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Non-Adherence to Treatment: Different Rules for Different Patients

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Abstract

Although adherence to healthy lifestyle behaviors and treatment recommendations is complex and multidimensional, a common frustration expressed by physicians is the ability to provide optimal care when their patients are non-adherent with the treatment recommendations. Non-adherence is a common problem among patients, with some estimates suggesting that as many as 50% of patients are non-adherent to treatment. Although there are many known reasons for non-adherence (e.g. intolerable side effects, numerous psychological, disease-specific, social and financial factors), the foundation of most non-adherence is likely due to weaknesses in both cognition and cognitive flexibilities, aspects that are unique to each patient. This paper proposes that by adding and enhancing the traditional medical style interview with a conversational style interview, the physician will be better able to attend to the unique cognitive attributes of each patient and be in a better position to tailor the approach that best fits the patient, thereby promoting adherence and improving outcomes. In essence, it confirms the clinical approach of different rules for different patients. The foundation of the conversational approach is the physician-patient rapport, which allows exploring in more depth the patient's cognitive abilities. As with the adoption of any new useful and practical technique, the initial challenge will be to learn the value of incorporating this new brief practical approach in everyday clinical practice.

Keywords

Adherence, Non-adherence, Cognition, Cognitive flexibility

Introduction

A common frustration expressed by the physician is their inability to provide optimal care when their patients are non-adherent with treatment recommendations. Moreover, non-adherence is common among patients, with some estimates suggesting that as many as 50% of patients are non-adherent to treatment and, with regard to medication adherence, fewer than 30% of those patients take medications as prescribed, with many stopping treatment following the resolution of acute symptoms [1,2]. Among patients with a psychiatric disorder who were prescribed antidepressants, fewer than 30% took the medication at 6 months following the initiation of pharmacotherapy [3]. Importantly, non-adherence affects patients of all ages and socioeconomic levels. Furthermore, poor adherence to treatment recommendations leads to negative outcomes, including an increased risk of complications, hospitalizations, functional disability and even premature death [4]. In this regard, premature death in patients with non-adherence to treatment, is 5.4 times higher in patients that have hypertension, 2.8 times higher if they have dyslipidemia and 1.5 times higher if they have heart disease [1,5]. In the United States, poor adherence has been estimated to cost approximately \$290 billion annually in total direct and indirect health care costs [6]. Some of the most common factors that contribute to non-adherence, are: the patient's or their family's limited understanding or denial of their illness, poor social support, and financial and housing difficulties [7,8]. Although there isn't a "one solution that fits all" to improve adherence, there is a pressing need for tailored approaches that attend to the various reasons for non-adherence in order to improve the patient's overall health [9,10].

The effectiveness of various adherence-promoting interventions have shown only modest effects in regard to treatment outcomes [9,11]. To note, adherence refers to the shared decision-making between patient and physician and is the preferred term, as compliance suggests the patient's passive stance of obedience.

The Complex Foundation of Non-Adherence

Non-adherence to healthy lifestyle behaviors (e.g., nutrition, exercise, stress management) and treatment recommendations is complex and multidimensional. This paper proposes that although there are many known reasons for non-adherence (e.g., intolerable side effects, numerous psychological, disease-specific, social and financial factors); a common foundation for non-adherence is weaknesses in both cognition and cognitive flexibility, which are unique to each patient.

Although it is implicitly known by health care providers that

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cognitive weaknesses and poor cognitive flexibility affect patients' decision making process, however, this concept has received little attention. Importantly, deficits in these aspects interfere with a patient's ability to understand the consequences of interruption in or non-adherence to treatment. As such, interventions promoting treatment adherence in the care of patients will need to be individually tailored with regard to their cognitive strengths and their weaknesses. Autonomy, competence, and relationships are fundamental needs that motivate people to initiate adaptive behaviors [12].

The Role of Family Medicine Physicians in Improving Adherence to Treatment Recommendations

The family physician is uniquely positioned to help his or her patients as a result of his or her longitudinal experience with the patient and, often, long-standing treatment relationship. In this regard, the physician knows his or her patients and, often, their family, as well as the patient's unique personality attributes, their achievements and failures, and not solely as a diagnostic entity. Furthermore, the longitudinal relationship between the patient and the family physician allows the tailoring of treatment recommendations for any given patient, in a manner that can be understood by the patient and or family. Herein, this paper proposes that physicians would benefit from access to a succinct way to assess a patient's cognitive strengths and weaknesses, in the context of busy day-to-day patient care in medical settings, which can be used to better understand the patient's ability to follow through with preventive care as well as treatment recommendations.

Nevertheless, at times, physicians may unknowingly deliver treatment recommendations with limited attention to the patient's ability to understand the nature of their illness and what they can expect by following the treatment recommendations. This occurs for a variety of reasons, including time constraints and this approach has become popularized with the proliferation of a number of disorder-specific guidelines and treatment algorithms over the past 3 decades [4,13,14]. However, this approach may fail to recognize a number of factors, and in particular cognitive factors, that can increase the risk for non-adherence. Even when physicians take the time to verbally explain treatment recommendations to patients, many patients have little or no idea of what is being explained. In fact, according to a recent Institute of Medicine report, nearly half of all adults in the United States-90 million people-do not fully understand physician-provided instructions and may fail to understand the nature of their illness and may be unable to fully comply with medication regimens [15].

As such, the physician should consider adding to their toolkit what Delgado and colleagues call a Contemporary Diagnostic Interview (CDI) to their clinical work with the intent of knowing the patient *from the inside out* [16]. The CDI helps to identify the many protective and risk factors in the patient and family. In regard to risk factors, weakness in cognition, cognitive flexibility and psychosocial pressures have a negative impact in their life habits. Although the CDI is best suited to assess psychiatric patients, as it makes use of what they call "the four pillars" (temperament, cognition, cognitive flexibility and attachment style), by incorporating cognition and cognitive flexibility, the physician will be better able to have realistic expectations about the patient's ability to understand and adhere with the treatment recommendations and can tailor the delivery of the information "at the patient's level".

The primary goal of a CDI is to add and enhance the traditional *medical style interview*. As with the adoption of any new useful and practical technique, the initial challenge will be to understand the value of incorporating this new brief practical approach in clinical practice.

Herein, this paper will discuss some of the limitations of a traditional medical style interview for some patients; will review the application of concepts of cognition and cognitive flexibility in the medical setting; outline a "how to" guide to complete a brief CDI in the busy day-to-day clinical work and end by "putting it all together", with examples of the application of the CDI to patient care.

Medical Style Interview

In the training of physicians, the empathic physician-patient relationship is recognized as the scaffolding on which successful treatments are constructed. Establishing rapport with the patient, based on mutual respect, is what physicians are natural at, as it facilitates the desired treatment outcomes. After rapport is established, patients are asked, when possible, to share the history of their present illness with a timeline that establishes when they first noticed their symptoms, the frequency of symptoms, variations in the intensity of symptoms over time, along with precipitating and perpetuating factors. Over the course of the evaluation the physician may become focused on elucidating risk factors, identifying predictors of treatment response, and determining which "symptoms" meet threshold criteria for a disorder. Thus, the diagnosis is based on a collection of signs, symptoms, and biological markers that have been well defined [17]. The goal of any diagnostic interview is to tailor the treatment approaches that best suit the patient and ideally incorporates a biological, psychological and social integrated approach [18]. Nevertheless, as Zoppe, et al. [19] note, "there is still tension between biological and psychosocial". The lack of integration is heavily influenced by the setting in which the patient is seen (e.g., academic medical center, community hospital, community health center) [16].

Thus, despite the best intentions of the physician, a standard *medical style interview* may obscure the true nature of the patient's innate cognitive and relational difficulties.

This paper does not advocate that the physician be proficient in formal, detailed cognitive assessments. Rather, it provides a tool which allows for the use of a typical conversational approach to gather and assess clinically-relevant information about how the patient functions and experiences their *real world* (e.g., feeling misunderstood or taken advantage by others). The foundation of the conversational approach is the everyday physician-patient rapport, which allows exploring in more depth the patient's cognitive abilities. It cannot be emphasized enough that patients with cognitive limitations struggle with social reciprocity, seeing matters from a physician vantage, even if it is in their best interest. Moreover, patients with innate cognitive deficits may be experienced by physicians and allied staff as; difficult, not "getting it", help-rejecting, with cluster B personality, unmotivated, etc. The subjective experience created by this type of patient, in health care teams, is that of frustration.

Cognition

The human brain is the center of the cognitive abilities that influence the emotional and behavioral regulations within the social context. Cognitive abilities are dynamic and multifaceted and should not be thought as static.

In routine family medicine practice, it is common that the patient's cognitive function (e.g., fund of knowledge, logical process) is not assessed unless it becomes apparent that cognitive abilities interfere with the capacity for collaborative decision making of their treatment, i.e. intellectual disability, serious mental illness or dementia. Such type of evaluation may be disadvantageous, though, as the clinician may remain unaware that deficits in innate core cognitive capacities are likely to be at the root of problems with non-adherence.

It is helpful to keep in mind that a conversational inquiry of a

patient's cognitive abilities is essential in order to recognize the weaknesses that may lead the patient to unknowingly provide information that may be inaccurate and of limited reliability. At a minimum, the physician should briefly assess whether the patient has the ability to interpret the treatment plan without major distortions.

Although medical texts pay limited attention to cognition and cognitive flexibility in forming personality, contemporary research has expanded our understanding of the many ways that patients mediate the selection of the experiences stored in what is often referred to as "implicit relational memory", which some consider the basis of the self [20]. It is "the self" that is unique to each person, and when things go well, it becomes the foundation of healthy reciprocal interactions with others and responsible decision making to improve one's quality of life. Nevertheless, when "the self" is encumbered by innate difficulties in cognition and cognitive flexibility, it leads people to experience relationships with others as unstable and they have an ever-present anxiety that contributes to their maladaptive behaviors (e.g. poor decision making, lack of trust of physician's and non-adherence to treatment). As Koole, eloquently noted, "Emotion regulation emerges as one of the most far-ranging and influential processes at the interface of cognition and emotion" [21].

Patient with good cognition and cognitive flexibility is in physical or psychological distress, and temporarily is unable to process the diagnostic results and treatment recommendations.

During a follow up visit with the physician, a well-regarded school principal, becomes overwhelmed when told that he has type 2 diabetes. He returns to work and finds himself forgetting the names of his recently-hired teaching staff and is unable to recall the agenda items for his upcoming administrative meetings. Although he has a superior cognition and cognitive flexibility at baseline, after the information about his type 2 diabetes was given, he had difficulties with memory and reasoning due to preoccupation of the impact his illness will have on his life. The physician, who has treated him for several years, is reassured that the patient will resort to his baseline strengths and seek emotional help from his family and will attend his follow-up appointments.

In extreme cases of bereavement or depression, the patient may present with what appears as severe cognitive deficits, and having access to a baseline cognitive functioning can help the physician appeal to the patient's family's strengths.

Patient is considered to be of "average intelligence", which fails to capture the receptive-language deficits that would likely place him in the below-average range for reciprocal verbal exchanges.

A twenty-five-year-old man is diagnosed with severe migraines, and treatment with an antiepileptic is recommended. He is told to try to limit his use of alcohol due to its interaction with the medication. Believing that he had been called an "alcoholic", the patient becomes irate and threatens to take legal action against the physician. The physician is surprised at the intense and hostile reaction, as he has shared that his prognosis is good and that improvement could be expected within a few weeks. A careful review of his EMR (electronic medical record) reveals that the patient had shared that he had struggled most of his life with a receptive-language disorder that resulted in often misinterpreting information, and although he excelled in visual and hands on tasks and was a successful artist, he had struggled to maintain employment in settings that required frequent verbal interactions with clients. After reviewing such information, the physician makes use of visual materials to explain the patient's illness in more detail and the possible effects of alcohol with the use of an antiepileptic.

There are many adults with learning weaknesses that present to the physician's office with a wide range of anxieties and vague somatic complaints, often due to experiencing feelings of rejection and frequent misunderstanding by others. Therefore, it is important that the physician engage in a brief assessment of the cognitive abilities of the patient, as they may interpret the treatment recommendations as being pressured to comply and proceed to reject following the recommendations.

By some reports, 10% of the general population has learning weaknesses, and among this group, many have formal learning disabilities [22,23]. Considering these statistics, it is not surprising that learning disorders or learning weaknesses may be frequently observed in non-adherent patients, but also in family members, whose cognitive deficits may prevent them from recognizing the patient's needs. As Delgado, et al. state: "Patients who present with impairment in academic, cognitive, social, and vocational functioning might be struggling with an unrecognized learning disorder" [24]. Herein, people with learning weaknesses will have significant struggles in providing an accurate history of present illness and in understanding the importance of following treatment recommendations to improve their quality of life.

Visual-spatial abilities (part of cognition)

Visual-spatial ability is having the capacity to understand and remember the position of objects in relation to other objects and is required to understand directional verbal descriptions. The patient's visual-spatial abilities are necessary to know how to follow the recommendations that involve going to new locations for treatment (e.g. physical or occupational therapy, specialized laboratories, etc.). A common statement made by patients with visual-spatial weaknesses is "I just can't follow directions. I always take the wrong turn and I am always late" Assessing visual spatial issues in the clinical setting can be briefly done by asking the patient, how far and what route they usually take to get to their place of employment from their home. Deficits in this area are noticed when the patient responds by giving rough estimates about distance and vague descriptions of the route without knowing the names of the streets or highways. It would be appropriate to follow with a question about difficulties with losing objects at home (e.g. keys, eyeglasses, etc.). When it becomes clear that deficits exist in this area and the physician may wish to pursue with further tests needed to be completed at a different location, it should be considered to ask the support staff to help the patient enter the address and retrieve images of the desired location in their cellular phone so they can visually recognize it when they arrive.

A common comorbid disorder that may present in a similar form is attention-deficit hyperactivity disorder (ADHD). The patient with ADHD will have struggles across many areas of functioning and not solely in those requiring visual-spatial abilities. Although similar interventions may help, the focus should be primarily on ADHD medication adherence.

Cognitive flexibility (social cognition)

Cognitive flexibility is defined as the aspect of cognition that allows the individual to understand that others have beliefs, intentions, and perspectives that are different from their own. This allows for the psychological mindedness needed to approach medical situations with a degree of openness and with adaptive patterns that promote adherence to treatment recommendations. Cognitive flexibility involves several components: executive function, attention, working memory and emotion regulation [25]. For example, a person is disappointed that their spouse struggles with weight problems and understands their spouse's need for empathic support and encouragement to follow the treatment recommendations. Moreover, the spouse with weight problems, if he or she has good

cognitive flexibility, may initially be reluctant to adhere to a diet and take medication, although implicitly understanding the possible medical consequences and proceeds to take medication regularly. Good cognitive flexibility permits people to accept the idea that in the case of a medical or mental illness, they can feel better by following treatment recommendations, as they can recall other people improving with treatment.

On the other hand, patients with weaknesses in cognitive flexibility store maladaptive patterns of interaction from infancy and throughout their life in the implicit non declarative memory system, which are repeated when feeling misunderstood, at a non-conscious level. Hence, these maladaptive behaviors (e.g. rejecting help, limited trust, non-adherence, etc.), unknowingly by the patient, get repeated when the physician is experienced, at a non-conscious level, as demanding and critical. Importantly, the physician should not take the patient's non-adherent behaviors as a personal failure, and understand that the reason for these behaviors are complex and will largely remain unknown, as they occur in implicit memory. It is now more accepted that oppositional defiant disorders in children and personality disorders in adults are a result of innate hardwired deficits in cognitive flexibility [16]. As such, authoritarian and paternalistic approaches are poorly received and promote non-adherent behaviors.

Cognition and cognitive flexibility in adolescents and children:

It is important to assess a parent's cognition and cognitive flexibility, to determine their ability to understand the nature of their child's medical illness and the benefit from treatment plan adherence. Parents with limitations in cognition may implicitly recognize their limitations and have their child assume responsibility for taking their own medication, which increases that possibility of missed doses or complete non-adherence. It is recognized that some adolescents are able to contribute to their care, although this must be addressed in a case by case manner.

Contemporary Diagnostic Interview

As outlined above, assessing cognition and cognitive flexibility

Table 1: CDI questions that help assess cognition and cognitive flexibility in adults.

- History of patient's education (e.g., learning difficulties, special resources at school, reasons for not completing high school or college).
- History of patient's employment, if they frequently changed places of employment and reasons this occurred.
- History of the patient's view of himself within the context of their significant other, family or friends.
- History of the patient's achievements and accomplishments.
- History of the patient's experience of holidays with family and friends.
- Inquire about patient's and family members' experiences with other physicians.
- Adapted from Delgado SV, et al. (2015) [16].

can be done briefly during routine evaluations and can allow the physician to tailor the treatment recommendations accordingly. In the course of a CDI-directed patient-physician exchange, the physician is encouraged to ask the patient to share their level of education, employment history, life achievements and accomplishments, and the views of relationships with their significant other, spouse, children, and friends (Table 1). The interview aims to allow the physician to determine the patient's cognitive and psychological ability to comply with the treatment recommendations. This will help predict which patients are more likely to be non-adherent to treatment. Further, it informs the physician how to best develop and deliver practical treatment recommendations that can be accepted and implemented.

In addition, the physician should attend to the patient's or family member's syntax. When their conversations have poor sentence structure, it will alert the physician to a few possibilities: lack of education due to socioeconomic or cultural barriers, cognitive limitations, and/or a formal learning disorder. As such, by continuing to use a conversational CDI approach, the physician can *in vivo* tease out these factors and become aware of the likelihood that perhaps the signs and symptoms the patient endorses may not be accurate or reliable, at which point collateral information is essential to avoid treatment recommendations that may not be helpful.

CDI in clinical work

To illustrate the use of a CDI in clinical work, a description of several inquiries adapted from the CDI used by Delgado and colleagues is reviewed.

Thanksgiving conversation

In the United States, during the month of November, the physician may inquire about the patient's plans regarding Thanksgiving, within the context of their family. The response to the inquiry will provide insight about the level of the patient's cognitive abilities (Table 2).

In order to further assess cognitive flexibility, the physician may follow this line of inquiry with:

Who usually cooks the Thanksgiving dinner? (Table 3). In both conversations, the responses convey the patient's ability to understand how their actions may impact another person.

Regarding the responses given by a patient with a learning weakness, they demonstrate their limited ability to see themselves as important, and in clinical practice they have difficulty accurately conveying their problems in a clear manner and are often described by physicians "they talk a lot but I can't follow them." In such situations, it is best for the physician to carefully interrupt the patient and ask pertinent questions about their condition in a simple and straightforward manner that allows for "yes" or "no" response.

Table 2: Thanksgiving conversation responses.

Cognitive level	Patient's possible responses	Assessment of responses
Above average	I will go visit my family, and we always have a blast. Hopefully you won't get mad that I will break my diet that day. [Chuckles]	Is aware of plans for future with comments on past. Aware of healthy dietary standards and temporary change during family reunion.
Average	I'll go visit my family. I'm not sure what time I need to be there or what I need to bring.	Is not bothered by the limited awareness of times or family's wishes. This laissez-faire attitude is likely to be repeated in following treatment recommendations.
Below average	I don't know. I don't like going. [Feeling frustrated with clinician]	Limited awareness about the importance of the gathering and is unable to explain what prevents the experience from being positive. Reflects limited awareness of the consequences of non-adherence.
Learning weakness	Not sure, I have to call my family and see what I am supposed to do. [Conveys uncertainty on how to respond] Responds with a topic vaguely connected to the holiday or family.	Aware of limitations and recognizes the need for help with details. Changes conversation to topic not relevant. May distort treatment recommendations.
Intellectual disability	Is unable to understand, and the physician will need to find a more reasonable form of verbal interaction.	Usually are accompanied by family or caretakers that explain reasons for visit.

Adapted from Delgado SV, et al. (2015) [16].

The CDI conversational questions can be tailored to the month in which the interview takes place (e.g., if in May, a Mother’s Day conversation is appropriate). This line of inquiry can also be used during relevant holidays.

Furthermore, the physician must accept his or her own proclivities and decide whether a conversational approach is a “good fit” for him or her. It may elicit fearful feelings of getting too close to one’s patients and may cause anxiety. In such case, a medical style interview is best suited and a consultation with a colleague with familiarity in using a CDI approach can provide valuable help understanding difficult patients.

Conclusion

Putting it all together

This paper proposes that by using a CDI conversational style interview, it allows the physician to attend to the unique cognitive attributes of each patient, and be in a better position to tailor the treatment approach to best fit the patient, thereby promoting adherence and improving outcomes. In other words, different rules for different patients (Table 4).

The CDI serves as a diagnostic tool that assesses the “here and now” functioning and can be completed within the standard time for a patient visit. Moreover, the CDI permits the physician to understand and help the patient at his or her level and to modify treatment recommendations *in vivo*.

In contrast, other interventions that help promote adherence and health (e.g., patient-centered approaches, stages of change and motivational interviewing) require training, rely on the active collaboration between the patient and physician and may be more

time intensive (often requiring multiple assessments). Thus, these interventions may be better suited for motivated patients with good cognitive abilities [26-28].

For the patient who has cognitive weaknesses, it is essential to give him or her enough time to ask questions about their illness and the treatment recommendations. It is reported that the average time a physician spends discussing all aspects of a newly prescribed medication, including risk and benefits, is a mere 49 seconds [29]. This inevitably leads to poor physician-patient communication of the treatment recommendations and possible complications due to misunderstandings regarding the treatment recommendations, which is particularly worrisome for patients with limited English proficiency. Some studies report that patients who were interviewed immediately after their visit had misunderstood the directions regarding prescribed medications [30].

Misunderstandings can be attenuated, at times, by delivering the recommendations in written or visual form. At other times, having the patient repeat back their recall about the nature of their illness and treatment recommendations can enhance the understanding. The request for repeat back is done in jovial manner, so as not to be experienced by the patient as condescending, i.e. “I want to make sure I said things correctly, can you please share what you heard me say” (Table 5).

Limitations

As with the adoption of any new useful and practical technique, the physician may initially feel that these approaches are cumbersome and would delay the care of other patients. However, the physician will have an individualized understanding of patients with regard to their cognitive abilities and the associated challenges related to

Table 3: Thanksgiving dinner conversation responses.

Cognitive flexibility	Patient’s possible responses	Assessment of responses
Good	Clearly, [name of family member] cooks the best turkey but we all bring our specialty dish.	Can appreciate the closeness with family.
Fair (Average cognition)	I like everything, it doesn’t matter to me. [Patient wonders why this is being asked]	Passive in regard to family context. This passive stance may note their limited motivation to comply with treatment.
Limited (Below average cognition)	Not sure? [Looking puzzled] I hope I don’t have to bring anything? [Feeling embarrassed] I don’t know. [Indifference]	Sees self as an outsider and fears needing to participate. Non-adherence is likely due to limited ability to tolerate the steps and time it takes for recovery.
Limited (Below average cognition due to learning weakness)	Not sure who cooks. [Displays a sense of failure, an experience with which he or she seems to be familiar] Begins sharing their view of Thanksgiving and within a few sentences they change topics without being aware.	Struggles in knowing what physician is asking and quickly loses sense of what question was about. Will likely view treatment on as needed basis and not understand the need for consistency.
Impaired (Intellectual Disability)	Is unable to understand, and the clinician will need to find a more reasonable form of verbal interaction.	Usually are accompanied by family or caretakers that explain reasons for visit.

Table 4: Putting it all together.

Cognition	Cognitive flexibility	Adherence	Interventions
Above average	Good	Very good.	Standard care.
Above average	Limited	Fair. Likely to ignore treatment plan if it does not meet his/her wishes. May have narcissistic traits.	Short term interventions. Follow-up appointments to discuss concerns within days or weeks. Provide advice that can be experienced as attentive to their needs.
Average	Good	Good, with support from others.	Give visual or easy to read information about illness and treatment.
Average	Limited (due to isolated deficits in cognition that lead to frequent misunderstanding of information)	Fair, due to executive function and social cognition deficits.	Involve significant others and family when possible. Make use of reminders by staff sending texts or emails every few days.
Learning weakness Below average	Limited (due to deficits in social cognition)	Poor will require significant support from others with better cognitive abilities.	Use short term interventions and repeat back of information. Follow-up with reminders of treatment recommendations by staff sending texts or emails every few days.
Intellectual disability	Limited	Limited and will need significant support.	Will need responsible parties with good cognition and cognitive flexibility.

Table 5: Practical strategies to promote treatment adherence.

- Develop an easy way to identify patients and families with weaknesses in cognition and cognitive flexibility by making the information visible (e.g. visible colored notes in the front of paper charts or alerts in EMR). This allows the physician, in advance, to tailor the best approach on how to communicate the treatment recommendations.
- Explore through CDI, if verbal, written, and visual or repeat back of recommendations best serves the patient.
- Provide handouts with visual cues to explain the diagnosis and how medication is to be taken.
- Consider asking permission to send SMS (short message service) as reminders of appointments, medication times or pending lab work, if possible.
- Have accessible updated information about the overall cost of medications most frequently prescribed. Affordable and once daily medications should be considered.
- Have awareness regarding the distance of the patient's pharmacy in relation to their home and what type of transportation is needed to access or if delivery services are offered.
- When liquid medication is prescribed, provide a visual handout outlining how to measure the prescribed amount with a household item or provide a syringe with markings.
- Inquire about other household member's medical status and their compliance with treatment. This provides a window on what to expect about the patient's own care.

treatment adherence and thus improve patient-oriented outcomes. Future research is needed in identify protective cognitive factors that can predict adherence-promoting programs. Finally, the impact of poverty, chronic distress, chaotic family environments and cultural beliefs can have in the ability to adhere to treatment, beyond matters of cognitive abilities, should not be underestimated.

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