Arterial line procedure pdf

Arterial blood gas (ABG) testing is a diagnostic test performed on blood taken from arteries that provides insight into how much oxygen and carbon dioxide is in your blood, along with your blood pH levels. ABG tests are used to evaluate respiratory and kidney function and provide a general study of the body's metabolic state. When inhaled and exhaled, the body releases oxygen and pushes carbon dioxide, a process called gas exchange. However, some conditions may affect this, causing imbalances across the body systems. Blood gas analysis helps to assess a person's respiratory and metabolic status. Your doctor may order an ABG test if you have symptoms of oxygen/carbon dioxide imbalance, including: shortness of breathSSSSPure breathingConfusionDizzinessNot care Your doctor may also order an ABG test if you have sleep apnea, heart disease, kidney problems, asthma, cystic fibrosis, chronic pulmonary obstructive disease (COPD) or other conditions affecting breathing and lung function. ABG can also be a useful metric for determining the effectiveness of certain therapies and treatments, such as additional oxygen or medications. ABGs can indicate how effectively the lungs provide oxygen to the body and then remove carbon dioxide. ABGs also measure the blood pH and integrity of the body's acid-based balance. In general, the ABG test measures five different markers: partial oxygen pressure (PaO2): oxygen pressure dissolved in the blood (determining how well oxygen can flow from the lungs into the blood). Partial carbon dioxide pressure (PaCO2): the pressure of carbon dioxide dissolved in the blood (determining how effectively carbon dioxide can move from the body). Arterial blood pH, amount of hydrogen ions in the blood: pH 7,35-7,45 is considered normal. Blood oxygen saturation (SaO2): the amount of oxygen carried by hemoglobin red blood cells. Bicarbonate (HCO3): a chemical buffer that helps to stabilise the blood pH. This test is most often performed in a hospital setting for patients who are very ill and at risk of respiratory failure, but can also be used for lung function in an institution or laboratory. The ABG test is a standard blood test and a very safe procedure. If done correctly, there's a very low risk, aside from the normal risk associated with any blood draw. Because the test is usually performed in an artery that is usually found deeper in the body than the veins, there may be some slight pain. The most common complication is excessive bleeding or bruising at the puncture site. If you are currently taking additional oxygen therapy, your oxygen levels should remain constant (without assistance) for at least 20 minutes before giving blood to the ABG test. Be sure to tell your healthcare provider if you are currently taking blood thinners such as warfarin or aspirin, even supplements like fish oil. There are no special preparations required for THE ABG test. After cleaning the area with antiseptic, the needle is used to collect a small amount of blood in either the radial artery of your arm or the thigh artery of your circuses. You may feel a small prick when the needle damages the skin. Since the arteries are slightly thicker than veins (they have more smooth muscle layers), arterial blood done can hurt a little more than venous blood done, but the pain should fade away quickly after the test. After the blood has been removed, direct pressure will be applied on the spot for several minutes to stop the bleeding. Blood will be sent to the laboratory (usually on-site) for rapid analysis, as ABG should be read within 10 minutes to obtain an accurate result. Blood gas analysis helps to assess a person's respiratory and metabolic status. Since the body can, of course, over-alkalise deficiencies in certain areas, the provider reading the results of your ABG test must be well trained in the interpretation of blood gases. Normal ABG value corresponds to the following ranges: ABG normal range Oxygen parallel pressure (PaO2) 75 to 100 millimetres mercury (mmHg) Partial carbon dioxide pressure (PaCO2) 35 to 45 mmHg pH 7,35 to 7 .45 Oxygen saturation (SaO2) 95% to 100% bicarbonate (HCO3) 22 to 26 mlequivalents per litre (mEq/liter) Note: At altitudes above 3000 ft, the oxygen saturation level may be lower. Pathological values may be signs of certain medical conditions. A pathological result basically means that your body is in an acid-based balance. As a result, your body fluids may become too acidic or too alkaline and less able to effectively support normal functioning. Abnormal ABG values pH Bicarbonate PaCO2 Metabolic acidosis < 7.4 Low metabolic alkalosis > 7.4 High respiratory acidosis < 7.4 High respiratory alkalosis > 7.4 Low low metabolic acidosis may lead to renal failure or severe diarrhoea, while metabolic alkalosis may cause chronic vomiting or steroid use. Respiratory alkalosis means that you have too little carbon dioxide, which can be due to a wide range of possible causes, such as anxiety, pregnancy, or liver disease. The results of the ABG test should be discussed in detail with your medical provider, who can take a look at your personal medical history to help determine the possible cause of the imbalance, and then take steps to help you breathe more easily. Updated: Deepak Sudheendra, MD, FSIR, RPVI, Assistant Professor of Invasive Radiology and Surgery at the University of Pennsylvania Perelman School of Medicine, with experience in vascular intervention radiology and surgical critical care, Philadelphia, PA. Review by VeriMed Healthcare Network. Also reviewed by David Zieve, MD, MHA, Medical Brenda Conaway, editorial director, and A.D.A.M. Editorial Team. There are many blood vessels in the body. Arteries are the ones that take blood away from the heart. Most of them deliver blood full of oxygen to tissues, organs and other blood vessels served by the circulatory system. They also remove waste products, maintain pH levels and circulate proteins. Each artery has three layers and a lumen, an opening through which blood occurs. The layers of the arteries are tunics. The outer layer is tunica externa, although some researchers refer to it as tunica adventitia. This layer consists mainly of collagen, which anchors arteries to the stability of nearby organs. The layer is also in bundles of protein elastin, which forms elastic fibers. Tunic externa contains vaso vasorum, a network of small blood vessels that supply walls to larger blood vessels. Flexible arteries such as the aorta receive blood and feed from the vasa vasorum. sitox/Getty Images Tunica externa surrounds tunica media. In smaller arteries, tunica media consists mainly of smooth muscle fibers. Most small arteries have one layer of these fibers, although larger arteries can be up to six. The femoral bone and other large arteries are a combination of elastic fibers and collagen, which alternate with smooth muscle layers. Major arteries, such as the aorta, have a significant amount of elastic tissue. alex-mit/Getty Images The deepest layer of arteries is tunica intima, a layer of endothelium cells that filter fluids, help with blood clotting, and cause inflammation. The inner elastic lamina made of elastin fibers supports tunic intimacy and separates it from the media. In the elastic arteries, this layer has a thin layer of support for collagen and myointimial cells, smooth muscle cells and fibroblasts that collect lipids. 7activestudio/Getty Images Large arteries such as aortic and pulmonary arteries have flexible arteries. They contain large amounts of collagen and e-fibers, allowing them to stretch more than other arteries. This flexibility also allows the arteries to maintain consistent pressure. When the heart contracts, the wall stretch hold large amounts of blood. When the heart rests, the arteries constrict to maintain blood flow. The elastic arteries connect with the muscular arteries and transfer blood to them. Bangkokerz/Getty Images Muscle arteries are also known as distributing arteries; these medium-sized vessels draw blood from the flexible arteries and distribute them to smaller vessels. Femoral and coronary arteries are examples of muscular arteries. The walls consist of a large amount of smooth muscle, allowing them to shrink and run out. However, since these arteries have less elastin, they cannot stretch as much as large elastic arteries. gecko753 / Getty Images Blood travels from the proliferation of arteries to the arteriol, smaller control blood flow to even smaller blood vessels - capillaries. Smooth muscles can shrink or dissipate arteriols, making them the primary source of vascular resistance. This resistance must be overcome to create blood flow. As blood speed decreases between arteriols and capillaries, blood pressure increases. wildpixel/Getty Images Although there are many arteries, the aorta stands out as one of the most important. It is the root of the systemic artery and receives blood directly from the left ventricle of the heart. The aorta is so large that anatomical sources often divide into their sections. Some medical sources divide the aorta based on its location in the body, while others base sections on blood flow. The aortic arch loops through the left pulmonary artery. It contains specific cells that transmit information about blood pressure, pH levels and carbon dioxide levels in the brain. Raycat/Getty Images When arteries stiff, they can limit blood flow. Atherosclerosis occurs when fats, lipids, and other substances form along the walls of the arteries. Although many people believe that this is a heart issue, atherosclerosis can occur in any artery of the body. In case of extreme accumulation, blood clots form. Symptoms are gradual and can be difficult to spot unless very little blood can travel through the arteries. Atherosclerosis can cause pain, numbness, high blood pressure, or difficulty speaking. metamorworks/Getty Images Rare, arteries narrow abnormally and prevent blood flow. When this occurs in the arteries that do not send to the heart or brain, peripheral artery disease develops. This disease mainly affects the legs, although any artery can narrow. Affected individuals may experience cramping, discomfort, or pain. A person may also feel that one arm or leg is noticeably colder than the other. The causes of peripheral artery disease are similar causes of atherosclerosis – anything that could cause an increase in the arteries, including smoking, diabetes, and hypertension. colematt/Getty Images arteries are blood vessels, just like veins. Medical professionals rely on veins to transport fluids and medications they administer intravenously. However, it is possible to confuse the artery in a normal vein. If an intra-arterial injection occurs, there may be serious side effects. Paraesthesia is an abnormal skin sensation such as tingling, burning or tickling - a common symptom of intraarterial injection. Death of cells and skin tissues may also occur. Treatment requires rest, antithrombotic wines, and anti-charging agents to clear the arteries of any obstruction. fotografixx /Getty Images