King Saud University
College of Medicine

Year 3 Cardio-Respiratory Block
Intravenous Interventions Skills Checklists

Department of Medical Education
Riyadh, August 2012

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Intravenous (IV) Injection

OBJECTIVE: To administer an intravenous (IV) drug to an appropriately selected vein.
MATERIALS: IV drug, syringe, clean gloves, alcohol swab, sterile gauze, adhesive tape, tourniquet.

***D**: Appropriately done **PD**: Partially done **ND**: Not done/Incorrectly done*

	STEP/TASK	D	PD	ND
	Preparation			
1.	Introduce yourself to the patient.			
2.	Confirm patient's ID.			
3.	Explain the procedure and reassure the patient.			
4.	Get patient's consent.			
5.	Wash hands.			
6.	Prepare the necessary materials. *(Medication should be drawn up into the syringe beforehand and expiration dates checked.)*			
7.	Check the doctor's order with the drug to be administrated to ensure correct drug and dosage			
8.	Put on a pair of clean gloves.			
9.	Position the patient in a lying or sitting position and uncover the arm completely.			
	The procedure			
10.	Apply tourniquet 10 cm above injection site. *(Make sure it is not too loose or too tight. When necessary, check if pulse is still present.)*			
11.	Select the site and appropriate vein for injection.			
12.	Visualize and palpate the vein using the pads of the fingertips. *(If veins are not visible ask patient i) to close and open the hand ii) apply gentle taps iii) apply warm/hot pad to selected site to help dilate the veins.)*			
13.	Clean the site with an alcohol swab using an expanding circular motion or a single wiping from distal to proximal. Do this 3 times with separate swabs. Let it air dry.			
14.	Take the syringe and open its cap.			
15.	Stabilize the vein and apply counter tension to the skin.			
16.	Insert the needle through the skin at an angle of 30-45 degrees and ensure the bevel is up.			
17.	Reduce the angle of the needle and advance approximately 3-5 mm further into the vein.			
18.	Aspirate and make sure venous blood appears in the syringe. *(If not, re-adjust position of the needle and aspirate again.)*			
19.	Release the tourniquet.			
20.	Inject the drug very slowly. *(Check for pain, swelling, hematoma. If present; withdraw the needle and repeat the procedure at another site with a new needle.)*			
21.	Withdraw the needle swiftly. Apply pressure with sterile gauze on the opening, secure it with an adhesive tape and have patient maintain the pressure.			
	After the procedure			
22.	Dispose of sharps and waste material according to infection control standards.			
23.	Ensure that the patient is comfortable.			
24.	Remove the gloves and wash hands.			
25.	Document the procedure.			

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Venepuncture

(Intravenous Blood Drawing)

OBJECTIVE: To draw venous blood sample from an appropriately selected vein.

MATERIALS: Syringe, clean gloves, alcohol swab, sterile gauze, adhesive tape, tourniquet.

***D**: Appropriately done **PD**: Partially done **ND**: Not done/Incorrectly done*

	STEP/TASK	D	PD	ND
	Preparation			
1.	Introduce yourself to the patient.			
2.	Confirm patient's ID.			
3.	Explain the procedure and reassure the patient.			
4.	Get patient's consent.			
5.	Wash hands.			
6.	Prepare the necessary materials (see above).			
7.	Put on a pair of clean gloves.			
8.	Position the patient in a lying or sitting position and uncover arm completely.			
	The procedure			
9.	Select the site and appropriate vein for venepuncture.			
10.	Apply tourniquet 10 cm above injection site. *(Make sure it is not too loose or too tight. When necessary, check if pulse is still present.)*			
11.	Visualize and palpate the vein using the pads of the fingertips. *(If veins are not visible ask patient i) to close and open the hand ii) apply gentle taps iii) apply warm/hot pad to selected site to help dilate the veins.)*			
12.	Clean the site with an alcohol swab using an expanding circular motion or a single wiping from distal to proximal. Do it for 3 times with different swabs. Let it air dry.			
13.	Attach the needle to the syringe and remove the cap			
14.	Stabilize the vein and apply counter tension to the skin.			
15.	Insert the needle through the skin at an angle of 30-45 degrees and make sure the bevel is up.			
16.	Reduce the angle of the needle and advance approximately 3-5 mm further into the vein.			
17.	Aspirate appropriate amount of venous blood. *(If aspiration fails, re-adjust position of the needle and aspirate again.)*			
18.	Release the tourniquet.			
19.	Withdraw the needle swiftly. Apply pressure with sterile gauze on the opening, secure it with an adhesive tape and have patient maintain the pressure.			
	After the procedure			
20.	Dispose of sharps and waste materials according to infection control standards.			
21.	Ensure that the patient is comfortable.			
22.	Remove gloves and wash hands.			
23.	Label the blood sample: *(Patient's name, date of birth and hospital number; date and time of drawing blood).*			
24.	Fill in the form: *(Patient's name, date of birth and hospital number; date of blood drawing; tests required).*			

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Intravenous (IV) Cannulation

OBJECTIVE: To apply an intravenous (IV) cannulation to an appropriately selected vein

MATERIALS: IV solution or drug, IV set, IV catheter or cannula, clean gloves, alcohol swab, transparent dressing or tape, tourniquet.

***D**: Appropriately done **PD**: Partially done **ND**: Not done/Incorrectly done*

	STEP/TASK	D	PD	ND
	Preparation			
1.	Introduce yourself to the patient.			
2.	Confirm patient's ID.			
3.	Explain the procedure and reassure the patient.			
4.	Get patient's consent.			
5.	Wash hands.			
6.	Prepare the necessary materials.			
7.	Check the doctor's order and the reason for cannulation.			
8.	Put on a pair of clean gloves.			
9.	Position the patient in a lying or sitting position and uncover arm completely.			
	The procedure			
10.	Apply tourniquet 10 cm above injection site. *(Make sure it is not too loose or too tight. When necessary, check if pulse is still present.)*			
11.	Select the site and appropriate vein for injection.			
12.	Visualize and palpate the vein using the pads of the fingertips. *(If veins are not visible ask patient i) to close and open the hand ii) apply gentle taps iii) apply warm/hot pad to selected site to help dilate the veins.)*			
13.	Clean the site with an alcohol swab using an expanding circular motion or a single wiping from distal to proximal. Do it for 3 times with different swabs. Let it air dry.			
14.	Prepare and inspect the catheter. Slightly pull the needle from the cannula, turn, and inspect for any defects.			
15.	Stabilize the vein and apply counter tension to the skin.			
16.	Insert the stylet through the skin at an angle of 30-45 degrees and make sure the bevel is up.			
17.	Observe for "flash back" of blood in the chamber of the stylet to confirm a successful entry.			
18.	Reduce the angle of the needle and advance approximately 1 cm further into the vein.			
19.	Slowly advance the catheter over the needle and into the vein while keeping tension on the vein and skin.			
20.	Release the tourniquet and quickly remove the needle over the catheter while pressing at least 0.5 cm above the insertion site to prevent backflow of blood. Connect the intravenous tubing immediately and open the regulator.			
	After the procedure			
21.	Anchor the catheter firmly in place by the use of transparent dressing or tape. *DO NOT interrupt the flow rate.*			
22.	Regulate the rate of flow according to the doctor's order.			
23.	Ensure that the patient is comfortable.			
24.	Dispose of sharps and waste material according to infection control standards.			
25.	Remove the gloves and wash hands.			
26.	Document the procedure.			

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Aspirating from ampoules (glass, plastic)

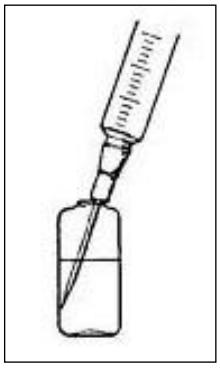
OBJECTIVE: To aspirate drug or solution from ampoules (glass, plastic).

MATERIALS: Required drug or solution (ampoule), syringe, needle (G21-G23), alcohol swab, sterile gauze.

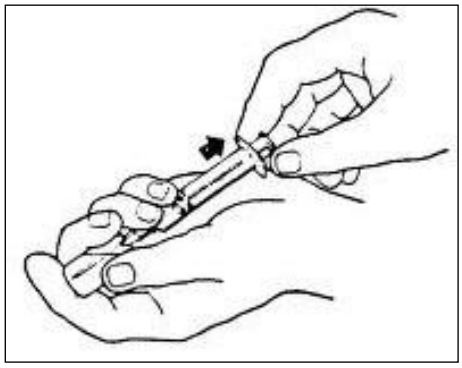
***D**: Appropriately done **PD**: Partially done **ND**: Not done/Incorrectly done*

	STEP/TASK	D	PD	ND
	Preparation			
1.	Wash hands.			
2.	Prepare the materials needed *(check the label, expiration date, integrity)*			
3.	Check if the stem of the ampoule is cleared of any trapped medication *(If ever gently tapping the top with the finger or swinging it fast in a downward spiralling movement).*			
4.	Place or wrap the ampoule on small sterile gauze square. *(A medicine file is drawn across the constricted portion to make a cut).*			
5.	Hold the lower portion of the ampoule with gauze, while the stem is snapped away with the other hand and carefully break off the top of the ampoule. *(The gauze protects the finger from injury, for a plastic ampoule twist the top).*			
6.	Check the syringe for air before aspirating the solution from the ampoule.			
7.	Carefully insert the needle into the opening without touching the outside of the ampoule			
8.	Aspirate the desired amount of solution *(make sure the tip of the needle kept submerged in the solution to avoid drawing air into the syringe).*			
9.	Once the syringe filled with the desired amount of medication pull the needle out of the ampoule.			
10.	Hold the syringe with the needle directed upward -to check accuracy of measurement.			
11.	Remove possible air from the syringe.			
12.	Change the aspirating needle with a new one (G21-G23).			
13.	Dispose of sharps and waste material according to infection control standards.			
14.	Wash hands.			

Step 5: Breaking off the top of the ampoule.



Step 7



Step 8

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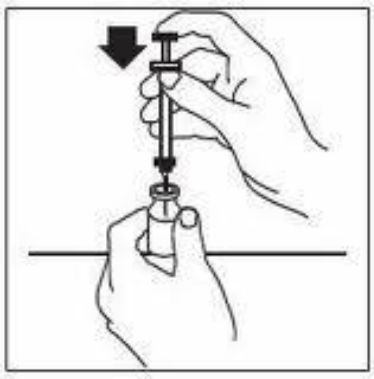
Aspirating from a vial

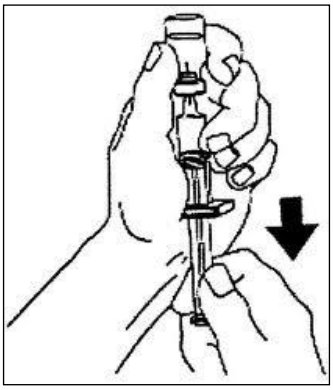
OBJECTIVE: To aspirate drug or solution from a vial.
MATERIALS: Required drug or solution (vial), syringe, needle (G21-G23), alcohol swab.

***D**: Appropriately done **PD**: Partially done **ND**: Not done/Incorrectly done*

	STEP/TASK	D	PD	ND
	Preparation			
1.	Wash hands.			
2.	Prepare the materials needed *(check the label, expiration date, integrity)*			
3.	Remove the plastic cover (or the center of the metal cover) of the vial.			
4.	Disinfect the rubber top of the vial with alcohol swab.			
5.	Fill the syringe with an equal amount of air to the amount of solution to be withdrawn.			
6.	Hold the vial and insert the needle into (top of) vial and turn upside –down.			
7.	Pump air into vial *(creating pressure)*.			
8.	Aspirate the desired amount of solution *(make sure the tip of the needle kept submerged in the solution to avoid drawing air into the syringe).*			
9.	Pull the needle out of the vial.			
10.	Hold the syringe with the needle directed upward -to check accuracy of measurement.			
11.	Remove possible air from the syringe.			
12.	Change the aspirating needle with a new one (G21-G23).			
13.	Dispose of sharps and waste material according to infection control standards.			
14.	Wash hands.			



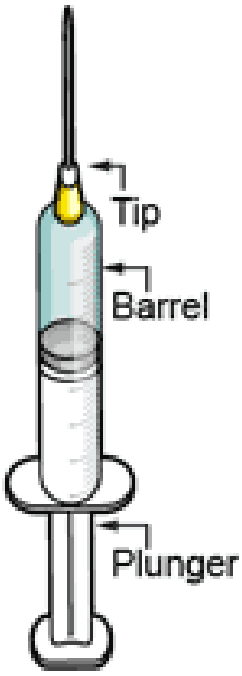
Step 6 & 7



Step 8

Syringes and Needles

The basic parts of a syringe are the barrel, plunger, and tip. The barrel is a tube that is open at one end and tapers into a hollow tip at the other end. The plunger is a piston-type rod with a slightly cone-shaped top that passes inside the barrel of the syringe. The tip of the syringe provides the point of attachment for a needle. The volume of solution inside a syringe is indicated by graduation lines on the barrel. Graduation lines may be in milliliters or fractions of a milliliter, depending on the capacity of the syringe. The larger the capacity, the larger the interval between graduation lines.

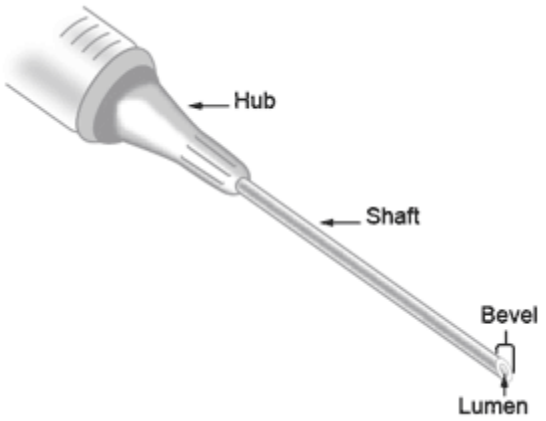


There are three common types of syringe tips: Slip-Tip®, Luer-Lok®, and eccentric. Slip-Tips® allow the needle to be held on the syringe by friction. The needle is reasonably secure, but it may come off if not properly attached or if considerable pressure is used. Luer-Lok® tips incorporate a collar with grooves that lock the needle in place. Eccentric tips, which are off-center, are used when the needle must be parallel to the plane of injection such as in an intradermal injection.

Syringes come is different sizes ranging from 1 to 60 ml. As a rule, select a syringe whose capacity is the next size larger than the volume to be measured. For example, a 3 ml syringe should be selected to measure 2.3 ml, or a 5 ml syringe to measure 3.8 ml. In this way, the graduation marks on the syringe will be in the smallest possible increments for the volume measured. Syringes should not be filled to capacity because the plunger can be easily dislodged.

The Cornwall syringe is used when many repetitions of filling a syringe to the same volume is needed. It is a manual device that has a two-way valve that attaches to both the syringe and the solution to be drawn into the syringe. Each time the grip is released, the syringe fills with solution. Each time the grip is compressed, the syringe volume is expelled. There are electronic versions of this basic design concept[1].

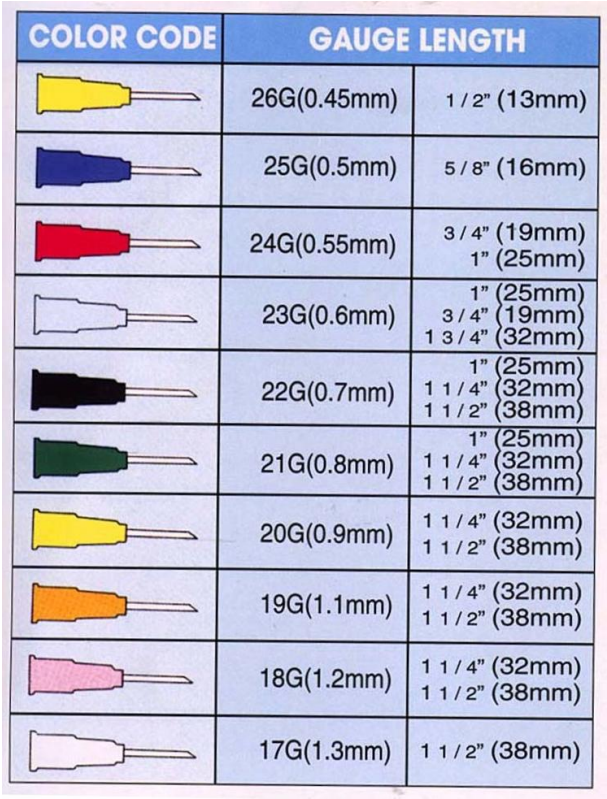
Needles



A needle has three parts, the hub, the shaft, and the bevel. The hub is at one end of the needle and is the part that attaches to the syringe. The shaft is the long slender stem of the needle that is beveled at one end to form a point. The hollow bore of the needle shaft is known as the lumen. Disposable needles should always be used when preparing admixtures as they are presterilized and individually wrapped to maintain sterility[1].

Needle Sizes

Needle size is designated by length and gauge. The length of a needle is measured in inches from the juncture of the hub and the shaft to the tip of the point. Needle lengths range from 3/8 inch to 3 1/2 inches; some special use needles are even longer. The gauge of a needle, used to designate the size of the lumen, ranges from 27 (the finest) to 13 (the largest).



COLOR CODE	GAUGE	LENGTH
	26G(0.45mm)	1/2" (13mm)
	25G(0.5mm)	5/8" (16mm)
	24G(0.55mm)	3/4" (19mm) 1" (25mm)
	23G(0.6mm)	1" (25mm) 3/4" (19mm) 1 3/4" (32mm)
	22G(0.7mm)	1" (25mm) 1 1/4" (32mm) 1 1/2" (38mm)
	21G(0.8mm)	1" (25mm) 1 1/4" (32mm) 1 1/2" (38mm)
	20G(0.9mm)	1 1/4" (32mm) 1 1/2" (38mm)
	19G(1.1mm)	1 1/4" (32mm) 1 1/2" (38mm)
	18G(1.2mm)	1 1/4" (32mm) 1 1/2" (38mm)
	17G(1.3mm)	1 1/2" (38mm)

There are two considerations when choosing a needle size; the viscosity of the solution, and the nature of the rubber closure on the parenteral container. Needles with larger lumens should be used for viscous solutions. Smaller gauge needles are preferred if the rubber closure can be cored easily. Coring is when a needle punctures or tears a piece of the rubber closure and the piece then falls into the container and creates particulate material contamination[1].

Disassembly of needle from syringe or other devices

Safe methods of removing the needle from the syringe or other devices are necessary to protect health workers from injury.This procedure must be carried out close to a sharps container, and the needle must be discarded immediately.

NEVER disassemble an exposed, used needle with your bare hands.

If the needle has to be disassembled from the barrel or syringe, re-sheath using a one-hand scoop technique, then remove the needle using a removal device. Both of these procedures are explained below.

One-hand scoop technique

1. Leave the needle cap on the surface and guide the tip of the used needle tip into it using only one hand. Clean the surface with disinfectant afterward to avoid leaving blood.
2. Place the needle cap against a firm upright surface with its opening towards the phlebotomist, and place the used needle tip into it.
3. Lift the needle and syringe vertically and, once the tip is covered, use the other hand to fix the cap into place.

Use of a removal device

Needle pliers – Hold the needle with pliers or artery forceps. Dislodge the needle by unscrewing or pulling it off. Discard immediately into a sharps container.

Needle guard (mushroom) – Place the cap in the device. Using one hand, insert the needle tip into the cap vertically and turn firmly to fix the needle in the cap. Lift the syringe or barrel and removed the covered needle. Discard immediately[2].

Intravenous Cannula Selection

When considering the choice of cannula consideration should be given to the following: minimising discomfort to the patient, ensuring good flow rates, and easy insertion with no tissue reaction to the cannula. It should be of the smallest practical size to provide the required fluid regimen and take into account the size of vessel cannulated, the time scale of the proposed administration of infusion and the viscosity of the fluid to be infused[4].

Gauge	Colour	Length	Max flow/min	Common uses
14	Orange	45 mm	240	Rapid transfusions, blood
16	Grey	45 mm	180	Rapid transfusions, blood
18	Green	45 mm	80	IV maintenance fluids
20	Pink	32 mm	54	IV drugs/infusions
22	Blue	25 mm	31	Paediatrics/difficult veins.
24	Yellow	19 mm	13	Paediatrics/difficult veins.

Explaining the procedure to a patient

Introduction:

Hello, I am _____ I work at this health-care facility.

What is your name? (Health-care worker checks first and last name against order for tests and the patient's name band if present).

I am trained to take blood for laboratory tests (or medical reasons) and I have experience in taking blood.

I will introduce a small needle into your vein and gently draw some blood for _____ tests. (Tell the patient the specific tests to be drawn).

Then I will label them with your name and contact details and send them off for tests to the laboratory. The results will be returned to Dr _____ (mention the name of the clinician who ordered the tests).

Do you have any questions? Did you understand what I explained to you? Are you willing to be tested?

Please sit down and make yourself comfortable.

Now, I will ask you a few questions so that both of us feel comfortable about the procedure.

- Have you ever had blood taken before?
- (If yes) How did it feel? How long ago was that?
- Are you scared of needles?
- Are you allergic to anything? (Ask specifically about latex, povidone iodine, tape.)
- Have you ever fainted when your blood was drawn?
- Have you eaten or drunk anything in the past two hours?
- How are you feeling at the moment?

Shall we start? If you feel unwell or uncomfortable, please let me know at once[2].

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4. Venepuncture and IV Cannulation Medical Student Practical Skill Session, University of Glasgow, University Section of Anaesthesia, Pain and Critical Care Medicine
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