Focus on Hypertension

(Relates to Chapter 33, "Nursing Management: Hypertension," in the textbook)


Persistent elevation of

- Systolic blood pressure ≥140 mm Hg
- OR
- Diastolic blood pressure ≥90 mm Hg
- OR
- Current use of antihypertensive medication(s)

Hypertension
Definition

Prehypertension
Definition

- Systolic BP: 120 to 139 mm Hg
- OR
- Diastolic BP: 80 to 89 mm Hg
Factors Influencing Blood Pressure (BP)

\[
\text{Blood Pressure} = \text{Cardiac Output} \times \text{Systemic Vascular Resistance}
\]

Blood Pressure Classification

- **Subtypes**
  - Isolated systolic hypertension
    - SBP > 140 mm Hg with DBP < 90 mm Hg
  - Pseudohypertension

Etiology of Hypertension

- **Primary (essential or idiopathic) hypertension**
  - Elevated BP without an identified cause
  - 90% to 95% of all cases
Etiology of Hypertension

- **Primary (essential or idiopathic) hypertension**
  - Contributing factors
    - ↑ SNS activity
    - ↑ Sodium-retaining hormones and vasoconstrictors
    - Diabetes mellitus
    - > Ideal body weight
    - ↑ Sodium intake
  - Alcohol intake

- **Secondary hypertension**
  - Elevated BP with a specific cause
  - 5% to 10% of adult cases
  - Contributing factors
    - Coarctation of aorta
    - Renal disease
    - Endocrine disorders
    - Neurologic disorders
    - Cirrhosis
    - Sleep apnea
Risk Factors for Primary Hypertension

- Age
- Alcohol
- Cigarette smoking
- Diabetes mellitus
- Elevated serum lipids
- Excess dietary sodium
- Gender

Risk Factors for Primary Hypertension

- Family history
- Obesity
- Ethnicity
- Sedentary lifestyle
- Socioeconomic status
- Stress

Factors Influencing BP

Fig. 33-1. Factors Influencing BP. Hypertension develops when one or more of the BP regulating mechanisms are deficient. EDRF = endothelium-derived relaxing factor.
Heredity
- Genetic factors have little contribution to BP levels in the general population.

Water and sodium retention
- High sodium intake may activate a number of pressor mechanisms, resulting in water retention.

Water and sodium retention
- Certain demographics are associated with “salt sensitivity.”
  - Obesity
  - Increasing age
  - African American ethnicity
Pathophysiology of Primary Hypertension

- Stress and increased SNS activity
  - Produce increased vasoconstriction
  - ↑ HR
  - ↑ Renin release

Pathophysiology of Primary Hypertension

- Insulin resistance and hyperinsulinemia
  - High insulin concentration stimulates SNS activity and impairs nitric oxide-mediated vasodilation

Pathophysiology of Primary Hypertension

- Altered renin-angiotensin mechanism:
  - High plasma renin activity
  - Endothelial cell dysfunction
Hypertension
Clinical Manifestations

- Referred to as the “silent killer” because patients are frequently asymptomatic until target organ disease occurs

Symptoms are often secondary to target organ disease and can include
- Fatigue, reduced activity tolerance
- Dizziness
- Palpitations, angina
- Dyspnea

Target organ diseases occur most frequently in the
- Heart
- Brain
- Peripheral vasculature
- Kidney
- Eyes
Hypertension Complications

- Hypertensive heart disease
  - Coronary artery disease
  - Left ventricular hypertrophy
  - Heart failure

Fig. 33-3: Massively enlarged heart caused by hypertrophy of both ventricles. The normal heart weighs 335 g (top). The heart with biventricular hypertrophy weighs 1100 g. The patient had suffered from severe systemic hypertension.

Fig. 33-3: Top, normal heart; Bottom, left ventricular hypertrophy

- Cerebrovascular disease
  - Stroke
- Peripheral vascular disease
- Nephrosclerosis
- Retinal damage

- History and physical examination
  - Bilateral BP measurement
    - Use arm with higher reading for subsequent measurements.
    - BP is highest in early morning, lowest at night.
Hypertension
Office BP Measurement

- Use auscultatory method with a properly calibrated instrument.
- Patient should be seated quietly for 5 minutes in a chair, with feet on the floor and arms supported at heart level.

- Use appropriately sized cuff to ensure accurate readings.
- Obtain at least two measurements.

Hypertension
Diagnostic Studies

- Urinalysis, creatinine clearance
- Serum electrolytes, glucose
- BUN and serum creatinine
- Serum lipid profile
- ECG
- Echocardiogram
“White coat” phenomenon may precipitate the need for ambulatory blood pressure monitoring (ABPM).
- Noninvasive, fully automated system that measures BP at preset intervals over 24-hour period

Overall goals
- Control blood pressure
- Reduce CVD risk factors

Strategies for adherence to regimens
- Empathy increases patient trust, motivation, and adherence to therapy.
- Consider patient’s cultural beliefs and individual attitudes when formulating treatment goals.
Lifestyle modifications
• Weight reduction: Weight loss of 10 kg (22 lb) may decrease SBP by approx 5 to 20 mm Hg
• DASH eating plan

Dietary sodium reduction: <2300 mg of sodium/day
• Moderation of alcohol consumption:
  - Men: No more than 2 drinks/day
  - Women: No more than 1 drink/day

Physical activity: Regular physical (aerobic) activity, at least 30 minutes, most days of the week
• Avoidance of tobacco products
• Psychosocial risk factors
Hypertension
Collaborative Care

- Drug therapy: Primary actions of drugs to treat hypertension
  - Reduce SVR
  - Reduce volume of circulating blood

Hypertension
Collaborative Care

- Drug therapy: Classifications of drugs used to treat hypertension
  - Diuretics
  - Adrenergic inhibitors
  - Direct vasodilators
  - Angiotensin-converting enzyme inhibitors
  - Angiotensin II receptor blockers
  - Calcium channel blockers

Antihypertensive Medications

Fig 33-4. Site and method of action of various antihypertensive drugs (bold type). ACE.
Hypertension
Collaborative Care

› Drug therapy and patient teaching
  • Identify, report, and minimize side effects.
  • Orthostatic hypotension
  • Sexual dysfunction
  • Dry mouth
  • Frequent urination

Hypertension
Nursing Management

› Nursing Assessment
  • Subjective data
    • Past health history
    • Medications
    • Functional health patterns
  • Objective data
    • Target organ damage

Audience Response Question

The nurse determines that the patient has stage 2 hypertension when the patient’s average blood pressure is:

1. 155/88 mm Hg.
2. 172/92 mm Hg.
3. 160/110 mm Hg.
4. 182/106 mm Hg.
Hypertension
Nursing Management

- **Nursing Diagnoses**
  - Ineffective health maintenance
  - Anxiety
  - Sexual dysfunction
  - Ineffective self-health management
  - Disturbed body image
  - Ineffective tissue perfusion

- **Collaborative problems**
  - Potential complication: Adverse effects from antihypertensive therapy
  - Potential complication: Hypertensive crisis
  - Potential complication: Stroke
  - Potential complication: Myocardial infarction

- **Planning: Patient will:**
  - Achieve and maintain the individually determined goal BP.
  - Understand, accept, and implement the therapeutic plan.
  - Experience minimal or no unpleasant side effects of therapy.
  - Be confident of ability to manage and cope with this condition.
Hypertension
Nursing Management

» Nursing Implementation
  • Health Promotion
    • Individual patient evaluation
    • Blood pressure measurement
    • Screening programs
    • Cardiovascular risk factor modification

Audience Response Question
While performing blood pressure screening at a health fair, the nurse counsels which of the following visitors as having the greatest risk for developing hypertension?

1. A 56-year-old man whose father died at age 62 from a stroke
2. A 30-year-old female advertising agent who is unmarried and lives alone
3. A 68-year-old man who uses herbal remedies to treat his enlarged prostate gland
4. A 43-year-old man who travels extensively with his job and exercises only on weekends

Hypertension
Nursing Management

» Nursing Implementation
  • Ambulatory and home care
  • Patient and caregiver teaching includes:
    • Nutritional therapy.
    • Drug therapy.
    • Physical activity.
    • Home BP monitoring (if appropriate).
    • Tobacco cessation (if applicable).
Hypertension
Nursing Management

**Nursing Evaluation**
- Patient will:
  - Achieve and maintain goal BP
  - Understand, accept, and implement the therapeutic plan
  - Experience minimal or no unpleasant side effects of therapy
  - Express confidence in ability to maintain plan

**Audience Response Question**
A patient’s blood pressure has not responded consistently to prescribed medications for hypertension. The first cause of this lack of responsiveness the nurse should explore is:

1. Progressive target organ damage.
2. The possibility of drug interactions.
3. The patient not adhering to therapy.
4. The patient’s possible use of recreational drugs.

**Hypertension in Older Persons**

- **Isolated systolic hypertension (ISH):**
  Most common form of hypertension in individuals age >50
Older adults are more likely to have “white coat” hypertension.
Often a wide gap between the first Korotkoff sound and subsequent beats is called the auscultatory gap.
Failure to inflate the cuff high enough may result in serious underestimation of the SBP.

Older adults have varying degrees of impaired baroreceptor reflex mechanisms.
Consequently, orthostatic hypotension occurs often, especially in patients with ISH.

Severe increase in BP (>220/140)
Often occurs in patients with a history of HTN who have failed to comply with medications or who have been undermedicated.
Hypertensive Crisis
Clinical Manifestations

- **Hypertensive emergency** = Evidence of acute target organ damage:
  - Hypertensive encephalopathy, cerebral hemorrhage
  - Acute renal failure
  - Myocardial infarction
  - Heart failure with pulmonary edema

Hypertensive Crisis
Nursing and Collaborative Management

- **Hospitalization**
  - IV drug therapy: Titrated to MAP
  - Monitor cardiac and renal function
  - Neurologic checks
  - Determine cause
  - Education to avoid future crises

Case Study
Case Study

- 40-year-old man attends a community health screening.
- He is alert, oriented, and coordinated in all movements.

Clinical findings:
- 5 foot, 9 inches; weight: 230 lb
- Blood pressure 182/104
- Pulse 90
- Respirations 24
- Temperature 97.0°F

Subjective: He states:
- “I’m a truck driver and I eat a lot of fast food.”
- “It’s hard to eat healthy on the road.”
- “This is my first checkup in a long time.”
- “I smoke a pack of cigarettes a day; this keeps me calm and helps me stay awake on the road.”
Discussion Questions

1. **What risk factors for hypertension does he have?**

2. **As part of the health screening, what should you do next?**

3. **In what areas should you provide teaching?**