

VASCULAR DISORDERS AND PROBLEMS OF PERIPHERAL CIRCULATION

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- *Assessment
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- *Aneurysm
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- *Arterial Thrombosis
- * Deep Vein Thrombosis
- *Chronic Venous Insufficiency
- *Leg Ulcer
- *Varicose Vein

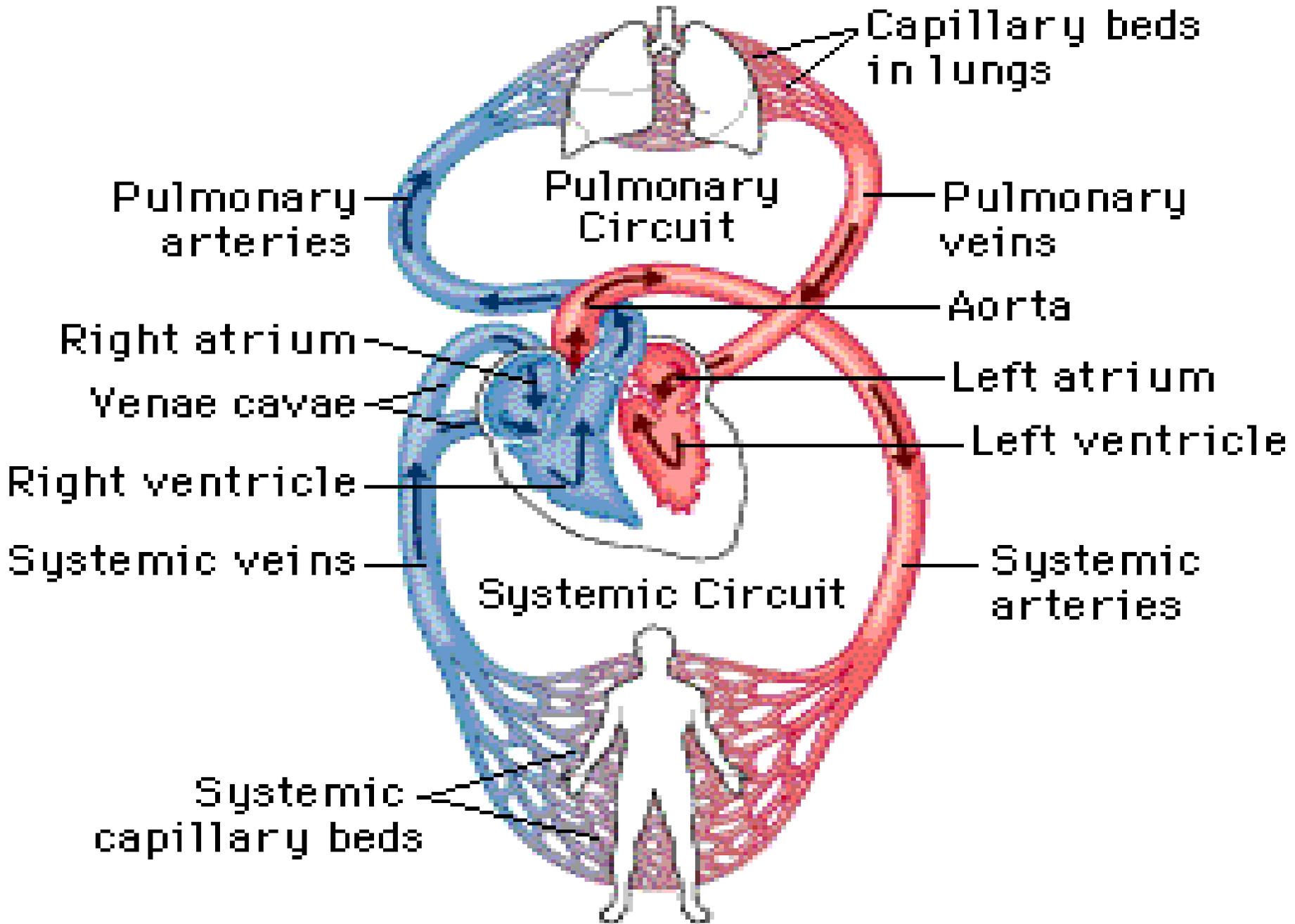
***Anatomic and Physiologic overview**

Arteries and Arterioles

Capillaries

Veins and Venules

Lymphatic Vessels



*Assessment

History

Inspection

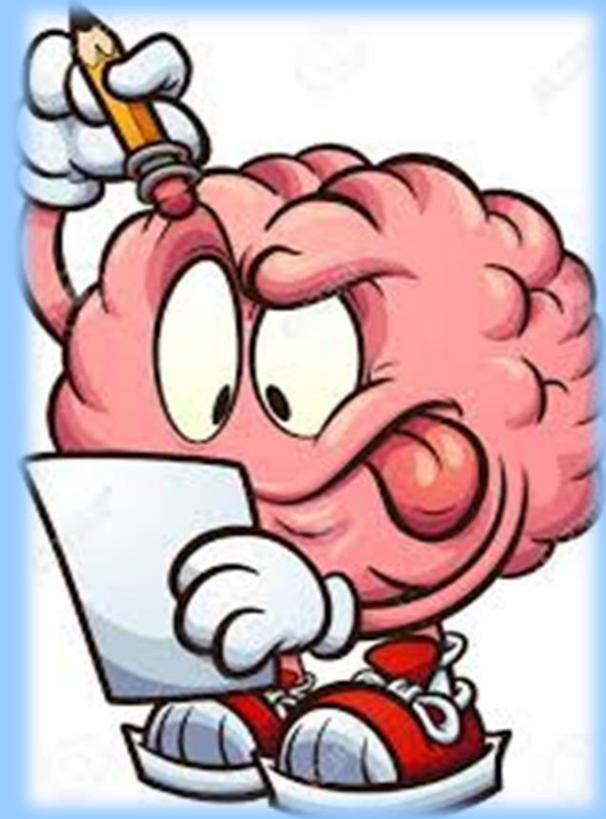
Palpation

History

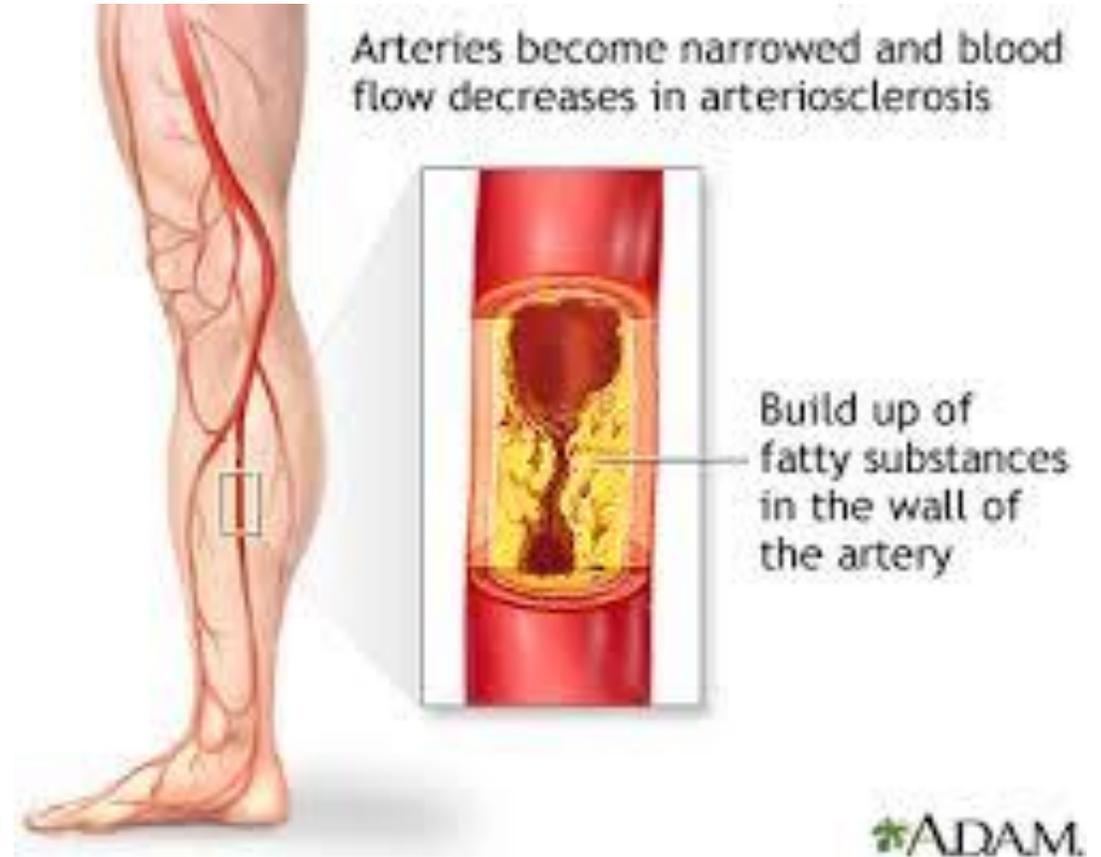
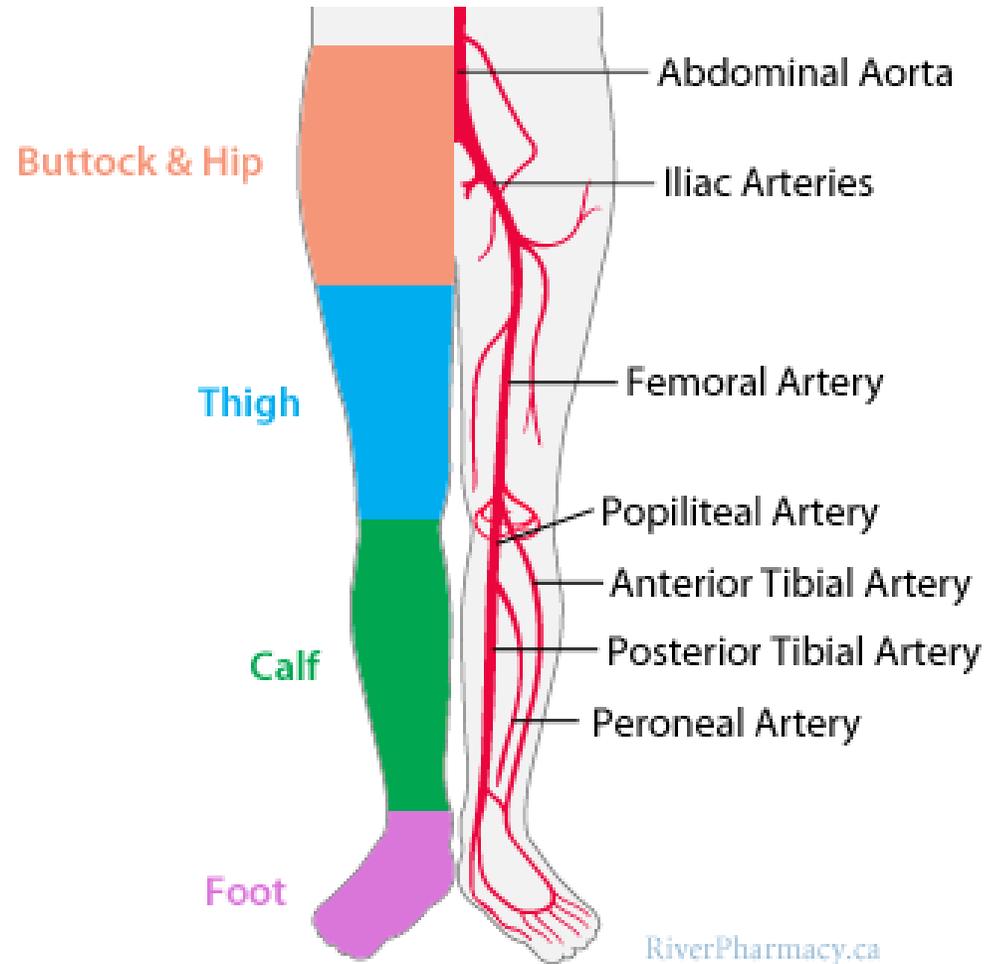
Intermittent Claudication

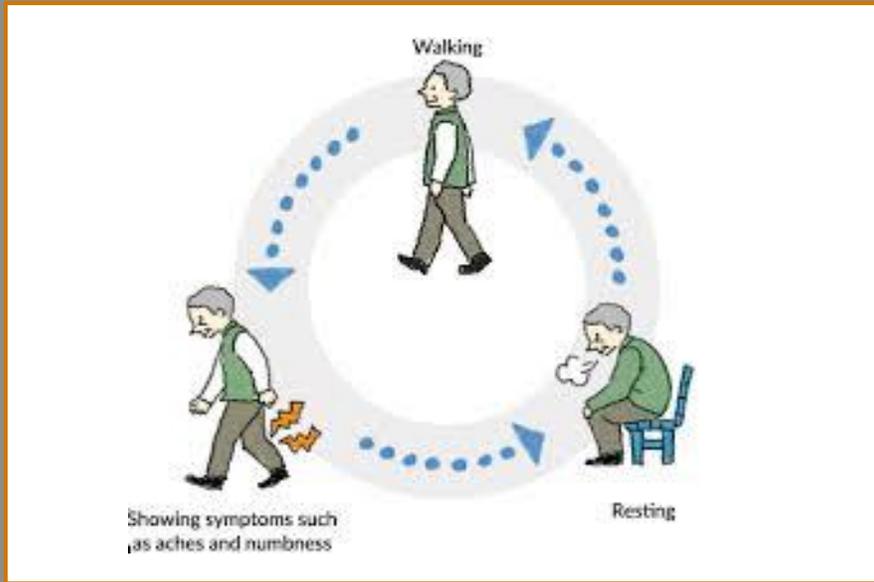
Rest pain

Why do these happen?



Intermittent Claudication





LACTIC ACID

Inspection

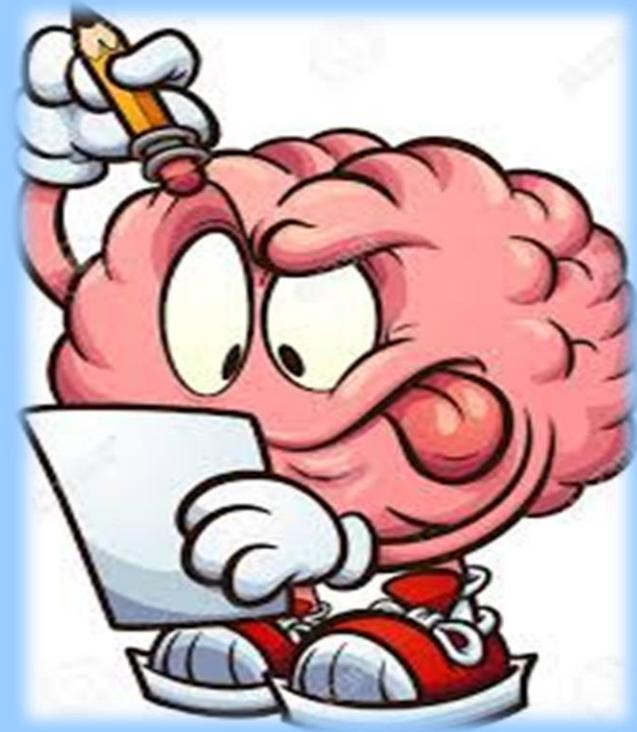
Rubor:

A reddish-blue discoloration of the extremities.

Cyanosis:

A bluish color of the skin.

Why do these happen?



Rubor happens because:

arterial damage in which vessels that cannot constrict remain dilated.

Cyanosis happens because:

Oxygenated hemoglobin contained in the blood is reduced

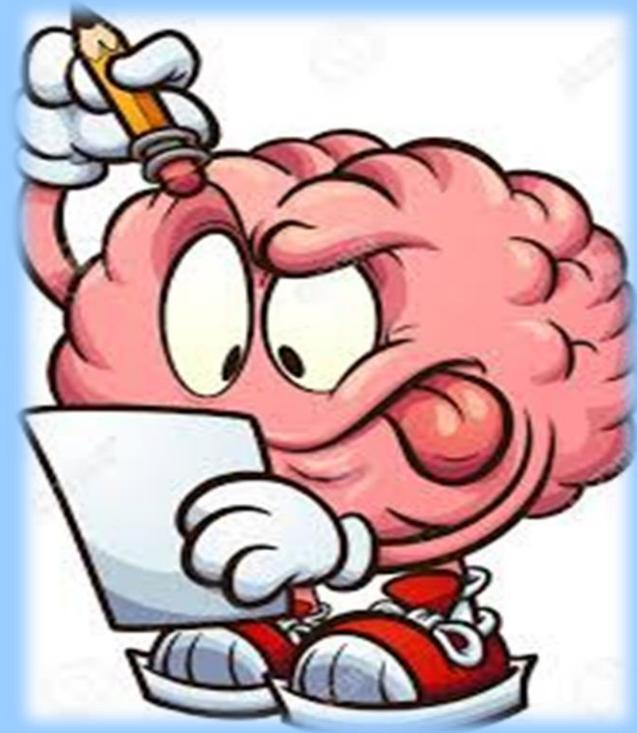


Inspection

loss of hair, brittle nails, dry or scaling skin, atrophy, and ulcerations.

Why do these happen?

Because of chronically reduced nutrient supply.



Palpation

Local Temperature

Palpation of Pulses

Pulses should be palpated bilaterally and simultaneously, comparing both sides for symmetry in rate, rhythm, and quality.

Assessing Peripheral Pulses



*Diagnostic Evaluation

Doppler Ultrasound Flow Studies

Exercise Testing

Computed Tomography Angiography

Duplex Ultrasonography

Computed Tomography

Angiography

Magnetic Resonance Angiography

Air Plethysmography

Contrast Phlebography (Venography)

Lymphangiography

Lymphoscintigraphy

*Diagnostic Evaluation

Doppler Ultrasound Flow Studies

When pulses cannot be reliably palpated, a handheld continuous wave (CW) Doppler ultrasound device may be used to hear the blood flow in vessels.



*Diagnostic Evaluation

Exercise Testing

Exercise testing is used to determine how long a patient can walk and to measure the ankle systolic blood pressure in response to walking.

*Diagnostic Evaluation

Computed Tomography Angiography (CTA)



The high volume of contrast agent injected into a peripheral vein limits the usefulness of CTA in children and patients with significantly impaired renal function.

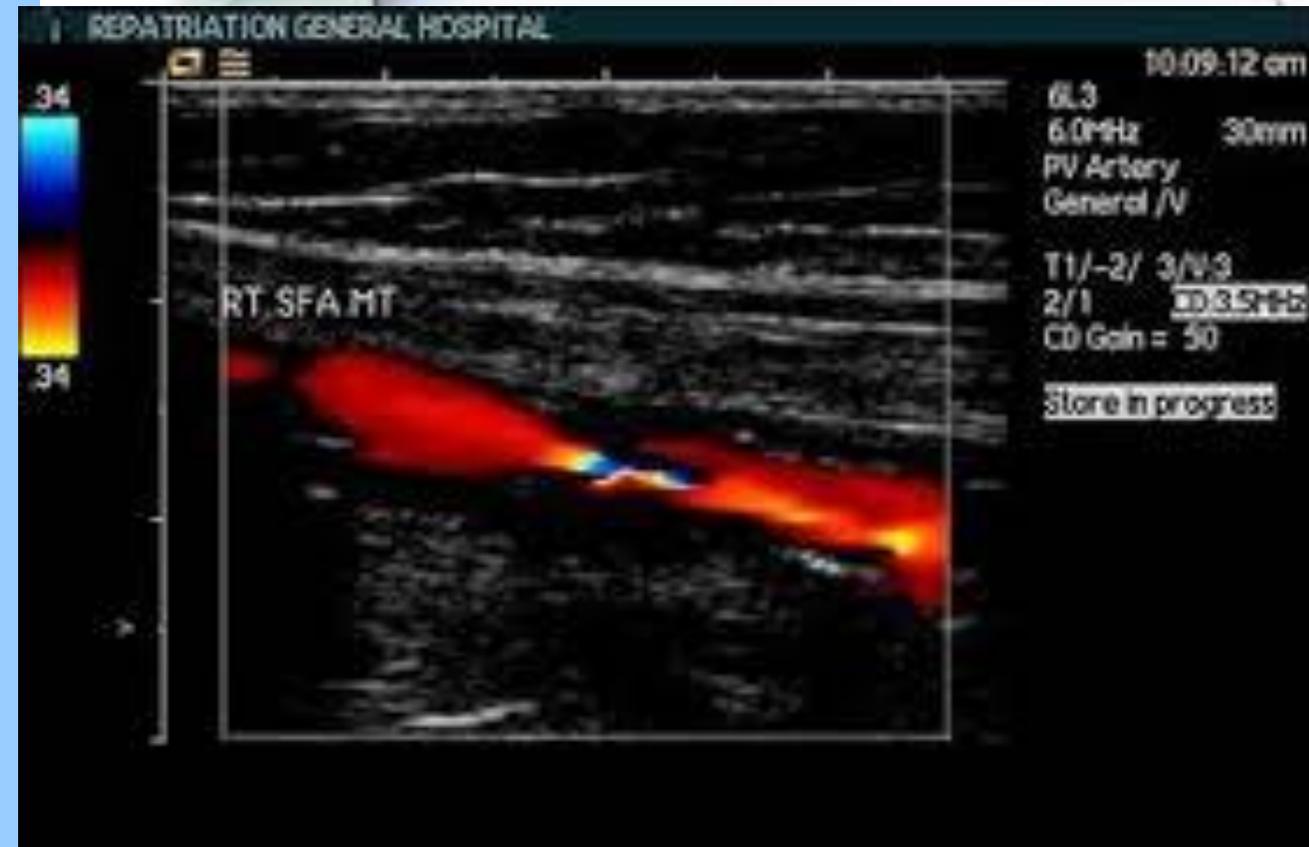
Why?



*Diagnostic Evaluation

Duplex Ultrasonography

A duplex ultrasound test is performed to diagnose medical conditions affecting blood flow



*Diagnostic Evaluation

Angiography



*Aneurysm

a localized sac or dilation formed at a weak point in the wall of the artery.

Aneurysms are serious because:

they can rupture, lead to hemorrhage, then death.

Etiologic Classification of Arterial Aneurysms:

Congenital

Mechanical (hemodynamic)

Traumatic (pseudoaneurysms)

Inflammatory

Infectious

Pregnancy-related degenerative

Anastomotic (postarteriotomy) and graft aneurysms

Most of aneurysms occur as a result of atherosclerosis

S&S depend on

pulsating mass affects surrounding structures.

THORACIC AORTIC ANEURYSM

Asymptomatic, pain, dyspnea, hoarseness, aphonia, dysphagia

ABDOMINAL AORTIC ANEURYSM

Asymptomatic, feeling of heart beating in the abdomen in lying position, bruit

Management for Aneurysms:

^ Control Hypertension

^ Bypass graft surgery

^ Stent

Nursing Management:

You tell me!

Please read page 871.



*Arterial Embolism and Arterial Thrombosis

DIFFERENCE?

Which one is more dangerous?



Clinical Manifestations

Depend on the:

size of the embolus,

the organ involved,

and the state of the collateral vessels.

Management

Anticoagulation

Embolectomy

Percutaneous mechanical thrombectomy

Nursing Management:

Page 873.

* Deep Vein Thrombosis (DVT)

Damage to the intimal lining of blood vessels creates a site for clot formation. Direct trauma to the vessels, as with fractures or dislocation, diseases of the veins, and chemical irritation of the vein from IV medications or solutions, can damage veins.

DVT occurs when 1- blood flow is reduced, 2- veins are dilated, and 3- skeletal muscle contraction is reduced.

Causes for the mentioned conditions:

1- heart failure or shock.

2- some medication therapies.

3- immobility or paralysis of the extremities.

Clinical Manifestations

Non-specific S&S

However, swelling, change in local temperature, and tenderness can be some indicators.

Management

For sure, you can tell me now!



Nursing Care for Patients with Deep Vein Thrombosis

- 1. If the patient is receiving anticoagulant therapy, monitoring PT & PTT and monitor bleeding tendency are necessary.
- 2. Use anti-embolism stocking or sequential compression device.
- 3. Remove stocking for 20 minutes twice a day and provide skin care.
- 4. Assess popliteal, dorsalis pedis, and posterior tibial pulses.
- 5. Assess skin temperature of legs.
- 6. Assess for unilateral calf pain or tenderness every 8 hours.
- 7. Avoid pressure on popliteal blood vessels from equipment (e.g, abductor splint straps, sequential compression stockings) or pillows.
- 8. Change position and increase activity as possible.
- 9. Supervise ankle exercises hourly.
- 10. Monitor body temperature.

***Chronic Venous Insufficiency/Post-thrombotic syndrome**

With obstruction or incompetent valves in veins, the blood cannot move toward the heart.

Edema, altered pigmentation, pain, and dermatitis may happen.

Venous ulceration is the most serious complication of chronic venous insufficiency.

Nursing Management

- ^ Elevating the legs (Why? Tell me what will happen)
- ^ No prolonged sitting or standing (Do you know why?)
- ^ Avoid placing pressure on the popliteal spaces (Do you know how?)
- ^ Constricting garments, especially socks that are too tight (For sure you know why 😊)
- ^ Protecting from trauma

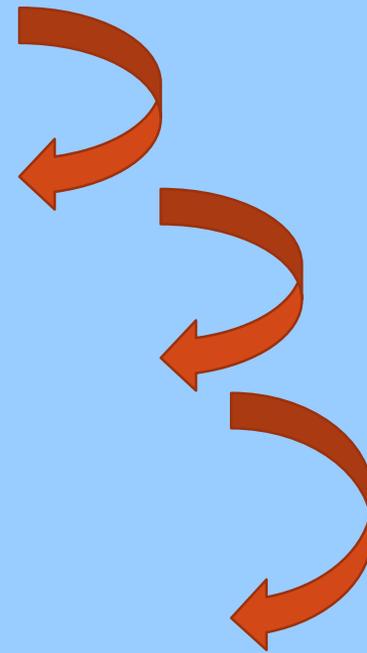
*Leg Ulcer

Can be caused by chronic venous insufficiency, arterial emboli, inflammation.

Poor O₂ and nutrients supply

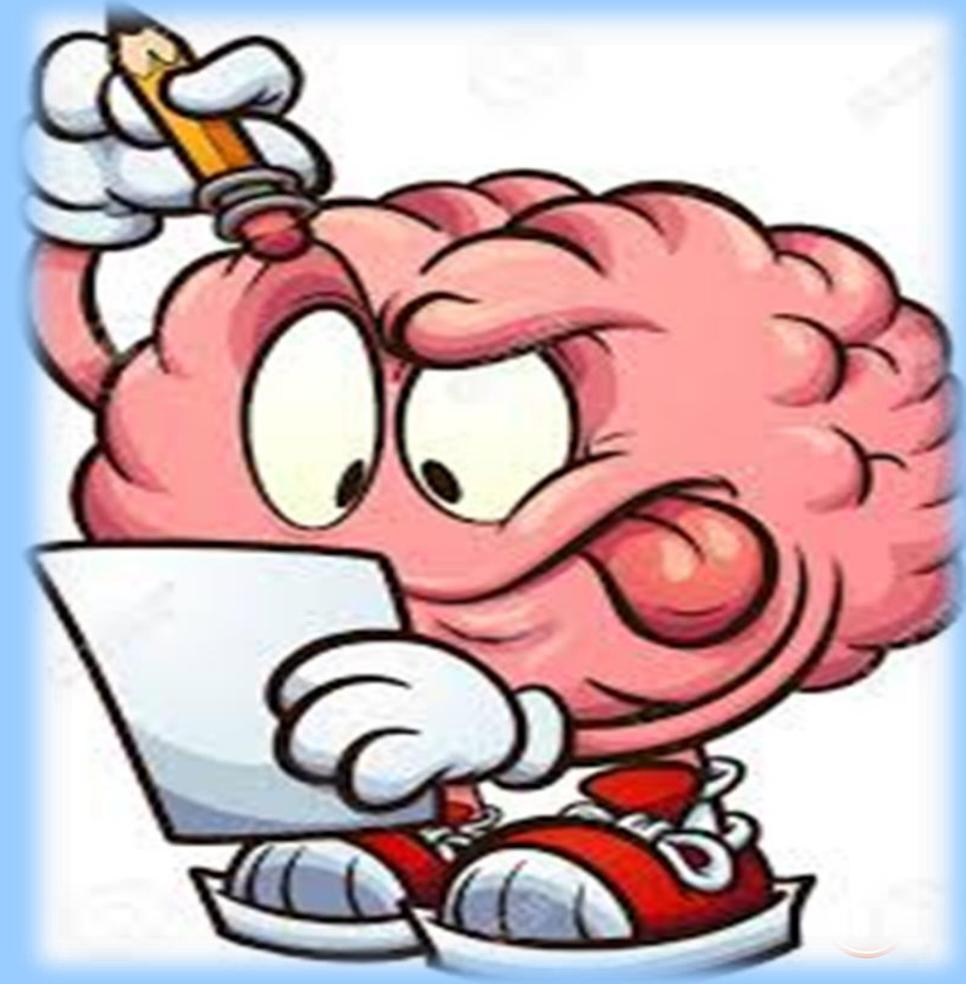
Low metabolism in cells

Cell necrosis and ulcer.



We need to know how can we figure out which ulcer is caused by venous insufficiency and which one by arterial!!!

Page: 881-882



Nursing Management

Page: 883-884

Let's see how you can highlight the importance in these two pages to help you more (Note: this is just an example for you).

shown a statistically significant improvement in the number of ulcers healed and a reduced time to wound closure (O'Donnell & Lau, 2006).

Knowledge deficit, frustration, fear, and depression can decrease the patient's and family's compliance with the prescribed therapy; therefore, patient and family education is necessary before beginning and throughout the wound care program.

Stimulated Healing

Tissue-engineered human skin equivalent (eg, Apligraf [Graftskin]) is a skin product cultured from human dermal fibroblasts and keratinocytes used in combination with therapeutic compression. When applied, it interacts with the patient's cells within the wound to stimulate the production of growth factors. Application is not difficult, no suturing is involved, and the procedure is painless.

Hyperbaric Oxygenation

Hyperbaric oxygenation (HBO) may be beneficial as an adjunct treatment in patients with diabetes with no signs of wound healing after 30 days of standard wound treatment. HBO is accomplished by placing the patient into a chamber that increases barometric pressure while the patient is breathing 100% oxygen. The process by which HBO is thought to work involves several factors. The edema in the wound area is decreased because high oxygen tension facilitates vasoconstriction and enhances the ability of leukocytes to phagocytize and kill bacteria. In addition, HBO is thought to increase diffusion of oxygen to the hypoxic wound, thereby enhancing epithelial migration and improving collagen production. The two most common adverse effects of HBO are middle ear barotrauma and confinement anxiety (Mechem & Manaker, 2005).

Negative Pressure Wound Therapy

Research findings suggest that negative pressure wound therapy using vacuum-assisted closure (VAC) devices decreases

Diagnosis

Nursing Diagnoses

Based on the assessment data, major nursing diagnoses for the patient may include:

- Impaired skin integrity related to vascular insufficiency
- Impaired physical mobility related to activity restrictions of the therapeutic regimen and pain
- Imbalanced nutrition: less than body requirements, related to increased need for nutrients that promote wound healing

Collaborative Problems/Potential Complications

Based on the assessment data, potential complications that may develop include:

- Infection
- Gangrene

Planning and Goals

The major goals for the patient may include restoration of skin integrity, improved physical mobility, adequate nutrition, and absence of complications.

Nursing Interventions

The nursing challenge in caring for these patients is great, whether the patient is in the hospital, in a long-term care facility, or at home. The physical problem is often a long-term and disabling one that causes a substantial drain on the patient's physical, emotional, and economic resources.

Restoring Skin Integrity

To promote wound healing, measures are used to keep the area clean. Cleansing requires very gentle handling, a mild soap, and lukewarm water. Positioning of the legs depends on whether the ulcer is of arterial or venous origin. If there is arterial insufficiency, the patient should be referred for evaluation for vascular reconstruction. If there is venous in-

Improving Physical Mobility

Generally, physical activity is initially restricted to promote healing. When infection resolves and healing begins, ambulation should resume gradually and progressively. Activity promotes arterial flow and venous return and is encouraged after the acute phase of the ulcer process. Until full activity is resumed, the patient is encouraged to move about when in bed, to turn from side to side frequently, and to exercise the upper extremities to maintain muscle tone and strength. Meanwhile, diversional activities are encouraged. Consultation with an occupational therapist may be helpful if prolonged immobility and inactivity are anticipated.

If pain limits the patient's activity, analgesic agents may be prescribed. The pain of peripheral vascular disease is typically chronic and often disabling. Analgesic agents may be taken before scheduled activities to help the patient participate more comfortably.

Promoting Adequate Nutrition

Nutritional deficiencies are common, requiring dietary alterations to remedy deficiencies. A diet that is high in protein, vitamins C and A, iron, and zinc is encouraged to promote healing. Many patients with peripheral vascular disease are elderly. Particular consideration should be given to their iron intake, because many elderly people are anemic. After a dietary plan has been developed that meets the patient's nutritional needs and promotes healing, diet instruction is provided to the patient and family.

Promoting Home and Community-Based Care

The self-care program is planned with the patient so that activities that promote arterial and venous circulation, relieve pain, and promote tissue integrity are encouraged. Reasons for each aspect of the program are explained to the patient and family. Leg ulcers are often chronic and difficult to heal; they frequently recur, even when the patient rigorously follows the plan of care. Long-term care of the feet

3. Attains adequate nutrition

- a. Selects foods high in protein, vitamins, iron, and zinc
- b. Discusses with family members dietary modifications that need to be made at home
- c. Plans, with the family, a diet that is nutritionally sound

Varicose Veins

Varicose veins (varicosities) are abnormally dilated, tortuous, superficial veins caused by incompetent venous valves (see Fig. 31-15). Most commonly, this condition occurs in the lower extremities, the saphenous veins, or the lower trunk, but it can occur elsewhere in the body, such as the esophagus (eg, esophageal varices; see Chapter 39).

It is estimated that varicose veins occur in up to 60% of the adult population in the United States, with an increased incidence correlated with increased age (Beebe-Dimmer, Pfeifer, Engle, et al., 2005). The condition is most common in women and in people whose occupations require prolonged standing, such as salespeople, hair stylists, teachers, nurses and ancillary medical personnel, and construction workers. A hereditary weakness of the vein wall may contribute to the development of varicosities, and it commonly occurs in several members of the same family. Varicose veins are rare before puberty. Pregnancy may cause varicosities because of hormonal effects related to decreased venous outflow, increased pressure by the gravid uterus, and increased blood volume (James, 2007).

Pathophysiology

Varicose veins may be primary (without involvement of deep veins) or secondary (resulting from obstruction of deep veins). A reflux of venous blood in the veins results in venous stasis. If only the superficial veins are affected, the person may

***Varicose Vein (varicosities)**

Abnormally dilated superficial veins caused by incompetent venous valves.

The condition is common in some occupation>>>

YES, YOU!!!

Clinical Manifestations

If present, may include dull aches, muscle cramps, increased muscle fatigue in the lower legs, edema, and a feeling of heaviness of the legs.

When deep venous obstruction results in varicose veins, the S&S of chronic venous insufficiency may occur.

Medical and Nursing Management

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Please read the **CRITICAL THINKING EXERCISES** on page 887.

Please **email** me if you have any questions:

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References

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