

Structural, Infectious, and Inflammatory Cardiac Disorders



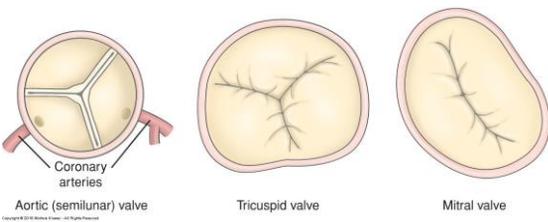
Valvular Disorders

- ❖ Regurgitation: The valve does not close properly, and blood backflows through the valve
- ❖ Stenosis: The valve does not open completely, and blood flow through the valve is reduced
- ❖ Valve prolapse: The stretching of the valve leaflet into the atrium during systole

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Valvular Disorders



Specific Valvular Disorders

- ❖ Mitral valve prolapse
- ❖ Mitral regurgitation
- ❖ Mitral stenosis
- ❖ Aortic regurgitation
- ❖ Aortic stenosis

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Nursing Management of Patients with Valvular Heart Disorders

- ❖ Patient education
- ❖ Monitor VS trends, heart and lung sounds, peripheral pulses
- ❖ Monitor for complications
 - Heart failure
 - Arrhythmias
 - Other symptoms: dizziness, syncope, angina pectoris
- ❖ Medication schedule: plan and education
- ❖ Daily weights: monitor for weight gain
- ❖ Plan activity with rest periods

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Mitral Valve Prolapse

- ▶ > ♀
- ▶ Pathophysiology
- ▶ Etiology
- ▶ S/S
 - fatigue, SOB, lightheaded, dizziness, syncope, palpitations, chest pain, anxiety, mitral click, systolic click, S/S of heart failure
- ▶ Dx
 - Echocardiogram
- ▶ Treatment/ Nursing Care
 - No caffeine, alcohol, smoking cessation
 - Antiarrhythmics
 - Chest pain- nitrates, Ca channel blocker, beta blockers
 - Mitral valve replacement
 - Prevent endocarditis

Mitral Regurgitation

- ▶ Pathophysiology
- ▶ Etiology
 - Degenerative changes
- ▶ S/S
 - If S/S- dyspnea, fatigue, weakness, palpitations, SOB on exertion, cough
 - Systolic murmur, HR regular or irregular
- ▶ Dx
 - Echocardiography, TEE
- ▶ Treatment/ Nursing Care
 - ACE inhibitors
 - ARB's
 - Beta-blockers
 - Mitral valve repair or valve replacement

Mitral Stenosis

- ▶ Pathophysiology
- ▶ Etiology
 - Rheumatic endocarditis
- ▶ S/S
 - Dyspnea, pulse is weak & irregular, diastolic murmur, atrial dysrhythmias, fatigue, dry cough, wheezing, hemoptysis, palpitations, PND, respiratory infections, atrial dysrhythmias
- ▶ Dx
 - Echo, ECG, cardiac catheterization
- ▶ Treatment/Nursing Care

Aortic Regurgitation

- ▶ Pathophysiology
- ▶ Etiology
 - Endocarditis, congenital syphilis, dissecting aneurysm, trauma, idiopathic
- ▶ S/S
 - Diastolic murmur, widened pulse pressure
 - Water-hammer (Corrigan's) pulse, forceful heartbeat, S/S of left ventricular failure
- ▶ Dx
 - Echo, TEE, radionuclide imaging, ECG, MRI, cardiac catheterization
- ▶ Treatment/Nursing Care

Aortic Stenosis

- ▶ Pathophysiology
 - narrowing
- ▶ Etiology
- ▶ S/S
 - Asymptomatic, exertional dyspnea, dizziness, angina, orthopnea, PND, pulmonary edema, systolic murmur, S4
- ▶ Dx
 - Echo, ECG, catheterization
- ▶ Treatment/Nursing Care
 - Valve replacement

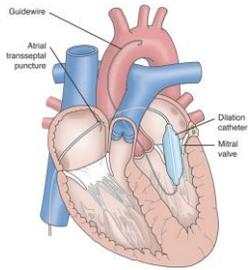
Surgical Management of Valvular Heart Disorders

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| <ul style="list-style-type: none">❖ Valvuloplasty<ul style="list-style-type: none">◦ Commissurotomy◦ Balloon valvuloplasty◦ Annuloplasty◦ Leaflet repair◦ Chordoplasty | <ul style="list-style-type: none">❖ Valve replacement<ul style="list-style-type: none">◦ Mechanical◦ Tissue◦ Bioprosthesis◦ Homografts◦ Autografts |
|--|--|

Valve Valvuloplasty/ Repair

- ▶ Commissurotomy
 - Closed/ balloon
 - Contraindications
 - Complications
 - Open
- ▶ Annuloplasty
- ▶ Leaflet Repair
- ▶ Chordoplasty

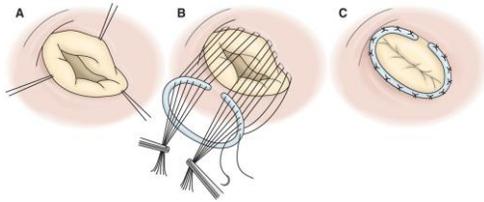
Balloon Valvuloplasty



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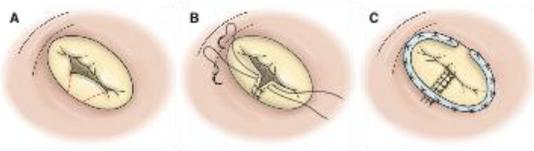
Annuloplasty Ring Insertion



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Valve Leaflet Resection and Repair with Ring Annuloplasty



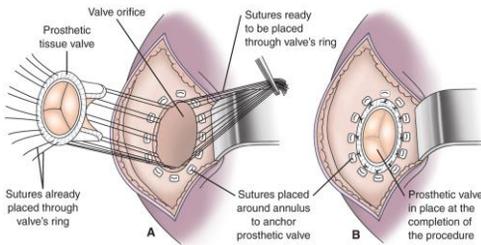
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Valve Replacement

- ▶ Mechanical Valves
- ▶ Tissue (biological) Valves
 - Bioprosthesis (heterografts)
 - Xenografts
 - Tricuspid valve
 - Homografts (allografts)
 - Aortic and pulmonic valve replacements
 - Autografts (autologous)
 - Pt's own pulmonic valve and portion of pulmonary artery for the aortic valve

Valve Replacement



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Nursing Care-Valvuloplasty/ Replacement

- ▶ Percutaneous
 - Telemetry/ ICU
 - Assess S/S of heart failure
 - Heart sounds every 4 hours
 - ▶ Surgical
 - ICU
 - VS every 5-15 minutes until recovers from anesthesia then every 2-4 hrs
 - Manage bp
 - Assess bp/ dysrhythmia
 - IV
 - Neuro, resp, CV assessments every 1-4 hrs
- Labs
Patient Education

Nursing Management of the Patient with Valvuloplasty or Valve Replacement #1

- ❖ Balloon valvuloplasty
 - Monitor for heart failure and emboli
 - Assess heart sounds every 4 hours
 - Same care as after cardiac catheterization
- ❖ Surgical valvuloplasty or valve replacements
 - Focus is hemodynamic stability and recovery from anesthesia
 - Frequent assessments with attention to neurologic, respiratory, and cardiovascular systems

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Nursing Management of the Patient with Valvuloplasty or Valve Replacement #2

- ❖ Patient education
 - Anticoagulation therapy
 - Prevention of infective endocarditis
 - Follow-up
 - Repeat echocardiograms

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Septal Defects

- ▶ Atrial Septal Defect (ASD)
 - Right to left shunt → pulmonary HTN, heart failure, arrhythmias, CVA
 - Exercise intolerance, dyspnea on exertion, palpitations, syncope, S/S of right ventricular failure or CHF
- ▶ Ventricular Septal Defect (VSD)
 - Left to right shunt → pulmonary HTN, SOB, syncope, chest pain, S/S of left ventricular failure

Treatment/ Management

Cardiomyopathy

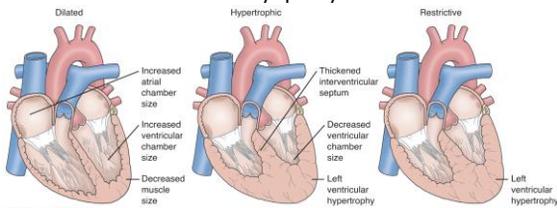
- ❖ Cardiomyopathy is a series of progressive events that culminates in impaired cardiac output
- ❖ Types
 - Dilated cardiomyopathy (DCM)
 - Hypertrophic cardiomyopathy (HCM)
 - Restrictive/constrictive cardiomyopathy (RCM)
 - Arrhythmogenic right ventricular cardiomyopathy/dysplasia (ARVC/D)
 - Unclassified cardiomyopathy

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Cardiomyopathy- Classifications

- ▶ Dilated cardiomyopathy (DCM)
- ▶ Hypertrophic cardiomyopathy
- ▶ Restrictive cardiomyopathy
- ▶ Arrhythmogenic right ventricular cardiomyopathy
- ▶ Unclassified cardiomyopathy



Assessment of the Patient with Cardiomyopathy

- ❖ History (predisposing factors, family history)
- ❖ Chest pain
- ❖ Review of systems: presence of orthopnea, syncope
- ❖ Review of diet (Na reduction, vitamin supplements)
- ❖ Psychosocial history: impact on family, stressors, depression
- ❖ Physical assessment: VS, pulse pressure; pulsus paradoxus; weight gain or loss; PMI; murmurs; S3 or S4; pulmonary auscultation for crackles, JVD, and edema

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Cardiomyopathy

- ▶ S/S
 - s/s of heart failure, PND, cough (exertional), orthopnea, fluid retention, edema, nausea, chest pain, palpitations, dizziness, syncope, tachycardia, S3,S4, systolic murmurs
- ▶ Diagnostic Tests
 - ECG, CXR, cardiac catheterization

Collaborative Problems and Potential Complications of the Patient with Cardiomyopathy

- ❖ Heart failure
- ❖ Ventricular arrhythmias
- ❖ Atrial arrhythmias
- ❖ Cardiac conduction defects
- ❖ Pulmonary or cerebral embolism
- ❖ Valvular dysfunction

Cardiomyopathy- Treatment

- ▶ Medications
- ▶ Low Na diet
- ▶ Exercise/rest regimen
- ▶ Control dysrhythmias
- ▶ Medications
- ▶ Implantable cardioverter defibrillator (ICD)
- ▶ Anticoagulants
- ▶ Fluid intake
- ▶ Avoid dehydration
- ▶ Beta blockers
- ▶ Pacemaker
- ▶ Nonsurgical septal reduction therapy (alcohol septal ablation)

Planning and Goals for the Patient with Cardiomyopathy

- ❖ Goals
 - Improvement of cardiac output and peripheral blood flow
 - Increased activity tolerance
 - Reduction of anxiety
 - Decreased sense of powerlessness
 - Effective management of self-care

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Nursing Interventions for the Patient with Cardiomyopathy #1

- ❖ Improve cardiac output and peripheral blood flow
 - Rest, positioning (legs down), supplemental O2, medications, low Na diet, avoid dehydration
- ❖ Increase activity tolerance and improve gas exchange
 - Cycle rest and activity, ensure patient recognizes symptoms that indicate the need for rest
- ❖ Reduce anxiety
 - Eradicate or alleviate perceived stressors, educate family about diagnosis, assist with anticipatory grieving

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Nursing Interventions for the Patient with Cardiomyopathy #2

- ❖ Decrease the sense of powerlessness
 - Assist patients in identifying things that have been lost (i.e., ability to play sports), assist patients in identifying amount of control they still have left
- ❖ Promote home and community-based care
 - Educate patients about ways to balance lifestyle and work while accomplishing therapeutic activities
 - Assess patient and family and their adjustment to lifestyle changes, educate family about CPR and AEDs, establish trust

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Evaluation of the Patient with Cardiomyopathy #1

- ❖ Maintains or improves cardiac function
 - HR and RR WNL, decreased dyspnea and increased comfort, maintain or improve gas exchange, absence of weight gain, maintain or improve peripheral blood flow
- ❖ Maintains or increases activity tolerance
 - Carries out activities of daily living (e.g., brush teeth, feed self), reports increased tolerance to activity

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Evaluation of the Patient with Cardiomyopathy #2

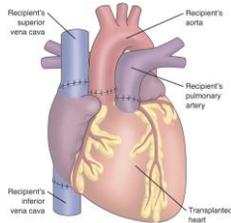
- ❖ Is less anxious
 - Discusses prognosis, verbalizes fears and concerns, participates in support groups, demonstrates appropriate coping mechanisms
- ❖ Decreases sense of powerlessness
 - Identifies emotional response to diagnosis, discusses control that they have
- ❖ Effectively manages self-care program
 - Takes medications as prescribed, modifies diet to accommodate sodium and fluid recommendations, modifies lifestyle, identifies S&S to be reported

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Cardiomyopathy- Surgical Treatment

- ▶ Left Ventricular Outflow Tract Surgery
- ▶ Latissimus Dorsi Muscle Wrap
- ▶ Ventricular Assist Device (VAD)
- ▶ Heart Transplantation



Infectious Diseases of the Heart

- ❖ Any of the three layers of the heart may be affected by an infectious process
- ❖ Diseases are named by the layer of the heart that is affected
- ❖ Diagnosis is made by patient symptoms and echocardiogram
- ❖ Management for all infectious diseases is prevention
- ❖ IV antibiotics usually are necessary once an infection has developed in the heart

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Infectious Heart Disease

- ▶ Rheumatic Endocarditis
- ▶ Infective Endocarditis
- ▶ Myocarditis
- ▶ Pericarditis



Clinical Manifestations of Infectious Diseases of the Heart

- ❖ Fever
- ❖ New heart murmur, friction rub at left lower sternal border (pericarditis)
- ❖ Osler nodes, Janeway lesions, Roth spots, and splinter hemorrhages in nailbeds (rheumatic)
- ❖ Cardiomegaly, heart failure, tachycardia, splenomegaly
- ❖ Fatigue, dyspnea, syncope, palpitations, chest pain (myocarditis)
- ❖ Diagnostic tools: blood cultures, echocardiogram, CBC, rheumatoid factor, ESR, CRP, ECG, cardiac catheterization, TEE, CT scan

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Rheumatic Endocarditis

- ▶ Etiology
 - Group A beta hemolytic streptococcal pharyngitis
 - Rheumatic fever
- ▶ S/S
 - Murmur, cardiomegaly, pericarditis, heart failure
- ▶ Dx- based on hx
- ▶ Treatment/Nursing Care
 - Prevention

Infective Endocarditis

- ▶ Microbial infection of the endothelium
 - Prosthetic heart valve, structural defects
 - IV drug users
 - Invasive procedures
- ▶ S/S
 - Fever, heart murmur, petechiae, small painful nodules on pads of fingers and toes, flat macules (palms, fingers, hands, soles, toes), roth spots, splinter hemorrhages on nail, cardiomegaly, heart failure, tachycardia, splenomegaly
- ▶ Dx
 - S/s, +RF, ↑ ESR, CRP, blood cultures
- ▶ Treatment/ Nursing Care
 - Prevention
 - Antibiotics
 - Surgical excision

Myocarditis

- ▶ Etiology
 - Viral infection- myocardial inflammation → heart dilation, thrombi, infiltration around coronary vessels, degeneration of muscle fibers
- ▶ S/S
 - Chest pain and upper abdominal pain, fatigue, dyspnea, palpitations, "flu-like" symptoms, HF, cardiac arrest
- ▶ Dx
 - Cardiac MRI, ECG
- ▶ Treatment/Nursing Care
 - Prevention
 - Early treatment

Pericarditis

- ▶ Classification
 - Serous, purulent, calcific, fibrinous, sanguinous
- ▶ S/S
 - Chest pain, friction rub, mild fever, ↑ WBC, ESR, or CRP, nonproductive cough, dyspnea, HF
- ▶ Dx
- ▶ Treatment/ Nursing Care
 - NSAIDs, corticosteroids, colchicine, pericarddiocentesis

Prevention of Infectious Diseases of the Heart

- ❖ Antibiotic prophylaxis before certain procedures
- ❖ Ongoing oral hygiene
- ❖ Female patients are advised NOT to use IUDs
- ❖ Meticulous care should be taken in patients "at risk" who have catheters
- ❖ Catheters should be removed as soon as they are no longer needed
- ❖ Immunizations
