

Arterial Needles and Direct Arterial Pressure Monitoring

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Arterial needles provide the following:

1. Readily available sampling sites for all routine blood work done within the hospital, i.e., arterial blood gases, hemoglobin, hematocrit, bleeding and clotting times, etc.
2. Arterial needles are tolerated well by patients and eliminate repeated veni- and arterial punctures necessary in the proper maintenance of the immediately postoperative and the critically ill patient.
3. Provides systolic and diastolic pressures and in most cases they are some 20% more accurate than conventional occlusive cuff techniques. This is particularly true in the management of patients with hypotensive shock. Ref. pulmonary emboli, myocardial infarctions, cardiovascular accidents, drug ingestions, adrenal insufficiencies or patients being maintained on vasopressors.

The mechanics of the system are as follows: A 16, 18 or 20 gauge teflon needle is placed in the artery of choice and connected to a 6-foot sterile Cobe high pressure monitoring line. The female Luer-Lok end of this line is then attached to a standard B and D MS13 four-way stopcock which is attached to either a Statham or Hewlett Packard pressure transducer and a 2 cc. Luer-Lok syringe. Considerable confusion has been encountered in the past using this stopcock, i.e., no blood pressure, blood in the pressure dome, unable to irrigate catheter, blood in the flushing bottle, air in the patient line and so forth. Almost always these problems

are the result of the stopcock being in the wrong position. Basically, it functions in the following manner:

1. Each stopcock is scribed on top to facilitate ease in the determination of the line of flow. With the wing in line with the transducer, the pressure line continuous, systolic and diastolic beat for beat blood pressure may be monitored.
2. With the wing at a 90° angle to the transducer and patient line, flushing solution may be drawn from the bottle to the 20 cc. Luer-lok syringe. No pressure will be monitored at this time.
3. With the wing at a 45° angle between the patient line and syringe, the pressure line may be irrigated and/or blood samples drawn for desired tests. It should be mentioned at this time that, in taking blood samples from this site, 4 or 5 cc. of blood should be allowed to run out of the line into the flushing syringe. This eliminates the chance of erroneous results due to dilution factors.
4. Once a sample is collected, the line should be immediately irrigated with the flushing solution to maintain a patent lumen in the arterial needle.
5. Medication should not under any circumstances be infused into this system.
6. Under normal conditions, the system will need irrigation approximately every 15 to 20 minutes with a small amount of solution.

PRECAUTIONS:

Extreme caution should be taken in moving the patient. These needles are easily dislodged and if unnoticed can cause considerable problems; examples, large hematomas and large volume losses of blood from the patient. Sterile techniques should be used at all times in handling the circuit. If the needle is placed in the radial, ulnar or brachial artery, an armboard should be placed on the arm with a folded towel under the wrist or elbow and the wrist or elbow hyperextended. The site should be properly restrained to allow a minimum amount of movement from the patient. Once the needle is in place, the area should be prepped with tincture of benzoin and allowed to dry. Then two to three pieces of one-half inch tape are slipped under the hub of the needle and cross folded onto the then adhesive benzoin area. This is then covered with a large piece of one-inch tape. If the pressure monitor is discontinued but the needle is to be left in place, the following procedure should be followed:

1. Using a 30 cc. glass Luer-Lok syringe, mix 1 cc. of lipo-heparin 1:1000 USP units with 29 cc. of normal saline for irrigation.
2. Attach a 36-inch venous extension tube to the syringe and the male slip end of the extension tube to the needle.
3. The tubing is then clamped with a pair of rubber-shod hemostats to keep blood from backing up in the syringe.
4. The syringe, tubing and hemostats are then placed with a small towel and wrapped around the patient's arm forming a sleeve and is then secured with pieces of one-inch tape, allowing freedom of movement for the patient, and at the same time providing protec-

tion for the arterial needle, syringe and irrigation solution.

5. This does not in any way eliminate the need for frequent irrigation. This is easily checked by simply removing the rubber-shod hemostats from the tubing. Blood should immediately pulsate back up the tubing if the needle is patent. If blood flow is sluggish or does not flow back, the needle is either obstructed or has slipped out of the artery.
6. When discontinuing the needle, pressure is applied just above the puncture site. The needle is then removed and an alcohol sponge is placed on top of the puncture and firm pressure is applied for a minimum of 7 minutes.
7. The sponge is then removed and the artery is milked to insure that there is no bleeding.
8. If blood is observed after this procedure, pressure is again applied and the milking procedure is again tested. Until no blood is visible from the puncture site, a sterile dressing is placed over the area for 24 hours.

The irrigation system routinely used in the hospital is 500 cc. of normal saline, 2.15 cc. of lipo-heparin 1:1000. The puncture site of choice is usually one of the following arteries:

1. Radial
2. Ulnar
3. Femoral
4. Brachial
5. Carotid (occasionally).

The above procedures should insure an effective monitoring and sampling site for as long as necessary, without complications.

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