

POPULATION CARE MANAGEMENT

Improving the health of a population, one patient at a time.

Controlling blood pressure is a Clinical Strategic Goal. This information is provided to help clinicians improve the health of members with high blood pressure. The Joint National Commission and KP's Care Management Institute recognize hydrochlorothiazide as the first drug of choice for hypertension if the patient does not have heart failure, coronary artery disease, chronic kidney disease, or microalbuminuria due to diabetes mellitus.

Hypertension Control in Patients with Diabetes Significantly Reduces Deaths from Heart Attacks and Strokes

According to the most recent National Health and Nutrition Evaluation Survey (NHANES), more than 70 percent of people with diabetes have hypertension. Only 10 percent achieved the goal blood pressure of < 130/80 mmHg.

The vast majority of patients with diabetes and high blood pressure have systolic hypertension. The underlying cause almost always includes a volume component, and therefore, it is very difficult to bring under control without a diuretic.

Clinical trials demonstrate that more than 70 percent of patients with diabetes and hypertension will need three or more antihypertensive drugs because of the difficulties of lowering systolic pressure to < 130 mmHg.

By prescribing hydrochlorothiazide/lisinopril (generic Prinzipide®) as an initial treatment, patients will have more rapid blood pressure control because of the pill's two-drug combination. This also means improved patient compliance (taking one pill versus two), fewer provider interactions, and less follow-up laboratory testing. Fewer visits can also improve access.

The four-drug treatment option preferred by the Regional Hypertension Committee is generic Prinzipide (counts as two drugs) 12.5/10, titrated to 12.5/20, and again to 25/20. Add atenolol 25 mg, titrated to 50 mg. Add nifedipine extended-release 30 mg, titrated to 60 mg, and again to 90 mg.

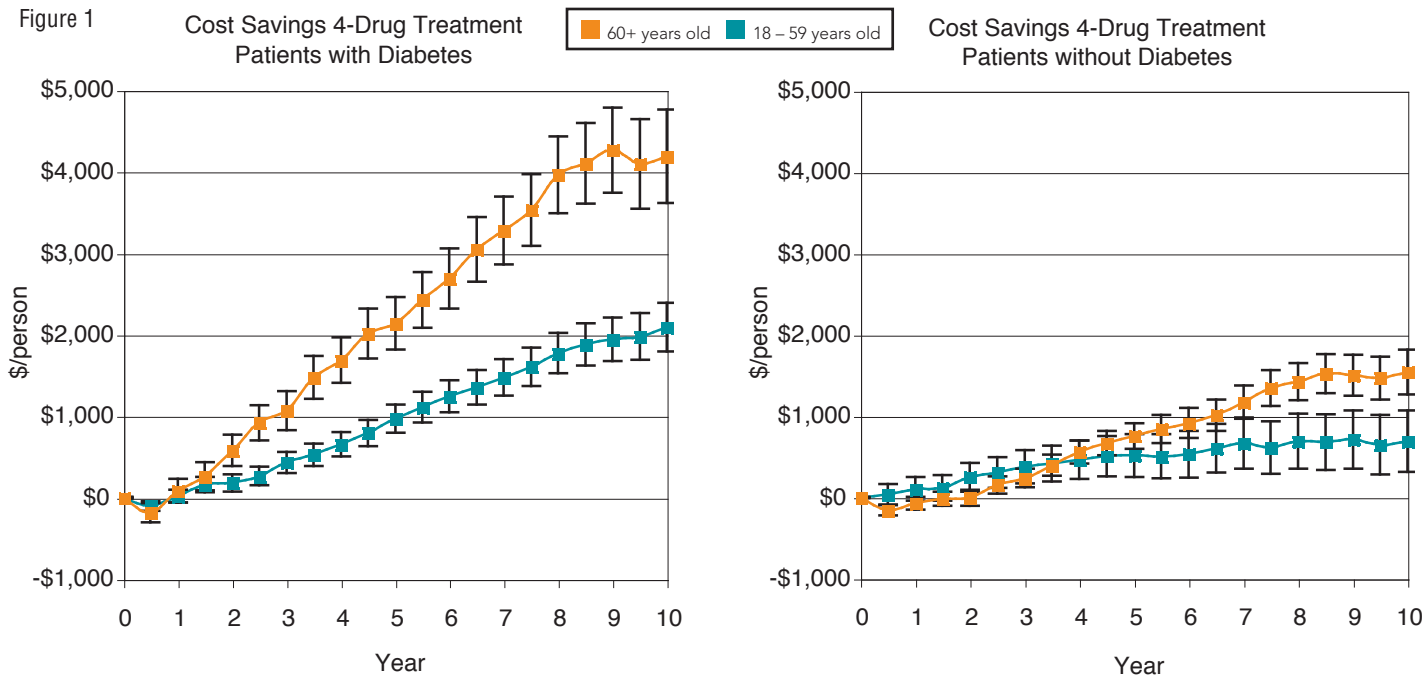
Generic Prinzipide is not appropriate for individuals with an estimated creatinine clearance < 30 cc/min. After initiating generic Prinzipide, order and obtain follow-up potassium and creatinine tests in two to four weeks. For women aged 70 and older, order and obtain follow-up serum sodium, potassium, and creatinine tests in approximately five days; look for hyponatremia.

In addition to greatly reducing the number of heart attacks and strokes, which improves patients' health outcomes, there are also considerable cost improvements to be achieved by controlling hypertension in our patients with diabetes (see Archimedes story).

The blood pressure goal for our members with diabetes is < 130/80 mmHg. Patients who know their blood pressure goal are more likely to achieve it.

Antihypertensive Drug Combination Saves Money and Lives in the Long Run

Figure 1



The Archimedes Model, a Kaiser Permanente innovation, can mathematically show the cost benefit of a medical intervention. Figure 1 illustrates the cost savings of a four-drug antihypertensive regimen on Kaiser Permanente Southern California (KPSC) patient populations with and without diabetes. The initial start-up expenses are

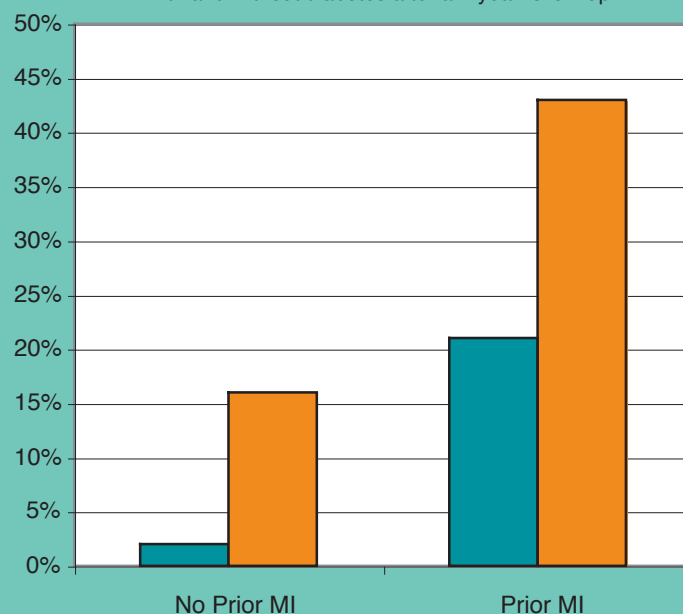
quickly offset by the savings associated with the reduced number of heart attacks and strokes. In less than three years, the cost benefit is \$1,000 for a member with diabetes who is 60 or older, and continues to grow to more than \$4,000 over the course of 10 years. Cost savings are primarily due to strokes and heart attacks that are prevented.

Facts about Hypertension and Diabetes

Studies continue to confirm that patients who have diabetes and uncontrolled hypertension have a high-risk of death from heart attacks and strokes.

- According to a Finnish population study, 80 percent of patients with diabetes will die from a cardiovascular-related event. Uncontrolled hypertension contributes significantly to the likelihood that these patients will die from a heart attack or stroke without proper treatment.
- A person with diabetes is 7.5 times more likely to die from cardiovascular causes when compared to a person without diabetes who has not had a myocardial infarction (see Figure 2). Additionally, the cardiovascular mortality risk increases three-fold for a patient with diabetes who has had a myocardial infarction (MI) when compared to a patient without diabetes who also has had an MI. Another way to view this is to say that the risk of death from an MI for a person with diabetes is comparable to a person without diabetes who has already suffered a heart attack.
- Because of the elevated cardiovascular risk, patients with diabetes derive twice as much benefit from hypertension treatment as those patients without diabetes. The Systolic Hypertension in the Elderly Program (SHEP) study demonstrated that 100 MIs and strokes were avoided over five years in patients with hypertension and diabetes who were treated with a thiazide-based regimen. That was twice as many CV events avoided when compared to the 50 MIs and strokes that did not occur over five years in patients without diabetes but with hypertension who were also treated with a thiazide-based regimen.

Figure 2 Incidence of death from cardiovascular causes in individuals with and without diabetes after a 7-year follow-up



Source: Sowers et al. *Hypertension* 2001; 37: 1053 - 1059