Heart Failure Review and Medication Adherence Strategies for APRNs

Two (2.0) Contact Hours

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Darrell Hulisz, RPh, PharmD is an Associate Professor of Family Medicine and Community Health in the School of Medicine at Case Western Reserve University, Cleveland, OH. He also holds a clinical faculty appointment at Ohio Northern University, College of Pharmacy. Dr. ("Darrell") Hulisz received his BS in Pharmacy from the University of Toledo and Doctor of Pharmacy from the Medical University of South Carolina.

Darrell has published over 70 papers in the medical and pharmacy literature, has lectured extensively both locally and nationally and has served as an investigator in several clinical trials. He has made numerous appearances on local television and radio programs. He also serves on several national advisory panels and is an author for WebMD’s Medscape.com and a speaker and author for AMN Healthcare's RxSchool.com.

Darrell currently practices as a clinical pharmacist with University Hospitals, Case Medical Center, Family Medicine Residency Program, where he works in consultation with family physicians, both on inpatient and outpatient services. Darrell has been the recipient of multiple teaching awards. He also completed a federal, multi-agency faculty development fellowship to further his expertise in the field of addiction medicine. He also served as a co-investigator for a multidisciplinary chronic pain study funded by the Macy Foundation. He was recently awarded a federal grant as a co-investigator to develop leadership and advocacy in urban health and community health within a multidisciplinary team.
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Purpose and Objectives

The purpose of this 2 contact hour course for Advanced Practice Registered Nurses (APRNs) is to review the basic pathophysiology of heart failure and discuss current pharmacological management options for managing this condition.

After successful completion of this continuing education course, the APRN will be able to:
1. Describe the epidemiology of heart failure with respect to prevalence and associated risks.
2. Explain the pathogenesis and basic pathophysiology of heart failure.
3. Understand the national consensus guidelines on pharmacological management of patients with heart failure.
4. Identify medications that can exacerbate or complicate the management of patients with heart failure.
5. Discuss the most common clinical scenarios where certain medications may be preferred or contraindicated when used to treat heart failure.
6. Summarize key nurse-to-patient counseling points to improve care of patients with heart failure.
7. Discuss strategies that APRNs can implement to improve medication adherence in patients with cardiovascular disease.

Introduction

Heart failure (HF) occurs when an abnormality of cardiac function is responsible for the inability of the heart to pump blood at a rate commensurate with the requirements of the metabolizing tissues. HF represents a syndrome in which cardiac dysfunction is associated with reduced exercise tolerance, a high incidence of ventricular arrhythmias and shortened life expectancy.
Epidemiology and Prognosis

The incidence, prevalence, and hospitalization rates of HF are increasing in the US. Approximately 5.1 million Americans have HF, and about 670,000 cases are diagnosed each year. The annual hospital charges for HF exceed 1 million dollars. Direct and indirect costs for in 2009 were about $37.2 billion.

HF can result from any disorder that affects the heart’s ability to contract and/or relax. The most common form of HF is impaired systolic function, whereas isolated diastolic failure is less common. Patients often present with co-existing systolic and diastolic dysfunction.

Preexisting hypertension and dyslipidemia in patients with HF underscores the importance of aggressive control of blood pressure (BP), lipids, and other risk factor reduction methods.

HF is more prevalent in women: Only 22% of males compared to 46% of females develop HF within 6 years of myocardial infarction.

The overall 5-year survival rate is ~50%. About 75% of HF cases have pre-existing hypertension. (Lindenfeld et al., 2010; Yancy et al., 2013).

Did You Know?

Studies suggest that up to 50% HF patients have preserved Left Ventricular Ejection Fraction (LVEF) with presumed diastolic dysfunction.

Test Yourself

About 75% of HF cases have preexisting hypertension.

A. True- Correct! The overall 5-year survival rate is ~50%. About 75% of HF cases have preexisting hypertension.

B. False

Etiology of HF

Coronary artery disease (CAD) is the cause in about 70% of all HF cases. Preserved left ventricle ejection fraction (LVEF), which was formerly known as diastolic dysfunction, results from restricted ventricular filling and increased ventricular stiffness which can be secondary to:

• Ventricular hypertrophy and hypertrophic cardiomyopathy
• Amyloidosis, sarcoidosis and endomyocardial fibrosis
• Myocardial ischemia and infarction
• Mitral or tricuspid valve stenosis

Systolic dysfunction (decreased contractility) results from:

• Reduction in muscle mass (e.g. myocardial infarction)

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• Dilated cardiomyopathies and ventricular hypertrophy
• Pressure pulmonary hypertension, aortic or pulmonic valve stenosis, valvular regurgitation, shunts and high output states
(Lindenfeld et al., 2010; Yancy et al., 2013).

Additional Etiology
Other causes of HF include:
• Alcoholic cardiomyopathy
• Viral cardiomyopathy (e.g. Coxsacki B virus myocarditis)
• Pericarditis

Myotoxic chemotherapy drugs, mainly the anthracycline derivatives, such as daunomicin, doxorubicin, can also cause HF, as well as high-dose cyclophosphamide.

Long-term abuse of cocaine has been associated with HF.

Several medications can exacerbate HF, such as negative inotropes, NSAIDs, TZDs (e.g. rosiglitazone), fludrocortisone, sodium overload and iron overload. HF exacerbations can also be due to pulmonary infections, atrial fibrillation, anemia and thyroid disease.
(Lindenfeld et al., 2010; Yancy et al., 2013).

Test Yourself
TZD drugs, such as rosiglitazone generally improve HF symptoms.

A. True
B. False- Correct! Several medications can exacerbate HF, such as negative inotropes, NSAIDs, TZDs (e.g. rosiglitazone), fludrocortisone, sodium overload & iron overload.
Pathogenesis and Sequelae of HF

(Lindenfeld et al., 2010; Yancy et al., 2013).

Compensatory Mechanisms in HF
The heart’s decrease in pumping capacity results in compensatory responses to maintain cardiac output. Responses are intended to be short term after acute reductions in BP or renal perfusion.

Persistent decline in cardiac output in HF results in long term activation of compensatory responses, leading to functional, structural, biochemical and molecular changes.

Chronic ventricular remodeling and hypertrophy lead to more detrimental compensatory effects which forms a major basis for pharmacotherapy.
(Lindenfeld et al., 2010; Yancy et al., 2013).

Clinical Presentation

Symptoms:
- Dyspnea, particularly on exertion
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Decreased exercise tolerance
- Cough
- Fatigue
- Nocturia
- Hemoptysis
- Anorexia
- Nausea, GI bloating
- Hypotension
- Early satiety
- Ascites
- Mental status changes
(Lindenfeld et al., 2010; Yancy et al., 2013).
Signs:
- Rales
- Pulmonary edema
- S3 gallop
- Cool extremities
- Pleural effusion
- Cheyne-Stokes respiration (late stages)
- Tachypnea
- Tachycardia
- Narrow pulse pressure
- Cardiomegaly
- Peripheral edema
- Jugular venous distension
- Hepatojugular reflux
- Hepatomegaly
(Lindenfeld et al., 2010; Yancy et al., 2013).

NYHA Functional Capacity Classification

Class I
No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or angina.

Class II
Slight limitation of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.

Class III
Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.

Class IV
Unable to carry on any physical activity without discomfort. Symptoms present at rest. With any physical activity, symptoms increase.
(The Criteria Committee for the New York Heart Association, 1994).

Overview of HF Management

The initial management of HF involves being able to identify and address the presumed etiology and/or precipitating factors.

HF co-morbidities, precipitating factors and risk factors should be addresses, such as concurrent hypertension, alcoholism, etc.

A variety of pharmacotherapeutic options are available; most patients with chronic HF need multiple medications.

A variety of implantable cardiac devices are available for selected patients.
Surgical techniques, including heart transplantation may be indicated in patients refractory to medical management.

Nonpharmacologic therapy is employed as well, and includes patient and family education, cardiac rehabilitation, supervised exercise, O2 if appropriate, sodium and fluid restriction, and daily weights with close monitoring and feedback to responsible physician and/or HF management team. (Lindenfeld et al., 2010; Yancy et al., 2013).

Prevention of HF

Angiotensin Converting Enzyme (ACE) Inhibitors (ACEIs) are recommended for prevention of HF in patients at high risk for HF, including those with:

- Coronary artery disease
- Peripheral vascular disease
- Stroke
- Diabetes
- Previous MI (Use of beta blockers (BB) and ACE Inhibitors is recommended)

ACE inhibitors are recommended for symptomatic patients with an LVEF ≤ 40%. ACE inhibitors should be titrated to doses used in clinical trials, as tolerated during up-titration of other medications, such as BB. ACE inhibitors are recommended as routine therapy for asymptomatic patients with an LVEF ≤ 40% in both post-MI, and in patients with a history of MI. (Lindenfeld et al., 2010; Yancy et al., 2013).

Did You Know?

Aggressive BP reduction is necessary in all patients with HTN to achieve a BP <130/80mmHg.
ACE Inhibitor Doses for HF

<table>
<thead>
<tr>
<th>Drug</th>
<th>Starting Dose</th>
<th>Target Dose</th>
<th>Manufacturer’s Maximal Dose</th>
<th>Approximate Daily Dose Conversion to Enalapril</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benazepril</td>
<td>5-10mg QD</td>
<td>20mg QD</td>
<td>40mg BID</td>
<td>1:1</td>
</tr>
<tr>
<td>Captopril</td>
<td>6.25-12.5mg TID</td>
<td>50mg TID</td>
<td>100mg TID</td>
<td>7.5:1</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5-5mg BID</td>
<td>10mg BID</td>
<td>20mg BID</td>
<td></td>
</tr>
<tr>
<td>Fosinopril</td>
<td>5-10mg QD</td>
<td>20mg QD</td>
<td>40mg QD</td>
<td>1:1</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>2.5-5mg BID</td>
<td>10mg BID</td>
<td>20mg BID (20mg QD)</td>
<td>1:1</td>
</tr>
<tr>
<td>Moexipril</td>
<td>3.75-7.5mg QD</td>
<td>7.5mg QD</td>
<td>30mg QD</td>
<td></td>
</tr>
<tr>
<td>Perindopril</td>
<td>2mg QD</td>
<td>4mg QD</td>
<td>16mg QD</td>
<td>1:5</td>
</tr>
<tr>
<td>Quinapril</td>
<td>5mg BID</td>
<td>20mg BID</td>
<td>40mg QD</td>
<td>2:1</td>
</tr>
<tr>
<td>Ramipril</td>
<td>1.25-2.5mg BID</td>
<td>5mg BID</td>
<td>10mg BID</td>
<td>1:2</td>
</tr>
<tr>
<td>Trandolapril</td>
<td>1mg QD</td>
<td>4mg QD</td>
<td>4mg BID</td>
<td>1:5</td>
</tr>
</tbody>
</table>

(Microdex, 2013, Lexi-Comp, 2013, Lindenfeld et al., 2010 and Yancy et al., 2013).

Considerations for Initiating ACE Inhibitors

Before starting an ACEI, it is important to review baseline data, such as:

- BP
- Serum creatinine
- Stability of creatinine
- Volume status
- History of recent diuresis
- Previous exposure to ACEI
- A history of intolerance to ACEI (e.g. angioedema and/or cough)
- The potential for pregnancy

ACE Inhibitors and Renal Function

ACEI are best tolerated when a patient is euvolemic (normal blood volume). Patients who are using diuretics can develop hypotension and in rare cases, this can precipitate renal impairment.

A baseline serum creatinine is necessary and a small rise in creatinine may be acceptable, but if creatinine rises to above 2.5-3mg/dl discontinue therapy immediately, as well as hold any diuretics that are being administered.

(Lindenfeld et al., 2010 and Yancy et al., 2013).

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ACE Inhibitors: Managing Adverse Effects
If patients develop a cough with an ACEI, an Angiotensin Receptor Blockers (ARB) is the recommended alternative.

If hyperkalemia, or worsening renal function develops, an ARB is likely to produce similar effects, so hydralazine/nitrate combination is a recommended alternative.

If angioedema develops, ARBs can be used with appropriate patient counseling and education, unless the history of angioedema was life-threatening.
(Lindenfeld et al., 2010 and Granger et al., 2003).

Beta Blockers (BB) in HF
BB have been shown to be effective in clinical trials in HF and are recommended for symptomatic patients with an LVEF ≤ 40%.

BB are recommended as routine therapy for asymptomatic patients with an LVEF ≤ 40%.

BB are recommended as routine therapy for post-MI patients.

Clinical benefits of BBs are delayed in patients with HF; counsel patients that it may take several weeks for them to feel better.
(Lindenfeld et al., 2010; Yancy et al., 2013).

Please note!
Avoid BBs in patients with active bronchospasm.

BB in HF Exacerbation and Cardiac Decompensation
For cases of recent HF exacerbation and cardiac decompensation:
• BBs are recommended after optimization of volume status and successful discontinuation of IV diuretics and vasoactive agents.
• BB should be initiated in the hospital at a low dose prior to discharge of stable patients.
• For symptomatic exacerbations, BBs are usually continued, but clinical caveats can modify this recommendation, such as shock and bradycardia.
(Lindenfeld et al., 2010; Yancy et al., 2013).
HFSA Guideline

General Considerations
- Initiate at low doses
- Up-titrate gradually, generally no sooner than at 2 week intervals
- Use target doses shown to be effective in clinical trails
- Aim to achieve target dose in 8-12 weeks
- Maintain at maximum tolerated dose

If symptoms worsen or other side effects appear
- Adjust dose of diuretic or concomitant vasoactive med
  Continue titration to target after symptoms return to baseline

If up-titration continues to be difficult
- Prolong titration interval
- Reduce target dose
- Consider referral to a HF specialist (Lindenfeld et al., 2010).

Titrating Beta-Blocking Agents

<table>
<thead>
<tr>
<th>Agent</th>
<th>Starting Dose</th>
<th>Target Dose &lt;85 kg</th>
<th>Target Dose &gt;85 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisoprolol*</td>
<td>1.25 mg PO daily</td>
<td>10 mg PO daily</td>
<td>10 mg PO daily</td>
</tr>
<tr>
<td>Carvedilol*</td>
<td>3.125 mg PO BID</td>
<td>25 mg PO BID</td>
<td>50 mg PO BID(^5)</td>
</tr>
<tr>
<td>Carvedilol Phosphate (Coreg CR(^\circ))</td>
<td>10 mg PO daily</td>
<td>80 mg PO daily</td>
<td>80 mg PO daily</td>
</tr>
<tr>
<td>Metoprolol Succinate CR/XL*</td>
<td>25 mg PO daily(^*) 12.5 mg PO daily(\dagger)</td>
<td>200 mg PO daily</td>
<td>200 mg PO daily</td>
</tr>
</tbody>
</table>

* NYHA Class II
\(\dagger\) NYHA Class III
\(^5\)mild to moderate HF
\(*\) generic available

(Lindenfeld et al., 2010).

Test Yourself

A majority of patients with HF who have experienced a recent myocardial infarction should receive a beta blocker unless a strong contraindication exists.

A. True - Correct!
B. False

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Angiotensin Receptor Blockers (ARBs) in HF

ARBs are recommended for routine administration to patients with an LVEF ≤ 40%, who are intolerant to ACEI for reasons other than hyperkalemia or renal insufficiency.

ARBs carry similar warnings to ACEIs including being contraindicated in pregnancy. Incidence of cough and angioedema is much less with ARBs, as compared to ACEIs.

### ARBs in HF

<table>
<thead>
<tr>
<th>Drug</th>
<th>Starting Dose</th>
<th>Target Dose</th>
<th>Manufacturer’s Maximal Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candesartan (Atacand®)</td>
<td>4-8mg QD</td>
<td>32mg QD</td>
<td>32mg QD</td>
</tr>
<tr>
<td>Valsartan (Diovan®)</td>
<td>20-40mg BID (80mg BID if hypertensive)</td>
<td>160mg BID</td>
<td>160mg BID</td>
</tr>
</tbody>
</table>

**ARBs Less Studied in HF**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Starting Dose</th>
<th>Manufacturer’s Maximal Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losartan (Cozaar®)</td>
<td>25-50mg QD</td>
<td>100mg QD</td>
</tr>
<tr>
<td>Irbesartan (Avapro®)</td>
<td>75-150mg QD</td>
<td>300mg QD</td>
</tr>
<tr>
<td>Olmesartan (Benicar®)</td>
<td>10-20mg QD</td>
<td>40mg QD</td>
</tr>
</tbody>
</table>

(Lindenfeld et al., 2010).

**Hydralazine and Oral Nitrates in HF**

A combination of hydralazine and isosorbide dinitrate is recommended as part of standard therapy, in addition to beta-blockers and ACE-I, for African Americans with HF and reduced LVEF.

The most widely studied combination is 20 mg of isosorbide dinitrate and 37.5 mg of hydralazine hydrochloride (BiDil®) which must be given TID.

Side effects, such as headache, edema, dizziness and lupus-like syndrome (with hydralazine) may complicate therapy.

(Lindenfeld et al., 2010 and Yancy et al., 2013).

**Please note!**

*Isosorbide dinitrate is the recommended product, verses isosorbide mononitrate.*
Aldosterone Antagonists in HF

Aldosterone antagonists are recommended for patients on standard therapy, including diuretics, who have NYHA class IV HF, or HF from reduced LVEF (≤ 35%).

Aldosterone antagonists can be considered for use in post-MI patients with HF or diabetes and an LVEF < 40% who are on standard therapy, including an ACE inhibitor (or ARB) and a BB, but not responding.

Aldosterone antagonists are not recommended when:
- Creatinine > 2.5mg/dL (or Clcr < 30 mL/min)
- Serum potassium > 5.0 mmol/L
- Therapy includes other potassium-sparing diuretics

(Lindenfeld et al., 2010 and Yancy et al., 2013).

When using an aldosterone antagonists it is recommended that potassium be measured at baseline, then in 1 week, then in 1 month, and every 3 months thereafter.

Avoid using aldosterone antagonists in combination with an ACEI plus an ARB, since this will dramatically increase the risk of hyperkalemia.

The maintenance dose in HF is:
- Spironolactone 12.5-25mg daily (may dose BID)
- Eplerenone 25mg daily (max 50mg/day)

Note! The dose can be adjusted downward, or used every other day if hypotension or hyperkalemia is a concern.
(Lindenfeld et al., 2010 and Yancy et al., 2013).

**Did You Know?**

*Supplemental potassium is not recommended unless potassium is < 4.0 mmol/L.*

Digoxin remains an option for patients exhibiting refractory HF symptoms in spite of ACEI/BB therapy.

No mortality benefit from digoxin in HF has been demonstrated in clinical trials.

Patients with renal impairment and the elderly are at increased risk for digoxin toxicity.
(Lindenfeld et al., 2010, Yancy et al., 2013 and The Digitalis Investigation Group, 1997).

**Did You Know?**

*Digoxin serum levels should be kept below <1ng/ml to avoid toxicity.*
Test Yourself
Renal impairment decreases the risk of digoxin toxicity.
A. True
B. False - Correct! Renal impairment increases the risk of digoxin toxicity.

Diuretics in HF
Diuretic therapy is recommended to restore and maintain normal volume status in patients with clinical evidence of fluid overload.

Loop diuretics rather than thiazide-type diuretics are typically necessary to restore normal volume status in patients with HF.
(Lindenfeld et al., 2010, Yancy et al., 2013)

**Did You Know?**
*Diuretics should not be administered in the evening since they may cause nocturia.*
*Volume overload manifests as weight gain, congestive symptoms and signs of elevated filling pressures.*

Diuretics in HF
Restoration of normal volume status may require multiple adjustments.

Once a diuretic effect is achieved with short-acting loop diuretics, increase frequency to 2-3 times a day if necessary, rather than increasing a single dose.

Oral torsemide may be considered in patients exhibiting poor absorption of oral medication or erratic diuretic effect.

Diuretic refractoriness may represent patient non-adherence, a direct effect of diuretic use on the kidney, or progression of underlying dysfunction.
(Lindenfeld et al., 2010, Yancy et al., 2013)

Sodium restriction and patient education with daily weights and symptom monitoring needed when diuretics used chronically in HF.

The addition of a diuretic with alternate mechanism of action may augment loop diuretic effect, such as metolazone.

Monitor electrolytes, renal function and volume status carefully (after 7-14 days) if metolazone is used, since there is a high incidence of over-diuresis and potassium and sodium depletion.
(Lindenfeld et al., 2010, Yancy et al., 2013)
Please note!

Intermittent use of diuretics is preferred over daily use.

Medications That Can Exacerbate HF

- NSAIDs
- Calcium channel blockers (verapamil, diltiazem)
- Thiazolidinediones (rosiglitazone)
- Tricyclic antidepressants (amitriptyline)
- Corticosteroids with mineralocorticoid effect (fludrocortisone)
- High-dose sympathomimetics
- Negative inotropic agents (Type 1a antiarrhythmics, such as quinidine and procainamide)
- Cyclosporine

(Feenstra et al., 1993 and Tsuyuki et al., 2001).

Patient Counseling

HF patients require consistent education on HF co-morbidities, such as hypertension, dyslipidemia and diabetes and the correct lifestyle modifications that are needed to successfully manage these conditions.

Patients should be counseled to decrease exacerbating life-style factors, such as smoking, excessive intake of sodium, alcohol, saturated fats, and should be encouraged to increase exercise as much as tolerated.

Educate patients on signs and symptoms of HF that may indicate a worsening of condition, such as weight gain, changes in exercise tolerance, worsening cough and dyspnea.

Promote the appropriate use of vaccines.

Monitor for drug interactions, poor adherence, under dosing, omitted medications and taking potentially inappropriate medications.

Overview of Medication Adherence

Compliance can be defined as the degree to which a patient’s actual dosing schedule corresponds with the regimen prescribed. It can also be defined as the right drug in the correct dose at the right interval.

Persistence is defined as success at seeing the medication therapy through to its intended point of closure. The problem of poor medication adherence should be regarded as one of the most important public health issues. Yet, many examples of poor medication adherence still exist in HF patients today.

Improving adherence is challenging in underprivileged populations.
Please Note!

Improving medication adherence is a critical factor toward generating favorable outcomes, and should be regarded as a shared responsibility of everyone in health care.

Chronic Conditions and Medication Adherence

Chronic conditions that require long term, frequently lifelong treatment have unique needs for increased adherence and persistence and consequently enhanced outcomes.

Many patients have the mistaken belief that they can discontinue treatment once they get lipid levels to goal, or lower their blood pressure to goal.

Denial of the chronic nature of these conditions may be overcome with intense patient educations focusing on the adverse health consequences of poor control and benefits of good control.

Did You Know?

50% of the 1.8 billion prescription medications dispensed annually in the United States are not taken correctly by patients (Smith, 1993).

More Emphasis on Medication Adherence is Needed

Considerable time and resources are spent on making a proper diagnosis and initiating proper treatment.

Costly patient work-ups and the extensive training of clinicians are to some degree “wasted” if patients do not adhere to their medication regimes.

Many years and of billions of dollars are spent on research and development of pharmaceuticals, as well as marketing expenditures, but the problem of adherence still persists.

An underlying assumption is often made that patients are adhering to their medications as prescribed.

Summary of Medication Adherence Studies

Most research that has been done with chronic cardiovascular conditions have been with conditions such as hypertension, HF and dyslipidemia.

Non-cardiovascular conditions studies include diabetes, HIV, asthma, depression, and in special populations, such as elderly patients and ethnic minorities.
Thus, extrapolating results of medication adherence studies to the population at large is limited. Medication non-adherence rates are highest in those:

- With low socioeconomic status
- Who belong to ethnic minority groups
- With low literacy rates
- With problems identifying their medications

Note that similar rates of non-adherence have been found in rural communities and is also problematic in affluent populations. (Haynes et al., 2005; DeWalt and Pignone, 2005)

**Test Yourself**

Studies have shown that medication non-adherence is lowest in those with high socioeconomic status.

**A. True- Correct! Medication non-adherence rates are highest in those with: low socioeconomic status, ethnic minorities, low literacy rates, and problems identifying their medications.**

**B. False**

**Economic and Humanistic Toll of Noncompliance**

About one-half of the prescriptions written annually are taken incorrectly by patients, and poor medication adherence is responsible for approximately 10% of all hospitalizations.

Poor medication adherence is responsible for 23% of all nursing home admissions.

Excessive treatments are associated with poor medication adherence, lost productivity, greater use of emergency care and even premature deaths.

The cost of non-adherence is $100-290 billion annually. (Berg et al., 1993)

**Test Yourself**

Approximately 10% of hospital admissions are directly related to medication non-adherence.

**A. True- Correct! Poor medication adherence is responsible for approximately 10% of all hospital admissions.**

**B. False**
Measuring Medication Adherence
There is no gold standard for measuring medication adherence. The use of both electronic health records, along with patient or caregiver / guardian education are needed.

Selection of the adherence measurement tool depends on multiple factors, including the type of intervention being evaluated, the resources of the organization, as well as ethical and legal considerations as related to patient intervention and confidentiality.
(Fairman and Motheral, 2000; Schnipper et al., 2006 and Smith et al., 2010).

Morisky Medication Adherence Scale
The Morisky Scale is a four-item, self-reported adherence tool used to assess medication adherence. One point is allocated to each positive response:

• Do you ever forget to take your medicine?
• Are you careless at times about taking your medication?
• When you feel better do you sometimes stop taking your medicine?
• Sometimes if you feel worse when you take the medicine, do you stop taking it?

The Morisky scale addresses barriers to taking medication, which allows the health care provider to reinforce positive adherence behavior.
(Morisky, Green and Levine, 1986).

Please note!
A score of >1 on the Morisky Scale requires further probing.

Modified Morisky Scale
The Modified Morisky Scale can be modified to include two additional yes or no questions:

1. Do you know the long-term benefit of taking your medicine as told to you by your doctor or pharmacist?
2. Sometimes do you forget to refill your medication on time?

The scale can be tailored for a specific disease state and can help identify adherence problems, barriers and potential solutions, as well as reinforce positive adherence behavior.
(Morisky, et al., 2008).
## Compliance Rates by Disease State

<table>
<thead>
<tr>
<th>Therapeutic Area</th>
<th># Reports</th>
<th>Mean Compliance Rate (%)</th>
<th>Range (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>5</td>
<td>80</td>
<td>35-97</td>
</tr>
<tr>
<td>Cardiovascular (all)</td>
<td>26</td>
<td>71</td>
<td>39-93</td>
</tr>
<tr>
<td>Hypertension</td>
<td>17</td>
<td>73</td>
<td>39-93</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>3</td>
<td>70</td>
<td>46-88</td>
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<tr>
<td>Glaucoma</td>
<td>2</td>
<td>78</td>
<td>76-80</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>8</td>
<td>74</td>
<td>40-62</td>
</tr>
<tr>
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</table>

(Cheng, Kalis and Feifer, 2001).
Patient-reported Reasons for Non-Compliance

Potential Barriers to Improving Adherence

- Denial
- Fear or embarrassment
- Side effects
- Religious beliefs
- Unable to “see” results of drug therapy
- Lack of choices
- Cost
- Poor attitude

- Memory deficits
- Language
- Literacy
- Cultural beliefs
- Alternative health beliefs
- Poor support
- Pride

(Vermeire et al., 2001).

How and Why Do Patients Fail to Comply?

Refusal to take medication

- Patient not convinced of need for drug
- Fear of adverse/side effects
- Cost
- Dislike of taking drugs

Reducing dosage to less than prescribed

- Intolerance of adverse effects

Discontinuation of medication

- Patient not convinced of drug’s benefits

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Increasing dosage
- Perception that more is better
- Perception that drug makes the patient feel good
- To “hurry” the cure of treatment process

Taking a drug holiday
- Patient not convinced of drug’s benefit
- To achieve effect perceived as enjoyable

“Whitecoat” compliance
- Patient not convinced of drug’s benefit
- To procure approval from clinician or avoid rebuke

Strategies to Address Patient Forgetfulness
Knowing that patients report forgetfulness as a top reason for poor adherence, the following methods should be considered.

Simplify prescribed regimens
- Once daily medications
- Taper or discontinue potentially inappropriate medications

Recommend the use of organizers & reminders
- Blister packs
- Calendars
- Dosage counters

Consider using adherence-aiding strategies
- Reminders via phone calls & email
- Medication diaries reviewed by health care provider
(Vermire et al., 2001).

Reinforcing the Value of Medication with the Patient
It is important to educate the patient on the importance of taking medication as prescribed. Discuss what medication use can and cannot accomplish, set realistic goals, temper expectations and provide clear indications of what may occur if the medication is not used properly or not at all.

Guard against making any statements that might undermine the relationship between patients and their physicians.

Try to solve potential drug related problems without putting the patient in the middle by contacting the prescriber directly.
Medication Compliance Often Worsens With Age

Studies have shown that there is a significant decline in medication adherence over time in patients on statin medications. Persistence with statin therapy in the elderly declines substantially over time, with the greatest drop occurring in the first six months of treatment.

Interventions to improve adherence are needed early in treatment and among high-risk groups, including those who experience coronary heart disease events after initiating treatment.

Disease states, such as dyslipidemia and hypertension may be asymptomatic, increasing the likelihood of poor adherence.

Long Term Persistence in Use of Statin Therapy in Elderly Patients

![Graph showing long term persistence in use of statin therapy in elderly patients.](image)

- **Non-Adherent**
- **Partially Adherent**
- **Adherent**

Nurses Can Improve Adherence

Nurses are approachable and available, and play an important role in patient education and compliance. Nurses are also ideally-suited and positioned to provide feedback to prescriber on medication adherence, and have access to electronic health records and patient prescription profiles.

Approach to Improving Medication Adherence

An assessment of the patient’s ability to understand and recall information, as well as a baseline knowledge level is helpful in determining the best way to educate your patient to improve medication compliance. Begin an assessment by asking the following core questions:
• Can the patient identify the medication?
• Does the patient understand benefits of the medication?
• Can the patient access the medication and select the right amount?
• Is the dosage form appropriate?
• Are any aids necessary for good compliance?
• What additional education is necessary for the patient and caregiver?
• What is the patient’s reading level? This should be matched to the reading level of drug information handouts.

Strategies to Improve Medication Adherence
When trying to improve medication adherence, the following strategies can be used:
• Recall that health literacy does not equal intelligence.
• Do not assume that physicians have explained medication use to patients.
• Avoid the use of medical verbiage and technical jargon.
• Even highly educated non-medical professionals have difficulty understanding medical terms.
• Ask patient to repeat instructions (teach-back method).
• Keep directions simple, use fewer medical terms.
• Emphasize importance of medication adherence at each encounter with patient.
• Involve the patient’s spouse or other immediate family members or guardian.

Assess and Remove Adherence Barriers
The nurse is instrumental in removing medication adherence barriers so that compliance can be improved.
Consider the following strategies for removing barriers:
• Assure patients that they will be an integral part of their own therapy and will have choices to make.
• Promote the use of pill keepers and calendars for patients with minor memory problems.
• Ensure that the needs of physically handicapped patients are accommodated.
• Utilize language interpreters where necessary.
• Ask about transportation for picking up medication and suggest or arrange for prescription delivery where available.

Establish Trust
• Build relationship with patient.
• Be available and approachable.
• Assess the patient’s willingness to learn from you.
• Be sincere and honest.
• Express a desire for patient to get well and maintain quality of life.
• Use a positive approach and exhibit confidence in patient and treatment plan.
• Recall that past behavior is a good predictor of future adherence.
Conclusion

APRNs play an important role in the management of chronic HF and the education of the patient with this chronic disease. A thorough understanding of the disease process and up-to-date management strategies provide the tools you need to care for your chronic HF patients.

Furthermore, by addressing patients’ adherence issues and focusing on the value of their medicines, you can make a significant difference in patients’ health care outcomes!

References


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