

## Overview

# Medication Adherence— Where Are We Today?

*This section covers the following topics:*

- Adherence concepts and terminology
- Statistics related to adherence
- Consequences of medication nonadherence
- Factors affecting medication adherence
- Prerequisites for adherence to medication regimens
- Predictors of medication nonadherence



Medication nonadherence is a multifaceted problem, especially for people with chronic diseases. Increasingly, our society relies upon medications to treat diseases and conditions, prevent hospitalization, and improve quality of life.

Numerous studies have shown that medicines improve clinical

outcomes and reduce illness, disability, and death. Despite such findings, many people do not realize the full potential benefits of their medications; too often this situation is the result of their failure to take some or all of the medications as prescribed.

Medication nonadherence, either willful or inadvertent, can include:

- Failing to initially fill a prescription
- Failing to refill a prescription as directed
- Omitting a dose or doses
- Taking more of a medication than prescribed
- Prematurely discontinuing medication
- Taking a dose at the wrong time
- Taking a medication prescribed for someone else
- Taking a dose with prohibited foods, liquids, and other medications
- Taking outdated medications
- Taking damaged medications
- Storing medications improperly
- Improperly using medication administration devices (e.g., inhalers).

## ADHERENCE CONCEPTS AND TERMINOLOGY

*Compliance*, *adherence*, and *persistence* are all terms commonly used in the literature to describe medication-taking behaviors. Adherence to, or compliance with, a medication regimen is generally defined as the extent to which a person takes medications as prescribed by their health care providers.

*Adherence* has become the preferred term, defined by the World Health Organization as “the extent to which a person’s behavior [in] taking medication...corresponds with agreed recommendations from a health care provider” (World Health Organization, 2003). The term *compliance* has come into disfavor because it suggests that a person is passively following a doctor’s orders, rather than actively

collaborating in the treatment process. Adherence, on the other hand, requires the person’s agreement to the recommendations for therapy.

*Persistence* is defined as the ability of a person to continue taking medications for the intended course of therapy. In the case of chronic diseases, the appropriate course of therapy may be months, years, or even the person’s lifetime. A person is classified as non-persistent if he or she never fills a prescription or stops taking a prescription prematurely. Discussing the intended course of therapy when medications are first started has been shown to be an important factor in keeping people persistent with a medication regimen.

## STATISTICS RELATED TO ADHERENCE

So what happens after a prescription is written? Here are some startling insights into the depth of the medication adherence problem in the United States. Consider these statistics (American Heart Association):

- 12% of Americans don’t fill their prescription at all.
- 12% of Americans don’t take medication at all after they fill the prescription.
- Almost 29% of Americans stop taking their medication before it runs out.
- 22% of Americans take less of the medication than is prescribed on the label.

Persistence rates, especially among those with newly diagnosed disease, also decrease over time, and in persons with newly diagnosed high blood pressure have been reported to be as low as 78% after 12 months and 46% after 54 months (Caro et al., 1999).

Surveys of older adults indicate that 55% do not follow, in some way, their medication regimens (Amaral, 1986). In an AARP survey of Americans aged 50 and older (AARP, 2004), 25% said they did not fill a prescription written by their doctor in the past two years; cost was cited as the main deterrent (Table 1). A 2002 study of 325 older persons (average age of 78 years) reported that 39% were unable to read the prescription labels, 67% did not fully understand the information given to them, and as a result 45% were nonadherent. These problems were especially prevalent in men and in people older than 85 years (Moisan et al., 2002). It is likely that the incidence of medication nonadherence is actually higher than published reports show, as methodological difficulties associated with conducting medication adherence studies may lead to an underestimation of the extent of the problem (Haynes et al., 1979).

**TABLE 1.**  
**MAIN REASON FOR NOT FILLING PRESCRIPTIONS,**  
**AMERICANS AGE 50 AND OLDER**

Cost of the drug	40%
Side effects of drug	11%
Thought drug wouldn’t help much	11%
Didn’t think I needed it	8%
Drug did not help	6%
Don’t like taking prescription drugs	5%
Condition improved	4%
Already taking too many prescriptions	3%

Source: AARP, 2004

## CONSEQUENCES OF MEDICATION NONADHERENCE

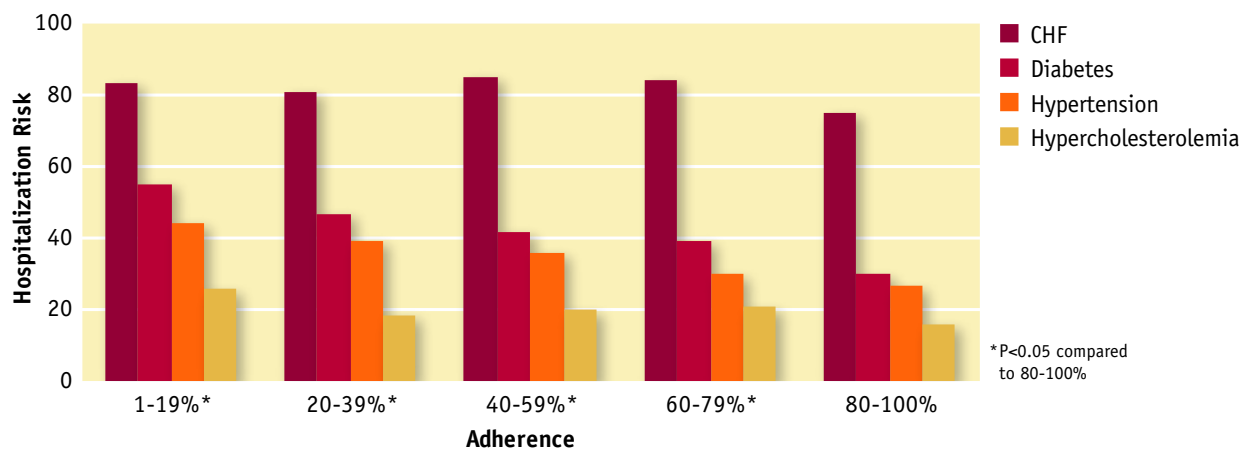
Nonadherence with medication regimens may result in increased use of medical resources, such as physician visits, laboratory tests, unnecessary additional treatments, emergency department visits, and hospital or nursing home admissions. Nonadherence may also result in treatment failure.

In the context of disease, medication nonadherence can be termed an “epidemic.” More than 10% of older adult hospital admissions may be due to nonadherence with medication regimens (Vermiere et al., 2001). In one study, one-third of older persons admitted to the hospital had a history of nonadherence (Col et al., 1990). Nearly one-fourth of nursing home admissions may be due to older persons’ inability to self-administer medications (Strandberg, 1984). Problems with medication adherence were cited as a contributing factor in more than 20% of cases of preventable adverse drug events among older persons in the ambulatory setting (Gurwitz et al., 2003). It is estimated that nonadherence costs the US health care system \$100 billion per year (Vermiere et al., 2001). In addition, approximately 125,000 deaths occur annually in the US due to nonadherence with cardiovascular medications (McCarthy, 1998).

Of all age groups, older persons with chronic diseases and conditions benefit the most from taking medications, and risk the most from failing to take them properly. Among older adults the consequences of medication nonadherence may be more serious, less easily detected, and less easily resolved than in younger age groups (Hammarlund et al., 1985).

Improving adherence with medication regimens can make a difference. A recently published study found that for a number of chronic medical conditions—diabetes, hypertension, hypercholesterolemia, and congestive heart failure—higher rates of medication adherence were associated with lower rates of hospitalization (Figure 1), and a reduction in total medical costs (Sokol et al., 2005).

**FIGURE 1. IMPACT OF MEDICATION ADHERENCE ON HOSPITALIZATION RISK**

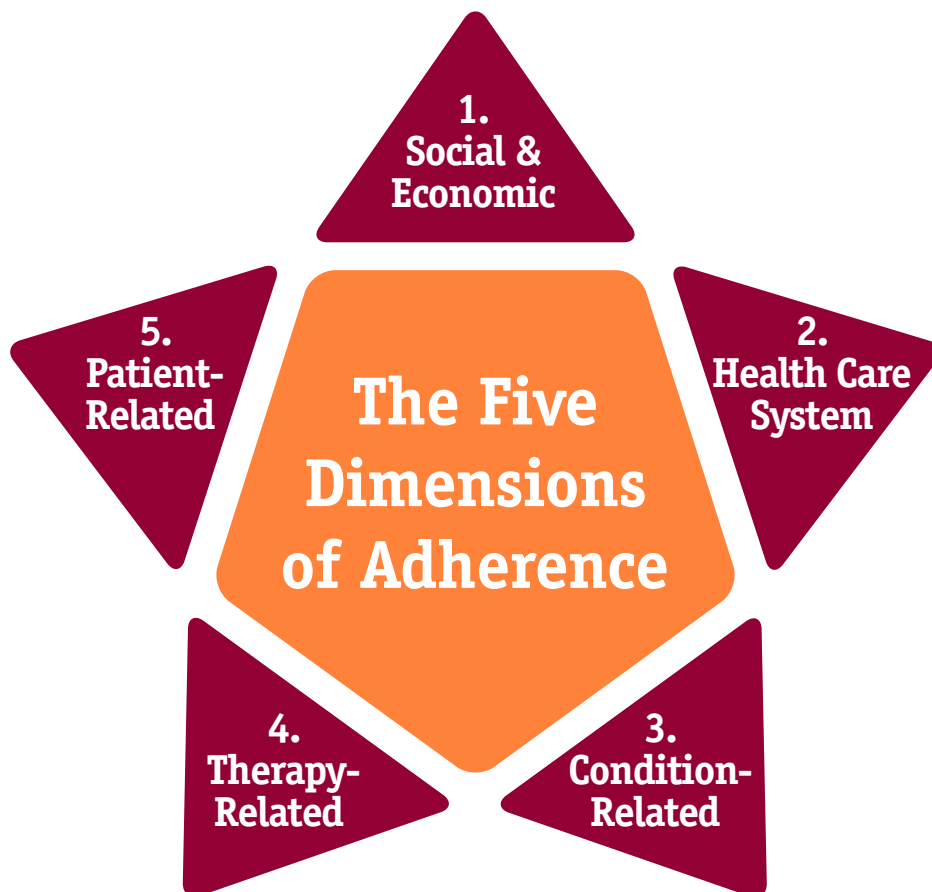


Adapted from Sokol et al., 2005

## FACTORS AFFECTING MEDICATION ADHERENCE

Age by itself is not a determining factor in medication nonadherence. Rather, there are many factors that may combine to render older persons less able to adhere to their medication regimens. However, there is evidence to suggest that with the proper motivation, education, and support, older persons can overcome many barriers to medication adherence (US Department of Health and Human Services, 1990).

**FIGURE 2. THE FIVE DIMENSIONS OF ADHERENCE**



Source: World Health Organization, 2003

Adherence is a multidimensional phenomenon determined by the interplay of five sets of factors, termed "dimensions" by the World Health Organization (Figure 2):

1. **Social/economic factors**
2. **Provider-patient/health care system factors**
3. **Condition-related factors**
4. **Therapy-related factors**
5. **Patient-related factors**

## OVERVIEW: MEDICATION ADHERENCE – WHERE ARE WE TODAY?

Patient-related factors are just one determinant of adherence behavior (World Health Organization, 2003). The common belief that a person is solely responsible for taking their medications often reflects a misunderstanding of how other factors affect people's medication-taking behavior and their capacity to adhere to treatment regimens. Factors associated with each dimension are listed in Table 2.

It is clear that adherence is a complex behavioral process strongly influenced by the environments in which people live, health care providers practice, and health care systems deliver care. Adherence is related to people's knowledge and beliefs about their illness, motivation to manage it, confidence in their ability to engage in illness-management behaviors, and expectations regarding the outcome of treatment and the consequences of poor adherence (World Health Organization, 2003).

It is important to recognize that a person may have multiple risk factors for medication nonadherence. Also, factors that can influence a person's medication-taking behavior may change over time. Therefore, it is important to continually assess a person's adherence throughout the course of therapy. In addition, because there is usually no single reason for medication nonadherence, there can be no "one size fits all" approach to improving adherence.

Many of the interventions used to improve adherence focus on providing education to increase knowledge; simplifying the medication regimen (fewer drugs or fewer doses); or making it easier to remember (adherence aids, refill reminders). However, simplifying a dosage regimen is unlikely to affect a person who does not believe that taking medications is important or that the therapy will improve his or her health, and the available evidence shows that knowledge alone is not enough for creating or maintaining good adherence habits (World Health Organization, 2003).

Based on published studies, it is evident that single interventions are less successful than multiple, long-term interventions in affecting adherence. Studies have shown that the most successful interventions have some follow-up component and address the underlying reason(s) for nonadherence (Krueger et al., 2003). Comprehensive interventions should address a variety of issues, including knowledge, motivation, social support, and individualizing therapy based on a person's concerns and needs (Krueger et al., 2003; McDonald et al., 2002).

The ideal time to initiate adherence interventions is when therapy first begins. Interventions that are initiated early in the course of therapy can support older persons through a period when they are most likely to have questions or to experience side effects from therapy.



**TABLE 2. FACTORS REPORTED TO AFFECT ADHERENCE**

1. SOCIAL AND ECONOMIC DIMENSION	4. THERAPY-RELATED DIMENSION
<p>Limited English language proficiency</p> <p>Low health literacy</p> <p>Lack of family or social support network</p> <p>Unstable living conditions; homelessness</p> <p>Burdensome schedule</p> <p>Limited access to health care facilities</p> <p>Lack of health care insurance</p> <p>Inability or difficulty accessing pharmacy</p> <p>Medication cost</p> <p>Cultural and lay beliefs about illness and treatment</p> <p>Elder abuse</p>	<p>Complexity of medication regimen (number of daily doses; number of concurrent medications)</p> <p>Treatment requires mastery of certain techniques (injections, inhalers)</p> <p>Duration of therapy</p> <p>Frequent changes in medication regimen</p> <p>Lack of immediate benefit of therapy</p> <p>Medications with social stigma attached to use</p> <p>Actual or perceived unpleasant side effects</p> <p>Treatment interferes with lifestyle or requires significant behavioral changes</p>
2. HEALTH CARE SYSTEM DIMENSION	5. PATIENT-RELATED DIMENSION
<p>Provider-patient relationship</p> <p>Provider communication skills (contributing to lack of patient knowledge or understanding of the treatment regimen)</p> <p>Disparity between the health beliefs of the health care provider and those of the patient</p> <p>Lack of positive reinforcement from the health care provider</p> <p>Weak capacity of the system to educate patients and provide follow-up</p> <p>Lack of knowledge on adherence and of effective interventions for improving it</p> <p>Patient information materials written at too high literacy level</p> <p>Restricted formularies; changing medications covered on formularies</p> <p>High drug costs, copayments, or both</p> <p>Poor access or missed appointments</p> <p>Long wait times</p> <p>Lack of continuity of care</p>	<p><b>Physical Factors</b></p> <p>Visual impairment</p> <p>Hearing impairment</p> <p>Cognitive impairment</p> <p>Impaired mobility or dexterity</p> <p>Swallowing problems</p> <p><b>Psychological/Behavioral Factors</b></p> <p>Knowledge about disease</p> <p>Perceived risk/susceptibility to disease</p> <p>Understanding reason medication is needed</p> <p>Expectations or attitudes toward treatment</p> <p>Perceived benefit of treatment</p> <p>Confidence in ability to follow treatment regimen</p> <p>Motivation</p> <p>Fear of possible adverse effects</p> <p>Fear of dependence</p> <p>Feeling stigmatized by the disease</p> <p>Frustration with health care providers</p> <p>Psychosocial stress, anxiety, anger</p> <p>Alcohol or substance abuse</p>
3. CONDITION-RELATED DIMENSION	
<p>Chronic conditions</p> <p>Lack of symptoms</p> <p>Severity of symptoms</p> <p>Depression</p> <p>Psychotic disorders</p> <p>Mental retardation/developmental disability</p>	

Sources: Miller et al., 1997; Nichols-English and Poirier, 2000; Vermiere et al., 2001; World Health Organization, 2003; Krueger et al., 2005; Osterberg and Blaschke, 2005

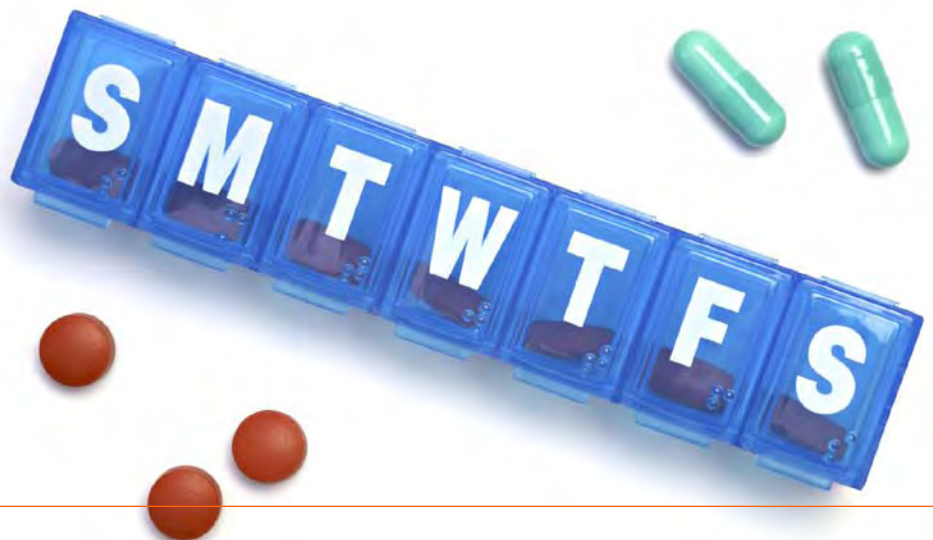
## PREREQUISITES FOR ADHERENCE TO MEDICATION REGIMENS

Berger and Felkey (2001) summarized the prerequisites for adherence to medication regimens. Adherence requires that a person:

- Show interest in his or her health and understand the diagnosis
- Understand the potential impact of the diagnosis
- Believe that the prescribed treatment will help
- Know exactly how to take the medication and the duration of therapy
- Find ways to fit the medication regimen into his or her daily routine
- Value the outcome of treatment more than the cost of treatment
- Believe that he or she can carry out the treatment plan
- Believe that the health care practitioners involved in the treatment process truly care about him or her as a person rather than as a disease to be treated.

Levine (1998) demonstrated that the following steps increase adherence:

- Assessing the person's understanding about the disease and the treatment regimen and then providing information where knowledge gaps exist
- Tying the medication-taking process to other daily routines
- Using adherence aids, such as medication organizers or charts
- Simplifying medication regimens
- Providing human support within the health care team
- Recognizing difficulty in coping and other socio-behavioral issues that may affect the person's ability to follow the treatment regimen.





## PREDICTORS OF MEDICATION NONADHERENCE

Predictors of medication nonadherence may be useful to identify older adults who are most in need of interventions to improve adherence (Table 3). Nonadherence warning signs may include:

- Not filling a new prescription
- Not obtaining refills as often as expected for medications taken on a chronic basis
- Not refilling prescriptions for chronic medications
- Not completing the entire course of therapy for short-term treatment.

**TABLE 3. PREDICTORS OF MEDICATION NONADHERENCE**

- Low literacy/limited English language proficiency
- Homelessness
- Depression
- Psychiatric disease
- Substance abuse
- Lower cognitive function or cognitive impairment
- Forgetfulness
- Anger, psychological stress, anxiety
- Lack of insight into illness
- Lack of belief in benefit of treatment
- Belief medications are not important or are harmful
- Complexity of medication regimen
- Tired of taking medications
- Inconvenience of medication regimen
- Side effects or fear of medication side effects
- Cost of medication, copayment, or both
- Barriers to access to care or medications
- Inadequate follow-up or discharge planning
- Missed appointments

Sources: Krueger et al., 2005; Osterberg and Blaschke, 2005

## OVERVIEW: MEDICATION ADHERENCE – WHERE ARE WE TODAY?

Identification of older persons at risk for medication nonadherence is just the first step in addressing this potential problem. In order to have an impact on adherence, health care providers must understand the barriers to adherence and tools and methods that can be used to overcome these barriers.

Overcoming one barrier or providing a single intervention will not guarantee medication adherence. In fact, studies show that no single intervention is adequate to ensure medication adherence (Hughes, 2004). A combination of approaches tailored to the individual person's needs that target specific barriers to adherence and reinforce positive behaviors is the most effective (Krueger et al., 2005).

As illustrated in Figure 2 and detailed in Table 2, factors that affect medication adherence can be grouped into five categories. This document is organized accordingly: each of the five following sections will discuss the specific factors in each dimension that create barriers to medication adherence in older adults and will provide suggested strategies to overcome those barriers. Useful techniques, tools, and forms to promote adherence are contained in the subsequent sections, and a list of all references cited in the text concludes this publication.