



The Cost-Effectiveness of Homecare Review of Literature, May 2005

Homecare Reduces Costs by 37 Percent for Heart Failure Patients

The May 2004 *Journal of the American Geriatrics Society* reports a study conducted at six Philadelphia academic and community hospitals to determine whether a three-month regime of homecare directed by Advanced Practice Nurses (APNs) would have a significant impact on rehospitalizations and costs over a year with respect to hospitalized patients suffering from heart failure and other comorbid conditions.

The study found a 37.6 percent reduction in the total costs of care for the intervention group compared to the control group, attributable to fewer and later hospitalizations and fewer deaths. The researchers felt that these results were obtained principally because of the continuity of care provided by the APNs who coordinated the patient's care both before and after hospital discharge and APNs who were trained in the complex care needs of patients suffering from multiple chronic conditions.

(“Transitional Care of Older Adults Hospitalized with Heart Failure: A Randomized Controlled Trial,” *Journal of the American Geriatrics Society*, May 2004.)

Cost of Intravenous Antibiotic Treatment at Home Is Less Costly than Other Settings

This 1998 study published in *Clinical Infectious Diseases* quantifies cost savings of a home intravenous antibiotic (HIVA) program in a Medicare managed care plan. In the study, 66 treatment courses of HIVA therapy were administered for a total of 1,542 patient-days of therapy. The cost of HIVA therapy included the costs of drugs, supplies, nursing and therapists' salaries, and laboratory studies. Savings were calculated based on the average daily direct variable cost for hospital acute unit or skilled nursing facility (SNF) care associated with the patient's discharge DRG. The number of days on HIVA therapy was assumed to equal the number of days in the hospital acute unit or hospital-based SNF.

The average cost per day of HIVA therapy was \$122, compared to \$798 in the hospital and \$541 in a SNF setting. The cost of home antibiotic infusion was approximately 15 percent that of receiving the same therapy in an inpatient acute care setting and about 22 percent of the cost of the same therapy in a SNF. In one year, the HIVA program saved one health system \$646,000-\$834,000. The authors note, “As more Medicare managed care plans increase their number of enrollees, [home IV antibiotic] programs will become increasingly important as powerful tools to control global costs in the treatment of infections. Regardless of the health care insurer, the need to maximize value and avoid unnecessary expenditures will drive cost-effective innovations like [home IV antibiotic] therapy.”

(Dalovisio, J., et al, “Financial Impact of a Home Intravenous Antibiotic Program on a Medicare Managed Care Program,” *Clinical Infectious Diseases*, 2000.)

Long-Term Oxygen Therapy at Home Saves Medicare Dollars

Oxygen can be provided to a chronic obstructive pulmonary disease (COPD) patient who lives at home for one full year at less than the average Medicare cost for one day in the hospital, which is \$3,606 (per Annual Statistical Supplement, 2004, Social Security Bulletin). The average Medicare payment for stationary and portable oxygen is approximately \$250 per month or roughly \$8.34 per day. Long-term oxygen therapy (LTOT) is one of the most cost-effective settings to care for patients with COPD, which is the 4th leading cause of death in the world, afflicting more than 14 million Americans. The direct medical costs for COPD in the U.S. total \$18 billion per year or nearly 9% of Medicare expenditures.

(Dunne PJ. "The demographics and economics of long-term oxygen therapy." *Respiratory Care*. 45:223-228, 2000. O'Donohue WJ, AL Plummer, "Magnitude of usage and cost of home oxygen therapy in the United States," *Chest* 107: 301-302, 1995. American Association for Homecare, "The Value of Homecare: COPD and Long-Term Oxygen Therapy," white paper, 2004.)

Pediatric Homecare Is More Cost-Effective than Institutional Care

A 1999 survey of literature reported in *Journal of Pediatric Health Care* on reimbursement sources and cost effectiveness of pediatric homecare found that homecare is a cost-effective alternative to institutional care. Pediatric homecare has grown because more chronically ill children are surviving due to new technologies and drugs and increased demand for homecare as a means of cost containment.

The article cites one study reporting that home health costs are 70 percent less than hospital costs for high-tech, ventilator dependent children and that the average cost of caring for these children at home is 87 percent less than a hospital setting. The article states that "although home care can be expensive, it still remains a cost-effective alternative to institutionalization."

(Balinsky, W., "Pediatric Home Care: Reimbursement and Cost Benefit Analysis," *Journal of Pediatric Health Care*, 1999.)

Arizona Home and Community-Based Services Saves Medicaid Dollars

A study published in the *Journal of Health Politics, Policy and Law* in December 1997 looks at cost savings from the Arizona statewide capitated home and community based (HCB) program in Medicaid during the early 1990s. Three quarters of program participants were determined by the authors to be at high risk of nursing home placement. For participants whose risk factors indicated a long nursing home stay in the absence of HCB, the savings were projected to be "substantial."

The authors determined that for patients with a low likelihood of nursing home placement, there was little to no savings. Even including this population, the program overall saved 35 percent of estimated nursing home costs, a savings figure that was "probably underestimated."

(Weissert, W., et al, "Cost Savings from Home and Community-Based Services: Arizona's Capitated Medicaid Long-Term Care Program," *Journal of Health Politics, Policy and Law*, December 1997.)

Homecare More Cost Effective for Joint Replacement Patients

A Rand Corporation study commissioned by the Medicare Payment Advisory Commission (MedPAC) looked at costs and outcomes for hip and knee replacement patients across post-acute care settings for the period January 2002 to June 2003 and found that the cost for joint replacement patients treated at home was approximately \$3,500 less than for patients discharged to a skilled nursing facility and \$8,000 less than for those sent to inpatient rehabilitation facilities. On April 21, 2005, MedPAC staff reported that a panel of eleven physicians stated, “ideally patients with hip or knee replaced should go home for rehabilitation.” MedPAC is an independent federal body that advises Congress on issues affecting Medicare.

(Buntin, M. B., Kaplan, S., “Comparing outcomes for hip or knee replacements across settings,” presentation to MedPAC, April 21, 2005.)

Medicaid Home Health Utilization Higher in States with Medicaid Budget Pressures

A study conducted in the early 1990s and published in *Medical Care* found that Medicare home health utilization is higher in states with Medicaid budget pressures and in those with no personal care programs. When state Medicaid funding for homecare decreases, Medicare home health expenditures increase in that state. There is an inverse relationship between the number of long-term care facilities and skilled nursing facilities (SNFs) in a state and the use of Medicare home health care. For some beneficiaries, Medicare home health care serves as a substitute for other long-term care needs, for others as a substitute for other post-acute care settings. There are additional factors that are related to the greater use of Medicare home health care in some states, including greater age of the population, a higher level of poverty, and a greater number of home health agencies.

The data on which this study is based dates from 1990-1993, before the Interim Payment System and Prospective Payment System (PPS), thus limiting its relevance as far as explaining variations in utilization among states today. The study has relevance, however, as reflective of the interrelationship between Medicare and Medicaid spending. The authors note that as the federal government controls expenditures under Medicare, pressure will increase on the Medicaid side.

(Cohen, M., Tumlinson, A., “Understanding the State Variation in Medicare Home Health Care,” *Medical Care*, Vol. 35, No. 6, 1997.)

Review of Medicaid Home-Based Services in Seven States Shows Reduced Costs

A 2002 study published in *Health Care Financing Review* describes the characteristics of Medicaid home and community-based (HCB) programs in seven states, including how the programs are administered, how eligibility is assessed, and how the states use their programs to provide home care services for clients who would otherwise face nursing home placement. HCB programs vary greatly from state to state. The seven states (Alabama, Indiana, Kentucky, Maryland, Michigan, Washington, and Wisconsin) treat their HCB programs very liberally. As an indication of this, the authors note that these states do not always adhere to admission restrictions instead focusing on expansion of services and increasing the number of people served rather than placing emphasis on cost control and tight regulation. At the same time, none of the states reported that spending on HCB programs was out of control.

In Washington, for instance, the state imposed strict fiscal caps, keeping spending to 40 percent of the cost of nursing home care on a per capita basis. In 1999 in Alabama, spending per enrollee in HCB services was \$6,612 compared to a per capita cost in nursing homes of \$22,771. This study indicates that the states know the value of home health for beneficiaries who would otherwise be institutionalized and that institutional costs are avoided by the use of HCB programs.

(Wiener, J., et al, “Home and Community-Based Services in Seven States,” *Health Care Financing Review*, Spring 2002.)

Congressional Joint Economic Committee Cites Home Health Care as Least Costly

In February 2004, the Congressional Joint Economic Committee issued an Economic Policy Brief on long-term care hospitals that cited the cost effectiveness of home health care compared to three other post-acute care settings. Home health care: \$4,000; Skilled nursing facility: \$8,300; Inpatient rehabilitation facility: \$12,500; Long-term care hospital: \$35,700.

(Congressional Joint Economic Committee, “Long Term Care Hospitals: More Facilities, More Expenditures, More Questions”)

Additional Published Studies

A 1999 study reported in the *Journal of the American Medical Association* reported savings of about 65 percent in a randomized-controlled trial of post-acute home-based management by advanced practice nurses. (Naylor, MD, et al, “Comprehensive discharge planning and home follow-up of hospitalized elders,” *JAMA* 281:613-620, 1999.)

A 2004 American Geriatrics Society meeting discussed a model similar to the Naylor study reported in *JAMA* (281:613-620, 1999) with a 70 percent savings comparing a treatment period to historical control data at Virginia Commonwealth University in Richmond, VA. (*Am Geriatrics Society* – 2004 AGS meeting abstract supplement, April 2004.)

The *New England Journal of Medicine* reported in 1995 a 50 percent reduction in recurrent congestive heart failure (CHF) hospitalizations, which was seen during a randomized controlled trial of post-hospital care for high-risk CHF patients. (Rich, MW, “A Multidisciplinary Intervention to Prevent the Readmission of Elderly Patients with CHF,” *NEJM* 333: 1190-1195, 1995.)

The *Annals of Long Term Care* reports a house call program within social health maintenance organizations (SHMO) in Las Vegas led to a 62 percent reduction in hospital days with a sample of 91 clients, producing annual savings of \$439,825 for acute, skilled, and subacute days, and net savings of \$261,225. (Phillips, SL, et al, “Chronic Home Care: A Health Plan’s Experience,” *Annals of Long Term Care*, 12(4), April 2004.)

In 2002, a VA Home-Based Primary Care program in an urban area documented a 67 percent reduction in acute hospital days, a 54 percent reduction in patients hospitalized, and a 17 percent reduction in emergency department visits. (Jackson, Susan, et al., “Impact of a Medical House Call Program on Use of Acute Hospital and Emergency Department Services in an Urban VA Medical Center,” poster 34121, AGS 2002.)

Home Health Program Cuts Hospital Admissions for Heart Failure Patients (unpublished)

A collaborative program in rural northeast Tennessee involving hospital, physician, home-health agency, and medical call center facilities decreased the number of hospitalizations and shortened length of stay for chronic heart failure (CHF) patients enrolled in a regional health plan.

Strategies employed in the program, run by the Mountain States Health Alliance, included use of skilled nurse home visits, telehealth monitoring, phone calls to patients, and evidence-based best practices.

As a result of the program, the Alliance reports a CHF hospital admission rate of 33.53 percent for control group vs. 19.61 percent for the treatment group. For the treatment group, there was an 11.5 percent pre-enrollment rate of hospital readmission vs. a 0 percent post enrollment rate. The average length of stay for readmissions was 7.07 days for the control group vs. 5.44 days for the treatment group. The emergency room visit rate was 18.53 percent for the control group and 15.69 percent for the treatment group.

(Source: Mountain States Health Alliance)

Cardiac Telehealth Program Reduces Hospital Readmissions, Improves ADLs

(unpublished)

Sentara Home Care Services developed a Cardiac Connection Program combining traditional home health nursing visits with interactive home telehealth. Since 2001, the program has enrolled 57 Medicare beneficiaries over age 65 with a New York Heart Association classification of 3 or 4. The agency targeted patients who were frequent users of the hospital emergency room and hospital beds. Registered nurses with cardiac nursing experience initially visited patients in their homes and installed the telehealth monitor and trained the patient and family on its use. On days when the nurse is not in the home, he/she makes a video visit to the patient.

Results of the program:

- 81 percent decrease in hospital readmissions
- 87 percent decrease in hospital days
- 50 percent improvement in ADLs
- 81 percent decrease in emergency room utilization
- improved utilization of nursing staff in time of nursing shortage

(Source: Sentara Home Care Services, Chesapeake, Virginia)

Wound Care Telehealth Program Speeds Healing (unpublished)

To manage a growing number of wound care patients, Sentara at the time of admission targets patients with daily and twice daily dressing changes, using a combination of certified wound care expert nurses, a digital camcorder, and a telehealth monitor. The goal is to decrease the length of healing time, increase education of field staff and caregivers, and decrease costs. The digital camcorder attached to the telehealth monitor streams live video to the wound care specialist in the agency's central office. The specialist assesses the wound, evaluates the effectiveness of current treatment, and makes recommendations to the physician. Live video allows the wound specialist to educate the patient and caregivers about nutrition and support surfaces. Patient

outcomes improved dramatically. Healing time was shortened by 50 percent and none of the patients were readmitted to the hospital during the time of the wound care telehealth visits. There was also a 34 percent reduction in supply costs.

(Source: Sentara Home Care Services, Chesapeake, Virginia)

Telehealth for Congestive Heart Failure, Coronary Artery Disease, COPD, Diabetes (unpublished)

Strategic Healthcare Programs (SHP), an independent national data service company, has analyzed 27 months of data from 178 home health agencies that use telemonitors for patients with certain diagnoses: CHF, coronary artery disease, COPD, and diabetes. The data spans the period January 1, 2002, to March 31, 2004. Analysis indicates that the telemonitored patients have a significantly greater reduction in the rate of hospitalizations and emergent care visits, as well as greater improvement/stabilization in the Activities of Daily Living (ADL), compared to non-monitored patients of comparable severity. As reported by SHP, this success is achieved by combining telemonitoring with a comprehensive clinical management program. Monitored patients with CHF had a hospitalization rate of 6.2 percent and an emergent care visit rate of 4.5 percent compared to 10.1 percent and 8.8 percent, respectively, for the non-monitored group. Of the 178 agencies in the study, 29 had a zero hospitalization rate for CHF patients while 39 had no emergent care visits among this cohort. The program has led to similar levels of improvement in rates of hospitalization, emergent care visits, and improvement/stabilization in ADLs for the other targeted diseases – coronary artery disease, COPD, and diabetes.

(Source: Strategic Healthcare Programs)

Power Mobility Produces Net Savings to Medicare (unpublished)

A 2003 study investigated whether Medicare's purchase of powered vehicles results in subsequent dollar savings for Medicare. Medicare data for 1994 through 2001 were used, though the period of primary investigation begins with 1997 when an improved generation of powered vehicles first became available. During the 1997-2001 period, powered vehicles purchased through Medicare consisted of approximately 89 percent power wheel chairs and 11 percent scooters. The study compares the Medicare expenditures of two groups: (1) beneficiaries for whom Medicare purchased a powered vehicle during the period, and (2) beneficiaries for whom Medicare did not purchase a powered vehicle during the study period who had characteristics similar to those who received a powered vehicle. The analysis compares differences in Medicare expenditures per quarter, using data from CMS's Standard Analytical Files. Data was analyzed for those who survived over the entire 1994-2001 period, had both Part A and Part B coverage for the whole period, and were not in a Medicare HMO at any time during the period. For those who survived at least 12 quarters after attaining a powered vehicle, there was a net savings to Medicare of more than \$5,300 per beneficiary over three years. The net savings documented are above and beyond savings that offset the cost of the powered vehicles.

("The Net Benefits to Medicare of the Purchase of Powered Vehicles for the Mobility Impaired: An Analysis of Medicare Data," House, D., et al, RRC, Inc.)