

# Cardiac Conditions

During pregnancy blood volume increases as much as 50% above the nonpregnant level and is accompanied by increases in maternal heart rate and stroke volume necessitating a drop in systemic and pulmonary vascular resistance. The client with heart disease may not be able to readily accommodate the higher workload of pregnancy as a result of decreased cardiac reserves.

(This plan of care is to be used in conjunction with the Trimesters and The High-Risk Pregnancy.)

## CLIENT ASSESSMENT DATA BASE

### Activity/Rest

Inability to carry on normal activities  
Nocturnal/exertion-related dyspnea; orthopnea

### Circulation

Tachycardia, palpitations; severe dysrhythmia.  
History of congenital/organic heart disease, rheumatic fever.  
Upward displacement of the diaphragm and heart proportionate to uterine size.  
May have a continuous diastolic or presystolic murmur; cardiac enlargement; loud systolic murmur, associated with a thrill.  
BP may be elevated or may be decreased with decreased vascular resistance.  
Clubbing of toes and fingers may be present, with symmetric cyanosis in surgically untreated tetralogy of Fallot.

### Elimination

Urine output may be decreased.  
Nocturia.

### Food/Fluid

Obesity (risk factor)  
May have edema of the lower extremities

### Pain/Discomfort

May report chest pain with/without activity

### Respiration

Cough; may or may not be productive.  
Hemoptysis.  
Respiratory rate may be increased.  
Dyspnea/shortness of breath, orthopnea may be reported.  
Rales may be present.

### Safety

Repeated streptococcal infections

## Teaching/Learning

Possible history of valve replacement/prosthetic device, mitral valve prolapse, Marfan's syndrome, surgically treated/untreated (rare) tetralogy of Fallot

## DIAGNOSTIC STUDIES

**White Blood Cell (WBC) Count:** Leukocytosis indicative of generalized infection, primarily streptococcal.

**Hemoglobin (Hg)/Hematocrit (Hct):** Reveals actual versus physiological anemia; polycythemia.

**Maternal Arterial Blood Gases:** Provide secondary assessment of potential fetal compromise due to maternal respiratory involvement.

**Sedimentation Rate:** Elevated in the presence of cardiac inflammation.

**Maternal Electrocardiogram (ECG):** Demonstrates patterns associated with specific cardiac disorders, dysrhythmias.

**Echocardiography:** Diagnoses mitral valve prolapse or Marfan's syndrome.

**Radionuclide Cardiac Imaging:** Evaluates suspected atrial or ventricular septal defects, patent ductus arteriosus, or intracardiac shunts.

**Serial Ultrasonography:** Detects gestational age of fetus and possible IUGR.

## NURSING PRIORITIES

1. Monitor degree/progression of symptoms.
2. Promote client involvement in control of condition and self-care.
3. Monitor fetal well-being.
4. Support client/couple toward culmination of a safe delivery.

## DISCHARGE GOALS

Inpatient care not required unless complications develop.

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### NURSING DIAGNOSIS:

#### Risk Factors May Include:

#### Possibly Evidenced By:

### DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT WILL:

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### Cardiac Output, risk for [decompensation]

Increased circulating volume, dysrhythmias, altered myocardial contractility, inotropic changes in the heart

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

Identify/adopt behaviors to minimize stressors and maximize cardiac function.

Tolerate the stress of increasing blood volume as indicated by BP and pulse within individually appropriate limits.

Demonstrate adequate placental circulation, kidney function with FHR and fetal movement WNL, and individually appropriate urine output.

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## **ACTIONS/INTERVENTIONS**

## **RATIONALE**

### **Independent**

Determine/monitor client's functional classification (as outlined by the New York Heart Association):

Class I: No limitation of physical activity, no discomfort during exertion

Class II: Ordinary activity may cause symptoms of palpitation, dyspnea, and angina

Class III: Less than ordinary activity causes cardiac symptoms, such as fatigue, dyspnea, and angina

Class IV: Symptoms of cardiac insufficiency occur in the absence of physical activity, and mortality risk per Clark's classification system of risk status for pregnant women.

Provide information about the necessity of adequate rest (e.g., 8–10 hr at night and ½ hr after each meal).

Discuss use of left or right lateral position.

Monitor vital signs.

Auscultate client's breath sounds.

Evaluate FHR, daily fetal movement count, and NST results as indicated. (Refer to CP: The High-Risk Pregnancy; ND: Injury, risk for fetal.)

Assess for evidence of venostasis with resulting dependent edema of extremities or generalized edema. Instruct client to elevate legs when sitting down and periodically during the day.

Instruct client to monitor fluid intake/output. (Refer to ND: Fluid Volume, risk for excess.)

Useful for identifying client needs/limitations, effectiveness of therapies, and progression/remission of condition.

Minimizes cardiac stress and conserves energy. Class IV clients may require bedrest for the duration of the pregnancy. (Refer to ND: Activity Intolerance, risk for.)

The occurrence of supine hypotension possibly to the point of loss of consciousness can be prevented if the client avoids the supine position and adopts the lateral recumbent resting position.

The beginning stage of decompensation caused by intolerance of circulatory load, infection, or anxiety may first be noted by an insidious change in the vital sign pattern, associated with increased temperature, pulse (110 bpm or greater), respiration (greater than 20–34/min), and BP.

Congestive heart failure (CHF) may develop, especially in clients whose functional classification is class III or IV. Conversely, clients with mitral valve prolapse may be symptom-free during pregnancy, owing to the increase in left ventricular volume, yet are at high risk for involvement related to chest pain, palpitations, and possibly death after delivery.

Fetal hypoxia caused by beginning stage of maternal cardiac decompensation may be noted in the form of tachycardia, bradycardia, or reduction in fetal activity.

Prolonged positioning of legs and ankles below the level of the heart further impairs venous return in an already stressed circulatory system and places the client at risk for PIH.

Although intake and output should be approximately the same, cardiovascular involvement may negatively affect kidney function, resulting in oliguria/anuria.

Investigate reports of chest pain and palpitations.  
Recommend limiting caffeine as appropriate.

Review medication needs and reason for conversion to heparin by warfarin (Coumadin) users.

Instruct client in self-administration of medication such as heparin. Observe return demonstration of procedure by client.

Assess for/review signs of ecchymosis, epistaxis, and so forth during anticoagulant therapy.

## Collaborative

Participate in/coordinate multispecialty care conference as appropriate.

Administer medications such as digitalis glycosides (digoxin or digitoxin) or propranolol (Inderal) as indicated. Monitor for early labor.

Administer loading dose of heparin.

Treat underlying infections as necessary, e.g., respiratory, and provide prophylaxis as necessary. (Refer to ND: Infection, risk for maternal.)

Using sequential serum/urine estriol levels and CST/NST, assess placental functioning. (Refer to CP: The High-Risk Pregnancy; ND: Injury, risk for fetal.)

Clients with mitral valve prolapse may develop arrhythmias resulting in chest pain and palpitations. Limiting caffeine may reduce frequency of episodes.

Because of its large molecular size, heparin sodium does not cross the placenta, as does warfarin; also, heparin may prevent clot formation in the client with valve prosthesis/atrial fibrillation.

Involves client in therapeutic process, and promotes self-care.

Signs of bleeding may indicate a need to reduce heparin dosage.

Provides opportunity to review management of both pregnancy *and* cardiac condition, and to plan for special needs during intrapartum and postpartum periods.

Cardiac stress brought on by increased demand for output is greatest between 28 and 32 weeks' gestation, then levels off until delivery. Digitalis glycosides maximize ventricular contractions, but increased plasma volume may lower circulating levels of the drug, necessitating increased or more frequent doses. Digitalis has a direct effect on the myometrium, often causing early labor as well as shortening the length of labor. Propranolol may be used to control dysrhythmias associated with mitral valve prolapse. Note: Although these drugs cross the placenta and have no reported teratogenic effects, studies have not yet clearly established their safety in pregnancy. In addition, ACE inhibitors are contraindicated because of the risk of fetal death or intractable neonatal renal failure.

Warfarin users should have their anticoagulant converted to heparin. Initial dose may be administered intravenously by healthcare provider.

Cardiac decompensation may develop/is worsened by superimposed upper respiratory infection, which is usually associated with coughing and increased secretions, and which may mask deterioration of cardiac function. Prophylactic antibiotics help prevent bacterial endocarditis in client with diseased heart valves.

Reduced cardiac function may negatively affect placental functioning.

Obtain/review sequential ECGs.

Monitor laboratory studies, such as clotting times and electrolyte levels.

Encourage use of antithrombotic stockings.

Prepare client for hospitalization as warranted by her condition.

Monitor hemodynamic pressures using arterial and central venous pressure (CVP) lines or Swan-Ganz catheter to monitor pulmonary artery wedge pressure as indicated.

May demonstrate pathological pattern if decompensation is present; may identify type of dysrhythmia.

Prolonged clotting times may indicate need to adjust heparin dosage. Hyponatremia/hypokalemia may occur, owing to reduced sodium intake or diuretic therapy with imbalances potentiating-development/aggravation of dysrhythmias.

Promotes venous return; limits venous stasis.

Clients with a functional classification of class II through class IV are usually hospitalized 2 wk before expected delivery, because likelihood of decompensation is greatest during the latter part of the third trimester. Clients with class IV function may be hospitalized earlier in the pregnancy, depending on fetal status/developing complications.

CVP lines measure venous return/circulating volume; the Swan-Ganz catheter may be required to monitor pulmonary pressures and, indirectly, left-sided heart function in client hospitalized for progressive CHF.

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**NURSING DIAGNOSIS:****Risk Factors May Include:****Possibly Evidenced By:****DESIRED OUTCOMES/EVALUATION****CRITERIA—CLIENT WILL:****Fluid Volume risk for excess**

Increasing circulating volume, changes in renal function, dietary indiscretion

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

Demonstrate stable fluid balance with vital signs

WNL, appropriate weight gain, absence of edema.

Verbalize understanding of restrictions/therapy needs.

List signs that require notification of care provider.

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**ACTIONS/INTERVENTIONS****RATIONALE****Independent**

Obtain baseline weight. Instruct client to monitor her weight at home periodically as indicated.

Review dietary intake, noting factors that may contribute to excessive fluid retention; provide information as needed.

Instruct client to monitor amount and color (concentration) of urine. Measure specific gravity as appropriate during home/office visit.

Weight gain exceeding the normal 2–2½ lb/wk may indicate accumulating fluid and potential CHF. If weight gain is sudden, rule out toxemia.

Improper diet, specifically a deficiency of protein and excess of sodium, contributes to fluid retention.

Decreased output, dark amber urine; increasing specific gravity may reflect impaired renal perfusion associated with developing CHF.

Assess for/review signs of CHF with client (e.g., dyspnea, distended neck veins, crackles, hemoptysis, and so forth).

Investigate unexplained cough.

### Collaborative

Restrict fluids and sodium in presence of CHF.

Administer diuretics, e.g., chlorothiazide (Diuril), hydrochlorothiazide (HCTZ), furosemide (Lasix), as appropriate.

Indicates developing failure and need for immediate treatment. The normal increase of 1300 ml in circulatory volume that occurs in pregnancy can put stress on the cardiac system. Further increase of fluid can be especially dangerous for the client with existing cardiac problems.

Cough unrelated to respiratory problems may indicate developing CHF.

Minimizes risk of fluid retention/overload.

Helps rid body of excess fluid resistant to conservative treatment of rest and decreased sodium intake.

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#### NURSING DIAGNOSIS:

##### Risk Factors May Include:

##### Possibly Evidenced By:

##### DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT WILL:

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#### Tissue Perfusion, risk for altered: uteroplacental

Changes in circulating volume, right-to-left shunt

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

Display BP, pulse, ABGs, and WBC count WNL. Demonstrate adequate placental perfusion as indicated by reactive fetus with heart rate ranging from 120–160 bpm and size appropriate for gestational age.

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### ACTIONS/INTERVENTIONS

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### RATIONALE

#### Independent

Note individual risk factors and pregravid state.

Assess BP and pulse. Note behavior changes, cyanosis of mucous membranes and nail beds, activity intolerance, and signs of decompensation (i.e., excessive weight gain, unexplained cough, crackles/wheezes, hemoptysis, and increased pulse and respiratory rate).

Provide information about use of modified upright position for sleeping and resting.

Any preexisting cardiac problems complicated by increased circulatory needs during pregnancy may result in impaired tissue oxygenation. Note: Such problems are greater in the older client with obesity and long-standing cardiac involvement.

Tachycardia (heart rate greater than 110 bpm) at rest, increasing BP, and behavior changes may indicate early cardiac failure or hypoxia. A fall in peripheral vascular resistance may result in a worsening of right-to-left shunting and cyanosis. Presence of cyanosis, a late sign of hypoxia, reflects severe problems and indicates severity of tissue damage and cardiac compromise.

Eases respiratory rate by reducing pressure of the enlarging uterus on the diaphragm and helps increase vertical diameter for lung expansion. Helps prevent venous stasis in lower extremities.

## Collaborative

Monitor laboratory studies as indicated:

Pulse oximetry/ABGs;  
Hb/Hct;

WBC count, culture of upper/lower respiratory secretions.

Assess uterine/fetal blood flow using NST/CST; check estriol levels and FHR. (Refer to CP: The High-Risk Pregnancy; ND: Injury, risk for fetal.)

Reflects adequacy of ventilation and oxygenation. Anemia further reduces oxygen-carrying capacity of blood and may require treatment. Any respiratory involvement reduces intake of oxygen. Infection increases metabolic rates and oxygen needs and may have a negative impact on tissue oxygenation.

Uterine/placental hypoxia reduces fetal activity and FHR, and presents as late decelerations on CST. Hypoxia may result in placental deterioration and falling estriol levels.

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### NURSING DIAGNOSIS:

#### Risk Factors May Include:

#### Possibly Evidenced By:

#### DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT WILL:

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### Infection, risk for maternal

Inadequate primary/secondary defenses, chronic disease/condition, insufficient information to avoid exposure to pathogens

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

Identify/adopt behaviors to reduce individual risk.

Remain free of bacterial infection.

Demonstrate appropriate use of antimicrobial agents, as indicated.

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## ACTIONS/INTERVENTIONS

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## RATIONALE

### Independent

Assess for individual risk factors and history of rheumatic fever.

There is increased risk of bacterial endocarditis in the prenatal client with underlying heart disease, such as valvular damage caused by rheumatic or congenital processes, mitral valve prolapse, ventricular septal defect, tetralogy of Fallot, pulmonic stenosis, coarctation of the aorta, or prosthetic valve.

Provide information about risk of bacterial endocarditis during specific medical-surgical procedures.

The client with a prosthetic valve is at high risk for bacterial endocarditis and emboli, even in an uncomplicated vaginal delivery. Transient bacteremia may occur following invasive procedures, including dental work. (About 60%–90% of clients develop bacteremia after dental extraction).

Review signs/symptoms suggestive of infectious processes requiring notification of healthcare provider, e.g., fever, malaise, cough, cloudy/odiferous urine.

Prompt recognition of problem facilitates timely intervention.

## Collaborative

Assess urine periodically, note pH, and presence of bacteria.

Obtain cultures as indicated.

Administer penicillin PO or IM, when indicated.

Bacteria may be asymptomatic and lead to bacteremia if untreated.

Useful in identifying infecting agent/appropriate therapy.

Prophylactic antibiotics may be recommended for prevention of streptococcal infection during pregnancy, especially in the client with history of rheumatic fever.

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### NURSING DIAGNOSIS:

#### Risk Factors May Include:

#### Possibly Evidenced By:

#### DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT WILL:

### Activity Intolerance, risk for

Presence of circulatory problems, previous episodes of intolerance, deconditioned status

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

Demonstrate self-responsibility for monitoring activity tolerance/intolerance.

Adopt behaviors to maximize tolerance.

Take appropriate actions if cardiac/respiratory symptoms arise.

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## ACTIONS/INTERVENTIONS

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## RATIONALE

### Independent

Assess for development of subjective/objective symptoms (e.g., lessening of tolerance to ordinary physical activity, fatigue, cyanosis, inability to carry on normal daily activities, increasing dyspnea with or without physical activity, nocturnal dyspnea, change in pulse rate, development of respiratory symptoms).

Review signs/symptoms with the client and significant other(s).

Assist client in setting priorities and restructuring daily routine to include needed rest/sleep periods. Determine expectations of client and partner. Explore conflicts/differences.

Identify energy conserving methods to accomplish necessary ADLs.

Indicates a worsening of the cardiac condition, evidenced by a decrease in the client's functional capacity.

Promotes self-care and timely medical interventions.

Circulatory/respiratory impairment may interfere with ability to perform activities of daily living (ADLs) and may result in fatigue. Activity is limited in relation to the extent of cardiac impairment. Clients with class I or II limitation may only need to include midmorning and midafternoon rest periods, whereas class III or class IV clients may need bedrest for much or all of the day.

May enable client to manage activities more effectively.

Ascertain effectiveness of household assistance and available resources.

May be needed to maximize rest, limit fatigue, and preserve cardiac function.

## Collaborative

Refer to home care agency, community resources

Can provide additional assistance when necessary, as indicated.

Refer to occupational therapist (OT), physical therapist (PT), as appropriate.

May be helpful in identifying assistive techniques/devices to conserve energy and accomplish desired ADLs.

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### NURSING DIAGNOSIS:

**Knowledge deficit [Learning Need], regarding condition, prognosis, and treatment needs**

#### May Be Related To:

Lack of exposure to and/or misinterpretation of information

#### Possibly Evidenced By:

Request for information, statement of misconception, inaccurate follow-through of instructions

#### DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT WILL:

Verbalize understanding of individual condition and treatment needs.

Identify symptoms indicating deterioration of cardiac functioning.

Intervene and/or notify healthcare provider appropriately.

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## ACTIONS/INTERVENTIONS

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## RATIONALE

### Independent

Assess understanding of pathology/complications regarding cardiac condition and pregnancy. Review history, incidence of complications, and so forth.

Establishes data base for health teaching. Increasingly severe cardiac symptoms may indicate client's need for more information and/or assistance to manage necessary self-care.

Discuss necessity for frequent monitoring; i.e., every 2 wk during first 20 wk, then every week until delivery.

Provides for early detection of problems and prompt intervention.

Provide information about symptoms indicative of cardiac involvement, such as shortness of breath, cough, palpitations, unusual or rapid weight gain (i.e., 2.2–4.4 lb or 1–2 kg in a 2-day period), edema, or anorexia.

Symptoms associated with decompensation should be differentiated from symptoms associated with PIH. (Refer to CP: Pregnancy-Induced Hypertension; ND: Fluid Volume deficit.)

Provide information as appropriate regarding diet, rest/sleep, exercise, and relaxation.

Enhances informed decision making, helps reduce likelihood of complications. The impact of pregnancy superimposed on an existing cardiac problem may necessitate changes in lifestyle. An understanding of techniques designed to lessen cardiac stress may require the acquisition of new knowledge.

Review need/techniques to avoid infection.

Review side effects of both prescription and OTC drugs.

Discuss special considerations, such as need to avoid foods high in vitamin K (raw, deep-green leafy vegetables) when on anticoagulants.

Include healthcare team in teaching/planning.

Provide appropriate information for protocol of care in home/community/hospital setting.

Identify support groups, community resources.

Resistance may be lowered because of general condition.

Determines client's level of knowledge and provides current information.

Such foods counteract/alter anticoagulant drug effect.

Provides continuity and completeness of care.

May foster self-responsibility and reduce anxiety.

May serve as role model for necessary adaptations, enhance coping ability, and provide encouragement for a successful outcome.