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The occasional arterial line: Part 2

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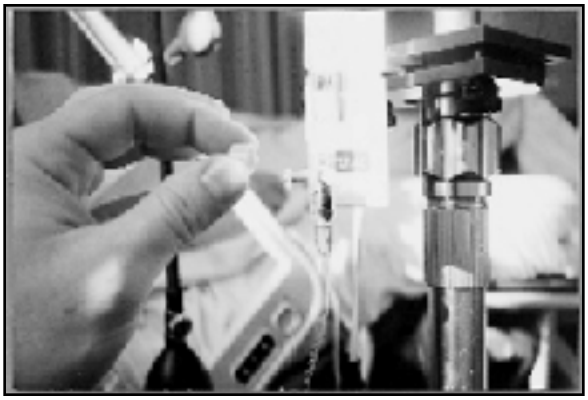
This paper has been peer reviewed.

The most recent in this series of Practitioner articles, "The occasional arterial line" (1997;2[2]:77-79), showed readers that arterial lines are simple and effective in certain cases encountered in rural medicine. The present article will show how to calibrate the set-up and how to draw blood from the line.

Remember that the heparinized saline flows from the pressure bag (inflated to about 300 mm Hg) through the transducer to the catheter inserted in the patient's artery. The transducer has a valve that automatically delivers 2 to 3 mL/h through the catheter. A manual flush valve allows a rapid flush of fluid whenever desired. Make sure that there is no air in the system.

There is a 3-way stopcock close to the transducer and another on the line close to the patient and the catheter. The stopcock close to the transducer is used primarily for calibration or "zeroing." On both stopcocks, the "off" position is the direction toward which the handle points; everything else remains open. When the handle is positioned at 45°, it is "off to everything." In the illustrations for this article, the handle has been painted black.

Zeroing



Make sure that the transducer is positioned at the level of the patient's midaxillary line. Turn the stopcock "off to the patient" (Fig. 1), remove the cap on the port, push the zeroing button on the monitor, and wait until the monitor indicates "zeroing completed." Doing this allows the monitor to "see" only the pressure in the line plus atmospheric pressure, without the patient's pressure; the monitor will automatically deduct this value from the total pressure to give an accurate reading of the patient's pressure. Manually flush a little fluid to fill the port and turn the handle "off to the port." Replace the vented cap, provided with the set-up, with a separate solid cap so that no air or fluid can leak out or in. Replace the cap on the distal stopcock. A good tracing should appear on the monitor screen.

Drawing blood from the line

Fig. 2
From the stopcock closest to the patient, remove the cap (which should already be a solid, nonvented one, as described in the section on zeroing), place it in an opened 2 * 2 cm gauze package, and screw a 5-mL syringe into the port. Turn the handle "off to the bag" (Fig. 2).

Fig. 3
Blood will flow backward up the tubing from the arterial catheter. Sometimes you will have to apply slight suction by means of the syringe. Remove enough of the blood-fluid mixture (3 or 4 mL) to ensure that only pure arterial blood is in the line (Fig. 3). Turn the handle to the 45° position ("off to everything"). Unscrew the syringe and discard it.

Fig. 4
Screw on either a heparinized syringe (for blood gases), a nonheparinized syringe (for regular blood work) or a venipuncture adapter, which is commonly used to accept standard tubes in the usual blood-taking procedure, and turn the handle back to "off to the bag" (Fig. 4).

Fig. 5
Withdraw the blood needed, turn the handle back to 45° ("off to everything"), and remove the syringe or adapter (Fig. 5).

Fig. 6
Turn the handle "off to the hub."

Manually flush the line in short bursts (less then 1 second each), to prevent distal arterial blanching, until all the blood is gone from the tubing (Fig. 6).

Fig. 7
Turn the handle "off to the patient" and flush the hub area to remove blood and air. Sponge it with a 2 * 2 cm gauze pad held over the hub opening (Fig. 7).

Fig. 8
Replace the cap (solid, nonvented), and turn the handle "off to the hub" (Fig. 8).

Keep the catheter in place for as short a time as possible, preferably less than 3 days.

Fig. 9
And "Bob's your uncle" -- no pain for the patient and a set-up that allows you to collect a plentiful supply of blood for all the tests you may wish to request (Fig. 9). Our nurses learn this technique from each other, and once they know the procedure they are certified by one of the physicians. They are proud to do it, and they appreciate the convenience it affords both themselves and the patient.

Correction

The illustration labelled "step 5" in the first article about inserting arterial lines (1997;2[2]:77-79) was linked to the incorrect txThe photo actually illustrates the connection of the cable from the pressure cassette of the monitor to the wires from the transducer.

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