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# Barriers to Adherence of Antihypertensive Medications in the Elderly Population

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# PERMISSION

Title: Barriers to adherence of antihypertensive medications in the elderly population

Department: Nursing

Degree: Master of Science

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## Abstract

High blood pressure is prevalent among patients over the age of 60, and poor adherence to antihypertensive medications is a major cause of failure to achieve optimal blood pressure control. It is estimated that 26-59% of patients over the age of 60 are noncompliant with prescribed antihypertensive medications. A 60-year-old Caucasian female, with newly diagnosed hypertension, has been on lisinopril for three weeks for blood pressure control. During examination, the patient had complaints of an irritating cough that started shortly after starting medication. Despite adding the lisinopril, her blood pressure remains elevated at 160/98. Literature search: Several factors were identified in the literature review as influencing adherence to prescribed drug therapy. The search was conducted in PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) and initially included studies published in English within the past five years. The search was expanded to a custom range of 2001-2018 to capture all relevant information related to antihypertensive management. This approach resulted in a total of 13 articles. Key words included in the search were: Hypertension, medication compliance, medication adherence, side effects, older adult, medication nonadherence, cardiovascular medications, and barriers. Managing hypertension in older adults can be challenging in clinical practice due to noncompliance with medications. Providers should screen for and address patient-specific barriers to medication adherence and equip patients with the tools and information needed for successful antihypertensive therapy and optimal blood pressure control.

## Background

High blood pressure, greater than 150/90, is prevalent in patients 60 years and older, and poor adherence to antihypertensive medications is a major cause of failure to achieve optimal blood pressure control (Lo, Chau, Woo, Thompson, & Choi, 2016). Hypertension affects approximately 70 million people in the United States, and two-thirds of those are 60 years or older (Lo, Chau, Woo, Thompson, & Choi, 2016). It is estimated that the rate of medication adherence is 26-59% in persons >60 years old and nonadherence occurs more often in older patients who have more medical conditions and require more medications (MacLaughlin et al., 2005).

Because the rate of medication adherence tends to be low in the elderly population, achieving guideline-recommended blood pressure levels with the use of blood pressure lowering medications in older patients has shown to be difficult (Chowdhury et al., 2013). Studies suggest that many older hypertensive patients are unable to achieve optimal blood pressure control because of poor adherence to antihypertensive medications (Lo et al., 2016). Poor adherence is related to illness perception, discomfort caused by side effects, having poor provider relationships, and low self-efficacy (Lo et al., 2016). In addition, it can lead to worsening of disease, increased comorbid disease, increased health care costs and death (Chowdhury et al., 2013).

There are several factors that have been associated with nonadherence to medication regimens, including: the health care team (the absence of a quality relationship between the patient and the health care provider, which can lead to less trust, not seeing the primary provider when needed, decreased comfort in asking questions, and not feeling involved in the treatment decisions); drug therapy prescribed (side effects and complexity of drug regimen); patient's

health beliefs (personal beliefs about diseases and medications); and socioeconomic conditions (e.g., poverty, health literacy, low social support) (AlGhuair, Hughes, Simpson, & Guirguis, 2012). Understanding patient barriers in adhering to antihypertensive medications will allow providers to incorporate more appropriative targeted health education strategies for improved patient compliance (Lo et al., 2016)

## Case Report

A 60-year-old Caucasian female, with newly diagnosed hypertension, has been on lisinopril for three weeks for blood pressure control. Her family history is positive for hypertension in both her brother and sister, and for cardiovascular disease in her father. During examination, the patient complained of an irritating cough that started shortly after starting lisinopril. At the time of this visit, she was taking a multivitamin, and 20 milligrams of lisinopril daily, and an occasional TUMS for indigestion. She routinely engages in regular exercise and follows a low-sodium diet. Despite the antihypertensive regimen, her blood pressure remains elevated at 160/98. She has been checking her blood pressures at home, with readings ranging from 140-144/80. Findings from a complete history and physical assessment are unremarkable except for a history of tobacco use (smoking one pack per day until 10 years ago), and daily caffeine intake. Laboratory data, including basic metabolic panel and lipid panel, were within normal limits.

The Eighth Joint National Committee (JNC8) published guidelines in 2014 that offer recommendations for management of hypertension in differing populations, including: people older or younger than age 60 years; people aged >18 year with chronic kidney disease; people aged >18 with diabetes; and black and nonblack populations ("JNC 8," 2017). These evidence-based guidelines focus on initiating antihypertensive medications at specific blood pressure

thresholds to improve health outcomes (James, Oparil, & Carter, 2014). Clinical guidelines now support initiating hypertensive treatment in persons 60 years and older when blood pressures exceed 150/90 to reduce the disease burden of myocardial infarction, stroke, renal failure, and death (James et al., 2014). There is also evidence to support the use of angiotensin-converting enzyme inhibitors (ACE), angiotensin receptor blockers (ARB), calcium channel blockers (CCB), or thiazide-type diuretics in reducing blood pressure in the nonblack hypertensive population (James et al., 2014).

Despite a three-week trial of lisinopril, the case patient's blood pressure remained elevated, and, in addition, she developed an irritating cough. As many as one-third of people who take ACE inhibitors develop a dry, hacking cough, often referred to as an ACE cough (Peck, 2001). Side effects are often a reason why patients discontinue therapy and put themselves at risk of developing a cardiac event, such as a heart attack (Peck, 2001). After careful review of the patient's medical history, the ACE inhibitor was discontinued, and the patient was started on the ARB losartan 50 milligrams per day. The patient has been directed to return to the clinic for evaluation of the effectiveness of the new medication after four weeks of therapy. At that time, kidney function and electrolyte studies will be completed as well as an evaluation of blood pressure.

In this case, the patient was taking medications as prescribed with the development of unwanted side effects which, if not addressed, would likely affect adherence in the future. Many patients face barriers which prevent them from adhering to their treatment plan. Even with access to medical care, older patients need effective provider-patient communication to help them better understand their health and medications.

## Literature Review

Managing hypertension in older adults can be challenging in clinical practice. To understand the current knowledge on barriers to effective treatment, a systematic literature search was conducted in PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) to find information on hypertensive medication compliance in the older population. This search was done by accessing these databases using the University of North Dakota's Harley E. French Library of the Health Sciences. Key words and search terms were used alone and in combination were: hypertension, medication compliance, medication adherence, side effects, older adults, medication nonadherence, hypertension guidelines, cardiovascular medications, and barriers. The search strategy used Medical Subject Headings (MeSH).

The initial search in PubMed was limited to randomized control trials, case reports, journal articles, clinical trials and systematic reviews. The search included only those studies in English and with publication dates in the past five years. This resulted in nine journal articles. To capture all data related to antihypertensive management, the publication date was expanded to a custom range of 2001-2018, which provided a total of 13 articles. The same search parameters were applied in the CINAHL database. Results were hand-checked for duplicates, and one more relevant publication was identified. Articles were reviewed for content, and additional literature was identified by reviewing the references of selected journal articles.

The literature suggests that the most significant modifiable barrier to achieving optimal blood pressure control in the elderly patient is adherence to antihypertensive medication (Krousel-Wood, Muntner, Islam, Morisky, & Webber, 2009). Barriers to antihypertensive medication adherence are multifactorial (AlGhuair et al., 2012). The literature consistently

supports the association between nonadherence to antihypertension medication and a) the patient's health care team (quality of the relationship between patient and the health care provider), b) medication therapy (side effects and complexity of drug regimen), c) patients' health beliefs (personal beliefs about diseases and medications), and d) socioeconomic factors (e.g., poverty, health literacy, low social support).

Studies suggest that many older hypertensive patients are unable to achieve optimal blood pressure control because of poor adherence to antihypertensive medications (Lo et al., 2016). Adherence is defined as "the extent to which a person's behavior corresponds with agreed recommendations from a health care provider" (AlGhuair et al., 2012, p. 877). The Centers for Disease Control and Prevention (CDC) estimates that about 65% of older adults have hypertension and medication nonadherence is a growing problem among older adults (Al-Ruthia et al., 2017). Nonadherence can lead to increased hospitalizations, decreased therapeutic benefits, and increased health care costs (Yap, Thirumoorthy, & Kwan, 2016). The World Health Organization (WHO) estimates that 30-50% of older adults are non-adherent with their antihypertensive medication regimen, up to 50% discontinue their antihypertensive treatment within the first year, and up to 75% of patient do not achieve target blood pressure (Van der Laan, Elders, Boons, Nijpels, & Hugtenburg, 2017). This data demonstrates the need to target the older population in identifying barriers that lead to nonadherence.

The provider-patient relationship is important in helping older patients navigate the physical, psychological, social, economic, and lifestyle changes associated with aging (Krousel-Wood, Muntner, Islam, Morisky, & Webber, 2009). The development of a trusting therapeutic relationship between a patient and their healthcare provider is essential in achieving positive health outcomes (Yap, Thirumoorthy, & Kwan, 2016). Elderly patients often have multiple

issues that they need addressed during an office visit, and hypertension management and medication adherence assessment may not be a provider priority (Turner et al., 2009).

Patients' who do not prioritize discussing hypertension or are poorly informed about medication instructions, are more likely to be non-adherent (Turner, Hollenbeak, Weiner, Have, & Roberts, 2009). According to Turner et al (2009), provider-patient interaction barriers were commonly reported; 15% of patients had trouble following the provider's advice about taking the medications, 26% stated that they did not feel it was important to talk to their provider about their blood pressure, and 16% did not feel their provider listened to them (Turner et al., 2009, p. 677). Other healthcare team barriers identified were difficulty in obtaining a refill prescription, lack of support from the provider, difficulty in scheduling appointments, quality of communication, and patient participation (AlGhuair et al., 2012).

Studies have indicated that older adults who have a positive relationship with their provider, are often more compliant with their medication regimen because of the quality time spent effectively assessing and treating concerns (Williams, Haskard, & DiMatteo, 2007). Routine medical visits also give providers the opportunity to communicate with their patients about their diagnosis and treatment options and tailor the education to the fit the patient's needs (Van der Laan, Elders, Boons, Nijpels, & Hugtenburg, 2017). Therapy barriers also include the unwanted effects of medications, the interference medications make on a daily routine, and the complexity of the drug regimen the patient needs to take each day (AlGhuair et al., 2012). Elderly patients often have multiple chronic diseases which require several different medications and create complex treatment plans that can impact medication adherence (MacLaughlin et al., 2005).

Unpleasant side effects are a significant factor in patients discontinuing their medication therapy (Van der Laan et al., 2017). Adverse drug reactions, can ruin quality of life, disrupt sleep, and be bothersome, all of which can lead patients to discontinue the medication and have inadequate blood pressure control (Alhawassi, Krass, & Pont, 2015). When starting patients on new medications, it is essential for the provider to follow-up with the patient on a more frequent basis and inform the patient of the most common side effects associated with the medication (Yap et al., 2016). This can help ensure the new medication is working effectively and allow providers the opportunity to change therapy if side effects develop (Yap et al., 2016). It is imperative that providers complete a medication review at each visit and inquire about any difficulties with complying with the medication regimen (Yap et al., 2016). Suggestions such as pill boxes to help organize medications, or the use of reminder notes, can also help the patient with medication compliance (Williams, Haskard, & DiMatteo, 2007).

Patient awareness and understanding of their health conditions and medications can lead to compliance and improved blood pressure control (AlGhuair et al., 2012). Older patients, that have had a cardiovascular event in the past, were found to be more compliant with their medication treatment (Brindel et al., 2006). According to Lo and colleagues, the most commonly reported patient-related barrier to compliance is a perception that the medication is not beneficial (Lo et al., 2016). Inadequate education about medications and inability to manage complex medication regimens can lead to medication non-adherence (Hsu et al., 2014). In addition, a patient may want to be able to streamline his or her medication dosing to make day to day management easier (Hsu et al., 2014).

Attributing unrelated conditions to hypertension may reduce medication compliance (Turner et al., 2009). Turner et al (2009) surveyed 202 elderly patients and reported that many of

these patients were unware of the correlation between stress and blood pressure, or that poor hypertension management was related to vascular diseases such as stroke and heart attack (Turner, Hollenbeak, Weiner, Have, & Roberts, 2009, p. 678). To achieve optimal blood pressure control, education targeted at the older population can help raise awareness of the risks associated with uncontrolled hypertension (Chowdhury et al., 2013). MacLaughlin and colleagues report that many providers do not routinely assess the literacy level of their older patients even though effective screening tools are available (MacLaughlin et al., 2005).

Socioeconomic factors associated with aging can affect medication adherence. Many elderly face economic hardships, experience the death of a spouse, or have a decreased understanding of their health (AlGhuair et al., 2012). Studies have found that elderly patients who live alone often lack social and emotional support needed to understand and take medications as directed (Dupre et al., 2017). Social support has been associated with better blood pressure management in older adults with hypertension (Williams et al., 2007). According to AlGhurair et al. (2012), elderly patients with partial assistance in medication management were 3.6 times more likely to adhere to their medication regime than those that had no support (AlGhuair et al., 2012).

Reducing out-of-pocket costs can lead to better medication adherence (O'Quin, Semalulu, & Orom, 2015). Costs of monthly prescriptions are a common barrier among the elderly, especially when they hit the "doughnut-hole", the gap in coverage between standard Medicare Part D drug coverage and catastrophic-coverage threshold (O'Quin et al., 2015). According to a study conducted by O'Quin et al (2015), when hitting the "doughnut-hole", patients were more likely to take their medications every other day or share medications with friends or family to reduce cost (O'Quin et al., 2015, p. 327). In a survey of 875 older adults,

19% had to cut back on their medication use in the past year due to cost (Wick, 2011). When the cost of medication is high, patients are less likely to take them which can increase to worsening disease, hospitalization and death (Wick, 2011).

To screen for some of these barriers, the provider should have the conversation with the patient about their home life. Ask the patient if they have a caregiver, do they live alone, are they able to afford their medication, do they have insurance to cover the medications being prescribed, and are they capable of managing their own medications on a day to day basis. Addressing these specific questions may highlight patient specific barriers and improve outcomes for adherence. In addition, to help ease the burden of cost for the patient, providers should eliminate unnecessary medications, request generic medications when available, and connect patients to programs that help during times of economic hardship.

In summary, adherence to medications is affected by several factors including the quality of the patient-provider relationship, the prescribed drug regimen, the patient's personal health beliefs, and socioeconomic issues. The literature supports a patient-centered approach as the gold standard for improving adherence (Krousel-Wood et al., 2009). Providers should work to create an open and trusting relationship, and incorporate patient beliefs, preferences, goals and barriers and allow patients to be involved in treatment decisions (Zullig & Bosworth, 2017). Patient-centered communication can help explore the social barriers and help the older population maintain independence and health and increase medication compliance (Williams et al., 2007).

## Learning Points

Adherence to blood pressure medications is essential for blood pressure control. Patients benefit from a therapeutic patient-provider relationship to help them understand their health, medications, and break down potential barriers that pose risks of nonadherence. Many studies included in the literature review cited common barriers that influence medication adherence in older patients. To address these potential barriers, providers should:

- Engage patients as partners in their health. Patient satisfaction with their healthcare team can influence their medication adherence (Lo et al., 2016). A therapeutic provider-patient relationship and satisfaction with the health care team is essential in promoting patient adherence to antihypertensive medications (Van der Laan et al., 2017).
- Screen for and address side effects of prescribed medications. Adverse drug reactions and side effects can lead to noncompliance with the agreed treatment plan (Van der Laan et al., 2017). Educate patients on potential side effects and follow up in a few weeks and change medications if side effects develop.
- Simplify treatment regimens when possible. Having multiple medications and a complex medication regimen can lead to poor adherence (Hsu et al., 2014).
- Educate patients on importance of adhering to their medication regimen. Patient awareness and understanding of their condition can lead to better medication compliance and improved blood pressure control (AlGhuair et al., 2012).
- Screen for socioeconomic barriers that prevent patients from adhering to their medication regimen and provide information on available resources. By asking key questions during an office visit, the provider can gain insight into the patients'

support system at home and their ability to manage and afford medications (Williams et al., 2007).

Numerous factors contribute to medication nonadherence in the older population, but by addressing patient specific barriers, providers can equip patients with the tools needed for successfully managing antihypertensive therapy and achieving optimal blood pressure control.

References

Al-Ruthia, Y. S., Hong, S. H., Graff, C., Kocak, M., Soloman, D., & Nolly, R. (2017). Examining the relationship between antihypertensive medication satisfaction and adherence in older patients. *Research in Social and Administrative Pharmacy*, *13*(3), 602-613.

AlGhuair, S. A., Hughes, C. A., Simpson, S. H., & Guirguis, L. M. (2012). A systematic review of patient self-reported barriers to adherence to antihypertensive medications using the World Health Organization Multidimensional Adherence Model. *The Journal of Clinical Hypertension*, *14*(12), 877-886.

Alhawassi, T. M., Krass, I., & Pont, L. G. (2015). Prevalence, prescribing and barriers to effective management of hypertension in older populations: a narrative review. *Journal of Pharmaceutical Policy and Practice*, *8*(24).

Brindel, P., Hanon, O., Dartigues, J., Ritchie, K., Lacombe, J., Ducimetiere, P., ... Tzourio, C. (2006). Prevalence, awareness, treatment, and control of hypertension in the elderly: the three-city study. *Journal of Hypertension*, *24*(1), 51-58.

Chowdhury, E., Owen, A., Krum, H., Wing, L., Ryan, P., Nelson, M., & Reid, C. (2013). Barriers to achieving blood pressure treatment targets in elderly hypertensive individuals. *Journal of Human Hypertension*, *27*(9), 545-51.

Dupre, M. E., Nelson, A., Lynch, S. M., Granger, B. B., Xu, H., Churchill, E., ... Peterson, E. D. (2017). Socioeconomic, psychosocial and behavioral characteristics of patients hospitalized with cardiovascular disease. *American Journal of the Medical Sciences*, *354*(6), 565-572.

Hsu, C., Lemon, J. M., Wong, E. S., Carson-Cheng, E., Perkins, M., Nordstrom, M. S., ... Bryson, C. L. (2014). Factors affecting medication adherence: patient perspectives from five veterans' affairs facilities. *BMC Health Services Research*, 14(533), 1-9.

James, P. A., Oparil, S., & Carter, B. L. (2014). 2014 Evidence-based guidelines for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee. *JAMA, 311*(5), 507-520.

Krousel-Wood, M. A., Muntner, P., Islam, T., Morisky, D. E., & Webber, L. S. (2009). Barriers to and determinants of medication adherence in hypertension management: Perspective of the cohort study of medication adherence among older adults. *Medical Clinics of North America*, *93*(3), 753-769.

Lo, S. H., Chau, J. P., Woo, J., Thompson, D. R., & Choi, K. (2016). Adherence to antihypertensive medication in the older adult with hypertension. *Journal of Cardiovascular Nursing*, *31*(4), 296-303.

MacLaughlin, E. J., Raehl, C. L., Treadway, A. K., Sterling, T. L., Zoller, D. P., & Bond, C. A. (2005). Assessing medication adherence in the elderly: which tools to use in clinical practice? *Drugs and Aging*, *33*(3), 231-55.

O'Quin, K., Semalulu, T., & Orom, H. (2015). Elder and caregiver solutions to improve medication adherence. *Health Education Research*, *30*(2), 323-335.

Peck, P. (2001). On an ACE inhibitor? You don't have to cough up a lung. Retrieved from https://www.webmd.com/heart-disease/news/20010816/on-ace-inhibitor-you-dont-have-to-cough-up-lung#1

The 2014 JNC 8 and 2017 AHA/ACA guidelines for management of high blood pressure in adults. (2017). Retrieved from https://sites.jamanetwork.com/jnc8/

Turner, B. J., Hollenbeak, C., Weiner, M. G., Have, T. T., & Roberts, C. (2009). Barriers to adherence and hypertension control in a racially diverse representative sample of elderly primary care patients. *Pharmacoepidemiology and Drug Safety*, *18*(8), 672-81.

Van der Laan, D., Elders, P., Boons, C., Nijpels, G., & Hugtenburg, J. (2017). Factors associated with antihypertensive medication non-adherence: a systematic review. *Journal of Human Hypertension*, *31*, 687-694.

Wick, J. Y. (2011). Adherence issues in elderly patients. Retrieved from http://www.pharmacytimes.com/publications/issue/2011/january2011/rxfocus-0111

Williams, S. L., Haskard, K. B., & DiMatteo, M. (*2*007). The therapeutic effects of the physician-older patient relationship: effective communication with vulnerable older patients. *Clinical Interventions in Aging*, 2(3), 453-467.

Yap, A. F., Thirumoorthy, T., & Kwan, Y. H. (2016). Medication adherence in the elderly. *Journal of Clinical Gerontology and Geriatrics*, *7*(2), 64-67.

Zullig, L. L., & Bosworth, H. (2017). Engaging patients to optimize medication adherence. Retrieved from https://catalyst.nejm.org/optimize-patients-medication-adherence/