

## Factors Influencing Glaucoma Treatment Adherence

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### Abstract

Despite the availability of effective medical therapies, poor adherence to glaucoma medications is a significant challenge in the management of the disease. The basis for non-adherence is probably a complex interplay of many potential causes that can vary between different patient populations. Studies vary in the way adherence is measured, in the root causes of non-adherence, and in the possible ways to improve it. However, the overarching commonalities of these studies is the underlying reality that poor adherence is a major problem affecting the quality of glaucoma care. Awareness and detection of non-adherence by clinicians is also problematic. Adherence is often inaccurately thought of as a responsibility that rests entirely with the patient. However, identifying potential barriers to adherence, and implementing techniques and strategies to overcome these barriers, can begin to set the stage for improvement.

### Keywords

Adherence, persistence, glaucoma, medications

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In the treatment of any chronic disease, even the most effective medical therapies cannot achieve optimal success without patients' co-operation with their prescribed regimens. Patient behaviors, outlooks, and circumstances that lead them to not take prescribed medications are still poorly understood. Such behaviors are probably the result of a complex interplay of many factors that are not easily generalized. What has been commonly referred to as patient compliance can be more accurately described as adherence—the degree to which a patient follows the instructions to take a prescribed treatment during a defined period of time.<sup>1</sup> Persistence represents a measure of the time until the patient first discontinues a medication.<sup>1</sup> Patient adherence and persistence represent a pervasive problem in the care of patients with glaucoma. Although glaucoma is a major cause of blindness worldwide, the typical course of the disease—a chronic process that is initially asymptomatic—appears to set the stage for suboptimal patient adherence and persistence. Patients with glaucoma are largely not reminded by the disease process itself of the importance of taking medications as prescribed. Indeed, in the care of patients with glaucoma, adherence and persistence rates are not as good as one would hope. And poor adherence to medications can lead to worsening disease.<sup>2,3</sup> Moreover, ophthalmologists are not great detectors of non-adherence, with one large study finding that approximately one-fifth of patients had non-adherence undetectable by their physician.<sup>4,5</sup> Thus, non-adherence represents a major obstacle in the effective treatment of this sight-threatening condition.

An emerging body of evidence examining factors that influence adherence is providing greater insight into the complexities surrounding why patients

have difficulty with adhering to glaucoma therapy and why doctors are poor at detecting this. In this article, we review methods of measuring adherence and persistence, and discuss some of the predominant barriers to adherence and possible strategies to improve it.

### Measuring Adherence and Persistence

How does one really know whether a patient is taking a medication as prescribed? Detection of adherence in the clinical setting most commonly uses patient self-reporting in some form or another. When determining adherence in larger cohorts, self-reporting through interviews or questionnaires is a simple method, but also one that has several weaknesses. Self-reports are affected by selection bias and recall bias, and will reflect only the patients who submit to them.<sup>2</sup> Those who fail to attend follow-up appointments are excluded from such measurements.<sup>2</sup>

Several studies have found that patients tend to overestimate their own adherence to treatment.<sup>2,6–9</sup> Rates of adherence across a variety of studies using self-reported figures range from 24 to 98 %.<sup>2</sup> This broad range—from dismally low to unexpectedly high adherence—reflects the probable inaccuracies of self-reporting in determining adherence rates.

Electronic measurements of adherence, which use a device to count the drops coming out of the bottle, might circumvent recall bias but cannot certify whether or not a drop was actually instilled into a patient's eye.<sup>2</sup> For most glaucoma medications, electronic devices are not readily available, and rates gleaned from studies using electronic measures thus have limited value in determining adherence rates in a broader sense.

The medication possession ratio (MPR) is another way to estimate adherence and persistence. The MPR is the amount of prescribed medication the patient has, divided by the amount of medication the patient should have if they are following the prescription according to instructions.<sup>1</sup> The MPR can be calculated using claims data from large patient databases. The theoretical advantages are minimizing biases and using data from large groups of patients. However, the weakness of the MPR as a surrogate for adherence is that it does not account for medication switches, medication additions, or the use of samples.<sup>2</sup> The Glaucoma Adherence and Persistency Study (GAPS) is the largest study thus far on adherence in patients with glaucoma. It used claims data from 13,956 subjects started on a glaucoma medication, with 10,260 patients followed for a minimum of one year. In this large patient population, the mean MPR was 0.64 for the 13,956 subjects and for the 10,260 patients at one year, with 59 % of the latter still in possession of some medication at the end of the first year and only 10 % having the medication available at all times.<sup>10,11</sup>

Measures of persistence through a variety of techniques, including Cox survival analysis, chart reviews, and decision-analysis, have also shown disappointingly low overall adherence.<sup>2</sup>

### Barriers to Adherence

There are a multitude of factors that appear to negatively influence adherence and persistence. As we gather from clinical practice when interviewing patients, the reasons for poor adherence are varied, and risk factors for poor adherence and persistence are difficult to identify.<sup>12</sup> Foremost, the very nature of the disease itself as an asymptomatic chronic process has a major role, as adherence decreases with time.<sup>12,13</sup>

To better understand and categorize potential barriers to adherence in patients with glaucoma, Tsai and colleagues described a classification based on a prospective series of interviews with patients.<sup>7</sup> Obstacles were grouped into four broad categories:<sup>14</sup>

- environmental and/or situational factors (49 %);
- medication regimen factors (32 %);
- patient-related factors (16 %); and
- provider-related factors (3 %).

Environmental or situational factors relate to a patient's social circumstances that might affect adherence, such as travel, major life events, lack of adequate support, and so on. Medication regimen factors can be cost, dosing frequency, multiple medications with complex schedules, and difficulty with instilling the medication. Patient-related factors include a multitude of potential obstacles, such as poor dexterity, financial limitations, lower health literacy, cognitive or emotional problems, and other co-existent general health problems—particularly in elderly patients primarily afflicted with glaucoma.<sup>12</sup> Provider-related factors can relate to trust and other qualities of the patient–physician relationship.<sup>4</sup> The physician's history-taking style also has a role in the poor detection of non-adherence by the physician (closed-ended questions and attitudes being less likely to help them detect non-adherence). Fewer follow-up visits, or the failure to attend those visits, have also been closely linked to non-adherence.<sup>2</sup>

From the GAPS study, which used structured interviews with patients and physicians, eight variables were found to be independently associated with a lower MPR. These variables were:<sup>11</sup>

- hearing everything one knows about glaucoma from the doctor;
- not believing that vision loss is a consequence of not taking one's medications;
- difficulties with cost of medication;
- difficulties with treatment when travelling or not at home;
- not acknowledging stinging and/or burning;
- being non-white;
- receiving samples; and
- not receiving a phone call as a visit reminder.

Although some of these variables are beyond the physician's control (for example, cost issues), what is revealing is that many of them can be influenced by the physician through enhanced patient education and communication in order to improve adherence.

### Strategies to Improve Adherence

If one's ability to predict adherence is poor to begin with and, additionally, if the reasons for poor adherence are so multifactorial and varying from patient to patient, how can we as healthcare providers begin to improve it? Clearly, the many factors causing poor adherence pose a significant challenge, not only in the treatment of the disease, but also in how one approaches the subject with patients. Several strategies have been proposed to improve adherence, and many lessons can be learned from adherence improvement strategies pertaining to other chronic diseases. Although few are validated in a prospective manner, they nonetheless appear to make sense and propose positive steps from a behavioral standpoint.

A prerequisite to improving non-adherence is its actual detection, which physicians are currently poor at. Why are physicians so poor generally at detecting non-adherence in the clinical setting? As described earlier, self-reported measurements, electronic measurements and MPR calculations are ways to estimate adherence quantitatively, but they are not commonly used in individual patient care. It is an easy task to identify non-adherence if the issues are self-evident. For example, the patient might admit to not taking the medication, might not remember the medication's name or administration route, or might readily state cost issues; the provider might be able to observe cognitive impairment/dexterity issues. However, in a large number of clinical practice scenarios, poor adherence is more subtle and doctors have a hard time detecting it.

The patient–physician relationship hinges on trust. However, the paternalistic nature of the traditional patient–physician relationship probably influences how willing patients are to tell healthcare providers what they really do with their medications. Patients do not generally want to disappoint their doctor by seeming to fail fulfilling their instructions. This may lead them to not readily admit non-adherence behaviors and probably contributes to cyclical non-adherence behavior—such as 'white-coat adherence',<sup>2,15</sup> where patients take their medications on the days preceding an appointment, with inconsistent use during the remainder of the interval between follow-up visits.

Other cyclical behaviors where there are gaps in treatment can be almost impossible for the clinician to detect. These behaviors may lead to the far too common scenario where disease progression might be evident, but with seemingly controlled measured intraocular pressure. This in turn leads to the dilemma of whether the disease is progressing either despite achieving an adequate target pressure, or because there are underlying adherence issues.

Closed-ended questioning styles are exceedingly common, because they are perceived to fit better—perhaps inaccurately—with the time constraints of a busy healthcare provider. In an observational study on videotaped physician–patient encounters, doctors spent eight minutes with each patient on average. Six minutes were spent talking to the patient, with the doctor speaking >70 % of the words during the whole encounter.<sup>16</sup> Doctors mostly asked closed-ended questions and rarely asked patients if they had any questions. This type of encounter has been described as ‘physician-centered’ and leads to lower abilities to detect non-adherence,<sup>16</sup> which seems logical as the doctor is doing all the talking and patient answers are limited to yes and no.

Strategies to improve adherence center on improving patient–physician encounters. Shifting from a ‘physician-centered’ to a more ‘patient-centered’ encounter style has been suggested as one method to address the fundamental way in which physicians communicate with patients as healthcare providers. Steven Hahn describes the use of a four-step adherence-assessment interview.<sup>17</sup> These steps are:

- open-ended questions about the medical regimen;
- acknowledgment by the provider of the difficulties of administration;
- ensuring the patient understands that treatment decisions hinge on whether they are taking the medication as prescribed; and finally
- asking directly about adherence.

An ‘ask–tell–ask strategy’ has also been described. This strategy is to use open-ended questioning to first ‘ask’ the patient about their understanding of their disease, then ‘tell’ by responding to the patient’s concerns, then ‘ask’ again to assess any changes in understanding.<sup>17</sup>

This type of strategy makes sense to enhance the dialog between doctor and patient and shift the nature of the relationship to a more open discussion, rather than one where ongoing therapy issues are concealed. In an ideal world, a physician would have the time to interview and

educate each patient without limits. Indeed, a leading complaint of patients is that there is insufficient time with their doctor.<sup>18</sup> This is unlikely to improve, given that time is increasingly limited and valuable, with greater numbers of patients and less time available for physicians to spend with each one. Increasing the accessibility to healthcare—for example, by extending surgery hours or cutting wait times—has been suggested as another way to improve adherence,<sup>12,19</sup> but for many healthcare providers this might not be possible.

One of the variables from the GAPS study was hearing everything one knows about glaucoma from the doctor. Simple measures, such as educational videos, re-inforcement of information through other office staff, and the use of written material, could help provide greater patient education without increasing the time spent with the physician. There is some evidence that patients who are active participants in their own care do better.<sup>20</sup> It has been suggested that inciting patients to bring written personal health summaries<sup>21</sup> encourages them to be more active participants in their own care and might thus also improve adherence.

Another simple technique to improve adherence is providing written medication instructions to patients. Tailoring medication regimens to be simple and individualizing them to best fit with each patient’s lifestyle is another strategy. As failure to maintain follow-up appointments is linked to poor adherence,<sup>2</sup> the use of follow-up reminder messages/calls, or even more frequent follow-up visits, might therefore also help.<sup>2,10</sup>

## Conclusion

Adherence to glaucoma therapy is poor, and the current ability of physicians to detect this is poor too. There is a wide array of factors that can influence adherence. Improving adherence starts with identification and detection. Understanding at the outset what risk factors might contribute to poor adherence is crucial. As the understanding of the barriers to adherence improves, there might be potential for more focused and efficient interventions. Many potential ways to improve adherence have been described—whether they involve a change in the fundamental way physicians interact with patients or other measures of positive re-inforcement. Further research into whether implementing various strategies actually translates into improved patient adherence is needed for validation. Greater adherence leads to better outcomes; finding ways of addressing the major issue of non-adherence is a significant challenge in the care of patients with glaucoma, but one with tremendous potential to make a difference. ■

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