Patient adherence

Background

1-The effectiveness of a therapy depends on only two elements:
First, the prescriber must select a therapy that is **appropriate** in all aspects. In other words, assuming a correct diagnosis, the therapy must be the right drug, by the right route, in the right dose, at the right time, for the right duration, for the right patient [(1)].

The **second** consideration is the extent to which the patient consumes the medications as recommended [(1)].

2-While adherence to medication is a problem, **adherence to diet and exercise, and other therapeutic modalities is even less than for medications** [(2)].

Definitions

1-Adherence to (or compliance with) a medication regimen is generally defined as the **extent to which patients take medications as prescribed by their health care providers** [(3)].

2-Often, the terms compliance and adherence are used interchangeably. However, they are somewhat different [(4)]. The word "**adherence**" is **preferred** by many health care providers, because "**compliance**" suggests that the pa**tient is passively following the doctor's orders** [(3)] (The physician would develop the treatment plan devoid of input from the patient) [(1)].

3-While **adherence presumes the patient's agreement** with the recommendations [(4)] and was intended to move away from viewing patients as individuals who simply did as they were told [(1)].

4-**White-coat adherence**", which means "improved patient adherence to treatment **around clinic visits**".

5-Hypercompliance occurs when the patient takes a prescribed medication at a level **over and above the recommended dosing interval** [(1)].

6-More recently, the term "**concordance**" has been used. The concordance may be defined as "**an agreement reached after negotiation between a patient and health care professional that respects the beliefs and wishes of the patient in determining whether, when and how medicines are to be taken**." [(5)].

Incidence of nonadherence

1-Because of the difficulties in measuring adherence, no estimate of adherence or non-adherence can be generalized, **but poor compliance is to be expected in 30-50% of all patients, irrespective of disease** [(7)].

2-According to a 2003 report published by the World Health Organization (WHO), **adherence rates** in **developed countries** average only **about 50%.** In **developing countries**, the rates are **even lower**

3-The rate of adherence for **short-term therapy was much higher** at between 70% and 80% [8].

4-Furthermore, the rates of non- adherence with different types of treatment also differ greatly. Estimates showed that almost **50%** of the prescription drugs for the **prevention** of bronchial asthma were not taken as prescribed. Patients' adherence with medication therapy for **hypertension** was reported to vary between **50% and 70%** [8].

The Consequences of The nonadherence

A-Poor medication adherence can cause negative health outcomes such as **worsening disease or even death** [9]. For example:

-Nonadherence has been found to be the **primary predictor of rejection of transplanted organs** [5].

-Up to 60% of patients with epilepsy are **non-adherents**, and this is the most **common reason for treatment failure** [9].

-Approximately 125,000 deaths occur annually in the US due to nonadherence with cardiovascular medications [10].

Types of Nonadherence [2]
Intentional nonadherence
• Lack of perceived efficacy • Perceived adverse effects • Do not care to take medicine • Altering dose schedule for convenience • Stop to see if still needed • Excess cost
Unintentional nonadherence
• Forgetfulness • Confusion • Trouble swallowing • Trouble with device, e.g., inhaler • Lack of understanding of necessity • Trouble reading labels • Lack of a routine

B-**For infectious diseases,** the consequences of non-adherence can include not only the direct impact such as treatment failures, **but also the development of resistant microorganisms** [8].

C-Poor medication adherence also may result **in increased health care cost** [7]. Estimates of cost associated with suboptimal medication utilization exceed US$100 billion a year [1].

D-It is estimated that **just over 5% of hospital admissions** and between **1% and 3% of emergency department visits** can be attributed to a patient's suboptimal medication utilization [1].

E-Additionally non-adherence has a **substantial negative effect** on **patient's quality of life** [8].

Causes of medication nonadherence

1-The reasons for poor medication adherence are often multifactorial. Nonadherence to medications can be **intentional** or **nonintentional**.

A-Intentional nonadherence: is an active process whereby the patient chooses to deviate from the treatment regimen.

B-Unintentional nonadherence: is a passive process in which the patient may be careless or forgetful about adhering to the treatment regimen [11].

2-The common belief that **patients are solely responsible for taking their medications** often reflects a **misunderstanding** of how other factors affect patient adherence to treatment regimens [10].

3-The World Health Organization has categorized potential reasons for medication nonadherence into 5 broad groupings that include **patient**, **condition**, **therapy**, **socioeconomic**, and **health system–related factors** [9]. (Figure-1). [10] Factors associated with each dimension are listed in Table-1 [10].

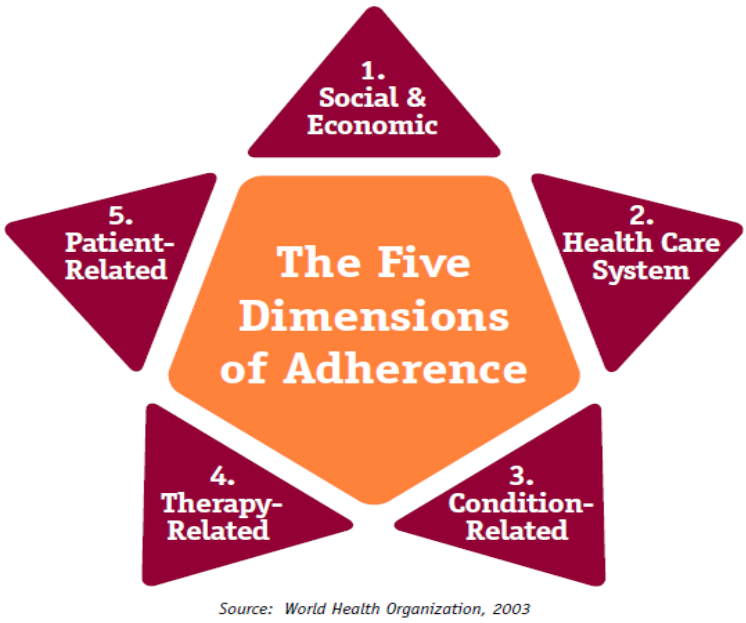

Figure-1. The five dimensions of adherence [10].

4-It is important to recognize that a person may have **multiple risk factors** for medication nonadherence and these factors **may change over time.** Therefore, it is important to continually assess a person's adherence throughout the course of therapy

Table-1. Factors reported to affect adherence [8, 10].

A-Social and economic dimension	B-Therapy-related dimension
1-Low health literacy**. 2-Medication cost. 3-Cultural and lay beliefs about illness and treatment. 4-Unstable living conditions; homelessness 5-Lack of family or social support network 6-Limited access to health care facilities 7-Lack of health care insurance 8-Inability or difficulty accessing pharmacy 9-Elder abuse 10-Inability to take time off work	1-Complexity of medication regimen (number of daily doses; number of concurrent medications) 2-Treatment requires mastery of certain techniques (e.g. inhalers) 3-Duration of therapy 4-Frequent changes in medication regimen. 5-Lack of immediate benefit of therapy 6-Medications with social stigma attached to use 7-Actual or perceived unpleasant side effects 8-Treatment interferes with lifestyle or requires significant behavioral changes 9-Route of administration 10-Taste of the medication

C- Condition- related dimension	
1-Chronic conditions 2-Lack of symptoms 3-Severity of symptoms 4-Depression 5-Psychotic disorders 6-Mental retardation/developmental disability	
D-Patient-related dimension	
Physical Factors	**Psychological/Behavioral Factors**
1-Visual impairment 2-Hearing impairment 3-Cognitive impairment 4-Impaired mobility or dexterity 5-Swallowing problems	1-Knowledge about disease 2-Understanding reason medication is needed 3-Expectations toward benefit of treatment 4-Confidence in ability to follow treatment regimen 5-Motivation to manage the disease 6-Fear of possible adverse effects 7-Fear of dependence 8-Feeling stigmatized by the disease 9-Frustration with health care providers
E-Health care system dimension	
1-Provider-patient relationship 2-Provider communication skills (contributing to lack of patient knowledge or understanding of the treatment regimen) 3-Disparity between the health beliefs of the health care provider and those of the patient 4-Lack of positive reinforcement from the health care provider 5-Weak capacity of the system to educate patients and provide follow-up 6-Lack of knowledge on adherence and of effective interventions for improving it 7-Patient information materials written at too high literacy level 8-High drug costs, copayments, or both 9-Poor access or missed appointments. 10-Long wait times 11-Lack of continuity of care	

Measurement of medication adherence

1-Adherence to medication regimens has been monitored since the time of Hippocrates [3].

2-The methods available for measuring adherence can be broken down into **direct** and **indirect** methods of measurement. Each method has advantages and disadvantages, and no method is considered the gold standard (Table-2) [3].

3-**Direct** methods mostly used for patients under **single-dose therapy** or **intermittent administration** and **hospitalized** [12].

Table-2. Methods of Measuring Adherence [3, 12].

	Test	Advantages	Disadvantages
Direct methods	Directly observed therapy	Most accurate	Patients can hide pills in the mouth and then discard them; impractical for routine use
	Measurement of the level of medicine or metabolite in blood or urine (e.g. serum level of antiepileptic drugs)	Objective	Variations in **metabolism** and "**white coat adherence**" can give a false impression of adherence; expensive

	Measurement of the biologic marker in blood *	Objective; in clinical trials, can also be used to measure placebo	Requires expensive quantitative assays and collection of bodily fluids
Indirect methods	Patient questionnaires, patient self-reports	Simple; inexpensive; the most useful method in the clinical setting	Susceptible to error with increases in time between visits; results are easily distorted by the patient
	Pill counts (Counting the number of pills that remain in the bottles).	Objective, quantifiable, and easy to perform	-Data easily altered by the patient (e.g., pill dumping) -No information on other aspects, such as dose timing -Unfeasible in assessing those medication taken as needed (prn)
	Rates of prescription refills;	Objective; easy to obtain data	A prescription refill is not equivalent to ingestion of medication requires a closed pharmacy system
	Assessment of the patient's clinical response	Simple; generally easy to perform	Factors other than medication adherence can affect clinical response
	Electronic medication monitors (recording and stamping the time of opening bottles, dispensing drops, or activating inhaler)	Precise; results are easily quantified; tracks patterns of taking medication	-Expensive; requires return visits and downloading data from medication vials -Do not document whether the patient actually ingested the drug or correct dose -Pressure to the patient
	Measurement of physiologic markers (e.g., heart rate in patients taking beta-blockers)	Often easy to perform	Marker may be absent for other reasons (e.g., increased metabolism, poor absorption, lack of response)
	Patient diaries	Help to correct for poor recall	Easily altered by the patient
	When the patient is a child, questionnaire for caregiver or teacher	Simple; objective	Susceptible to distortion

*Non-toxic biological markers can be added to medications and their presence in blood or urine can provide evidence that a patient recently received a dose of the medication under examination [4, 6].

Requirements for medication adherence.

1-There are **three things required for patients to adhere to medication regimens**: sufficient **understanding** of the disease and the medications being used to treat it, **motivation to take the medication**, and **implementation of necessary behavior changes** (**taking medication**) [2].

2-The impact on adherence to medications for each of these three requirements **differs between acute and chronic medications** (**Figure 2**) [2].

A-In patients taking **acute medication**, **patient understanding plays a major role**, since most patients with acute diseases **have symptoms** and it is easy to be motivated to take medications that will end the symptoms. Similarly, the behavioral changes (**taking medication**) are **short lived**, lasting for only a few days. Therefore, it is not surprising that **education and enhancing patient understanding** have been shown to **have a significant impact** on adherence in patients with **acute symptomatic** diseases [(2)].

B-In patients with **asymptomatic chronic diseases**, such as **hypertension**, and **hypercholesterolemia**, **understanding** about their disease and medications is still important for adherence, but has far **less impact** on adherence because **motivation and behavioral changes are the major forces in determining adherence**. Since there are no obvious symptoms of these chronic diseases, it is more difficult for patients to motivate themselves to take medication to prevent **some vague future complications** [(2)].

Therefore, it is not surprising that studies show the **lack of impact of education alone** on medication adherence in patients with **chronic asymptomatic diseases** [(2)].

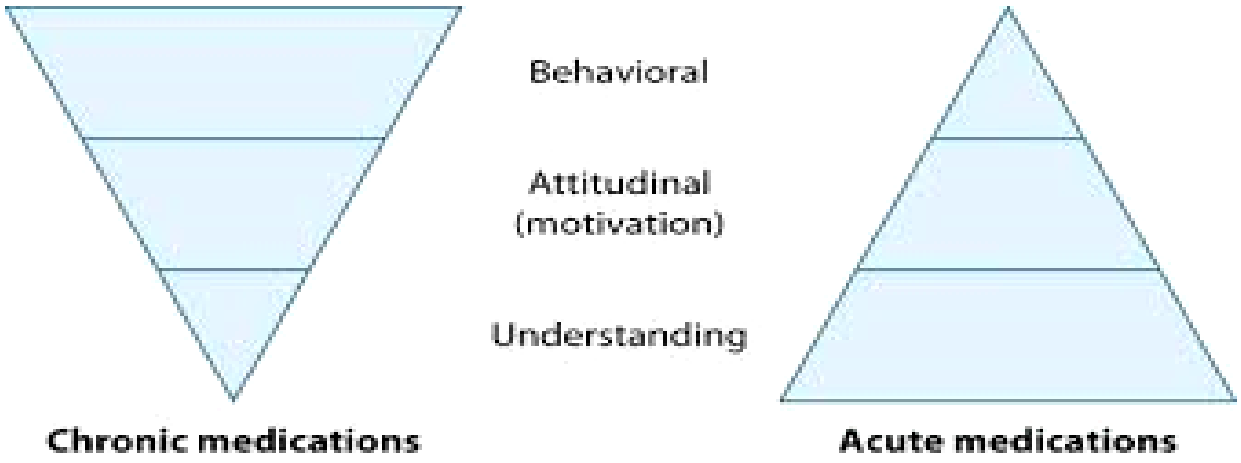

Figure 2: Requirements for medication adherence [(2)].

Techniques to help patients improve medication adherence

Notes:

A-Identify poor adherence with encouraging **blame free** environment (I know it must be difficult to take all your medications regularly. How often do you miss taking them?)

B-One Step at a Time

Initiate changes slowly, one step at a time, building self-confidence as you progress rather than have them try to make changes in diet, exercise, taking medication, and self-testing **all at once, potentially overwhelming the patient** [(2)].

C-Studies show that **no single intervention is adequate to ensure medication adherence** [(11)]. A **combination of approaches** is the most effective [(10)].

1-Develop a Routine

Probably the most important thing to improve adherence is to help patients develop a routine for taking their medication [(2)].

2-Simplify the Treatment Regimen

In general, the **more doses** one has to take and dosing regimens **greater than twice daily**, both **negatively impact medication adherence**. Therefore, reducing the number of medications and the frequency of dosing improves adherence [(2)].

Once effective dosages of individual medications have been established, look for **combination products** in those strengths to reduce the number of pills that have to be taken every day. Alter regimens so that no medication has to be taken more than twice daily [(2)].

3-Minimize the Cost

1- Wherever possible use **generic medications,** reserving expensive extended release for those patients whose unusual routine absolutely requires them [(2)].

2-If a combination product is far more expensive than both drugs alone, **then talk with the patient and let them choose which one is more acceptable to them** [(2)].

4-Confirm Appropriate Administration Technique

Patients who use medication administration **devices that require a specific technique** for efficacy (i.e., inhalers, eye drops) and who are experiencing suboptimal disease control warrant a check for **proper administration technique**. For example, in a patient on several topical glaucoma preparations, have them demonstrate how they administer each one [(2)].

5-Reward Patient Success

Rewarding patient successes **verbally** or in more formal ways helps improve medication adherence. Verbal rewards even for partial success or substantial progression toward target values are highly effective [(2)].

6-Increase Attention

Increasing the frequency of contact with the patient improves medication adherence. Even periodic telephone calls by the provider or his staff are effective [(2)].

7-Enlist Support of Others

Enlisting the **support of others** can be a critical factor in improving adherence to the treatment regimen. **This is especially true in implementing dietary or exercise changes** [(2)].

Many times patients have caregivers; they too need to be included in the therapeutic process [(2)].

8-Use Adherence Aids

“My other patients who have had the same trouble have found several things that seem to help. One leaves their evening medicine by her bedstand, another puts it next to her

toothbrush, and another sets her alarm clock as a reminder. Do any of these ideas sound like they might work for you?" [2].

The WHO, in its 2003 report on medication adherence, states that "**increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatment**" [10].

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