Pharmacologic Therapy in HTN and Nursing Care

فریماه شیرانی

دکترای پرستاری

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HTN

- **ACEI/ARB**
- **CCB**
- **Thiazide**

- Spironolactone
- Beta blocker
- Lasix
- Alpha blocker (Prazosin, Terazosin)
- Vasodilator (Minoxidil, Hydralazine)
- Central acting (Clonidine, Methyl dopa)

First-Line Drug Classes:

- Guidelines recommend initiating treatment of HTN with one or more of three classes of first-line BP-lowering agents:

(1) calcium channel blockers (CCBs)

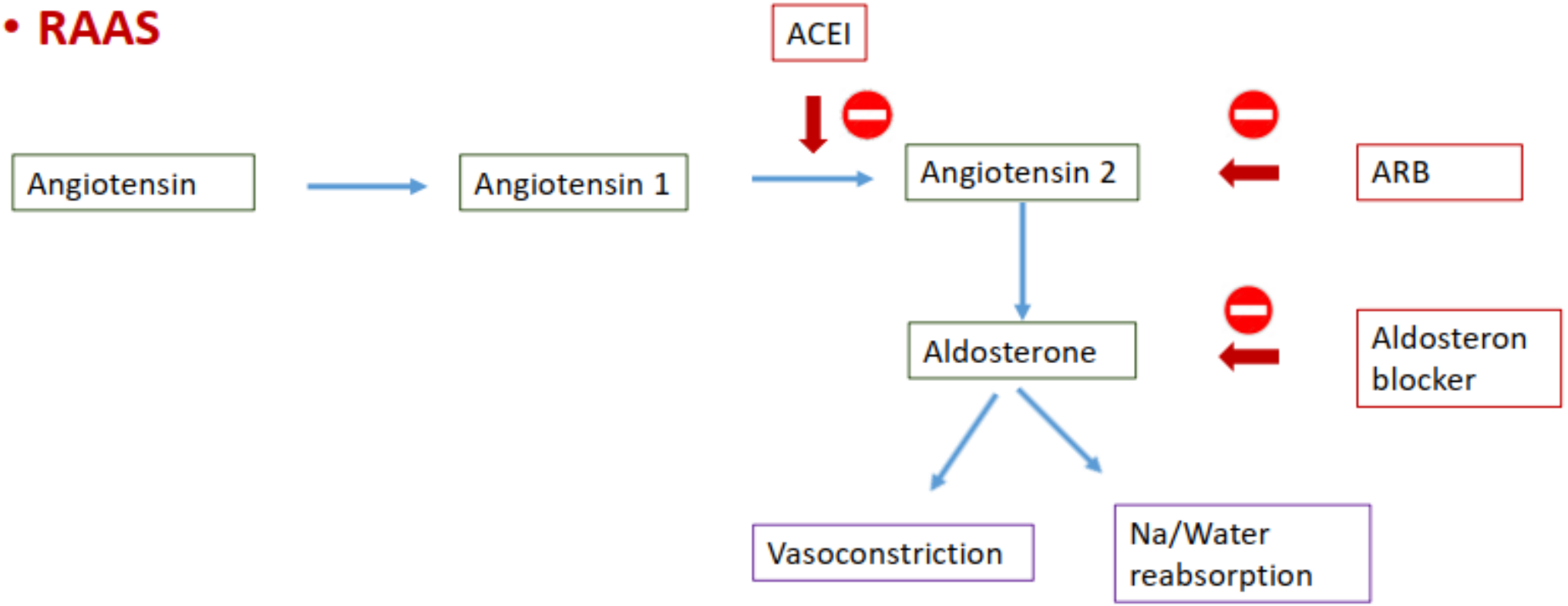
(2) renin-angiotensin system (RAS) inhibitors, either ACEIs or ARBs

(3) thiazide-type diuretics

- They have additive effects when used in combination

ACEI/ARB/Aldosteron Blocker

- **RAAS**



ACEI

- Captopril (BD-TDS)
- Enalapril (BD-D)
- Lisinopril (D)

Adverse reactions of ACEI

- **1. Cough:** can arise within hours of first dose or it can present after weeks to months of treatment.
- 2. **Angioedema:** Facial and neck swelling, obstruction to airflow by **laryngeal edema**. (ACEI should be avoided in this population)
- 3. **Acute kidney dysfunction**
- **4. Hyperkalemia**
- **5.Hypotention**

ARB

- Losartan (BD-D)
- Valsartan (BD-D)

Adverse reactions of ARB

- ~~**1. Cough**~~
- ~~2. **Angioedema**~~
- 3. **Acute kidney dysfunction**
- **4. Hyperkalemia**
- **5.Hypotention**

Diuretics:

- Multiple RCTs have shown that thiazide-type diuretics reduce the risk of coronary events, strokes, and HF in elderly patients.
- In ALLHAT the diuretic was equally effective as ACEI and CCB in preventing coronary events and strokes, more effective than the CCB in preventing HF.
- Most clinical trials supporting the benefits of diuretic therapy for hypertension did not use HCTZ but rather indapamide or chlorthalidone, thiazide-type diuretics that are more *potent* and *longer* lasting than HCTZ

Side effects:

Thiazide-type diuretics can aggravate glucose intolerance (particularly in higher doses and when used in combination with a standard beta blocker), cause hypokalemia and hypomagnesemia and hyponatremia, precipitate gout, and elevate serum lipids with increased hepatic triglyceride content they can also cause photosensitive dermatitis.

They may be more likely than other antihypertensive drugs to cause erectile dysfunction but evidence is limited.

Thiazide-type diuretics are the most common cause of severe hyponatremia, especially in older women. (esp+ SSRI antidepressants)

Although less well recognized than thiazide-induced hypokalemia, thiazide-induced hyponatremia is a common reason why some elderly hypertensive individuals simply cannot tolerate even low-dose thiazides.

Aldosterone Antagonists

- Low-dose spironolactone (12.5 to 50 mg daily) or eplerenone (25 to 100 mg daily) are highly effective add-on drugs for difficult cases of hypertension.

- The efficacy of spironolactone related inversely to the patients' plasma renin activity, implicating a pivotal role for excessive renal sodium retention in the pathogenesis of difficult primary hypertension, but is effective even with normal aldosterone level.

Beta-Adrenergic Blockers:

- Although beta blockers are first-line drugs for angina and HF, experts disagree whether they should be included among the first-line drugs for uncomplicated hypertension because of their inferior stroke protection and increased risk for incident diabetes.

- Vasodilating beta blockers such as labetalol or carvedilol also block alpha-adrenergic receptors, whereas nebivolol stimulates endogenous production of nitric oxide.

- are highly effective add-on drugs for difficult hypertension

- Atenolol and metoprolol provide little if any stroke protection.

Alpha-Adrenergic Blockers

- blocking the interaction of norepinephrine on vascular alpha adrenergic receptors
- By increasing blood flow in skeletal muscle, alpha blockers increase insulin sensitivity
- intravenous phentolamine selectively block alpha1 adrenoceptors; phenoxybenzamine blocks both alpha1 and alpha2 receptors.
- not first-line agents and should not be used as monotherapy because their propensity to cause fluid retention can lead to tachyphylaxis and unmask or exacerbate HF.
- When used in a combination regimen that includes a diuretic, however, they are effective add-on therapy for difficult hypertension.
- Although marketed specifically for prostatism and not as an antihypertensive agent, the selective alpha1A blocker tamsulosin lowers BP and can precipitate symptomatic orthostatic hypotension in some older men

Central Sympatholytics

By stimulation of pre and postsynaptic alpha2-adrenergic receptors reduce adrenergic drive to the heart and peripheral circulation.

- are best reserved for short-term oral treatment of hypertensive urgency
- are potent antihypertensive as add-on therapy for very difficult hypertension, but their troublesome CNS side effects reduce quality of life
- To avoid rebound hypertension between doses, short-acting clonidine must be given every 6 to 8 hours or, whenever possible, discontinued through gradual tapering.
- Alpha-methyldopa is poorly tolerated and no longer a first-line therapy for hypertension i

Direct Vasodilators:

- Potent hyperpolarizing arterial vasodilators minoxidil and hydralazine act by opening vascular ATP-sensitive K+ channels.
- By causing selective and rapid arterial dilation, both drugs induce profound reflex sympathetic activation and tachycardia.
- Hydralazine is useful for the treatment of preeclampsia and as rescue therapy for very difficult hypertension.
- Severe hypertension accompanying advanced CKD is the main indication for minoxidil, which must be combined with a beta blocker to prevent excessive reflex tachycardia and with a loop diuretic or dialysis to prevent excessive fluid retention.

Nursing Care Plan

- **Nursing Care Plans**
- Nursing care planning goals for hypertension include lowering or controlling blood pressure, adherence to the therapeutic regimen, lifestyle modifications, and prevention of complications.
- **Here are six nursing diagnoses for hypertension nursing care plans:**
- Risk for Decreased Cardiac Output
- Decreased Activity Tolerance
- Acute Pain
- Ineffective Coping
- Overweight
- Deficient Knowledge

Risk for Decreased Cardiac Output

- Blood pressure is the product of cardiac output multiplied by peripheral resistance. Hypertension can result from an increase in cardiac output (heart rate multiplied by stroke volume), an increase in peripheral resistance, or both.

- **Nursing Diagnosis**
- Risk for Decreased Cardiac Output
- *Other possible nursing diagnoses include:*
  - Risk for Impaired Cardiovascular Function
  - Decreased Cardiac Output
  - Risk for Decreased Cardiac Tissue Perfusion

- **Risk factors may include**
- The following are the common related factors for the nursing diagnosis risk for decreased cardiac output secondary to hypertension:
- Increased vascular resistance, vasoconstriction
- Myocardial ischemia
- Myocardial damage
- Ventricular hypertrophy/rigidity

- **Goals and desired outcomes**
- Below are the common expected outcomes for decreased cardiac output secondary to hypertension:

Nursing Assessment and Rationale

- Here are the nursing assessments for the nursing diagnosis risk for decreased cardiac output secondary to hypertension.

- **1. Review clients at risk as noted in Related Factors and individuals with conditions that stress the heart.**
  Persons with acute or chronic conditions may compromise circulation and place excessive demands on the heart.
- **2. Check laboratory data (cardiac markers, complete blood cell count, electrolytes, ABGs, blood urea nitrogen and creatinine, cardiac enzymes, and cultures, such as blood, wound, or secretions).**
  To identify contributing factors.
- **3. Monitor and record BP. Measure in both arms and thighs three times, 3–5 min apart while the** patient is at rest, then sitting, then standing for initial evaluation. Use correct cuff size and accurate technique. Comparison of pressures provides a complete picture of vascular involvement or the scope of the problem. Severe hypertension is classified in adults as a diastolic pressure elevation of 110 mmHg; progressive diastolic readings above 120 mmHg are considered first accelerated, then malignant (very severe). Systolic hypertension is also an established risk factor for cerebrovascular disease and ischemic heart disease when elevated diastolic pressure. *See updated guidelines for classifying hypertension above*.

- **4. Note presence, quality of central and peripheral pulses.**
  Bounding carotid, jugular, radial, and femoral pulses may be observed and palpated. Pulses in the legs and feet may be diminished, reflecting effects of vasoconstriction (increased systemic vascular resistance [SVR]) and venous congestion.
- **5. Auscultate heart tones and breath sounds.**
  S_4 heart sound is common in severely hypertensive patients because of atrial hypertrophy (increased atrial volume and pressure). Development of S_3 indicates ventricular hypertrophy and impaired functioning. The presence of crackles, wheezes may indicate pulmonary congestion secondary to developing or chronic heart failure.
- **6. Observe skin color, moisture, temperature, and capillary refill time.**
  The presence of pallor; cool, moist skin; and delayed capillary refill time may be due to peripheral vasoconstriction or reflect cardiac decompensation and decreased output.

- **7. Note dependent and general edema.**
  May indic
- **8. Evaluate client reports or evidence of extreme fatigue, intolerance for activity, sudden or progressive weight gain, swelling of extremities, and progressive shortness of breath.**
  To assess for signs of poor ventricular function or impending cardiac failure.
- **Nursing Interventions and Rationales**
- Here are the therapeutic nursing interventions for the nursing diagnosis risk for decreased cardiac output secondary to hypertension.
- **1. Provide calm, restful surroundings, minimize environmental activity and noise. Limit the number of visitors and length of stay.**
  It helps lessen sympathetic stimulation; promotes relaxation.
- ate heart failure, renal or vascular impairment.

- **2. Maintain activity restrictions (bedrest or chair rest); schedule uninterrupted rest periods; assist patient with self-care activities as needed.**
  Lessens physical stress and tension that affect blood pressure and the course of hypertension.

- **3. Provide comfort measures (back and neck massage, the elevation of head).**
  Decreases discomfort and may reduce sympathetic stimulation.
- **4. Instruct in relaxation techniques, guided imagery, distractions.**
  Can reduce stressful stimuli, produce a calming effect, thereby reducing BP.
- **5. Monitor response to medications to control blood pressure.**
  Response to drug therapy (usually consisting of several drugs, including diuretics, angiotensin-converting enzyme [ACE] inhibitors, vascular smooth muscle relaxants, beta and calcium channel blockers) is dependent on both the individual and as the synergistic effects of the drugs. Because of side effects, drug interactions, and patient's motivation for taking antihypertensive medication, it is important to use the smallest number and lowest dosage of medications.

- **7. Implement dietary sodium, fat, and cholesterol restrictions as indicated.**
  These restrictions can help manage fluid retention and, with the associated hypertensive response, decrease myocardial workload.
- **8. Prepare for surgery when indicated.**
  When hypertension is due to pheochromocytoma, removal of the tumor will correct the condition.

Decreased Activity Tolerance

- **1. Note the presence of factors contributing to fatigue (age, frail, acute or chronic illness, heart failure, hypothyroidism, cancer, and cancer therapies).**
  Fatigue affects both the client's actual and perceived ability to particip
- **2. Evaluate the** client's actual and perceived limitations or degree of deficit in light of usual status.
  Provides comparative baseline and provides information about needed education and interventions regarding the quality of life.
- **3. Assess the patient's response to activity.**
  Noting pulse rate more than 20 beats per min faster than resting rate; marked increase in BP during and after activity (systolic pressure increase of 40 mm Hg or diastolic pressure increase of 20 mm Hg); dyspnea or chest pain; excessive fatigue and weakness; diaphoresis; dizziness or syncope. The stated parameters help assess physiological responses to the stress of activity and, if present, are indicators of overexertion.
- ate in activitie

- **4. Assess emotional and psychological factors affecting the current situation.**
  Stress or depression may be increasing the effects of an illness, or depression might be the result of being forced into inactivity.
- **Nursing Interventions and Rationales**
- In this section are therapeutic nursing interventions to address activity intolerance nursing diagnosis.
- **1. Instruct patient in energy-conserving techniques (using a chair when showering, sitting to brush teeth or comb hair, carrying out activities at a slower pace).**
  Energy-saving techniques reduce energy expenditure, thereby assisting in the equalization of oxygen supply and demand.
- **2. Encourage progressive activity and self-care when tolerated. Assist as needed.**
  Gradual activity progression prevents a sudden increase in cardiac workload. Providing assistance only as needed encourages independence in performing activities.

Acute Pain

- Elevation in resting blood pressure means a progressive reduction in sensitivity to acute pain, which could result in a tendency to restore arousal levels in the presence of painful stimuli.
- **Nursing Diagnosis**
- Acute Pain
- **Related Factors**
- Common related factors for acute pain nursing diagnosis:
- Increased cerebral vascular pressure

Defining Characteristics

- The common assessment cues could serve as defining characteristics or part of your "as evidenced by" in your diagnostic statement.
- Verbal reports of throbbing pain located in suboccipital region, present on awakening and disappearing spontaneously after being up and about
- Reluctance to move head, rubbing head, avoidance of bright lights and noise, wrinkled brow, clenched fists
- Changes in appetite
- Reports of stiffness of neck, dizziness, blurred vision, nausea, and vomiting
- **Desired Outcomes**
- Goals and expected outcomes for acute pain nursing diagnosis:
- Patient will report relief of pain/discomfort.
- Patient will verbalize methods that provide relief.
- Patient will follow prescribed pharmacological regimen.
- Patient will demonstrate use of relaxation skills and diversional activities, as indicated, for individual situation.

- **Nursing Assessment and Rationales**
- The following are nursing assessments to address acute pain for this hypertension nursing care plan.
- **1. Note the client's attitude toward pain and use of pain medications, including any history of substance abuse.**
  To assess etiology or precipitating contributory factors.
- **2. Determine specifics of pain (location, characteristics, intensity (0–10 scale), onset, and duration). Note nonverbal cues.**
  Facilitates diagnosis of problem and initiation of appropriate therapy. Helpful in evaluating the effectiveness of therapy.

- **Nursing Interventions and Rationales**
- Here are the therapeutic nursing interventions for this hypertension nursing diagnosis to address acute pain.
- **1. Encourage and maintain bed rest during the acute phase.**
  Minimizes stimulation and promotes relaxation.
- **2. Provide or recommend nonpharmacological measures to relieve headache such as cool cloth to forehead; back and neck rubs; quiet, dimly lit room; relaxation techniques (guided imagery, distraction); and diversional activities.**
  Measures that reduce cerebral vascular pressure and slow or block sympathetic response effectively relieve headaches and associated complications

- **3. Eliminate or minimize vasoconstricting activities that may aggravate headache (straining at stool, prolonged coughing, bending over).**
  Activities that increase vasoconstriction accentuate the headache in the presence of increased cerebral vascular pressure.
- **4. Assist patient with ambulation as needed.**
  Dizziness and blurred vision frequently are associated with vascular headaches. The patient may also experience episodes of postural hypotension, causing weakness when ambulating.
- **5. Provide liquids, soft foods, frequent mouth care if nosebleeds occur, or nasal packing has been done to stop bleeding.**
  Promotes general comfort. Nasal packing may interfere with swallowing or require mouth breathing, leading to stagnation of oral secretions and drying of mucous membranes.

- **6. *Administer medications as indicated:***
- **Analgesics; Antianxiety agents: lorazepam (Ativan), alprazolam (Xanax), diazepam (Valium).**
  Reduce or control pain and decrease stimulation of the sympathetic nervous system. May aid in the reduction of tension and discomfort that is intensified by stress.

Ineffective Coping

- The general well-being ("I'm not feeling sick"), the complexity of the therapeutic regimen, required lifestyle changes, and side effects of medications usually result in the inability of the patients to cope.
- **Nursing Diagnosis**
- Ineffective Coping
- **Related Factors**
- Common related factors for ineffective nursing diagnosis:
- Situational/maturational crisis; multiple life changes
- Inadequate relaxation; little or no exercise, work overload
- Inadequate support systems

- Poor nutrition
- Unmet expectations; unrealistic perceptions
- Inadequate coping methods
- Gender differences in coping strategies
- **Defining Characteristics**
- The common assessment cues could serve as defining characteristics or part of your "as evidenced by" in your diagnostic statement.
- Verbalization of inability to cope or ask for help
- Inability to meet role expectations/basic needs or problem-solve
- Destructive behavior toward self; overeating, lack of appetite; excessive smoking/drinking, proneness to alcohol abuse
- Chronic fatigue/insomnia; muscular tension; frequent head/neck aches;
- chronic worry, irritability, anxiety, emotional tension, depression

Desired Outcomes

Common goals and expected outcomes for Ineffective coping nursing diagnosis:

- Patient will identify ineffective coping behaviors and consequences.
- Patient will verbalize awareness of own coping abilities/strengths.
- Patient will identify potential stressful situations and steps to avoid/modify them.
- Patient will demonstrate the use of effective coping skills/methods.

Nursing Assessment and Rationales

The following are nursing assessments to address ineffective coping for this hypertension nursing care plan.

1. Determine individual stressors (family, social, work environment, life changes, or healthcare management).

To evaluate the degree of impairment.

2. Evaluate ability to understand events, provide a realistic appraisal of the **situation.**

To evaluate the degree of impairment.

3. Assess the effectiveness of coping strategies by observing behaviors (ability to verbalize feelings and concerns, willingness to participate in the treatment plan).

Adaptive mechanisms are necessary to appropriately alter one's lifestyle, deal with the chronicity of hypertension, and integrate prescribed therapies into daily living.

- **4. Note reports of sleep disturbances, increasing fatigue, impaired concentration, irritability, decreased tolerance of headache, inability to cope or problem-solve.** Manifestations of maladaptive coping mechanisms may be indicators of repressed anger and be major determinants of diastolic BP.
- **Nursing Interventions and Rationales**
- This section contains specific nursing interventions and ineffective coping nursing diagnosis measures for this hypertension nursing care plan.
- **1. Assist the patient in identifying specific stressors and possible strategies for coping with them.** Recognition of stressors is the first step in altering one's response to the stressor.

- **2. Include the patient in care planning and encourage maximum participation in the treatment plan.**
  Involvement provides the patient with an ongoing sense of control, improves coping skills, and can enhance cooperation with the therapeutic regimen.
- **3. Encourage the patient to evaluate life priorities and goals. Ask questions such as "Is what you are doing getting you what you want?"**
  Focuses patient's attention on the reality of present situation relative to patient's view of what is wanted. Strong work ethic, need for "control," and outward focus may have led to a lack of attention to personal needs.

- **4. Assist the patient in identifying and begin planning for necessary lifestyle changes. Assist in adjusting, rather than abandon, personal/family goals.**
  Necessary changes should be realistically prioritized so patients can avoid being overwhelmed and feeling powerless.
- **5. Help client to substitute positive thoughts for negative ones such as ” I can do this; I am in charge of myself.”**
  To provide meeting psychological needs.

Overweight

- Excess weight or being overweight is an added risk in causing hypertension. Studies suggest that weight gain may pathophysiologically contribute to blood pressure elevation.
- **Nursing Diagnosis**
- Overweight
- *Other possible nursing diagnoses:*
  - Risk for Overweight
  - Obesity
- **Related Factors**
- The following are the common related factors for the nursing diagnosis of Overweight:
- ADVERTISEM

- Excessive intake in relation to metabolic need
- Sedentary activity level
- Cultural preferences
- **Defining Characteristics**
- The common assessment cues could serve as defining characteristics or part of your "as evidenced by" in your diagnostic statement.
- Adult BMI greater than 25kg/m^2
- Triceps skinfold more than 15 mm in men and 25 mm in women (maximum for age and sex)
- Reported or observed dysfunctional eating patterns
- Sedentary lifestyle
- **Desired Outcomes**
- Common goals and expected outcomes for Overweight nursing diagnosis:
- Patient will identify correlation between hypertension and obesity.
- Patient will demonstrate change in eating patterns (e.g., food choices, quantity) to attain desirable body weight with optimal maintenance of health.
- Patient will initiate/maintain individually appropriate exercise program.

Nursing Assessment and Rationales

- **Nursing Assessment and Rationales**
- Here are the nursing assessments for this nursing diagnosis.
- **1. Assess risk or presence of conditions associated with obesity**
  Obesity is an added risk with high blood pressure because of the disproportion between fixed aortic capacity and increased cardiac output associated with increased body mass. Many studies have shown that weight loss is frequently associated with a decrease in blood pressure.
- **2. Assess the meaning and significance of food in the patient's life.**
  The patient's attitude towards food implicitly determines their choices between healthy and unhealthy foods.
- **3. Assess patient understanding of the direct relationship between hypertension and obesity.**
  Weight reduction may obviate the need for drug therapy or decrease the medication needed to control BP. Dysfunctional eating habits contribute to atherosclerosis and obesity, which predispose to hypertension – ultimately complications such as stroke, kidney disease, and heart failure.

- **4. Assess the patient's current nutritional status by using a food diary.**
  Insightful to examine the usual foods eaten and the patient's pattern of eating. Self-monitoring apps are also useful and convenient.
- **5. Review usual daily caloric intake and dietary choices.**
  Identifies current strengths and weaknesses in the dietary program—aids in determining the individual need for adjustment and teaching.
- **Nursing Interventions and Rationales**
- In this section are therapeutic nursing interventions for this nursing diagnosis.
- **1. Establish a realistic weight-reduction plan with the patient, such as 1 lb weight loss per wk.**
  Reducing caloric intake by 500 calories daily theoretically yields a weight loss of 1 lb per wk. Therefore, a slow weight reduction indicates fat loss with muscle-sparing and generally reflects a change in eating habits.
- **2. Encourage the patient to maintain a diary of food intake, including when and where eating takes place and the circumstances and feelings around which the food was eaten.**
  Provides a database for both the adequacy of nutrients eaten and the emotional conditions of eating. It helps focus attention on factors that the patient has control over or can change.
- **3. Discuss the necessity for decreased caloric intake and limited fats, salt, and sugar as indicated.**
  Excessive salt intake expands the intravascular fluid volume and may damage kidneys, which can further aggravate hypertension. Restriction on salt intake and lowering intake of saturated fats and cholesterol helps in reducing body weight.

- **4. Instruct and assist in appropriate food selections, such as a diet rich in fruits, vegetables, and low-fat dairy foods referred to as the DASH Dietary Approaches to Stop Hypertension) diet and avoiding foods high in saturated fat (butter, cheese, eggs, ice cream, meat) and cholesterol (fatty meat, egg yolks, whole dairy products, shrimp, organ meats).**
  Avoiding foods high in saturated fat and cholesterol is important in preventing progressing atherogenesis. Moderation and use of low-fat products in place of total abstinence from certain food items may prevent a sense of deprivation and enhance cooperation with the dietary regimen. In conjunction with exercise, weight loss, and limits on salt intake, the DASH diet may reduce or even eliminate the need for drug therapy.
- **5. Recommend patient to eat a well-balanced, healthy breakfast every morning.**
  Skipping breakfast will likely cause the patient to overeat during the evening.
- **6. Refer to a dietitian as indicated.**
  Can provide additional counseling and assistance with meeting individual dietary needs.

با تشکر از توجه شما بزرگواران