

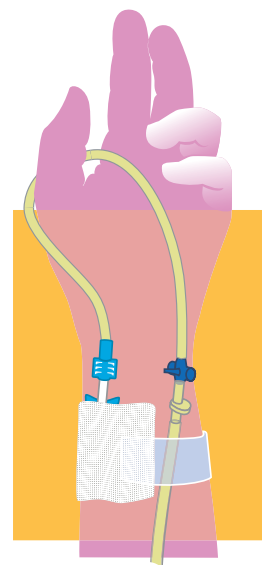
## Arterial Catheterization

An arterial catheter is a thin, hollow tube that is placed into an artery (blood vessel) in the wrist, groin, or other location to measure blood pressure more accurately than is possible with a blood pressure cuff. This is often called an “art line” in the intensive care unit (ICU).

The catheter can also be used to get blood samples when it is necessary to frequently measure the levels of gases (oxygen and carbon dioxide) in the bloodstream. Blood for other lab tests may also be drawn at times.

Measuring blood gases can be very important when a person has a critical illness. Oxygen and carbon dioxide are the important gases exchanged in the lungs and carried by the blood. Oxygen is brought into the body when we breathe in. All of our cells require oxygen to survive. Delivery of oxygen can be affected by problems in the lungs, circulation (movement of blood through the arteries and veins) or blood.

Carbon dioxide is a gas produced by our cells as they function. It carries excess acid from the body as a person breathes it out. A build-up of carbon dioxide can be harmful. This build-up of carbon dioxide can occur with lung or circulation problems.



### Why Do I Need Arterial Catheterization?

Common reasons an arterial catheterization is done include:

- **Low blood pressure (hypotension or shock)**—Low blood pressure can be treated by giving IV fluids (fluid given intravenously or “by vein”) and, in some instances, giving medications to help increase blood pressure (vasopressors, sometimes referred to as “pressors” in the ICU). By knowing precisely what the blood pressure is, doctors can use the least amount of fluid and/or medicine needed to get the blood pressure to a safe level. The need to measure pressures directly in the artery is greatest when the person is receiving medicines to keep the blood pressure up. The arterial catheter allows accurate, second-to-second measurement of the blood pressure.
- **High blood pressure (hypertension)**—In some situations, the blood pressure can go so high that it is life-threatening. Such high blood pressure must be lowered gradually in steps, and measurements with an arterial catheter help guide treatment.

- **Severe lung problems**—When a person has a lung problem that is so severe that it requires checking the levels of oxygen or carbon dioxide in the blood more frequently than 3 to 4 times a day, the arterial catheter can be used to draw blood without having to repeatedly stick a needle into the person. An arterial line can provide valuable information to adjust oxygen therapy or mechanical ventilator (respirator; breathing machine) settings. The blood oxygen pressure measures from an arterial line give more detailed information than that from a pulse oximeter (a sensor that is clipped on to a finger, toe or earlobe) in a very ill person.

### Risks of Arterial Catheterization

Some of the risks of arterial catheterization include:

- **Pain during placement**—Discomfort can result from the needle stick and placement of the catheter at the time it is inserted. A local numbing medicine (an anesthetic) can be used to lessen the pain. The discomfort is usually mild and lessens once the catheter is in place.

- **Infections**—As in the case with all catheters inserted into the body, bacteria can travel up the catheter from the skin and into bloodstream. The longer the catheter remains in the artery, the more likely it is to get infected. Special care in bandaging the skin at the catheter site and changing the tubing can help to decrease the risk of infection.
- **Blood clots**—If blood clots form on the tips of arterial catheters, the clots can block blood flow. If another blood vessel does not carry blood to the area beyond the clot, this can cause the loss of a hand or leg. Such a loss is very rare, and most people have other blood vessels that also supply the arm or leg that will make up for some limited blood flow when a catheter is in place. To decrease the likelihood of these problems, the intensive care unit (ICU) staff checks regularly for blood flow in the hand or leg when a catheter is in the artery.
- **Bleeding**—Bleeding can occur at the time the catheter is inserted. The bleeding may stop without doing anything. Sometimes, the catheter may need to be removed and pressure applied to the site.

#### Preparation for Arterial Catheterization

The person's skin will be cleaned and a small amount of an anesthetic will be injected into or applied to the skin to numb it before the procedure.

#### Common Questions

##### *How long will the catheter stay in?*

In general, the tube will stay in only so long as it is needed (to measure low blood pressure, high blood pressure, or to take frequent blood samples). The medical team will review the need for the catheter on a daily basis and will remove it as soon as it is safe to do so.

##### *Can a person move around while the catheter is in?*

Having an arterial catheter does not limit moving a person. Care and assistance with moving is needed to avoid dislodging (accidentally removing) the catheter.

##### *Can the arterial catheter be used to give medicine like an intravenous (IV) line?*

All arterial lines are maintained with some fluid, like normal saline. Sometimes a blood thinner is also given to prevent clotting of the line. Other medications are not generally given in an arterial line because they can be too irritating.

##### *Will there be any pain or possible complications when the catheter is removed?*

There can be bleeding, and the site can be a little tender. Usually the blood circulation returns to normal after the catheter is removed.

**Source:** Manthous, C., Tobin, MJ, A Primer on Critical Care for Patients and Their Families

**Reviewers:** Marianna Sockrider MD DrPH, Ann C Long, MD MS

## Rx Action Plan

- ✓ Talk with your healthcare provider about the use of numbing medicine that will reduce discomfort during placement of the catheter.
- ✓ Have the ICU staff show you how the line is bandaged and how it is watched to reduce the risk of infection or circulation problems.
- ✓ A little bleeding at the site is not unusual and typically does not cause any problems.

**Healthcare Provider's Contact Number:**

#### Resources:

**American Thoracic Society:**  
[www.thoracic.org/patients](http://www.thoracic.org/patients)

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