STROKE NETWORK *of* Southeastern Ontario

Managing Blood Pressure: It Takes a Team

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MODULE 1

October 2011

MODULE ONE

THE BASICS OF BLOOD PRESSURE & SUPPORTING THE PATIENT

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When you see this symbol during the presentation, it is highlighting a potentially life-threatening situation. In these situations, you must **get help immediately.**

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Module One:
THE BASICS OF BLOOD PRESSURE & SUPPORTING THE PATIENT

Objectives

Identify/describe:

- the causes, risk factors and consequences of hypertension and hypotension
- BP target range
- hypotension
- hypertension
- agency or LTC home's policy re: reporting changes in condition.
- interventions to support blood pressure management.
- the impact of hypertension on major body systems.
- the signs and symptoms of heart attack, TIA, stroke and hypotension and the appropriate response.

Note: Where the word 'patient' is used, it is also intended to represent 'client' and 'resident'.

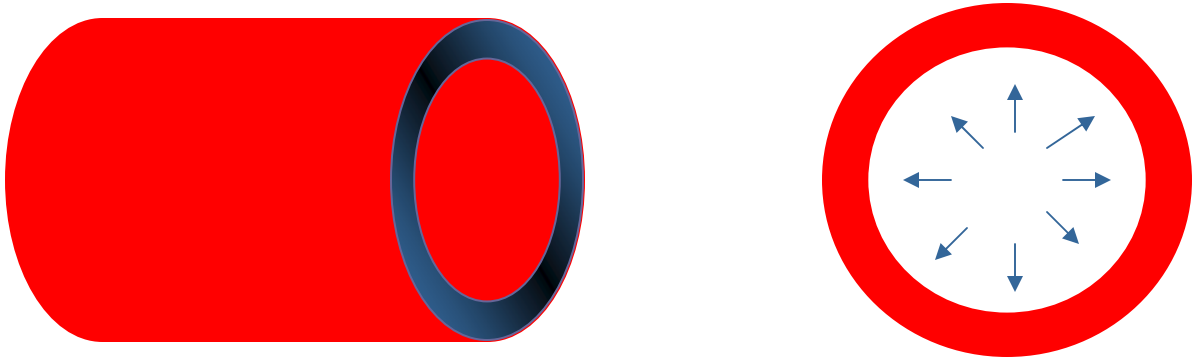
Hypertension:
A National Health Issue

- Five million Canadian adults have high blood pressure, representing 19% of the adult population.*
- Hypertension is the leading cause of death for adults in Canada.
- Hypertension is a leading risk factor for cardiovascular disease in adults.

*Heart & Stroke Foundation

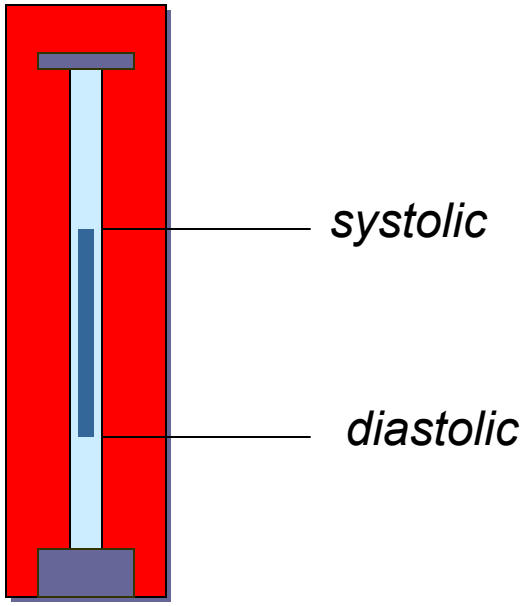
What Is Blood Pressure?

- **Blood pressure (BP)** is the amount of force exerted by the blood pushing on the walls of the arteries.
- **Hypertension** is too much pressure on your arteries.
- **Hypotension** is not enough pressure on your arteries



What Are The Two Blood Pressure Numbers?

- The moment the heart muscle contracts and forces blood through the vessels is **systole - the top number.**
- The moment the heart muscle relaxes is **diastole – the bottom number.**

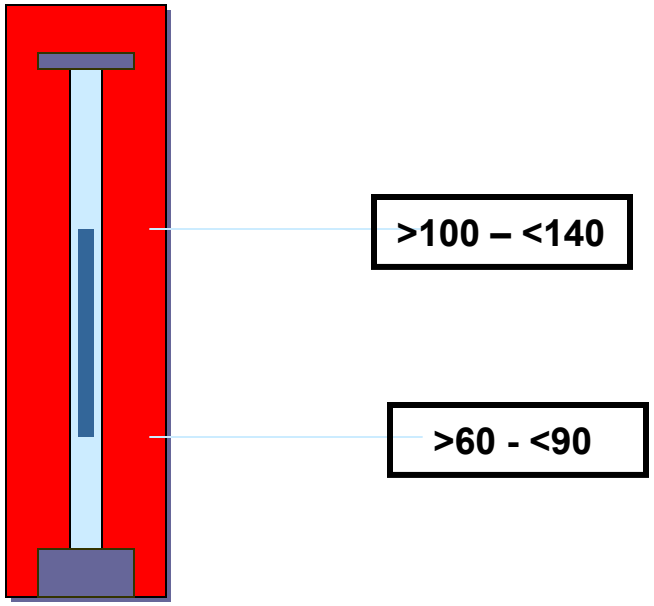


Blood Pressure Is Controlled By:

- The strength of the contraction of the heart.
- The amount of blood pumped with each contraction. In an adult, the heart pumps 2.5 to 3 ounces (about 70 mL) with each contraction.
- How easily the blood flows through the blood vessels.

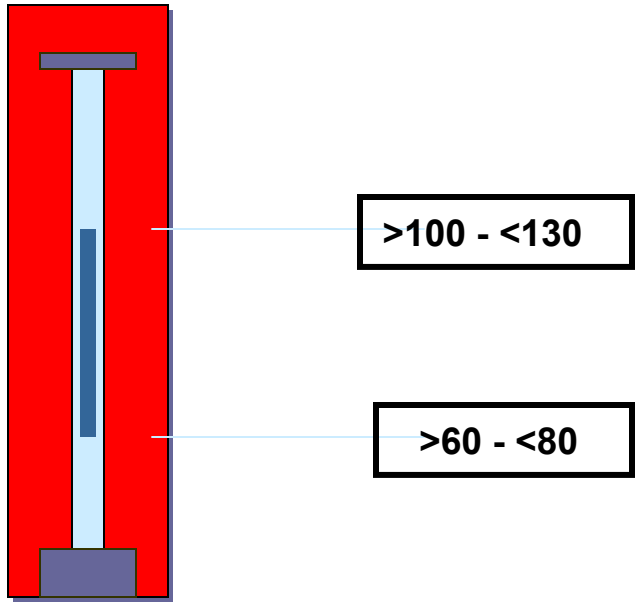
Blood Pressure Target Range

- BP is measured in mmHg (millimeters of mercury).
- Blood pressure varies easily, therefore there are acceptable **ranges.**
  - Systolic range – > 100 and <140 mmHg.
  - Diastolic range – >60 <90 mmHg.



What Is Blood Pressure Target Range for those with Diabetes?

- Systolic range – >100 and <130 mmHg.
- Diastolic range – >60 and <80 mmHg.



Variations in Blood Pressure with Age

- 53.2% of Canadians aged 60 to 79 years have high blood pressure.*
- For those with a BP within the target range at age 55, over 90% will develop hypertension within an average lifespan.**
- However after the age of 50 years, systolic BP goes up and diastolic BP declines.***

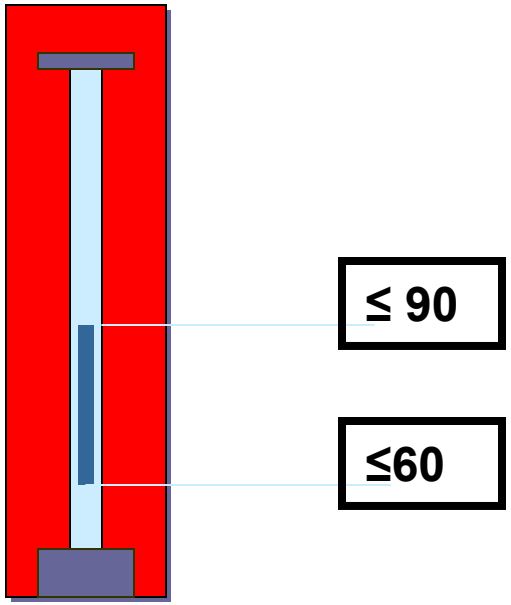
*Heart & Stroke Foundation

**Vasan, R. S., Beiser, A., Seshadri, S. Larson, M.G. et al. (2002). Residual lifetime risk for developing hypertension in middle-aged women and men: The Framingham Heart Study. *Journal of the American Medical Association, 287*, 1003-1010. http://jama.ama-assn.org/content/287/8/1003?cited-by=yes&legid=jama;287/8/1003

***Franklin, S. S., Gustin, W., Wong, N.D. & Larson, M. G. (1997). Hemodynamic patterns of age-related changes in blood pressure: The Framingham Heart Study. *Circulation, 96,* 308-315 http://circ.ahajournals.org/content/96/1/308.full

What Is Hypotension (Low Blood Pressure)?

- Blood pressure with readings of systolic < 90 mmHg and diastolic < 60 mmHg.
- In practice, the blood pressure reading would not be used in isolation to determine treatment. The practitioner would also consider symptoms.



Symptoms of Hypotension

- Dizziness
- Lightheadedness
- Weakness
- Fainting

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Get help IMMEDIATELY!!!

Signs of Hypotension: What to Report?

- Sudden light headedness or dizziness, especially with a change in position.
- Fainting
- Sudden weakness
- Sudden confusion
- Falls when getting up from a sitting or lying position.

Get help IMMEDIATELY!!!

Orthostatic Hypotension

Orthostatic hypotension is the fall of blood pressure (>10mmHg diastolic and/or >20mmHg systolic) when the patient sits up or stands up.

Blood pressure may also fall due to a 'vasovagal' response following a meal.

Preventing Falls

- Teach the patient to always follow the **"Slow and Go Rule"** when getting out of bed in the morning, when going to the bathroom at night, or after sitting for more than 20 minutes.

Instructions

- Sit on the side of the bed with feet hanging over the side.
- Dorsiflex feet 10 times (alternate pointing toes and pulling them upwards towards head).
- Stand up
- Count to 10 before starting to walk

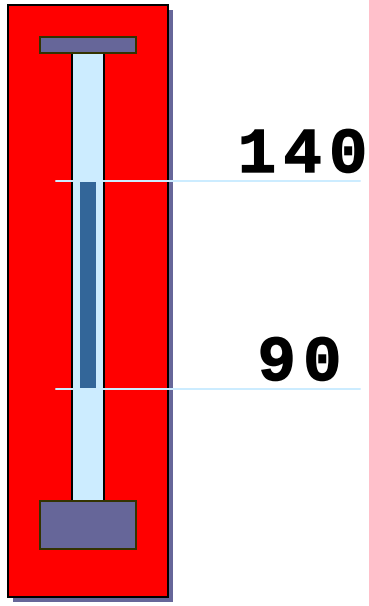
Vasovagal Reaction

- **Vasovagal reaction** occurs when the heart slows down. The blood vessels in the legs dilate (get larger) and the heart pumps out less blood so the blood pressure drops, the brain is deprived of oxygen and fainting occurs.
- This can happen when an older person has a large bowel movement.

What is Hypertension (High Blood Pressure)?

A serious and complex, even life threatening health condition.

Persistent systolic readings ≥140 mmHg and/or diastolic readings ≥ 90 mmHg on more than two occasions). *Note that for residents with diabetes, hypertension would be persistent systolic readings ≥130 mmHg and/or diastolic readings ≥ 80 mmHg on more than two occasions*



BLOOD PRESSURE

Target range systolic < 140 mmHg diastolic < 90mmHg
Target range for patients with diabetes systolic < 130 mmHg diastolic < 80mmHg
What needs **immediate** attention?  systolic ≥180 mmHg diastolic ≥110mmHg **Get help IMMEDIATELY!!!**

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BLOOD VESSELS & HIGH BLOOD PRESSURE

- If blood flow is reduced in the vessels, blood pressure can increase.
- Blood flow may be reduced if the blood vessel is narrowed due to the presence of plaque or if the vessel is ‘hardened’.

Serious Health Risks Of Hypertension

- Heart Attack
- Stroke
- Kidney (renal) failure
- Blindness
- Loss of Cognitive Function or Dementia

Hypertension often has no symptoms so is called a "silent killer"

Serious Health Risks Of Hypertension

Considering the following 5 lifestyle factors:

- Exercise
- Diet
- Body mass index (BMI), and
- Alcohol consumption

Women and men who were adherent to all 5 low-risk factors had an 80% lower risk of ischemic stroke compared with women and men who had no low-risk factors.

http://circ.ahajournals.org/content/118/9/947.full.pdf

Women who were adherent to those same 5 low-risk factors there was an 83% reduction in heart attacks.

http://www.jhasim.com/files/articlefiles/pdf/ASIM_Issue_4_5Ap365_371.pdf

Factors That Can Influence Blood Pressure

- Age, gender, weight
- Family history
- Blood Volume
- Diabetic
- Stress
- Pain
- Activity
- Ethnicity
- Time of day
- Medications
- Diet: salt, coffee, alcohol
- Position
- Smoking
- White Coat Syndrome

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What Can be Changed or Modified?

Not Modifiable

- x Men and post menopausal women
- x ≥ 55 years old
- x Family history of hypertension
- x Diabetes
- x Heredity
- x Some ethnic groups

Modifiable

- ✓ Sedentary lifestyle
- ✓ Being overweight (Body Mass Index: BMI >25
- ✓ Waist Circumference - more than 94cm for men, more than 80 cm for women, more than 90 cm for South Asian men
- ✓ Stress
- ✓ Unhealthy diets
- ✓Salt
- ✓ Alcohol intake (>9 drinks/week women and >14 drinks/week men)
- ✓ Smoking
- ✓ High cholesterol
- ✓ Female oral contraceptives

Preventing And Controlling High Blood Pressure

- **Eat a healthy diet low in saturated fat-** eat more fresh fruits, vegetables, low-fat dairy products, nuts and legumes, soluble fibre (i.e. kidney beans, lentils and oats) and non-animal protein (i.e. soy).
- **Canada's Food Guide recommends**:
  - 5 to 10 portions of fruit and vegetables
  - 2 to 4 portions of low-fat milk products (e.g. low fat cheese, yogurt 1% or skim milk)
  - 4 to 8 grain products
  - 1 to 3 meat and alternatives
- **DASH (Dietary Approaches to Stopping Hypertension) Diet**
  - Similar to *Canada's Food Guide*, but *Canada's Food Guide* has a greater range in the number of servings than the DASH diet, which also recommends a higher level of fruit and vegetable intake.

Salt and Hypertension

- High sodium (salt) consumption leads to high blood pressure
- **Eat less salt-** choose foods low in salt, avoid adding extra salt to food while cooking or at the dinner table and eat fewer packaged or processed foods.

- ***Get the Sodium Facts: www.sodium101.ca***

Adequate Intake of Sodium per Day

- 1,500 mg for people aged 9-50 years = **about ½ level teaspoon of salt**
- 1,300 mg for people aged 51-70 years
- 1,200 mg for seniors over 70 years

Get the Sodium Facts: www.sodium101.ca

Limiting Salt Intake = Improved Health

- Reduction of sodium to around 1500 mg per day **(about ½ level teaspoon of salt)** would lower BP 5.06/2.7 mm Hg in adult hypertensive patients
- This would result in ~ 1 million fewer hypertensive patients (lower prevalence by 30%)
- Improve control in those with hypertension by 6.5%

Joffres MR, Campbell NRC, Manns B, Tu K, Estimate of the benefits of population-based reduction in dietary sodium additives on hypertension and related health care costs in Canada Can J Cardiol 2007;23(6):437-443

Preventing And Controlling High Blood Pressure

- **Exercise regularly-** moderate exercise at least 5 days a week for 30-60 minutes or more per session to help maintain a healthy weight and waist size. Activities for older adults can include: walking, gardening, golfing, Tai Chi and light weight training.
- **Attain or maintain a healthy weight** (BMI< 25) and waist circumference - less than 94cm for men, less than 80 cm for women, less than 90 cm for South Asian men

Preventing And Controlling High Blood Pressure

- Create a smoke-free environment.
- Use alcohol in moderation: 0 - 2 standard size drinks for men and 0 -1 standard size drink for women per day. Men should have no more than 14 drinks and women no more than 9 drinks per week.

  Note: 1 standard drink = 1 beer (12 oz.), or 1 glass of wine (5 oz.) or 1.5 oz. Of spirits. Source www.lrdg.net

Preventing And Controlling High Blood Pressure

- **Manage stress-** teach strategies to deal with stress and to relax. Good coping ideas are exercising, getting enough rest, laughing and asking for help from others when needed.
- **Monitor blood pressure-** check blood pressure regularly using a blood pressure cuff or monitor. www.hypertension.ca

Remember…

- It is often very difficult to change a lifestyle
- This can be more difficult in older people as they have had that lifestyle for a longer time
- Changing a lifestyle begins with small steps
- Work with the patient/family and be sure to discuss **their** goals

Medications

- Many different types of medications are available.
- Many people may have to take 2 or more prescription medications regularly.
- Medications do not replace a healthy lifestyle.
- Medications will not cure hypertension, they simply make it possible to keep this disease under control.
- Treatment should be maintained as prescribed, without changing or stopping it before speaking with a doctor.

The Action of Medications

- The heart is the pump and the blood vessels are the pipes. In order to bring blood pressure down:
- Some drugs reduce the heart rate (*slow the rate of pumping*).
- Some drugs dilate the blood vessels (*increase pipe diameter or size*).
- Some drugs reduce the volume of liquid circulating in the blood vessels (*reduce water in the pipes*).

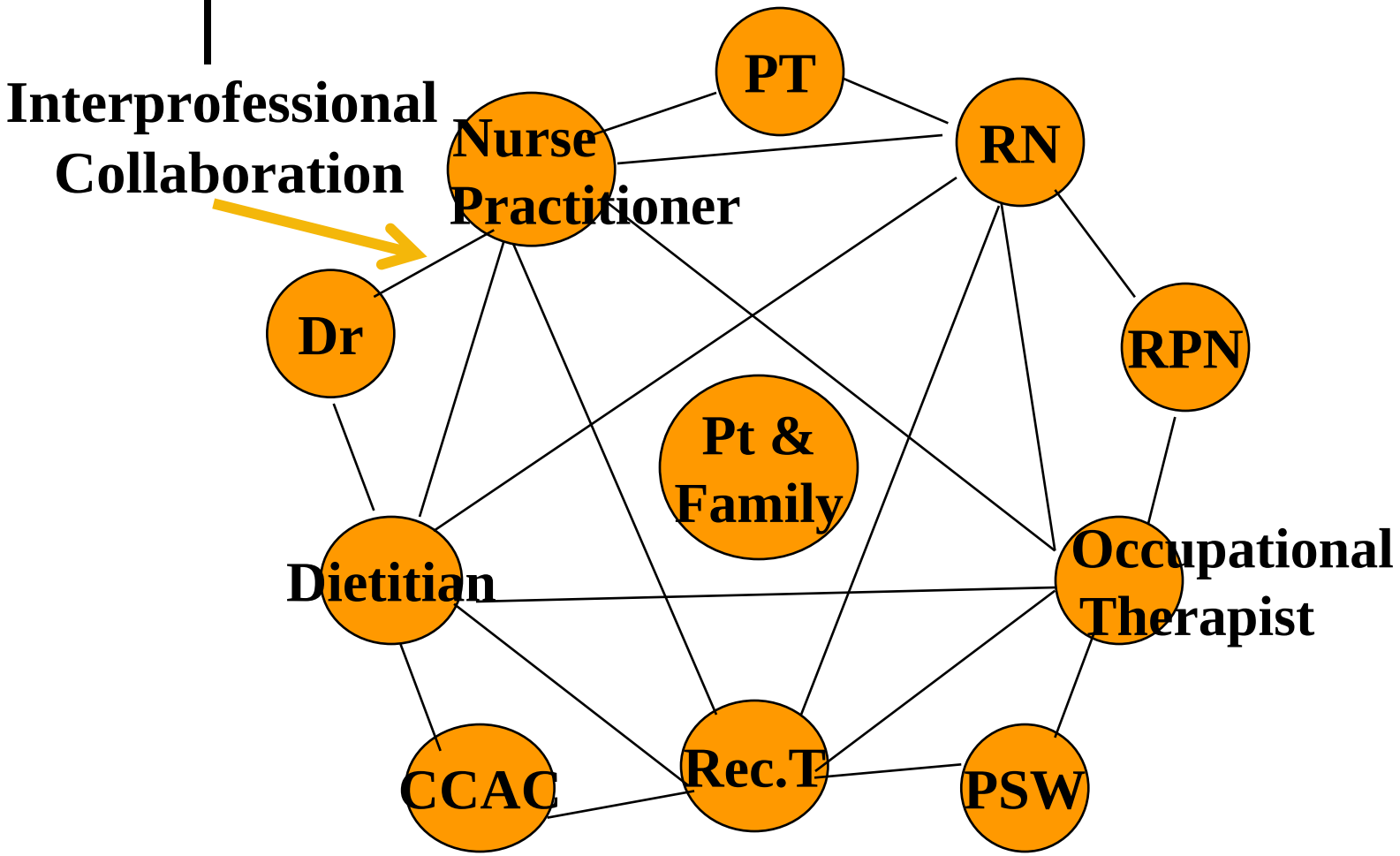
Managing Hypertension

- Hypertension can be prevented and/or controlled with medication(s) and with certain lifestyle changes.
- The purpose of managing high blood pressure is to prevent complications.
- Everyone on the team, including the resident and family, plays a valuable role in contributing to the management of hypertension.

Your Role in the Successful Management of Blood Pressure

- Support lifestyle changes and ensure medications are taken as prescribed.
- Adherence to medication is an essential part of treating hypertension.
- Monitor blood pressure and report each blood pressure to the nurse on your team.
- Monitor weight and be sure to take it at the same time every day using the same scale.
- Resident/family education.

Patient Care Team



How do each of these providers contribute to blood pressure management?

SIGNS TO OBSERVE & REPORT

Signs may be sudden or ongoing:

- Headache, slurred speech, difficulty swallowing.
- Blurred vision, cool clammy skin.
- Dizziness, muscle weakness, increased swelling of feet, legs or hands.
- Chest pain, pain in arm or shoulder, nausea and or vomiting, shortness of breath.
- Numbness in arm or leg, loss of balance, weakness.
- Light headedness or dizziness especially with a change in position
- Confusion, fainting
- Falls when getting up from a sitting or lying position

Be aware that the patient may deny symptoms.
Get help IMMEDIATELY!!!

SYSTEMS AFFECTED BY HYPERTENSION

THE HEART

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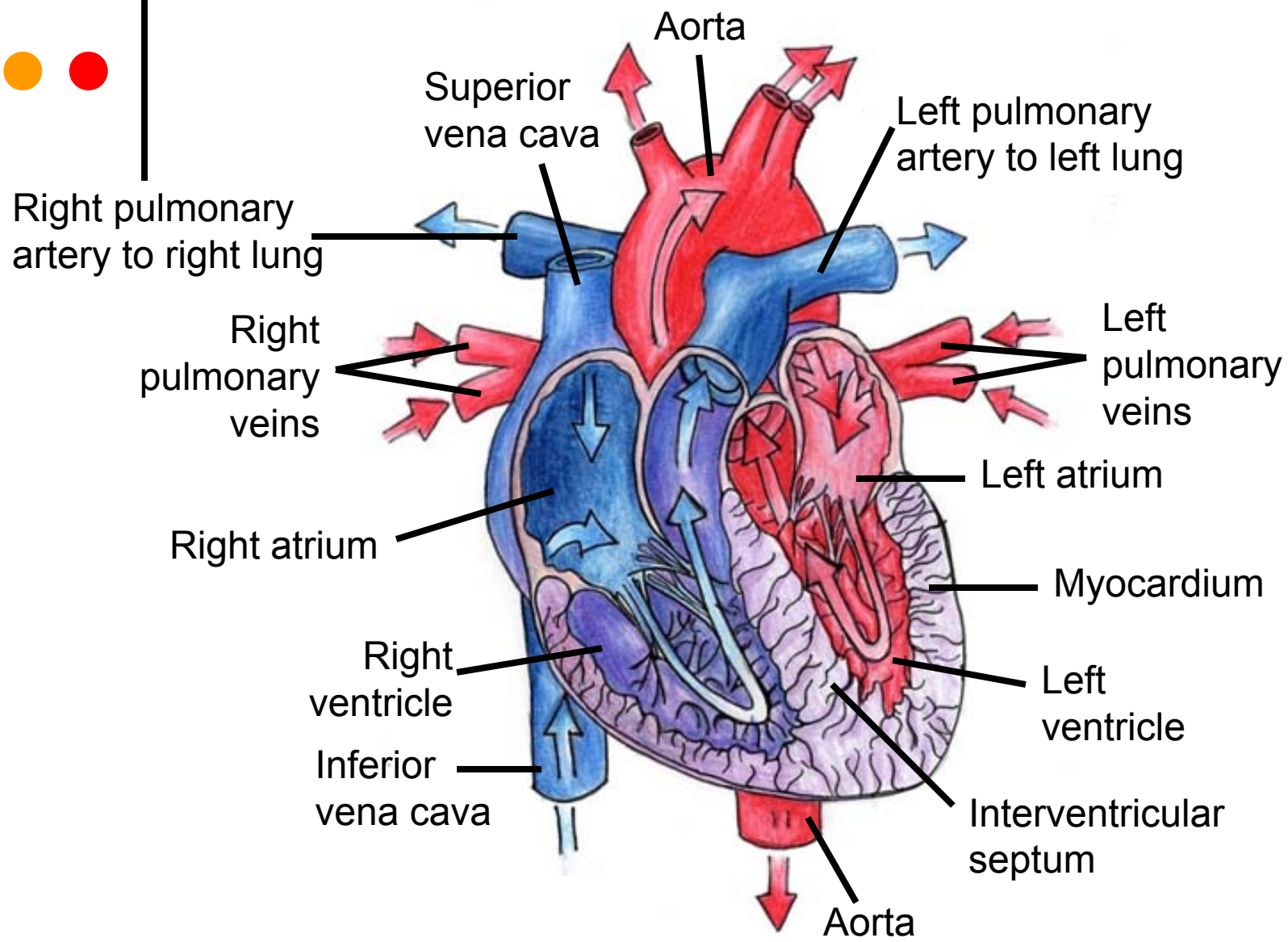
The Heart

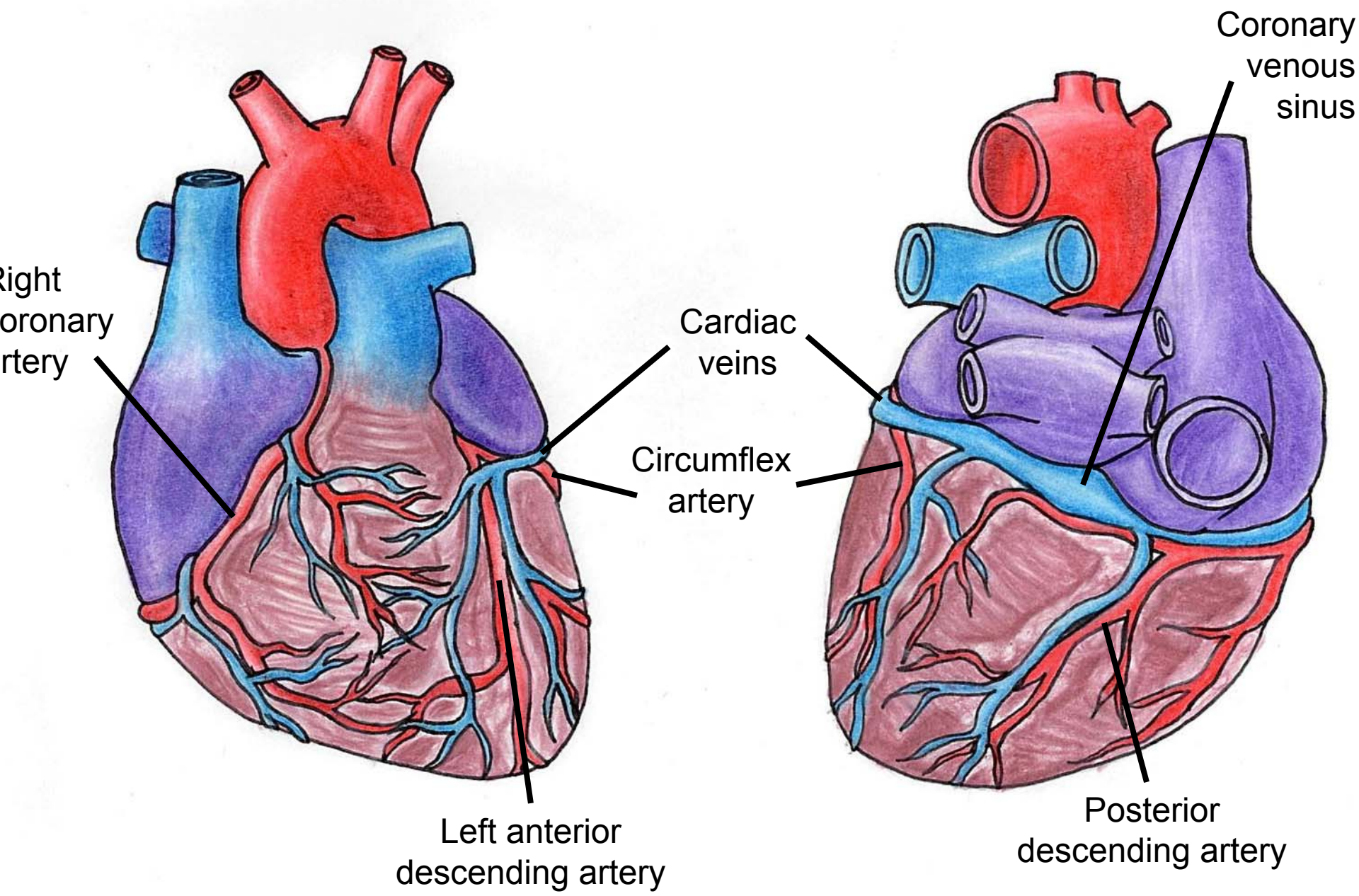
- Main muscle pump.
- Strong contractions are needed to push blood through the vessels.
- Blood is first supplied to the heart to keep it nourished and strong.


Aorta
Superior vena cava
Left pulmonary artery to left lung
Right pulmonary artery to right lung
Right pulmonary veins
Left pulmonary veins
Left atrium
Right atrium
Myocardium
Right ventricle
Left ventricle
Inferior vena cava
Interventricular septum
Aorta

Cardiovascular Circulation

- The heart pumps blood continuously through the circulatory system to deliver oxygen and nutrients and to remove waste from our bodies.
- The blood vessels (arteries and veins) are the tubes that carry the blood
- Narrowing of these blood vessels causes damage to organs such as the heart, kidney, brain and eyes.

PRIMARY HEART VESSELS



Blood Supply to the Heart

- Coronary arteries: supply blood to the heart.
  - Right coronary artery: nourishes the right side of the heart, especially the right ventricle.
  - Left coronary artery: supplies blood to the left side of the heart, especially the left ventricular wall.

Blood Supply to the Heart Continued…

- Decreased coronary blood flow can result in:
  - Ischemia (oxygen deprivation)
  - Angina (chest pain)
  - Myocardial infarction (heart attack)

Functional Causes of A Heart Attack

- Blood Vessel Damage
- Plaque build up in blood vessels
- Clot formation

WARNING SIGNS OF HEART ATTACK

- Sudden discomfort or pain that does not go away with rest
- Pain that may be in the chest, neck, jaw, shoulder, arms or back
- Pain that may feel like burning, squeezing, heaviness, tightness or pressure
- In women, pain may be more vague
- Chest pain or discomfort that is brought on with exertion and goes away with rest

Be aware that the patient may deny symptoms.

Get help IMMEDIATELY!!!

WARNING SIGNS OF A HEART ATTACK MAY ALSO BE:

- Shortness of breath
  - Difficulty breathing
- Nausea
  - Indigestion
  - Vomiting
- Sweating
  - Cool, clammy skin
- Fear
  - Anxiety
  - Denial

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Be aware that the patient may deny symptoms.
Get help IMMEDIATELY!!!

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SYSTEMS AFFECTED BY HYPERTENSION

THE BRAIN

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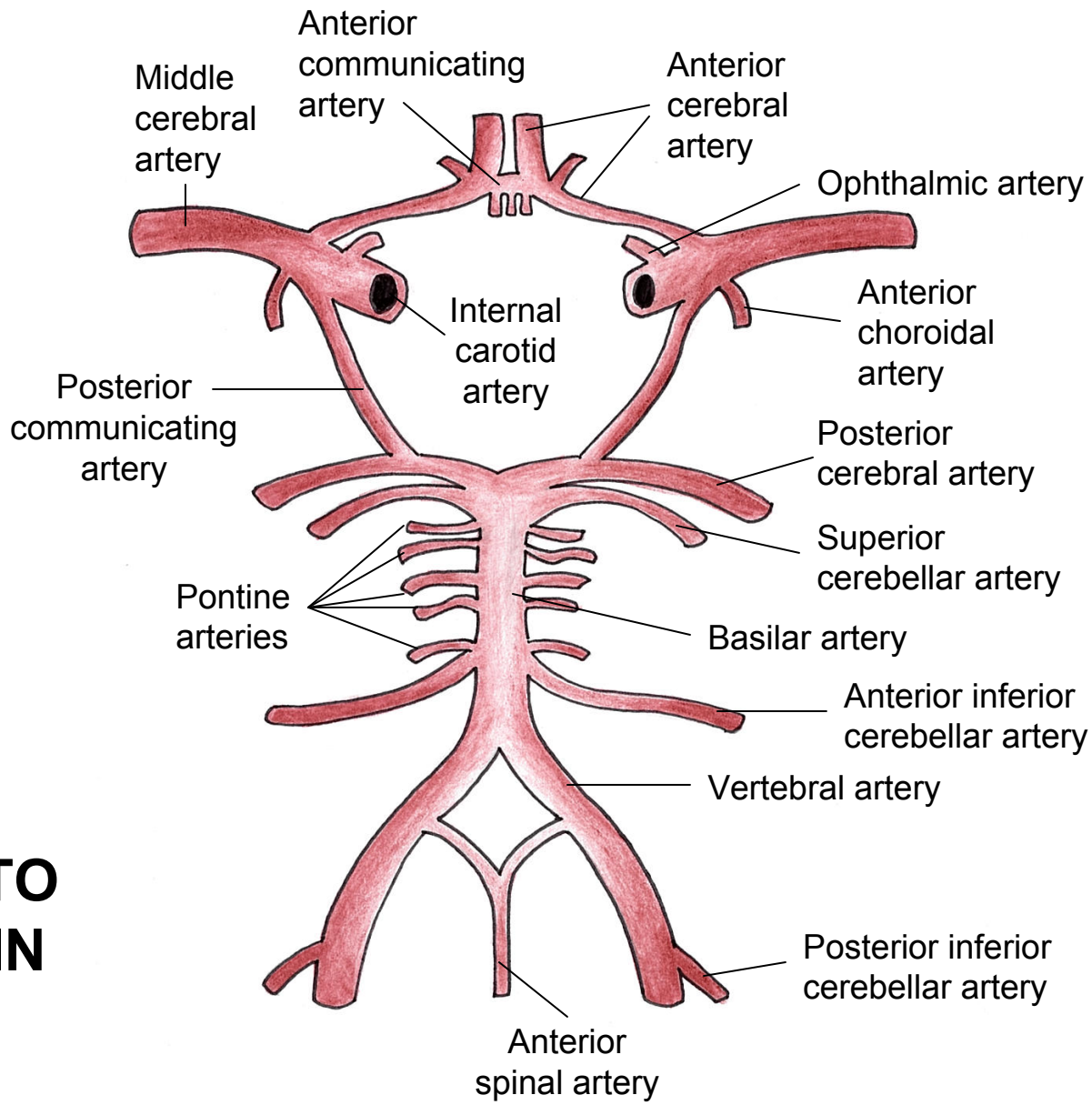
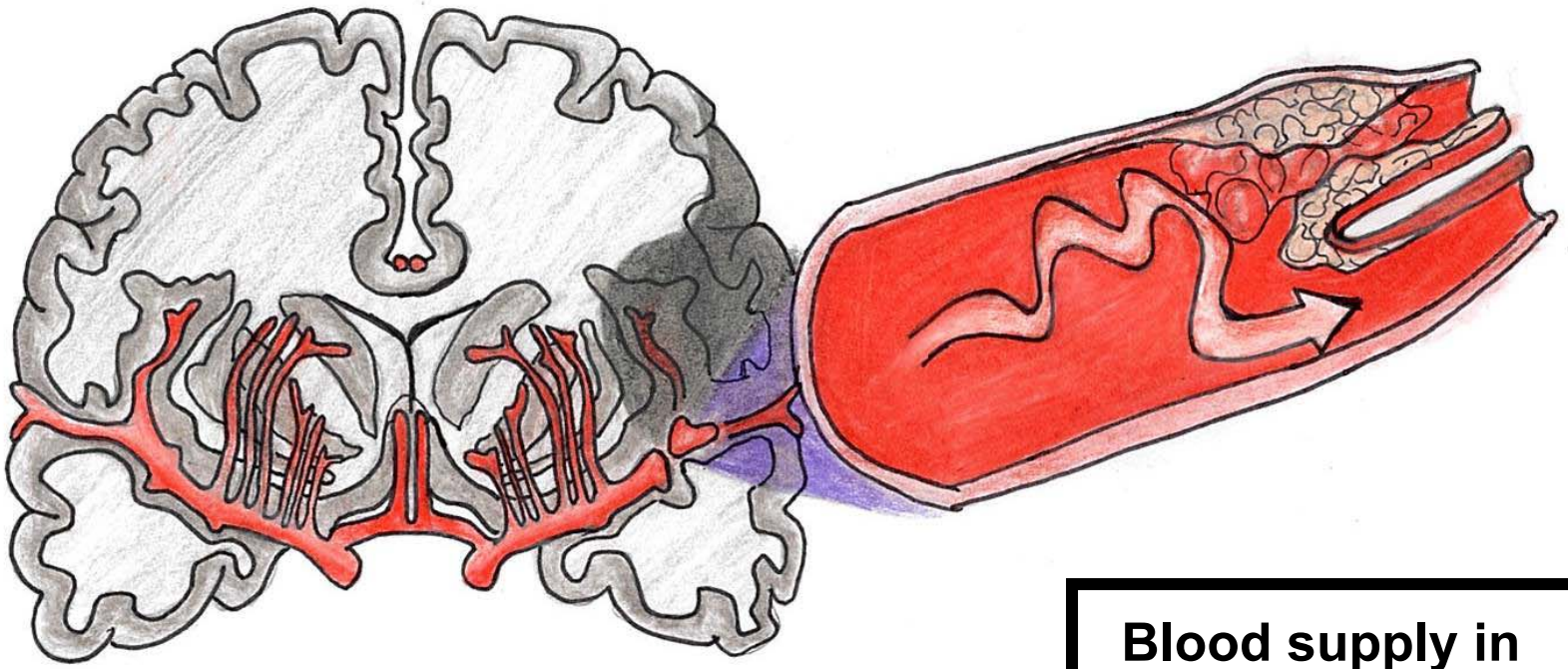
BLOOD SUPPLY TO THE BRAIN

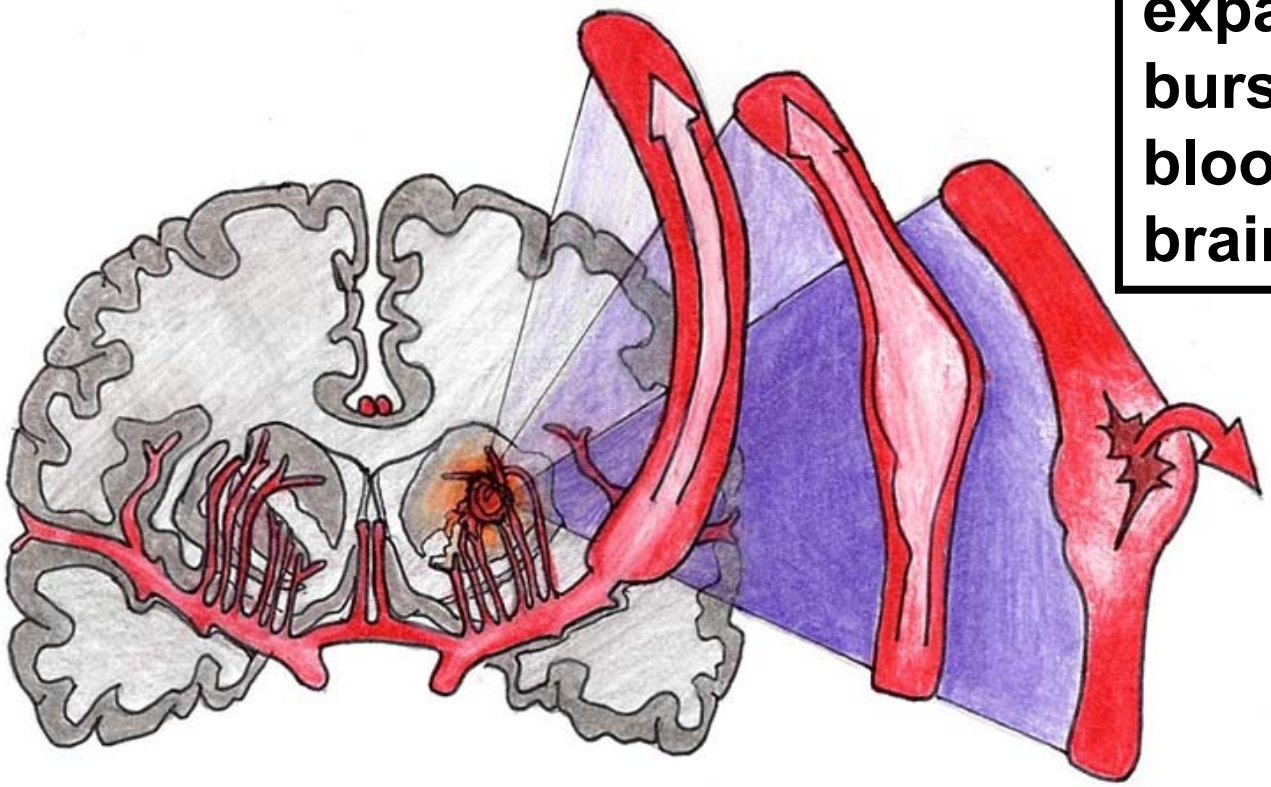


Two Types of Stroke - Ischemic



Blood supply in brain is blocked or insufficient

Two Types of Stroke - Hemorrhagic



Blood vessel expands and bursts, leaking blood into brain tissue

Transient Ischemic Attack - TIA

- A TIA is sometimes called a mini-stroke
- Symptoms are usually ‘transient’; they do not last
- Often a warning that person is at risk of a stroke. ***10% of people who have a TIA if not treated will have a stroke within 90 days and half of these people will have a stroke within 48 hours of the TIA. ****
- A TIA is caused by a temporarily blocked blood vessel.

***Gladstone, D. J., Kapral, M. K., Fang, J., Laupacis, A. et al. (2004). Management and outcomes of transient ischemic attacks in Ontario. *Canadian Medical Association Journal, 170,* 1099-1104.**

Warning Signs of A Stroke/TIA

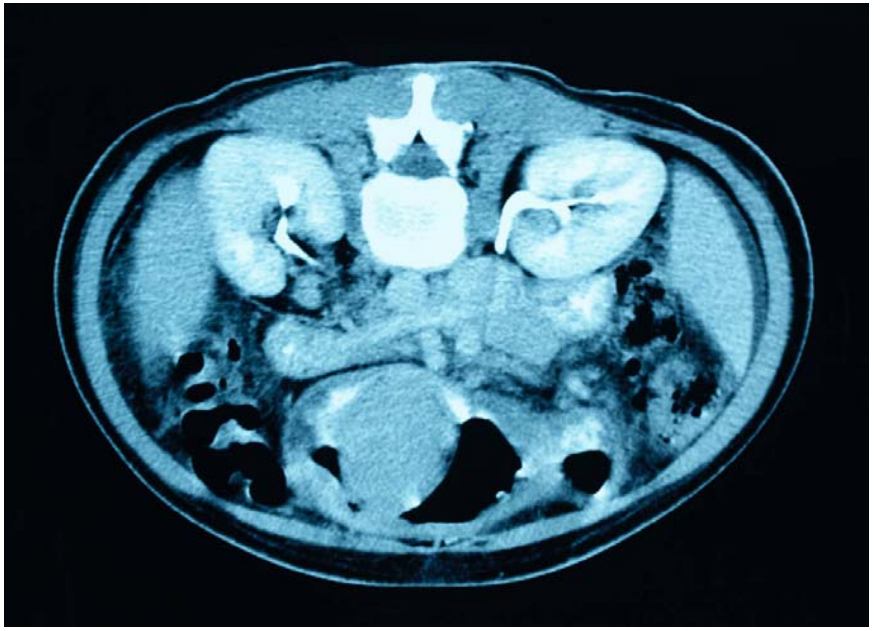
- Sudden loss of strength or sudden numbness in the face, arm or leg, even if temporary
- Sudden difficulty speaking or understanding or sudden confusion, even if temporary
- Sudden trouble with vision, even if temporary
- Sudden severe and unusual headache
- Sudden loss of balance, especially with any of the above signs.

Kingston General Hospital 2011

Be aware that the patient may deny symptoms.
Get help IMMEDIATELY!!!

SYSTEMS AFFECTED BY HYPERTENSION

THE KIDNEYS



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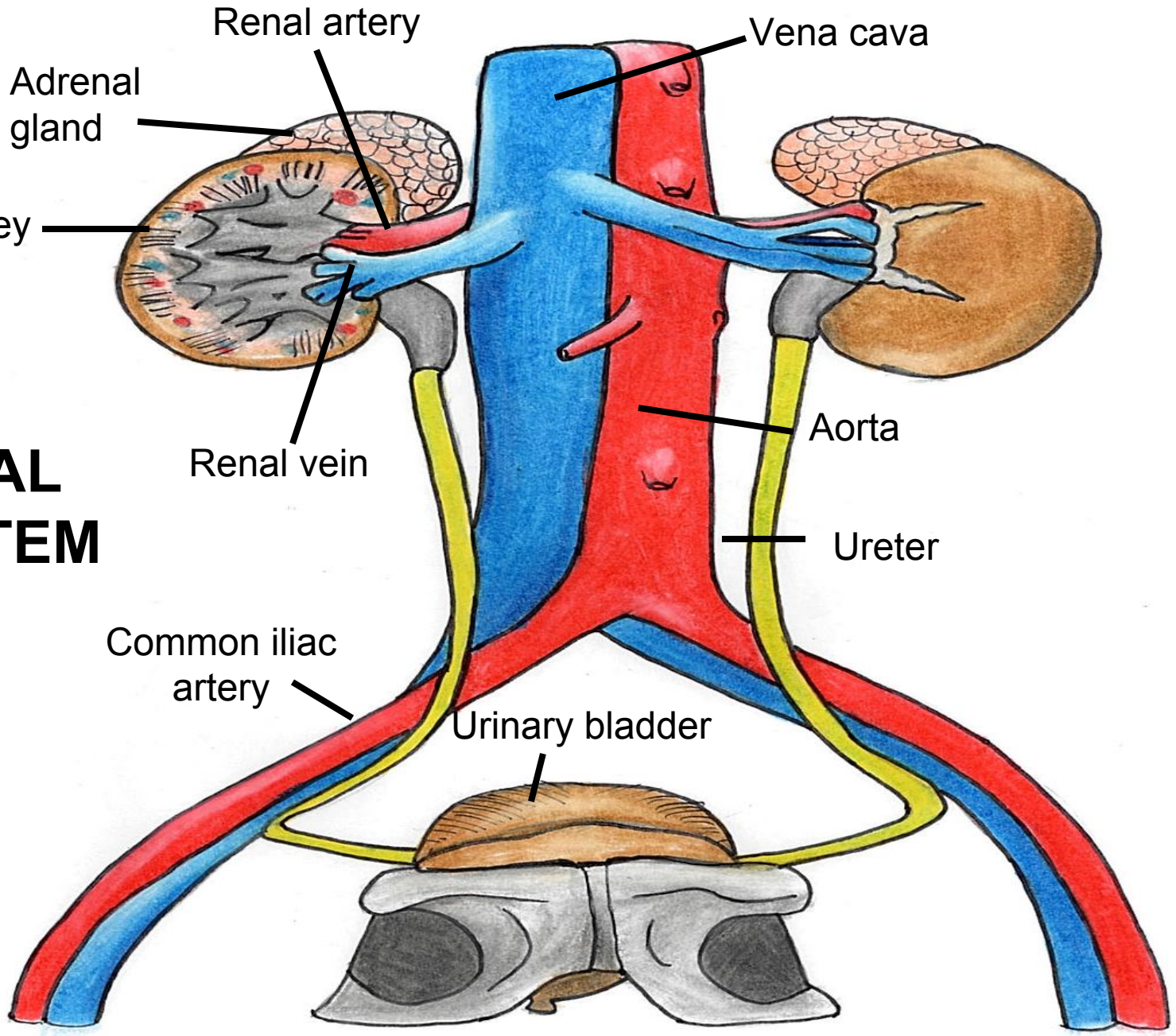
RENAL SYSTEM



Kidneys

- Regulate blood volume by determining the amount of water excreted
- Help regulate the electrolyte content of the blood
- Play a role in regulation of **blood pressure**

Hormones That Work on the Kidneys

- Aldosterone:
  - Stimulates the reabsorption of sodium and water.
  - Increases blood volume and blood pressure.

Hormones That Work on the Kidneys Continued…

- Antidiuretic hormone (ADH):
  - Stimulates the reabsorption of water.
  - Plays a role in determining blood volume and blood pressure.
  - Release is stimulated by a decrease in blood volume and an increase in the concentration of solutes in the plasma.

OTHER IMPACTS OF HYPERTENSION

EYES

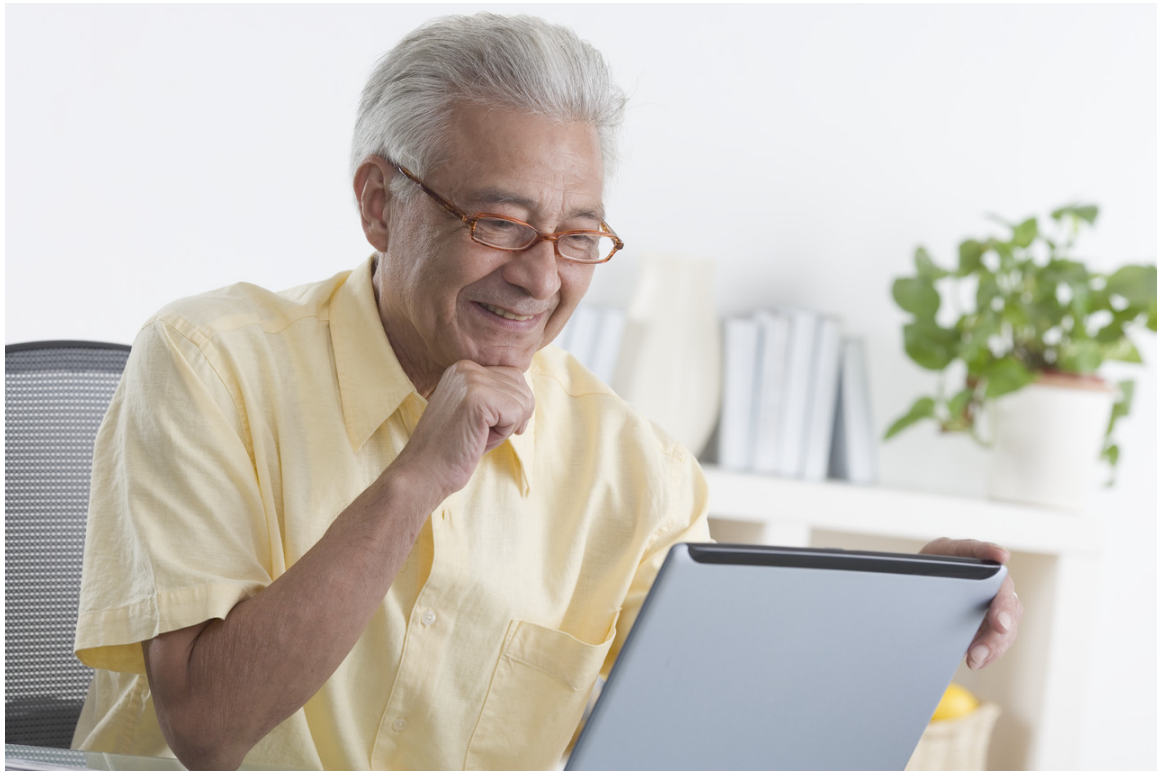
- Can result in decreased vision or blindness
- IMPAIRED COGNITIVE FUNCTION
- Vascular dementia or mild cognitive impairment
- ARTERIES
- Atherosclerosis & arteriosclerosis
- Aneurysm
- Peripheral vascular disease

Key Points

- You are an important member of the health care team and you contribute to the management of your patient's blood pressure.
- You are the eyes and the ears for your team. Know your patient's, blood pressure, diagnosis and baseline health condition.
- Observe and report any changes in condition to the nurse on your team immediately.
- Remember, hypertension can be a "silent killer".

CASE STUDY 1

- Mr. Jones



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CASE STUDY 2

- Mrs. Bell

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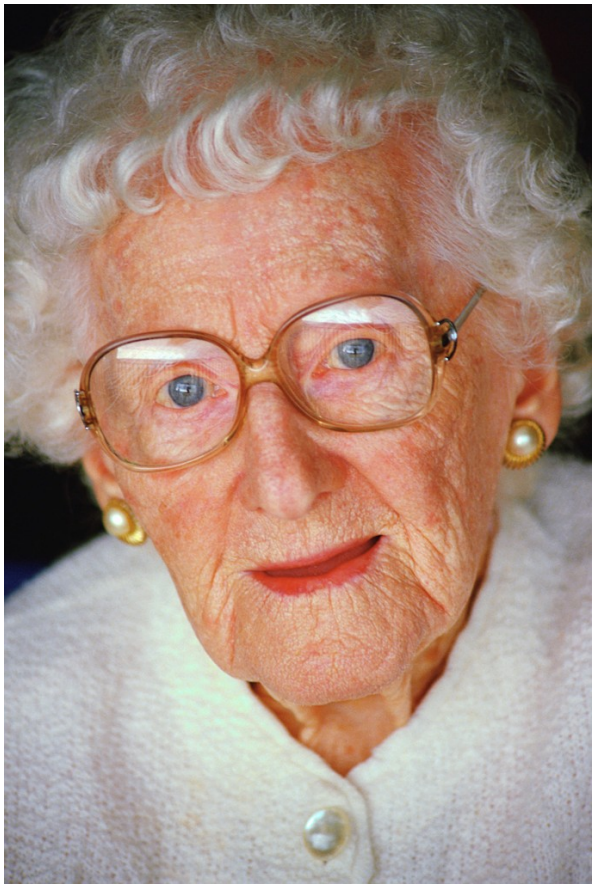
CASE STUDY 3

- Mrs. Smith



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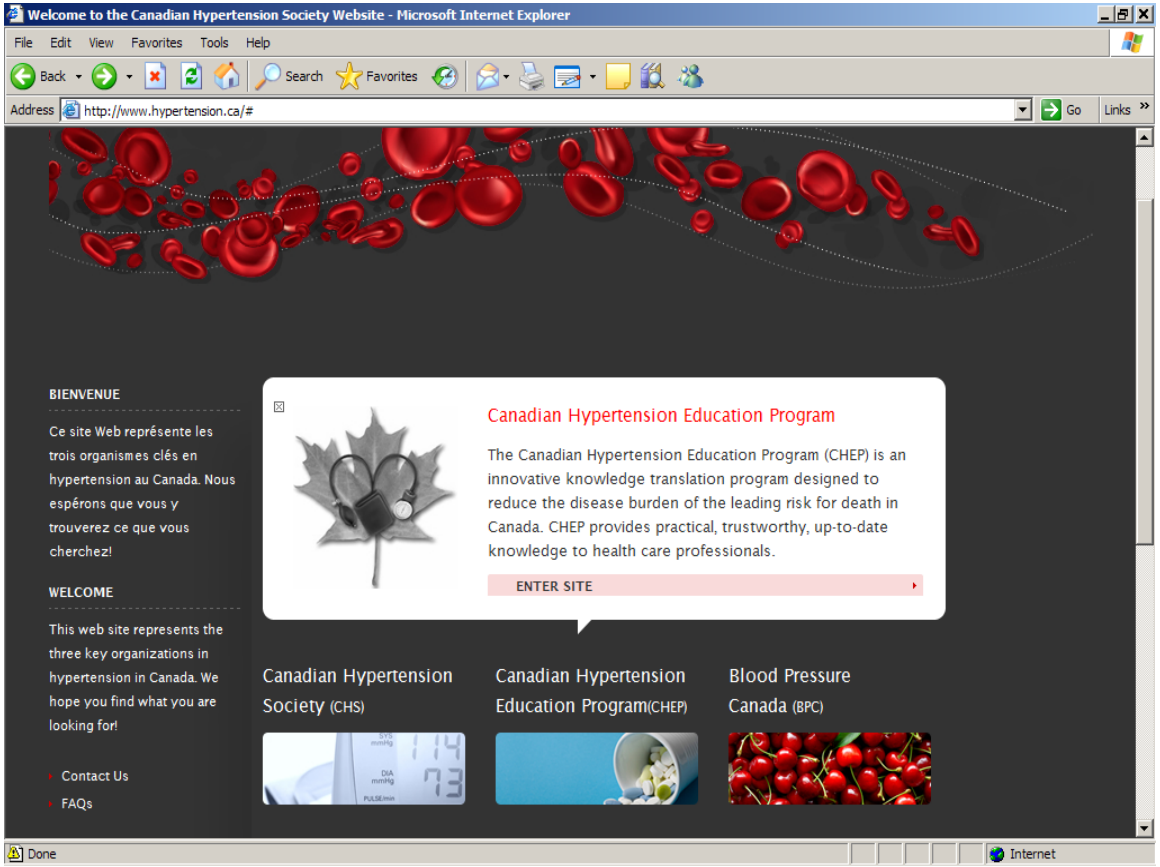
The Canadian Hypertension Education Program: www.hypertension.ca



Hypertension Public Recommendations

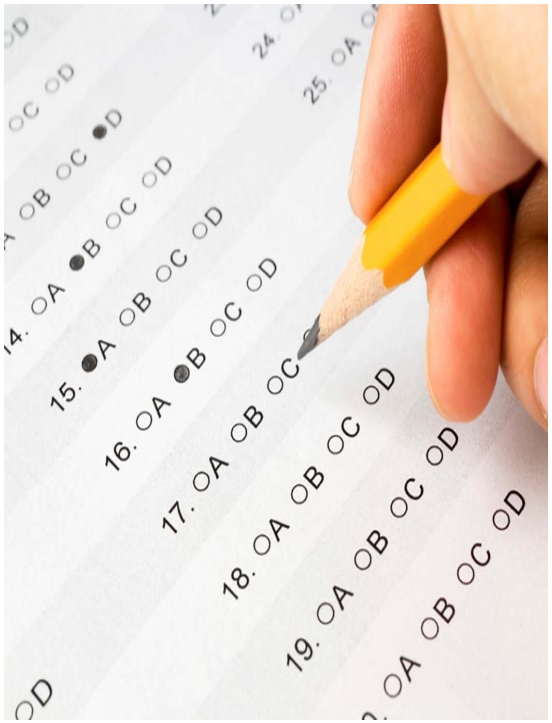
- Hypertension recommendations designed for patient and public education are developed annually.
- The summary is available

electronically at www.hypertension.ca/bpc and www.heartandstroke.ca/BP

YOUR FEEDBACK

- Please take 5 minutes to complete an evaluation of this Blood Pressure Module by clicking on the link below:

http://www.surveymonkey.com/s/BPModuleOne



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