

## A Simple Method for Predicting Adverse Outcomes in Heart Disease Patients

Gehi AK, Ali S, Na B, Whooley MA. Self-reported medication adherence and cardiovascular events in patients with stable coronary heart disease: the Heart and Soul Study. *Arch Intern Med* 2007;167:1798–803.

### Study Overview

**Objective.** To determine whether patient self-report can provide an accurate assessment of medication adherence and whether self-reported nonadherence is associated with worse outcomes in patients with stable coronary heart disease (CHD).

**Design.** Longitudinal survey of patients in the Heart and Soul Study [1].

**Setting and participants.** 1015 outpatients with established CHD were recruited from 2 Veterans Affairs Medical Centers, 1 university medical center, and 9 community health clinics in Northern California. Patients were asked a single question about medication adherence: "In the past month, how often did you take your medications as the doctor prescribed." Potential patient responses were "all of the time" (100%), "nearly all of the time" (90%), "most of the time" (75%), "about half the time" (50%), or "less than half the time" (< 50%). Nonadherence was defined as taking medications  $\leq 75\%$  of the time.

**Main outcome measures.** Cardiovascular events (CHD death, myocardial infarction, or stroke) during 3.9 years of follow-up identified by phone interview with the patient and verified by chart review conducted by 2 independent and blinded adjudicators.

**Main results.** Of 1015 participants, 83 (8.2%) reported nonadherence to their medications, and 146 (14.4%) developed cardiovascular events. At 3.9-year follow-up, 19 of 83 (22.9%) nonadherent patients developed cardiovascular events as compared with 127 of 924 (13.7%) adherent patients ( $P = 0.03$ ). After adjusting for baseline cardiac disease severity, traditional risk factors, and depressive symptoms, self-reported nonadherence remained an independent predictor of adverse cardiovascular events (hazard ratio, 2.3 [95% confidence interval, 1.3–4.3];  $P = 0.006$ ).

**Conclusion.** Patients with stable CHD who self-reported medication nonadherence were more than 2 times more likely than adherent patients to experience subsequent cardiovascular events. A single question about medication adherence may effectively identify patients at higher risk for adverse cardiovascular events.

### Commentary

CHD is currently the leading killer of Americans [2]. Despite decades of progress in the development of new therapies, corresponding reductions in cardiovascular deaths have been lacking. Part of the reason for the slow pace of improvements in patient outcomes is that patients often fail to receive appropriate therapy. Despite the strong evidence base, critical life-saving drugs are either not offered to patients or, when offered, they are not taken (noncompliance).

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Therefore, it is critical to identify which patients are at risk for medication noncompliance and target educational activities at these patients and their physicians.

The study by Gehi and colleagues demonstrated that asking a simple question can help to identify a group of patients at very high risk for poor cardiovascular outcomes. Although it is tempting to attribute the worse outcomes to nonadherence, several differences between adherent and nonadherent patients are likely to confound this relationship. The authors adjusted for several potential confounding factors, such as cardiac disease severity, demographic characteristics, and depressive symptoms; however, they could not account for the fact that nonadherent patients are likely different in other, unmeasured ways as well. For example, they may be more likely to engage in risk-taking behaviors (eg, smoking) and less likely to live a healthy lifestyle.

Another potentially important explanation is that nonadherence itself may be a marker of poorly controlled heart disease in ways that the investigators could not measure. For instance, when patients begin to feel worse, they may stop taking their medications out of fear that they are no longer effective or are making them feel poorly. Finally, it is possible that nonadherence was causative. This would not be surprising, given that the cardiac medications are all highly effective for preventing complications from heart disease

and one would expect that adherence should lower one's risk for poor outcomes.

### Applications for Clinical Practice

Although the study does not elucidate why nonadherent patients have worse outcomes, it convincingly demonstrates that patients who report nonadherence are at high risk for poor outcomes, and therefore more aggressive, close management of their CHD is warranted. Asking patients if they are adherent to their medications—a simple question that most clinicians rarely ask—can help identify patients who will likely benefit from more intensive care.

—Review by Ashish K. Jha, MD, MPH

### References

1. Gehi A, Haas D, Pipkin S, Whooley MA. Depression and medication adherence in outpatients with coronary heart disease: findings from the Heart and Soul Study. *Arch Intern Med* 2005;165:2508–13.
2. Rosamond W, Flegal K, Friday G, et al; American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2007 update: a report of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee [published erratum appears in *Circulation* 2007;115:e172]. *Circulation* 2007;115:e69–171.

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