

IV, IO and Medication Skills Instructions

Thank you for serving as a Skill Examiner at today's examination. Before you read the instructions for the skill you will be evaluating today, please take a few moments to review your general responsibilities as a Skill Examiner:

- Conducting examination-related activities on an equal basis for all candidates, paying particular attention to eliminate actual or perceived discrimination based upon race, color, national origin, religion, gender, age, disability, position within the local EMS system, or any other potentially discriminatory factor.
- Objectively observing and recording each candidate's performance.
- Acting in a professional, unbiased, non-discriminating manner, being cautious to avoid any perceived harassment of any candidate.
- Providing consistent and specific instructions to each candidate by reading the "Instructions to the Psychomotor Skills Candidate" exactly as printed in the material provided by the National Registry. Skill Examiners must limit conversation with candidates to communication of instructions and answering of questions. All Skill Examiners must avoid social conversation with candidates or making comments on a candidate's performance.
- Recording, totaling, and documenting all performances as required on all skill evaluation forms.
- Thoroughly reading the instructions for the assigned skill before actual evaluation begins.
- Checking all equipment, props, and moulage prior to and during the examination.
- Briefing any Simulated Patient and EMT Assistant for the assigned skill.
- Assuring professional conduct of all personnel involved with the particular skill throughout the examination.
- Maintaining the security of all issued examination material during the examination and ensuring the return of all material to the National Registry Representative.

These skills are designed to verify a candidate's competency in establishing a peripheral IV on a manikin arm and administering an intravenous bolus injection of medication. These skills are scenario-based and the candidate must choose the appropriate IV solution and medication following the instructions and scenarios in accordance with American Heart Association guidelines and other accepted medical practice.

There is a potential for four different levels of candidates to enter your skill today. Be sure to ask the candidate what level he/she is testing and check the related block on the skill evaluation form. Based on the U.S. Department of Transportation National EMS Education Standards, the following candidates should be tested over the following skills in accordance with their respective scopes of practice:

LEVEL	SKILL(S) TO TEST
Advanced EMT	<ul style="list-style-type: none">▪ Intravenous Therapy▪ Intravenous Bolus Medications (naloxone and dextrose 50% only)
Intermediate/99	<ul style="list-style-type: none">▪ Intravenous Therapy▪ Intravenous Bolus Medications

If any Advanced Level candidate (Advanced EMT, or Intermediate/99) candidate is unsuccessful in establishing a patent IV within the criteria outlined, he/she will be unable to administer the IV bolus of medication in this skill as well as in the field. Should this occur, a failure must be reported and documented for both the IV Therapy and IV Bolus Medications skills. Be sure to check the appropriate spaces on the form to document this situation. When

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any candidate (Advanced EMT or Intermediate/99) is unsuccessful in establishing a patent and flowing IV within six minutes or three attempts, you should check the appropriate statement under "Critical Criteria" on the Intravenous Therapy section of the evaluation form. You will also need to check the space on the "NOTE" which explains that the Advanced EMT or Intermediate/99 candidate did not successfully establish an IV line. Dismiss the candidate from the room and do not evaluate him/her over the Intravenous Bolus Medications skill.

Intravenous Therapy

In this skill, you will evaluate the candidate's ability to establish a peripheral IV on a manikin arm. Several patient scenarios are provided for you to read to the candidates. **You must alternate these scenarios between candidates throughout the examination.** Respond to any of the candidate's questions as a patient would in the field, but do not provide any misleading or "tricky" responses.

You should prepare the equipment to include an assortment of catheters, IV solutions, and administration sets for representative purposes. If costs are a major consideration, it is acceptable for all candidates to infuse one specific solution with only one size of catheter and administration set. For example, if a large quantity of microdrip tubing is available and a large supply of any expired solution has been obtained from pharmacy services, it is acceptable to use these items in lieu of the supplies selected by the candidate from the representative supplies. If multiple skills are set up, be sure all equipment is identically labeled. As soon as the candidate chooses the solution from the representative sample of equipment assembled, you will need to hand him/her the expired solution and state, "For the purposes of this evaluation, we'll assume this is the solution you selected. You may continue." By the same token, you should replace large catheters (14 – 16 ga.) with smaller catheters (20 – 22 ga.) after they are chosen to prolong the useful life of the manikin arm skin. Likewise, total taping of the IV with immobilization of the limb is not mandatory and can be verbalized to assist in cost control.

Self-protecting catheters are common in practice. As the stylette is removed from the catheter, several different mechanisms are used to automatically shield the bevel of the contaminated sharp, thereby reducing the possibility of a needle stick injury with a contaminated sharp. However, these mechanisms may not be infallible. In accordance with current OSHA recommendations, any blood-contaminated sharp should be disposed of immediately into a proper container at the point of use. Be sure to uphold this standard for the examination, too.

Notoriously, manikin IV arms are perhaps best noted for malfunction of the "flashback" system during an examination. Should this occur during the exam, you should immediately attempt to correct the problem or replace the arm. If these efforts fail, you must explain the problem to each candidate before evaluation begins. At the point where a flashback would occur in his/her performance of the skill, simply state, "Blood is now seen in the flash chamber of the catheter." You may also need to supply other logical clinical information that cannot be simulated with the manikin arm. For example, if the tourniquet is left in place and the candidate turns the IV on, immediately report the IV won't run. If the candidate analyzes the problem and remediates the omission in a timely manner, credit should be awarded for this step.

At the conclusion of the performance, carefully review all "Critical Criteria" statements on the evaluation form and be sure to document your rationale for checking any of these statements. Be sure that all your paperwork is complete, totaled, signed, and your room has been prepared to appear in a consistent manner before accepting the next candidate for evaluation.

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Intravenous Bolus Medications

An array of commonly used medications packaged in prefilled syringes should be available on the testing table from which the candidate must select the appropriate medication (atropine, epinephrine 1:10,000, naloxone, and dextrose 50% at a minimum). These syringes can be filled with water, saline, or IV solution and must be refilled and repackaged before each candidate is permitted to enter the room.

After reading the prepared scenario, each candidate must select, prepare, and inject the correct amount of the appropriate drug into the IV line based on the given scenario. You should respond to the candidate's questions as a patient would in the field and should not provide any misleading or "tricky" responses. If asked, you should state your actual or imaginary weight in pounds only so the candidate may calculate the correct dosage based upon your weight. Do not let any candidate leave the room with any documentation of his/her calculation. The amount of drug dispensed from the syringe and injected into the medication port of the IV line verifies the dosage administered to the patient regardless of any verbally stated dosage. Therefore, take great care in refilling all syringes between candidates. Given the scenario, the administration of an incorrect drug or improper dosage must be noted in the "Critical Criteria" section on the evaluation form and your rationale for checking any of these statements must be documented.

You will need to know the level at which the candidate is testing so that an appropriate scenario for the Intravenous Bolus Medications skill can be read to the candidate. In accordance with the current *National EMS Education Standards and Scopes of Practice*, you will be limited to deliver only the following two scenarios to the Advanced Emergency Medical Technician candidate:

1. Administration of naloxone for management of a suspected narcotic overdose
2. Administration of dextrose 50% for management of hypoglycemia

At the conclusion of the performance, carefully review all "Critical Criteria" statements on the evaluation form and be sure to document your rationale for checking any of these statements. Be sure that all your paperwork is complete, totaled, signed, and your room has been prepared to appear in a consistent manner before accepting the next candidate for evaluation.

Pediatric Intraosseous Infusion

These skills are designed to evaluate a candidate's ability to establish an intraosseous infusion in the pediatric patient. An array of commonly used equipment to establish an intraosseous line in a pediatric patient should be available on the testing table from which the candidate must select the appropriate materials. **Manual insertion of Jamshidi® needles as well as the use of electric, drill-type devices and spring-loaded devices such as the B.I.G. Bone Injection Gun® are permitted in this skill.** To help control costs for the examination, expired solutions may be used. As soon as the candidate chooses the solution from the representative sample of equipment assembled, you will need to hand them the expired solution and state, "For the purposes of this evaluation, we'll assume this is the solution you selected. You may continue." In a similar way, any other equipment in this skill may be repackaged and reused. If multiple skills are set up, be sure all equipment is identically labeled.

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After reading the prepared scenario, each candidate must select, prepare, and establish an intraosseous infusion in the pediatric intraosseous infusion manikin. **The use of wet tissue (chicken legs, etc.) for this skill is prohibited.** You should respond to the candidate's questions as the parent of this patient would in the field. Do not provide any misleading or "tricky" responses. If asked, you should answer any questions about the patient and should state the weight of the patient in pounds only as listed in the scenario.

When preparing the solution, administration set, and syringe, some systems use a three-way stopcock valve instead of the additional extension tubing. The use of extension tubing is optional in this skill and subject to local practices. Please keep this in mind when reviewing the step that reads, "Attaches syringe and extension set to IO needle and aspirates; or attaches 3-way stopcock between administration set and IO needle and aspirates; or attaches extension set to IO needle." Remember that many successful IO sticks are "dry sticks" that yield no marrow return upon aspirating the IO needle. It is acceptable for the candidate to immediately connect the infusion set to the IO needle and slowly infuse fluid while watching for early signs of infiltration. In this case, the candidate properly evaluated the patency of the IO line in an acceptable manner.

The candidate has a maximum of two attempts to establish an intraosseous infusion within the six minute time limit. You should immediately dismiss the candidate when the six minute time limit expires, or he/she is unsuccessful in placing the needle after two attempts. It is imperative that the correct landmark be identified before insertion of the needle to avoid damage to the epiphyseal plate. The candidate should locate the tibial tuberosity and insert the needle 2 – 3 fingers' width below this landmark on the anteromedial surface. After properly cleansing the site, the needle should be inserted at about a 90 degree angle or slightly directed away from the joint. The Jamshidi® needle should be inserted using firm pressure and in a twisting, back-and-forth, boring motion until penetration through the bone is noted by feeling a "pop" and the sensation of a sudden lack of resistance. When using an electric, drill-type device, the needle is advanced until there is a noticeable lack of resistance. When using the B.I.G. Bone Injection Gun®, the depth of insertion should be adjusted based upon the patient's age. No matter what device is used, the site should also be stabilized in a safe manner while the puncture is being performed. If the candidate holds the leg in the palm of one hand while performing the puncture directly over top of his/her hand, you should mark the related "Critical Criteria" statement for this potentially dangerous action and document the candidate's actions as required. Additionally, it is imperative that the safety device is only removed after firmly placing the B.I.G. Bone Injection Gun® on the leg and stabilizing the device before deploying the trochar. The Skill Examiner must be vigilant and immediately stop any dangerous act before actual harm may occur. Be sure to dismiss the candidate, check the Critical Criteria statement for "Uses or orders a dangerous or inappropriate intervention," and specifically document the situation on the back side of the skill evaluation form.

After removing the trochar, the IO catheter should stand up unsupported if it has been properly placed in the bone. Extension tubing or a three-way stopcock valve with a syringe should be attached and aspiration of blood or bone marrow can be attempted to confirm proper placement or fluid can be injected slowly while watching for signs of infiltration. Remember that it is not always possible to aspirate cloudy marrow or blood from a properly placed intraosseous needle and you may wish to alter your response between candidates accordingly. The candidate should slowly inject fluid and observe for signs of infiltration around the injection site and then adjust the appropriate flow rate. Finally, the needle should be secured in place and stabilized with sterile gauze or other bulky dressings.

The scenario lists the weight of the patient and the amount of fluid to be administered. You may alter the weight of the patient throughout the examination as long as you note the weight on the candidate's evaluation

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form. Given the scenario, the candidate should bolus an appropriate amount of fluid or calculate and set the appropriate drip rate as he/she would in the field. If the fluid is not administered appropriately, you should deduct the point for the step which reads, "Connects administration set and adjusts flow rate as appropriate," check the related "Critical Criteria" statement, and completely document the error as required on the back side of the evaluation form. Do not let any candidate leave the room with any documentation of his/her calculation.

At the conclusion of the performance, carefully review all "Critical Criteria" statements on the evaluation form and be sure to document your rationale for checking any of these statements. Be sure that all your paperwork is complete, totaled, signed, and your room has been prepared before accepting the next candidate for evaluation.

Equipment List

Do not open these skills for testing until the following equipment is available. You must ensure that all equipment is working adequately throughout the examination:

- Examination gloves
- IV infusion arm
- Intraosseous infusion manikin with replacement tibias (6 – 8 sticks/tibia)
- IV solutions*
- Administration sets**
- IV extension tubing or 3-way stopcock
- IV catheters***
- Intraosseous needles (either Jamshidi®; electric, drill-type; or spring-loaded device)
- IV push medications (prefilled syringes)****
- Tape
- Gauze pads (2x2, 4x4, etc.)
- Bulky dressing
- Syringes (various sizes)
- Tourniquet
- Alcohol preps or similar substitute
- Approved sharps container

NOTE: Please refer to the essay for a detailed discussion of the following:

* Need a selection array but may be expired

** Need a selection array and must include microdrip tubing (60 gtt/cc)

*** Need a selection array and can replace with small (20 – 22 ga.) catheters

**** Must include atropine, epinephrine 1:10,000, naloxone, and dextrose 50% plus several others

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The Skill Examiner reads the following instructions to all Advanced EMT candidates who complete the Intravenous Therapy and Intravenous Bolus Medications Skills:

Instructions to the Advanced EMT Psychomotor Skills Candidate for IV and Medication Skills

Welcome to the IV and Medication Skills.

[The Skill Examiner now marks the respective "Level of Testing" on the Intravenous Therapy and Intravenous Bolus Medications evaluation form. The following instructions are only for Advanced EMT candidates. For other candidates, please turn the page and read the appropriate directions for Intermediate/99 candidates.]

Since you are testing at the Advanced EMT level today, you will be given a patient scenario and will be required to establish an IV and administer an IV bolus of medication just as you would in the field. You will have three attempts in a six minute time limit to establish the IV. If you do not successfully establish the IV, you will not be able to administer the IV bolus of medication to the patient. Although we are using the manikin arm, you should conduct yourself as if this were a real patient. You should assume that I am the actual patient and may ask me any questions you would normally ask a patient in this situation. After you establish the IV, you will have three minutes to begin IV administration of a bolus of medication. Do you have any questions?

The patient you are treating is... [Skill Examiner to alternate between the following:]

-unresponsive and breathing at a rate of 6 and shallow. His pupils are two mm and do not respond to light.

-confused and is being transported from an extended care facility for evaluation. After consulting with you and the medical staff of the facility, medical direction has ordered you to administer 12.5 grams of dextrose 50% IV.

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The Skill Examiner reads the following instructions to all Intermediate/99 candidates who complete the Intravenous Therapy and Intravenous Bolus Medications Skills:

Instructions to the Intermediate/99 Psychomotor Skills Candidate for IV and Medication Skills

Welcome to the IV and Medication Skills. Are you testing at the Intermediate/99 level today?

[The Skill Examiner now marks the respective "Level of Testing" on the Intravenous Therapy evaluation form. The following instructions are only for Intermediate/99 candidates.]

Since you are testing at the Intermediate/99 level today, these skills are designed to evaluate your ability to establish venous access in the adult patient and administer an IV bolus of medication. You will be given a patient scenario and will be required to establish an IV and administer an IV bolus of medication just as you would in the field. You will have three attempts in a six minute time limit to establish the IV. If you do not successfully establish the IV, you will not be able to administer the IV bolus of medication to the patient. Although we are using the manikin arm, you should conduct yourself as if this were a real patient. You should assume that I am the actual patient and may ask me any questions you would normally ask a patient in this situation. After you establish the IV, you will have three minutes to begin IV administration of a bolus of medication. Do you have any questions?

The patient you are treating is... [Skill Examiner to alternate between the following:]

- complaining of nausea, weakness, dizziness and crushing substernal chest pain. The monitor is showing sinus bradycardia with a heart rate of 48 and no ectopy. Your attempts to pace the patient are unsuccessful.

- in cardiac arrest. CPR is in progress and an endotracheal tube has been placed. The monitor is showing sinus tachycardia at a rate of 132. No pulse is palpable.

- confused and is being transported from an extended care facility for evaluation. After consulting with you and the medical staff of the facility, medical direction has ordered you to administer 12.5 grams of dextrose 50%.

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The Skill Examiner reads the following instructions to all Advanced EMT, Intermediate/99 candidates who complete the Pediatric Intraosseous Infusion Skill:

INSTRUCTIONS TO THE PSYCHOMOTOR SKILLS CANDIDATE FOR PEDIATRIC INTRAOSSEOUS INFUSION

Welcome to the Pediatric Intraosseous Infusion skill. This skill is designed to test your ability to establish an intraosseous infusion in a pediatric patient just as you would in the field. You will have a maximum of two attempts to establish a patent and flowing intraosseous infusion within a six minute time limit. Within this time limit, you will be required to properly administer fluid to a pediatric patient just as you would in the field based on a given scenario. Although we are using the manikin, you should conduct yourself as if this were a real patient. You should assume that I am the parent of this patient and may ask me any questions you would normally ask in this situation. Do you have any questions?

The patient you are treating is... [Skill Examiner to alternate between the following:]

-A six month old who was just removed from a burning house. The patient has deep superficial and full thickness burns to the arms and chest. The patient is tachycardic with other signs of inadequate perfusion. Your partner has secured an airway and your standing orders require fluid to be administered through an intraosseous line at 20 mL/kg. The child weighs 15 pounds.

-An eight month old with a history of diarrhea and decreased fluid intake for the past two days. There are signs of circulatory compromise and your standing orders require fluid to be administered through an intraosseous line at 20 mL/kg. The child weighs 20 pounds.