

# Patient Noncompliance: Causes and Solutions

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## Abstract

This essay examines the subject of patient noncompliance with prescribed medications or other health regimens and its possible causes, and discusses possible solutions. Noncompliance or nonadherence to prescribed medical regimens may have serious detrimental effects on the patient's health and quality of life, and may lead to further morbidity or mortality. Proposed solutions to the problem of noncompliance are many (Table 3). If aggressively pursued, they may help improve the health of individual patients and the general community.

**Key Words:** Compliance, noncompliance, adherence, nonadherence.

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## Introduction

POOR COMPLIANCE (or adherence) by patients with prescribed medication or other caregiver recommendations such as lifestyle changes is a widely acknowledged problem. There is inconsistent and inconclusive evidence for the effectiveness of various approaches to improve compliance (1). A recent study of multi-compartment medication devices, for example, showed limited success in promoting adherence among nonadherent adults living at home (1).

This essay examines the subject of patient noncompliance and its possible causes, and discusses possible solutions to ameliorate the problem and increase patient adherence to prescribed medications or other health regimens. Poor compliance is an important health care problem, which can result in reduced efficacy or failure of the recommended intervention, with detrimental effects on the patient's health, on the effective use of limited health care resources, and on evaluating the "real" clinical efficacy of health care interventions (2).

## Literature Review

In one study of patients with chronic pain, the authors showed that, although patients reported high compliance with maintaining paper diaries, actual compliance was low and hoarding was common (3). The excellent compliance achieved with electronic diaries indicates that low compliance was not due to the particular sample of patients or an overly burdensome protocol. These results call into question, conclude the authors, the validity of paper diary records.

In a review of compliance with pelvic floor exercises by women with stress incontinence (2), the author reviews the literature on compliance and the factors that might influence it. The author concludes that motivation is a critical prerequisite for influencing compliance with the intervention and its ultimate success. Factors to optimize motivation are suggested.

Kesteloot points out that "noncompliance" usually refers to patients' failure to follow health interventions as recommended by the health care provider, but it can also refer to the providers' failure to act according to practice guidelines or standards of care (4). The author discusses the economic implications of noncompliance in health care, concluding that it is not enough to investigate the effectiveness of interventions that enhance compliance. The intervention's benefit in terms of increasing patients' quality of life must be weighed against the costs of the interventions. Such a bal-

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ance will help to “guarantee efficient allocation of scarce resources in health care” (4).

Kane et al. studied the effects of nonadherence to medication among patients with quiescent ulcerative colitis (5). They conclude that nonadherence is associated with clinical recurrence of disease and recommend that researchers (a) determine why patients are nonadherent and (b) develop disease-specific interventions to improve adherence or compliance.

Voss et al. studied the effects on compliance and quality of life among postmenopausal women taking hormone replacement therapy (6). They point out that ensuring long-term compliance is one of the major challenges in the prevention and early treatment of postmenopausal osteoporosis. Among other things, they conclude from their study that less anxiety about the medication was associated with higher treatment satisfaction and better compliance with the regimen. Similarly, Thomas et al. found that HIV patients who discontinued their drug therapy did so because they felt that their body “needed a break from the drugs” or because the drugs made them not feel good or they wished to try a more holistic approach (7).

Pumilia describes a case study of compliance related to the psychological impact of the physician-patient relationship (8). Studies seeking to identify the typical “profile” of a noncompliant patient have been mostly unsuccessful. The author concludes that there are a myriad of factors underlying a patient’s noncompliance as well as mechanisms through which attempts can be made to address it. Resolving noncompliance, unfortunately, is often a task that requires more time and energy than is available to the physician. Physicians and medical teams and psychologists provide the most effective and efficient foundation for addressing not only patient noncompliance but also “the enhancement of factors that lead to enduring relations between physician and patient throughout the course of treatment” (8).

In a study of dietary and fluid compliance of Chinese hemodialysis patients, Lee and Molassiotis found that more than half of the dialysis patients did not comply with fluid restrictions (9). Compliance varied according to the patients’ dietary knowledge and health beliefs. They recommend patient education and family involvement to improve compliance.

Discussing methods to improve elderly patient compliance with taking medication, Banning suggests that patients be given the least complex combination of drugs (10).

Patients should also be given printed forms of information to supplement the oral teaching of the

treatment regimen by the physician or nurse. Joel Hill reminds us that for many physicians the non-compliant patient compromises the ideal of medicine as a healing art, since their patients’ functional ability and quality of life depend on their success at self-care (11). Metcalf-Wilson proposes a model of three C’s (confidentiality, communication and compliance) to help create an environment that will provide competent, holistic, quality care to adolescent patients (2). DiMatteo examines emerging issues in consumer-provider communication and patient adherence to cancer screening and prevention, diagnosis, treatment and coping with the loss of a loved one. She reports that many factors affect adherence and that these can be supported or hindered by provider-patient relationship, patient’s beliefs, social and cultural norms, family and social support, mood and behavioral management (13). Worth and Dhein conclude that patient education may modify the behavior of patients in the management of COPD by improving their self-control and self-management of the disease and thus reducing mortality (14). Gray et al. review the literature on compliance as well as interventions to enhance compliance with antipsychotic medications (15). They point out that noncompliance with antipsychotic medication is observed among approximately 50% of patients with schizophrenia and offer possible solutions to achieve compliance (see Table 3).

Murray et al., in a randomized controlled trial of training patients in self-management of warfarin treatment, concluded that such training is feasible, practical and cost-effective (16). Sewitch et al. studied medication nonadherence among women with fibromyalgia (17). The authors conclude that “unintentional non-adherence was predicted by community subjects not being under a rheumatologist’s care, less disease activity, less use of instrumental coping [‘task-oriented strategies to deal with the illness’] and higher patient-physician discordance. Intentional nonadherence was predicted by shorter duration under a rheumatologist’s care and higher patient-physician discordance.” The authors also conclude that “the therapeutic relationship, in addition to [its] clinical and psychosocial characteristics, influenced nonadherence to medication” (17).

Cotter and his colleagues studied the lack of aspirin effect and examined two possible reasons: aspirin resistance or resistance to taking aspirin (18). The authors concluded that nonadherence is a significant mediator of poor outcome in myocardial infarction and that it is important to evaluate whether or not patients are taking their medications. Hartigan points out that patient education is

vital to promote patient safety, optimal dosing and adherence to the treatment plan (19). Calsyn et al. report that noncompliant patients in a modified opioid substitution program can benefit and improve compliance without an associated significant increase in harm in the larger clinic population (20). Nearly three quarters of the patients placed in a minimal services track were retained in treatment and more than one third of them improved sufficiently to return to the regular opioid substitution program. The minimal services track was the basis of improved compliance. Gethin outlines the concept of patient compliance and its relevance to the care of patients with chronic wounds (21).

In order to improve compliance with prescribed regimens, the patient must be involved in the decision-making process and fully supported by professionals. This requires the multidisciplinary team to allow enough time to educate patients, listen to fears and anxieties and deal with them as much as possible, and provide the support that patients need. Uribe et al. describe factors predictive of poor compliance with study visits in three ethnic groups of patients with systemic lupus erythematosus (22). Noncompliant patients were more likely to be young, unmarried, of African American ethnicity, live closer to the medical centers, and have longer disease duration and greater disease activity as assessed by the physician. The authors will use the information they have gathered to develop interventions to reduce noncompliance.

Kennedy and Erb “showed that about 1.3 million adults with disabilities did not take their medications as prescribed because of cost and [that] more than half reported health problems as a result” (23). The authors conclude that “prescription noncompliance due to cost is a serious problem for many adults with chronic disease or disability.”

David Bartels discusses adherence to oral therapy for type 2 diabetes (24). The author points out that studies have demonstrated that treatments including multiple medications or frequent dosing have a negative impact on adherence. Several approaches have been used to improve adherence, including increased communication between health care providers and patients, implementation of multidisciplinary programs and the use of easier dosing regimens (i.e., reduced number of drugs or doses per day). Morris addresses the issue of dosing frequency in diabetes and suggests a simple approach to improving adherence to therapy and clinical outcomes, (i.e., the use of “diabetes drugs that simplify or reduce the number of daily doses required”) (25). The author points out that treatment adherence is a major issue in the effective management of any chronic illness. For diabetes, treat-

ment adherence is the key to maintaining tight glycemic control, which in turn reduces the risk of long-term complications.

A number of factors that contribute to nonadherence in chronic illness have been identified. These must be addressed to improve adherence and better health outcomes for patients. Patel et al. report on the acceptability of and compliance with hip protectors among community-dwelling women at high risk of hip fracture (26). The authors conclude “that only a minority of [these] women will wear hip protectors to reduce fracture risk.”

Singleton et al. provide a historical perspective on the term “compliance,” postulating that such a perspective provides a framework for discussion of approaches to compliance identified from the research literature (27). The authors draw an analogy between these approaches and leadership styles, which raises the question of the role provider style plays in patient compliance.

Pinikahana et al. explore the complexity of compliance in schizophrenia (28). They review socio-demographic characteristics of these patients, including age, gender and socioeconomic status; illness factors such as insight, symptoms, duration of illness, substance abuse, adverse effects of medication; psychosocial factors such as health beliefs and social support; and treatment factors including the patient-physician relationship. The authors conclude that these factors provide important information to guide the caregiver (physician and mental health nurse) in facilitating patient compliance (28).

Banning considers medication management among older people and explains how nurses can work with patients and other professionals to improve concordance (29).

## Discussion

The literature on noncompliance is so vast that I singled out several categories on noncompliance for additional consideration: nonadherence in cardiology, in pediatrics, among older patients and among HIV/AIDS patients.

### Nonadherence in Cardiology

We have already discussed above a study of adherence to taking aspirin among patients at risk of developing myocardial infarction (18) as well as a study of compliance with warfarin therapy (16). A conceptual map for studying long-term exercise adherence in a cardiac population is provided by Graham (30). Diehl strongly suggests the need for more vigilant hypertension treatment (31). The au-

thor offers strategies for improving adherence to therapy, including patient education, family support, individualized therapy for each patient's needs and situation, self-monitoring of blood pressure, telephone follow-up, and the use of combination therapy, which has fewer side effects and, in some cases, costs less (31).

### **Noncompliance among Elderly Patients**

Evangelista et al. discuss compliance behaviors of elderly patients with advanced heart failure (32). They studied six prescribed activities by elderly ( $\geq 65$  years) and younger ( $<65$ ) patients: medical appointments, medication, diet, exercise, smoking cessation and alcohol abstinence. Elderly patients were more compliant with diet and exercise than their younger counterparts. There was no difference in the other health care behaviors.

Half the elderly patients reported some degree of difficulty complying with exercise, while 37%, 24% and 23% had difficulty following the diet, keeping follow-up appointments and taking medications, respectively. Only 9% of elders continued to smoke and 18% continued to drink alcohol.

The authors conclude that strategies to help older patients minimize perceived difficulties associated with health care regimens may improve compliance and long-term morbidity and mortality from heart failure. Neily et al. studied potential contributing factors to noncompliance with dietary sodium restriction among patients with heart failure (33). The authors concluded that on referral to a specialty heart failure clinic, many patients have severe deficiencies in their knowledge base regarding dietary sodium intake that would preclude compliance with the sodium restriction guidelines. Directed education focusing on sodium intake corrected many of these deficiencies (33).

Sherry and co-workers discuss a case of non-compliance in heart transplantation that ultimately resulted in the death of the patient (34). They point out that noncompliance with the prescribed medical treatment regimen has been implicated as a major risk factor for morbidity and mortality after heart transplantation. Szekendi reports that compliance with acute MI guidelines lowers inpatient mortality (35). Daly et al. review the barriers to participation in and adherence to cardiac rehabilitation programs (36). They point out that only one third of patients maintain attendance in these programs after six months and they discuss factors associated with nonadherence, such as being older, female gender, fewer years of formal education and others.

Sebaste and DeGeest state that poor adherence is the primary reason for suboptimal benefit for pa-

tients with chronic diseases (37). They call for nursing managers and policymakers to play an active role in addressing the major problem of patient nonadherence to the prescribed treatment regimen.

### **Nonadherence in Pediatrics**

Watson and Forshaw point out that child outpatient nonattendance may indicate welfare concerns (38). Lamberth et al. compared the rates of missed appointments among pediatric patients in a private practice for patients receiving Medicaid and those with private insurance (39). The authors discuss why many pediatricians do not accept Medicaid patients. They quote a study that showed that the rate of missed appointments was three times higher among patients with Medicaid than among patients with private insurance.

McPherson et al. discuss noncompliance with medical follow-up after pediatric intensive care (40). In a cohort of 111 critically ill children, the authors found that lack of ordered medical follow-up did not affect emergency visits. However, 28% of the patients did not receive timely medical follow-up. No socioeconomic or demographic risk factors were identified for noncompliant patients. However, severity of illness, longer PICU stay and longer hospital stay as well as the number of follow-up appointments ordered were predictors of noncompliance. The authors conclude that the potential exists for implementing strategies to improve compliance in identified populations (40).

Toole and Berry discuss the subject of increasing immunization compliance among children (41). School-based immunization reflects a growing trend in the area of health care, because children spend at least 25% of their day in school. The authors point out the challenges in successfully implementing a school immunization program, including the availability of working parents, lack of access to primary care, lack of transportation, and the impact of the Health Insurance Portability and Accountability Act (HIPAA).

The authors describe an immunization project that removed almost all of those barriers for high-risk students and gave the school nurses tools to succeed in achieving higher levels of immunization compliance in inner-city schools. Since the project's inception, compliance in the district has risen from an overall level of 50–60% to 90–100%, along with better record keeping and the prevention of exclusions from school (41). The removal of the barriers to compliance was the reason that this project was so successful.

## Noncompliance with HIV/AIDS Therapy

Murphy et al. discuss the barriers to highly active antiretroviral therapy (HAART) among HIV-infected adolescents (42). They conclude that adherence was tied closely to daily routine, which supports the assumption that helping adolescents improve their organizational skills may be necessary to improve adherence. Patient-level intervention, provider-level intervention, and health care system modification may all be necessary to improve HIV-infected adolescents' adherence to HAART (42). Tucker et al. point out that medication regimens for HIV infection are complex and inconvenient, often produce side effects, and must be taken consistently for long periods of time in order to improve prognosis in HIV disease (43). More important, perhaps, their findings suggest a correlation between nonadherence and the presence of emotional disorders and/or substance abuse problems, and thus "the need for screening and treatment for mental health and substance use problems among HIV-positive patients to improve adherence to antiretroviral medications" (43).

Painter and his colleagues performed a qualitative interview study to assess women's reasons for not participating in follow-up visits before starting short-course antiretroviral prophylaxis for prevention of mother-to-child transmission of HIV (44). The authors concluded that difficulties experienced by women during their contacts with staff working on a prevention program and negative views that the women have about the program can contribute to their nonparticipation in prophylaxis. Training and supervision of program staff may increase the likelihood of positive interactions between staff and clients, thereby facilitating women's participation in preventing transmission of HIV from mother to child. Outreach and mobilization in communities that are served by prevention programs may complement these measures by contributing to increased social support for women's efforts to prevent HIV transmission (44).

Allardice provides a clinical update on HAART medication adherence in the era of highly active antiretroviral therapy (45). She concludes that health care providers need to genuinely consider a holistic approach to care. Strategies need to be developed to accurately assess a client's readiness to begin therapy, and support that acknowledges a client's experiences needs to be put in place. Health care providers need to change the model to make it fit the client rather than asking the client to adapt to an inflexible model that doesn't allow for life getting in the way (45).

Ramirez Garcia and Cote discuss the factors affecting adherence to antiretroviral therapy among patients living with HIV/AIDS (46). They point out that "antiretroviral treatments have given hope to people living with HIV/AIDS and play a role in improving their quality of life. However, the effectiveness of these treatments is directly related to the level of adherence and commitment to them. Researchers have [shown] many factors that play an important role in adopting and maintaining adherence behavior. ...the authors present an in-depth review of the literature and...enumerate the factors that link adherence behavior to the individual, the treatment, the illness, and the relationship with the health professional. An understanding of these factors," conclude the authors, "is essential to develop interventions that will improve adherence to therapeutic regimens among people with HIV/AIDS" (46).

Both Benarroch and Ammassari describe the effects of cognitive dysfunction and treatment regimen complexity on medication adherence among HIV-positive adults (47, 48).

## Summary and Conclusions

Nonadherence or noncompliance with prescribed medical regimens for a variety of disorders and diseases is a serious problem in pediatric, adult and elderly population groups, both among males and females and among people of all ethnic, cultural and religious backgrounds. Such poor compliance or noncompliance may have seriously detrimental effects on the patient's health and quality of life, and may lead to additional morbidity and mortality.

Noncompliance or nonadherence to prescribed medical regimens may also lead to additional diagnostic testing, added discomfort to the patient, increased cost to both the patient and the health care system, and a deterioration or increased discordance in the doctor-patient relationship.

Factors that are associated with nonadherence (Table 1) can be classified as patient factors, treatment factors and lifestyle factors (21) as well as demographic factors, psychosocial factors and sociodemographic factors (34). Possible adverse effects from a patient's noncompliance with the treatment regimen are summarized in Table 2.

Various solutions to the problem of noncompliance have been proposed. These are detailed in Table 3.

There is no clear evidence that the application of the enumerated suggestions in Table 3 will lead to the desired outcomes. However, the serious problem of patient nonadherence to prescribed medical regimens can be addressed aggressively and possibly overcome in many situations by using one or more of these suggestions. If successful for some patients,

**TABLE 1**  
*Possible Causes of Patient Noncompliance*

**A. Patient Factors**

1. Lack of knowledge about the treatment regimen.
2. Lack of motivation and/or inconvenience.
3. Lack of self-esteem.
4. Beliefs and attitudes concerning the effectiveness of the treatment regimen—cultural and ethnic patient background.
5. Lack of a positive patient-physician relationship.

**B. Treatment Factors**

1. Impact on the patient's lifestyle and need for changes.
2. Complexity of the treatment and extended duration.
3. Patient's ability to comply with treatment regimen.
4. Comfort or discomfort associated with treatment regimen.
5. Physician-patient discordance.

**C. Lifestyle Factors**

1. Environmental limitations such as poor housing.
2. Resource limitations such as no transportation to the clinic.
3. Occupational limitations such as the patient's need to return to work or resume household duties.
4. Lack of awareness of illness and consequences of non-compliance.

**D. Sociodemographic Factors**

1. Age, educational level, smoking, drinking, illegal drug use.
2. Marital and socioeconomic status, lack of social support system.

**E. Psychosocial Factors**

1. Lack of self-motivation, depression, anxiety.
2. Patient's perceptions, beliefs and attitudes.
3. Lack of interest, lack of time or inconvenience, cost to patient and complexity of treatment regimen (high dosing frequency).
4. Worries about side effects of the treatment, fear.
5. Dependency on others or denial of illness.
6. Previous poor experience with a treatment regimen.
7. Fear of weight gain, forgetfulness, indifference.
8. Feeling of doubt, vulnerability and side effects.

Modified from references 21 and 34.

**TABLE 2**  
*Possible Adverse Outcomes Related to Noncompliance with Medication Regimens*

1. Worsening or aggravation of the illness.
2. Decreased quality of life.
3. Additional diagnostic testing.
4. Added discomfort to the patient.
5. Increased costs to the patient and health care system.
6. Deterioration of physician-patient relationship.
7. Adverse effects on the patient's health.

these techniques can then be tested on a wider scale with other noncompliant patients. The possible benefits clearly make the effort worthwhile.

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**TABLE 3**  
*Proposed Possible Solutions to the Problem of Patient Noncompliance with Treatment Regimen*

1. Provide patients with multi-compartment medication devices to help them with the complexity of the regimen.
2. Provide patients with paper or electronic diaries to record their daily medication use.
3. Provide patient with better education.
4. Improve the patient-caregiver relationship.
5. Offer patients monetary or other rewards for compliance.
6. Attempt behavior modification techniques.
7. Provide educational and cognitive strategies.
8. Motivate patients to comply—give reasons for the need to comply.
9. Establish phone and letter contacts with patients.
10. Establish an environment of trust between the caregiver and the patient.
11. Provide an atmosphere of cooperation and mutual involvement.
12. Provide effective communication between patient and caregiver.
13. Assist the patient with needed lifestyle changes such as smoking cessation.
14. Involve the family of the patient to promote compliance.
15. Remove barriers to compliance, if possible.
16. Reduce the complexity of the medication regimens.
17. Preferentially prescribe longer-acting medications.
18. Use medication teaching programs, but be sure to give information that is easily understood and assimilated by the patient over a period of time.
19. Repeat the education if necessary. The education should be patient centered and specific for each medication.
20. Improve provider-patient relationship by taking into account the patient's beliefs, social and cultural norms, family and social support.
21. Try mood and behavioral management, if available.
22. Provide education to modify the behavior of the non-compliant patient by improving self-control and self-management of the illness or disorder, thus reducing morbidity and mortality and increasing compliance.
23. Although education increases the patient's understanding of the illness, it does not necessarily improve compliance. Interventions such as compliance therapy based on cognitive behavioral techniques appear to be effective in enhancing compliance of psychiatric patients (15).
24. Education needs to be tailored for each individual patient using resources such as medication information sheets to reinforce the teaching.
25. Encourage family support and use of telephone follow-up.
26. Individualize therapy for the patient's unique needs and situation.

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