

**TEXAS WOMAN'S UNIVERSITY
DALLAS CAMPUS
COLLEGE OF NURSING
WOMEN'S HEALTH NURSING III**

HEART DISEASE IN WOMEN

Objectives: Heart Disease in Women, Hypertension, Hyperlipidemia

1. Discuss the physiology of women relating to heart disease, distinguishing between the way heart disease presents in females.
2. Discuss statistics associated with heart disease in women.
3. List risk factors (hypertension, age, smoking, obesity, diabetes, cholesterol, sedentary lifestyle, and family history, previous history of disease, stress, oral contraceptives, pregnancy, and menopause) associated with heart disease in women, differentiating these risk factors from those experienced by males.
4. Review strategies used for prevention of heart disease in women, including effects of estrogen and progesterone upon heart disease (oral contraceptive pills, hormone replacement therapy).
5. Review the effect that pregnancy has upon women with heart disease using the classifications of heart disease (I-IV).
6. Describe the symptoms of a heart attack from the woman's perspective.
7. Discuss the assessment strategies, lab tests, diagnosis, and differential diagnoses of heart disease in women.
8. Discuss the utilization of the following cardiac diagnostic tests in women: resting EKG, exercise EKG, thallium scan, radio nuclide ventriculogram, exercise echocardiogram, cardiac catheterization, and cardiac enzyme determination.
9. Review evaluation of heart murmurs in women.
10. Discuss management, co-management and referral of women with heart disease.
11. Discuss hypertension, differentiating between primary and secondary hypertension.
12. Describe risk factors associated with hypertension in women.
13. Describe the complications of hypertension.
14. Describe primary assessment strategies of blood pressure, differentiating among Stage I, Stage II, Stage III, and Stage IV.
15. Describe other assessment strategies, including lab values, used to diagnose hypertension.
16. Describe management of primary hypertension, including non-pharmacological and medical management.
17. Discuss the phenomena of hyperlipidemia, including factors which contribute to hyperlipidemia.
18. Discuss the effect combined oral contraceptive pills, progesterone contraceptive devices, pregnancy, and menopause have lipids, including triglycerides, HDL and LDL.
19. Describe the classification of total cholesterol and HDL cholesterol into desirable, borderline-high, high, and low HDL.
20. Describe the plan of management for clients with the above designations.
21. Differentiate among those women who can be managed by the WHNP as compared to women whose management requires consultation or referral.

22. Discuss instances in which women with hypercholesterolemia would require lipid-lowering medication, including follow-up care for these women.
23. Discuss the benefits and risks of bile acid sequestrants, nicotinic acid, statins, fibric acids, probucol, and estrogen replacement therapy in women.

Physiology of Heart Disease in Women

Heart disease is manifested differently in women than men because of inherent physiological differences, including:

1. The female heart and thoracic cavity is smaller and lighter than the male heart and thoracic cavity.
2. A woman’s heart weighs approximately 275 grams, while a man’s heart weighs 325 grams.
3. The female heart has smaller coronary arteries than the male heart.
4. The right coronary artery appears to be more dominant in women than in men.
5. On the EKG the PR and QRS intervals tend to be shorter in women and the amplitude of the R, S, and T waves across the precordium are also smaller.
6. Left ventricular end-diastolic pressure and volume is also lower in women, yet resting ejection fractions (EF) tend to be higher in women than men. (Up to 30% of women with normal coronary arteries do not have an increase in EF with exercise. This affects interpretation of exercise testing for women.
7. Women tend to have increased clotting tendencies, especially in pregnancy or while on combined hormonal contraception.
8. Women tend to have smaller blood vessels than men.
9. The blood vessels of women are more friable than those of men.
10. The surface area of the heart is smaller in women.
11. Difference in ventricle response to stress, in women the left ventricle dilates rather than constricts as it does in men.

As a result of these differences, women tend to have coronary disease related to clot formation rather than plaque formation.

Statistics Related to Cardiovascular Disease

1. “Of the current US population of 255 million, nearly 59 million people have some form of cardiovascular disease. As the population ages, these diseases may have an even greater human and economic impact. Heart failure is becoming more prevalent.” AHA
2. “According to the most recent computations done by the National Center for Health Statistics, if all forms of major cardiovascular diseases were eliminated, total life expectancy would rise by 9.78 years.” AHA
3. Leading, Causes of Death in Women (Annual Deaths per 1,000 Women, 1993)

All CVD	500
CHD alone	300
All Cancer	300
Lung Cancer	60

4. Other 1992 mortality: cancer 521,100; accidents 86,300; HIV (AIDS) 33,600
5. In the United States, all cardiovascular diseases combined claim the lives of more than 446,000 males and 479,000 females annually, while all forms of cancer combine to kill about 272,000 males and 242,000 females. (Approximately 500,000 women die annually from CAD. Of these women, 230,000 are less than 65 years old)
6. Myocardial infarction is the #1 killer of American women.
7. Of the more than 512,000 fatal heart attacks that occur each year, 47.7% of these are in women.
8. Thirty-nine percent of women who have heart attacks die within ONE year (compared to 31% of men.)

Research: A ten-year follow-up of the Danish verapamil infarction trial (2338 men and 738 women) indicated that short-term mortality was significantly higher in younger women than younger men.

Galiatius-Jensen S, et al. Sex related differences in short and long term prognosis after acute myocardial infarction: 10 year follow up of 3073 patients in database of first Danish verapamil infarction trial. BMJ (313), 137-40.

9. One in nine women aged 45-64 has some form of cardiovascular disease.
10. After the age of 65, one in three women has cardiovascular disease.
11. Approximately 24,000 women under the age of 65 die of a heart attack each year; nearly 27% of these are under the age of 55.
12. Women who are diagnosed with CAD are treated less aggressively despite symptoms and signs of increased disability.
13. Women receive thrombolytics less frequently than men.
14. Women undergo invasive procedures and surgery for CAD less frequently than men.

Research: Multicenter study of ED examined whether sex predicted the use of thrombolytic therapy, cardiac catheterization or revascularization procedures within 30 days. among 2542 patients with confirmed MI or angina, women were significantly less likely than men to receive thrombolytic therapy or to undergo cardiac procedures. Adjusting for risk factors, it was found that differences persisted with women with angina (70% as likely to undergo coronary angioplasty and 60% as likely to have bypass surgery). However, once the patient was catheterized, there was no sex difference in the use angioplasty or bypass surgery.

Circulation, (Supp. ii) (94): 93-39. Maynard, C. et al. 1996. Influences of sex on the use of cardiac procedures in patients presenting to the emergency

15. Women re-occlude at a higher rate than men after a percutaneous catheter procedure.

Research: The Cardiovascular Disease Study looked at 13,061 PTCA patients to examine the relationship between gender and PCTA. Women were more like to require emergent bypass surgery and had a higher death rate than men undergoing the same procedure. (PCTA was generally safe for both sexes and absolute mortality was relatively low.)

Malenka, D.J., et al. (1996). Differences in outcomes between women and men associated with percutaneous transluminal coronary angioplasty: a regional prospective study of 13061 procedures. Circulation, (94), 99-104.

Risk Factors Women Share with Men

1. Hypertension affects women more severely than men, and is more prevalent in the African American women than other women.

Research: In the previous study done by Maynard, women were older than men, and were more likely to be black, or to have a history of hypertension or diabetes (Maynard, 1996.)

2. Age-Women tend to be older than men with the first MI. (Women tend to be protected from CAD by estrogen. By the age of 65, male and female incidence of CAD is equivalent.) Since women are older than men with the onset of heart disease, they are more likely to have age-related problems (diabetes, hypertension or arthritis).

3. Smoking – If women stop smoking the risk of CV disease returns to normal in 2-4 years. While the percentage of male smokers is decreasing, the percentage of female smokers increases. Nearly one-fifth of deaths from cardiovascular diseases are attributable to smoking. It is also estimated that about 37,000 – 40,000 nonsmokers died from cardiovascular diseases as a result of exposure to environmental tobacco smoke. Smoking decreases HDL levels and increases platelet aggregation and fibrinogen levels. Smoking is associated with early menopause. The greatest increase in smoking is with young women. Women are less likely to quit smoking because they fear weight gain, and they gain more weight than men do when they quit smoking.

Research: Three studies indicated that girls and young women are at risk for smoking. The women at highest risk tend to be minority women, women with limited education and emotionally vulnerable adolescent girls (scored via the Clinic Interview Schedule). All studies appeared in the February, 1996, issue of the American Journal of Public Health.

4. Obesity – Generally, obese men have a greater risk than obese women. (The apple versus the pear.) If a woman is 30% overweight she is at increased risk for developing a MI, CHF, or stroke. The distribution of fat may be more predictive of heart disease than

the total weight. Women with a waist-hip ratio of .8 or greater have a higher risk of heart disease. Obesity tends to be associated with elevation of triglycerides, uric acid and blood pressure, reduction of HDL cholesterol and alteration of glucose tolerance and insulin sensitivity.

5. Diabetes – Maturity onset diabetes is associated with obesity and with CAD in both men and women. Diabetes in women seems to be more predictive of CAD in women than in men, and is the most significant predictor of CAD in women next to smoking. The mortality rate in women with diabetes experiencing a MI is twice as high as that of men with diabetes. Diabetes is associated with the development of atherosclerosis and abnormalities in the lipid profile, with increased LDL total cholesterol and triglycerides and decreased HDL. In addition, estrogen does not protect against CAD as effectively in diabetic women
6. Cholesterol – Estimates are that 94.6 million American adults (52%) have blood cholesterol values of 200 mg/dl and higher, and about 37.2 million American adults (20 percent) have levels of 240 or above. An estimated 36.5 percent of American youth age 19 and under have serum cholesterol levels of 170 mg/dL or above. These include 31.5% of white females and 45.7% of black females. Studies done on people age 20 and over show that women's cholesterol is higher than men are from age 20-34 and from age 55 on up. Before age 45, the total blood cholesterol level of women averages 190 mg/dL, but between ages 45 and 64, the average rises to between 217 and 237 mg/dL. Fifty-three percent of white females and 50.7 percent of black females have serum cholesterol levels of 200 mg/dL or higher. However, HDL value of greater than 60 mg/dL is protective against heart disease. Recommendations include HDL greater than 40, LDL less than 130, and the ratio of total cholesterol and HDL should not be higher than 4.5. Some sources (Das and Banka) believe the total cholesterol: HDL ratio is the best predictor of anatomic heart disease in women
7. Sedentary lifestyles – Women tend to have less active work than men. Like men, women need to engage in aerobic exercise three times a week for at least 30 minutes. Aerobic exercise lowers blood pressure and heart rate and counteracts the detrimental effects of other cardiovascular risk factors like obesity and stress.
8. Family history of heart disease – Men are screened for family history more thoroughly than women. If the mother or the father of the woman died of heart disease, the woman is at increased risk. However, maternal heart disease before age 60 is a higher risk factor than paternal heart disease. Black Americans have higher blood pressure and are more likely to develop heart disease than white Americans.
9. Previous history of infarction increases the risk in both men and women.
10. Stress – A woman's perception of her own stress is significant to the development of CAD. Although some studies have shown that Type A personality is predictive of CAD in men, to date no studies have shown this to be true for women.

Risk Factors Specific to Women

1. Oral Contraceptives – Women who use oral contraceptives have an increased risk of MI. Oral contraception affects lipid metabolism. This effect is synergistic if the woman smokes, and increases markedly after age 35. The risk diminishes after oral contraceptives are stopped.

Current Research: Two studies (conflicting with two previous studies) indicate that OC users had an increased odds ratio for ischemic stroke. Odds ratios were lower-for younger women, nonsmokers, and women without preexisting hypertension, but were higher for women over age 35 or who had no BP checks. Odds ratios were lower for low-dose pills, but duration of use did not affect odds ratio. The risk of hemorrhagic stroke was more than doubled among users over 35, more than triple among users who smoked and 10-15 times increased in users with a history of hypertension, compared to users without risk factors.

WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. Ischemic stroke and combined oral contraceptives: results of an international, multicenter, case-control study & WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. Hemorrhagic stroke, overall stroke risk and combined oral contraceptives: results of an international multicenter, case-control study. (1996). Lancet (348), 498-510.

A study of California Kaiser patients identified all fatal and nonfatal strokes from 1991 from women aged 15 to 44, and determined that the odds ratio for ischemic stroke among OC users was 1.18, and smoking increased this ratio to 3.64. This study indicated that there was not a significant increase for stroke in nonsmoking, low-dose OCP users. Petitti, D.B., et al. (1996.) Stroke in users of low-dose oral contraceptives New England Journal of Medicine (335), 8-15.

2. Pregnancy is a state of hypercoagulopathy (although platelets may decrease with HELLP syndrome.) As more women are becoming pregnant at an older age, more women with cardiac disease are becoming pregnant.
3. Menopause – The risk of CAD increases following either surgical or natural menopause due to a state of diminished estrogen. With decreasing estrogen the blood vessels become more friable, clotting tendencies increase and some vessels become smaller. After menopause there is a decrease in HDL levels and an increase in LDL levels. Recent research suggests that elevated iron levels greatly increase a man's risk of heart disease. Research is needed to see if this is a factor in heart disease risk in women following menopause.

“The Estrogen Replacement and Atherosclerosis (ERA) trial was presented in April 2000 at the American College of Cardiology annual meeting. Analyses of this research indicated that women with >30% stenosis in one or more coronary arteries did not differ

in disease progression whether or not they received CEE , CEE/MPA or placebo (Burkman, Collins, & Greene).

The HERS II study (a follow-up to the original HERS study) showed that the lower rates of coronary heart disease in women in the hormone treatment group did not persist with additional years of treatment with hormones, and that after 6.8 years, there was no reduction of cardiovascular events (Grady et al., 2002). Furthermore, there was an increased risk of venous thromboembolic disease and biliary tract disease in the women receiving hormone replacement as compared to the women in the placebo group (Hulley, et al., 2002).

The Women's Health Initiative Study (WHI) was released in July, 2002. Results from this publicized study have challenged the previous belief that hormone replacement therapy was generally safer than no therapy in menopausal women. The WHI was a random-assignment, clinical, double-blind, placebo trial of CEE/MPA in menopausal women with a uterus, CEE in menopausal women who had experienced hysterectomy, and placebo groups. Analyses of this data revealed that in a population of 10,000 women who received CEE/MPA, there would be 7 additional heart attacks or other coronary events, 8 more strokes, and 8 more episodes of pulmonary emboli as compared to women on placebo medication. Therefore, it was recommended that this regimen not be initiated or continued for primary prevention of coronary heart disease (Writing Group for the Women's Health Initiative Investigators, 2002)."

Previous research on this topic included the following studies:

Daly, E. (1996). Risk of venous thromboembolism in users of hormone replacement therapy. Lancet (348), 977-80.

Jick, H. et al. (1996). Risk of hospital admission for idiopathic venous thromboembolism among users of postmenopausal estrogen. Lancet (348), 981-3.

Grodstein, F. et al. (1996). Prospective study of exogenous hormones and risk of pulmonary embolism in women. Lancet (348), 983-7.

4. A list of risk factors pertinent to women would include: age greater than 55 or-premature menopause without ERT, diabetes, hypertension (even if treated), current smoker, low HDL (<35 mg/dL), a family history of premature CH D and a personal history of cardiac symptoms, diagnosed conditions, treatment and procedures. Other factors to consider include oral contraceptive use, personality (type A), low education level and cocaine use. The traditional risk factors are important to assess in women, but may differ in prediction of heart disease.

Points to Remember

- 1, Early menopause (natural or surgical) is a risk factor for premature coronary disease.
2. Post menopausal estrogen supplementation decreases the future risk of cardiovascular events.

4. Women are often referred for diagnostic and/or therapeutic cardiac procedures at lower rates than men; this referral bias may contribute to a higher mortality from cardiac procedures/events.
5. Coronary artery disease is the #1 killer of women.
6. Women have a greater risk than men of dying from a myocardial infarction.
7. Cigarette smoking is an especially strong risk factor for CV mortality/morbidity in women, especially young women.
8. Oral contraceptive use is a risk factor unique to women.

Symptoms of a Heart Attack from a Woman's Perspective

1. Shortness of breath, fatigue, nausea and upper abdominal pain are more common presentations in women. Both sexes may present with chest pain, dizziness, limb weakness, and fainting. Men are more likely to "break out in a cold sweat."
2. Women report to the ER later than men. They may have angina, shortness of breath swelling in hands and feet and exercise intolerance.
3. Women tend to have non-classical signs and symptoms such as localized back or nausea and vomiting.
4. Women tend to be non-demanding and polite. They may be in a state of denial about the possibility of a heart attack.

Methods to Reduce the Incidence and Improve Outcomes of CAD in Women

1. Education including women, health care providers and the public.
2. Non-biased research on heart disease in women.
3. Public policy changes, including standards for treatment of women with CAD.
4. Reimbursement for preventive care.
5. Appropriate equipment to diagnose and treat CAD. Include equipment that is the appropriate size for women.
6. Risk factor modifications needed for women.

Current Research: Women have poor outcomes and severe symptoms with smaller left ventricles. The current criteria for surgery for aortic regurgitation are based upon research on the

size of the male left ventricle (54mm). After adjustment for age and other variables, being female with aortic regurgitation increased the risk for poor outcome by 80%, with women with aortic regurgitation not meeting the criteria for size for surgery.

Kiodas, E, et al. (1996). Surgery for aortic regurgitation in women contrasting indications and outcomes compared with men. Circulation (94), 2472-8.

7. Appropriate screening.
8. Appropriate use of Standards of Care for CAD.
 - Class I: asymptomatic with no limitation of physical activity.
 - Class II: slight limitation of physical activity, asymptomatic at rest, symptomatic with heavy physical activity
 - Class III: considerable limitation of physical activity, asymptomatic at rest, symptomatic with minimal physical activity
 - Class IV: severe limitation of physical activity, symptomatic with any physical activity, may be symptomatic at rest
9. Reduce time to treatment. Goals are to identify all eligible patients for treatment. Achieve reperfusion within two hours after onset of symptoms. Begin thrombolytics within 30 minutes of presentation.

Assessment and History of Cardiac Disease in Women

1. Past Medical History – cardiac surgery or hospitalization, rheumatic fever, unexplained fever, swollen joints, inflammatory disease, chronic illness: hypertension, bleeding disorder hyperlipidemia, diabetes, CAD, congenital heart defect
2. Family History – diabetes, heart disease, hyperlipidemia, hypertension, congenital heart defects, sudden death (particularly in young or middle-aged relatives)
3. Personal and Social History – employment, environmental hazards, emotional stress, tobacco, nutritional status, alcohol consumption, known hypercholesterolemia, personality assessment, relaxation activities, exercise, use of illegal drugs I cocaine, amyl nitrate)
3. Common Presenting Problems – chest pain, fatigue, cough, difficult breathing, leg pain or cramps, transient syncope

Cardiac Diagnostic Tests

Heart disease is more difficult to diagnose in women compared to men. Interpretation of chest pain is more difficult, because of an increased incidence of noncoronary causes of chest pain. Further diagnostic tests are needed by women with chest pain. The presence of findings such as dysrhythmias, mitral regurgitation, a forth heart sound (atrial gallop), or basilar crackles increases the chance of a positive diagnosis of heart disease. Women with convincing heart disease may lack angiographic evidence 30% of the time.

RESTING EKG

This is a good test for women, and increases recognition of a silent infarction. The presence or absence of abnormal Q waves on resting may be affected by estrogen replacement therapy.

EXERCISE EKG

This test is controversial in the diagnosis of heart disease. It is associated with a higher false-positive rate since ST segment depression is fairly nonspecific in women. A true positive is profound ST segment depression. Greater accuracy is present with multi vessel disease, but more women have single vessel disease than men. Some women simply cannot raise their heart rate to the 85% maximum capacity required by the test. The test may be too strenuous for the elderly or with women with other medical conditions such as arthritis.

THALLIUM SCAN

With this test, thallium is injected at peak exercise and myocardial blood flow is evaluated. This test has better accuracy in women than the exercise EKG, with fewer false positive results. However, radioactivity over the breast tissue may lead to a false-positive diagnosis of a fixed perfusion defect in the anteriolateral segment. This test is also expensive and exposes the patient to radiation.

RADIO NUCLIDE VENTRICULOGRAM

With this test red blood cells are labeled in vivo with technetium 99m and images are recorded of blood flowing in the cardiac chambers. This test assesses chamber size and function, and the response of left ventricular EF and presence or absence of new wall motion abnormalities during exercise. This test has little diagnostic value in 30% of women because no increase in EF at peak exercise.

EXERCISE ECHOCARDIOGRAM

The exercise echocardiogram is a good test for women. It has 90% accuracy in women. It is sensitive to single vessel disease, which occurs more often in women than in men.

CARDIAC CATHETERIZATION

This test is the "gold standard" to detect cardiac disease. Men are still more than 10 times as likely to have a cardiac catheterization as women. Usually cardiac catheterization reveals less invasive disease in women.

EVALUATING HEART MURMURS IN WOMEN

CHARACTERISTICS OF BENIGN MURMUR

Benign murmurs occur in 50% to 70% of children and 50% of young adults.

1. Systolic
2. Grade 1/6 or 2/6
3. Short duration
4. Occur in early, middle, or late systolic phase
5. May be transmitted to the carotids
6. The second heart sound is always normal

7. Heard best when the patient is supine
8. Exacerbated by anemia, exercise, pregnancy, thyrotoxicosis, fever and emotional disturbances

GUIDE TO REFERRAL OF MURMURS

Heart murmurs that by client history or clinician findings suggest pathology should be referred for cardiac consultation.

1. History of chest pain
2. History of SOB at rest and/or exertion
3. History of RHD
4. History of signs of congestive heart failure: orthopnea, paroxysmal nocturnal dyspnea, , pedal edema, wheezing, coughing
5. History of previous cardiac problems
6. History of growth failure
7. Cyanosis
8. Enlarged or irregular thyroid
9. Hypertension
10. Suggests cardiac heart failure or right-sided ventricular failure: inspiratory basilar crackle or wheeze, edema, jugular vein distention, hepatomegaly
11. Severe anemia (Hct. 27%) or polycythemia
12. Diastolic murmur present
13. Irregular heart rate or rhythm
14. Bruit, heave, “click” or tactile thrill
15. Suspected cardiomegaly
16. Any murmur grade 3 or better
17. Murmur intensified by exercise or Valsalva maneuver (suggests sub aortic stenosis)
18. Diminished femoral pulses or unequal BP in right or left arms (suggests coarctation of aorta)
19. Friction rub (suggests pericarditis)
20. Fixed split S-2 (this means S-2 is split on inspiration and expiration and suggests atrial-septal defect; a split S-2 is normal on inspiration only and should disappear on expiration)
21. Paradoxical splitting of S-2 (noted when the split narrows on inspiration and widens with expiration, suggests left bundle-branch block)

Screening for Hypertension

Complications from Hypertension – Hypertensive and Atherosclerotic

The complications of hypertension may be divided into two risk categories:

- 1) Hypertensive risks: stroke, congestive heart failure and renal failure, with these risks correlating with high systolic pressure.
- 2) Atherosclerotic complications: coronary artery disease and peripheral vascular disease, with coronary complications varying depending upon the presence of other risk factors such as smoking, hypercholesterolemia, and glucose intolerance.

Risk Factors of Hypertension

Risk factors include age, gender, race, obesity, positive family history, alcohol intake, and psychological stress. Cigarette smoking, is not positively associated with increased blood pressure, but hypertensive smokers are at a greater risk to develop CV complications than nonhypertensive smokers.

Treatment Benefits

Hypertension is an asymptomatic disease, with clinically silent damage occurring for a decade or more. Regarding treatment, meta analyses suggest:

1. Benefit from blood pressure reduction increases with the severity of the elevation.
2. African-Americans and those older than 50 benefit most from treatment.
3. Young white women benefit the least.
4. Treatment in mild hypertension produces a marked reduction in stroke *38%), but only a modest reduction in (8%) in coronary events.
5. In most patients, benefits from treatment appear within 2 to 3 years.

Screening Methods

The correct measurement of blood pressure consists of two readings, 5 minutes apart, sitting in a chair. Elevated readings should be confirmed in the contralateral arm.

Ambulatory BP monitoring would be indicated for evaluation of “white coat hypertension.”

Absence of 10-20 percent BP decrease during sleep may indicate increased CVD risk.

Definition of Hypertension

Definitions of hypertension are arbitrary and vary from country to country. Consensus from a national report indicates a systolic pressure greater than or equal to 140 or a diastolic pressure greater than or equal to 90 is hypertensive. This report did not recommend the use of “mild,” “moderate,” or “severe.” four stages were designated.

Category	SBP mm Hg		DBP mm Hg
Normal	<120	and	<80
Prehypertension	120-139	or	80-89
Hypertension, Stage 1	140-159	or	90-99
Hypertension, Stage 2	≥160	or	≥100

Clinical Presentation

PRIMARY HYPERTENSION

Primary or essential hypertension accounts for 95% of cases. Onset is usually between 30 and 50. Patients may have a family history. Patients are generally asymptomatic.

LABILE HYPERTENSION

Labile hypertension is a blood pressure that intermittently rises above the normal levels for each age group and sex. Established hypertension subsequently happens more likely with these patients.

WHITE COAT HYPERTENSION

“White-Coat Hypertension” is blood pressure elevation that occurs with health care providers (most often doctors.)

SECONDARY HYPERTENSION

Secondary hypertension has definable etiology and occurs within a wide age range, is often abrupt in onset and is severe. Family history may be negative. (See table 19-2).

Establishing the Diagnosis

The diagnosis of hypertension is based on multiple determinations. Physical examination includes BP in both arms, and the bell of the stethoscope should also be used. The remainder of the exam should focus up-on possible secondary causes of hypertension. Patients at higher risk for secondary hypertension include those younger than 35, those with rapid onset of elevated BP and a negative family history, those with severe hypertension, and those who have failed to respond to empiric therapy.

PHYSICAL EXAM

Physical examination should focus on blood pressure (both arms), weight and pulse measurement, skin (Cushing’s, chronic renal failure and neurofibromatosis, funduscopy for arterial narrowing and increased vascular tortuosity, thyroid for enlargement, carotid pulses for bruits or diminution, lungs for signs of heart failure, heart for left ventricular lift, S-4 and S-5, abdomen for masses and bruits and the neurological exam for focal deficits.

LABORATORY STUDIES

(Goals of laboratory studies are to ascertain end-organ failure, to identify patients at high risk for the development of CV complications, and to screen for secondary, possibly reversible forms of disease. Basic labs are CBC, UA (primary renal disease), BUN or serum creatinine (primary renal disease), serum potassium (primary aldosteronism), fasting blood sugar (CV risk), serum cholesterol (CV risk), and ECG (CV risk).

Treatment

If a secondary cause of hypertension is determined, patient should be referred for treatment. If drugs are a possible cause of hypertension, the drug should be discontinued/changed and the patient should be reevaluated.

NONPHARMACOLOGICAL METHODS

Nonpharmacologic methods include limitation of overall cardiovascular risk (cessation of smoking and dietary reduction of fat) and salt restriction, weight reduction, exercise, reduction of excess alcohol, behavioral therapies and potassium/calcium supplements.

SALT RESTRICTION

Salt restriction works well with Blacks and the elderly. Either a no-added-salt diet or a low-sodium (2g/d diet) is recommended.

WEIGHT REDUCTION

The effect of weight reduction is independent of salt intake. Weight loss is particularly effective in patients with central adiposity (hip to waist ration .85 in women). The relationship of obesity to hypertension is strongest in young to middle-aged adults.

REDUCTION IN EXCESS ALCOHOL CONSUMPTION

More than 2 oz. of alcohol a day increases risk of hypertension.

EXERCISE

Aerobic exercise reduces weight and improves CV fitness and may help in patient with mild, uncomplicated hypertension. Candidates should be stress-tested before engaging in any vigorous exercise program.

BEHAVIORAL THERAPIES

Therapies such as relaxation techniques and biofeedback may have a modest benefit in those with mild pressure elevations. Meta analysis and future research is indicated.

POTASSIUM AND CALCIUM SUPPLEMENTS

Correction of diuretic-produced hypokalemia can produce short-term decreases in blood pressure. The overall effect of calcium supplementation is small and unpredictable.

PHARMACOLOGICAL THERAPY

the time of initiation of pharmacological therapy in women is especially controversial at this point and needs further research. Generally, therapies are initiated with physician consult, and following a protocol like that of Figure 26-1. Sequencing of drugs is generally through the use of thiazides and beta-blockers, with centrally acting sympatholytics, ganglionic blockers and older peripheral vasodilator being used less frequently. Newer agents include angiotensin converting enzymes (ACE) inhibitors, and calcium channel blockers, newer beta blockers and alpha blockers. See Table 26-1.

Assessment of Heart Disease in Women Reference:

Campbell, C. (1995). Primary care for women: Comprehensive cardiovascular assessment. *Journal of Nurse-Midwifery*, 40(2), 137-150