manage breathing * Assess and manage circulation * Obtain an oxygen saturation reading - *if available* | * The administration of oxygen is a priority when a patient is hypo-ventilating secondary to an opioid overdose. * A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94-98%. * **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO2 at 88-92%. * Document the SpO2 reading on the EMS Report or ePCR. |
| ⧫ Initiates Bag-Mask Ventilations (BMV) while preparing to administer the medication  ***\*\*Administer one (1) breath every 5-6 seconds (about 10-12 per minute)*** | * Patients presenting with an altered mental status and hypoventilation must receive positive pressure ventilation with a bag-mask device in order to avoid going into cardiac arrest. * High dose opioids can cause Central Nervous System (CNS) depression, that leads to respiratory and cardiac arrest. * Opioids may also be taken in combination with other drugs that further increases the respiratory depressant effect of opioids. |
| ⧫ Perform a secondary assessment:   * Obtain a SAMPLE history –if possible * Perform a rapid medical exam including DCAPBTLS TIPS on each body region * Look for allergy tags (necklace or bracelets) * Obtain vital signs: Blood Pressure, pulse, and respirations | * When performing a complete body check, the EMT ***MUST******USE EXTREME CARE*** to avoid the possibility of a needle sticks. * The pockets of the patient’s clothing should be carefully checked prior to palpating the patient. * An important step in medication administration is to attempt to determine if the patient is allergic to any medication. |
| **PREPARATION CONTINUED…** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Verbalize the signs and symptoms of an opioid overdose:   * Altered mental status * Slow, shallow, or no breathing * Small or pinpoint pupils that are same the size in each eye * Bradycardia or tachycardia * Extreme drowsiness (lethargy) | * Los Angeles County has removed the respiratory rate parameter for the administration of naloxone from Los Angeles County Reference No. 1247, Overdose/Poisoning Medical Control Guideline, the focus should be on the assessment of the patient to determine if the administration of naloxone is warranted. * Los Angeles County Reference No. 1306 states that signs and symptoms of an altered mental status include, but are not limited to: lethargy, disorientation to person, place, or time. A finding or lethargy with or without disorientation is a red flag to the possibility of an underlying serious condition. * **Some synthetic fentanyl, which are designed to mimic its pharmacological effects, (Carfentanyl) may be as much as 10,000 times more potent than morphine.** |
| ⧫ Verbalize the criteria for assisting a patient with their own emergency medication in the prehospital setting:   * Prescribed to the patient * Meets indications * No contraindications * ALS unit has been requested | * If the estimated time of arrival (ETA) of the ALS unit exceeds the ETA to the most accessible receiving (MAR) facility, EMT transport is warranted. * EMTs may always assist the patient with the patient’s own naloxone |
| ⧫ Verbalize the criteria for carrying naloxone on the ambulance:     * The medication is in the EMTs basic scope of practice * The EMT is working, and on duty, for a provider agency that has been approved to carry and administer the medication * The indications for administration are met * There are no contraindications for administration * Advanced life support (ALS) must be enroute, and the patient must be transported to the hospital after the administration | * EMTs may carry naloxone ***ONLY*** if they are working for, and on duty, for an EMS provider agency has been approved by the local EMS Agency Medical Director to carry and administer the medication. This authorization * US Brand names - Narcan, Nalone, and Evzio * Forms supplied:   + Prefilled auto injectors (IM) - 2mg/0.4mL   + Single dose ampule/vial – 1 mg/mL   + Preloaded nasal spray – 2mg, 4mg   + Preload – 2mg/2mL * If the estimated time of arrival (ETA) of the ALS unit exceeds the ETA to the most accessible receiving (MAR) facility, EMT transport is warranted. * EMTs may always assist the patient with the patient’s own Naloxone |
| ⧫ Verbalize the mechanism of action(s) for naloxone:   * Naloxone reverses the effects of opioids by competing with receptor sites in the Central Nervous System (CNS) * Reverses respiratory and CNS depressant effects | • Naloxone is a medication that is used to reverse an opioid overdose. Opioids include heroin and prescription pain medications such as morphine, hydrocodone, and oxycodone.   * Naloxone binds to opioid receptors in the brain and blocks the receptors from responding to the opioid. |
| ⧫ Verbalize the adult and pediatric dosages of naloxone   * Adult – 2mg IM or IN * Pediatrics (Based on a formulation of 1mg/mL) 0.1mg/kg | * EMS personnel shall utilize a length based tape (i.e., Broselow) to determine weight in kilograms and color zone for children less than or equal to 14 years of age. * The formulation of the medication is the dosage form of the medication. * The maximum dosage, which may be administered to a pediatric patient is 2mg. * When administering medication to a pediatric patient, the dosage will be smaller than the adult dose. Therefore, the EMT must be knowledgeable on how to perform medicine dosage calculations. |
| ⧫ Verbalize the onset of action and duration of effects for Naloxone   * The onset of action is 2-3 minutes * The duration of actions is 20-120 minutes |  |
| **Skill Component** | **Key Concepts** |
| ⧫ Verbalize the indications for administration of Naloxone.   * Suspected opiate overdose with altered mental status **AND** * Signs and symptoms of hypoventilation: * Breathing that is too slow (bradypnea) * Breathing that is too shallow (decreased tidal volume) | • Hypoventilation occurs when a patient’s respiratory status is no  longer capable of performing gas exchange (O2 and CO2).   * Hypoventilation is a state where there is a decreased amount of air entering the alveolar sacs, which leads to decreased levels of oxygen and increased levels of carbon dioxide. * Causes of hypoventilation can include breathing that is too slow (bradypnea) and breathing that is too shallow (decreased tidal volume). |
| ⧫ Verbalize the contraindication for administration of naloxone:  • Altered mental status with adequate breathing | * Like most medications, naloxone has side effects. Therefore, it should only be administered when indicated.   • Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration. |
| ⧫ Verbalize the side effects of naloxone:   * Cardiovascular   + Tachycardia   + Hypertension   + Chest pain/Angina   + Arrhythmias   + Increased oxygen demand * Central Nervous System   + Seizures   + Tremors   + Anxiety/Agitation   + Nervousness/restlessness * Gastrointestinal   + Abdominal Pain   + Nausea and Vomiting * Respiratory      * Pulmonary Edema | * Naloxone may enhance the effects of endogenous epinephrine, which accounts for most of listed side effects. However, naloxone is a safe medication to administer when indicated. The advantage of preventing the need for advanced airway management techniques outweighs the disadvantages. * When an advanced life support (ALS) team must perform advanced airway techniques, ALS providers are placed at an increased risk of disease exposure. |
| ⧫ Prepare the nasal naloxone, ampule, vial, or auto injector **(DICCE):**  • **D**rug name  • **I**ntegrity of container/medication  • **C**oncentration/Dose  • **C**larity  • **E**xpiration date  ***\*\* If using a pre-filled nasal spray, remove from package*** | * An important step in medication preparation is to DICCE the medication by determining if:   + You have the correct medication   + The container does not appear to be contaminated   + You are using the correct concentration and dose   + The medication does not appear cloudy   + The medication has not expired. * **DO NOT PRIME THE DEVICE AS THIS WILL DELIVER MOST OF THE MEDICATION INTO THE AIR AND NOT THE PATIENT** |

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| **PROCEDURE – MEDICATION WITHDRAWAL FROM**  **A SINGLE DOSE AMPULE** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Calls for an Advanced Life Support Unit |  |
| ⧫ Remove the ampule from the package and prepare to draw up the medication using a syringe with a needle | * Single dose ampule/vial-1mg/1mL * Supplies needed:   + 3mL syringe   + Alcohol wipe   + 2X2 gauze   + Filter needle – ***if using an ampule***   + 1” or 11/2”21-23/gaugeneedle for IM injection   + Intranasal Mucosal Atomization Device (MAD) |
| ⧫ Flick or tap the top of the ampule | * Tapping the top of the ampule assist in moving the medication trapped in the top of the ampule to the bottom of the ampule |
| ⧫ Withdraw the medication from an **ampule** (1mg/mL):   * Break off tip of ampule using 2 X 2 gauze to protect the fingers * Attach the filter needle to the syringe * Open the safety device * Invert the vial * Insert the needle into the ampule * Withdraw the contents of the ampule into the syringe * Re-confirm that you have the correct medication by re-checking the ampule before discarding the ampule * Remove the needle and place into an approved sharps container | * Using a 2x2 assists with decreasing the possibility of being cut by the frayed pieces of glass. * If withdrawing from an ampule, the filtered needle must be removed and replace by 1” or 11/2”21-23/gaugeneedle for IM injection * Use of a filter needle when withdrawing medication from an ampule prevents particulate such as glass particles from being drawn up into the syringe. * Using a mosquito forceps to remove the needle assists with minimizing the chance of an inadvertent needle stick. |
| **PROCEDURE – MEDICATION WITHDRAWAL FROM**  **A SINGLE DOSE VIAL OR MULTI-DOSE VIAL** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Withdraw the medication from a **vial** (1mg/mL):   * Remove the protective cap from the vial * Cleanse the top of the vial using an alcohol wipe in a circular motion inner to outer * Attach a 1-11/2” needle to the syringe * Pull back on the plunger of the syringe to the 1mL line to aspirate air into the syringe * Insert the needle into the vial and insert the 1mL if air into the syringe * Invert the vial, withdraw 1mL while ensuring that the tip of the needle is withdrawing the medication into the syringe, and not air. * Re-confirm that you have the correct medication by checking the vial * Remove the needle and activate the safety device – if available place into an approved sharps container | * Inserting 1mL of air into the vial with a syringe assists the medicine being aspirated into the syringe to flow freely. * Removing the needle carefully using a mosquito forceps assist with avoiding a needle stick. **DO NOT REMOVE THE NEEDLE USING YOUR FINGERS.** * The needle should be placed directly into an approved sharps container. If the container is over-stuffed with needles, replace it with a new container as over-stuffed containers may cause a needle to penetrate the plastic and cause an inadvertent needle stick. Replace the sharps disposal container when it is ¾ full. |
| **PROCEDURE – INTRANASAL MEDICATION ADMINISTRATION**  **PREFILLED NASAL SPRAY OR PRELOAD WITH MEDICATION ATOMIZATION DEVICE (MAD)** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Remove the nasal spray from the package **– *if using pre-filled nasal spray*** | * Preloaded Nasal Spray – 2mg and 4mg * ***DO NOT PRIME THE DEVICE AS THIS WILL DELIVER MOST OF THE MEDICATION INTO THE AIR AND NOT THE PATIENT*** |

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| **Skill Component** | **Key Concepts** |
| ⧫ Attach the MAD device to the tip of the syringe – if  withdrawing with a syringe or preload |  |
| ⧫ Discontinue positive pressure ventilations and oxygen delivery - *if in progress* |  |
| ⧫ Place the head in a neutral position *– if possible.* | * The head should be placed in a neutral position (A.K.A. sniffing position) * Hyper-extending the patient’s neck or placing the head back causes the medication to run into the patient’s mouth. Moreover, it may be difficult to determine if the patient has sustained trauma that may warrant SMR precautions. |
| ⧫ Insert the tip of the nasal spray/MAD device into the nostril and gently pull outward ensuring that the tip of the device remains parallel to the nasal septum  ***\*\*Briskly depress the nasal spray OR plunger on the syringe to deliver the medication*** | * Pulling outward on the nostril with the tip of the nasal spray enlarges the nares to create more surface area for medication absorption. |
| ⧫ Resume and continue BMV ventilations - *if indicated* | * Resuming positive pressure ventilation assists with medication absorption along with providing oxygen to the patient |
| ⧫ Discard the nasal spray in an appropriate container |  |
| ⧫ Discard the syringe into a sharps container |  |
| ⧫ Evaluate the response to the medication   * Respiratory status * Level of consciousness | * Signs and symptoms of an improved respiratory status includes: * Increased respiratory rate * Increased tidal volume * Improved SpO2 reading * Skin signs are returning to normal |
| **PROCEDURE**  **INTRAMUSCULAR THIGH INJECTION AUTO-INJECTOR** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Remove and/or cut clothing to expose the thigh |  |
| ⧫ Describe the areas that should be avoided when administering an IM injection:   * Bruised * Scarred * Areas that have superficial blood vessels | * It is common to find areas on the patient’s body where the veins are very darkened, which is due to scarring and the buildup of toxins along the length of the vein. These darkened areas are known as “track marks.” |

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| ⧫ Identifies the correct location of the injection site    Rectus femoris | * Naloxone auto-injectors **MUST** **BE ADMINISTERED IN THE THIGH ONLY**. * The rectus femoris lies over the femur. When using this location, place the injection in the center of the muscle at approximately the level of the mid-shaft femur. * Thigh Injections require that long pants be removed, thereby exposing EMTs to inadvertent needle sticks so use extreme caution while removing the pants. * While literature states that a naloxone auto-injector may be administered through pants, this is not recommended in Los Angeles County. |
| ⧫ Cleanse the injection site with alcohol wipe  ***\*\*Cleanse in a circular motion from inner to outer*** | * Cleansing the injection site is accomplished by using an alcohol wipe in a circular motion, from inner (closest to the injection site) to outer. |
| ⧫ Remove the safety cap from the auto-injector | * Placing fingers at the end of the safety cap is hazardous as any pressure on this end may inadvertently trigger the injector device. |
| ⧫ Place the tip of the auto-injector at a 90° angle against  the site of injection and | * The auto-injector must be placed perpendicular to the thigh (90° angle). |
| ⧫ Apply pressure to the tip of the auto-injector to activate  the device | * Pressure must be applied on the tip of the auto-injector in order to activate the device. |
| ⧫ Continue to hold the auto-injector in place for 3 seconds to ensure all of the medication has been delivered  ***\*\*Apply an adhesive bandage (Band-Aid)*** | * An advantage of IM administration of naloxone is that positive pressure ventilations may continue while the medication is being administered. |
| ⧫ Discard the auto-injector into a sharps container | * Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick. |
| ⧫ Evaluate the response to the medication   * Improved respiratory status * Improved level of consciousness | * Signs and Symptoms of an improved respiratory status includes: * Increased respiratory rate * Increased tidal volume * Improved SpO2 reading * Skin signs are returning to normal * Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration. |
| **PROCEDURE**  **INTRAMUSCULAR DELTOID INJECTION USING A SYRINGE** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Remove and/or cut clothing to expose the upper arm | * The deltoid muscle is the preferred IM injection over the thigh. This is based upon principles of rescuer safety. * Injections in the thigh require that long pants be removed, thereby exposing EMTs to inadvertent needle sticks. * Naloxone auto-injectors must be administered in the thigh region only. |

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| **Skill Component** | **Key Concepts** |
| ⧫ Identify the location of the deltoid muscle and the intramuscular injection (IM) site:   * Locate the acromion process with index finger and leave in place (the bony protuberance of the shoulder) * Locate the Injection site:   + 3 to 4 finger-breaths below the acromion process | * The acromion process is also known as the acromial process and is a bony process on the scapula. * IM injections administer medication into the muscle which is very vascular and permits systematic deliver at a moderate absorption rate. * If the fingers are small, (women) use four (4) fingers (one (1) on the acromion process and three (3) to measure just below the index finger. For males with large fingers, place the index finger on the acromion process and then lay two (2) fingers just below the index finger. If the patient has a larger deltoid muscle, use an additional finger as a guide. The proper injection site will be located just below the last finger used. * An IM injection penetrates the dermal and subcutaneous tissue. * The deltoid muscle is very vascular and permits easy absorption. * Use extreme caution to avoid inadvertent needle sticks when exposing the deltoid area. * For administration of naloxone, the deltoid muscle is preferred over the thigh muscle because removal of the patient’s pants could subject an EMT to an inadvertent needle stick. |
| ⧫ Cleanse the injection site with alcohol wipe  ***\*\*Cleanse in a circular motion from inner to outer*** | * Cleansing the infection site is accomplished by using an alcohol wipe in a circular motion, from inner (closest to the injection site) to outer. |
| ⧫ Remove the cap on the needle |  |
| ⧫ Stretch the skin taut with your non-dominant hand | * Making the skin taut is accomplished by using the thumb and index finger on your non-dominant to stretch the skin on the deltoid region. |
| ⧫ Insert the needle into the skin at a 90° angle | * An advantage of IM administration of naloxone is that positive pressure ventilations may continue while the medication is being administered. |
| ⧫ Pull back on the plunger (aspirate) on the syringe to check for the presence of blood in the syringe  ***\*\* If blood appears in the syringe, withdraw the syringe, activate the safety device on the needle and dispose into a sharps container – if applicable*** | * If blood appears, the needle is in a blood vessel. Withdraw the needle from the deltoid muscle and discard the syringe and needle into an appropriate sharps container. * If no blood appears in the syringe, continue with the medication administration. |
| ⧫ Inject the medication slowly by depressing the plunger until the syringe is empty |  |
| ⧫ Remove the needle and activate the safety device on the needle | * If a safety cap does not exist on the needle, **DO NOT RECAP THE NEEDLE.** Place the needle and syringe directly into a sharps container. * Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick. |

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| **Skill Component** | **Key Concepts** |
| ⧫ Apply pressure to the injection site with opposite hand using a sterile 2X 2 sterile if puncture site is bleeding  ***\*\* Apply an adhesive bandage – if indicated*** | * Patients who abuse narcotics may have hepatitis and be HIV positive. The blood clotting factors that are produced in the liver may be affected, which will lead to prolonged blood clotting. |
| ⧫ Place the syringe and needle into an appropriate sharps container | * Replace the sharps disposal container when it is ¾ full. An over-stuffed sharps container can lead to needles puncturing through the plastic and causing an inadvertent needle stick. |
| ⧫ Evaluate the response to the medication   * Improved respiratory status * Improved level of consciousness | * Signs and symptoms of an improved respiratory status includes: * Increased respiratory rate * Increased tidal volume * Improved SpO2 reading * Skin signs are returning to normal * Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration. |
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| **RE-ASSESSMENT**  **PATIENT REPORT &DOCUMENTATION**  **(Ongoing Assessment)** | |
| **Skill Component** | **Key Concepts** |
| § Repeat an ongoing assessment a minimum of every **5 minutes**:  • Primary assessment  • Relevant portion of the secondary assessment  • Vital signs   * SPO2 * Breathing – rate, depth, tidal volume   ***\*\*Manage patient’s condition as indicated***  ***\*\*Administers a second dose- if indicated*** | • Patients displaying signs and symptoms of hypoventilation associated with a narcotic overdose are unstable patients.  • Unstable patients are those who have abnormal vital signs, S/S of poor perfusion, if there is a suspicion that the patient’s condition may deteriorate, or when the patient’s condition changes.   * Since the duration of action of naloxone is anywhere between 20-120 minutes, there may be times when the ETA for the responding ALS unit is delayed or the ETA to the most accessible receiving facility is prolonged beyond the duration of the medication. Therefore, the respiratory status of the patient must be monitored closely.   • Patients must be re-evaluated at least every 5 minutes if any treatment was initiated, medication was administered.   * Naloxone may cause acute opioid withdrawal symptoms after administration. Therefore, EMTs must prepare for violent behavior after administration. * Certain opioids require higher doses of naloxone to reverse the respiratory depressive effects stronger. The recent literature suggests that Carfentanyl may be 100 X stronger than Fentanyl and 10,000 times stronger than Morphine. * Evaluating and comparing results from a previous assessment assists with recognizing whether if the patient’s condition is improving or deteriorating.   ***NOTE:***  ***EMTs may administer one (1) additional dose of naloxone in the opposite nostril if the patient’s respiratory status did not improve from the first dose within 2-3 minutes if advanced life support (ALS) has not arrived on scene, OR the ETA of the most appropriate Emergency Department exceeds the ETA of the responding ALS Unit.*** |

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| **Skill Component** | **Key Concepts** |
| § Verbalize/Document  • Assessment findings before and after administration  • Drug  - name  - dose  - route  - site  - time  - who administered medication  • Patient’s response to medication  • Respiratory status  • Cardiovascular status  • Mental status  • Vital signs: Blood pressure, pulse, and respirations   * SpO2 | • Documentation must be completed on a Los Angeles County EMS Report Form, a provider Patient Care Record form or ePCR.  • Documenting reassessment information provides a comprehensive picture of patient’s response to treatment.   * Last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS Report. |

Developed 7/2017; Revised 11/2018