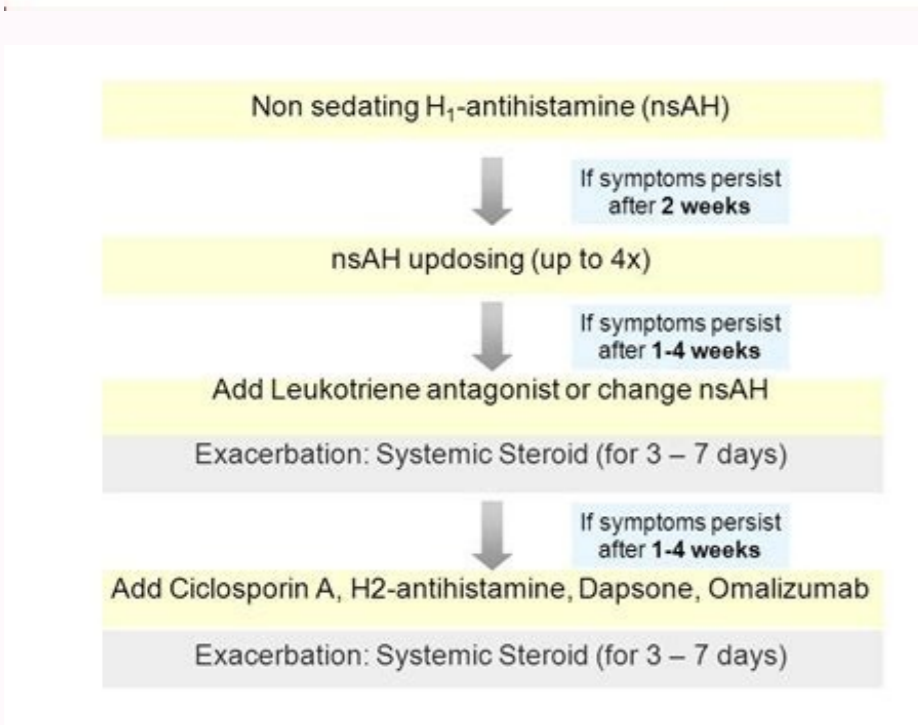
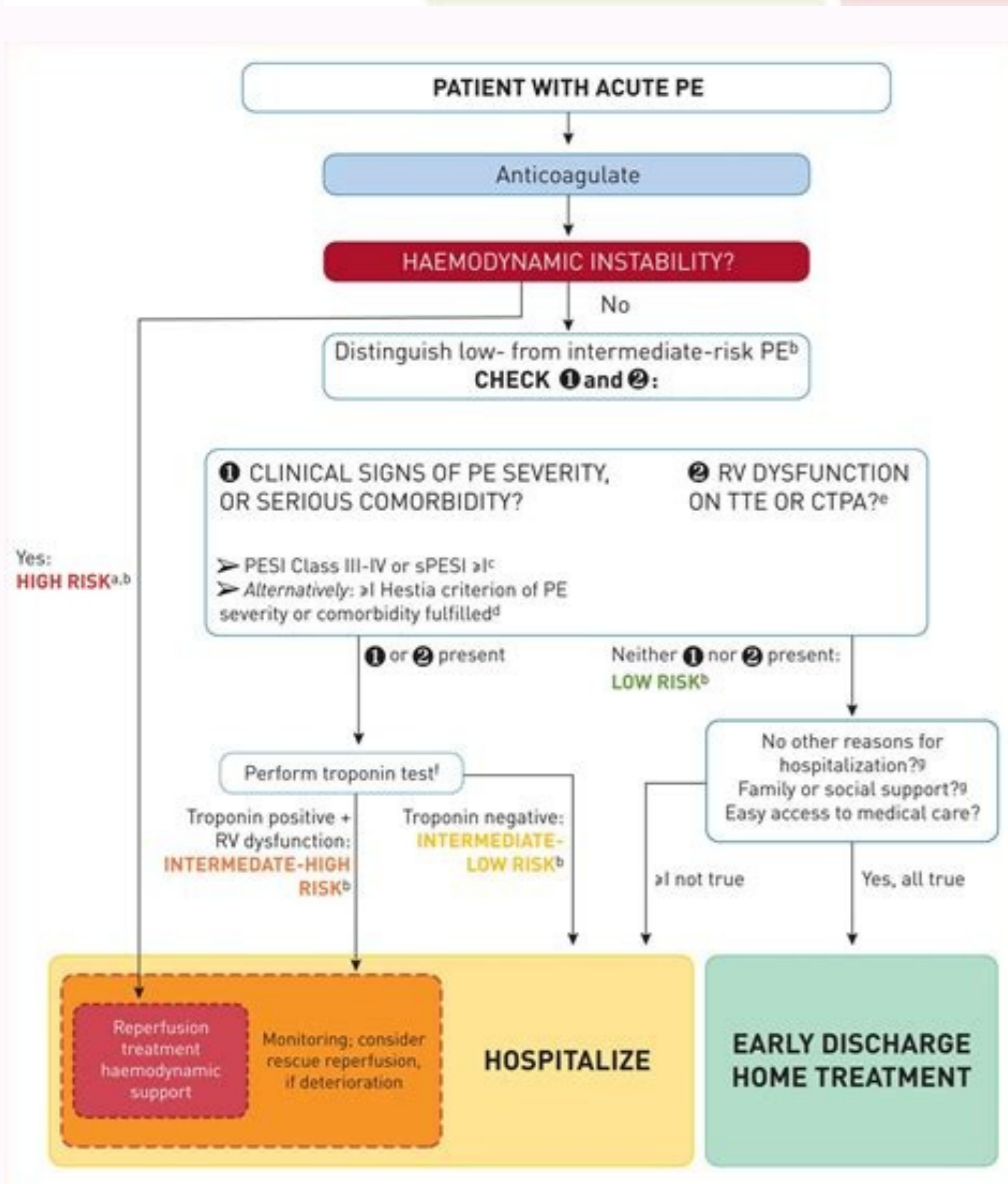
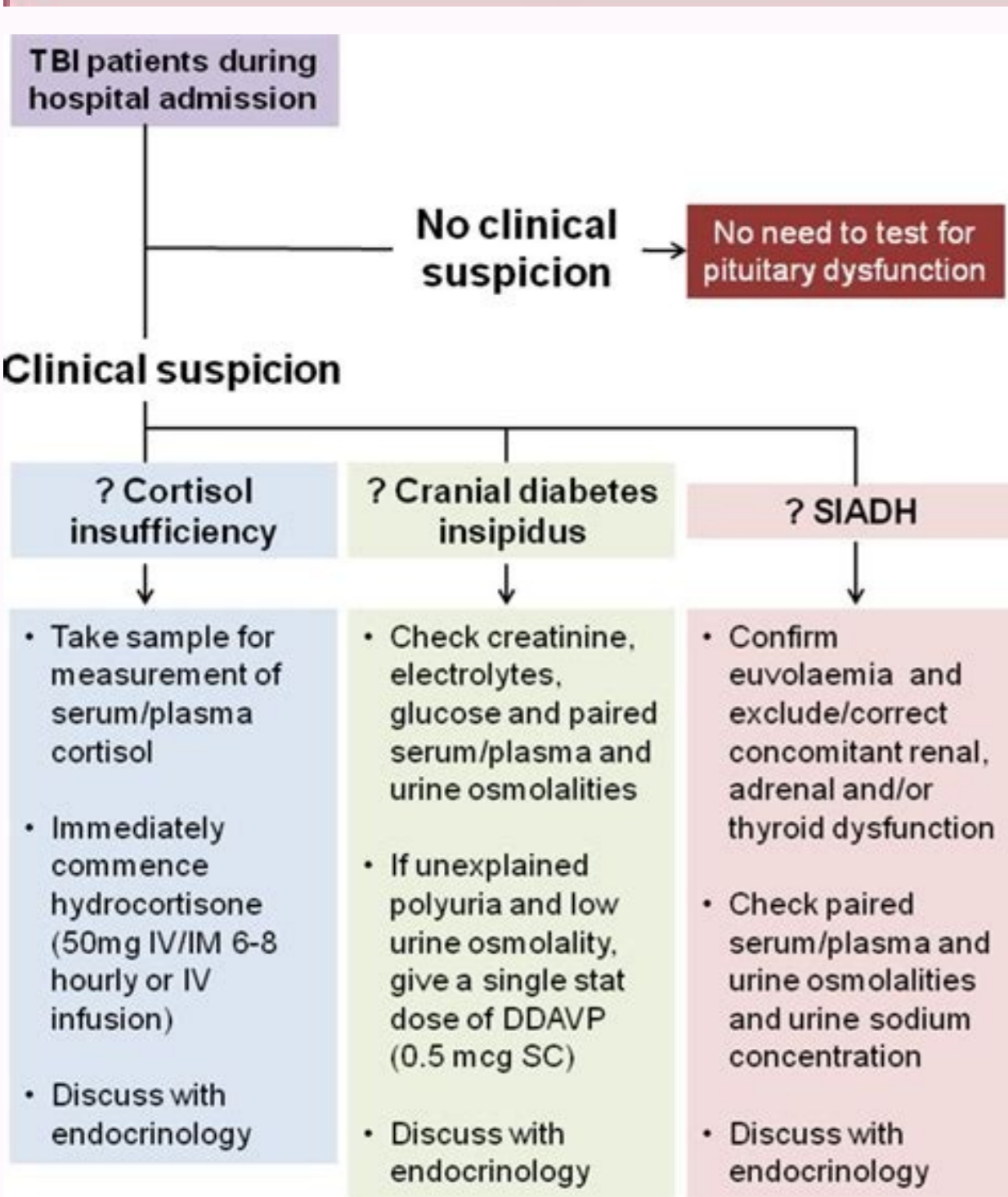
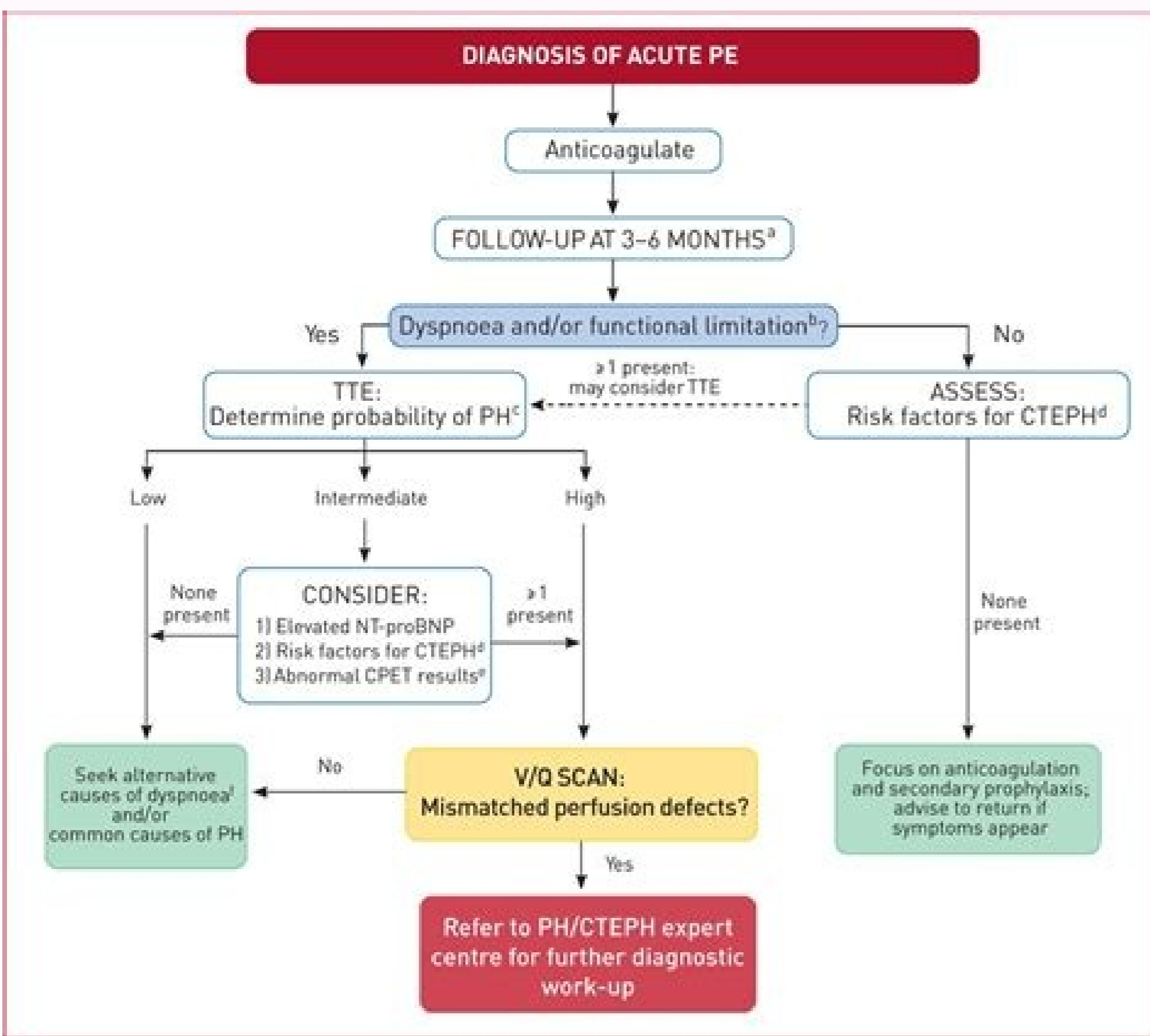
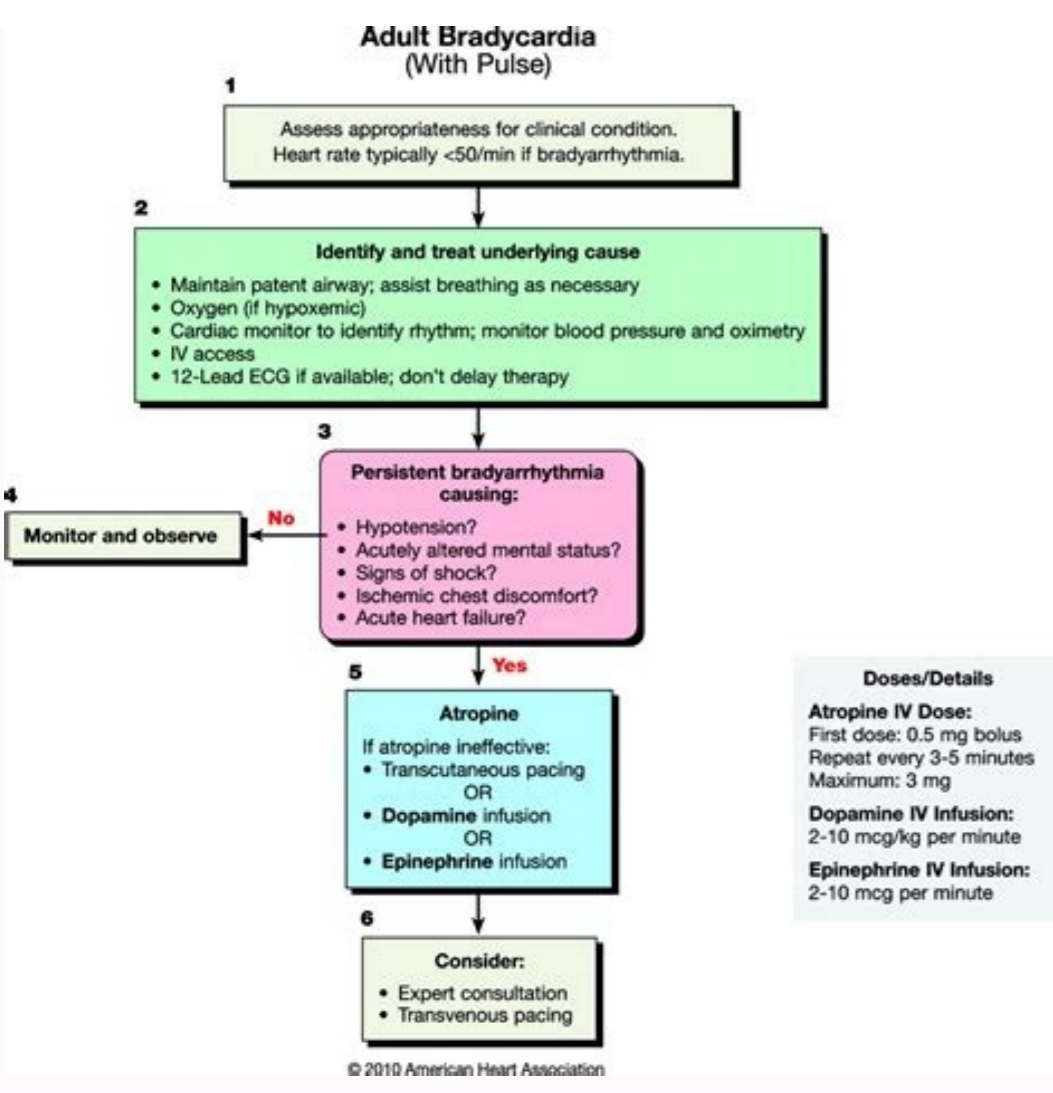


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US Pharm. 2014;39(2):2-4. Hypotension (low blood pressure) can be just as serious as hypertension. But the good news is that low blood pressure can be easily recognized by key signs and symptoms. Low blood pressure occurs when blood pressure drops below a normal range (120/80 mmHg). Though it varies from person to person, a reading of 90 mmHg or lower of systolic blood pressure or 60 mmHg or lower of diastolic blood pressure is generally considered hypotension. Low blood pressure is often an indicator of an underlying problem and is especially dangerous when the pressure drops suddenly. Hypotension causes an inadequate flow of blood to the body organs and may cause stroke, heart attack, kidney failure, and shock if not treated.1 The main causes of low blood pressure include decrease in cardiac output, dilation of blood vessels, decrease in blood volume, inhibition of brain centers that control blood pressure, impairment of the autonomic nervous system, and certain medications. Treatment is determined by the cause of the low blood pressure.1 In this clinical review, we will look at the signs and symptoms, causes, risk factors, and treatment of this condition. Normal Blood Pressure The human body has certain mechanisms to maintain blood pressure and blood flow at a normal level. Artery walls sense blood pressure and send signals to the heart, the arterioles, the veins, and the kidneys to make flow adjustment and increase or decrease blood pressure. Heart mechanisms adjust the amount of blood pumped by the heart into the arteries (cardiac output), the amount of blood in the veins, the volume of blood, and arteriole resistance.2 Heart contractions can eject more blood into the arteries and increase blood pressure. Veins can expand and narrow and store more blood. The arterioles can also expand and narrow and cause more or less resistance to the flow of blood. The kidneys respond to these changes by increasing or decreasing the amount of urine that is produced, which in turn changes the volume of blood. The kidney mechanism takes much longer to affect the blood pressure than other mechanisms.2 All of these adaptive mechanisms keep the blood pressure in normal range. Signs and Symptoms Low blood pressure will not deliver enough blood to the organs of the body. The organs can be damaged temporarily or permanently.3 Lightheadedness, dizziness, and even fainting (orthostatic hypotension) can happen due to insufficient blood flow to the brain. The brain malfunctions first because it is located at the top of the body and blood has to fight gravity to reach it. Changing position from sitting or lying to standing to often produces the symptoms of low blood pressure. This is due to the settlement of blood in the veins of the lower body. An insufficient amount of blood delivered to the coronary arteries may cause chest pain or even a heart attack. Low blood flow to the kidneys will reduce the elimination of waste from the body, and urea (measured as blood urea nitrogen, or BUN) and creatinine levels will increase in the blood. In addition, the major organs of the body, such as the brain, kidneys, liver, and heart, may collapse rapidly owing to prolonged low blood pressure. Fatigue, nausea, thirst, rapid and shallow breathing, cold, clammy and pale skin, and blurred vision are some of many early signs of low blood pressure. In general, compensatory mechanisms try to increase blood pressure that is low. Classification Knowing the four major types of hypotension may help to diagnose a person's condition.4 Postural or orthostatic hypotension (OH): This is low blood pressure that occurs when one stands up from sitting or lying down. Orthostatic hypotension is strongly age-dependent, with prevalence ranging from 5% to 11% in middle age to 30% or higher in the elderly. Current guidelines suggest a wide range of treatments, but systematic reviews of the evidence-based literature for such recommendations are lacking. Postural hypotension was traditionally classified as neurogenic (less common but often more severe) or nonneurogenic (more common, with no direct signs of autonomic nervous system disease). Postprandial hypotension: This occurs when blood pressure drops suddenly after eating. The intestines require a large amount of blood for digestion. Postprandial is more common than postural hypotension and occurs mainly in the elderly. Some risk factors for this are Parkinson disease and autonomic neuropathy. Drugs such as octreotide reduce the amount of blood flowing to the intestines. Certain nonsteroidal anti-inflammatory drugs (NSAIDs) cause salt to be retained and thus increase blood volume. Neurally mediated hypotension: This occurs when blood pressure drops after standing for a long period of time. Multiple system atrophy with orthostatic hypotension: This is also known as Shy-Drager syndrome. Marked by progressive damage to the autonomic nervous system, this condition causes hypotension when standing and hypertension when lying down. Causes of Low Blood Pressure Anyone can be affected by hypotension, especially those who are over the age of 65 years. The following conditions, and the taking of certain medications, increase the risk of hypotension.4,5 Dehydration: Even mild cases of dehydration can cause low blood pressure. Dehydration can result from prolonged nausea, vomiting, or severe diarrhea. In situations like this, a large amount of water is lost and blood shunts away from the organs to the muscles. Patients with mild dehydration may experience only thirst and dry mouth. Moderate dehydration may cause orthostatic hypotension, and severe dehydration (hypovolemia) can lead to shock, kidney failure, confusion, acidosis, coma, and even death. Blood loss: A major injury or internal bleeding can quickly deplete an individual's body of blood, leading to low blood pressure. Bleeding can occur from injury, trauma, gastrointestinal diseases including as diverticulitis, or surgical complications. The severe and rapid bleeding from a ruptured aortic aneurysm can cause shock and death. Plasma loss (from burns) is also a major hypovolemic factor. Heart problems: Heart valve problems such as aortic stenosis, low heart rate, heart attack, medications that are toxic to the heart, and infection of the heart muscle by viruses (myocarditis) can all lead to hypotension. Bradycardia can lead to low blood pressure, light-headedness, dizziness, and even fainting. Causes of bradycardia include sick sinus syndrome, heart block, and drug toxicity (digoxin). Many of these conditions happen in the elderly, and the problem usually lies in the heart's failure to circulate enough blood. Severe allergic reactions: Also known as type 1 immunoglobulin E (IgE)-mediated hypersensitivity reaction or anaphylaxis, this reaction can suddenly cause the blood pressure to drop. Pancreatitis: In acute pancreatitis, fluids leave the blood vessels to enter the inflamed tissues around the pancreas as well as the abdominal cavity, concentrating the blood and reducing its volume (pooling of unavailable fluids). Severe infection: Also known as gram-negative septicemia, any infections that enter the bloodstream can cause potentially fatal drops in blood pressure. Endocrine problems: An under- or overactive thyroid gland can trigger hypotension. Diabetes, postgastrectomy (or dumping) syndrome, primary hypoadosteronism, and pheochromocytoma are other endocrine factors that cause hypotension. Pregnancy: Pregnant women often experience hypotension because the circulatory system rapidly expands during pregnancy. Blood pressure typically returns to a normal level after childbirth. Medications: Diuretics, beta-blockers, alpha-blockers, calcium channel blockers, certain antidepressants (e.g., amitriptyline), drugs for Parkinson disease (carbidopa and levodopa), and erectile dysfunction drugs such as sildenafil, when used in combination with nitroglycerin, can cause hypotension. Diagnosis and Evaluation In many healthy individuals, symptoms of weakness, dizziness, and fainting can be due to low blood pressure. Measuring the blood pressure is generally the first step in diagnosing this condition. A decrease in blood pressure upon standing causes the heart rate to increase. In many cases, the cause may be apparent as mentioned above, but at other times, the cause may be identified by the following tests and techniques: CBC, blood electrolyte measurement, cortisol levels, blood and urine cultures, radiologic studies, electrocardiogram, Holter monitor (to record intermittent episodes of brady- and tachycardia), echocardiogram, ultrasonography examinations of the leg veins, CT scan of the chest, and tilt-table tests.5,6 Treatment In some cases, the symptoms of hypotension may be very mild and may not signal the need for immediate medical attention. However, low blood pressure can be an indicator of a more serious health condition. For more serious cases of hypotension, the underlying cause is treated first, such as endocrine problems, heart problems, dehydration, or use of certain medications. Mild dehydration is treated with fluids and electrolytes. Moderate-to-severe dehydration is usually treated in the hospital or emergency room with IV fluids and electrolytes.7 Low blood pressure from severe bleeding needs to be treated immediately. Hypotension due to bradycardia may be caused by a medication, and the dosage of such a medication must be adjusted. Bradycardia due to a sick sinus rhythm or heart block is normally treated with a pacemaker. Blood pressure medications or diuretics that cause low blood pressure may be changed or stopped altogether by the physician. Drug Therapy Fludrocortisone is recommended as first-line drug therapy. This is a drug that prevents dehydration by causing the kidneys to retain water. This drug boosts the blood volume, which raises the blood pressure. Fludrocortisone is a very potent mineralocorticoid with high glucocorticoid activity, used primarily for mineralocorticoid effects. It promotes increased reabsorption of sodium and loss of potassium from renal distal tubes. This drug is given as 0.1 mg daily in conjunction with a high salt diet and adequate fluid intake and may be increased in increments of 0.1 mg per week; the maximum daily dose is 1 mg.8 Midodrine is used to raise standing blood pressure levels in patients with chronic orthostatic hypotension. This is recommended for monotherapy or combined therapy with fludrocortisone. It forms an active metabolite, which is an alpha 1 agonist. This agent increases arteriolar and venous tone, resulting in a rise in standing, sitting, and supine systolic and diastolic blood pressure in patients with orthostatic hypotension. The dose is 10 mg three times per day during daytime hours when the patient is upright (maximum dose is 40 mg/day). In the prevention of hemodialysis-induced hypotension (unlabeled use), 2.5 to 10 mg is given 15 to 30 minutes prior to a dialysis session. The major side effect of this drug is supine hypertension (7% to 13%).9 Norepinephrine is a vasoactive agent used in the treatment of severe hypotension and shock. It stimulates beta1 adrenergic receptors and alpha-adrenergic receptors, causing increased contractility and heart rate and thereby increasing systemic blood pressure. Dosage administration requires the use of an infusion pump, and the drug is therefore used in emergency room and inpatient settings. The initial adult norepinephrine dose is 8 to 12 mcg/min, and it is then titrated to the desired response.10 Octreotide is a somatostatin analogue that inhibits release of gastrointestinal peptides, some of which may cause vasodilation. Subcutaneous doses given 30 minutes before a meal may be used to reduce postprandial orthostatic hypotension. Octreotide does not increase supine hypotension. Nausea and abdominal cramps may occur. Prevention Not all cases of hypotension are preventable, but taking the following steps can reduce the risk of developing the condition. Water Intake: Drinking water helps combat dehydration and increases blood volume. In addition, hydrating drinks like alcohol and coffee and triggers such as a high temperature environment must be avoided. Compression stockings: These are elastic stockings that are commonly used to relieve pain and can reduce pooling of blood in the legs and, in certain cases, prevent hypotension. Body positions: Patients should sit up and breathe deeply as they get out of bed in the morning or when standing up from a sitting position. Dorsiflexing their feet first and even crossing the legs while upright can be helpful. REFERENCES 1. Feldstein C, Weder AB. Orthostatic hypotension: a common, serious and underrecognized problem in hospitalized patients. J Am Soc Hypertens. 2012;6(1):27-39. 2. Logan IC, Witham MD. Efficacy of treatments for orthostatic hypotension: a systematic review. Age Ageing. 2012;41(5):587-594. 3. Fedorowski A, Melander O. Syndromes of orthostatic intolerance: a hidden danger. J Intern Med. 2013;273(4):322-335. 4. Lanier JB, Mote MB, Clay EC. Evaluation and management of orthostatic hypotension. Am Fam Physician. 2011;84(5):527-536. 5. Sathapalan T, Aye MM, Atkin SL. Postural hypotension. BMJ. 2011;16:342-348. 6. Luciano CL, Brennan MJ, Rothberg MB. Postprandial hypotension. Am J Med. 2010; 123(3): 281-286. 7. Raj SR, Koshman ML, Sheldon RS. Outcome of patients with dual-chamber pacemakers implanted for the prevention of neurally mediated syncope. Am J Cardiol. 2003;91(5):565-569. 8. Kearney F, Moore A. Pharmacological options in the management of orthostatic hypotension in older adults. Expert Rev Cardiovasc Ther. 2009;7(11):1395-1400. 9. Prakash S, Garg AX, Heidenheim AP, et al. Midodrine appears to be safe and effective for dialysis-induced hypotension: a systematic review. Nephrol Dial Transplant. 2004;19(10):2553-2558. 10. Dellinger RP, Levy MM, Rhodes A, et al. Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock. Crit Care Med. 2013;41(2):580-637. To comment on this article, contact rdavidson@uspharmacist.com.

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