

# Chapter 22

## Nursing Care of Patients with Hypertension

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Health & Illness III

### Objectives

- Explain the pathophysiology of hypertension
- Identify causes and risks factors for hypertension
- List signs and symptoms of hypertension
- Describe therapeutic measures for hypertension
- Define hypertension emergency
- List common complications of hypertension
- Plan nursing for patients with hypertension
- Evaluate effectiveness of nursing interventions

### Pathophysiology of Hypertension

### What is Hypertension

- Term to refer to **high blood pressure**
- **Risk factor** for cardiovascular disease and stroke
- **Normal**
  - Less than 120/80 mm Hg
- **Elevated**
  - 120-129/80 mm Hg
- **Hypertension**
  - Stage 1
    - 130-139/80-89 mm Hg
  - Stage 2
    - Greater or equal to 140/90 mm Hg



## Pathophysiology of Hypertension

- Heart pumps-forces blood through vessels
- Pressure exerted on vessel walls-measured as blood pressure
- Blood pressure-determined by:
  - **Cardiac Output (CO)**
    - Physical and emotional activities-increase CO
  - **Peripheral vascular resistance (PVR)**
    - Anything causing narrowing vessels-increases PVR
    - Nervous system causing vasoconstriction-increases PVR
  - **Blood volume (BDV)**
    - Hormones that increase sodium retention-increases BDV
    - Decreased kidney function-increases BDV

## Types of Hypertension

### Primary (Essential Hypertension)

- Chronic elevation of unknown cause

### Secondary

- Elevation from known cause
  - Treat unknown cause-Blood pressure usually returns to normal



Dora

- Dora's blood pressure is 154/96 at the clinic. The provider explains her blood pressure reflects a primary stage 2 hypertension.
- The provider leaves the room and ask you, what is primary hypertension and what is stage 2?
- What do you tell her?
- What is the difference between Stage 1 and 2?

## List signs and symptoms of hypertension



## Signs and Symptoms of Hypertension

### "Silent Killer"

Often diagnosed when seeking care for other reasons

### S/S

- Headache
- Bloody nose
- Dizziness
- Visual disturbances
- Ankle and sacral edema

### Target Organ Disease- Damage to

- Blood Vessels of Heart
- Kidney
- Brain
- Eyes

## Diagnosis of Hypertension

### Risk Factors

Presence of S/S

History of kidney or heart disease

Use of medication

### Blood Pressure Readings

- Home Blood Pressure Measurements
- Average BP for two or more readings on different dates, greater than 139/89
- ECG, blood glucose, HCT, KCL, Ca, cholesterol level

## Identify causes and risks factors for hypertension



## Risk Factors for Hypertension-Nonmodifiable

- Family history (**twice the risk**)
- Age (plaque builds up in arteries)
- Diabetes (family history with obesity)
- Ethnicity
  - African Americans higher risk
- Renin-Angiotensin-Aldosterone
  - Increased renin activity...greater sodium and fluid retention
- Body-Fluid Volume
  - Diuretics-hydrochlorothiazide; furosemide (Lasix)



# Risk Factors for Hypertension-Modifiable

- Decrease sodium
  - 1500 mg per day-(Average American 3400 mg per day)
- Healthy diet and lifestyle
  - Weight-BMI/sodium/fats
  - 2000 calories per day
- Increase activity
  - Decrease peripheral resistance
  - Decrease body fat.
  - 30 minutes a day every day
- Stop smoking
  - Nicotine constricts the blood vessels.
- Decrease alcohol intake and stress
- Adequate sleep



## Am I at Risk for Hypertension?



Gloria, 34 year old, single female in graduate school studying effects of hypertension on children, states she is "living her best life"



Marsha, 45 year old married female, works as elementary school teacher, best friend has hypertension and counseling her on benefits of healthy lifestyle



Richard, 65 year old married male, retired from banking, both parents have history of hypertension, stopped smoking 10 years ago



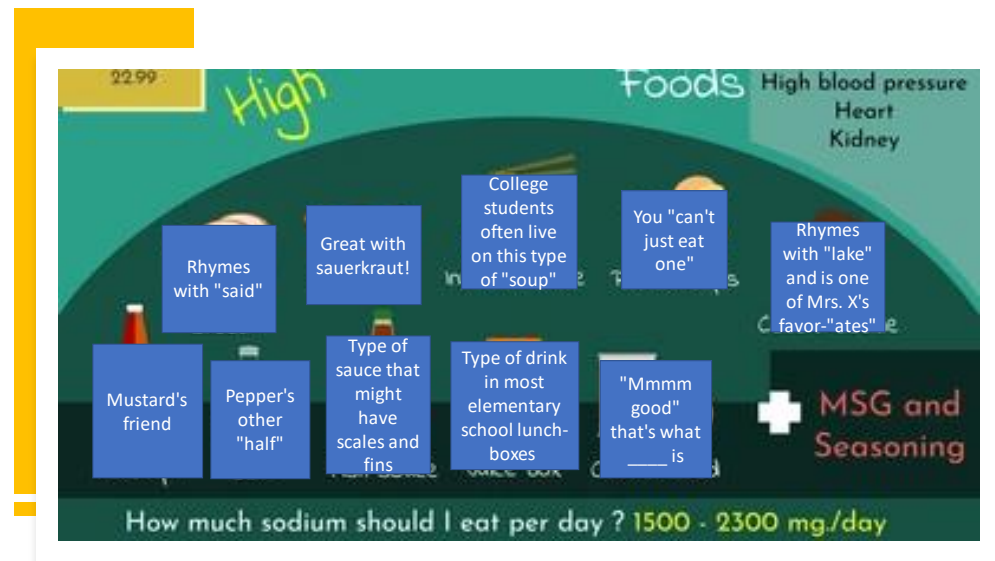
Andrew, 35 year old male, never been married, healthcare administrator of major healthcare organization, wants to implement measures to reduce hypertensive in elderly population

## Foods to Avoid-High in Sodium

- Tomato juice
- Canned vegetables
- Frozen vegetables
- Cheese
- Salted crackers/bread
- Canned fish/meats/soups
- Ham, lunch meats
- Fast food
- Catsup



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Describe therapeutic measures for hypertension



## Acute phase of Hypertension

- Intake and output hourly
- Weigh patient daily
- Medications-observe side effects
- Monitor-dependent edema
  - Turn, cough, deep breath
  - Antiembolism stockings
- Provide-emotional support
- Provide-low sodium diet, possibly restrict fluids
- Educate-diet, medication, and activity

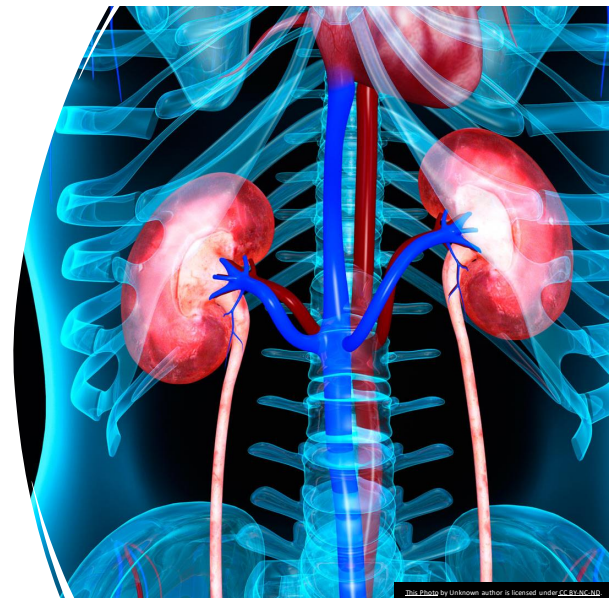


## Treatments-Antihypertensive Medications

- Diuretics-Increases urine output by balancing sodium and water by kidney
  - **Thiazide and Thiazide-like Diuretics**
    - Give with food
    - Monitor Intake and Output
    - Assess edema
    - Monitor electrolytes
    - Educate to take during waking hours-prevent night urination
    - *Hydrochlorothiazide*- monitor potassium, blood glucose may increase in diabetics, hypercalcemia with digoxin
  - **Loop Diuretic**
    - Acts on ascending loop of Henle in kidney-causes sodium and water loss, potassium, magnesium, and calcium
  - *Furosemide (Lasix)*
    - Contraindicated if allergic to sulfonamides
    - Monitor potassium
    - Educate: take with food or milk
    - Use sunscreen to prevent photosensitivity

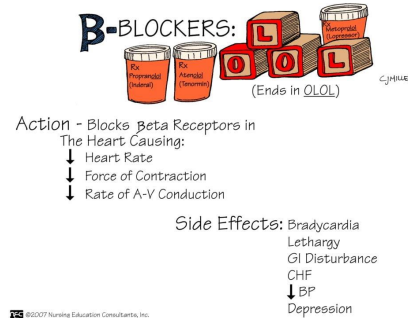
## Treatments-Antihypertensive Medications

- Diuretics-Increases urine output by balancing sodium and water by kidney
  - **Potassium-sparing diuretics**
    - Mild diuretic-causes sodium and water loss and potassium retention by kidney
    - *Amiloride (Midamor)*
    - Monitor potassium
    - Check blood pressure prior to administering



# Treatments-Antihypertensive Medications

- Sympatholytic (Beta Blockers)-Decreases sympathetic nervous system response
  - Ends in OLOL
  - Decreases blood pressure, heart rate, cardiac output, conduction
  - Assess: Heart rate, blood pressure-can cause bradycardia and orthostatic hypotension
  - Assess I&O and weight
  - Monitor for bronchospasm
  - Educate:
    - Rise slowly
    - Do not stop medication abruptly-may cause hypertension, angina, arrhythmias
- *Atenolol (Tenormin)*
- *Metoprolol (Lopressor)*
- *Metoprolol (Toprol XL)*
- *Propranolol (Inderal)*



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# Treatments-Antihypertensive Medications



## Alpha-1 Blockers-Causes vasodilation

- Assess heart rate and blood pressure
- Can cause hypotension and tachycardia
- *Prazosin (Minipress)*
- *Terazosin (Hytrin)*

## Combined Alphas and Beta Blockers-Causes vasodilation

- Assess heart rate and blood pressure
- Can cause bradycardia and hypotension
- Monitor I&O and weight
- *Labetalol (Normodyne)*

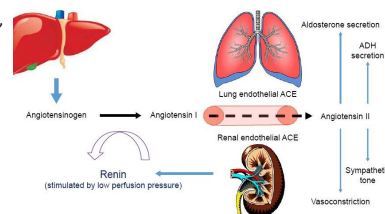
## Central-acting Alpha2, Agonists-Causes vasodilation

- Assess blood pressure and edema
- Educate: rise slowly
- Do not stop abruptly-rebound hypertension, angina, arrhythmia
- Hard candy for dry mouth
- *Clonidine (Catapres)*

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# Treatments-Antihypertensive Medications

- **Angiotensin-Converting Enzyme (ACE) Inhibitors**-Blocks Angiotensin II which is a vasoconstrictor; decreases peripheral arterial resistance
  - Monitor edema with heart failure, blood pressure with hypertension, new onset of cough
  - Educate:
    - Report new cough, rise slowly, use sunscreen, do not stop abruptly-rebound hypertension, angina, arrhythmia
  - *Enalapril maleate (Vasotec)*
  - *Captopril (Captoten)*
  - *Quinapril (Accupril)*
- **Angiotensin II Receptor Blocker (ARB)**-Vasodilation
  - Assess edema with heart failure and decrease blood pressure with hypertension
  - Educate: report new onset cough, use sunscreen
  - *Candesartan (Atacand)*



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**Action:** Blocks calcium access to cells causing: ↓ Contractility + ↓ Conductivity of the heart

↓ Demand for oxygen

**Side Effects:** ↓ BP, Bradycardia, May precipitate AV block, Headache, Abdominal discomfort (constipation, nausea), Peripheral edema

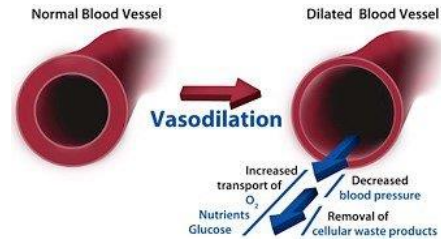
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# Treatments-Antihypertensive Medications

- **Aldosterone Receptor Antagonist**-blocks aldosterone; reduces sodium
  - Monitor potassium
  - *Eplerenone (Inspra)*
- **Calcium Channel Blocker (CCB)**-prevent calcium into cells; vasodilation
  - Assess blood pressure, heart rate (bradycardia), arrhythmia, angina
  - Can increase digoxin levels
  - *Amlodipine (Norvasc)*
  - *Diltiazem (Cardizem)*
  - *Felodipine (Plendil)*
  - *Nifedipine (Procardia)*

## Treatments-Antihypertensive Medications

- Direct vasodilators-relaxes smooth muscles; vasodilation
- Assess for hypertension and hypotension, tachycardia
- *Hydralazine (Apresoline)*
- *Minoxidil (Loniten)*

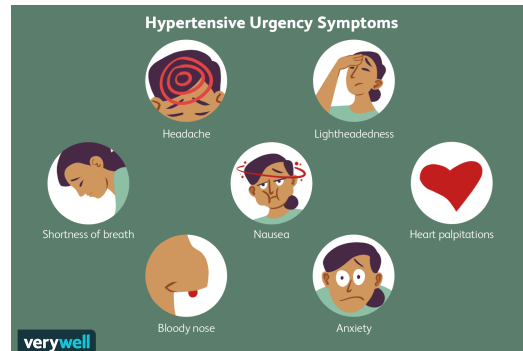


## Define hypertension emergency



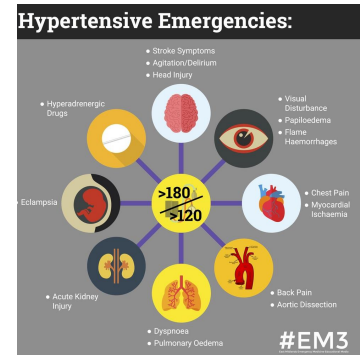
## Hypertensive Urgency

- Occurs when blood pressure is elevated without progression of target organ dysfunction
- May have severe headaches, nosebleeds, shortness of breath, severe anxiety
- Treatment:
  - Follow up visits with provider



## Hypertensive Emergency (Crisis)

- Severe type of hypertension
- Symptoms
  - BP higher than 180/120 mm Hg
  - Severe headache
  - Blurred vision
  - Dizziness
  - Disorientation
  - Nose bleeding
- Risk for
  - Myocardial Infarction
  - Heart failure
  - Dissecting aortic aneurysm
- IV medications
  - Nitroprusside (Nipride)





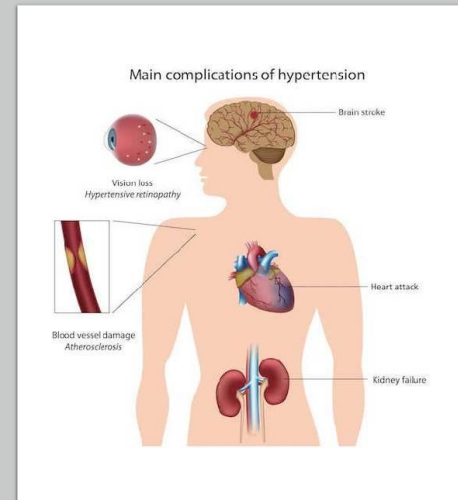
## List common complications of hypertension



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## Potential Complications of Hypertension

- What are some signs and symptoms that the kidney has been affected?



## Plan nursing for patients with hypertension



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## Nursing Interventions

- **Goal:** Help patient achieve normal blood pressure
  - Independent and dependent interventions
  - Without adverse effects of organ damage
- **Encourage**
  - Consult a dietitian
  - Develop plan
    - Weight loss
    - Low Sodium and fat
    - Healthy diet
    - Healthy lifestyle
- **Educate**
  - Disease process
  - Medication regimen, side effects
  - Risks of falls-get up slowly



What to do for the  
Hypertensive patient?

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LEOPARDY!