CHAPTER 13

DISEASE MANAGEMENT

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Abstract

Disease management applies comprehensive, evidence-based approaches to optimize medication therapy across major therapeutic areas through systematic assessment, intervention, and monitoring strategies. Cardiovascular disorder management encompasses hypertension, dyslipidemia, heart failure, anticoagulation, and coronary syndromes through guideline-directed medication selection, risk stratification, and monitoring protocols addressing both symptomatic control and outcome modification. Endocrine disorder approaches optimize diabetes mellitus, thyroid conditions, adrenal disorders, and metabolic bone diseases through medication regimen individualization, monitoring parameter selection, and complication prevention strategies addressing complex hormonal interactions. Respiratory condition management addresses asthma, COPD, pulmonary infections, and sleep-disordered breathing through appropriate controller and rescue medication selection, device technique optimization, and exacerbation prevention protocols. Infectious disease therapy implements antimicrobial stewardship principles, empiric therapy selection, de-escalation protocols, and transition strategies across bacterial, viral, and fungal infections balancing effective pathogen eradication with resistance prevention. Oncology management encompasses chemotherapy optimization, targeted therapy selection, immunotherapy monitoring, and supportive care integration through molecular biomarker utilization and complex regimen management. Mental health approaches address depression, bipolar disorder, schizophrenia, anxiety, and substance use disorders through appropriate medication selection, therapeutic monitoring, and adherence support addressing both symptomatic control and functional improvement. This systematic approach enables optimal medication management across diverse disease states through specialized therapeutic knowledge and patient-centered application.

Keywords: *Pharmacotherapeutics, Guideline Implementation, Therapy Optimization, Disease Modification, Treatment Algorithms*

Learning Objectives

After completion of the chapter, the learners should be able to:

- Implement evidence-based pharmacotherapy for cardiovascular disorders including hypertension, heart failure, dyslipidemia, and arrhythmias through guideline-directed medical therapy.
- Optimize medication management for endocrine disorders including diabetes mellitus, thyroid conditions, and metabolic bone disease using appropriate therapeutic algorithms.
- Develop comprehensive treatment approaches for respiratory conditions including asthma, COPD, and pulmonary infections addressing both maintenance therapy and exacerbation management.
- Apply antimicrobial stewardship principles to infectious disease management including appropriate empiric selection, de-escalation, and duration optimization.
- Implement specialized medication management strategies for oncology patients including chemotherapy protocols, targeted therapy monitoring, and supportive care optimization.
- Develop therapeutic approaches for mental health conditions including appropriate medication selection, monitoring, and adherence support for depression, anxiety, and serious mental illness.

CARDIOVASCULAR DISORDERS

Hypertension

Initial assessment evaluates secondary causes, target organ damage, and cardiovascular risk factors to establish appropriate treatment goals, typically <130/80 mmHg for most patients based on current guidelines, with consideration of individualized targets for elderly patients (sometimes accepting <140/90 mmHg) or those with significant orthostatic tendencies. First-line agent selection emphasizes thiazide diuretics (chlorthalidone preferred over hydrochlorothiazide due to longer duration of action), ACE inhibitors/ARBs (particularly for those with diabetes, chronic kidney disease, or heart failure), and calcium channel blockers based on compelling indications, demographic considerations, and comorbidities. Combination therapy strategies address resistant hypertension through rational multi-drug approaches addressing complementary mechanisms rather than simply maximizing single-agent doses, with fixed-dose combinations improving adherence compared to multiple individual

prescriptions.

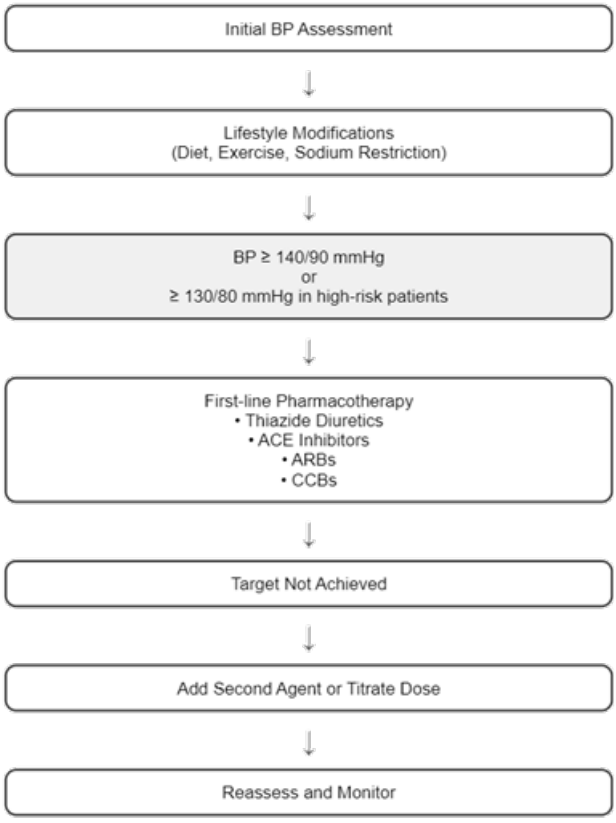

Figure 13.1: Hypertension Management Algorithm

Dyslipidemia

Risk assessment employs validated calculators including the Pooled Cohort Equations to estimate 10-year ASCVD risk, guiding intensity of intervention and treatment goals, with primary prevention typically recommended for those with ≥7.5% 10-year risk plus risk-enhancing factors or ≥20% risk regardless of additional factors. Statin therapy optimization implements appropriate intensity selection based on risk category, with high-intensity statins (atorvastatin 40-80mg, rosuvastatin 20-40mg) for established ASCVD or highest-risk primary prevention, and moderate-intensity statins for intermediate-risk categories, targeting specific LDL reduction percentages (≥50% for high-intensity, 30-49% for moderate-intensity) rather than arbitrary numerical goals.

Non-statin therapy integration addresses residual risk or statin intolerance through evidence-based agents including ezetimibe (10mg daily), PCSK9 inhibitors (evolocumab 140mg every 2 weeks or alirocumab 75-150mg every 2 weeks), bempedoic acid, and icosapent ethyl (4g daily).

Table 13.1: Management of Cardiovascular Disorders

Cardiovascular Condition	Assessment Parameters	Evidence-Based Pharmacotherapy	Monitoring Approach
Hypertension	BP measurement (technique, timing, device), TOD assessment, comorbidity evaluation	ACEI/ARB, CCB, thiazide diuretics, beta-blockers per guideline algorithms	BP target achievement, TOD regression, adverse effect monitoring, adherence assessment
Heart Failure with Reduced EF	NYHA class, volume status, ejection fraction, biomarkers	GDMT (ACEI/ARB/ARNI, beta-blocker, MRA, SGLT2i), diuretics, digoxin, ivabradine	Symptom improvement, hospitalization reduction, biomarker trends, ejection fraction changes
Heart Failure with Preserved EF	Diastolic function, volume status, exercise capacity	Diuretics, blood pressure control, comorbidity management, potentially SGLT2i	Volume status, symptom control, exercise tolerance, hospitalization prevention
Atrial Fibrillation	Rhythm assessment, rate control, stroke risk (CHA_2DS_2-VASc), bleeding risk (HAS-BLED)	Rate control (beta-blockers, CCB, digoxin), rhythm control (antiarrhythmics), anticoagulation	Rate control adequacy, rhythm maintenance, stroke prevention, bleeding avoidance
Coronary Artery Disease	Angina classification, risk factor profile, ischemic burden	Antiplatelet therapy, statins, beta-blockers, nitrates, antianginals	Symptom control, event prevention, risk factor modification, revascularization need

Cardiovascular Condition	Assessment Parameters	Evidence-Based Pharmacotherapy	Monitoring Approach
Dyslipidemia	Lipid panel, ASCVD risk assessment, secondary causes	Statins (intensity based on risk), ezetimibe, PCSK9 inhibitors, other agents	LDL-C reduction goals, ASCVD event prevention, muscle symptoms, liver function
Thromboembolic Disease	VTE risk assessment, bleeding risk, recurrence risk	Anticoagulant selection (DOAC vs. warfarin), duration determination, intensity selection	Clot resolution, recurrence prevention, bleeding avoidance, therapeutic levels if applicable
Peripheral Artery Disease	Functional classification, ABI measurement, symptom assessment	Antiplatelet therapy, statins, cilostazol, risk factor modification	Symptom improvement, walking distance, limb preservation, cardiovascular risk reduction

Heart Failure Management

Stage A/B intervention (patients at risk or with structural heart disease without symptoms) emphasizes risk factor control and neurohormonal blockade to prevent progression, including blood pressure management, diabetes control, and ACE inhibitor/ARB therapy for those with reduced ejection fraction regardless of symptom status. Stage C therapy (symptomatic heart failure) implements comprehensive regimens including RAAS inhibitors (ACE inhibitors, ARBs, or sacubitril/valsartan), beta-blockers (carvedilol, metoprolol succinate, or bisoprolol), aldosterone antagonists (spironolactone or eplerenone), and SGLT2 inhibitors for reduced ejection fraction, with different approaches for preserved ejection fraction focusing on symptom management and comorbidity control. Volume status optimization balances diuretic therapy against electrolyte stability and renal function, with flexible dosing strategies based on congestion assessment including daily weight monitoring, symptom evaluation, and physical examination findings.

Anticoagulation Management

Atrial fibrillation stroke prevention employs risk stratification using CHA_2DS_2-VASc scoring to identify appropriate candidates for anticoagulation (generally recommended for scores ≥2 in men or ≥3 in

women), with agent selection between warfarin (target INR 2-3) and direct oral anticoagulants (apixaban, dabigatran, edoxaban, rivaroxaban) based on specific patient factors including renal function, drug interactions, and cost considerations. Venous thromboembolism management implements appropriate acute treatment and secondary prevention durations based on event characteristics, provocation status, and bleeding risk assessment, with provoked events typically treated for 3 months, first unprovoked events for at least 6-12 months, and recurrent unprovoked events often receiving indefinite therapy. Periprocedural management develops bridge therapy protocols addressing thromboembolic risk during temporary anticoagulation interruptions, stratifying patients into low, moderate, and high risk categories with corresponding strategies ranging from simple interruption to full-dose parenteral bridging.

Acute Coronary Syndrome Management

Antiplatelet therapy optimization includes appropriate loading and maintenance strategies for aspirin (162-325mg loading, 81mg daily maintenance) and $P2Y_{12}$ inhibitors (clopidogrel 600mg loading/75mg daily, ticagrelor 180mg loading/90mg twice daily, prasugrel 60mg loading/10mg daily) based on presentation, intervention approach, and bleeding risk. Anticoagulant selection for acute management navigates options including unfractionated heparin, low molecular weight heparins, and direct thrombin inhibitors based on institutional protocols and patient characteristics, with careful attention to appropriate dosing, monitoring, and duration. Secondary prevention implements comprehensive approaches including dual antiplatelet therapy of appropriate duration (typically 12 months after acute coronary syndrome with shorter or longer durations based on individual bleeding and thrombotic risk), high-intensity statin therapy, RAAS inhibition, and risk factor modification addressing smoking cessation, diabetes control, and blood pressure management.

Peripheral Arterial Disease Management

Antiplatelet therapy optimization implements single-agent therapy with aspirin (81mg daily) or clopidogrel (75mg daily) for most patients, with combination therapy in specific high-risk scenarios including recent revascularization or concurrent coronary artery disease with high ischemic and low bleeding risk. Statin therapy employs high-intensity agents based on the established cardiovascular risk equivalent status of peripheral arterial disease, typically atorvastatin 40-80mg or rosuvastatin 20-40mg daily unless contraindicated or poorly tolerated. Claudication symptom management includes structured exercise programs (supervised treadmill exercise 3 times weekly for 30-60