

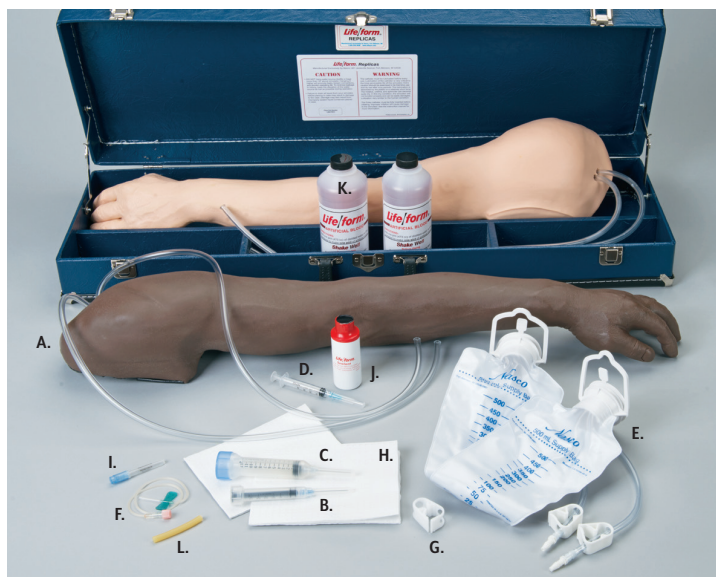
INSTRUCTION MANUAL

Advanced Injection Arm

LF01121 & LF01126



About the Simulator

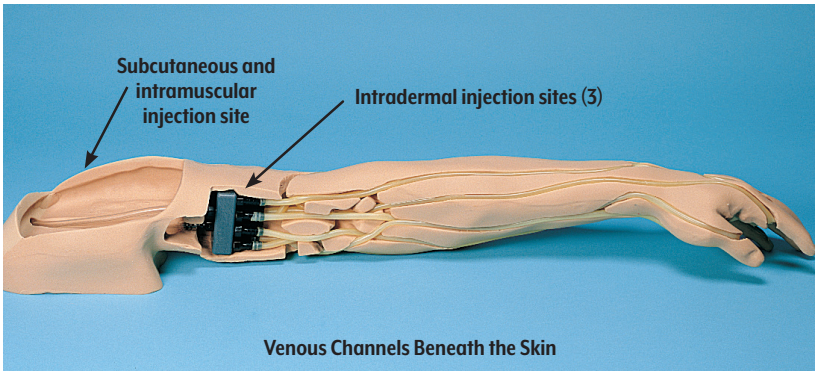


The **Life/form**® Advanced Injection Arm Simulator duplicates the human condition as closely as modern plastics technology allows. This unit is the simulation of the entire human arm from the shoulder to fingertips. Externally, the skin texture is realistic to touch, and the fingertips have fingerprints.

Although this arm will provide you with long trouble-free usage, the skin and veins can be easily removed and replaced when needed, providing literally, a brand new arm. The life of the replaceable skin and veins will be prolonged by utilizing smaller needle sizes (such as 20- to 25-gauge). However, if instruction with larger needle sizes is required, this can be done; the skin and veins will merely need to be replaced sooner. The Skin and Vein Kits are available through Nasco (see list of supplies).

LIST OF COMPONENTS

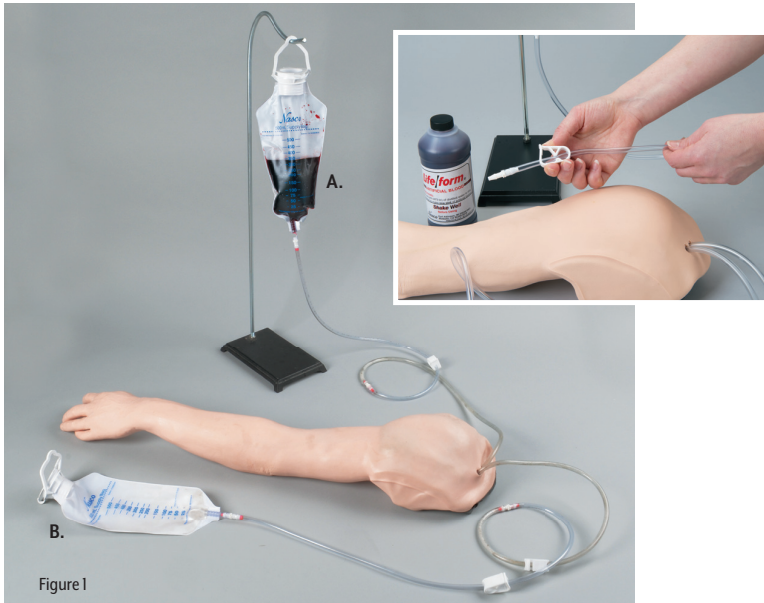
- A. Advanced Injection Arm Simulator (LF01121U – White or LF01126U – Black)
- B. 3 cc Syringe with Needle
- C. 12 cc Syringe with Needle
- D. 22-gauge Needle
- E. 2 Fluid Supply Bags
- F. Infusion Butterfly
- G. Pinch Clamp
- H. 2 Small Towels
- I. Infusion Needle
- J. Intra-dermal Sealant (2 oz.)
- K. 2 Pint Bottles with Blood Powder
- L. Latex Adapter



INTERNAL STRUCTURE

Internally the vascular structure (dry natural rubber tubing) includes the basilic, median, accessory cephalic, and metacarpal veins. This venous system is constructed of special self-healing dry natural rubber tubing, with the lumen being the approximate size of a human vein. This vascular structure has inlet tubing and outlet tubing at the shoulder, and it is via these tubes that the venous system is filled. Thus, the techniques of blood drawing and starting intravenous infusions may be practiced on the Advanced Injection Arm.

Instructions for Use



A. Pressurizing the Veins with Synthetic Blood:

1. Add 1 pint of distilled water to the pint bottle with blood powder; shake it to mix.
2. Be sure the clamp on the fluid supply bag A tubing is closed, fill it with the blood and hang the bag no more than 18" above the level of the arm. (See *Figure 1 and inset.*) (Fluid Supply Stand shown sold separately.)
3. Attach the fitting end of the fluid supply bag A tubing to one of the shoulder tubes. (Make sure the arm is palm down at this point.) (See *Figure 2.*)

Note: Connecting the fluid supply bag to the shoulder tube may require a small amount of water soluble lubricant, heating the shoulder tube end in the palm of a warm hand, or dipping the shoulder tube end into warm water.

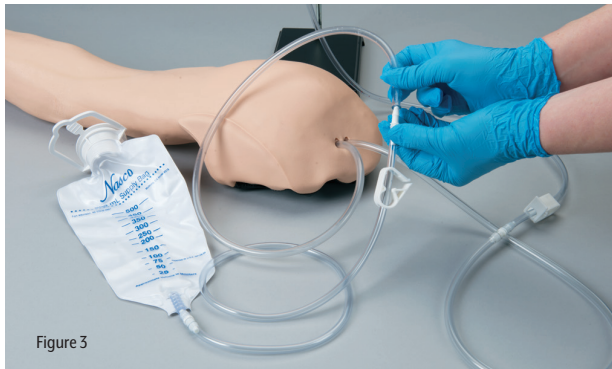


Figure 3



Figure 4

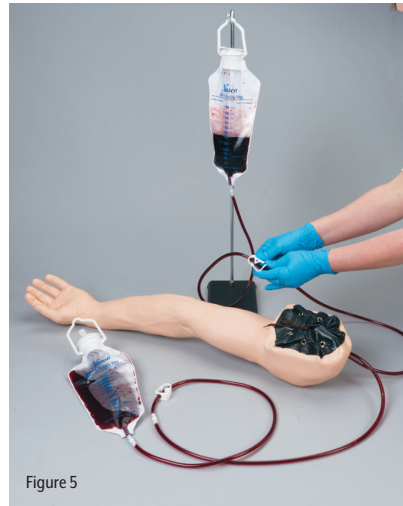


Figure 5

4. With the other shoulder tube attached to the second (empty) fluid supply bag B, (see *Figure 3*) gradually “flush” the vascular system with synthetic blood by slowly opening the clamp on fluid supply bag A. (See *Figure 4*.) (The pinch clamp on fluid supply bag B should be open.) Allow some “blood” to pass through the system until the air bubbles have been eliminated.
5. Close the clamp on bag A and then turn the arm over so it is palm up. Slowly open the clamp on bag A to allow some blood to pass through and to remove any remaining air that is trapped in the system. (See *Figure 5*.)
Note: It may be necessary to swap the positions of the fluid supply bags A and B during the filling process in order to prevent bubbles in the tubing. If bag A runs out of blood before the arm is fully prepped, simply remove it from its hanging position and replace it with (full) bag B.
6. Once the system is filled, close the clamp on (resting) fluid supply bag B and leave (hanging) fluid supply bag A clamp open. The arm is now fully pressurized and can be used palm up or down.

Instructions for Use



Figure 6

B. IV Injection and Withdrawal

1. Start with a fully pressurized arm. See procedure A under General Instructions for Use.
2. Close the clamp on Fluid Supply Bag B.
3. Open the clamp on Fluid Supply Bag A.

The arm is now ready to perform injections or withdrawals along any of the 8 fluid lines present in the arm. Nasco recommends the use of small diameter needles for these procedures; 20 to 25 gauge. Use only distilled water to prep the injection sites and as an injection. A realistic flashback will occur when the vein has been properly punctured. (See Figure 6.)

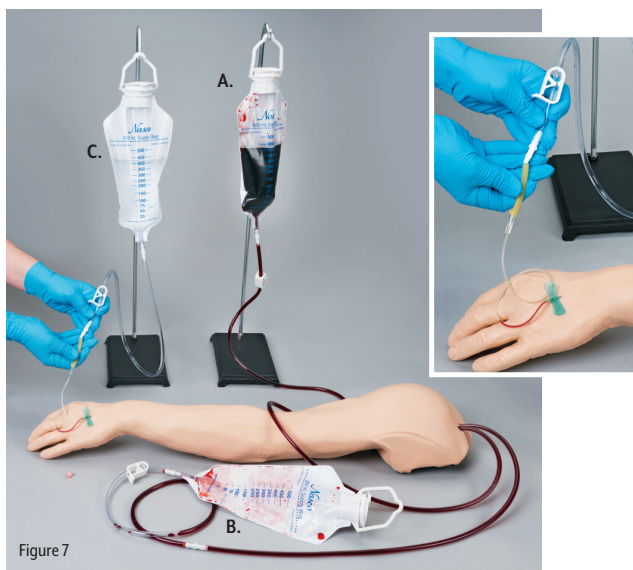


Figure 7

C. Intravenous Infusions

1. Begin with a fully pressurized arm. See procedure A under General Instructions for Use.
2. Select the appropriate intravenous infusion needles or butterfly included. Nasco recommends small gauge needles 20-25 gauge.
3. Make sure the arm is palm down and the clamps on Bags A and B are closed.
4. Simulate cleansing the injection site with distilled water.
5. Insert the IV needle or butterfly into a vein. Flashback will indicate proper insertion.
6. Attach the needle or butterfly to the tubing from the infusion solution (not supplied) or fluid supply bag C (sold separately) with the latex adapter if needed. (See Figure 7 and inset.)
7. Open the clamps on fluid supply bag B.



Figure 8

8. Open the clamp on the infusion solution or fluid supply bag C. Proof of proper procedure will be evidenced by the flow of fluid from the infusion solution or fluid supply bag C. (See Figure 8.)

Note: This procedure may dilute your simulated blood solution.



Figure 9

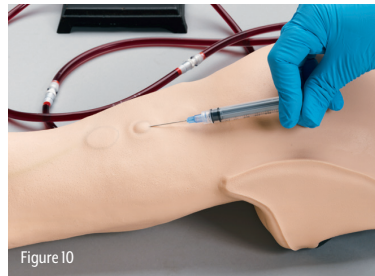


Figure 10

D. Intramuscular Injections

The procedure for administering intramuscular injections can be practiced in the area of the deltoid. (See Figure 9.) Prep the site with distilled water only. Injections can be done utilizing the appropriate needle and syringe. ½ cc of distilled water may be injected, however, we recommend utilizing air as injectant since the distilled water cannot be drained, but must evaporate from the arm. Synthetic blood must NEVER be used for injections.

E. Intradermal/Intracutaneous Injections

Use a 3 cc syringe with a 25-gauge needle for this procedure.

F. Internal Structure

The arm features three locations. All are located on the outer aspect of the upper arm. (See Figure 10.) If fluid is properly injected, a characteristic skin welt will form. The welt is removed by drawing the fluid after practice. We recommend you use distilled water as an injection fluid.

Care of the Intradermal Sites



Puncturing the skin with needles forms small slits or cuts which will eventually lead to deterioration. Should leakage occur, perform the following steps:

1. Using the supplied Intradermal Sealant and supplied 22-gauge syringe, remove the needle end of the syringe by twisting at the luer lock.
2. With the needle removed, insert the open end of the syringe into the intradermal sealant. (See Figure 11.)
3. Pull back on the plunger to load the syringe with the sealant.
4. Replace the needle on the syringe twisting at the luer lock. (See Figure 12.)
5. Insert the syringe into the Intradermal Site in the same manner you would to perform procedures.



6. Inject the Intradermal Sealant into a blister dot. (See Figure 13.)
Note: This will require more pressure applied on the syringe than the typical procedure to form a blister dot.
7. Remove the syringe leaving the sealant inside the Intradermal Site.
8. Rub any excess or leaked intradermal sealant on the skin surface to seal surface holes. (See Figure 14.)
9. Allow to set overnight.
10. Withdraw remaining intradermal sealant and the intradermal site is ready for practice.

Actual product may vary slightly from photo. Nasco reserves the right to change product color, materials, supplies, or function as needed.

Care and Maintenance

The Advanced Injection Arm should be completely drained of fluid and dry before storing. Simulated blood can be reused.

A. Draining and Rinsing the Simulator

1. Disconnect the fluid supply bags and drain simulated blood into the supplied pint bottles.
2. Fill one bag with water and reconnect to a shoulder tube.
3. Reconnect the other rinsed fluid supply bag to the open shoulder tube.
4. Open both clamps and allow the system to flush.
5. Repeat with clean water until the water runs clear from the arm.
6. Drain the fluid supply bags and leave the caps open to allow the inside to air dry as much as possible.
7. Excess water may be removed from the arm by raising the hand, lowering the shoulder, and draining it into a sink or basin.
8. Remove the clamps from the fluid supply bag tubing as they can cause permanent kinks and restrict fluid flow.

B. Cleaning the Simulator

1. Wash the outside of the arm with mild liquid detergent and water.
2. Stubborn stains may be removed using Nasco Cleaner (LF09919U, sold separately). Simply dispense the Nasco Cleaner to the stained area and wipe clean with a soft cloth or paper towel.

C. Maintaining the Simulator

1. Nasco Vein Tubing Sealant Kit (LF01099U) will extend the useful life of the tubing.
Note: Nasco Vein Tubing Sealant cannot be shipped outside of the United States.
2. Vyna Bond, purchased separately (See Supplies and Replacement Parts) can be applied to the skin to repair puncture sites.

CAUTIONS

1. This synthetic blood is specially formulated to be compatible with the self-sealing veins and plastics used in manufacturing the arm.
2. NEVER use synthetic blood for intramuscular injection.
3. DO NOT use dull or burred needles, as these will cause leaks in the system. Burred needles will cause permanent damage. Use **smaller needles** (20- to 25-gauge).
4. DO NOT allow “blood” to dry on simulator — it may stain the skin.
5. Use only 500 cc of infusion fluid, as a larger amount will also increase the pressure of the venous system, resulting in leaks.
6. DO NOT clean the simulator with solvents or corrosive material as they will damage it.
7. Newsprint, similar printed paper, or plastic will permanently stain the simulator if prolonged contact occurs.

Troubleshooting

PROBLEM: Cannot get blood to flow or flashback.

If you are unable to get blood flow through your IV Arm, there is most likely a restriction somewhere within the system. Restrictions can be caused by air bubbles, kinks (either in the veins or supply and drain tubing), or dried blood within the system.

1. **Check for kinks in the tubing of the fluid supply bags:** If a clamp has been located in one spot of the tube for a long period of time, the tube can become kinked, restricting flow even when the clamp is open. Massage the tube where the clamps have been to open the tubing again. Change positions of clamps often to keep this from reoccurring.
2. **Fluid supply bag height:** Is the supply bag hung at the appropriate height according to the instruction manual? Hanging the supply bags slightly higher for the arms that are not producing enough pressure can create just enough gravity on the fluid to facilitate flow.
3. **Vein connection:** Are the veins/tubes connected to the manifold correctly? Check correct positions in the instruction manual for LF01122U Advanced IV Arm Skin and Vein Replacement Kit. Contact Nasco for a FREE instructional video.
4. **Check for air bubbles:** Make sure you purge the arm of air bubbles. Gradually “flush” the system with synthetic blood by slowly opening the supply clamp. Allow some blood to pass through the system until the air bubbles have been eliminated in the drain bag. Close the clamp on the supply bag and then turn the arm over so it is palm up. Slowly open the clamp to allow some blood to pass through and to remove any remaining air that is trapped in the system.
5. **Dried blood left in veins from previous uses:** If these are veins that have been used before, you could try running a couple of bags of clear warm water through them. There may be some sediment from previous uses lodged within the veins/tubing.
6. **Check vein tubing for kinks:** Following a skin/vein replacement, it is possible that a vein rolled out of the track or there may also be a slight kink in the tubing. This is most likely in the underside of the fingers. Flexing the fingers will sometimes work out the kink. Try massaging the area of the arm (thumb and fingers) to relocate the vein back within the track of the arm core. Also, make sure you haven’t pulled the skin on too tight, causing a restriction. Skins should be loose fitting, especially around the thumb and finger areas. Apply lubrication to help move the veins back into place.

SUPPLIES AND REPLACEMENT PARTS

LF00845U	Life/form ® Blood, 1 quart
LF00846U	Life/form ® Blood, 1 gallon
LF00991U	Shoulder Injection Pad Replacement
LF00993U	Replacement Vein Manifold
LF00996U	Vyna Bond
LF01009U	Intradermal Sealant, 2 oz.
LF01022U	Fluid Supply Stand
LF01099U	Vein Tubing Sealant Kit
LF01104U	Life/form ® IV Arm Skin & Vein Replacement DVD — FREE
LF01105U	Life/form ® IV Arm Set-Up & Troubleshooting DVD — FREE
LF01122U	White Skin & Vein Replacement Kit
LF01123U	Black Skin & Vein Replacement Kit
LF01124U	Vein Replacement Kit
LF01130U	Fluid Supply Bag
LF09919U	Nasco Cleaner



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