The Effectiveness of Disease Management Programs in the Medicaid Population

An Annotated Bibliography: Disease Management in the Medicaid Population

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The Vermont Blueprint for Health is a state-wide public-private initiative to transform care delivery, improve health outcomes, and enable everyone in the state to receive seamless, well-coordinated care. A recent analysis of the first pilot program found significant year-over-year decreases in hospital admissions and emergency department visits, and their related per person per month costs. Further savings are forecast once comprehensive financial reform is in place. When rolled out statewide, the initiative is projected to save 28.7% in incremental health spending in the state by its fifth year.
### Article Title:
Report to the Congress on Medicaid and CHIP

### Author(s):
Medicaid and CHIP Payment and Access Commission

### Date:
March 2011

### State (if applicable):
Across the U.S.

### Disease Area(s):
Children’s and Chronic Disease

### Disease Management Program:
Nothing specific cited

### Research Sponsor:
None cited

### Key Words:
DMPs

### Summary of Results:
- 76 million people receive health care coverage through Medicaid (68 million people with a $406 billion program) and the state Children’s Health Insurance Program (8 million children with a $11 billion program).
- Medicaid finance health care and related services for 10 million low income individuals with disabilities, 30 million low-income children and 6 million low income seniors.
- CHIP finances health coverage for 8 million uninsured children in families with moderate incomes above Medicaid eligibility levels.
- A framework for measuring access takes into account complex health needs as well as program variability across states; provider shortages can be identified by the framework.
- The framework focuses on primary and specialty care providers and services and has three main elements: availability, enrollee characteristics, utilization.
- Medicaid adopts a flexible position in determining provider payment rates but this has raised questions regarding the relationship of payment policies to access and quality and the potential role for payment innovations that best address efficiency and economy while assuring access.

### Bibliographical Info:
Medicaid and CHIP Payment and Access Commission, Report to the Congress on Medicaid and CHIP, March 2011.

## Abstract:

The Medicaid and CHIP Payment and Access Commission was established in 2009 and is a non-partisan, federal agency for the Congress on Medicaid and CHIP. The commission conducts independent analysis and health service research on payment policies, access to care issues, eligibility, quality if care, interaction between Medicaid and Medicare, and data development to support policy analysis and program accountability.
The Effectiveness of Disease Management Programs in the Medicaid Population

Article Title: Medication Adherence Leads to Lower Health Care Use and Costs Despite Increased Drug Spending

Author(s): M. Christopher Roebuck, Joshua N. Liberman, Marin Gemmill-Toyama, Troyen A. Brennan

Date: January 6, 2011

State (if applicable): Disease Area(s): CHF, hypertension, diabetes dyslipidemia (high cholesterol)

Disease Management Program: Medication adherence

Research Sponsor: The People-to-People Health Foundation Inc.

Key Words: Medication adherence, chronic disease, benefit cost

Summary of Results:
- Improvements in medication adherence increase pharmacy spending but may be offset by reduction in use of medical services
- Total average health care costs per patient per year: $14,813 for hypertension; $39,076 for CHF; $17,955 for diabetes; $12,688 for dyslipidemia
- Pharmacy costs per patient per year range between $2,867-$3,780
- Adherence to medication significantly lowered inpatient hospital days: 1.18 less for dyslipidemia, 5.72 for CHF
- Annual medical spending ↓ for adherent patients, reductions of: $8,881 in CHF, $4,337 in hypertension, $4,413 in diabetes and $1,860 in dyslipidemia
- Annual per adherent patient savings: $7,823 for CHF, $3,908 for hypertension, $3,756 for diabetes, $1,258 for dyslipidemia
- Average benefit-cost ratios, combining increases in pharmacy spending with decreases in medical spending: 8.4:1 for CHF; 10.1:1 for hypertension; 6.7:1 for diabetes, and 3.1:1 for dyslipidemia


Abstract:

Researchers have routinely found that improved medication adherence is associated with reduced total health care use and costs. Studies prior to this one do not provide strong evidence of a causal link. This article employs a more robust methodology to examine the relationship. Results indicate that although improved medication adherence by people with four chronic vascular diseases increased pharmacy costs, it also produced substantial medical savings as a result of reductions in hospitalization and emergency department use. Our findings indicate that programs to improve medication adherence are worth consideration by insurers, government payers, and patients as long as intervention costs do not exceed the estimated health care cost savings.
Abstract:

Previous to this, no study reported on the cost of treating breast cancer among Medicaid beneficiaries younger than 65 years of age. To assess the funding required for treatment programs this information is required. The study assessed the incremental cost of breast cancer treatment among Medicaid beneficiaries aged below 65. Results indicate that with the exception of in situ cancers, the cost of cancer care continued to increase beyond the initial 6-month period. The extended period of health care utilization, beyond the immediate 6 months after diagnosis indicates that Medicaid coverage may be required for many months after diagnosis to complete treatment. The report recommended that continuous Medicaid coverage should be provided for an adequate period to ensure that complete and comprehensive treatment is provided.
Abstract:

The rise of primary care case management (PCCM) programs is directly attributed to rising healthcare costs and the increasing burden of chronic disease in the U.S. In an effort to rein in Medicaid spending, states have increasingly looked towards new models of healthcare delivery that emphasize coordination and efficiency in order to drive down inappropriate spending and improve healthcare outcomes. DMPs were developed to adapt the Chronic Care Model to delivery structures historically designed to respond to acute illness, improve quality and decrease costs associated with high utilization populations. In 2006 the state of Illinois implemented two programs: Illinois Health Connect and Your Healthcare Plus. The programs emphasize behavioral modification through coverage of preventive services, social outreach, and community and medical home partnerships. With strong emphasis on disease management and quality healthcare for patients over high volume, these programs have met with initial success in terms of patients/provider satisfaction, improved quality metrics, and early cost savings to the state.
### Abstract:

In 2003 the Indiana Office of Medicaid Policy and Planning launched the Indiana Chronic Disease Management Program, a program intended to improve the health and healthcare utilization of 15,000 aged, blind and disabled Medicaid members living with diabetes and congestive heart failure in Indiana. Program components were derived from the chronic care model and education based on integrated theoretical framework were utilized to create a telephonic care management intervention delivered by trained, nonclinical care managers working under the supervision of a registered nurse. CMs utilized computer-assisted health education scripts to address medication adherence, diet, exercise and prevention of disease-specific complications. Reflective listening techniques and self-management were assessed and members were encouraged to engage in health-improving activities. Evaluation results indicate the low-intensity telephonic intervention shifted utilization and lowered cost.
The study assessed administrative data from the North Carolina Medicaid program linked with cancer registry data to analyze total Medicaid costs for patients under age 65 with cervical cancer and the incremental costs of cervical cancer care at 6 and 12 months from diagnosis. Total Medicaid costs at 6 months after diagnosis were $3,807, $23,187, $35,853 and $45,028 for in situ, local, regional and distant cancers respectively. The incremental costs for local and regional cancers were $13,935 and $26,174 and by 12 months increased to $15,868 and $30,917 respectively.
Abstract:

OptumHealth tested the feasibility of physician-directed population management in 3 primary care practices and with 546 continuously insured patients who exhibited claims markers for coronary artery disease, diabetes, and/or hypertension. During the intervention portion of the study, they asked physicians to improve the following health measurements: blood pressure, body mass index, cholesterol, hemoglobin HbA1c, and smoking status. They offered a modest pay-for-outcomes incentive for each risk factor improvement achieved. Additionally, on an eligible subset of these patients, they asked physicians to actively refer to population management programs those patients they determined could benefit from nurse or health coach interventions, advising as to which components of their treatment plan they wished us to address. The 6-month intervention period exhibited a 10-fold improvement in the trend rate of risk factor management success when compared to the prior 6-month period for the same patients. A net of 96 distinct risk factor improvements were achieved by the 546 patients during the intervention period, whereas 9 net risk factor improvements occurred in the comparison period. This difference in improvement trends was statistically significant at P<0.01. Of the 546 study participants, a subset of 187 members was eligible for participation in OptumHealth care management programs. The authors conclude that physician-directed population management with aligned incentives offers promise as a method of achieving important health and wellness goals.
Abstract:

**UnitedHealthcare Community & State Model Programs**  
*Helping People Live Healthier Lives*

UHC Community and State is the largest single provider of Medicaid in the United States. They serve over 3.3 million members in 24 states plus the District of Columbia.

**Program:** Acute Case Management  
**Location:** New Jersey; Horizon NJ Health

**Description:** Horizon NJ Health case manages members with acute care needs. A screening tool identifies and balances member needs as well as staff workload. Items assessed include barriers to care, care-giver needs, co-morbidities, medications, functional disabilities, use of medical equipment, pain, mental health condition, recent hospitalizations, recent ER visits, impact on quality, ability to improve outcomes and impact on cost savings. The internal and ongoing audits have validated the tool as an effective screening method of gathering and reviewing case management efficiencies for members.

**Program:** Asthma Management Improvement Through Drug Utilization Review  
**Location:** New Jersey; Horizon NJ Health

**Description:** Horizon NJ Health has a comprehensive program that collects and analyzes data on drug utilization. Letters are sent to eligible members with asthma and their primary care providers. In July 2009 and 6 months after the original mailing, 19% of the target members were filling prescriptions and 53% were no longer over-utilizing short acting beta agonists.

**Program:** Biggest Winner Nutrition Program  
**Location:** Philadelphia, Pennsylvania; Health Partners of Philadelphia, Inc.

**Description:** Health Partners is a not-for-profit health plan that provides medical assistance access and is a hospital-owned plan. The nutrition program was designed to educate and screen members...
who have diabetes or hypertension and high cholesterol, generate community awareness and emphasize the value of making healthy food choices. Participants lowered their numbers in at least one of the three measures: blood pressure, sugar and cholesterol.

Program: Childhood Obesity – Improving the Monitoring of BMI  
Location: Midwest Health Plan

Description: Midwest Health Plan initiated an obesity program in the fall of 2008 with the goal of educating providers on the importance of calculating patient BMI and stressing the importance that primary care providers counsel patients, provide education and nutrition information and stress physical activity. Following counseling noted improvements were measured.

Program: Clinical Documentation Standard: CHATME  
Location: Missouri; Missouri Care – an Aetna Company

Description: Missouri Care identified the need to promote a systemic clinical documentation practice to meet state and NCQA denial management standards. The format was developed and implemented and the requirement that Missouri Care medical directors do online review decisions supports their documentation audit process and provides reinforced training to achieve full compliance.

Program: Chopper Check Dental Screening for Children  

Description: The children’s dental outreach initiative was created for Health Partners members. Mobile dental stations provide the clinical setting in convenient locations in the community. Incentives include movie tickets and for parents, a $15 Wal-Mart card for participating in a free blood pressure screening.

Program: Community Baby Shower Program  
Location: Philadelphia, Pennsylvania; Keystone Mercy Health Plan, AmeriHealth Mercy Family

Description: The program offered by Keystone Mercy Health Plan sponsors community baby showers to connect pregnant women with health care providers, care managers and other community organizations to provide valuable support. Philadelphia Medicaid recipients represent 75% of annual births. Prenatal and nutritional information has been communicated to over 300 moms and 200 pregnant women.

Program: CONNECTIONS Plus®  
Location: Across the U.S.; Centene Corporation

Description: CONNECTIONS Plus® is a cell phone program developed for high risk members who have limited or no access to safe, reliable phones. The phone is programmed to allow specific numbers that are important to the member’s health care and safety. For individuals who received a phone utilization data showed a 38% drop in inpatient admissions, a 29% decrease in average length of hospital stay, and a 20% drop in ER visits.

Program: Cultural Competency Program  
Location: Missouri; Missouri Care, an Aetna Company

Description: The program focuses on health literacy and brochures are distributed to provider offices. Provider training is the next step of the program and online training is being created.
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Program: Dancing for Your Health  
Location: New Jersey; Horizon NJ Health

Description: Dancing for Your Health is a bi-lingual health education community outreach program that emphasizes dancing as an exercise. The program has been positively received by adults and children aged three years old to 12.

Program: Diabetes Disease Management Program  
Location: Kentucky; Passport Health Plan

Description: Kentucky is ranked 9th in the U.S. in incidence of diabetes. The DMP uses medical claims and pharmacy data to identify adult member with diabetes and a letter is sent introducing them to the program and provides information on how to contact a diabetes care manager. Reminders for eye exams are sent as well as reminders for regular testing. Participants were noted as having an increase in hemoglobin HbA1c to 87.3% from 64.9%; screening for kidney disease raised to 78.7% from 29.1%; participants lowered their cholesterol rates.

Program: Diabetes “One-on-One” Pilot Program  
Location: New Jersey; Horizon NJ Health

Description: Diabetes affects 8% of New Jersey’s population. A targeted telephone outreach program invites high risk diabetic individuals to participate. Members are educated on standards of care for diabetes and empowered to maintain care.

Program: Don’t Gamble With Your Numbers: Improving Control of Hypertension and Hyperlipidemia  
Location: Midwest Health Plan

Description: Quality control measures around improving hyperlipidemia screening and control among cardiovascular and diabetic patients was undertaken. Mailings regarding screening sessions and follow-up phone calls were used. Participants realized significant increases in LDL-C screening rates.

Program: Early Periodic Screen Diagnosis and Treatment Program  
Location: Passport Health Plan

Description: Phone calls are made to families who have not received the recommended EPSDT screening for children. Prior to the program screening rate was 17% and post implementation the rate improved to 95%. The number of annual dental visits for children increased 14.8%. The number of well-child visits also increased.

Program: Embedding a Care Manager in the Physician Office  
Location: Keystone Mercy Health Plan, AmeriHealth Mercy Family of Companies

Description: The program embedded a health plan care manager in a clinic practice. The care manager actively engaged health plan members during their office visit and identified care gaps. Outcomes showed reductions in hospital admissions from 627 to 523; reductions in inpatient length of stay from 4.3 days to 2.7 days; reduction in readmission within 30 days from 30% to 7%.
Program: ER Diversion Program  
Location: Unison Health Plan of the Capital Area (DC)

Description: Although assigned PCPs, Plan members often seek care from area emergency departments (ED). In 2009, the Emergency Department diversion program was implemented under the direction of the Chief Medical Officer, to reduce inappropriate utilization. Nurse case managers receive daily information from hospitals regarding emergency visits for Unison members. The nurses contact these members and ascertain their reason for emergency room usage and make certain they understand the instructions given from the ED physician. Nurses then attempt to engage the member in primary care and assist in obtaining a primary care appointment for members who need assistance. The nurse contacts members to ensure that they keep their appointments. They also leave their contact information in the event that the member needs assistance in seeking further care.

Outcome: Data analysis was performed in April 2010. Analysis occurred for the period October 2009 through February 2010. The data demonstrated a 37.9% decrease in ED admissions and approximately a 41% decrease in non-medically necessary ED visits. While the plan acknowledges that there are activities that can be done to enhance this clinical outreach program, the preliminary results are encouraging. Health Plan management are satisfied that the program has been an effective use of resources.

Program: Fluoride Varnish Program  
Location: United Healthcare Community & State – New York

Description: This pediatric primary care program will educate and engage Primary Care Physicians/Pediatricians (PCPs), dentists and members in early preventive oral hygiene. It is a collaborative model which seeks to create a true “health home” for children age four and younger, and coordinate medical and dental health in preventive care. The program provides incentives to primary care physicians to apply fluoride varnish to pediatric patients, and to refer them to dentists. Physician training is web-based with a full complement of resources. Upon completion of training, physicians are rewarded with CEU credit from the Arizona School of Dental Health. The program includes member education materials in several languages, sample starter kits for PCPs, dental assessment kits, as well as dental homecare kits for children age four and under.

The goal will be to have all children age four and under establish a health home (i.e., integrated medical and dental home) by early referral of physician to dentist at three designated Federally Qualified Health Centers (FQHCs). This will create a solid partnership with United Healthcare Community & State (NY) and allow the Sales and Marketing teams to establish background and develop necessary relationships with program directors.

Outcome: Short-term success will be measured by analyzing claims data to see the number of applications of fluoride varnish and visits to the dentist by the target population at the targeted FQHCs. Long-term success will be measured by analyzing medical and dental outcomes over time.

Program: Generic Drug Fill Rates  
Location: Centene Health Plans

Description: Better adherence and communication tactics were used to lower net drug costs. The program included mandatory generic benefit set-up at the pharmacy; selection use of co-pays; over-the-counter benefits and retail pharmacy point of sale messaging. The outcome noted that generic fill
rates steadily increased since the program was implemented, resulting in better adherence to medications as well as lower costs.

**Program:** Glorious Women Assembly  
**Location:** Passport Health Plan

Description: The program is focused on health needs of women and offers women a day to focus on themselves and receive pertinent health information in a sharing and warm environment. Women had access to cholesterol screenings, on-site mammograms, clinical breast examinations, pap smears, home colon care kits and eye care appointments.

**Program:** The Gift For Life: Aggressive Mammography Outreach and Event Scheduling  
**Location:** Keystone Mercy Health Plan, a member of the AmeriHealth Mercy Family of Companies

Description: The Gift for Life program was developed to engage an educate Keystone Mercy members who have not had screenings in the past 2 years and conducts mobile mammography. Additional screening of cholesterol, blood pressure, height and weight are offered. Results for breast screening rose from 52.2% in 2008 to 57.9% in 2009.

**Program:** Gold Star Program  
**Location:** The Unison Health Plan of Pennsylvania

Description: Gold Star pay-for-performance program has completed a third year (2007/2008/2009). The program was developed to meet the plan’s internal need to improve quality, grow membership, enroll excellent providers in the plan network and control the cost of health care. The Gold Star program is also part of a successful strategy that enabled the health plan to capture a substantial bonus ($5.1 of $12 million available) for 2009 with the expectation that the bonus earned for 2010 will be greater.

The metrics developed for the program are:
- Membership levels and maintaining an open panel
- Medical loss ratio
- Emergency department usage reduction
- Electronic claims and encounter data submission
- Quality measures (all are HEDIS measures and are included in the PA DPW P4P bonus program)
- Member satisfaction

Outcome: As of February 2010, Gold Star practices have shown a 19% increase in overall membership in their practices. The primary premise of the Gold Star program is that quality practitioners provide cost-effective care. MLR for 2009 is 8.5% lower for the Gold Star providers than the Non Gold Star providers. Additionally, the cost of service from specialists is 10% lower for members served by Gold Star doctors even though the need for a referral to a specialist from the PCP is removed for Gold Star doctors.

**Program:** Health Literacy  
**Location:** New Jersey; Horizon NJ Health

Description: Horizon NJ Health developed activities to address challenges generated by low health literacy. Staff and members of the provider community were educated. Using health literacy guidelines member education and marketing materials were edited and redesigned.
Program: Healthy Moms and Babies  
Location: South Carolina; Select Health of South Carolina

Description: Select Health’s program is a unique integrated model performing material and newborn utilization review, risk-based case management and member education. Efforts focus on early and complete prenatal and postpartum healthcare. Increases were noted in prenatal and postpartum care and frequency of ongoing prenatal care increased.

Program: “Healthy You, Healthy Me” Childhood Obesity Program  
Location: Harrisburg, PA; AmeriHealth Mercy Health Plan

Description: The program is based on curriculum that provides activities and programs that encourage improved nutritional choices and increased physical activity in youth aged 5 to 13. Self-inventories were given to participants and 45% of participants decreased their BMI.

Program: Heart Failure Program  
Location: South Carolina; Select Health of South Carolina

Description: Members in the program receive direct case management follow-up, focused educational mailings along with education on preventive measures for worsening symptoms of heart failure, medication compliance, lipid level monitoring and smoking cessation. Outcomes include increased knowledge regarding appropriate heart failure treatment and self-management skills, favourable behavior modification, self-management behaviours and increased compliance with daily weights.

Program: HEDIS Enhanced Capitation Program  
Location: California; CHOC Health Alliance Schaller Anderson/Aetna

Description: On a monthly basis providers involved in the enhanced capitation program receive a list of unmet interventions based on HEDIS goals. A bonus of $1.00 is paid monthly for providers meeting 90% of their monthly target. Outcomes have realized gains in adolescent well care, immunizations and Chlamydia.

Program: Hospital ER Focused Dental Initiative  
Location: New Jersey; Horizon NJ Health

Descriptions: A letter is mailed to members utilizing the ER for dental related visits. Members with 3 or more ER visits within 3 months are referred to a Pharmacy Department. The program has increased awareness of oral health by members and physicians, decrease of ER utilization for dental issues and potential discovery and treatment of substance abuse issues.

Program: Improving Blood Lead Screening in Two-Year Olds  
Location: United Healthcare Community & State - Great Lakes Health Plan (GLHP -MI)

Description: Lead poisoning may affect 20,000 Michigan children under the age of six. If not detected early, the lead that accumulates in a child’s body may cause brain damage, mental retardation, developmental delay, learning difficulties, behavior problems, anemia, liver and kidney damage, hearing loss, hyperactivity, and in extreme cases, even coma and death. A GLHP nurse participates in the Michigan Childhood Lead Poisoning Prevention Program (CLPPP). CLPPP’s purpose is to educate families, pregnant women, health care providers and child health advocates in Michigan communities on prevention of blood lead poisoning.
GLHP nurses examine primary care practitioner (PCP) blood lead screening (BLS) rates of two year olds to identify those PCPs whose rates are lower than the national Medicaid 50th percentile and conduct in-office educational visits on BLS and use of filter paper kits for in-office sampling. GLHP runs articles in its monthly and quarterly provider newsletters on BLS and in-office filter paper kits to obtain test samples. GLHP identifies unscreened children who are turning two years old and calls parents/guardians to educate on blood lead poisoning, its effects and screening, and to make appointments for screening and arrange free transportation. GLHP also places recorded messages to parents/guardians of all children who are nine and 18 months to educate parents/guardians on BLS, free tests and free transportation. GLHP includes quarterly articles on BLS in its member newsletter. GLHP includes educational information on its member health pages concerning BLS. GLHP offers physician and member incentives for BLS.

Outcome: GLHP interventions were designed to address known barriers which include:
Clinicians assert that there is no clinical research demonstrating that all children need to be screened for BLS. Parents do not understand the long term effects of blood lead poisoning on their children. Transportation is a problem for the poor. Poor children may have greater access to toys manufactured in countries with less requirements concerning lead content. Going to a lab after leaving a doctor’s office for a venous blood draw is difficult for many parents due to transportation issues and time away from hourly paid jobs. Using HEDIS®3, GLHP measured its BLS rate for two-year-old children continuously enrolled in the health plan for the measurement year, allowing for one 30-day enrollment break in the year. HEDIS 2008 (measurement year 2007) served as the baseline year. Over three years, GLHP improved its BLS rate nearly 14 percentage points. GLHP’s performance goal is 80%.

Program: Lose to Win Type II Diabetes and Obesity Education Program
Location: Keystone Mercy Health Plan, a member of the AmeriHealth Mercy Family of Companies

Description: Lose to Win is a 12-week program launched in cooperation with the YMCA. Participants have a one-on-one session with a wellness coach and nurse case managers develop care plans to improve their blood glucose, blood pressure and weight. On average participants improved their BMI by 3.8% and their HDL by 5.5%.

Program: Mommy and Me Program
Location: Kentucky; Passport Health Plan

Description: Members are identified through provider referrals, member self-referrals and referrals from local health departments. A guidebook is provided and education material emphasizes the importance of prenatal care. The plan saw prenatal visits increase and the rate of female members receiving postpartum visits increased from 57% to 76%.

Program: Navigating for Care – Aged, Blind and Disabled
Location: Midwest Health Plan

Description: Phone calls are made to individuals who have not seen a health care provider to ensure appropriate evaluation of their medical condition. Improvement in many chronic conditions measures was noted including: diabetic measures, annual monitoring for persistent medication, control of high blood pressure and medication for patients with asthma.

Program: Notice of Action Database (NOA database)
Location: Missouri; Missouri Care, an Aetna Company

Description: A database was developed to track, trend and report all medical and behavioural health. This automation realized efficiencies in administration.
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Program: Nurse Response™ Treatment Adherence Support Program
Location: A Centene Corporate Specialty Company

Description: The program was based on a telephonic call program that targeted persons with serious and persistent mental illness. Following a telephone call participants were sent communication by mail. The program demonstrated improved adherence to long term medication, decreased ER utilization and self-reported improvement in quality of life.

Program: Nutur® Asthma Program
Location: Indiana; Centene Corporation – Natur DM Specialty Company

Description: Nutur® is a work-life health and wellness company dedicated to helping people transform their lives through best-in-class life and health coaching. Participants were selected to improve their respiratory disease outcomes for asthma and COPD. Results indicated that children ER visits decreased by 17.3% and visits to primary care physicians rose by 11.1% and vaccination rates were higher by 22.5%.

Program: Pediatric Obesity Program
Location: United Healthcare Community & State (Tennessee)

Description: UHC Community & State has developed a comprehensive weight management program for children ages five to 18. This program is comprised of mailed educational materials, coaching calls to high-risk members and unique local intervention options. It is the goal of this program to provide members with opportunities to increase physical activity and education/awareness on healthy food choices and lifestyles. They include parental or caregiver involvement in each step of the process, and we strive to meet the unique needs of our membership. The YMCA has designed a program called “Stepping Up,” which partners fitness with nutrition while including a parent component. This program is offered in after-school programs across the region and through a mobile unit to reach children in rural areas.

Outcome: A total of 4,243 children currently participating in the weight management program. A group of 49 children who have been closely monitored since August 2009 have currently lost a combined total of 319 pounds.

Program: Pharmacy Multi-Lingual Program
Location: New Jersey; Horizon NJ Health

Description: The program provides pharmacies with tools to enable members to receive prescription labels in their preferred language. Response to the program has been overwhelmingly positive.

Program: Physician Summit Awards
Location: Centene Corporation

Description: The program recognizes physicians, providers and obstetricians for providing outstanding service and high quality care.

Program: Reducing the Risk of Recurring Pre-Term Births with 17-P
Location: South Carolina; Select Health of South Carolina

Description: The program uses 17-P to reduce risk of recurring preterm births and has seen a 73% reduction in eligible pregnant members.
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Program: SECA Program  
Location: UnitedHealthcare Community & State (Pennsylvania)

Description: A Member-targeted outreach to persons with a recent history of Significant Episodes of Cluster Activity (SECA) defined as two or more acute inpatient readmissions or four or more ER visits over the previous six months. Program is designed to identify and rapidly assist Members with significant clinical and/or behavioral health issues who may not be captured in traditional Disease Management programs.

Members meeting the SECA criteria are identified in near real-time. Care Teams composed of Inpatient and Complex Case Managers and a Social Worker collaborate to identify issues and barriers affecting Members’ health. The Care Team then deploys a variety of resources including, in-home physician visits, in-home lab draws, and total care coordination with PCP/Medical Home. Referrals are promptly made with behavioral health providers or other specialists. Members remain part of the SECA program for a minimum of one year following identification. Care Teams monitor and discuss Member compliance with treatment programs.

Outcome: SECA’s member-centric approach has proven effective because it starts with a global assessment of all aspects affecting a Member’s needs: clinical, behavioral and demographic and only then, drills down to clearly identify disease markers. On average, SECA Members enrolled six months or more have shown a 60% reduction in ER visits and Acute Readmissions. The same continuously enrolled population has also shown a 22% reduction in overall annual medical costs.

Program: Start Smart for Your Baby 17P Program Impact on Reducing Premature Birth  
Location: Centene Corporation

Description: Members are identified as potential candidates for 17-P based on criteria and a review of birth outcomes showed that preterm births decreased by 51.7%. Offering 17-P as a benefit has a positive effect on reducing the rate of recurrent preterm delivery and rate of NICU and special care nursery admission.

Program: Synagis® Success  
Location: Centene Corporation

Description: Synagis is a medication approved for the prevention of respiratory syncytial virus in high risk children and guidelines led to better utilization with significant cost savings to Medicaid.

Program: Texas Health Passport and Its Impact on Psychotropic Medication Utilization in Texas Foster Care Children  
Location: Texas; Superior HealthPlan Network – STAR Health, Centene Corporation

Description: Health Passport is an electronic patient record that collects patient demographic data, clinician visit records, dispensed medication, vital sign history, lab results, immunization data and other appropriate documentation. The Health Passport aids in reducing the overuse of psychotropic medication and has seen a 15% reduction in prescriptions.

Program: Healthy First Steps Text4babies Program  
Location: United Healthcare Community & State - National Medical Management

Description: Each year in the United States, more than 500,000 babies are born prematurely, and an estimated 28,000 children die before their first birthday, according to the Center for Disease Control’s National Center for Health Statistics. The program has partnered with National Healthy Mothers, Healthy
Babies Coalition (HMHB) on an innovative educational program called Text4baby. This new initiative is supported through a Voxiva collaboration to deliver free educational text messaging to pregnant women based upon their delivery dates and the baby’s date of birth. Newborn messaging is also available up to one year of age.

Outcome: The program is designed to promote healthy births and reduce infant mortality among underserved populations. To assess the outcomes of this project, the program targeted a number of metrics to measure the effectiveness of the program.

Program: Thumbs Up for Johnnie Health Initiatives for Children
Location: Centene Corporation
Description: The program features the creation of children’s books to create innovative health education programs for children.

Program: Type YOU Campaign
Location: South Carolina; Select Health of South Carolina
Description: The Type YOU Campaign is culturally competent diabetes initiatives geared towards African-American women. Diabetes education workshops were complemented by material regarding testing and examinations (eye, LDL and overall diabetes care).

Program: Well-Child Outreach Initiatives
Location: South Carolina; Select Health of South Carolina
Description: The program is a comprehensive preventive health program available to members under the age of 21. The program has continued to improve EPSDT screening rates each year.

Program: Wisconsin Wrap-Around
Location: United Healthcare Community and State (Wisconsin)
Description: Wisconsin Wrap Around is a member-centric, intensive care management model that engages Plan care managers, community-based care managers and relevant providers as part of a ‘team’ for coordinating care across systems and services. The Wrap Around model targets members with complex medical, behavioral, social and spiritual needs. The team shares information, develops a plan, and communicates that plan to the member and all team providers. The goal of Wrap Around is to reduce avoidable hospitalizations and ED visits, reduce medical errors that often result from poor care coordination and minimize the duplication of services.

Wrap Around is a resource intense management program. There are primary and secondary criteria for member selection for Wrap Around: Primary criteria include three or more inpatient stays and/or six or more ED visits in a six-month period. Secondary criteria include admissions and ED visits associated with Ambulatory Care Sensitive Conditions (ACSS) and overall medical costs.

Care managers compile information on Wrap Around enrollees including utilization history, current providers, member interview findings, member goals and perceptions of health status, member strengths and assets. The compiled information forms the basis of a holistic medical, psychosocial and problem list. The plan’s Medical Director and care manager identify Wrap Around Team invitees based on the problem list. These are typically ED physicians and hospitalists, primary care providers, specialists, community-based care managers and social workers, home health providers and behavioral health care managers. Once identified, these Wrap Around ‘team’ members participate in a conference call facilitated by the plan Medical Director. A care plan is developed as a result of the ‘team’
teleconference. The care plan, which typically involves a member contract, is disseminated to all team members and implemented. Members continue to be followed by care managers. Several outcomes are measured including claims, cost, ED utilization and inpatient stays.

Outcome: Primary outcomes are post-Wrap Around ED and hospitalization rates as compared to pre-Wrap Around rates. There has been a 31% reduction in ED visits and 73% reduction in inpatient stays. In addition, the plan assessed per-member-per-month costs and claims.

Program: Women’s Cancer Screening Program
Location: Kentucky; Passport Health Plan

Description: Passport Health Plan recognized and promotes early detection for both breast and cervical cancer. In 1997 breast cancer screening was at 38.8% and in 2009 the rate increased to 54.7%. In 1997 cervical cancer screening was at 43.1% and in 2009 the rate increased to 70.8%.
### Article Title:
Beyond Health Plans: Behavioural Health Disorders and Quality of Diabetes and Asthma Care for Medicaid Beneficiaries

### Author(s):
Clark, Robin E., et.al.

### Date:
May 2009

### State (if applicable):
Massachusetts

### Disease Area(s):
Diabetes, asthma

### Disease Management Program:
None cited

### Research Sponsor:
None cited

### Key Words:
Quality of care, mental health, asthma, diabetes, adherence

### Summary of Results:
- There are significant variations across plans in the quality of care for chronic conditions such as asthma, diabetes, and cardiovascular disease – reasons: socio-demographic context, provider practice, health plan benefits
- Members with moderate but below average overall illness burden had higher quality of diabetes care than those with low illness burden
- Members with type 1 diabetes were more likely to receive HbA1c screening and nephropathy monitoring than type 2 diabetics
- Substance abuse was associated with lower odds of receiving recommended care for asthma
- Alcohol and drug use disorders were consistently associated with lower quality care
- Substance users reported lower adherence to glucose monitoring
- DMPS often specifically target individuals with higher disease burden
- Other groups in need of additional assistance include members who frequently receive care in ERs and young adult women with asthma

### Bibliographical Info:
Clark, Robin E., et.al., Beyond Health Plans: Behavioural Health Disorders and Quality of Diabetes and Asthma Care for Medicaid Beneficiaries, Medical Care, Vol. 47, No. 5, May 2009 545-552.

### Abstract:
Most health insurance plans monitor ambulatory care quality using the Healthcare Effectiveness Data and Information Set (HEDIS), publicly reporting results at the plan level. Plan-level comparisons obscure the influence of patients served or settings where care is delivered. Mental illness, substance abuse, and other physical co-morbidities, particularly prevalent among Medicaid beneficiaries, can impact adherence to recommended care. The study concluded that additional efforts to improve quality of care for asthma and diabetes for Medicaid beneficiaries are needed for individuals with substance use disorders and young adults.
### The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>The Indiana Chronic Disease Management Program’s Impact on Medicaid Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Katz, Barry P., et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>February 2009</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Indiana</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Diabetes, heart failure</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Indiana Chronic Disease Management Program (ICDMP)</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>DMP, Diabetes, CHF</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Paper examined a longitudinal evaluation based on a multiple baseline design with repeated measures of the ECDMP on CHF and diabetes individuals  
- After the implementation of the DMP the trend in the average total claims per member per month flattened significantly for CHF and to a lesser extent for diabetes  
- The study was not able to extend past 2005 due to the implementation of prescription drug coverage that affected the per member per month total claims |

**Abstract:**

Disease management programs have grown in popularity over the past decade as a strategy to curb escalating healthcare costs for persons with chronic diseases. This study evaluated the effect of the Indiana Chronic Disease Management Program on the longitudinal changes in Medicaid claims statewide on individuals with diabetes and congestive heart failure. It was observed that across both disease claims that there was a flattening of cost trends between the pre- and post-ICDMP initiation periods. The change was significant for all models except for CHF in southern Indiana. The trend in average total claims changed significantly after the implementation of ICDMP, with a decline in the rate of increase in claims paid observed for targeted Medicaid populations across the state of Indiana.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Challenges in Merging Medicaid and Medicare Databases to Obtain Healthcare Costs for Dual-Eligible Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Prela, Cecilia M., et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>2009</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Washington (King County)</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td></td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>Centers for Medicare and Medicaid Services, US Department of Health and Human Services, Sandy MacColl Foundation</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Dual eligible</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Medicare and Medicaid programs account for 46% of all national healthcare spending (in 2004 U.S. $1.7 trillion)  
- In 2004 there were 7.5 million individuals who were dually eligible  
- Dually eligible beneficiaries incur 40% of Medicaid spending (US $105 billion) even though they account for only 15% of the entire Medicaid population  
- Current focus of U.S. healthcare programs, to determine which program insurance can provide effective care for chronic diseases while controlling healthcare use and costs, requires ascertainment of complete healthcare use and cost data; in the past these were underestimated due to incompatibility of state and federal databases  
- There is a clear need to develop better estimates of healthcare utilization and reimbursements for dual-eligible beneficiaries to improve coordination of public funds, to document changes in healthcare spending and to accurately predict future trends to support specific programs |
| Bibliographical Info: | Prela, Cecilia M., et.al., Challenges in Merging Medicaid and Medicare Databases to Obtain Healthcare Costs for Dual-Eligible Beneficiaries, Pharmacoeconomics, Vol. 27, No. 2 2009 167-177. |

Abstract:

Dual-eligible Medicaid, Medicare beneficiaries represent a group of people who are in the lowest income bracket in the U.S., have numerous co-morbidities and place a heavy financial burden on the US healthcare system. As cost-effectiveness analyses are used to inform national policy decisions and to determine the value of implemented chronic disease control programs, it is imperative that complete and valid determination of healthcare utilization and costs can be obtained from existing state and federal databases. Differences and inconsistencies between the Medicaid and Medicare databases have presented significant challenges when extracting accurate data for dual-eligible beneficiaries.

The two databases were linked to compile a complete and accurate assessment of healthcare use and costs for dual-eligible beneficiaries with a costly chronic condition. The resulting merged database provided a virtually complete documentation of both utilization and costs of medical care for a population who receives coverage from two different programs.
### Summary of Results:
- State has a “learn as you go” approach to designing, testing, evaluating and refining multiple strategies to improve the quality and cost-effectiveness of care for high-need beneficiaries.
- Initial participants in the DMPs received an initial health assessment to determine their risk level and establish a baseline; lower risk received telephonic education and at home visits provided for higher risk individuals.
- The DMPs did not generate cost savings agreed to in vendor contracts.
- DMPs initially focused on individuals with only one chronic disease condition.
- The Medicaid Disease Management pilot ceased in 2006 and was replaced by the Chronic Care Management Program in Jan. 2007.
- The CCMP provides case management, education and support as well as assistance accessing health resources.

### Bibliographical Info:

### Abstract:
The case study reported on innovative strategies to improve the quality and cost effectiveness of care for Medicaid populations with complex and special needs. The evolution of Washington’s Medicaid care models for beneficiaries with complex needs illustrates how a state can function as a learning laboratory that allows the state to incorporate the lessons of one program into the development of new ones, with simultaneous programs testing a variety of different models at any given time.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Evaluation of Washington State Medicaid Chronic Care Management Projects Qualitative Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Qualis Health</td>
</tr>
<tr>
<td>Date:</td>
<td>December 31, 2008</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Washington</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Aged, blind, disabled</td>
</tr>
<tr>
<td>Disease Management</td>
<td>Aging and Disability Services Administration Chronic Care Management Project</td>
</tr>
<tr>
<td>Program:</td>
<td>Health Recovery Services Administration AmeriChoice Washington Chronic Care Management Project</td>
</tr>
<tr>
<td></td>
<td>Health Recovery Services Administration King County Care Partners Chronic Care Management Project</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>DMP</td>
</tr>
</tbody>
</table>
| Summary of Results:     | The three programs are not comparable with each other due to significant differences between essential elements and client characteristics  
                          | - Aging and Disability Project: findings showed that nearly half the clients achieved improvements in health condition, living environment or access to treatment; available resources varied by region  
                          | - AmeriChoice Washington: self-reported successes such as smoking cessation, use of preventive care and completion of advanced directives  
                          | - Kin County Care: findings showed referring clients to supportive health and social service programs, stabilizing mental health conditions through coordinating services for clients and increase in smoking cessation  
                          | - Report found that chronic care management programs could benefit from increased use of validated tools such as the Patient Activation Measure and ImpactPro™ risk assessment that help target interventions appropriate to the client’s readiness to change and their greatest area of need |

Abstract:

The purpose of the evaluation is to report the findings of the start-up phase of the three chronic care management programs. It was specifically developed to evaluate the impact of offering a new program to a select group of high need, high-cost Medicaid clients.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Chronic Disease Management: Evidence of Predictable Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Meyer, Jack, Markham Smith, Barbara</td>
</tr>
<tr>
<td>Date:</td>
<td>November 2008</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Nothing specific cited</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>CHF, COPD, Asthma, High-risk pregnancy, Diabetes, Mental Illness</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Nothing specific cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>Pharmaceutical Research and Manufacturers of America</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Savings, CHF, COPD, Asthma, High-risk pregnancy, Diabetes, Mental Illness, adherence</td>
</tr>
</tbody>
</table>

**Summary of Results:**
- Research consistently showed a strong ROI for CHF care management ranging from $2.72 to $32.70 saved per dollar invested.
- CHF populations receiving more intensive interventions saw a decline in hospital admissions from 21% to 48%; asthma patients saw a decline ranging from 11% to 60%; reductions in ER use ranged from 24% to 69% for asthma individuals.
- In patients with diabetes declines in hospitalization ranged from 37% to 62%.
- In high-risk pregnancy reductions in NICU admissions ranged from 37% to 62%.
- Among seniors with multiple conditions, declines in hospitalization ranged from 9% to 44%.
- Depression care management tended to increase costs, reflecting the substantial under-use of mental health services.

**Bibliographical Info:** Meyer, Jack, Markham Smith, Barbara, Chronic Disease Management: Evidence of Predictable Savings, Health Management Associates, November 2008.

**Abstract:**

The study observed the drive to obtain better results in caring for those with chronic illness while slowing spending growth has stronger. The study showed that carefully targeted and well-designed care management programs can improve health outcomes for people with chronic illness and save money on a predictable basis. Key findings include:

- The evidence base regarding the impact of care management is heterogeneous and generalizations should be carefully framed.
- Targeting patients according to predictors of continued utilization substantially enhances the opportunity for savings.
- Highly individualized hospital pre-discharge planning and counseling by multi-disciplinary teams yield substantial savings in avoided readmissions, even in absence of other interventions.
- Education-only interventions tend to be less effective.
- Electronic interventions without feedback mechanisms and generic guidelines to physicians and not personalized to the care of specific patients also tend to be less cost effective.

Following analysis of studies cited from PubMed and Medline identified savings include:
- Interventions to manage CHF, multiple conditions among the elderly, high-risk pregnancy provided the most fertile fields for improved outcomes and savings.
- Most of the savings result from reductions in hospitalizations, particularly readmissions and ER use.
| **Article Title:** | Unfilled Prescriptions of Medicare Beneficiaries: prevalence, reasons and types of medicines prescribed |
| **Author(s):** | Kennedy, Jae, et.al. |
| **Date:** | August 2008 |
| **State (if applicable):** | Across the United States |
| **Disease Area(s):** | Diabetes, asthma, COPD, |
| **Disease Management Program:** | Nothing specific cited |
| **Research Sponsor:** | U.S. Department of Education’s National Institute on Disability and Rehabilitation Research, Field Initiated Research Grant |
| **Key Words:** | Adherence, |
| **Summary of Results:** | - 4.4% failed to adhere to prescription medications in 2004  
- Reasons for non-adherence included cost of drugs and lack of insurance coverage |
| **Bibliographical Info:** | Kennedy, Jae, et.al., Unfilled Prescriptions of Medicare Beneficiaries: prevalence, reasons and types of medicines prescribed, Journal of Managed Care Pharmacy, July/August 2008, Vol. 14, No. 6 552-560. |

Abstract:

Despite the proven efficacy of prescription regimens in reducing disease symptoms and preventing or minimizing complications, poor medication adherence remains a significant public health problem. Medicare beneficiaries have high rates of chronic illness and prescription medication use, making this population particularly vulnerable to non-adherence. Failure to fill prescribed medication is a key component of non-adherence.

In 2004, an estimated 1.6 million Medicare beneficiaries (4.4%) failed to fill or refill 1 or more prescriptions. Rates of failure to fill were significantly higher among Medicare beneficiaries aged 18 to 64 years of age. Failure to fill rates were higher among beneficiaries with psychiatric conditions; arthritis, cardiovascular disease, asthma and COPD.

Most Medicare beneficiaries fill their prescriptions but some subpopulations are at higher risk for non-adherence associated with unfilled prescriptions including working-age beneficiaries, dual-eligible beneficiaries, and beneficiaries with multiple chronic conditions. Self-reported unfilled prescriptions included critical medication for treatment of acute and chronic disease, including antihyperlipidemic agents, antidepressants, and antibiotics.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>The Net Fiscal Impact of a Chronic Disease Management Program: Indiana Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Holmes, Ann M., et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>2008</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Indiana</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Diabetes CHF</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Indiana Chronic Disease Management Program</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>Indiana Office of Medicaid Policy and Planning</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Chronic disease, DMP, savings</td>
</tr>
<tr>
<td>Summary of Results:</td>
<td>- Chronic illness accounts for more than 75% of total U.S. health care spending</td>
</tr>
<tr>
<td></td>
<td>- Two types of interventions: intensive nurse care management program for high risk members; less intensive telephone program for low risk members</td>
</tr>
<tr>
<td></td>
<td>- Findings indicated that potential cost savings attributable to the ICDMP varied by target condition and whether or not the Medicaid member was considered to be at high or low risk</td>
</tr>
<tr>
<td></td>
<td>- No statistically significant impacts on claims paid were found for members with diabetes; CHF may be more amenable to DM interventions in the short term</td>
</tr>
<tr>
<td></td>
<td>- Study revealed greater fiscal gains from DM targeted to lower-risk members</td>
</tr>
</tbody>
</table>

Abstract:

In 2003 the Indiana Office of Medicaid Policy and Planning implemented the Indiana Chronic Disease Management Program (ICDMP). The paper reported on the fiscal impact of the ICDMP from the state's perspective, as estimated from the outcomes of a randomized trial. Medicaid members with congestive heart failure (CHF), or diabetes, or both, were randomly assigned by practice site to chronic disease management services or standard care. The effect of the ICDMP varied by disease group and risk class; while cost savings were achieved in the CHF subgroup, disease management targeted to patients with only diabetes resulted in no significant fiscal impact.
### Summary of Results:
- PDLs vary amongst states
- Need greater understanding of how various pharmaceutical cost containment policies affect patients, payers and providers to balance spending, quality and access
- Prescription drugs share of Medicaid spending increased from 6.9% in 1990 to 12.5% in 2004
- Prior authorizations are requested for 23.6% of Medicaid prescriptions for statins and antihypertensive medications
- Pas accounts for largest share of costs (36.8%) for prescriptions covered by PDLs
- Medicaid PDLs have generated cost to physicians; $3.2 billion in 2006

### Bibliographical Info:

### Abstract:

Medicaid preferred drug lists (PDLs) might reduce costs for Medicaid programs while creating costs to physicians. The study measures the cost of complying with Medicaid’s PDLs for primary care physicians and cardiologists to quantify the costs of a hypothetical PDL for Medicare Part D. Physicians’ PDL-related costs average $8.02 per prescription. Average costs not covered per prescription were $14.41 and average cost covered by the PDL was $6.59. Medicaid PDL costs per physician averaged $1110 for statins and antihypertensives alone.
### Article Title:
Are Disease Management Programs Cost-Effective

### Author(s):
Peck, Charles A.

### Date:
2008

### State (if applicable):
Across the U.S.

### Disease Area(s):
Various

### Disease Management Program:
Various

### Research Sponsor:
None Cited

### Key Words:
DMPs, cost effectiveness

### Summary of Results:
- Maintains that higher healthcare spending is driven primarily by unit costs, not aging population
- According to a Morgan Stanley survey in recent years an increased number of government payors are picking up a greater portion of the healthcare tab
- DMPs have evolved from chronic condition management to wellness programs, health coaching, chronic condition management and intensive case management
- Program results indicate that outcomes demonstrate significant savings over time and as clinical outcomes improve so do savings
- Self-management interventions, such as self-monitoring and decision making, lead not only to improvements in health outcomes and health status, but to increased patient satisfaction and reductions in hospital and ER room costs.

### Bibliographical Info:
Peck, Charles A., Are Disease Management Programs Cost-Effective.

### Abstract:

Several case studies were cited in the presentation:

**Summer 2000 – The Impact of DM on Outcomes and Cost of Care: A Study of Low-Income Asthma Patients**
- The study focused on asthma DM for low-income patients and was aimed at helping physicians in a fee-for-service primary care case management program manage asthma in Medicaid recipients
- Found rate of ER visits dropped 41% and direct savings to Medicaid of $3-$4 for every incremental dollar spent providing DMP support to physicians

**August 2006 – Cost-savings Analysis of an Outpatient Managed Program for Women with Pregnancy-related Hypertensive Conditions**
- The study found outpatient management services reduced need for inpatient care and is cost effective
- For each dollar spent on outpatient management, an average of $2.50 was saved

**June 2003 – Can A DMP Reduce Healthcare Costs? The Case of Older Women with Heart Disease**
- The study assessed the impact of health DMP on use of hospital services for females aged 60+
- Findings indicate program participants experienced 46% fewer inpatient days and 49% lower inpatient costs and hospital cost savings exceeded program costs by a ratio of 5:1

**August 2004 – Analysis of Peak-Flow Based Asthma Education on Self-Management Plan in High-Cost Population**
- The study analyzed the cost-effectiveness of peak flow-based action plans in reducing costs associated wither visits and hospitalizations due to acute asthma
The peak flow self-management program had an incremental cost effectiveness ratio of $60.57 per ER visit averted.

April 2002 – Does Diabetes DM Save Money and Improve Outcomes?
- The study compared health care costs for patients who fulfilled HEDIS criteria for diabetes and were in an HMO-sponsored DMP with costs for those not in a DMP.
- Findings indicated that per member per month claims averaged $395 for program patients compared with $502 for non-program patients.
Abstract:

With a focus on population-based programs the evidence for the effect of disease management on quality of care, disease control and cost was assessed. A literature review identified three evaluations of large-scale population based programs as well as several other smaller studies. There was consistent evidence to indicate that disease management improves processes of care and disease control but no conclusive support could be found for its effect on health outcomes. Disease management was not found to affect utilization except for a reduction in hospitalization rates amongst patients with CHF and an increase in outpatient care (and prescription drug use) for patients with depression. When the costs of the intervention were accounted for and subtracted from savings, there was no conclusive evidence that disease management leads to a net reduction of direct medical costs.
Abstract:

The study evaluated the effect of telephonic care management with diabetes DMP on adherence to treatment with hypoglycemic agents, ACE inhibitors, angiotensin receptor blockers, statins, and recommended laboratory tests in a Medicaid population. Changes in utilization were evaluated separately for those who were characterized as adherent to treatment at baseline and those who were not. Both groups achieved significant improvement in adherence between baseline and follow-up. The telephonic care management intervention effectively induced Medicaid patients with diabetes to begin treatment and improved adherence to oral hypoglycemic agents and recommended tests. It also substantially improved adherence among baseline insulin users.
### The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Improving the Management of Care for High-Cost Medicaid Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Billings, John and Mijanovich, Tod</td>
</tr>
<tr>
<td>Date:</td>
<td>2007</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>New York</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Chronic illness, cardiovascular disease, diabetes</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Nothing specific cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>New York Community Trust and the United Hospital Fund</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Intervention, savings</td>
</tr>
<tr>
<td>Summary of Results:</td>
<td>4% of Medicaid enrollees are responsible for half of all Medicaid spending</td>
</tr>
<tr>
<td></td>
<td>Even a sizeable investment in the improved health and welfare of potentially high-cost patients is offset by savings from reduced future hospitalizations</td>
</tr>
<tr>
<td></td>
<td>Spending of $2,500 per patient per year on an intervention will enable a break even position with only a 10% reduction in future hospitalization; spending of $3,000 per patient per year with a 20% reduction in hospitalization will result in a $10.2 million savings for mandatory Medicaid managed care patients and $24.6 million for seriously and persistently mentally ill patients after deducting the cost of the intervention program</td>
</tr>
<tr>
<td></td>
<td>Effective intervention will generate some costs associated with discharge planning, care coordinators, use of more primary and specialty care and prescription drugs</td>
</tr>
<tr>
<td></td>
<td>Algorithm employed by the authors using logistic regression techniques predicts patients at greatest risk for future hospital admissions within a 12 month period</td>
</tr>
</tbody>
</table>

**Abstract:**

Increased policy attention is being focused on the management of high-cost cases in Medicaid. The paper presents an algorithm that identifies patients at high risk of future hospitalizations and offers a business case analysis with a range of assumptions about the rate of reduction in future hospitalization and the cost of intervention. The characteristics of the patients identified by the algorithm are described, and the implications of the findings for policymakers, payers and providers interested in responding more effectively to the needs of these patients are discussed, including the challenges likely to be encountered in implementing an intervention initiative.
Disease management is being promulgated by many policy makers, legislators, and a burgeoning new disease management industry as the next major hope, together with information technology and consumer-directed health care, to bring cost containment to runaway costs of health care. Many expect quality improvement as well. The concept is being aggressively marketed to employers, health plans, and government in the wake of managed care’s failure to contain costs. There is widespread confusion, however, about what disease management is and what impact it will have on patients, physicians, and the health care system itself. This article gives a snapshot of disease management by addressing:

- rationale and growth
- track record concerning costs and quality of care
- impact on primary care.
A prevalent, chronic condition among members of the mushrooming elderly population in the United States, heart failure (HF) is a logical focus for population-based disease management. Evidence supporting the premise that multidisciplinary interventions can significantly improve clinical outcomes while decreasing the cost of medical care for people with HF is steadily mounting. A growing number of controlled and observational studies focus on the effects of HF disease management on re-admission rates, length of stay, and improvement in appropriate diagnostic testing and prescribing. The paper describes a large-scale, comprehensive HF program and reports on clinical quality, utilization, and financial outcomes observed after 1 year. The preliminary findings strengthen the case for comprehensive HF disease management as an effective means for improving clinical outcomes and reducing total medical costs for large patient populations.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Diabetes Disease Management in Medicaid Managed Care: A Program Evaluation (full article not accessible)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Patric, Kenneth, et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>2006</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Tennessee</td>
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<tr>
<td>Disease Area(s):</td>
<td>Diabetes</td>
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<tr>
<td>Disease Management Program:</td>
<td>Tenn-Care</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>Not known</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Diabetes, DMP, adherence</td>
</tr>
</tbody>
</table>

**Summary of Results:**
- Individuals in the diabetes DMP group showed a high rate of satisfaction and an increased adherence to testing.
- The program was successful in meeting the stated goal of providing an effective DMP for TennCare patients with diabetes.

**Bibliographical Info:**
Patric, Kenneth, et.al.: Diabetes Disease Management in Medicaid Managed Care: A Program Evaluation, Disease Management, Vol. 9, No. 3 June 2006 144-156.

**Abstract:**
The objective of the study was to evaluate the outcomes of a diabetes disease management initiative among TennCare's Medicaid population. A quasi-experimental design group was conducted using a control group and a diabetes DMP intervention group. Primary outcome measures were rates for three key recommended tests (microalbuminuria, lipids, hemoglobin HbA1c). Secondary performance measures were patient satisfaction and program evaluation issues were also assessed.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>What Will It Take For Disease Management to Demonstrate a Return on Investment? New Perspectives on an Old Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Linden, Ariel</td>
</tr>
<tr>
<td>Date:</td>
<td>April 2006</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>None cited</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>None cited, general article regarding evaluation techniques</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>None cited, general article regarding evaluation techniques</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Disease management, program effectiveness, chronic illness</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Various evaluation techniques have been criticized; a total population pre-post study design is a weak technique subject to many sources of bias  
- Using total cost as primary outcome measure to demonstrate program effectiveness and ROI poses threat to validity of outcomes  
- Mean length of stay has decreased overall for conditions due to changes to hospital reimbursement and increased efficiencies  
- The national rates of hospital admissions and ER visits for chronic illness typically managed by DMPs has been flat since the advent of DMPs  
- Based on national healthcare data, cost savings that DMP companies offer purchasers can only be achieved via significant reductions in hospitalizations or ER visits; admissions must be reduced from 10% to 30% to cover program fees alone |
| Bibliographical Info: | Linden, Ariel, What Will It Take For Disease Management to Demonstrate a Return on Investment? New Perspectives on an Old Theme, The American Journal of Managed Care, Vol. 12, No. 4, April 2006 217-222. |

Abstract:

Disease management programs are expected (and usually contractually required) to reduce total costs in the diseases they manage. The study discusses the appropriateness of using utilization indexes in lieu of cost and the importance of reviewing utilization trends to determine whether sufficient opportunity exists for a program to be financially effective and to conduct an analysis to determine the number of admissions that must be reduced for a program to achieve various levels of return on investment.
Abstract:

Using a cross-sectional analysis of baseline data from an ongoing randomized controlled trial the study determined characteristics associated with drug adherence and blood pressure control among patients with hypertension and assessed agreement between self-reported and refill adherences. Age, sex, race and depression are associated with antihypertensive drug adherence and blood pressure control. Self-reported and refill adherences appear to provide complementary information and are associated with reductions in systolic and diastolic blood pressure of similar magnitude.
In 2002, an asthma disease management program was initiated in Washington State in the US. The program was designed for clients of the state’s Medicaid program, which provides health coverage for qualified low-income state residents. In response to the escalating cost of healthcare and because of concerns about the quality of care, the Washington State Legislature mandated implementation of this disease management program as a pilot project to assist individuals to improve their health. Medicaid administrators used a carefully designed process to identify client needs and to obtain proposals for disease management programs.

The asthma program seeks to narrow the gap between the standards of care and its practice. In particular, the program aims to provide patients with a richer understanding of asthma and how to control it. This is accomplished through disease education, symptom awareness and management, trigger avoidance, self-monitoring, and education on recommended medication strategies. The program is based on the US National Institutes of Health’s published guidelines on the optimal treatment of asthma.

Enrollment of Medicaid clients into the asthma program began in April 2002. This article describes three approaches to evaluation of the first 3 years of the program: (i) 3 years of self-reported client data; (ii) an independent evaluation of the first year’s changes in utilization and quality of care; and (iii) an actuarial analysis of cost effectiveness. The first study used vendor-reported data collected during initial and follow-up assessments.

The authors of this first study also reported the results of a satisfaction survey conducted on behalf of the vendor. The independent evaluation conducted by the University of Washington relied on medical record review and claims analysis, and reported statistical analysis of pre/post comparisons.
actuarial study also reported pre/post comparisons using an analysis of claims per member per month in periods before the program started and at 1 and 2 years of program operations.

Clients were assessed according to several dimensions of health including self-management, symptoms, functional status, medication management, and trigger management. Numerous interventions were provided to study participants including access to round-the-clock telephone consultation with a registered nurse, self-care education, alerts sent to the primary provider, and symptom issue follow-up. The asthma disease management program outcomes provide evidence of initial success for those clients who completed the reassessment process. The results of the first 3 years of participation in the program indicate trends toward improved health status and client satisfaction with the program. Long-term evaluation will be necessary to determine if the program reduces costs and closes the quality chasm. If successful, this program could serve as a model for programs with similar clients and similar challenges.
The Effectiveness of Disease Management Programs in the Medicaid Population

Article Title: The Indiana Chronic Disease Management Program
Author(s): Rosennman, Marc B., et.al.
Date: 2006
State (if applicable): Indiana
Disease Area(s): CHF, Diabetes
Disease Management Program: Indiana Chronic Disease Management Program (ICDMP)
Research Sponsor: 
Key Words: Disease management program, chronic disease, cost, asthma, CHF
Summary of Results: Discerning start up versus steady-state costs is a challenge

Abstract:

The Indiana Chronic Disease Management Program (ICDMP) is intended to improve the quality and cost-effectiveness of care for Medicaid members with congestive heart failure, diabetes, asthma and other conditions. The ICDMP is being assembled by Indiana Medicaid primarily from state and local resources and has seven components:
- Identification of eligible participants to create regional registries
- Risk stratification of eligible participants
- Nurse care management for high risk participants
- Telephone intervention for all participants
- Internet-based information
- Quality improvement collaboratives for primary care providers
- Program evaluation
Abstract:

The study compared the ability of risk stratification models derived from administrative data to classify groups of patients for enrollment in a tailored chronic disease management program. Models were built to identify patients with different levels of expenditure to predict costs. A simple least-squares regression model performed as well as more complex models. The simple 3-parameter model, based on readily available administrative data stratified Medicaid members according to predicted future utilization as well as more complicated models.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Meta-Analysis: Chronic Disease Self-Management Programs for Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Chodash, Joshua, et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>September 20, 2005</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Across the U.S.</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Hypertension, osteoarthritis and diabetes</td>
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<tr>
<td>Disease Management Program:</td>
<td>Various</td>
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<tr>
<td>Research Sponsor:</td>
<td>Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, RAND Health</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Self-management</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Statistically significant and clinically important benefits for measures of blood glucose control and blood pressure reduction for chronic disease self-management programs aimed at patients with diabetes and hypertension  
|               | - No significant findings for the study of osteoarthritis participants  
|               | - Chronic disease self-management for older adults yielded improvement in blood pressure and glucose level controls |
| Bibliographical Info: | Chodash, Joshua, et.al., Meta-Analysis: Chronic Disease Self-Management Programs for Older Adults |

Abstract:

Although enthusiasm is growing for self-management programs for chronic conditions, there are conflicting data regarding their effectiveness and no agreement on their essential components. The study assessed the effectiveness and essential components of self-management programs for hypertension, osteoarthritis and diabetes. The study concluded that self-management programs for diabetes and hypertension probably produce clinically important benefits. The elements of the programs most responsible for benefits cannot be determined from existing data, and this inhibits specification of optimally effective or cost-effective programs. Osteoarthritis self-management programs do not appear to have clinically beneficial effects on pain or function.
Abstract:

Diabetes mellitus is a common and costly chronic disease that increasingly affects minority populations; however, there is little evidence regarding the critical effectiveness and costs of culturally appropriate DMPs. The study combined stepped-care diabetes nursing case management and culturally oriented peer-led self-empowerment training. Participants had a significant reduction in HbA1c, systolic and diastolic blood pressure, total cholesterol and low-density-lipoprotein cholesterol. Expenditures for pharmacy and disease management increased. Total costs were higher during the first year of the DMPs. Project Dulce was effective in improving clinical outcomes for control of diabetes and related conditions in a medically indigent, culturally diverse population. Our finding of reduced hospital expenditures, although statistically insignificant, is clinically and economically important and suggests that intervention might provide an immediate benefit to a high-risk population.
**Article Title:** Implementation and Outcomes of Commercial Disease Management Programs in the United States: The Disease Management Outcomes Consolidation Survey

**Author(s):** Fitzner, Karen, et. al.

**Date:** 2005

**State (if applicable):** Survey was administered throughout the U.S.

**Disease Area(s):** Asthma, diabetes, CAD, cancer, CHF, COPD, Depression, ESRD, High-risk maternity, hyperlipidemia, rare diseases

**Disease Management Program:** Mention of 57 DMPs but no other details provided

**Research Sponsor:** Disease Management Association of America; grants from AstraZeneca, Health Dialog Services Corporation, Matria Healthcare, Applied Health Outcomes/GSK

**Key Words:** Return on investment, decreased utilization; adherence

**Summary of Results:**
- Surveys of organizations indicated: 73 said DMPs improved clinical outcomes; 69% said reduced medical costs; 4% said they support marketing DMP to employers; 19% said a DMP improves their relationship with physicians
- ROI for diabetes DMPs reported at 1.98:1; lower hospitalization rates for DMP participants decline ranged from 5% and 37%
- ROI for asthma DMPs was 2.56:1; lower hospitalization rates for DMP participants decline ranged from 5% and 87.5%
- Noted increase in asthma medication adherence
- Organizations estimated that investment in DMP would increase over next 3 years
- Caution – low response rate to the survey (10%)
- Improving clinical outcomes appeared to be the highest priority for DMPs

**Bibliographical Info:** Fitzner, Karen, et. al., Implementation and Outcomes of Commercial Disease Management Programs in the United States: The Disease Management Outcomes Consolidation Survey, Disease Management, Vol. 8, No. 4, 2005 253-264.

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**Abstract:**

Despite widespread adoption of disease management programs by US health plans, gaps remain in the evidence for their benefits. The Disease Management Outcomes Consolidation Survey was designed to gather data on DMPs for commercial health plans, to assess program success and DM effectiveness. The questionnaire was mailed to 292 appropriate health plan contacts; 26 plans covering more than 14 million commercial members completed and returned the survey. Respondents reported that DM plays a significant and increasing role in their organizations. Key reasons for adopting DM were improving clinical outcomes, reducing medical costs and utilization, and improving member satisfaction. More respondents were highly satisfied with clinical results than with utilization or cost outcomes of their programs (46%, 17%, and 13% respectively). Detailed results were analyzed for 57 DMPs with over 230,000 enrollees. Most responding plans offered DMPs for diabetes and asthma, with ROI ranging from 0.16:1 to 4:1. Weighted by number of enrollees per DMP, average ROI was 2.56:1 for asthma (n=1,136 enrollees) and 1.98:1 for diabetes (n=25,364). Most (but not all) respondents reported reduced hospital admissions, increasing rates of preventive care, and all improved clinical measures.
### Abstract:

In the fall of 2005 APS Healthcare contracted with the Georgia Health Policy Centre to produce survey baseline measures for Georgia’s Medicaid’s new DMP, Georgia Enhanced Care.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Asthma Disease Management: Regression to the Mean or Better?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Tinkelman, David and Wilson, Steve</td>
</tr>
<tr>
<td>Date:</td>
<td>December 2004</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Colorado</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Asthma</td>
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<tr>
<td>Disease Management Program:</td>
<td>National Jewish Medical and Research Centre Disease Management Program for Asthma (NJDMP)</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Asthma, DMP, savings, ROI</td>
</tr>
</tbody>
</table>
| Summary of Results:| - Six months of claims data was used as the baseline for the groups  
                      - The level of anti-inflammatory medication rose from 72.6% to 85.2% at 6 months  
                      - At one year the monthly cost per intervention group member was $179.17 compared to $250.76 in the control group  
                      - The net savings over and above the cost of the program was 9.1% greater for the intervention group than the control group |
| Bibliographical Info: | Tinkelman, David and Wilson, Steve, Asthma Disease Management: Regression to the Mean or Better?, The American Journal of Managed Care, Vol. 10, No. 12, December 2004 948-954. |

Abstract:

The article assessed the effectiveness of disease management as an adjunct to treatment for chronic illnesses, such as asthma and to evaluate whether the statistical phenomenon of regression to the mean is responsible for many of the benefits community attributed to disease management. The intervention group revealed an 18.4% savings. The study concluded that using a control group to control for the statistical effects of regression to the mean, a DMP for asthma in a population covered by Medicaid is effective in reducing healthcare cost.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Medicaid Disease Management: Issues and Promises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Williams, Claudia</td>
</tr>
<tr>
<td>Date:</td>
<td>September 2004</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Colorado, Florida, Indiana, Maryland, Missouri, New York, North Carolina, Oregon, Washington</td>
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<tr>
<td>Disease Area(s):</td>
<td>Chronic conditions: asthma, diabetes, CHF</td>
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<td>Disease Management Program:</td>
<td></td>
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<tr>
<td>Research Sponsor:</td>
<td>The Henry J. Kaiser Family Foundation</td>
</tr>
<tr>
<td>Key Words:</td>
<td>DMP, chronic conditions, adherence</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Many states want to achieve immediate cost savings from their DMPs and see outsourcing as a viable option  
- Programs have evolved away from pharmaceutical management and implementation disease-by-disease to focus on multiple diseases and improving self-care  
- Mental health issues are generally not targeted  
- More than 60% of adult Medicaid enrollees have a chronic or disabling condition  
- For asthma: in Colorado costs for participants declined 37.4%; in North Carolina average cost of an asthma episode was 24% lower for a child in a DMP, rate of hospitalization and ER use was lower for participants; Florida observed reductions in inpatient stays, ER use and office visits; Virginia projected $3 to $4 savings for every dollar on DMP support; Washington saved $250,000 in the first year of the program and flu shots increased from 45 to 65%, daily medication consumption went up from 63% to 80%  
- For diabetes Washington noted $900,000 in savings for the first year of the program, diabetics taking daily aspirin increased from 41% to 64%; testing for HbA1c increased from 40 to 59%, flu vaccinations increased from 51% to 69%  
- For CHF Washington realized $375,000 for the first year of the program in savings and the percentage of CHF clients weighing themselves daily increased from 32 to 64%; ACE inhibitor use increased from 60 to 72%  
- For ESRD Washington saw savings of $680,000 |

Abstract:

More than half of all adult Medicaid enrollees have a chronic or disabling condition, according to some estimates. Many states are adopting Medicaid DMPs as a way to improve health care quality and reduce costs for these enrollees. Nine state programs were examined to observe the motivations, goals, strategies and impact of the state efforts, in addition to describing the details of their initiatives. The findings have important implications for Medicaid, including strategies for addressing the needs of dual eligibles.
### Article Title:
Can Disease Management Reduce Health Care Costs by Improving Quality?

### Author(s):
Fireman, Bruce, Bartlett, Joan and Selby, John

### Date:
2004

### State (if applicable):
California

### Disease Area(s):
Coronary disease, heart failure, diabetes and asthma

### Disease Management Program:
Permanente program (TPMG)

### Research Sponsor:
None cited

### Key Words:
DMPs, chronic disease, adherence

### Summary of Results:
- TPMG programs included clinical guidelines, patient self-management education, disease registries, risk stratification, proactive outreach, reminders, multidisciplinary care teams and performance feedback to providers
- Costs for the study are in 2002 dollars: % of patients taking statins, ACE inhibitors, beta-blockers increased substantially; lipid monitoring increased; median LDL improved from 125 to 99 in CAD patients and from 132 to 108 in diabetic patients; adherence to inhaled corticosteroids increased; costs rose 19% - drug cost increased
- Visits to physicians decreased but visits to other clinicians increased
- ER visits declined but cost per clinic visit rose
- Study found most of treatments recommended for targeted conditions are cost-effective but not cost-saving

### Bibliographical Info:
Fireman, Bruce, Bartlett, Joan and Selby, John, Can Disease Management Reduce Health Care Costs by Improving Quality?, Health Affairs, Vol. 23, No. 6, 2004 63-75.

### Abstract:
Disease management promises to achieve cost savings by improving the quality of care for chronic diseases. During the past decade the Permanente Medical Group in Northern California has implemented extensive DMPs. Examining quality indicators, utilization and costs for 1996-2002 for adults with four conditions found evidence of substantial quality improvement but not cost savings. The causal pathway – from improved care to reduced morbidity to cost savings – has not produced sufficient savings to offset the rising costs of improved care. The study concluded that the rationale for DMPs, like the rationale for any medical treatment, should rest of effectiveness and value.
Private health plans and government health insurance programs in the United States base their coverage decisions on evidence criteria, rather than explicit cost-effectiveness criteria. As health spending continues to grow rapidly, however, approaches to coverage policy that ignore costs fail to meet the needs of consumers, employers, health plans, and federal and state governments. The role of evidence-based criteria in formal coverage decision making is described and contrasted with ways that those criteria differ from cost-effectiveness criteria. Options for incorporating considerations of cost-effectiveness into coverage policy and other aspects of benefit design are discussed.
Article Title: Recommendation for Management of Diabetes in Vermont
Author(s): The Vermont Program for Quality in Health Care
Date: May 2004
State (if applicable): Vermont
Disease Area(s): Diabetes
Disease Management Program: Diabetes Prevention and Control Program in Vermont
Research Sponsor: Vermont Department of Health, BlueCross BlueShield of Vermont, CIGNA HealthCare, MVP Healthcare
Key Words: DMP, self-management, adherence
Summary of Results: Recommendations in the report detail guidelines for DMP multi-faceted healthcare and self-management regimens

Abstract:

The report provided recommendations for:
- Level of hemoglobin HbA1c
- Frequency of ophthalmic exams
- Frequency of foot exams, ulcer and infection exams
- Blood pressure monitoring
- Renal disease screening
- Lipid level and management
- Self-management education
- Medical nutrition therapy
- Self-monitoring for blood glucose testing
- Smoking cessation
- Exercise
- Obesity treatment and management
- Immunization
- Screening for Type 2 Diabetes Mellitus
- Screening for gestational Diabetes Mellitus
- Medication management and adherence
- Psychosocial issues
- Primary prevention
Abstract:

Diabetes disease management programs (DMPs) are proliferating, but their effectiveness in improving quality and mitigating health care spending has been difficult to measure. Using two quasi-experimental methods, this study analyzed the first-year results of a multistate DMP for people with diabetes sponsored by a national managed care organization. In both analyses, overall cost of care was significantly lower in DMP sites, and the payer saved more than it spent. Pharmacy costs showed mixed results. Quality scores in the DMP sites were significantly better than in sites without the program.
The Effectiveness of Disease Management Programs in the Medicaid Population

**Summary of Results:**
- Medicaid MCOs offer disease management programs and tools that place an emphasis on prevention.
- Medicaid’s FFS demographic often is the chronically ill; in 2004 there were over 30 states with FFS Medicaid disease management programs.
- Across the U.S.A., over 700 community health centers are charged with providing preventative and primary care with funding from the federal government, Medicaid, private insurance and patient fees.
- Disease management programs can improve care quality and patient satisfaction.

**Bibliographical Info:**
Disease Management in Medicaid, The Health Strategies Consultancy, The Intersection of Business Strategy and Public Policy, n.d.

**Abstract:**
By 2020 the number of individuals suffering from a chronic condition is expected to rise to 157,000,000. By 2010 disease management industry revenue is expected to reach $20 billion. Medicaid MCOs operate in 47 states but generally enroll healthier populations. Some Medicaid MCOs outsource disease management programs to vendors who are paid on a performance metric basis while fee for service MCOs cover a different population base, often the most chronically ill. Throughout the 1990s the number of community health centers throughout the United States depending on Medicaid as a source of income increased. Examples of disease management Medicaid fee for service include: Florida – Asthma, CHF, HIV/AIDS, hemophilia, ESRD, diabetes, hypertension, depression (1998-present) Mississippi – Asthma, diabetes, hyperlipidemia, coagulation disorders (1998 – present) North Carolina – Asthma, diabetes, LTD polypharmacy (1998 – present) Virginia – Asthma, diabetes, ulcers, GERD, CHF, COPD (Asthma pilot 1995-1997, all others 1997 – present) Washington – Asthma, CHF, diabetes, ESRD, other high cost patient populations (2002-present)

Florida is considered to be the leader in implementing Medicaid disease management programs.

**Statistics:**
- Diabetics utilizing CHCs twice as likely to have glycohemoglobin tested on schedule
- CHC Medicaid patients 22% less likely to have preventable hospitalizations

(Source: Ann Dievler and Terence Giovannini: Community Health Centers: Promise and Performance, Medical Care Research and Review, 1998.)
Florida experience
- All non-manufacturer sponsored disease management programs have produced savings of $13.3 million since implementation; manufacturer (operated by drug companies) sponsored programs produced savings of $64.7 million and reduced inpatient days and ER visits; hospital admissions have decreased by 36%

Washington experience
- Quality improvements between 2002 and 2003 include increase in flu shots for asthma patients from 45% to 59%; CHF patients regularly weighing themselves increased from 28% to 67%; diabetic patients consumption of aspirin increased from 41% to 57%
Source: Washington Medicaid and its Contractor, McKesson, Get National Award for Best Disease Management Program Washington State Department of Social and Health Services, October 15, 2002

North Carolina results
- To address rising drug costs ($1.1 billion spent on Medicaid prescriptions in 2001) polypharmacy initiative saw quality results: 19% decline in use of unnecessary drugs, 7% decline in wrong dosages, 9% decline in adverse effects; and cost results: $16 million in annual savings, 4.2% savings per patient, 13:1 savings to cost ratio
### Article Title:
Variability in Asthma Care and Services for Low-Income Populations Among Practice Sites in Managed Medicaid Systems

### Author(s):
Lozano, Paula, et.al.

### Date:
December 2003

### State (if applicable):
Massachusetts, California, Washington

### Disease Area(s):
Asthma

### Disease Management Program:
- In 1998 the Asthma Care Quality Assessment Study followed Medicaid insured children with asthma in 85 practice sites across three states.

### Research Sponsor:
None cited

### Key Words:
Chronic illness,

### Summary of Results:
- Practice sites ranked information system items lowest
- Self-management support category processes varied widely
- Practice site responders indicated that promoting two way communication between specialists and primary care, facilitating specialist referral for difficult cases and promoting guidelines were of value
- There was great variability in processes amongst the various practice sites

### Bibliographical Info:
Lozano, Paula, et.al., Variability in Asthma Care and Services for Low-Income Populations Among Practice Sites in Managed Medicaid Systems, Health Services Research, Vol. 38 No. 6, Part 1 December 2003 1563-1578.

### Abstract:
The study characterized and described the variability in processes of asthma care and services tailored for low-income populations in practice sites participating in Medicaid managed care. The processes of care related to asthma varied greatly in how often practice sites reported doing them, with information systems and self-management support services ranking lowest. There is room for improvement in provision of chronic asthma care for children in managed Medicaid, particularly in the areas of self-management support and information systems. The lack of consistency within MCOs on many processes of care suggest that care may be driven more at the practice site level than the MCO level, which has implications for quality improvement efforts.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Medicaid Disease Management Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Gillespie, Jeann L. and Rossiter, Louis F.</td>
</tr>
<tr>
<td>Date:</td>
<td>2003</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Florida, Virginia, West Virginia</td>
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<tr>
<td>Disease Area(s):</td>
<td>asthma, diabetes, HIV/AIDS, hemophilia, hypertension, cancer, end-state renal disease, CHF, and sickle cell anemia</td>
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<tr>
<td>DM Program:</td>
<td>Virginia Health Outcomes Project, West Virginia Health Initiatives Project</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Medication adherence, savings</td>
</tr>
</tbody>
</table>
| Summary of Results: | - DMPs can reduce costs in a Medicaid population by 33% due to reductions in ER visits and urgent care visits  
- Overall disease management is a $US 10-15 billion industry  
- Asthma DMPs ↓ hospitalization by 83%; see 82% less hospitalization days and 42% fewer ER visits  
- As at Feb. 2001 Florida’s DMPs cost the state $US 24.1 million, no money saved |

Abstract:

Disease management emphasizes prevention of disease-related exacerbation and complications using evidence-based guidelines and patient empowerment tools. It can help manage and improve the health status of a defined patient population over the entire course of a disease.

More than 20 states in the US are developing and implementing Medicaid disease management programs (DMPs). While most are in the early stage of development, a small number of states were pioneers and have gained much insight. Among them, three states, Florida, Virginia and West Virginia provide significant lessons.

In the late 1990s, Florida’s Medicaid agency authorized development of DMPs for patients with asthma, diabetes, HIV/AIDS, hemophilia, hypertension, cancer, end-state renal disease, CHF, and sickle cell anemia. Problems result from Florida trying to implement too many programs at once, using contracts with multiple vendors.

The Virginia Health Outcomes Project was shown to be effective in reducing use of emergency and urgent care services by Medicaid patients with asthma and increasing use of asthma medications. It was shown to be cost effective, with direct savings to Medicaid of $US 3 to $US 5 for every dollar spent providing DM support to physicians.

The goals of the West Virginia Health Initiatives Project were to deliver quality care, improve health status and quality of life, and ensure the efficient and appropriate utilization of resources for Medicaid patients with diabetes.

States are experimenting with cutting-edge programs to tackle not only their fiscal issues, but also the issue of ensuring high-quality, cost-effective healthcare for the patients they serve.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Evaluating ROI in State Disease Management Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Wilson, Thomas W.</td>
</tr>
<tr>
<td>Date:</td>
<td>November 2003</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>None cited</td>
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<tr>
<td>Disease Area(s):</td>
<td>None cited, article focused on evaluation techniques</td>
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<tr>
<td>Disease Management Program:</td>
<td>None cited, article focused on evaluation techniques</td>
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<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Disease Management Programs, return on investment</td>
</tr>
</tbody>
</table>
| Summary of Results:    | - Use of comparability and equivalence to determine investment in DMP has led to a positive ROI  
                          - Changes in healthcare costs over time can’t be assumed to be solely due to DMP services  
                          - Analysis must ensure DM population is compared with appropriately chosen and measured reference population  
                          - Two principles to follow: 1) risk of experiencing the economic outcome over time in the absence of the DMP must be equivalent between the reference and DMP population; 2) metrics used to assess risk and measure the economic outcome must be comparable in both the intervention and reference population  
                          - Ways to address non-equivalence between intervention and reference population: regression to the mean due to selection bias and should be addressed at the selection stage; focus on non-equivalence at the analytic stage  
                          - Approaches to calculating ROI include direct and indirect  
                          - Indirect ROI assessments are easily biased by both non-equivalence and lack of comparability |

Abstract:

In light of soaring health care premiums and plummeting state revenues, many states are turning to disease management programs as a means of controlling spending in their Medicaid programs and high-risk pools. Disease management is believed to help prevent major disease events (e.g. stroke or heart attack) and thus reduce the costs associated with hospitalization and often medical services for such events.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Can a Disease Self-Management Program Reduce Health Care Costs: The Case of Older Women with Heart Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Wheeler, John R. C.</td>
</tr>
<tr>
<td>Date:</td>
<td>June 2003</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Michigan</td>
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<tr>
<td>Disease Area(s):</td>
<td>Heart disease self-management</td>
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<tr>
<td>Disease Management Program:</td>
<td>Women Take Pride (WTP)</td>
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<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Disease self-management, cost efficiencies</td>
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<tr>
<td>Summary of Results:</td>
<td>- Program participants experienced 46% fewer in-patient days and 49% lower in-patient costs</td>
</tr>
<tr>
<td></td>
<td>- No significant difference in ER visits was found</td>
</tr>
<tr>
<td></td>
<td>- Hospital cost savings exceeded program costs by a ratio of 5:1</td>
</tr>
<tr>
<td></td>
<td>- Estimated savings in hospital costs for a chronic disease self-management program approximated at $750 per individual (Lorig)</td>
</tr>
<tr>
<td>Bibliographical Info:</td>
<td>Wheeler, John R.C., Can a Disease Self-Management Program Reduce Health Care Costs: The Case of Older Women with Heart Disease, Medical Care, Vol. 41, No. 6, June 2003 706-715</td>
</tr>
</tbody>
</table>

Abstract:

A heart disease self-management program can reduce health care utilization and potentially yield monetary benefits to a health plan. The impact of a heart disease management program on use of hospital services was studied to estimate associated hospital cost savings. Potential cost savings were compared with the cost of delivering the program. Data was collected from hospital billing records during a 36 month period. Participants were recruited from 6 hospital sites and screening criteria included females 60 years or older, diagnosed with cardiac disease and seen by a physician every 6 months. Measures include hospital admissions, in-patient days and ER visits. Results indicated that hospital cost savings exceeded program costs by a ratio of nearly 5 to 1.

Statistics

Estimated savings in hospital costs for a chronic disease self-management program approximated at $750 per individual (Source: Lorig et.al. Chronic Disease Self-Management Program, Medical Care, Vol. 39, 2001 1217-1223)
Abstract:

Disability reduction or prevention programs for people with arthritis and other rheumatic conditions reduce long-term pain and disability but reach only a fraction of their target audience. Few public health professionals are aware of these programs or their benefits. The objective of this study is to review and describe packaged (ready-to-use) arthritis self-management education and exercise/physical activity programs that have had at least preliminary evaluation. Nine intervention programs were included (5 self-management education programs and 4 exercise/physical activity programs met study criteria). Several of the packaged arthritis interventions reviewed help people with arthritis and other rheumatic conditions maximize their abilities and reduce pain, functional limitations, and other arthritis-related problems. Other packaged interventions show promise in reducing pain, disability and depression and in increasing self-care behaviours, but they need to be evaluated more extensively.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Evaluation Methods in Disease Management: Determining Program Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Linden, Ariel, Adams, John L., Roberts, Nancy</td>
</tr>
<tr>
<td>Date:</td>
<td>October 2003</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>None cited</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>None cited, general article regarding evaluation techniques</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>None cited, general article regarding evaluation techniques</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td></td>
</tr>
<tr>
<td>Key Words:</td>
<td>Disease management, evaluation techniques, measure of effectiveness</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Assessment of program impact gauged by the total population approach, the survival analysis, and the time series analysis  
                      - Determination of financial performance based on three elements: the type/mix of services; the amount of services used; the price paid for services used  
                      - Evaluation must ensure that the design chosen best fits the data and mitigates the effects of bias that may raise concerns about the validity of results  
                      - One bias is measurement bias which results from intervention focusing on reduction in acute health service utilization but uses cost as the outcome measure for assessing program effectiveness – more appropriate would be the use of utilization as the outcome measure and then transforming the results to financial performance based on current indices. |

Abstract:

The purpose of this paper is to provide an overview of various evaluation techniques that should be considered for assessing disease management (DM) program effectiveness. Each design has a particular suitability, depending on the type of DM program and the outcome variables measured. In all cases however, threats to validity must be controlled for or the accuracy of the results may be called into question. Of particular concern, is the current use of utilization measures as the focus of the intervention and cost as the outcome measure. To mitigate the effects of these potential measurement biases, utilization variables should be used as the outcome measure and a transformation made to financial performance. This document should provide DM program planners the tools necessary for choosing the evaluation method that is most appropriate for assessing effectiveness in improving health outcomes and reducing morbidity of the population.
Disease management programs are designed to contain costs by improving health among the chronically ill. More than 20 states are now engaged in developing and implementing Medicaid disease management programs for their primary care case management and fee-for-service populations.

Disease management is one of the few policy options available to states that offers a least the potential to improve care quality while also containing costs. While the early adopters of Medicaid DM have not found it to be an immediate panacea, they do believe that DM provides a longer-term direction for state Medicaid program and a potentially significant cost-saving strategy. A key challenge for states, and for the DM industry as a whole, will be to develop common standards for measuring cost and clinical outcomes, which will enable states to evaluate the true impact of these programs.
The successful management of diabetes with a goal of achieving near-normoglycemia requires patients to make multiple lifestyle changes as part of an intensive, complex and coordinated therapeutic regimen aimed at reducing the risk of complications associated with the disease. The difficulty in creating and sustaining these lifestyle behavior changes is a major stumbling block in achieving the desired therapeutic goal. An underlying assumption of comprehensive disease management is that regular, personal contact with nurses and ancillary health professionals will facilitate these lifestyle behavior changes for program participants. The results of a survey of self-reported data from 750 participants in a comprehensive diabetes management program, reporting on here, show strong perceptions of positive behavior change over the broad range of medical and lifestyle treatment areas associated with effective management of diabetes. These results suggest that diabetes disease management programs are an effective approach to helping diabetic patients accomplish the lifestyle behaviors critical to their health.
Article Title: Long-term Persistence in Use of Statin Therapy in Elderly Patients

Author(s): Benner, Joshua S., et.al.

Date: July 2002

State (if applicable): New Jersey

Disease Area(s): Coronary heart disease

Disease Management Program: Nothing specific mentioned

Research Sponsor: Bristol-Myers Squibb, honorariums from Pfizer Inc.

Key Words: Medication adherence

Summary of Results:
- Over a 4 year period only one patient observed prescribed medication adherence
- In the first three months of therapy there was total compliance; after 6 months 29% did not adhere to their medication; at 60 months 56% were not compliant.
- The most effective persistence-enhancing interventions for long term treatment consist of combinations of more convenient care, information, counseling, reminders, reinforcement, and other forms of supervision or attention


Abstract:

Knowledge of long-term persistence with 3-hydroxy-3-methylglutaryl co-enzyme Areductase inhibitor (statin) therapy is limited because pervious studies have observed patients for short period of time, in closely monitored clinical trials, or in other unrepresentative settings. Persistence with statins decreases over time. The greatest drop in adherence occurs within the first 6 months of treatment. Interventions are needed early in treatment and among high-risk groups, including those who experience coronary heart disease events after initiating treatment.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Disease Burden Profile: An Emerging Tool for Managing Managed Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Zhao, Yang, et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>2002</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>None cited</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>None cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>DMP, disease profile,</td>
</tr>
<tr>
<td>Summary of Results:</td>
<td>- Effective management of health care for a population requires knowing the prevalence and distribution of its medical problems</td>
</tr>
<tr>
<td></td>
<td>- Article illustrates the usefulness of a population-based classification system for characterizing a population’s disease burden as a first step in population-based health management</td>
</tr>
<tr>
<td></td>
<td>- Diagnostic cost group (DCG) methodology is used for classification</td>
</tr>
<tr>
<td></td>
<td>- Disease profiles between Medicaid and private under age 65 samples differ significantly; Medicaid individuals have more medical problems but lower resource utilization</td>
</tr>
<tr>
<td></td>
<td>- DCGs predict future costs and provide clinical descriptions at the group or individual level</td>
</tr>
<tr>
<td></td>
<td>- Population disease profiles are useful in managing high cost diseases with multiple co-morbidities (such as diabetes)</td>
</tr>
<tr>
<td></td>
<td>- Approach manages populations, not diseases</td>
</tr>
</tbody>
</table>

Abstract:

As health plans assume financial risk for providing health care services, effectively managing the health of a population remains one of the toughest challenges. This article shows how risk assessment methods can be used to measure disease burden in the full population and to discriminate levels of future health care needs within specific disease cohorts. We also examine and compare the predictive power of claims-based models within a diabetic cohort.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Does Diabetes Disease Management Save Money and Improve Outcomes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Sidorov, Jaan, Shull, Robert, et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>April 2002</td>
</tr>
<tr>
<td>State:</td>
<td>Pennsylvania</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Diabetes disease management</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Disease management program, reduction of cost, diabetes</td>
</tr>
</tbody>
</table>
| Summary of Results:    | - Diabetes affects 16 million Americans at a cost of $44 billion a year in medical and treatment costs.  
                         - Diabetes accounts for 5.8% of all personal health care expenditure in the U.S.  
                         - During the period of the study program patients experienced $394.62 in claims per months versus $502.48 for non program patients  
                         - ER visits less in program patients; 0.49 visits versus 0.56  
                         - Lower inpatient health care use in program patients (0.12 admissions versus 0.49)  
                         - Program patients had higher primary care visits (8.36 versus 7.78)  
                         - Program patients achieved higher HEDIS scores for HbA1c testing as well as for lipid, eye and kidney screenings  
                         - Savings: $104,806 per month/$1,294.32 per diabetic per year |

Abstract:

The study compared health care costs for patients who fulfilled a defined criteria set for diabetes in a HMO-sponsored disease management program with costs to those not in disease management. This study found that an opt-in disease management program appears to be associated with a significant reduction in health care costs and other measures of health care use. There was also a simultaneous improvement in HEDIS measures of quality care. The data suggests that disease management may result in savings for sponsored managed care organizations and that improvements in HEDIS measures are not necessarily associated with increased medical costs.
Drug use patterns among patients with type 2 diabetes mellitus have been studied in the general population but not specifically in the Medicaid population. The study examined antihyperglycemic drug use patterns and assessed patients’ persistence and compliance with different antihyperglycemic drug regimes. Simple 1 drug antihyperglycemic regimens were associated with better compliance and persistence than more complex multiple-drug regimes.
**Article Title:** Medicaid Disease Management: Seeking to Reduce Spending By Promoting Health  
**Author(s):** Wheatley, Ben  
**Date:** August 2001  
**State (if applicable):** Florida, Mississippi, Texas, Utah, Virginia, West Virginia  
**Disease Area(s):** Diabetes, Asthma, HIV/AIDS, Hemophilia, CHF, end-stage Renal disease, Cancer, Hypertension, Sickle Cell Anemia, Depression, GRD  
**Disease Management Program:** Various  
**Research Sponsor:** The Robert Wood Johnson Foundation  
**Key Words:** Disease management, reduce spending, improved health outcomes  
**Summary of Results:**  
- States have established DMPs for their primary care case management populations by submitting state plan amendments to their Section 1915(b) waivers  
- Disease management organizations are placed at a financial risk to achieve Medicaid cost savings but do not have the leverage to control provider behavior (e.g., authority to conduct a utilization review)  
**Bibliographical Info:** Wheatley, Ben, Medicaid Disease Management: Seeking to Reduce Spending By Promoting Health, State Coverage Initiatives Issue Brief, August 2001.

**Abstract:**

Over the past 2 years, states across the country have been struggling to cope with rising Medicaid expenditures and, in some cases, significant budget shortfalls. They have sought to cut Medicaid spending by limiting benefits, increasing cost-sharing and slowing provider payment increases. A number of states have also tightened Medicaid eligibility standards or have delayed planned eligibility expansions until their budget situation improves.
### Summary of Results:

- Chronic disease accounts for 70% of all health care expenditures (Hoffman, C., Rice D, and Sung, H-Y, JAMA 1996)
- CDSMP is based on the generic principles of the Arthritis Self-Management Program
- Patients taking part in the self-management program improved their health behaviours, improved self-rated health and participation in social/role activities, reduced disability, fatigue and distress, and had significantly fewer hospitalizations and fewer days in the hospital
- Categories of outcomes assessed: health status, health services utilization, perceived self-efficacy to manage different aspects of their health and functioning
- Study concluded that a low-cost 7-week self-management program reduces health distress and results in fewer outpatient visits
- Total reduction during the 2 years was 2.5 visits per participant to the ER; savings in reduced outpatient visits were $100 per participant
- Reduction in hospitalization during first 6 months represents $490 less utilization per participant
- Two year savings due to reduced hospital days and outpatient visits is $590 per participant; actual 2 year savings were between $390 and $520 per participant

### Bibliographical Info:


### Abstract:

The study assessed the 1 and 2 year health status, health care utilization and self-efficacy outcomes for the Chronic Disease Self-Management Program (CDSMP). The hypothesis is that during the 2-year period CDSMP participants will experience improvements or less deterioration than expected in health status and reductions in health care utilization. Health status was gauged by self-rated health, disability, social/role activity limitations, energy/fatigue, health distress, health care utilization, days in hospital and perceived self-efficacy. Compared with the baseline for each of the 2 years, ER/outpatient visits and health distress were reduced. Self-efficacy improved. The study concluded that a low-cost program for promoting health self-management can improve elements of health status while reducing health care costs in populations with diverse chronic diseases.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Asthma Prevalence, Cost, and Adherence with Expert Guidelines on the Utilization of Health Care Services and Costs in a State Medicaid Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Piecoro, Lance T., et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>June 2001</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Kentucky</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Asthma</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Nothing specific cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Asthma, utilization, cost</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Asthma related and total health care costs incurred during the study year were $616 and $3,564 respectively  
- Only 175 of total health care costs were due to asthma  
- Study concluded that DMPs aimed at controlling costs and improving quality of care must be comprehensive in nature, taking into account the significant amount of co-morbidities in the population  
- There is a direct relationship between inhaled steroid use and decreased ER and hospital care costs  
- Medicaid patients with asthma were found to have a substantial amount of co-morbidities, necessitating the need for comprehensive DMP interventions |

Abstract:

The purpose of the article was to provide a descriptive analysis of asthma prevalence and costs in a Medicaid population and gauge the degree of adherence with expert guidelines for asthma medication management from the National Asthma Education and Prevention Program. Guideline non-adherence was widespread and associated with an increase in exacerbation of asthma that resulted in hospitalizations. Asthma prevalence and utilization of health care services in a Medicaid population were similar to previous estimates reported nationally and in health maintenance organizations.
The naturalistic study used claims data to examine the relationship of medication non-adherence to hospital use and costs among severely mentally ill clients in Wisconsin. Clients with schizophrenia or schizoaffective disorder were noted to use medication irregularly 31%. The rates were 33% among those with bipolar disorder and 41 among those with other severe mental illnesses. Irregular users had significantly higher rates of hospitalization compared with medication adherents ($3,992 versus $1,048). The availability of drug claims data and the ability to use them in practice analyses make them a potentially useful data source in studies of medication adherence among persons with severe mental illness.
Abstract:

The growing number of persons suffering from major chronic illnesses face many obstacles in coping with their condition, not least of which is medical care that often does not meet their needs for effective clinical management, psychological support, and information. The primary reason for this may be the mismatch between their needs and care delivery systems largely designed for acute illness. Evidence of effective system changes that improve chronic care is mounting. The authors have tried to summarize this evidence in the Chronic Care Model (CCM) to guide quality improvement. The paper describes the CCM, its use in intensive quality improvement activities with more than 100 health care organizations, and insights gained in the process.
Abstract:

Statin adherence is a serious problem in patients with hyperlipidemia. However, it is not clear whether statin adherence is associated with medical utilization or health care costs. The study assessed associated medical utilization and health care costs in patients with type 2 diabetes, based on a national Medicaid database. The study of patients over the course of 1 year found the average adherence rate to statins was 0.61. Diabetic patients adherent to statins showed lower risks for hospitalization and all cause medication costs by 15% and hyperlipidemia medical costs by 12%.
### The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Evidence Suggesting That A Chronic Disease Self-Management Program Can Improve Health Status While Reducing Hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Lorig, Kate R., et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>1999</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>California</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Chronic disease: chronic lung disease, heart disease, stroke, chronic arthritis</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Chronic Disease Self-Management Program</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>University of California Tobacco-Related Disease Research Program</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Chronic disease, self-management, patient education, cost, utilization</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Chronic disease is responsible for 70% of healthcare expenditures  
  - Three primary classifications of outcome variables: health behaviours, health status and health service utilization  
  - Participants in a self-management program demonstrated significant improvement in five of the health status variables  
  - Visits to physicians decreased by 0.98; 0.65 fewer days in hospital  
  - Healthcare expenditure savings approximated $750 per participant, more than 10 times the cost of the program |
| Bibliographical Info: | Lorig, Kate R., et.al., Evidence Suggesting That A Chronic Disease Self-Management Program Can Improve Health Status While Reducing Hospitalization, Medical Care, Vol. 37, No. 1, 1999 5-14. |

**Abstract:**

The study evaluated the effectiveness (changes in health behaviours, health status, and health service utilization) of a self-management program for chronic disease designed for use with a heterogeneous group of chronic disease patients. It also explored the differential effectiveness of the intervention for subjects with specific diseases and co-morbidities. Fewer hospitalizations and days of hospitalizations were noted for group of chronic disease patients taking part in self-management programs.
<table>
<thead>
<tr>
<th><strong>Article Title:</strong></th>
<th>Emerging Practices in Medicaid Primary Care Case Management Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s):</strong></td>
<td>Rawlings-Sekunda, Joanne; Curtis, Deborah; Kaye, Neva</td>
</tr>
<tr>
<td><strong>Date:</strong></td>
<td>June 2001</td>
</tr>
<tr>
<td><strong>State (if applicable):</strong></td>
<td>Alabama, Florida, Iowa, Maine, North Carolina, Oklahoma, Texas, Virginia</td>
</tr>
<tr>
<td><strong>Disease Area(s):</strong></td>
<td>Florida (HIV/AIDS, hemophilia, end stage renal disease, congestive heart failure, diabetes, asthma); Texas (diabetes); North Carolina (asthma)</td>
</tr>
<tr>
<td><strong>Disease Management Program:</strong></td>
<td>North Carolina (Access II and Access III); Alabama (Patient 1st); Florida (MediPass); Iowa (MediPass); Maine (Maine PrimeCare, MaineNET/Partnership); Oklahoma (SoonerCare Choice); Texas (Texas Health Network, STAR”+PLUS); Virginia (MEDALLION)</td>
</tr>
<tr>
<td><strong>Research Sponsor:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Key Words:</strong></td>
<td>DMP, cost, medication adherence, pharmacy management</td>
</tr>
</tbody>
</table>
| **Summary of Results:** | - Some states have implemented certain program components/features that show success in quality monitoring and improvement (Maine uses provider profiling; Texas distributes provider profiles; Virginia and North Carolina developed indicators for provider profiles; Alabama, Iowa, Maine and Texas have quality improvement advisory committees; Texas conducts community health needs assessments; Alabama uses targeted surveys; Florida, Oklahoma, Texas and Maine have defined pharmacy management structures  
  - Florida, North Carolina and Oklahoma have formalized DMP structures and approaches  
  - In Florida each DMP contractor must guarantee the state 6.5% annual savings compared to adjusted baseline |

**Bibliographical Info:** Rawlings-Sekunda, Joanne; Curtis, Deborah; Kaye, Neva, Emerging Practices in Medicaid Primary Care Case Management Programs, National Academy for State Health Policy, June 2001.

**Abstract:**

The states are employing innovative strategies in the areas of:

- Organizational structure and administration (Texas uses plan administrators to implement state policies and decisions; North Carolina focuses on population management; Maine has a project focused on individuals receiving long term care services at home)
- Provider recruitment and retention (specially designated provider outreach staff in Alabama, Florida, Virginia, Texas; provider hotlines in Alabama, Iowa, Maine, North Carolina, Oklahoma, Texas, Virginia; feedback mechanisms such as provider profiling in Maine, Alabama, Texas; strategies to gain provider input and suggestions in all the 8 states listed above)
- Quality activities such as DMPs in North Carolina, Florida and Oklahoma
- Finance modifications (Maine and Oklahoma have incentive payment systems; Oklahoma has primary/preventive services)
- Service management (Maine has care coordinators for people eligible for long-term care services at home; Maine and North Carolina have health needs assessments)
- Enrollment functions such as targeted processes to facilitate the enrollment of populations with special needs in Alabama and Oklahoma
Article Title: Adherence to Asthma Treatment Guidelines Among Children in the Maryland Medicaid Program

Author(s): Zuckerman, Ilene H., et.al.

Date: December 2000

State (if applicable): Maryland

Disease Area(s): Asthma

DM Program: National Asthma Education and Prevention Program

Research Sponsor: Agency for Healthcare Research and Quality

Key Words: Asthma, children, adherence

Summary of Results: - In 1990 asthma-related costs were estimated to be $6.2 billion
- Asthma is the most common chronic pediatric illness, affecting an estimated 4.8 million children
- During the first 6 months of the study period 68.6% were adherent to all asthma treatment criteria
- The lack of use of anti-inflammatory agents in children with persistent asthma was more common in older than younger children
- 82% of children presenting to the ER with symptoms of asthma did not regularly use inhaled anti-inflammatory therapy
- Older children are at greater risk to be non-adherent


Abstract:

Asthma is the most common chronic illness in children. However, adherence to asthma treatment guidelines in children is poor. The factors associated with this non-adherence are not well understood. The study assessed adherence to national asthma treatment guidelines in pediatric Medicaid enrollees in Maryland. Factors associated with non-adherence and with short-term persistence in non-adherence were studied. The most frequently failed treatment criterion was lack of use of anti-inflammatory inhalers in persistent asthma. Approximately one third of children with asthma are not being treated in accordance with current treatment guidelines. Older children are at higher risk than younger children for non-adherence to NAEPP guidelines. Adherence to asthma treatment guidelines varies over time, suggesting that patients' regimens should be monitored frequently.
### Article Title:
The Impact of Disease Management on Outcomes and Cost of Care: A Study of Low Income Asthma Patients

### Author(s):
Rossiter, Louis F., Whitehurst-Cook, Michelle Y, et.al.

### Date:
Summer 2000

### State (if applicable):
Virginia

### Disease Area(s):
Asthma

### Disease Management Program:
Virginia Health Outcomes Partnership (VHOP)

### Research Sponsor:
National Pharmaceutical Council

### Key Words:
Asthma, disease management, savings, cost-effectiveness, self-management

### Summary of Results:
- Prior to VHOP, Virginia Medicaid was spending more than $16.7 million for asthma services; $1.9 million for inpatient hospital stays; $5.8 million for ER visits; $1.8 million for hospital outpatient visits; $3.8 million for physician visits and $3.4 million for medication.
- Study aimed to train physicians to inform patients re: self-management.
- Key measures for outcome were claims for ER visits and guideline-recommended drugs.
- Substantial reductions in ER services observed, fell 40.7%.
- Medicaid spending for asthma reduced by $54,540 per year.
- Per physician trained the program results in Medicaid gross savings of $839.
- Each dollar spent in training another physician generated another $3 program savings.

### Bibliographical Info:

### Abstract:

An asthma disease management program designed specifically for low-income patients experiencing significant adverse events can improve health outcomes substantially, while lowering costs. The Virginia Health Outcomes Partnership aimed to help physicians in a fee-for-service primary care case management program manage asthma in Medicaid recipients. Approximately one third of physicians treating asthma in an area designated as the intervention community volunteered to participate in training on disease management and communication skills. This large-scale study discovered that the rate of ER visit claims for patients of participating physicians who received feedback reports dropped an average of 41 from the same quarter a year earlier, compared to only 18% for comparison community physicians. Although only a third of the intervention community physicians participated in the training, ER visit rates for all intervention community physicians nonetheless declined by 6% relative to the comparison community. At the same time, the dispensing of some reliever drugs recommended for asthma increased 25% relative to the comparison community. A cost-effectiveness analysis projected direct savings to Medicaid of $3 to $4 for every incremental dollar spent providing disease management support to physicians. The results of this study demonstrate the potential this program offers, especially for Medicaid programs in other states that want to improve the care of their primary care case management networks, and, at the same time, manage costs.
The Effectiveness of Disease Management Programs in the Medicaid Population

<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Outcomes Evaluation of a Comprehensive Intervention Program for Asthmatic Children Enrolled in Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Szelc Kelly, Cynthia, et.al.</td>
</tr>
<tr>
<td>Date:</td>
<td>2000</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Virginia</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Asthma</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>None cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>None cited</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Utilization, hospitalization, cost</td>
</tr>
</tbody>
</table>
| Summary of Results:  | - 50% of the subjects in the intervention group had a decrease in the number of hospitalizations: 58% had fewer visits to the ER  
|                      | - Total charges in the intervention group children decreased by $721 despite the additional cost of subspecialty care in the allergy clinic and salary support for the outreach nurse  
|                      | - The study did not have access to pharmaceutical consumption so this component was not included in the study |

Abstract:

The objective of the study was to evaluate health care and financial outcomes in a population of Medicaid-insured asthmatic children after a comprehensive asthma intervention program. Children in the intervention group received asthma education and medical treatment in the setting of a tertiary care pediatric allergy clinic. An asthma research nurse maintained monthly contact with the families enrolled in the intervention group.

Measures included ER visits, hospitalizations, and health care charges per patient in the year after enrollment. Results indicated that baseline demographics did not differ between the two groups. During the study year, ER visits decreased to a mean of 1.7 per patient in the intervention group and 2.4 in controls, while hospitalizations decreased to a mean of .2 per patient in the intervention group and .5 in the control. Average asthma health care charges decreased by $721/patient/year in the control group.
Abstract:

Logistic regression modeling of data from the New Jersey Medicaid program was used to study compliance and related demographic factors in a retrospective cohort of elderly outpatients newly starting antihypertensive therapy from 1982 to 1988. The study concluded that despite the efficacy of antihypertensive therapy in preventing cardiovascular morbidity, such high rates of noncompliance may contribute to suboptimal patient outcomes.
An Annotated Bibliography:
Disease management
**Summary of Results:**
- Pharmacists often identify concern through program known as the medication therapy management program.
- Reimbursed medication therapy management services cost $15 to $50 per consultation.
- Drug costs for patients who had a face to face or telephone session were 5.2% lower, drug use was down 5% and more generic medications were used.
- Each medication therapy intervention cost an average of $8.44 and resulted in an estimated savings in medical services of $93.
- In Iowa the medication therapy services uncovered 2.6 medication related problems per patient and in 52% of cases a new medication was recommended, in 31% of cases discontinuing a medication was recommended.
- Minnesota’s services resulted in a 31% decrease in total health expenditures per patient, from $11,965 to $8,197 (14%); the savings exceeded the cost of medication therapy services by more than 12:1.

**Abstract:**

One in 4 Americans (75 million people) do not follow directions when taking prescription medication. This can cost an estimated $290 billion annually in hospital admissions, doctor visits, lab work and nursing home admissions.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Prevalence and Cost of Non-adherence with antiepileptic drugs in an adult managed care population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Davis, Keith L., Candrilli, Sean D., and Edin, Heather M.</td>
</tr>
<tr>
<td>Date:</td>
<td>2007</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>Across the U.S.</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>Not applicable – use of PharMetrics data from an integrated outcomes database</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>GlaxoSmithKline</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Adherence, cost</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Non-adherence to medication leads to increased financial burden on patients, payers and society and is estimated to be $100 billion per year across all chronic diseases in the U.S.  
- 39% of epilepsy patients are non-adherent with drug regimens  
- Non-adherence to AED therapy was associated with an 11% increased likelihood in hospitalization and an additional $1,799 in additional inpatient costs as well as $260 in additional ER costs  
- Non-adherence with AED has a statistically significant positive effect on volume and associated cost of inpatient, ER, and total health care utilization.  
- Despite expected cost offsets from reduced prescription drug utilization among non-adherers, AED non-adherence was associated with a large increase in overall health care utilization and costs  
- Efforts to promote AED adherence may lead to cost savings for managed care systems and improved health outcomes for epileptic patients |
| Bibliographical Info: | Davis, Keith L., Candrilli, Sean D., and Edin, Heather M., Prevalence and Cost of Non-adherence with antiepileptic drugs in an adult managed care population. |

Abstract:

The study assessed the extent of refill non-adherence with antiepileptic drugs (AEDs) and the potential association between AEDs non-adherence and health care costs in an adult-managed care population. The study found adherence with AEDs among adult epilepsy patients is suboptimal and non-adherence appears to be associated with increased health care costs. Efforts to promote AED adherence may lead to cost savings for managed care services.
Abstract:

Non-adherence with prescribed drug regimens is a pervasive medical problem. Multiple variables affecting physicians and patients contribute to non-adherence, which negatively affects treatment outcomes. In patients with hypertension, medication non-adherence is a significant, often unrecognized, risk factor that contributes to poor blood pressure control, thereby contributing to the development of further vascular disorders such as heart failure, coronary heart disease, renal insufficiency, and stroke.

Analysis of various patient populations show that choice of drug, use of concomitant medications, tolerability of drug, and duration of drug treatment influence the prevalence of non-adherence. Intervention is required among patients and healthcare prescribers to increase awareness of the need for improved medication adherence. Within this process, it is important to identify indicators of non-adherence within patient populations.

The review examined the prevalence of non-adherence as a risk factor in the management of chronic diseases, with a specific focus on antihypertensive medications. Factors leading to increased incidence of non-adherence and the strategies needed to improve adherence are discussed.
### Summary of Results:
- For some chronic conditions, increased drug utilization can provide a net economic return when driven by improved adherence with guidelines-based therapy.
- For all 4 conditions, patients who maintained adherence to medication 80-100% of the time were significantly less likely to be hospitalized.
- Higher drug costs are offset by reductions in medical costs.
- For diabetes, the average ROI is 7.1:1 with a net savings of $1074 per patient.
- For cardiovascular conditions, the ROI is 4.0:1 and 5.1:1 for hypercholesterolemia.
- Although drug costs are a small part of the total healthcare costs, any reduction can cause a larger reduction in medical costs; as generics become available, more reductions are possible.

### Bibliographical Info:
Sokol, Michael C., et al., Impact of Medication Adherence on Hospitalization Risk and Healthcare Cost, Medical Care, Vol. 43, No. 6, June 2005, S21-S30.

### Abstract:
The study evaluated the impact of medication adherence on healthcare utilization and cost for 4 chronic conditions. Measurements included disease-related medical costs, drug costs, and hospitalization risk measures. For diabetes and hypercholesterolemia, a high level of medication adherence was associated with lower disease-related medical costs. For those conditions, higher medication costs were more than offset by medical cost reductions, producing a net reduction in overall healthcare costs. For diabetes, hypertension, and hypercholesterolemia, cost offsets were observed for all cause medical costs at high levels of medication adherence. For all four conditions, hospitalization rates were significantly lower for patients with high medication adherence.
## Article Title
Cost Effectiveness of Adherence-Enhancing Interventions: A Quality Assessment of the Evidence

## Author(s)
Elliott, Rachel A., et.al.

## Date
March 2005

## Disease Area(s)
Asthma, mental disease, hypertension, diabetes, coronary

## Disease Management Program
Nothing specific cited

## Research Sponsor
None cited

## Key Words
Adherence, compliance, cost-effectiveness, resource utilization

## Summary of Results
- There is no standard measure of adherence; self-reporting is the most common method
- Most AEIs are atheoretical with a didactic educational component containing no ongoing patient contact after initial counseling and education sessions
- Existing evidence around the efficiency of AEIs is poor

## Bibliographical Info

### Abstract
The objective of the research was to determine whether the current cost-effectiveness evidence on adherence-enhancing interventions was of sufficient quality to aid in decision-making regarding medication adherence policies. 45 comparative studies from 43 publications were reviewed. Reporting of adherence and outcome results were often unclear. Cost data was of a poorer quality than outcome data. The authors were not able to make a definitive conclusion about the cost-effectiveness of adherence-enhancing interventions due to the heterogeneity of the studies found and the incomplete reporting of results. Important policy decisions need to be made about non-adherence; however, they are currently being made in a vacuum of adequate information. Adherence-enhancing interventions (AEIs) must be based on reasons for non-adherence and be evaluated using accepted clinical and economic quality criteria.
### Abstract:

Adherence to medication is one of the most intriguing and complex behaviours demonstrated by patients. Non-adherence to a therapeutic regimen may result in negative outcomes for patients and may be compounded in populations with multiple morbidities which require multiple drug therapy. Such a population is exemplified by the elderly.

A range of strategies has been implemented to try and improve adherence in this patient population. The use of forgiving drugs (which have a prescribed dosage interval that is 50% of less the duration of the drug action) may facilitate occasional lapses in drug-taking. Drug holidays have been used in Parkinson’s disease to reduce adverse effects. Good adherence should be seen as a means of achieving a satisfactory therapeutic result and not as an end in itself.
**Article Title:** Improving Primary Care for Patients with Chronic Illness  
**Author(s):** Bodenheimer, Thomas, Wagner, Edward H., Grumbach, Kevin  
**Date:** October 2002  
**State (if applicable):** California, New Mexico [also reference to studies conducted across the U.S.]  
**Disease Area(s):** Chronic disease; diabetes, CHF, asthma  
**DM Program:** Lovelace Health Systems “Episodes of Care” (New Mexico)  
**Research Sponsor:** None cited  
**Key Words:** Chronic disease, diabetes, CHF, asthma  

### Summary of Results:
- 3 CHF studies showed that the chronic care model-component intervention produced a reduction in health care use (2 failed to show reduced use or cost)  
- 8 asthma studies indicated reduced health care use (5 failed to show)  
- 7 diabetes studies indicated reduced health care cost and use (2 failed to show)  
- The cost savings achievable through improvements in CHF, asthma and diabetes care result from fewer days in the hospital and less use of the ER  
- If Medicaid paid for chronic care start up costs (including information systems), reimbursed non-physicians who provide chronic care services, and increased reimbursement rates for provider organizations with superior performance, the business case for chronic care would become more viable  
- Implementation of a chronic care model signifies a major redesign of medical practice  

### Bibliographical Info:  

**Abstract:**

The article reviewed research evidence to show what extent the chronic care model can improve the management of chronic conditions (using diabetes as an example) and reduce health care costs. 32 of 29 studies found that interventions based on chronic care model components improved at least 1 process or outcome measure for diabetic patients. Regarding whether chronic care model intervention can reduce costs, 18 of 27 studies concerned with 3 examples of chronic conditions (CHF, asthma, diabetes) demonstrated reduced health care costs or lower use of health care services. Even though the chronic care model has the potential to improve care and reduce costs, several obstacles hinder its wide-spread adoption.
Abstract:

To handle the increasing complexity of CHF care, several new models for the care of patients with CHF have been developed to replace traditional strategies. The study evaluated the potential benefit of implementing a CHF DMP at a tertiary care center, particularly in terms of beta-blocker use and cost to the health care system. Implementing a CHF DMP was associated with improved CHF medication dosing and with decreased hospitalizations for patients with CHF. The study concluded that a CHF DMP is an effective method for a health care system to care for patients with CHF.
<table>
<thead>
<tr>
<th>Article Title:</th>
<th>Drug Therapy in the Elderly: What Doctors Believe and What Patients Actually Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
<td>Barat, I, Andreasen, F., Damsgaard, E.M.S.</td>
</tr>
<tr>
<td>Date:</td>
<td>June 2001</td>
</tr>
<tr>
<td>State (if applicable):</td>
<td>(Denmark)</td>
</tr>
<tr>
<td>Disease Area(s):</td>
<td>None cited</td>
</tr>
<tr>
<td>Disease Management Program:</td>
<td>None cited</td>
</tr>
<tr>
<td>Research Sponsor:</td>
<td>SygekassernesHelsefond, VeluxFonden</td>
</tr>
<tr>
<td>Key Words:</td>
<td>Adherence, medication, compliance</td>
</tr>
</tbody>
</table>
| Summary of Results: | - Dose deviations were found in 71% of subjects  
                   | - 60% knew the purpose of their medication and 75% knew what medication they were taking; only 4% knew of side effects and 5% knew of toxic risks  
                   | - The use of compliance aids may reduce non-adherence                          |
| Bibliographical Info: | Barat, I, Andreasen, F., Damsgaard, E.M.S., Drug Therapy in the Elderly:  
                           What Doctors Believe and What Patients Actually Do, British Journal of  

Abstract:

The study examined the medication adherence among old persons living in their own homes, to assess their knowledge of their medication, and to indicate target areas for intervention. A comparison was done between general practitioner information and subjects' actual drug consumption. 24% of the subjects reported they did not always follow prescriptions. A differential evaluation of adherence (by considering the drug, the dose, and the regimen separately) produced quantifiable data concerning the subjects' medication habits. Non-adherence ranged from 20-70% depending on the measuring method. The participants' knowledge of the treatment was poor. Results suggest that better information on medication and the use of compliance aids may prevent non-adherence. Special attention should be paid to persons receiving three or more drugs, living alone, receiving drugs from other doctors, and to persons with pre-dementia symptoms as they are at a higher risk of non-adherence.
### Article Title:

### Author(s):
Pelletier, Kenneth R.

### Date:
1999

### State (if applicable):
Workplace settings throughout the U.S.

### Disease Area(s):
Disease Management

### Disease Management Program:
Workplace DMPs: Southern California Edison, Wellpower of UNUM Life Insurance Company, Union Pacific Railroad, First Chicago NBD Corp., Coors, Citibank, Procter and Gamble, Chevron

### Research Sponsor:
None cited

### Key Words:
DMPs, cost, private plans

### Summary of Results:
- All participants completed an initial risk assessment and screening before participating
- There was a focus on disease management and secondary prevention
- Smoking cessation was a popular program
- Participation in worksite programs is sensitive to cost and amongst the worksites there is a profound lack of standardization
- Findings indicate the majority of programs were of sufficient intensity breadth and duration to affect a decrease in an number of the risks to result in an overall risk reduction
- Comprehensive DMPs in the workplace have evolved significantly and large self-insured and self-administered corporate medical plans are prototypes of the increasing emphasis on comprehensive health promotion and disease prevention programs in managed care plans

### Bibliographical Info:

### Abstract:
This is the fourth in a series of articles written by Dr. Pelletier summarizing the results of studies examining the impact of comprehensive health promotion and DMPs on health and cost.
Abstract:

Prescription drug costs constitute a burden for many chronically ill adults and are strongly related to patients’ likelihood of using less medication than prescribed. The study examined the extent to which patients’ trust in their physicians may moderate the impact of economic constraints and other risk factors for cost-related adherence problems. The study found that patients with higher out-of-pocket costs were more likely to forgo medications because of cost pressures when physician trust levels were low. Having a low income was only associated with cost-related adherence problems in the context of low physician trust. Patients who reported medication underuse for reasons other than cost were 4 times more likely as other patients to report cost-related underuse, and those with significant depressive symptoms had more than twice the risk of cost-related underuse compared with those without depression. The findings suggest that a trusting physician relationship may moderate the impact of cost pressures on patients’ medication adherence. More generally, addressing non-cost barriers to adherence may reduce rates of cost-related medication underuse.
Abstract:

Disease management is an approach to patient care that emphasizes coordinated, comprehensive care along the continuum of disease and across health care delivery systems. Evidence-based medicine is an approach to practice and teaching that integrates pathophysiological rationale, caregiver experience, and patient preferences with valid and current clinical research evidence. Using diabetes mellitus as an example, the study describes the importance of evidence-based medicine to the development of disease management programs. A method for developing and implementing evidence-based clinical guidelines, clinical pathways, and algorithms to describe the creation of system to measure and report processes and outcomes that drive quality improvement in diabetes care is explored. The report cites that multidisciplinary teams are ideally suited to develop, lead, and implement evidence-based disease management programs, since they play an essential role in the preventive, diagnostic, and therapeutic decisions for patients with diabetes throughout the course of their disease.
**Article Title:** Economic Evaluation of Pharmacist Involvement in Disease Management in a Community Pharmacy Setting

**Author(s):** Munroe, Wendy P., et al.

**Date:** 1997

**State (if applicable):** Virginia

**Disease Area(s):** Hypertension, diabetes, asthma, hypercholesterolemia

**Disease Management Program:** Pharmacy-based disease management

**Research Sponsor:** MedOutcomes Inc. (MunRo Partners and Health Outcomes Inc.)

**Key Words:** Disease management, medication adherence

**Summary of Results:**
- Insurance claim data was used to monitor health care prescription claims
- Comparison of cost between the pharmacy DM group ($723.36 cost per patient per month) and the individuals not in the group ($1016.75); savings of $293.39
- Results indicate that pharmacists can help reduce overall health care expenditures
- Pharmacists work to uncover drug-related problems and to address non-adherence

**Bibliographical Info:** Munroe, Wendy P., et al., Economic Evaluation of Pharmacist Involvement in Disease Management in a Community Pharmacy Setting, Clinical Therapeutics, Vol. 19, No. 1 1997 113-123.

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**Abstract:**

The study evaluated the economic impact of patient-focused pharmacist intervention in the community retail setting in patients with hypertension, diabetes, asthma and/or hypercholesterolemia. Specially trained pharmacists intervened by providing targeted patient education, performing systematic patient monitoring, offering feedback and behavior modification, and communicating regularly with patients’ physicians to enable early intervention for drug-related problems. The study also evaluated prescription drug costs and total medical costs by comparing claims data from 188 patients enrolled in the program at least 3 intervention pharmacies with data from 401 control patients at 5 nonparticipating pharmacies from the same retail chain. For all disease states, the average cost per prescription was significantly higher in the group receiving intervention than in the control group. Differences in total monthly prescription costs were significant only for patients with asthma, with higher monthly costs in the group receiving intervention. Substantial savings were demonstrated across all cost analyses for total monthly medical costs. Savings ranged from a conservative estimate of $143.95 per patient per month to $293.39 per patient per month when accounting for the possible influence of age, co-morbid conditions, and disease severity. The data indicate that pharmacist intervention in community pharmacy-based disease management models substantially reduces monthly health care costs in patients with hypertension, hypercholesterolemia, diabetes and asthma.
Outcomes research is a rapidly evolving field that incorporates epidemiology, health services research, health economics, and psychometrics. Measurement of clinical and other outcomes has become increasingly important to the stakeholders in a rapidly changing health care environment. The desire to improve outcomes and control costs has stimulated greater interest in cost-effectiveness studies, which determine how well effective therapies work in the usual practice setting and how much they cost. The application of outcomes principles to the practices of health care providers has resulted in efforts to implement DMPs. Unlike traditional programs carried out by physicians, these new efforts are based on systematic population-based approaches to identifying persons at risk, intervening with specific programs of care, and measuring clinical and other outcomes. The new efforts depend heavily on modern information systems.
The Cameron Institute is an alternative, not-for-profit, public policy think tank specializing in the independent study of current health, social, and economic issues. The Institute researches policy concerns in the health world related to the need for balance between patient safety and access to new, innovative, affordable therapies. It is an objective of The Cameron Institute to provide decision makers with analyses that will help inform choices. The Institute is also dedicated to educating and better preparing patients, providers, and payers to make appropriate administrative and clinical choices.

Dr. Robert Freeman has worked as an academic, an academic administrator, industry executive and consultant in the pharmacy and pharmaceutical sectors. He is currently a research associate with The Cameron Institute, Principal of The Freeman Group LLC, and a professor at the Midway College School of Pharmacy.

Dr. Kristina M. Lybecker is an assistant professor in the Department of Economics and Business at Colorado College. She is also a research associate with The Cameron Institute and a consulting health economist to the pharmaceutical industry and government.

Dr. D. Wayne Taylor has worked as an executive in the private sector, as a senior civil servant, as a political chief of staff, and is currently a faculty member at the Ron V. Joyce Centre, McMaster University. He is also the founding Executive Director of The Cameron Institute and president of his own private international consultancy.
The Effectiveness of Disease Management Programs in the Medicaid Population