

Pill taking ‘routinization’: a critical factor to understanding episodic medication adherence

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Abstract *This exploratory study examines the contextual factors that lead to episodic nonadherence to highly active antiretroviral therapy. Unlike global adherence that refers to the overall probability that a participant will take his or her medication over a given time period, episodic adherence refers to whether an individual took a particular dose (e.g., Saturday morning, 17 September). Semi-structured, qualitative interviews were conducted with a convenience sample of 27 consecutive participants enrolled in ongoing adherence trials who had missed at least one dose of antiretroviral medication during the past 2 days. A qualitative analysis revealed that routinization of pill regimens and factors associated with the participant’s ability to maintain these routines (e.g., time of day of scheduled dose; location of participant at time of dose) play an important role in successful adherence. In addition, psychosocial factors such as psychological distress, substance abuse, and active and unpredictable social lives may act as barriers to adherence. Implications for adherence interventions are discussed.*

Introduction

Highly active antiretroviral therapy (HAART) has made a significant impact on mortality and morbidity rates associated with human immunodeficiency virus (HIV) in the United States (Sepkowitz, 2001). However, patients find adherence to these complex regimens to be particularly challenging with average adherence rates ranging from 50 to 80% (Arnsten *et al.*, 2001; McNabb *et al.*, 2001; Paterson *et al.*, 2000). Recent evidence suggests that very high levels of adherence (above 95%) may be needed for complete viral suppression and prevention of both drug resistance and loss of treatment options (Paterson *et al.*, 2000). Consequently, clinicians and scientists have placed increased importance on the need to develop effective methods for helping patients improve their pill taking skills.

Scientists have tried to identify predictors of adherence to HAART in order to better understand the antecedents of nonadherence and inform the development of adherence interventions. Variables found to be correlated with nonadherence include various patient characteristics (e.g., youth, depression, substance abuse, negative attitudes towards treat-

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ment) (Arnsten *et al.*, 2000; Duran *et al.*, 2001; Kasrissios *et al.*, 1998; Roberts, 2000; Schulz, 1998; Wenger *et al.*, 1999), treatment characteristics (e.g., side effects, regimen complexity) (Farthing, 2000; Gifford *et al.*, 1998; Luber *et al.*, 2000), and variables related to the patient–doctor relationship (Catz *et al.*, 2000; Chesney *et al.*, 2000; Duran *et al.*, 2001); however, researchers have been unable to identify a set of variables that reliably predict a patient's adherence. For any given variable, there are studies that reveal it to be associated with adherence, and other studies that indicate no such relationship.

Adherence research to date has focused on assessing 'global' adherence rather than 'episodic' adherence. Global adherence refers to the overall probability that a participant will take his or her medication in a timely manner, and is usually presented as a percentage of prescribed doses actually taken. Even measures of very recent short-term adherence (e.g., past 3 days) are then used to extrapolate to the patient's 'usual' adherence pattern. As an aggregate measure, global adherence is not expected to be highly correlated with specific events in the daily lives of individuals. In contrast, episodic adherence, which refers to whether an individual took a particular dose of medication in a timely manner (e.g., Saturday morning, 17 January), is probably best predicted by the activities and emotional experiences of the individual that occur immediately before or during the scheduled pill-taking time.

Since episodic adherence is embedded in the larger pattern of global adherence, it is expected that correlates of global adherence are also weakly associated with episodic adherence and vice-versa. An exception may be the routinization of pill-taking, or the extent to which a patient integrates the pill regimen into their daily routine and connects medication doses with specific daily events or behaviours. Such routinization has been shown to predict global adherence (Gifford *et al.*, 2000; Roberts, 2000; Wenger *et al.*, 1999) and is likely to be at least equally predictive of episodic adherence. Improving our understanding of adherence at the episodic level will help us better identify the mechanisms through which patients achieve varying degrees of success in their global adherence. Understanding these mechanisms, particularly the barriers, facilitators and the specific contexts in which people fail to adhere, are critical for developing effective interventions for helping patients improve their adherence and obtain optimal benefits from treatment.

We are unaware of any published studies of episodic adherence and its determinants. To begin to fill this gap, we conducted an exploratory study of the factors that influence individuals' episodic adherence. Qualitative interviews were conducted with HIV-seropositive individuals who had very recently missed a medication dose, and ethnographic methods were used to identify key themes representing common barriers and facilitators of episodic adherence.

Methods

Sample

Participants in this study were concurrently participating in one of two HIV adherence projects conducted by the authors, one of which specifically involved people with drug abuse histories (past or current). All participants were on regimens of three or more medications, and all had missed at least one medication dose in the 2 days prior to the study interview. A convenience sample of 27 consecutive participants were interviewed for this study. Most were male (77%), African–American (64%), unemployed (77%), and had at least a high school diploma (73%); 41% were in an unstable housing (homeless or transitional housing) situation. At baseline, 36% of the sample were diagnosed with clinical depression and 54%

were active drug users (substances other than marijuana or alcohol). At baseline, mean self-reported CD4 count was 529 cells/mm³ and 50% had an AIDS diagnosis.

Procedures

Participants' pill taking behavior was monitored for 2 or 4 weeks, depending on the adherence study in which they were enrolled. Adherence was measured using electronic monitoring caps that record the exact date and time of each bottle opening; each bottle opening is assumed to represent a single dose taken, although there is no way of actually knowing whether the dose is ingested. The medication with the most complex dosing instructions was selected from the participant's regimen to be monitored by the cap. At the end of the observation period, adherence results from the cap were reviewed with the participant. Participants who had missed a dose within the past 2 days were administered a semi-structured qualitative interview that was approximately 10–20 min in duration.

Participants were interviewed about their activities and experiences during days that they took and did not take their pills. First, data from the electronic cap were used to identify the most recent day that the participant had failed to take at least one dose of their medication. Participants were asked to recount what had happened in their lives during the 24 h surrounding this missed dose. Participants were then asked to compare how this particular day was either different or similar to the time period surrounding the most recent dose taken. A semi-structured interview protocol was used to guide the interview (see Appendix A). Most interviews were tape recorded and transcribed; if the participant did not consent to audiotaping, extensive notes were taken as the interview unfolded.

Analysis

Qualitative analyses were conducted based on multiple readings of the interview transcripts and notes. During the first reading, factors were identified that appeared to either act as barriers or facilitators for participants to take their medications. These factors were then sorted into groups of similar categories. Our goal was to explore the participants' perception of the events and circumstances that led to their missing specific doses. In our descriptions, we use quotes from the participants to highlight identified themes and variables contributing to episodic adherence. We have marked participant identification codes in brackets. Since the interviews were exploratory in nature and designed to follow the logic and details of each participant's own circumstances, not all participants were asked the same exact questions. This prevents us from showing proportions and looking at group differences.

Results

In discussing circumstances surrounding doses missed and doses taken, nearly all participants described efforts to integrate their pill regimen into their daily schedule and routine. The extent to which participants routinized their pill regimen, and factors that influenced the degree to which routinization successfully facilitates adherence, were the primary themes elicited from the interviews.

Routinization

Pill-taking routines. Participants spent considerable time describing how they had integrated the pill regimen into their daily routine. Many of the respondents lived very hectic and unstable lives, in part due to temporary housing accommodations, unstable employment and drug use. Yet, even under these circumstances, some were able to develop stable ‘mini-routines’ around their pill regimen, while others were less successful. In general, two strategies were predominantly used: some individuals tied pill-taking to specific events or behaviours (e.g., eating breakfast, or watching specific television programs), while others connected pill-taking to hourly schedules (usually late morning/noon and late evening).

Some participants clearly saw the advantages of linking pill-taking to specific events. For instance, one respondent felt he was most adherent during the evening meal, ‘because everything is all right there, my meal, my meds, my water. It is all right in front of me. I don’t have to go fish for it. I don’t have to think about it [11]’. Several people mentioned taking pills when they watched particular television programs. As one respondent said, I hear ‘I Love Lucy’; I take the pill. Another respondent noted that he remembered to take his pill in the evening every time he heard the ‘Jeopardy’ theme song. Others tied their pill-taking to specific meals (mostly breakfast and dinner) or specific daily events like brushing their teeth or using the bathroom first thing in the morning. Some felt that placing the pills out in plain view helped to remind them to take their medications.

Still others felt that pill-taking was something that needed to be tied to an even bigger and more important goal. For example, one respondent had finally decided after many years to begin estrogen therapy to switch genders. Having recently started therapy, she described how each morning she would get up and stand in front of the two full-length mirrors on her closet doors. Then she would lift up her shirt and look to see if her breasts had grown. After that she would go straight to the kitchen and make breakfast and then take her estrogen followed by her HIV medications. When asked what advice she would give to someone taking HIV medications, she stated, ‘A person has to make up their mind about what is important to them’. She had reached a point in her life where taking care of herself and her health was the priority, and for her that meant taking her hormones and her HIV medications [26].

Location at the time of scheduled dose. The location of the participant at the intended dosage time is a factor that seemed to influence the participants’ ability to successfully integrate their pill regimen into their daily routine. Respondents found it easier to remember to take their pills when they were at home. Being out, whether running errands, visiting friends, or going to therapy meetings or doctors appointments were often associated with missing a dose. One respondent noted that he often forgot about his pills when outside but when ‘I start to do things inside the house, then I remember the medications [9].’

Sleeping in different places was often associated with missed doses. At least three people reported forgetting to take their medications when they stayed over at someone else’s home. One respondent left his medication bottles at a friend’s house and missed almost a week’s worth of medication before he could get the bottle back. Creating a stable routine regardless of location may be crucial for increasing adherence. One respondent described the problem as such:

My schedule is erratic. It looks like I have to go back to work next month, so maybe it will be a little better then. [Why is that?] Because in the evenings, I’ll be in a certain place. I’ll be at home in the evening, and in the morning I’ll be at work. It won’t be like in the evening I’m at my folks house and in the morning I could be at my aunt’s house [2].

This is not to say that pills are only taken at home. Participants did carry their pills with them and sometimes they did remember to take them when they were away from home. The chance of missing a dose, however, does seem to increase when away from home. When asked what was the most difficult part of taking the medications, one respondent said, 'Having to remember to keep them with me at all times, or to keep a supply with me. It is not always easy wrestling with my pills and my knapsack and my water on the train. But I have taken my pills on the train before [11].'

Time of day of scheduled dose. Factors that influence adherence in the morning differ from factors that influence adherence in the evening. Mornings appear more regimented for most people, as pill-taking is more likely to be associated with specific activities, such as brushing teeth, taking vitamins or eating breakfast. For example, one respondent explained his routine as follows:

I wake up. . . I take my medications out of the containers. I set them up on my dresser and I already know that I have to take my medications. . . Yeah, then I know that I have my medications pending. After I make my breakfast and that's when I take my medications. Then I do what I have to do. But I always take my medications [9].

Morning doses are missed because of waking up late, being disoriented, or rushing off to an appointment. A couple of individuals mentioned problems associated with psychological medications they were taking. For example, one person reported that the psychotropic medications he took in the evening made him pretty disoriented in the mornings [3].

Evenings can be particularly troublesome for adherence because people tend to be more active and social, and activities are often more varied and less structured at night. As one person noted, 'Something always comes up, either people are there or I just forget [17]' Participants reported returning to the house at different times during the evening. When asked about pill taking in the evening, one respondent simply said, 'That one is crazy, because I never know where I am going to be [2]'.

Some participants reported that they went out in the evening and forgot to take their pills along. For those who might stay over at a friend's place this can mean missing both the evening and the next morning's dose. Even those who stay home may be distracted by social activity or watching television. Another respondent reported, 'There is always someone knocking for cigarettes, always. . . talking to somebody. Or its like 3:00 and we have to answer the door because whoever's downstairs doesn't have his keys [6]'. Regular scheduled events in the evening such as Alcoholic's or Narcotic's Anonymous meetings or other group meetings can be a double-edged sword. On the one hand, they provide structure and stability to a person's evening, but they can also create a more hectic environment. One participant put it this way:

I have to go to my group session. I always keep that on my mind to take my medications before leaving. . . [But] sometimes, I go to the meeting at the community center and then when I am at the meeting I remember I forgot to bring my medication with me. . . I forget my medication because I rush and I do this and I do that. Too many things and I forget the most important thing—my medications [9].

Delayed effects on adherence. Adherence may be influenced by events and behaviors that occurred many hours before. Events and behaviors that occur the night before can influence

morning adherence and morning and afternoon events and behaviors can influence evening adherence. At least three people blamed late afternoon and early evening fatigue caused by excessive errands for missing their medications. Hectic days filled with errands, chores, and non-routinized events seem to adversely affect pill taking in the evening either by disorienting the respondent's normal schedule or causing exhaustion. One respondent noted, 'If company is coming by, you know, or if my mom needs something from the store and I have to run to Ralph's or Albertson's and different things. So then when I get caught up, I forget [2]' Another respondent missed a dosage because she was tired and worn out after caring for her sick baby nephew [13].

Late nights, poor sleep, and excessive partying may influence adherence in the morning more than they do evening dosages. At least three respondents attributed missed morning dosages to being up late the night before. On several occasions, we found that individuals had taken their medications early in the evening, then spent the night partying, and missed the next morning's dose. One respondent explained why he woke up late on some mornings, 'Its according to whether I stay up all night or not. Its not whether I'm high, but has more to do with how busy a day I've had, if I drank four or five beers, how much company I've had, how much drugs, all that. That has a lot to do with it [4]'.

Juggling the interval between doses

The participants in this study were all on twice-a-day regimens; therefore, the optimal window or interval between doses was 12 h. Respondents varied, however, in what they considered the acceptable time frame in which they could safely take their medications. Some seemed comfortable with taking their pills within 1–2 h of the ideal time, while others used a 2–4 h period. Some respondents linked the window to fixed time periods, for example 8–10 in the morning and 8–10 at night. Others did not link doses to particular times, but rather, calculated 12 h from the last time they took a dose.

For those who missed a dose, or who took their medication earlier or later than normal, it meant not only calculating the next window and remembering to take the next dose, but also trying to schedule pill-taking within the remaining activities of the day. Since some medications need to be taken with meals, missed or late doses may disrupt future meal times. Sometimes, respondents felt it was easier to simply skip the dose completely and wait until the next regular window arrived. One respondent said, 'Sometimes, I wake up and I forget about taking them. I then think about it and I figure it is already too late. It is already the afternoon or the evening [3]'.

In another example, a respondent went to temple in the morning and got back at 9:30 or 10 a.m., which was a bit later than usual. When asked why he had not taken his pill then, he responded, 'Ok, because I got home too late. That must have been what it was. I got out of that window. I would have gotten home outside of that window'. When asked what time he usually takes his morning dose, he elaborated further, 'About 8ish. So that way it would have only been about 10 hours different instead of the 12 hours, because. . . I'm normally asleep by 8 p.m. [11]'. Another respondent got up in the morning and left the house at 6 a.m., planning to be back at 8 a.m. to take his medication. Instead, he was called to work so he missed his morning dose. When he got back at 3 p.m. he decided not to take his medication and instead waited until 8 p.m. to do so [17].

Other barriers to adherence

Emotional events and psychological distress. Psychological distress and emotional experiences appeared to contribute to the respondents missing doses. For three respondents, depression seemed to play a role in missed doses. One individual missed a dose on a day in which he reported spending all day alone watching television and generally feeling lethargic and down [25]. Another respondent missed a dose on a day in which he was preparing to change residences around the holidays and noted, 'Its depressing to move. It's more depressing around Christmas. So I'm hanging decorations, taking decorations down. So you know, I was sort of like "ooh, wow" [4]'. Another respondent reported that stressful family events caused him to forget several doses. Apparently, a niece had not come home 'and it worried the hell out of everybody in my family and so that weekend was really kind of crazy. So, I'm sure it had some kind of effect on the way I take my meds, because I spent a lot of time at her house and my other sister's house, and the calling and driving around looking for her [2]'. Emotional ups and downs with partners, family or friends were often cited as creating an emotionally stressful environment that led to missed doses.

In three other cases, respondents reported missing doses at times in which they had either gotten into an altercation or had been angry over some event. One respondent said, 'It was Saturday or Sunday. I don't remember. I got into a scuffle at the house and left everything and didn't even think about it (taking medication) [3]'. Another reported that he had become angry in the morning and had taken his HIV medications along with medications prescribed by his psychiatrist but was essentially 'out of it' for the rest of the day and therefore missed his evening dose. This latter response may also be an example of how psychotropics and other medications can have side effects that result in disorientation or lack of cognitive clarity that can lead to missed doses.

Drug abuse. Drug use appears to have both direct and indirect effects on adherence. When drugs become all consuming, they directly affect pill taking. For example, one respondent recounted his past experience with drugs and HIV medications this way:

When I was on HIV meds, I was incarcerated. When I got out, I was on the streets and I got in the habit of using a lot of dope, so I didn't even take the damn pills. I mean, I took them for a couple of days but it was tough 'cause I was doing whatever else I was doing [3].

Drug use and nonadherence, however, are not always directly correlated. Furthermore, drugs are often consumed outside of the home in social settings that place additional burdens on remembering to carry and take medications. Given the many other activities that are associated with substance use, it is difficult to attribute missed doses to a specific incident of drug use. Take the example of the participant who reported one day that he woke up, used drugs from 9 to 10 a.m., took his medication, then used crack and marijuana again throughout the day, missing his evening dosage. The next day, the same participant woke up at 10:30 a.m. and watched television until 2:30 p.m. (forgetting his morning dosage). He then went and met a friend, got drugs, and used. At about 6 p.m., he arrived at a friend's house, where he had a cocktail and watched television until 12:30 a.m. Though he had carried his pill bottle with him, he forgot to take his evening dosage. He noted that he had not been feeling very happy that day and that he tends to get depressed after he uses. The next day, he left the friend's house but forgot his medication bottle. Subsequently, he missed the next 5 days worth of his medications [16]. For this respondent, some doses were missed while others were taken

within the context of drug use, and some missed doses could be attributed to drug use and/or several other concurrent factors.

The effects of drug use on adherence appear to be tied into how drug consumption is integrated into one's daily routine. For most respondents who were drug users, drug use occurred infrequently and most often at night after they had already taken their evening dosage. For other respondents, drug use was a regular and predictable event. One woman admitted to being high almost every night and, in fact, she consistently missed her evening dose; however, she was fairly consistent in taking her medications in the late afternoons after she woke up. For some, drug use has more of an indirect or delayed affect on adherence rather than being the direct cause of missed doses. The following example seems typical.

More than likely, what was going on was that I was getting high. I was probably taking bottles and cans up to the redemption and I got in a little late. I sat down and got my little high going and my beer and when that was over, I lay down and went to sleep. [Interviewer: But you didn't miss that dose, that night.] No, but I still took it late, and then didn't take it the next morning. I probably overslept [4].

The role of social networks

Only one respondent reported that someone reminded him to take his medications — this was his girlfriend. Social supports may help improve adherence in the context of long-term stable relationships. Unfortunately, for many respondents active social networks often interfered with adherence. Multiple respondents attributed missed doses to social activities. Sometimes social activities are spontaneous and interrupt a regular routine. For example, one person missed his morning dose because he had met up with a friend and gone out to breakfast, a relatively rare event. Another reported he was preoccupied while waiting for his boyfriend to come at 9 a.m. on Saturday. He had planned to take his medications at 8 a.m. but had forgotten. Usually the boyfriend comes on Wednesdays and Sundays, so this irregularity or break in routine may have contributed to him forgetting his dose [18].

One person missed a weekend dosage because he had been attending a large 'family gathering, drinking, eating, lounging, laughing... with grandkids, nephews, sisters, in-laws, and cousins [2]'. Evening doses appear to be particularly vulnerable to spontaneous social events. As another respondent notes, 'Something is always going on, people are over and you just forget [17]'. Another had attended a party on a boat and had gotten ill. It seems sadly ironic that events that are seen as joyous and happy are often linked to poor adherence.

Discussion

Consistent with conceptual models that account for the influence of situational contexts in explaining health behaviour (Ross & Ferreira-Pinto, 2000), findings from this small exploratory study of episodic adherence suggest that understanding daily routines and their role in pill-taking behaviour may be vital to optimizing adherence. The experiences of our participants, and results from other studies indicating that 'change in daily routine' is a common reason for missed doses (Chesney *et al.*, 2000), suggest that the ability to successfully integrate the regimen into one's daily routine and to adjust to spontaneous disruptions in the routine are important components to achieving high levels of adherence. Accordingly, tailoring a regimen to fit the patient's daily routine has become a standard

strategy used by clinicians to prepare patients to adhere to HAART (Gifford *et al.*, 2000; Roberts, 2000).

How pill-taking regimens can best be integrated into one's daily routine, however, remains somewhat unclear. It is apparent from our interviews that patients live unique and often unstable lives and missed doses are often the result of a complex and protracted set of circumstances. Under such conditions, it is obvious that no single solution is apt to work for everyone. One strategy is to help patients identify and develop stable, consistent routines in their lives that can then be tied to scheduled medication doses. Several of the participants in our study connected scheduled doses to specific behaviours (e.g., brushing teeth, going to bed) or events (e.g., watching a favorite TV program) in their daily routine. Another strategy is to build flexibility into the pill-taking routine so that it can be adjusted to accommodate variations in location, time of day, and spontaneous unplanned events. Teaching individuals to anticipate and prepare for potential interruptions by carrying extra pills and rescheduling meals can also be helpful.

Adherence research has focused almost entirely on measuring the proportion of prescribed doses taken by the patient. Yet, it has become increasingly evident that the timing of doses is an important component of adherence and the relationship between adherence and clinical outcomes (Hooper *et al.*, 2001; Stansell *et al.*, 2001). Consistent intervals between doses (e.g., 12 h between twice-a-day doses) are needed to achieve steady drug concentrations in the blood throughout the day and to maintain complete viral suppression. Our qualitative interviews indicate that some patients have misconceptions or are confused about whether or not to take a dose if the dose is remembered after the 'dosage window' has elapsed. This highlights the need for more refined patient education regarding pill taking and dosage intervals. It is widely recognized that patients should not take multiple doses at once to compensate for missed doses because of the risk for increased toxicity. However, guidelines are not as clear as to when a late dose is too late to take, and this has resulted in patients, and some clinicians, being unclear about the parameters in which a missed dose should be taken or skipped.

Similar to studies of variables associated with global adherence, our exploration of episodic adherence uncovered the influence of psychosocial factors including emotional distress, drug use, and social support networks. A number of participants missed doses of their pill regimen within the context of being depressed, angry or under other forms of emotional stress. With many participants recruited from a study of adherence among patients with a drug abuse history, it is not surprising that several respondents talked about drug use in connection with missed doses. For some, drug use directly contributed to forgetting doses or to lack of motivation or desire to take a dose. However, it is not only the state of being 'high' that accounts for why people miss specific doses, but also the process of getting high and its aftermath that disrupt regular routines and produce additional barriers to adherence. In this way, substance use is directly and indirectly associated with lapses in adherence.

The study interviews highlighted the mixed effects that one's social network can have on adherence. While we often focus on the benefits of social support, numerous examples provided by our respondents suggest that social activities, particularly unstructured and spontaneous activities, are apt to disrupt pill taking routines and lead to nonadherence. The extent to which social activities impede adherence may be mediated by the patient's self-disclosure, or lack thereof, of their HIV and treatment status. If one's social network is not aware of one's HIV status and need to take timely medication doses, the network's ability to be helpful (e.g., reminders, encouragement) is nullified. Social supports within the context of long-term, stable relationships may be more apt to provide benefits and assistance with regard to treatment and adherence.

This qualitative exploration of episodic adherence revealed that routinization of pill regimens may be a critical component to successful adherence. Our findings suggest that those whose lives are less routinized are likely to be at higher risk for nonadherence. Identifying such patients may not be as obvious as it appears. Individuals with seemingly unstable, chaotic lives can still incorporate relatively consistent patterns of behaviour into their daily life, and there are no established methods for reliably assessing routinization. This qualitative study is the first step in our efforts to develop a quantitative measure of the concept of routinization — or the extent to which one's life is routinized or has consistent, structured patterns of events and behaviours. As a second phase to this research effort, we are attempting to develop a quantifiable measure of routinization. We hope this will help us better predict which patients are likely to experience difficulties with adherence and therefore deliver more targeted and appropriate intervention strategies.

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Appendix A: Semi-structured interview protocol

A.1. Questions about daily events

We noticed that you didn't open your medication bottle in the morning on [day and time here]. Can you describe what was going on in your life that day?
 What was happening during the time you normally take your pills?
 Where were you?
 What kinds of activities were you engaged in?
 Who else was around at the time?
 Do you recall how you were feeling at the time?
 Do you recall remembering/thinking about taking your pill?

A.2. Compare and contrast questions

Now think about the previous day, (or later/previous time that day). How was this time different from the previous/later time that day when you took your pill?
 Where were you?
 What was going on?
 Who else was around?
 How were you feeling?
 How was it different from the same time but previous/later day?
 Where were you?
 What was going on?
 Who else was around?
 How were you feeling?

A.3. Questions about normal pill-taking pattern

Can you describe what a normal pill-taking day is like?
 When do you usually take your pills? (What is your routine?)
 What else is usually going on?
 Is it associated with another specific event (brushing your teeth, eating)?
 How constant is your routine?
 Are there particular events that tend to disrupt this routine?
 Do you have someone around to help remind you to take your pills?
 Do you try to keep track of when you take your pills?

A.4. Questions about typical missed doses

Are there any particular times that are worse than others for taking your pills?

When?

Why?

So what are the biggest hassles you have encountered about taking your meds?

A.5. Questions about severity

People have a lot of different perceptions about how drugs work and what the results are if you miss a dose.

What do you think happens when you miss a dose?

How worried are you when you miss a pill?

What do you do when you realize you have missed a dose?

A.6. Questions about typical solutions

Have you found anything that has been particularly helpful in following your pill regimen?

If someone else was having a lot of trouble remembering to take their meds, what would you suggest they do?

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