



CE PRN

PHARMACY CONTINUING EDUCATION FROM WF PROFESSIONAL ASSOCIATES

● ABOUT WFPA ● LESSONS ● TOPICS ● ORDER ● CONTACT ● MCA EXAM REVIEWS

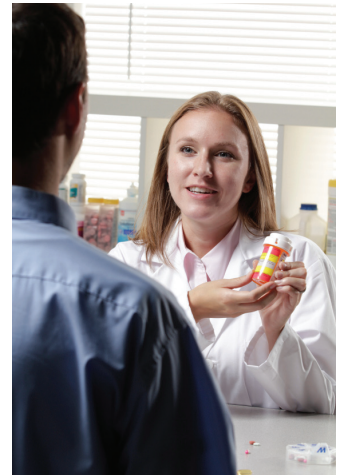
“A Pharmacy View of Adherence”

April 2014

Adherence is a consideration that has become increasingly significant---for positive patient outcomes & to insurers & other 3rd party providers. Therefore, we update & review this concept periodically. The goals of this lesson are to provide an understanding of where non-adherence can arise & to suggest techniques for reducing non-adherence. This lesson provides 1.25 hours (0.125 CEUs) of credit, and is intended for pharmacists in all practice settings.

The objectives of this lesson are such that upon completion the participant will be able to:

1. Describe the importance associated with medication adherence.
2. List methods to assess non-adherence in patients.
3. Relate strategies that pharmacists can incorporate to improve adherence.
4. Provide examples of pharmacist interventions that improve adherence related to specific disease states.



This is a subscription program. To get continuing education credit, you must subscribe to the program, or pay fee for individual lessons.

OTHER 2014 TOPICS

New Drugs 2014
Geriatric Considerations
Shingles (Herpes zoster)
Parenteral Nutrition

Pharmacy Waste
Nosocomial Infections
Blood Thinners



PHARMACY CONTINUING EDUCATION FROM WF PROFESSIONAL ASSOCIATES

**CHECK YOUR CPE MONITOR.
ALL CREDITS ARE IN YOUR ACCOUNT.**

CREDIT STATEMENTS.

Check your CE activity or print a statement from your NABP eProfile (CPE Monitor) Account. To login, go to www.nabp.net. Enter your user name (your email address) & your password. Click on "CE Activity" to view your history & to print a CE report.

WHEN YOU SEND IN QUIZZES

**ALWAYS KEEP A COPY. YOU MAY EMAIL OR FAX THEM. FAX # IS 847-945-5037. OR
SEND A CONVENTIONAL EMAIL WITH YOUR ANSWERS TO
CEINFO@WFPROFESSIONAL.COM**

This lesson provides 1.25 hours (0.125 CEUs) of credit, and is intended for pharmacists in all practice settings. **The program ID # for this lesson is 707-000-14-004-H04-P. Participants completing this lesson by March 31, 2017 may receive full credit.**

To obtain continuing education credit for this lesson, you must answer the questions on the quiz (70% correct required), and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. Computerized records are maintained for each participant.

If you have any comments, suggestions or questions, contact us at the above address, or call 1-847-945-8050. **Please write your NABP eProfile (CPE Monitor) ID Number & birthdate (MM/DD) & your CE PRN ID Number (the number that is on the top of the mailing label) in the indicated space on the quiz page** (for continuous participants only).

All opinions expressed by the author/authors are strictly their own and are not necessarily approved or endorsed by W-F Professional Associates, Inc. Consult full prescribing information on any drugs or devices discussed.

CE PRN® (ISSN 0199-5006) is owned and published by W-F Professional Associates, Inc. 400 Lake Cook Road, Suite 207, Deerfield, Illinois 60015. William J. Feinberg, President. CE PRN® is published eleven times per year, monthly, January through November. Subscription rate is \$110.00 per year. © 2014 by W-F Professional Associates, Inc. All rights reserved. None of the contents of this publication may be reproduced in any form without the written permission of the publisher. POSTMASTER: Send all address changes to W-F Professional Associates, Inc., 400 Lake Cook Road, Suite 207, Deerfield, IL 60015.

INTRODUCTION

The World Health Organization (WHO) has defined adherence as the extent to which a person's behavior – taking medication, following a diet and/or executing lifestyle changes – corresponds with agreed upon recommendations from a health care provider.¹ The National Community Pharmacists Association recently released the *National Report Card on Medication Adherence*. They found that just 24% of Americans earned a grade of "A" for being completely adherent. In fact, the average grade across the United States was just a "C+" with 15% of Americans being classified as largely non-adherent with a grade of "F."² Poor adherence can lead to increased morbidity and mortality, causing 10% of hospitalizations and 125,000 deaths.³ Some estimates suggest that non-adherence can lead to increased healthcare costs of up to \$100 billion per year.⁴

The importance of medication adherence is highlighted in the Medicare and Medicaid Services Five-Star Quality Rating System. Specifically, health plans will need to have more than 75% of their beneficiaries with at least 80% adherence for hypoglycemia agents, statins and hypertension medications to achieve 5-stars.⁵ Medication adherence is also important on a business level for providers and payers. As patient care models evolve and organizations and providers can be penalized financially for poor patient outcomes, adherence is going to become an even more important focus.⁶ This review focuses on the general aspects of medication adherence and strategies to improve non-adherence in cardiovascular disease, diabetes and HIV management.

Adherence rate is usually defined as the percentage of prescribed doses of the medication taken by the patient over a specified period. Unfortunately, there is not a standard for the optimal adherence rate. Some clinical trials suggest that at least 80% adherence to medications is required for optimal clinical effect. There are data to that indicate adherence rates up to 90% are required for viral suppression of the HIV virus.

BARRIERS TO ADHERENCE

Poor adherence to medical therapies compromises patient outcomes. According to the WHO, improving adherence to medical therapy for hypertension, hyperlipidemia, and diabetes would result in significant health and economic benefit. Adherence is a multi-faceted behavioral process determined by many patient-specific and societal factors. To better understand and address adherence in patients, it is important to understand the contributors to non-adherence. The factors for non-adherence can be classified into **patient-related factors, physician-related factors and healthcare system factors.**

PATIENT-RELATED FACTORS

Patients are non-adherent for many variant reasons; however, a recent article proposed that there are at least six different classifications for non-adherent patients. These are summarized in Table 1.⁵ By classifying non-adherent patients into groups, we can better address the root causes of non-adherence and not apply a "one size fits all" approach. These categories address factors that have routinely been considered to be associated with non-adherence such as a lack of understanding of the disease state, lack of involvement in the treatment decisions, poor medical literacy, beliefs of the efficacy of treatment, previous experiences with medications, and lack of motivation.⁷

Table 1: Six Classifications of Non-Adherent Patients.

1. Patient does not understand the relevance of medication adherence to continued health & well-being.
2. Patient has concluded the benefits of taking medications do not outweigh the costs.
3. Complexity of medication management exceeds the information processing capacity of the patient.
4. Patient is not sufficiently vigilant.
5. Patient holds inaccurate, irrational, or conflicting normative beliefs about medications.
6. Patient does not perceive medication to have therapeutic efficacy.

Table 1 Adapted from Reference #6.

Treatment for asymptomatic conditions, such as hypertension, often presents a challenge for patients with poor health literacy because the sequelae of the disease may be difficult to conceptualize. Additional patient-related factors that contribute to poor adherence include lower socioeconomic status, high medication costs, lack of transportation, poor understanding of medication details, and long wait times at the pharmacies. Family and social support is also an integral part of improving adherence. Lastly, mental illness (e.g. depression and anxiety) can be predictive of non-adherence to medical recommendations.

MEDICATION-RELATED FACTORS

Beyond the patient-related factors are medication-related factors. Specifically, factors such as cost, regimen complexity and adverse effects can impact patient adherence.⁷ The more expensive a medication is, the less likely patients are to be compliant. There are conflicting data regarding the effect of the number of drugs in a regimen on adherence. While some studies find that increased medication number leads to decreased adherence, this is not always the case. In addition, if a medication causes adverse effects, patients are less likely to be adherent with that specific therapy. It is imperative that a pharmacist be aware of the effect of these medication-related factors on adherence and manage them as best as possible to improve adherence.

PHYSICIAN-RELATED FACTORS

Physicians contribute to non-adherence by not recognizing or acknowledging medication adherence during their visit. They may contribute by prescribing complex regimens, failing to address the benefits and potential side effects of prescribed medications and failing to consider financial burdens associated with prescribed treatments.^{1,8} Studies have indicated a correlation between patient adherence and the provider's communication, namely "positive talk," and asking specific questions about adherence.¹ Patients who feel like partners in the treatment plan and who are actively engaged have better adherence. In addition warmth and empathy from the clinician continues to be a factor that improves adherence.

HEALTHCARE SYSTEM-RELATED FACTORS

Healthcare systems can create barriers to adherence by limiting the healthcare coordination and patient access to care.^{1,8} Costs of medications can be prohibitive leading to non-adherence. Systems that promote continuity of care, fee structures that reimburse for patient counseling

and education facilitate improved adherence. Information sharing between providers and pharmacies has the potential to improve adherence by allowing prescribers to understand the patient's behavior toward prescription refills. Clinicians often see a large volume of patients without resources to address individual needs. The amount of time spent with a patient may be insufficient to assess and understand medication taking behaviors. Discussions engaging patients about the importance of adherence are vital to improve and sustain appropriate medication taking behaviors.

The ability of physicians to recognize and address adherence is poor. In some circumstances, they may contribute to non-adherence by prescribing complex regimens, failing to explain benefits of therapy and potential adverse effects of a medication effectively, and inadequately appreciating the financial burden to the patient.⁸ Pharmacists have the unique opportunity to address non-adherence in the pharmacy setting, and contributing to improved outcomes.

HOW TO ASSESS ADHERENCE

As stated previously, pharmacists are the perfect healthcare providers to assess adherence. The first step in addressing non-adherence is recognizing the problem. There are several forms of subjective and objective information that could potentially suggest a non-adherence problem. Subjective information is obtained through interaction with the patient. You may discover non-adherence through open ended questions such as:⁹

- *Can you tell me how you take your medications?*
- *Which medications do you take in the morning?*
- *How often do you miss doses of medications?*

A mix of open ended questioning and closed ended questioning may be best for obtaining information.⁹ It is important that the pharmacist notice subtle clues of non-adherence:¹⁰

- *I'm **supposed** to take it.*
- *I **think** they said to take it twice a day.*

Few patients will admit to non-adherence freely. Further assessment of these patients through questioning to gain additional subjective information and through collection of objective information can inform the pharmacist of the patient's adherence status.

Objective information regarding adherence is obtained from a source other than the patient's statements.¹⁰ Forms of objective information that can be used to assess adherence include:

- *Computerized medication profiles.*
- *Drug serum concentrations.*
- *Signs and symptoms of disease i.e. uncontrolled hypertension.*

Computerized medication profiles provide a history of medication refill rates.¹⁰ However, this information should be used with the knowledge that patients may refill their medications on time but still not take them appropriately. Drug serum concentrations can be used to monitor a finite number of medications. However, variations in individual metabolism of medications and

need for appropriate timing make this difficult. Signs and symptoms of disease progression are commonly used as predictors of adherence. However, it is possible that the patient is taking their medications appropriately and the disease is progressing despite their efforts. No method of assessing adherence is perfect; therefore, it is important that pharmacists utilize a combination of multiple methods to gather information.

In addition, there are several adherence assessment tools available in the literature. Tools such as the adherence estimator, Medi-Cog scoring, Morisky Medication Adherence Scale and others can assist the pharmacist in assessing adherence.⁵ These are well researched and validated ways to assess adherence. In addition, they allow a pharmacist to systematically track adherence changes over time.

It is also very important to not only assess adherence, but to document this assessment in the medical record. This allows pharmacists to track non-adherence in the electronic health record and to ensure that all providers are aware. In addition, there is an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code to document non-adherence (V15.81).⁵

STRATEGIES TO IMPROVE ADHERENCE

There are multiple methods to improve adherence. The adherence interventions should be individualized based on the patient's barriers to adherence. Pharmacists can address many patient related barriers by providing education about the disease state and medications. Costs of medications can be prohibitive to adherence, so pharmacists can collaborate with physicians to help determine the most cost-effective therapy based on the available funding or insurance program. Medication regimens that require multiple doses throughout the day have been shown to decrease adherence. Data from a meta-analysis indicate there is a 10% decrease in adherence with each additional daily dose.^{4,11} Selection of medication regimens with the least number of pills and least frequent dosing schedule should be attempted for all patients. In some circumstances, complex treatment regimens cannot be avoided; therefore, pharmacists should specifically target these patients for adherence counseling and interventions such as follow-up phone calls, pillboxes and medication teaching. In 2003, Medicare recognized the non-adherence potential with patients on multiple medications; therefore, the Medicare Prescription Drug Improvement and Modernization Act mandated a team-based approach of medication therapy management services (MTMS). This program is provided by insurers through community pharmacies. They are designed to provide education and counseling to improve patient understanding, improve medication adherence and detect adverse reactions.⁸

Innovative pharmaceutical packaging seems like a simple approach to improve adherence but there is a paucity of data that have assessed its benefits.¹² Some examples include medication packaging that incorporates a simple day or date calendar feature that can prompt a patient to take a medication daily, or calendar pill organizers with plastic trays and separate compartments labeled with days of the week, or calendar blister packaging or "blister-packs" with unit-of-use packaging in which each pill's blister is labeled with the day of the week or date of the month. Zedler and colleagues systemically reviewed 10 prospective, randomized trials assessing the evidence for the adherence benefits of calendar blister packaging and calendar pill organizers for self-administered, long-term medication use. Three of the trials included supplemental strategies to improve adherence that increased educational efforts

and adherence reminders. Six of the ten trials reported increased medication adherence with calendar blister packaging or calendar pill organizers, but only one study demonstrated improvement of clinical effectiveness. Innovative pharmaceutical packaging is a promising, simple approach for pharmacists to utilize to promote adherence, but definitive evidence supporting its clinical effectiveness is still lacking.¹²

Beyond the above methods, effective strategies to affect patient medication adherence should also improve patients' understanding of their treatments; provide counseling and accountability; and ensure that there are tools and strategies to assist patient self-monitoring.⁶ The following section discusses specific interventions involving pharmacists that promote adherence assessment and monitoring with the goal of improved outcomes.

CARDIOVASCULAR DISEASE

Statin therapy

3-hydroxy-3-methyl-glutaryl-CoA reductase inhibitors (statins) are highly effective at reducing cardiovascular disease burden in a wide spectrum of patients.¹³ In clinical trials, statins reliably lower low density lipoprotein (LDL) cholesterol and reduce the risk of cardiovascular events such as myocardial infarction and stroke. Despite the well documented efficacy of statin therapy, non-adherence is quite common. Studies have demonstrated that up to 50% of patients are non-adherent with statin therapy. Non-adherence with statin therapy is associated with a significant increase in health risk. Specifically, one study found that patients who took pravastatin less than 75% of the time had event rates for coronary death or nonfatal myocardial infarction similar to that of placebo.¹⁴ In contrast, those patients who take their medication greater than 75% of the time had a significant reduction in event risk.

Several factors listed in Table 2 have been consistently associated with non-adherence to statin therapy.^{15,16} While the data are inconsistent, generally patients who speak English as a second language, smokers, those who report psychological stress, patients with lower income, patients that pay a higher copay for their statin therapy and those that experience myopathy (a common statin adverse effect) are likely to be less adherent.

Table 2: Predictors for poor adherence.

- Low levels of literacy.
- Age-related challenges: vision loss, cognitive impairment.
- Psychosocial issues: depression, homelessness, inadequate social support, stressful life-events, dementia, psychosis.
- Current substance abuse (History of substance abuse is not a risk factor).
- Stigma of the disease.
- Difficulty with swallowing medications.
- Complex regimens with multiple pills and multiple daily dosing.
- Adverse drug effect.
- Treatment fatigue.

Table 2 Adapted from References 15, 16, 28.

Perhaps the most important strategy to improve adherence with statin therapy is patient education.³ Knowledge of the role of cholesterol in heart disease risk is generally poor and this problem is further compounded by the fact that dyslipidemia is a silent disease.¹³ Repeated brief educational counseling sessions by pharmacists generally appear to improve statin adherence. It is important that the education be simple and jargon-free. It is also important to understand a patient's anxieties about therapy. Once a pharmacist understands the patient's specific concerns, they can be addressed through individual counseling sessions.

Patients who experience adverse events with statin therapy are also more likely to be non-adherent.¹³ It is important for pharmacists to counsel patients on the muscle related adverse events associated with statin therapy. Specifically, statins can cause myopathy which can progress to rhabdomyolysis which is a life threatening condition that can cause acute renal failure. Specifically, patients should be counseled to monitor for unexplained muscle pain or weakness and to report this to a healthcare provider. Patients who experience this adverse effect with a higher potency statin can often receive lower doses of the same statin or a lower potency statin without a problem. However, if patients lack awareness or understanding of this adverse event, they may simply self-discontinue the drug or take it less regularly. Pharmacists play a very important role in counseling patients on medications and adverse events.

Another tool pharmacists can use to improve adherence is ensuring that the process of refilling statin prescriptions is straightforward. Specifically, patients that use online portals or scheduled refills are likely to be more adherent.¹⁷

Hypertension

According to data from 2007-2010, approximately 33% of American adults have hypertension.¹⁸ However, only 70% are taking antihypertensives, and only 50% are at their goal blood pressure. This is despite the knowledge that blood pressure control significantly decreases the risk of cardiovascular disease and stroke.¹⁹ One major contributor to the number of patients who have not reached their target blood pressure is non-adherence with medication therapy. The guidelines for hypertension management highlight the importance of improving patient adherence with these medications. Non-adherence to antihypertensive therapy leads to a significant increase in the risk for all cause mortality, and cardiovascular disease related hospitalizations.²⁰

Patients are non-adherent with anti-hypertensive therapy for many reasons. However, some of the most common reasons are consistent with factors associated with statin non-adherence and are listed in Table 2.²¹ Hypertension is a symptomless disease; therefore, patients do not perceive benefit from therapy. In addition, the therapy for hypertension is life-long and is often associated with adverse events. Also, stress, anxiety and depression are common barriers to adherence.²² Therefore, patient education plays an important role in improving adherence. Patients should be counseled on the positive effects of blood pressure control on heart disease and stroke risk. Improving patient understanding of these points can also help to improve adherence.

Many studies have assessed the ability of healthcare providers to improve adherence with anti-hypertensive therapy and some of the best data are from pharmacist intervention studies.²³ The most effective approaches to improving adherence to these medications are multi-factorial.

They include patient education through counseling sessions, provision of written materials, and use of adherence aids such as pill boxes or blister packs. One of the most frequently referenced studies of pharmacist interventions was published in the *Journal of the American Medical Association* in 2006.²⁴ The authors studied 200 community-based patients aged 65 years or older taking at least 4 chronic medications at Walter Reed Army Medical Center. After a two month run-in phase of usual care and adherence measures, the patients underwent a 6-month intervention phase (standardized medication education, regular follow-up by pharmacists, and medications dispensed in time-specific packs). They were then transitioned to usual care or continued pharmacist intervention for an additional 6 months. Mean adherence improved from 61% at baseline to 97% after the 6 month pharmacist intervention ($p < 0.001$). Along with this they had a significant drop in systolic blood pressure and LDL cholesterol levels. However, those patients who returned to usual care after the 6 month pharmacist intervention returned to their baseline compliance, blood pressure and cholesterol levels. This study shows that targeted pharmacist education and intervention can significantly improve blood pressure and lipid control.

DIABETES

Diabetes is a chronic medical condition that requires continued medical care, chronic patient self-management, and support to prevent acute complication and the risk of long-term sequelae.²⁵ Diabetes affects 24 million people in the United States, resulting in 174 billion dollars in annual healthcare expenditures. The health care system remains challenged by this complex patient population.

There have been improvements in the proportion of diabetic patients achieving recommended targets of hemoglobin A1c, blood pressure and LDL cholesterol goals in the last decade.²⁵ Data from NHANES, (National Health and Nutrition Examination Survey), demonstrate that mean A1c declined from 7.82% (in 1999) to 7.18% (in 2004). In addition, improvements in lipids and blood pressure control have led to reductions in end-stage complications in patients with diabetes. Although this data is encouraging, there are some studies that demonstrate that only 12% of patients achieve all three target hemoglobin A1c, blood pressure and LDL cholesterol goals. Moreover, there is room for improvement in the quality and consistency of diabetes care. Multiple interventions improving adherence to national standards have been implemented, but a major contributor to suboptimal care is a fragmented healthcare system. Systems that include multidisciplinary teams are best suited to provide care for patients with diabetes.²⁵ Increasing amounts of evidence demonstrate that pharmacists, working as patient educators, consultants, or clinicians in partnership with other healthcare professionals can improve patient outcomes.

One reason for non-adherence in diabetic patients is lack of knowledge about their disease. Pharmacists can proactively educate patients about their disease, including signs and symptoms of hypoglycemia and hyperglycemia and long-term sequelae of poor glucose control. In addition, pharmacists can educate patients about the medication side effects, administration techniques for insulin and storage requirements. In a study conducted at 16 community health centers, pharmacists developed and established diabetes management programs. The pharmacists provided patient education, monitored adherence, prompted physicians to complete standards of care, and provided education and medication therapy consultations for medical staff. For patients that remained in the program for 6 months, the positive results were impressive. The average HbA1c dropped from 9.1 to 7.7%, ($P < 0.01$). In addition, significant reductions in blood pressure and LDL were achieved.²⁶ Pharmacists can

provide patient education, but as with other disease states, it is imperative for pharmacists to assess barriers to adherence, apply motivational interviewing, address adverse effects and individualize treatment regimens.²⁷ Due to complexity of diabetes management, multi-disciplinary teams that include pharmacists are necessary to optimize clinical outcomes.

HIV

Adherence to antiretroviral therapy is associated with improved viral suppression, lower resistance rates, and increased survival and improved quality of life.²⁸ Similar to other chronic conditions, lifelong treatment is required for optimal outcomes. Patients must be screened for adherence predictors prior to the initiation of antiretroviral therapy. Predictors for non-adherence are listed in Table 2. Antiretroviral therapy requires a commitment from the patient as well as the healthcare team.

Prior to initiation of antiretroviral therapy, clinicians must assess a patient's willingness to take medications. Identifying and addressing social issues prior to initiation of antiretrovirals (such as psychiatric illness, active drug use, and housing) is imperative for successful outcomes and reduces the risk of non-adherence. A pharmacist can assess readiness to start HIV medications by:

- Assessing how the medications fit into the patient's lifestyle and work schedule.
- Assessing adherence by using a trial with candy.
- Making a contingency plan during schedule changes, such as weekends and holidays.
- Assess the patient's understanding and acceptance of the regimens.

Deferring therapy may be required until social support and co-morbidities are addressed; therefore, several office visits may be required before therapy is initiated. As has been stated with other disease states, patients often comply with regimens when they are involved with the treatment decisions. Because there are multiple first-line regimens for HIV with different dosing frequencies, pill size, and side effects, patients are more likely to commit to a regimen that they selected.^{4,8} Pharmacists can assist by educating patients about the pill size, dosing frequency and potential side effects to foster adherence and acceptance. Many of the HIV medications are available as a combination product. Pharmacists can help reduce pill burden and potentially pill fatigue by suggesting these alternatives (Table 3). There are many online resources available for patient education, including photographs of the medications. (See <http://aidsinfo.nih.gov>).

Table 3: Fixed-dose combinations for HIV.

| Medication | Comments |
|---|---|
| Truvada® Tenofovir 300mg Emtricitabine 200mg | Dose: 1 tablet daily. Preferred agent for combination therapy for HIV. |
| Epzicom® Abacavir 600mg Lamivudine 300mg | Dose: 1 tablet daily. Alternative agent for combination therapy for HIV. |
| Combivir® Zidovudine 300mg Lamivudine 150mg | Dose: 1 tablet twice daily. Alternative agent for combination therapy for HIV. |
| Atripla® Tenofovir 300mg Emtricitabine 200mg Efavirenz 600mg | Dose: 1 tablet at bedtime. Preferred agent therapy for HIV therapy. |

| Medication | Comments |
|---|---|
| Complera Tenofovir 300mg Emtricitabine 200mg Ralpivirine 25mg | Dose: 1 tablet daily with food (at least 400 calories). Alternative therapy for HIV therapy. |
| Stribild Tenofovir 300mg Emtricitabine 200mg Elvitegravir 150mg COBicistat 150 mg | Dose: 1 tablet daily with food. Preferred agent therapy for HIV therapy. |
| Kaletra® Lopinavir 200mg Ritonavir 50mg | Dose: 4 tablets daily or 2 tablets twice daily Alternative agent for combination therapy for HIV |

Table 3 Adapted from Reference 28

Multiple interventions have demonstrated efficacy including pharmacist-led individualized interventions, cognitive-behavior therapy, peer support groups, and reminder strategies.²⁸ Reminder strategies include alarms, watches, pagers, or cell phone alarms. In addition, it is vital to involve family and friends as a support system. Maintenance of adherence requires close follow-up with the healthcare team, whether it involves a phone follow-up, house visits, or more frequent clinic visits. Adherence should be addressed and emphasized at every pharmacy visit. In addition, it is important to review adverse effects about the medications at every visit to assure that adverse effects are not a barrier to adherence.

CONCLUSION

Poor adherence to medication regimens is common. Lack of adherence contributes significantly to increased medical costs and increased morbidity and mortality. Healthcare providers should always address adherence by emphasizing the value of the medication regimen and assessing for barriers to adherence. Simplifying and customizing the regimen to a patient's lifestyle is imperative for adherence and acceptance by the patient. Nonjudgmental questions about patient's adherence are a simple way for pharmacists to identify non-adherence. Multi-disciplinary teams also enhance adherence interventions. As medication regimens become more complex and patients continue to have more chronic conditions, pharmacists must remain an integral part of adherence assessment and patient education.

REFERENCES

1. Sabaté E, ed. *Adherence to Long-Term Therapies: Evidence for Action*. Geneva, Switzerland: World Health Organization, 2003.
2. "Medication Adherence in America: A National Report Card." Published by NCPA June 25, 2013. Accessed, at <https://www.ncpanet.org/pdf/reportcard/AdherenceReportCard Full.pdf>; on January, 23, 2014.
3. Viswanathan M, Golin CE, Jones CD, et al. Interventions to improve adherence to self-administered medications for chronic diseases in the United States. *Ann Intern Med*. 2012;157:785-95.
4. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med*. 2005;353(5):487-497. doi: 10.1056/NEJMra050100.
5. Marcum ZA, Sevick MA, Handler SM. Medication nonadherence: a diagnosable and treatable medical condition. *JAMA*. 2013 May 22;309(20):2105-6.
6. Zullig LL1, Peterson ED2, Bosworth HB3. Ingredients of successful interventions to improve medication adherence. *JAMA*. 2013 Dec 25;310(24):2611-2.
7. Gellad WF, Grenard JL, Marcum ZA. A systematic review of barriers to medication adherence in the elderly: looking beyond cost and regimen complexity. *Am J Geriatr Pharmacother*. 2011 Feb;9(1):11-23.

8. Brown MT, Bussell JK. Medication adherence: WHO cares? *Mayo Clin Proc.* 2011;86(4):304-314.
9. Bokhour BG, Berlowitz DR, Long JA, Kressin NR. How do providers assess antihypertensive medication adherence in medical encounters? *J Gen Intern Med.* 2006;21(6):577-583.
10. Pharmacist-Patient Consultation Program PPCP -- Unit 3. Counseling to Enhance Compliance Manual. Pfizer Inc.
11. Claxton AJ, Cramer J, Pierce C. A systematic review of the associations between dose regimens and medication compliance. *Clin Ther.* 2001;23(8):1296-1310.
12. Zedler BK, Kakad P, Colilla S, Murrelle L, Shah NR. Does packaging with a calendar feature improve adherence to self-administered medication for long-term use? A systematic review. *Clin Ther.* 2011 Jan;33(1):62-73.
13. Bates TR, Connaughton VM, Watts GF. Non-adherence to statin therapy: A major challenge for preventive cardiology. *Expert Opin Pharmacother.* 2009;10(18):2973-2985.
14. Compliance and adverse event withdrawal: Their impact on the west of Scotland coronary prevention study. *Eur Heart J.* 1997;18(11):1718-1724.
15. Mann DM, Woodward M, Muntner P, Falzon L, Kronish I. Predictors of nonadherence to statins: A systematic review and meta-analysis. *Ann Pharmacother.* 2010;44(9):1410-1421.
16. Warren JR, Falster MO, Fox D, et al. Factors influencing adherence in long-term use of statins. *Pharmacoepidemiol Drug Saf.* 2013;22:1298-307).
17. Sarkar U, Lyles CR, Parker MM, et al. Use of the refill function through an online patient portal is associated with improved adherence to statins in an integrated health system. *MedCare.* 2013.
18. Heart Disease and Stroke Statistics—2014 Update: A Report from the American Heart Association, on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation.* 2014;129:e28-e292.
19. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA.* 2013 Dec 18.
20. Shin S, Song H, Oh SK, et al. Effect of antihypertensive medication adherence on hospitalization for cardiovascular disease and mortality in hypertensive patients. *Hypertens Res.* 2013;36:1000-5).
21. Morgado MP, Morgado SR, Mendes LC, Pereira LJ, Castelo-Branco M. Pharmacist interventions to enhance blood pressure control and adherence to antihypertensive therapy: Review and meta-analysis. *Am J Health Syst Pharm.* 2011;68(3):241-253.
22. Khatib, Schwalm JD, Yusuf S. Patient and healthcare provider barriers to hypertension awareness, treatment and follow up: a systematic review and meta-analysis of qualitative and quantitative studies. *PLOS One.* 2014;9:e84 238).
23. Lee JK, Grace KA, Taylor AJ. Effect of a pharmacy care program on medication adherence and persistence, blood pressure, and low-density lipoprotein cholesterol: A randomized controlled trial. *JAMA.* 2006;296(21):2563-2571.
24. Cutrona SL, Choudhry NK, Fischer MA, et al. Modes of delivery for interventions to improve cardiovascular medication adherence. *Am J Manag Care.* 2010;16(12):929-942.
25. American Diabetes Association. Standards of medical care in diabetes--2011. *Diabetes Care.* 2011;34 Suppl 1:S11-61.
26. Armor BL, Britton ML, Dennis VC, Letassy NA. A review of pharmacist contributions to diabetes care in the United States. *J Pharm Pract.* 2010;23(3):250-264.
27. Meece J. Improving Medication Adherence Among Patients With Type 2 Diabetes. *Journal of Pharmacy Practice* published online 27 December 2013 (Jerry Meece).
28. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. February 12, 2013. Accessed <http://aidsinfo.nih.gov/guidelines> on 2/3/2014.

Fill in the information below, answer questions and return **Quiz Only** for certification of participation to: CE PRN[®], 400 Lake Cook Road, Suite 207, Deerfield, IL 60015.

NAME _____ **CE PRN I.D.#**(1st line on label) _____
ADDRESS _____ **CITY** _____ **STATE** _____ **ZIP** _____

CPE Monitor ID _____ **Birthdate (MM/DD)** _____
ARE YOU LICENSED IN FLORIDA? IF YES, FL LIC # _____
EMAIL Address (we need this) _____

LESSON EVALUATION

Please fill out this section as a means of evaluating this lesson. The information will aid us in improving future efforts. Either circle the appropriate evaluation answer, or rate the item from 1 to 7 (1 is the lowest rating; 7 is the highest).

1. Does the program meet the learning objectives?
 Describe importance of drug adherence YES NO
 List ways to access non-adherence YES NO
 Relate ways to improve adherence YES NO
 Discuss examples of pharmacists improving adherence YES NO

 2. Was the program independent & non-commercial YES NO
- | | | | | | | |
|--|---------------|---|---|---------------|---|-----|
| | Low Relevance | | | Very Relevant | | |
| | 1 | 2 | 3 | 4 | 5 | 6 7 |
3. Relevance of topic
 4. What did you like most about this lesson? _____
 5. What did you like least about this lesson? _____

Please Mark the Correct Answer(s)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Poor adherence can lead to: A. Increased healthcare costs B. Improved patient outcomes C. Decreased mortality D. A & C 2. For patients with chronic diseases, what is the estimated adherence rate? A. 100% B. 90% C. 50% D. 20% 3. A patient with poor literacy & poor understanding of the disease is considered to have which type of adherence barrier? A. Patient-related B. Healthcare system C. Physician-related D. Pharmacy-related 4. Healthcare system related adherence barriers include: A. Clinicians seeing a high # of patients B. High costs of medications C. No reimbursement for patient counseling D. A & C 5. Which of these improve adherence? A. Patient education & counseling B. Decreasing pill burden C. Follow up phone calls D. All of these | <ol style="list-style-type: none"> 6. How is adherence measured objectively? A. Computerized medication profiles B. Drug serum concentrations C. Signs & symptoms of disease D. Pill counting E. All of these 7. Which of these is/are open ended questions? A. Can you tell me how you take your medications? B. Do you take your meds every day? C. How often do you miss doses of your medications? D. A & C 8. Which of these are causes of non-adherence for antihypertensives & statins? A. Treat asymptomatic diseases B. Have risk to cause adverse reactions C. Used for treating chronic conditions D. All of these 9. Written & verbal patient education, as well as adherence aids, will improve patient adherence. A. True B. False 10. Adherence barriers to HIV patients are: A. Low level of literacy B. Current substance abuse C. Multiple daily dosing D. Adverse drug effects E. All of these |
|--|---|

Contributing Author

Contributing Authors
Rupali Jain, PharmD, BCPS
University of Washington
School of Pharmacy
Seattle, WA

Kathryn M. Momary,
PharmD, BCPS
Mercer University
College of Pharmacy
Atlanta, GA

Executive Editor

William J. Feinberg,
BS Pharm, MBA

**W-F Professional Associates, Inc.
400 Lake Cook Rd. Suite 207
Deerfield, IL 60015**

847.945.8050

Fax 847-945-5037

ceinfo@wfprofessional.com

Program ID #707-000-14-004-H04-P.

CE Provider Tracking # with CEBroker.com is 50-3170.



CE PRN® is a publication of W-F Professional Associates, Inc. W-F Professional Associates, Inc. is accredited by the Accreditation Council for Pharmacy Education (ACPE) as a provider of continuing pharmaceutical education. Providers who are accredited by ACPE are recognized by **All States** for fulfilling CE requirements. Pharmacists completing this course by March 31, 2017 may receive full credit. This lesson furnishes 1.25 hours (0.125 CEUs) of credit.

ALL PHARMACISTS---READ THIS! CREDIT STATEMENTS & HISTORY!

Check your CE activity or print a statement from your NABP eProfile (CPE Monitor) Account.

FLORIDA PHARMACISTS---READ THIS!

We don't know you're Florida licensed unless you tell us. Place your Florida license # on EVERY quiz.