

Respiratory Rate

Lecture 4

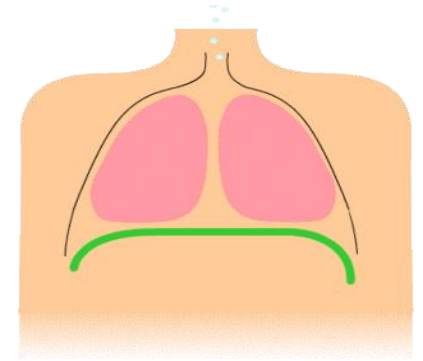
By

Dr. Sali Jabrou

What is the respiration rate?

The respiration rate is the number of breaths a person takes per minute.

the rate is usually measured when a person is at rest and simply involves counting the number of breaths for one minute by counting how many times the chest rises.



Respiration rates may increase with :

1- fever

2- illness

3- other medical conditions.

Normal respiration rates for an adult person at rest range from 12 to 16 breaths per minute

The breathing process or respiration is a metabolic process that supplies the essential **oxygen** to the body's **cells** and expels out the **carbon dioxide**.

Abnormal respiration rate or breathing rate can be an indicator of a serious health issue like cardiac arrest.

12 to 20 respirations per minute is considered to be the average breaths per minute — or average respiration rate — or normal respiration rate. Conversely, a respiration rate above 25 or below 12 is considered to be abnormal. Thus, a person with 12-20 bpm is considered to have a good respiration rate.

the average breathing rate while sleeping is **15-16 per minute**.

some of the health conditions wherein abnormal respiration rate is observed.

- Congestive heart failure
- Fever
- lung disease
- asthma, anxiety
- pneumonia
- use of narcotics or drug overdose .

Respiratory rate is an early, extremely good indicator of physiological conditions such as **hypoxia (low levels of oxygen in the cells)**, **hypercapnia (high levels of carbon dioxide in the bloodstream)**, metabolic and respiratory acidosis.

Conditions in altered RR include:

- Dehydration: Dehydration alone can result in a rapid rate of breathing.
- Fever: An increased rate of breathing with a fever is the body's attempt to lose heat by breathing faster
- Hyperventilation: People may breathe more rapidly in response to stress, pain, anger or during a panic attack
- Metabolic acidosis states increase the tidal volume
- Metabolic alkalosis decreases the RR.

Common Causes of an Increased Respiratory Rate



Fever



COPD



Asthma



Dehydration



Overdose



Acidosis



Infection



Heart conditions



Hyperventilation



Lung conditions

Respiration rate normal values

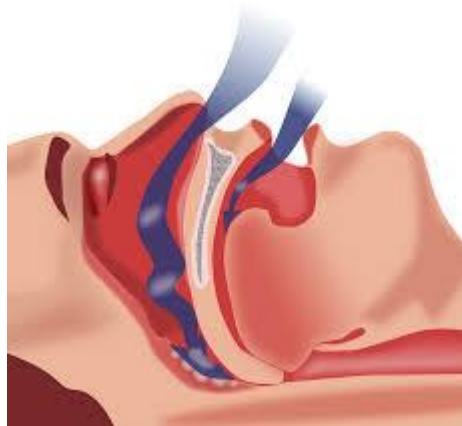
The number of breaths per minute varies depending on age, among other factors. In newborns through infancy, breathing frequencies sometimes vary considerably between age groups:

- Newborn: 30-60 breaths per minute
- Infant (1 to 12 months): 30-60 breaths per minute
- Toddler (1-2 years): 24-40 breaths per minute
- Preschooler (3-5 years): 22-34 breaths per minute
- School-age child (6-12 years): 18-30 breaths per minute
- Adolescent (13-17 years): 12-16 breaths per minute
- The average respiratory rate in a healthy adult is between 12 and 18 breaths per minute.
- Normal respiratory rates in elderly people tend to be higher than those of younger adults, especially among older adults who are in long-term care facilities



Terms to describe abnormal respiratory rate include:

- Bradypnea is the medical term used to define breathing that is abnormally slow.
- Tachypnea is the medical term used to define an elevated respiratory rate. This rapid respiratory rate is usually shallow, versus hyperpnea which can be rapid and deep.
- Dyspnea refers to the sensation of shortness of breath and can occur with an elevated, a normal, or a decreased respiratory rate.
- Hyperpnea refers to breathing that is abnormally deep and appears laboured. It may occur with or without rapid breathing.
- Apnea means literally “no breath” and refers to the absence of breathing



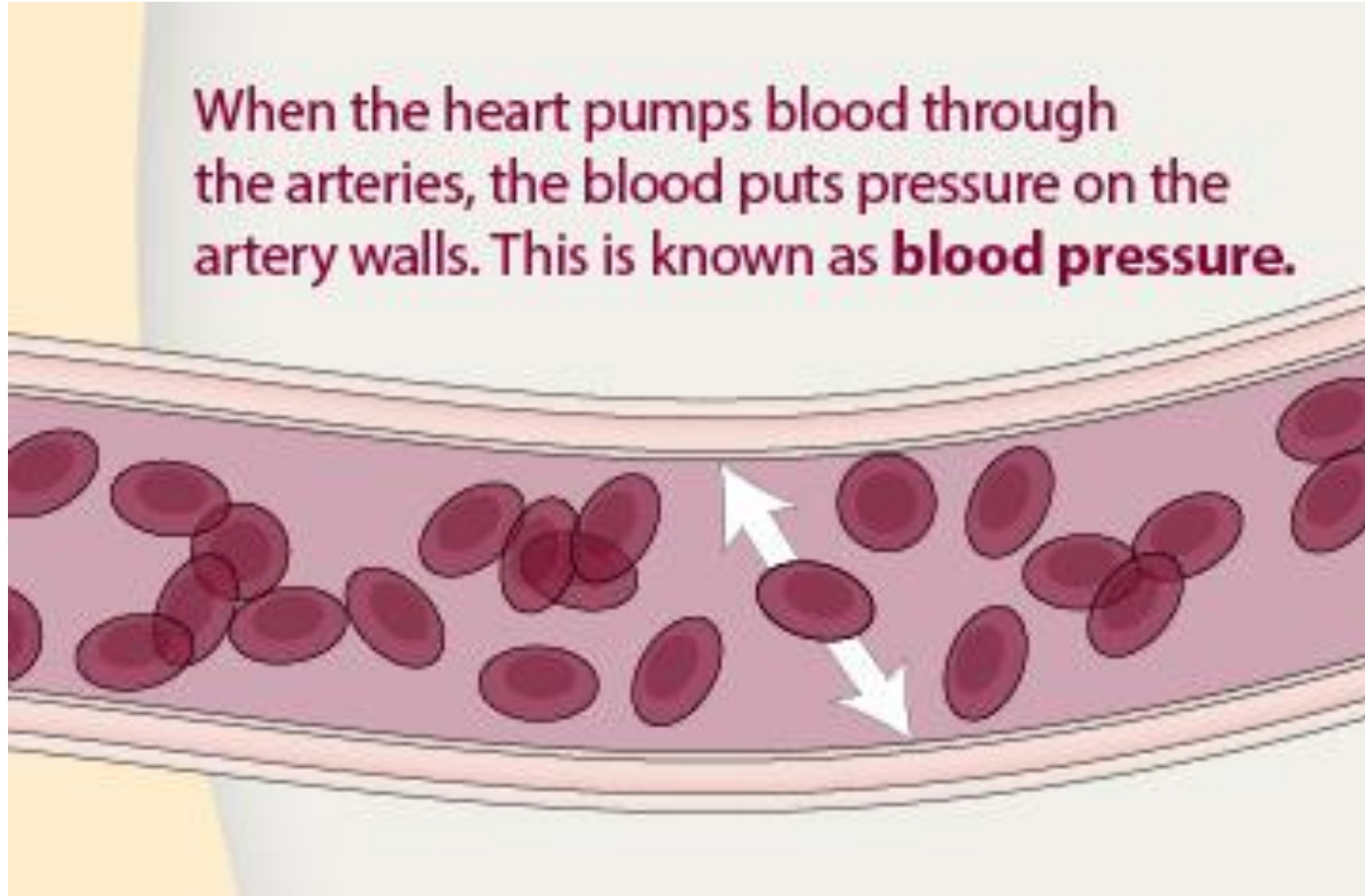
- **YOU can make the difference:**
 - **Welcoming presence**
 - **Decrease any anxieties & fears**
 - **Reassure patients & family**
 - **Accurate vital signs**



Blood pressure

What is blood pressure?

Blood pressure is a measure of the force that your heart uses to pump blood around your body.



What do blood pressure numbers mean?

Blood pressure is measured using two numbers:

The first number, called *systolic* blood pressure, measures the pressure in your arteries when your heart beats.

The second number, called *diastolic* blood pressure, measures the pressure in your arteries when your heart rests between beats.

If the measurement reads 120 systolic and 80 diastolic, you would say, “120 over 80,” or write, “120/80 mmHg.”

Blood pressure is measured in millimetres of mercury (mmHg) and is given as 2 figures:

- ✓ systolic pressure – the pressure when your heart pushes blood out
- ✓ diastolic pressure – the pressure when your heart rests between beats

As a general guide:

- ideal blood pressure is considered to be between 90/60mmHg and 120/80mmHg
- high blood pressure is considered to be 140/90mmHg or higher
- low blood pressure is considered to be below 90/60mmHg

Healthy and unhealthy blood pressure ranges

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)	and/or	DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
<u>HYPERTENSIVE CRISIS</u> (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Blood pressure categories

The five blood pressure (BP) ranges as recognized by the American Heart Association are:

Normal

Blood pressure numbers of less than 120/80 mm Hg are considered within the normal range. If your results fall into this category, stick with heart-healthy habits like following a balanced diet and getting regular exercise.

Elevated

Elevated blood pressure is when readings consistently range from 120-129 systolic and less than 80 mm Hg diastolic. People with elevated blood pressure are likely to develop high blood pressure unless steps are taken to control the condition.

Hypertension Stage 1

Hypertension Stage 1 is when blood pressure consistently ranges from 130-139 systolic or 80-89 mm Hg diastolic. At this stage of high blood pressure, doctors are likely to prescribe lifestyle changes and may consider adding blood pressure medication based on your risk of atherosclerotic cardiovascular disease (ASCVD), such as heart attack or stroke.

Hypertension Stage 2

Hypertension Stage 2 is when blood pressure consistently ranges at 140/90 mm Hg or higher. At this stage of high blood pressure, doctors are likely to prescribe a combination of blood pressure medications and lifestyle changes.

Hypertensive crisis

This stage of high blood pressure requires medical attention. If your blood pressure readings suddenly exceed 180/120 mm Hg, wait five minutes and then test your blood pressure again. If your readings are still unusually high, contact your doctor immediately. You could be experiencing a hypertensive crisis.

If your blood pressure is higher than 180/120 mm Hg and you are experiencing signs of possible organ damage such as chest pain, shortness of breath, back pain, numbness/weakness, change in vision or difficulty speaking, do not wait to see if your pressure comes down on its own. Call 911.

What are the signs and symptoms of high blood pressure?

High blood pressure usually has no warning signs or symptoms, and many people do not know they have it. Measuring your blood pressure is the only way to know whether you have high blood pressure

What causes high blood pressure?

High blood pressure usually develops over time. It can happen because of unhealthy lifestyle choices, such as not getting enough regular physical activity. Certain health conditions, such as diabetes and having obesity, can also increase the risk for developing high blood pressure. High blood pressure can also happen during pregnancy.



What problems does high blood pressure cause?

High blood pressure can damage your health in many ways. It can seriously hurt important organs like your heart, brain, kidneys, and eyes.

1- Heart Attack and Heart Disease

High blood pressure can damage your arteries by making them less elastic, which decreases the flow of blood and oxygen to your heart and leads to heart disease. In addition, decreased blood flow to the heart can cause:

- Chest pain, also called **angina**.
- Heart attack, which happens when the blood supply to your heart is blocked and heart muscle begins to die without enough oxygen. The longer the blood flow is blocked, the greater the damage to the heart.
- Heart failure, a condition that means your heart can't pump enough blood and oxygen to your other organs.

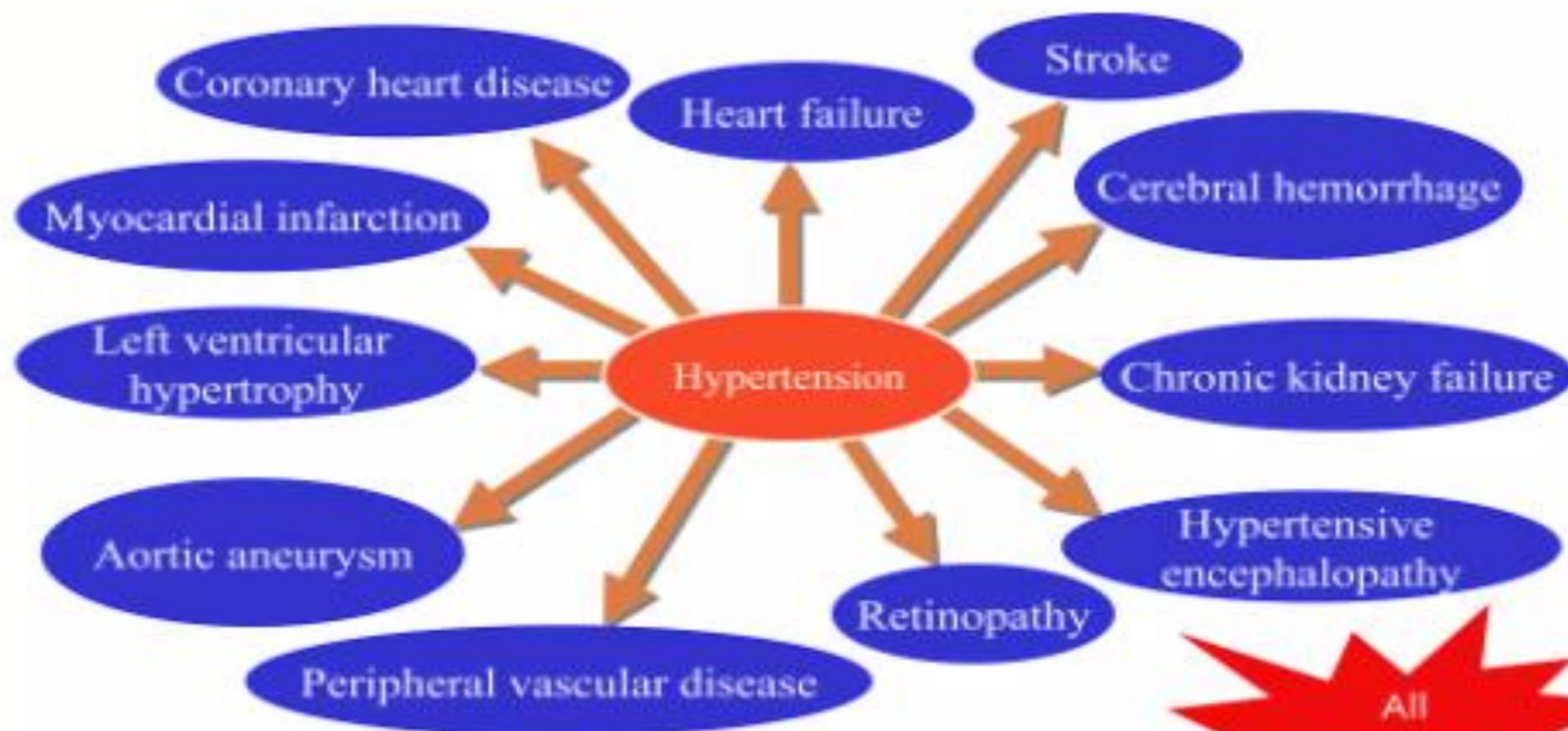
2- Stroke and Brain Problems

High blood pressure can cause the arteries that supply blood and oxygen to the brain to burst or be blocked, causing a stroke. Brain cells die during a stroke because they do not get enough oxygen. Stroke can cause serious disabilities in speech, movement, and other basic activities. A stroke can also kill you.

3- Kidney Disease

Adults with diabetes, high blood pressure, or both have a higher risk of developing chronic kidney disease than those without these conditions.

Diseases Attributable to Hypertension



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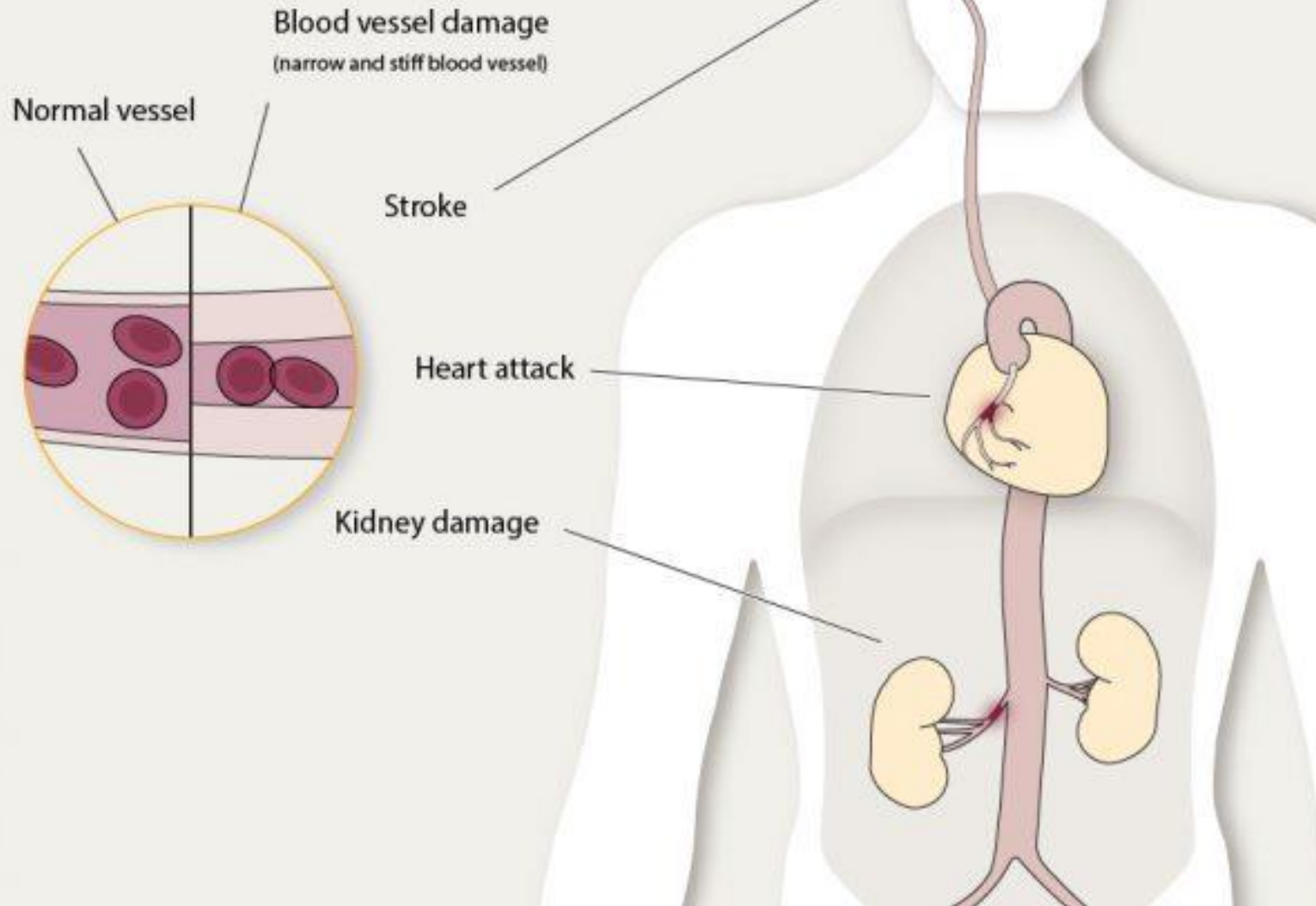
What can I do to prevent or manage high blood pressure?

Many people with high blood pressure can lower their blood pressure into a healthy range or keep their numbers in a healthy range by making lifestyle changes. Talk with your health care team about

- Getting at least 150 minutes of physical activity each week (about 30 minutes a day, 5 days a week)
- Not smoking
- Eating a healthy diet, including limiting sodium (salt) and alcohol
- Keeping a healthy weight
- Managing stress
- In addition to making positive lifestyle changes, some people with high blood pressure need to take medicine to manage their blood pressure.



Hypertension Complications



You can manage your blood pressure to lower your risk for serious health problems that may affect your heart, brain, kidneys, and eyes