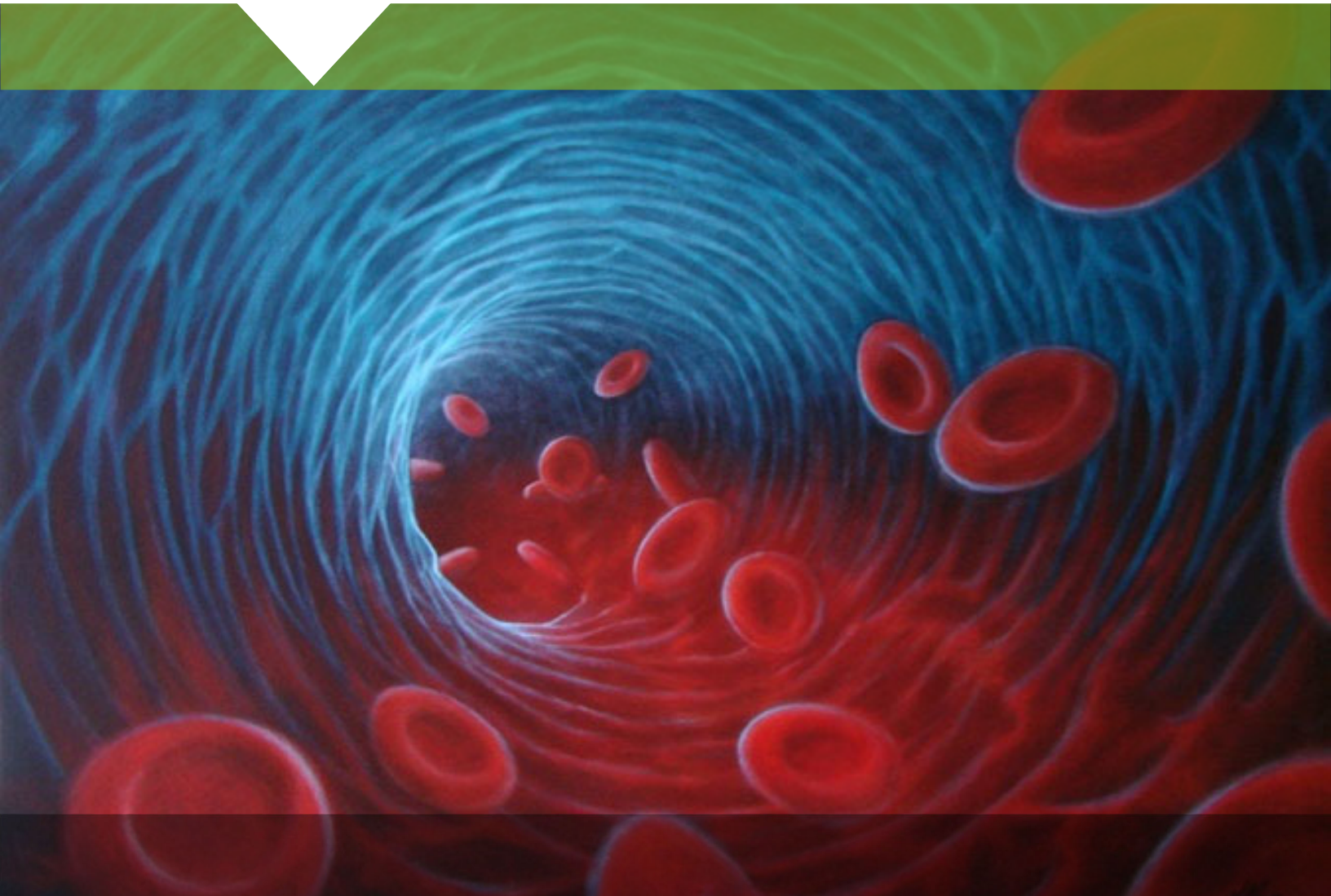




A DISEASE PROCESS MODULE: COMMON VASCULAR CONDITIONS



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We hope you enjoy this inservice, prepared by registered nurses especially for caregivers like you!

A Disease Process Module:

COMMON VASCULAR CONDITIONS

Instructions for the Learner

If you are studying the inservice on your own, please do the following:

- Read through **all** the material. You may find it useful to have a highlighting marker nearby as you read. Highlight any information that is new to you or that you feel is especially important.
- If you have questions about anything you read, please ask _____.
- Take the quiz. Think about each statement and pick the best answer.
- Check with your supervisor for the right answers. You need **8 correct** to pass!
- Print your name, write in the date, and then sign your name.
- Keep the inservice information for yourself and turn in the quiz page to _____ no later than _____. Show your Inservice Club Membership Card to _____ so that it can be initialed.
- Email In the Know at feedback@knowingmore.com with your comments and/or suggestions for improving this inservice.

THANK YOU!

After finishing this inservice, you will be able to:

Identify the main parts of the vascular system.



Demonstrate proper care for clients with 4 common vascular conditions:

DVT

Aneurism

PVD

Varicose Veins



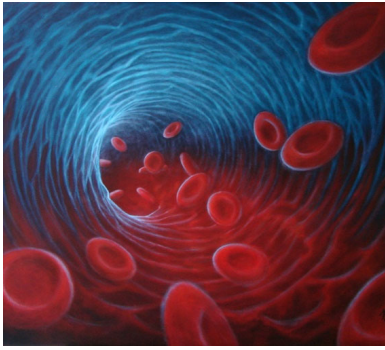
List at least 4 risk factors that may contribute to vascular disease.



Identify 3 lifestyle changes clients can make to prevent common vascular conditions.



Demonstrate proper foot care for clients with vascular disease.



A Disease Process Module:
Common Vascular Conditions

Inside This Inservice:

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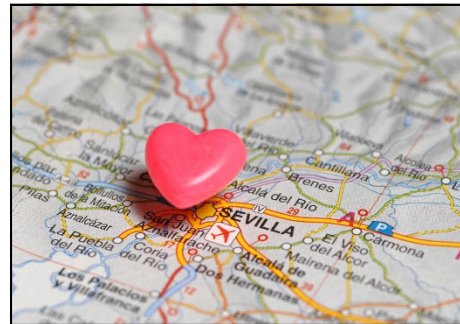
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In accordance with industry standards, this inservice material expires on December 31, 2022. After that date, you may purchase a current copy of the materials by calling 877-809-5515.

ARE YOU READY FOR A ROAD TRIP?

The vascular system is made up of blood vessels called arteries and veins that transport blood to every single cell in the body.



- Arteries lead blood that is loaded with oxygen and nutrients away from the heart, out to all the organs in the body.
- Once the blood has delivered all its oxygen, the veins lead it back to the heart to get re-fueled.

Think of the vascular system like a roadmap of a busy city. The city's center is the heart. The arteries and veins are the roadways. The blood cells are the cars and trucks!

Just like the roadways on which you drive, the "roads" of the vascular system can have problems. In this in-service, you will learn about *atherosclerosis*, which you'll see is like a twenty car pile-up!

You will also learn about *blood clots* that will remind you of driving behind the little old lady who is doing 35 when the speed limit is 65!

And, you'll learn about *aneurisms*. Aneurisms are like what happens when the roads weaken or get "pot holes!"

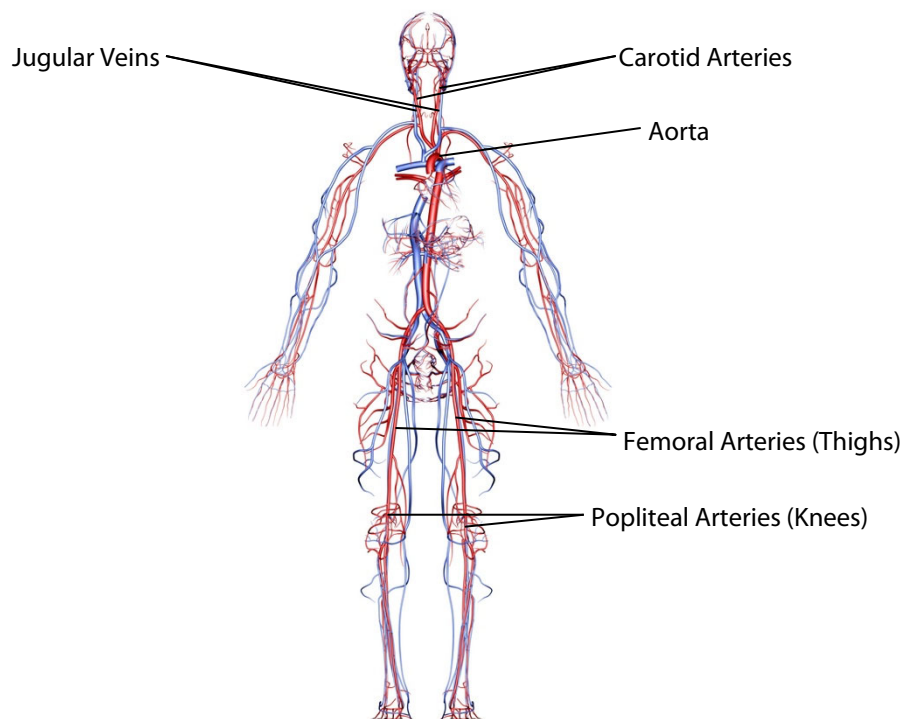
Did you know that there are about **60 thousand miles** of blood vessels in the human body?

Compare that to a trip around the entire earth, which is only about 25 thousands miles.

That means, if you took all the blood vessels from one human body and laid them in a line, they would circle the earth twice - and still have some left over!

So, get your road map (or your GPS) and buckle up for a road trip on the Vascular Super Highway!

ANATOMY OF THE VASCULAR SYSTEM



WHAT IS NORMAL BLOOD FLOW?

- **ARTERIES** lead the blood with oxygen and nutrients from the heart and lungs to all other areas of the body.
- Arteries branch out and become smaller capillaries. **Capillaries** are the drop off point where the blood cells *unload* all the oxygen and nutrients to specific organs or muscles.
- Capillaries connect to venules (tiny veins). **Venules** are the “bus stop” where blood cells get back on the road and travel toward the veins.

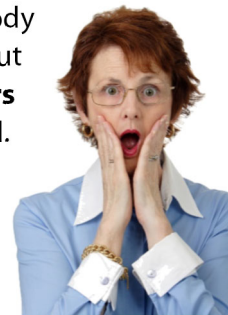
- **VEINS** return the blood (that has dropped off the oxygen and nutrients, and picked up waste products from all parts of the body) back to the heart and lungs.

Normal blood flow occurs when the arteries and veins allow the blood to move to and from areas of the body *without interruption*.

Normal arteries and veins are fully open and have a smooth lining, making it easy for blood to flow through them.

FACTS ABOUT THE VASCULAR SYSTEM

- The vascular system is a part of the **cardiovascular** system which includes the heart and lungs. It can also be called the circulatory system.
- While there are special doctors and nurses that treat only vascular disorders, almost all doctors and nurses deal with vascular conditions in some way because these disorders can effect ANY part of the body.
- Remember: there are about **60 thousand miles** of blood vessels in the human body.
- Red blood cells make around **250 thousand** round trips of the body before they die.
- The average adult body has about **4-6 liters** of blood.



WHAT'S NEW?

Grab your favorite highlighter! As you read through this inservice, **highlight five things** you learn that you didn't know before. Share this new information with your supervisor and co-workers!



WHAT CAN GO WRONG?

THE TWENTY CAR PILE-UP

- Twenty car pile-ups usually start with a single, one or two car accident. Then as other cars come speeding up behind the accident without paying attention, the pile-up becomes bigger and bigger, with more and more cars involved. This is sort of what happens with *atherosclerosis* (pronounced ath-ero-scle-ro-sis).
- **ATHEROSCLEROSIS** is a build-up of waxy plaque in inside part of a blood vessel. Cholesterol and other waste products cause this build-up. Over the years, more and more junk gets caught up in the plaque. The build-up hardens and can even block off blood flow completely. If the blockage occurs in or near the heart, the person may have a heart attack. If the blockage occurs in a carotid artery, which supplies blood to the brain, a stroke may occur.



- **THROMBUS:** A thrombus is a blood clot that *stays in one place*. A blood clot can form if there is damage to a blood vessel or if a person is immobile (not moving or walking enough). Blood clots can form in veins or arteries and can slow down the flow of blood (like driving behind the little old lady) or stop it altogether (like a road block).
- **EMBOLUS:** An embolus is a blood clot that *moves*. Remember, arteries become smaller and smaller (capillaries) as they reach the organs. So, blood clots that move eventually become wedged in a vessel that is too small. This causes a blockage. Blockages can occur in the vessels that supply blood to the lungs. This is called a pulmonary embolism. Other blockages can occur in the eye, causing blindness, or in the brain, causing a stroke.

LITTLE OLD LADIES AND ROAD BLOCKS

- Normally, blood flows smoothly and evenly throughout the vascular system. It's like driving, free as the wind, on the open highway! But, that's not always the case. A blood clot can slow down movement or even stop it all together.



POTHOLES

- Sometimes blood vessels weaken in spots and cause a widening, or an area that becomes ballooned out, like a dip in the road. This is called an aneurism (pronounced an-yer-iz-em).
- **ANEURISMS** can occur anywhere but are most common in the brain or aorta (the main artery of the heart). If an aneurism ruptures, bleeding occurs and death is very likely.



WANT TO KNOW MORE ABOUT VASCULAR DISEASE?

Check out these exciting websites for the latest information in research, prevention, medicine, surgery and nursing care for clients with vascular conditions.

Vascular Disease Foundation

www.vdf.org

American Venous Forum

www.veinforum.org

Coalition to Prevent DVT

www.preventdvt.org

N. American Thrombosis Forum

www.natfonline.org

SPOTLIGHT ON DEEP VEIN THROMBOSIS (DVT)



WHAT IS DEEP VEIN THROMBOSIS?

A deep vein thrombosis, or DVT, is a blood clot that forms in a vein deep in the body. Most deep vein blood clots occur in the lower leg or thigh.

HERE ARE THE FACTS:

A DVT alone is not such a serious problem . . . but, if the clot breaks off and moves (becoming an embolism), it can travel to the lungs . This is called a pulmonary embolism, or PE.

- A PE is a very serious condition. It can damage the lungs and even cause death.
- DVT's in the thigh are more likely to break off and cause a pulmonary embolism than blood clots in other parts of the body.
- About 400 thousand Americans develop a DVT each year. Half of those will develop a PE, and, about 60 thousand of those will die.

Clients at risk for DVT include those with:

- A history of DVT
- Injury from surgery, a broken bone, or other trauma
- Immobility
- Pregnancy and the first 6 weeks after giving birth
- Overweight or obesity

HOW IS DVT TREATED?

Blood clots are much easier to *prevent* than to treat. That's why anyone with risk factors should have orders in place to keep a clot from developing.

Clients who have recently had surgery, or those who are immobile, may be on medication that helps to thin the blood.

Elastic stockings or TED Hose are often ordered to prevent DVT and to relieve pain and swelling.

If a pulmonary embolism is suspected, immediate emergency treatment is needed!

SYMPTOMS OF PE INCLUDE:

- Difficulty breathing
- Rapid heart rate
- Chest pain
- Coughing up blood
- Very low blood pressure
- Lightheadedness

If you notice any of these symptoms in your client, elevate the head of the bed to make breathing easier and activate your work place emergency response system or call 911.

WHAT TO WATCH FOR:

- Nearly half of all people who develop a DVT have no noticeable symptoms. DVT symptoms may also mimic an infection.
- For clients at risk for DVT, look at their limbs at least once in the A.M and once in the P.M. and report any of the following observations:
 - Pain or tenderness in one or both legs, especially when standing or walking
 - Tenderness when the calf is squeezed
 - Leg fatigues easily
 - Swelling in one or both legs, including swelling in the ankle and foot
 - Increased warmth of the affected leg
 - Redness or discolored skin in the affected leg
 - Visible surface veins
 - Discomfort when the toes are pulled upward

DID YOU KNOW?

Air travel can contribute to the development of a DVT. It's known as "**Economy Class Syndrome,**" and it comes from sitting in an uncomfortable airplane seat for a long period of time.



SPOTLIGHT ON ANEURISMS



WHAT IS AN ANEURISM?

An aneurism (also spelled *aneurysm*) is a balloon-like bulge in a weakened area of a blood vessel. An aneurism can get bigger gradually and rupture. A ruptured aneurism causes dangerous bleeding inside the body and can lead to death.

HERE ARE THE FACTS:

Normal blood vessels are strong enough to handle the force of blood pressure on their inner walls. But, if an area of the blood vessel becomes weakened, the force of blood pushing against the weakened area can cause an aneurism.

Factors that can weaken blood vessels include:

- Aging
- Smoking
- High blood pressure
- Atherosclerosis
- Trauma or injury

Most aneurisms occur in the aorta—the main artery that carries blood from the heart to the rest of the body. This is called an Aortic Aneurism.

Signs and symptoms of an aneurism depend on the type of aneurism, its location, and whether it has ruptured. Aneurisms can develop and grow for years without causing any symptoms at all.

HOW IS IT TREATED?

Aneurisms can be treated with medicines or surgery.

Medications can help slow the growth of an aneurism but cannot cure it. Only surgery can repair an aneurism completely.

A small aneurism that's found early and isn't causing symptoms may not need treatment.

Since aneurisms often have no symptoms until they rupture, most are discovered by chance during routine exams for other purposes.

The latest surgical techniques involve clipping (closing off) the aneurism or filling the aneurism (like repairing a pothole) so that blood can no longer enter the damaged area.



WHAT TO WATCH FOR:

- Blood leaking into the brain is painful! If your client says he has the “worst headache of his life”, let your supervisor know right away. In addition, a brain aneurism may cause:
 - Nausea and vomiting
 - Vision changes
 - Neck stiffness
- Most abdominal aneurisms produce *no* symptoms. However, some people experience:
 - Deep, aching pain in the chest, abdomen, lower back, or kidney area that lasts for hours or days
 - A pulsating sensation in the abdomen
- An aneurism in the chest can cause a deep, throbbing chest pain, plus:
 - Back pain
 - Shortness of breath
 - Hoarseness
 - Difficulty swallowing

CELEBS WITH ANEURISMS

Actress, Teri Garr (recovered).

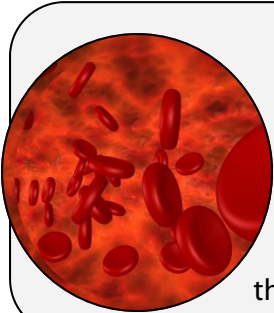
Singer, Neil Young (recovered).

Lucille Ball (died in 1989).

Albert Einstein (died in 1955).

Conway Twitty (died in 1993).

SPOTLIGHT ON PERIPHERAL VASCULAR DISEASE



WHAT IS PERIPHERAL VASCULAR DISEASE (PVD)?

People with PVD have atherosclerosis (a 20 car pile-up) causing blockages that alter blood flow through arteries and veins. The most commonly affected areas are the peripheral blood vessels in the legs, arms, kidneys and neck.

HERE ARE THE FACTS:

Atherosclerosis causes the blood vessels to become narrow and stiff. This makes it difficult for blood to pass through to get to where it is needed.

For example, a client with PVD in a leg may not be able to get enough blood and oxygen to the muscles of the leg when it is needed most (during exercise or walking).

As the disease progresses, there may not be enough blood and oxygen, *even when the muscles are resting.*

Mild or early symptoms of PVD include:

- Pain and burning of the feet, calves, or thighs.
- Symptoms usually worsen during exercise and go away after several minutes of rest.

Severe symptoms include:

- Pain or tingling in the feet or toes that is worse when the leg is elevated and improves when the leg is dangled.

HOW IS IT TREATED?

BEHAVIORAL CHANGES

- People with PVD should be encouraged to exercise (if cleared by the doctor) to improve circulation.
- A low fat, low cholesterol diet should be followed.
- Clients with PVD should be encouraged to quit smoking. Smoking makes blood vessels constrict (or narrow) making the symptoms of PVD worse.

MEDICATION

- Clients with PVD may take any or all of the following: aspirin, blood thinners, cholesterol lowering medication, and pain relievers.

SURGERY

- Doctors can remove the damaged area of the blood vessel or place a stent (a tube placed inside the blood vessel to keep it open).
- Amputation may be a last resort.

WHAT TO WATCH FOR:

- In addition to the mild and severe symptoms already mentioned, be sure to watch out for:
 - Buttock pain
 - Limping or abnormal gait while walking
 - Numbness, tingling or weakness in the legs
 - Wasting away of the calf muscle
 - One or both legs or feet feel cold or change color (turning pale, bluish or dark reddish)
 - Hair loss on the legs and thickening of the toenails
 - A sore on a leg or a foot that will not heal
- Only half the people with peripheral vascular disease experience symptoms.
- People with PVD are at a higher risk for stroke and heart disease.

FYI: About 10 million people in the US have PVD. Most are over age 50. Men are slightly more likely than women to have it. And, it is more common in diabetics and smokers. The combination of diabetes and smoking almost always results in more severe disease.

SPOTLIGHT ON VARICOSE VEINS



WHAT ARE VARICOSE VEINS?

Varicose veins are veins that swell and bulge above the surface of the skin. Commonly found on the legs, varicose veins develop when valves in the veins stop working properly, allowing blood to pool, causing the vein to get larger.

HERE ARE THE FACTS:

Varicose veins are most common in the legs because they are farthest from the heart. The blood has to work against gravity to get back up to the heart from the legs.

- **More than 50 percent of people over the age of 50 have varicose veins.** Women are more likely than men to have them.

For most people, varicose veins cause no problems at all. However, they can lead to more serious problems if they occur in a deep vein and cause a clot (DVT) or if they rupture.

Symptoms of a more serious problem include:

- Achy or heavy feeling in legs
- Burning, throbbing, or swelling
- Pain that is worse after prolonged sitting or standing
- Itching feeling around veins
- Skin ulcers near ankle (**report this immediately to the nurse**)

HOW IS IT TREATED?

BEHAVIORAL CHANGES

- People with varicose veins should be encouraged to exercise to improve circulation.
- Prolonged sitting or standing should be avoided. It can make varicose veins worse.
- Clients who are overweight should be encouraged to lose weight.

MEDICATION

- Clients with varicose veins may take blood thinners to avoid developing a blood clot in the lower legs.

SURGERY

- If the varicose veins are not causing any problem, treatment is usually not necessary. However, if the varicose veins stop blood flow or cause pain and swelling, surgery to remove the affected veins may become necessary.

WHAT TO WATCH FOR:

- Varicose veins can form anywhere from the groin to the ankle.
- Varicose veins protrude from under the skin and feel “ropey”. If varicose veins are severe, the skin covering the leg may become swollen, dry and irritated. After several years, a brownish discoloration may develop in the lower leg.
- People with varicose veins may have cramps in their legs at night.
- If a section of the vein engorges with blood, it becomes swollen, firm, red and tender. This common condition is called *phlebitis*.
- Some people may have no symptoms at all. For most people, varicose veins are mainly a cosmetic problem.

DID YOU KNOW?

Hemorrhoids are a type of varicose vein.

Spider veins are like varicose veins, but they are smaller.



VASCULAR CONDITIONS AND DIABETES

People who have diabetes have too much glucose in their blood. Blood that has too much glucose is thick and sticky, like honey. It is more likely to clot and more likely to form plaques (atherosclerosis) that can block blood flow.

- **Vascular diseases are the principal causes of death and disability in people with diabetes.**
- **Diabetics are up to 5 times as likely to have peripheral vascular disease.**

FOOT CARE is the most important part of caring for a diabetic client. Since the blood vessels in the legs are most commonly affected by peripheral vascular disease, blood flow to the feet is often a problem. The body needs blood flow to heal areas of damage. So, if the foot becomes injured, even the tiniest cut cannot heal without adequate blood flow.

Wounds on the feet of diabetics can quickly become infected or even lead to gangrene (rotting flesh). When this happens, the result is almost always amputation.

FOOT CARE RECOMMENDATIONS ARE:

- Keep your diabetic clients' feet clean and dry.
- Inspect feet daily for any cuts, scratches, blisters, redness or ingrown toenails. *Report any of these to the nurse right away.*
- Keep feet covered at all times with shoes for walking outside and slippers for indoors.
- Be sure diabetics always wear clean, dry, white cotton socks or specially designed diabetic socks, if preferred.
- Never use toenail clippers on a diabetic client.

Clients with diabetes should always be encouraged to control blood glucose levels through frequent monitoring, good nutrition and routine exercise.

GET OUT!

Thinking outside the box!

Working with clients in the home often requires coming up with creative solutions to common problems.

- **THE PROBLEM:** You are caring for a 70 year old man with many health problems. He has diabetes and is a smoker. Because of breathing problems, he sleeps sitting up in his recliner chair.
- When you arrive at his home for your routine visit, he complains that his legs and feet feel like they have “pins and needles.”
- **WHAT YOU KNOW:** You know that being in a seated position all night long may be slowing or blocking blood flow to his lower legs.
- You also know this client is supposed to get up and walk at least 3 times a day for 10 minutes at a time, which he often refuses because he says he can't catch his breath.
- You ask him if he can get up and walk, and he can. After a few minutes he reports the feeling has gone away.
- **GET CREATIVE:** Think of **3 creative solutions** you could suggest to this client to get him to ambulate as ordered.
- Do you think quitting smoking would help this client with this problem?
- **TALK ABOUT IT:** Share your ideas with your co-workers and supervisor and find out how they would solve the problem.



CLIENT CARE TIPS

FOR CLIENTS AT RISK FOR DVT:

- Get moving! Clients who are able to get out of bed should ambulate at least three times a day. Those on bed rest should be taught (or helped) to do ROM exercises on their feet, ankles and legs every 2-4 hours.
- Most clients will have to wear elastic stockings (TED hose) all day, only removing them for showers or bathing. Be sure you have the right size stockings for your client. Stockings that are too tight can cut off blood flow and actually cause a DVT.
- If your client wears elastic stockings, the lower extremities should be checked in the A.M. *and* the P.M. Report any swelling, cold or blue skin or complaints of pain or numbness.
- Ask the nurse if your client is on blood thinners. Even the smallest cut can cause a large amount of bleeding for someone on blood thinners.

FOR CLIENTS WITH AN ANEURISM:

- Depending on where the aneurism occurred and how much damage was done, most people will spend a few weeks in the hospital after an aneurism repair.
- Upon returning home, clients will have doctors orders to avoid lifting and straining for a few weeks. Be sure your client understands the restrictions and has someone available to help when you are not there.
- You can help your client avoid complications and prevent future aneurisms by encouraging a healthy diet, light exercise (when permitted), keeping blood pressure under control and quitting smoking.

FOR CLIENTS AT RISK FOR PVD:

- Encourage your clients with PVD to exercise if they are able. Always perform range of motion exercises for clients who are unable to exercise independently.
- Serve a low fat, low cholesterol diet.
- Remind clients of the importance of taking prescribed blood pressure lowering and cholesterol lowering medications.
- Remember, for clients on blood thinners, never use a razor or nail clippers. Use an electric razor and nail file instead.
- Always monitor your clients' feet and legs carefully. Report any break in the skin immediately. People with PVD will not be able to heal and amputation may become necessary.

FOR CLIENTS WITH VARICOSE VEINS:

- As with most vascular conditions, prevention is much easier than treatment! Help your clients prevent varicose veins by encouraging regular exercise. Daily walking is the best option, if possible.
- Clients should be instructed to avoid sitting or standing for long periods of time. Bed bound clients should be repositioned every two hours.
- Encourage overweight clients to eat a healthy low fat diet and strive to reach their ideal weight.
- Avoid restrictive (tight) clothing. Be sure elastic stockings, if required, fit properly.



PREVENTING VASCULAR CONDITIONS

Most of the vascular conditions you have read about so far in this inservice can be *prevented* by making a few lifestyle changes. Remember, it is always easier (and less expensive) to prevent a problem than it is to treat it.

Some changes you can encourage ALL your clients to make in order to prevent vascular disorders include:

- **EAT A HEALTHY DIET:** A well balanced diet includes plenty of fluids, high fiber foods, and fresh fruits and vegetables. Limit high fat and fried foods.
- **MAINTAIN A HEALTHY WEIGHT:** Obese people are much more likely to develop a vascular condition or worsen a condition that may already be present.
- **CONTROL CHOLESTEROL:** Eating a balanced diet and controlling weight will lead to better cholesterol levels. Remember, it's the cholesterol that causes *atherosclerosis* (the build-up of plaque) that can block the blood vessels.
- **CONTROL BLOOD PRESSURE:** Blood pressure is the measure of the force of blood on the walls of the blood vessels. Blood pressure that is too high puts excess pressure on the vessels. An area of weakness (such as an aneurism) can rupture if blood pressure is too high.
- **EXERCISE/MOBILITY:** Encourage you client to get up and walk a few times a day. Other low impact forms of exercise that will help increase circulation include stretching, yoga, and swimming.
- **QUIT SMOKING:** Smoking damages the inner lining of the blood vessels which put smokers at risk for all vascular diseases. Smoking also causes blood vessels to constrict (tighten). Clients who already have vascular disease increase their chance of developing dangerous complications by smoking. Encourage all your clients who smoke to quit. (And, if you smoke, kick the habit!)



CONNECT it now!

Apply what you know

THINK ABOUT A CLIENT YOU ARE CARING FOR RIGHT NOW . . .

1. Does your client have any of the vascular conditions discussed in this inservice? If so, what is your client's condition?

2. What symptoms does your client have?

3. What risk factors increase your client's chances for developing or worsening a vascular condition? (*Check all that apply*).

- Family history of vascular disease
- Overweight
- Unhealthy diet
- Lack of exercise
- Diabetes
- High blood pressure
- High cholesterol levels
- Smoking

4. How can you help your client minimize the risk factors that you checked above?

Discuss your answers with your supervisor and co-workers.



A Disease Process Module:
Understanding Common Vascular Conditions

EMPLOYEE NAME
(Please print):

DATE: _____

- ***I understand the information presented in this inservice.***
- ***I have completed this inservice and answered at least eight of the test questions correctly.***

EMPLOYEE SIGNATURE:

SUPERVISOR SIGNATURE:

Inservice Credit:

<input type="checkbox"/> Self Study	1 hour
<input type="checkbox"/> Group Study	1 hour

File completed test in employee's personnel file.

Are you "In the Know" about Vascular Conditions? Circle the best choice or fill in your answer. Then check your answers with your supervisor!

- True or False**
Normal arteries and veins are fully open and have a smooth lining.
- True or False**
Atherosclerosis is a blood clot that moves.
- True or False**
A pulmonary embolism is a minor complication associated with DVT's.
- True or False**
An aneurism occurs in a weakened area of a blood vessel.
- A client with a DVT suddenly has difficulty breathing, chest pain and rapid heart rate. You should:**
 - Perform CPR.
 - Activate your workplace emergency response system, or call 911.
 - Have the client stand up and walk it off.
 - Lay the client down flat.
- True or False**
Diabetes has no effect on the vascular system.
- Preventing vascular conditions involves all of the following, EXCEPT:**
 - Eating a low fat diet
 - Smoking
 - Controlling blood pressure
 - Getting regular exercise
- True or False**
Since CNA's do not give medications, it is not important for them to know what medications their client is on.
- True or False**
Cigarette smoking only effects the lungs. It has nothing to do with blood flow through the blood vessels.
- Fill in the Blanks** (Options: "Toward," and "Away From")

Veins move blood _____ the heart.

Arteries move blood _____ the heart.

