

# Quality Improvement & Implementing Evidence-Based Interventions in Management of Diabetes and Hypertension



## Acknowledgements

This report was produced as part of the *Prevention First Project*. Funded by the Centers for Disease Control and Prevention through the California Department of Public Health, this program is designed to support a statewide implementation of cross-cutting approaches to promote health and prevent and control chronic diseases and their risk factors, as well as to maintain coordination and collaboration across programs.

## Authors

We gratefully acknowledge the team from *Intrepid Ascent* who produced the content of this report and whose expertise have made invaluable contributions to this project.

Intrepid Ascent is a California-based consulting firm that guides healthcare organizations through the adoption and use of information technology to reach their clinical and business goals.

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This material was produced with funding from Centers for Disease Control and Prevention (CDC) Grant Number DP004795 through the California Department of Public Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC or the U. S. Department of Health and Human Services.



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## The Role of Quality Improvement in Optimizing Health of Patients with Diabetes and Hypertension

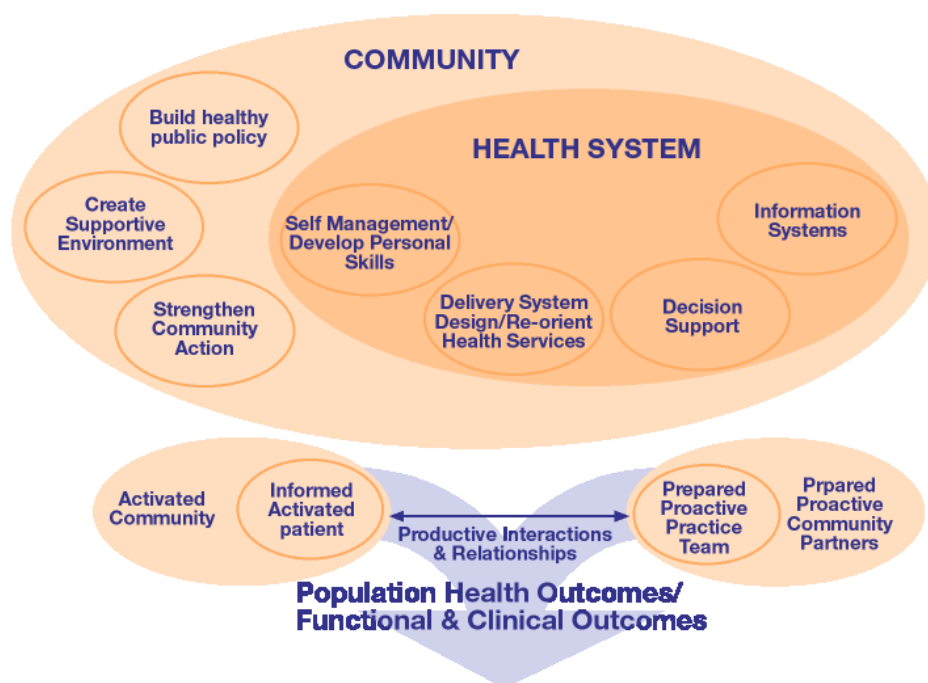
Quality improvement is a science. Per the Institute for Healthcare Improvement, the science of improvement is "...an applied science that emphasizes innovation, rapid-cycle testing in the field, and spread to generate learning about what changes, in which contexts, produce improvements." Any health care practice or organization should learn the basics of quality improvement before launching any significant effort to improve care and patient health outcomes. The Institute for HealthCare Improvement offers a variety of free and low-cost learning resources and opportunities, particularly focused on the Model for Improvement; however, many health care organizations have adopted Lean Technology as a quality improvement and management system. Both approaches emphasize the importance of health information technology, setting measurable goals, and rapid-cycle testing of change ideas.

### Getting Started with Quality Improvement:

<http://www.ihi.org/Topics/ImprovementCapability/Pages/GettingStarted.aspx>.

## The Chronic Care Model

Any quality improvement effort to enhance outcomes in diabetes and hypertension care should start with the Chronic Care Model. The Chronic Care Model identifies the essential elements of a health care system that encourage high-quality chronic disease care.



Created by: Victoria Barr, Sylvia Robinson, Brenda Marin-Link, Lisa Underhill, Anita Dotts & Darlene Ravensdale (2002)  
Adapted from Glasgow, R., Orleans, C., Wagner, E., Curry, S., Solberg, L. (2001). Does the Chronic Care Model also serve as a template for improving retention? *The Milbank Quarterly*. 79(4), and World Health Organization, Health and Welfare Canada and Canadian Public Health Association. (1986). Ottawa Charter of Health Promotion.

<sup>1</sup> Chronic Care Model: [http://www.improvingchroniccare.org/index.php?p=Model\\_Elements&s=18](http://www.improvingchroniccare.org/index.php?p=Model_Elements&s=18)



These elements are the community, the health system, self-management support, delivery system design, decision support, and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise. The Model can be applied to a variety of chronic illnesses, health care settings, and target populations. The bottom line is healthier patients, more satisfied providers, and cost savings.

## Health Information Technology Driving Quality Improvement

At the heart of quality improvement is data, which requires health information technology (HIT). The following study highlights an example of how HIT as part of a multicomponent quality improvement initiative can lead to improvements in hypertension care and outcomes.

### **Technology-driven Intervention Improves Hypertension Outcomes in Community Health Centers**

**Summary:** This study assessed the impact of an electronic medical record (EMR) with clinical decision support (CDS) and performance feedback on provider adherence to guideline-recommended care and blood pressure (BP) control compared with a standard EMR alone. Open Door Family Medical Centers, a federally qualified health center, implemented a tailored multicomponent CDS system, which included a BP alert, a hypertension (HTN) order set, an HTN template, and clinical reminders. The results showed that patients were 1.5 times more likely to have controlled BP post-intervention than pre-intervention.

There is evidence that the following four features of clinical decision support systems (CDSS), some of which were present in this study, are strongly associated with positive findings: 1) automatic provision of decision support as part of the clinical workflow; 2) provision of recommendations rather than just assessments; 3) provision of decision support at the time and location of decision making; and 4) computer-based decision support.

Finally, the CDSS provided opportunities for changes in the clinical team's responsibilities. Open Door's staff was trained to use the new CDSS to screen for adherence to medications, removing this task from the provider and engaging clinical support staff in this dimension of patient care.

<http://www.ncbi.nlm.nih.gov/pubmed/22216768>;

[https://healthit.ahrq.gov/sites/default/files/docs/activity/2011\\_017167\\_kopal\\_pdf\\_3.pdf](https://healthit.ahrq.gov/sites/default/files/docs/activity/2011_017167_kopal_pdf_3.pdf).



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In addition to CDS via the EMR, another effective tool that applies use of data to drive improvement is a performance dashboard. Dashboards display individual provider or care team performance on prioritized clinical improvement metrics—e.g., HbA1c control—for that provider or care team's panel of patients. Dashboards can be effective drivers of improvement if shared frequently with providers and care teams. Providers and care teams tend to improve when they see data reflecting how well they are or are not meeting key quality metrics—especially if those data are shared transparently across the clinic, with patients, and the community.

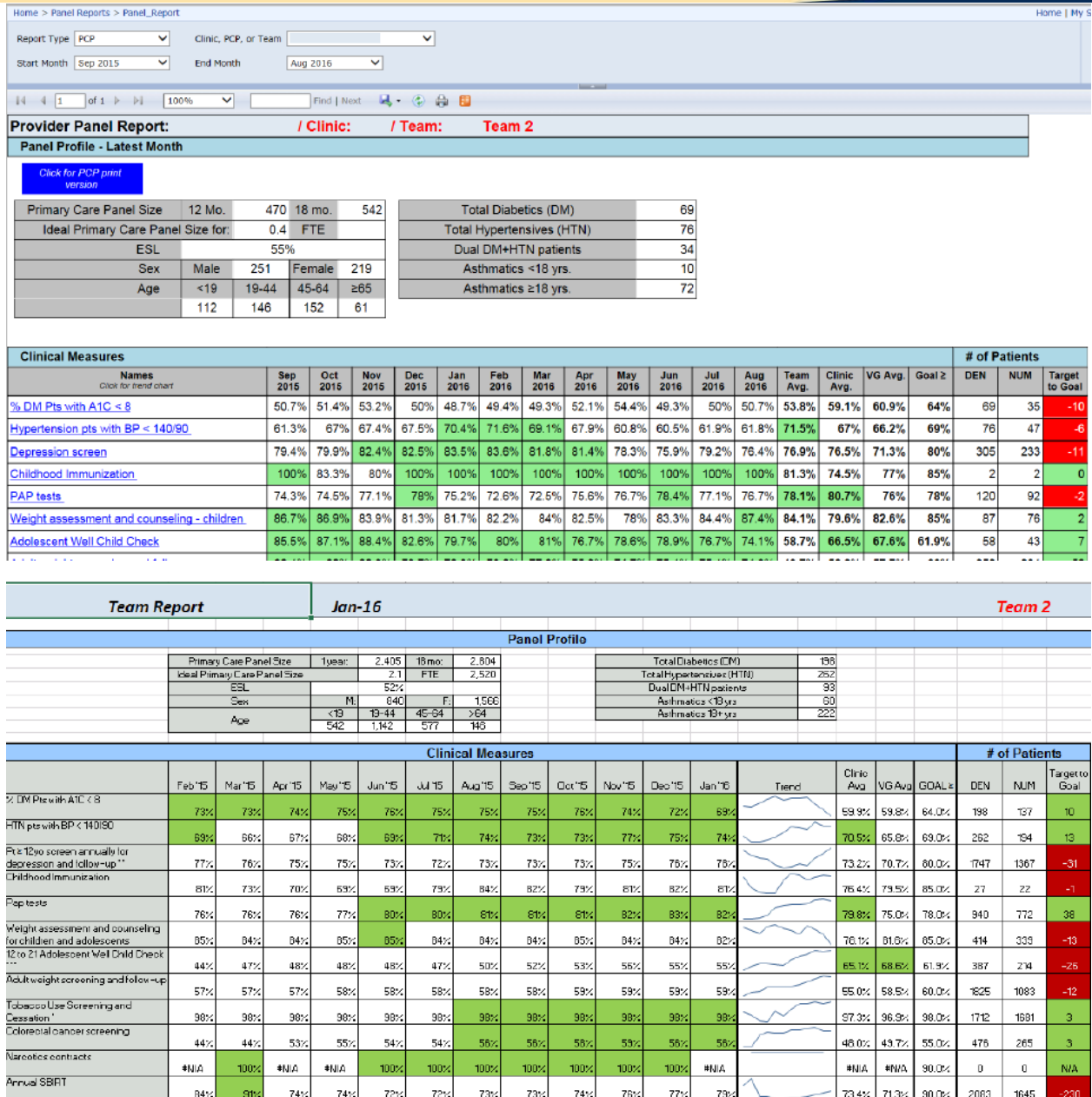
Dashboards may be provided in various formats and levels of sophistication as noted in the examples below. The first example offers a reasonably sophisticated view into a population health dashboard mock up that provides views for patient compliance within specific conditions, in addition to diabetes and hypertension metrics in a non-graphical manner. This graph can consider one provider or many providers based on the parameters selected for viewing and offers everyone a view into the same data, including roles ranging from executive management to nurse practitioners. This caters to organizations being aligned throughout as to what goals must be achieved, how those goals are being met at any point in time and what the gap is in achieving the goals. In turn this offers the viewers the ability to work as a team to implement changes that may assist in closing gaps.



Below is another example of a simple provider dashboard.



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Strategies to make dashboards effective include:

- Establish and communicate clear goals associated with the data shown on the dashboards.
- Provide high visibility by sharing data frequently (monthly or more often) and broadly with all providers/care-team members.
- Can quickly drill down from aggregated views into patient specific references that allow the care- team members to take action. For example, if providers don't know what 36% of their patient panel have uncontrolled blood pressure, the view into the dashboard is meaningless.
- Continue to improve accuracy, and ask providers and care- teams to let data staff know when they find inaccuracies.



- Focus on key performance metrics that matter to the organization and providers.
- Create dashboards that are simple and easy to understand from a quick glance.

## The Role of Clinical Guidelines in Spreading High Quality Care

Health care practices and organizations that pursue quality must establish and monitor adherence to evidence-based clinical treatment guidelines. This involves adopting national guidelines such as the JNC-8 for hypertension (see link below), or the diabetes guidelines available from the Guideline Clearinghouse developed by the Agency for Healthcare Research and Quality at <https://www.guideline.gov/search?q=diabetes+clinical+guidelines>. Some practices adapt national guidelines to the unique provider practice style and needs of the patient population.

The following examples of clinical guidelines for managing hypertension include a national clinical guideline, a comprehensive system-wide protocol, a template for provider organizations to use in creating their own clinical guidelines and protocols, and a proven medication algorithm that, when incorporated into a population health management program, has led to a 60% drop in heart attacks and strokes for participating members of Kaiser Permanente.

### Summary:

Kaiser Permanente's program, Preventing Heart Attacks and Strokes Every Time (PHASE), has led to a 60% reduction in heart attacks and strokes for patients on the three-drug regimen. It is a population-based approach to chronic care management that has proven successful at ensuring effective secondary prevention of coronary events. Developed more than a decade ago by Kaiser Permanente, PHASE uses a three-drug regimen and lifestyle changes to tackle cardiovascular disease (CVD). There is very strong evidence that the three-drug regimen—aspirin, ACE-inhibitors, and statins—substantially reduces CVD events in patients.

**JNC-8 hypertension guidelines:** <https://www.guideline.gov/search?q=diabetes+care>

**New York City Health and Hospitals Hypertension Protocol:**

[https://millionhearts.hhs.gov/files/NYC\\_HHC\\_Hypertension\\_Protocol.pdf](https://millionhearts.hhs.gov/files/NYC_HHC_Hypertension_Protocol.pdf)

**Million Hearts Template for Hypertension Protocol:**

<https://millionhearts.hhs.gov/files/Hypertension-Protocol.pdf>

**PHASE Hypertension Medication Algorithm:**

[https://continuingphase.files.wordpress.com/2015/06/phase\\_medication\\_algorithm-2014.pdf](https://continuingphase.files.wordpress.com/2015/06/phase_medication_algorithm-2014.pdf)

## Team-Based Care

One key tenet of the Chronic Care Model is team-based care. Team-based care for managing hypertension is defined as a “health systems-level, organizational intervention that incorporates a multidisciplinary team to improve the quality of hypertension.” Teams comprise the patient, the patient's primary care practitioner, and other clinicians and care- team staff, such as nurses, pharmacists, social workers, health coaches, and community health workers. Each health team



member is tasked with using his or her skills and training to enhance hypertension care by performing activities such as providing information and following up with patients, helping to manage patient medications, and helping patients adhere to their treatment regimen, such as monitoring blood pressure, taking medications, reducing sodium intake, and exercising. Evidence from the review of 80 studies by the Community Services Preventive Task Force shows that *patients who received care from a team of professionals were more likely to have improved blood pressure compared to patients who received care from a single physician.*<sup>2</sup>

## **Team-Based Care: Nurses and Pharmacists Effective at Treating Hypertension**

### **Review of Research:**

#### **Summary:**

A 2012 review of research studies on team-based care documents a strong body of evidence that teams are effective in treating hypertension. The review focused specifically on the value of nurses and pharmacists as chronic care-team members. Specifically, the authors propose the following roles:

- A nurse with hypertension expertise to provide education, counsel patients, perform case management, and modify medications and dosages
- A pharmacist to counsel patients about proper medication use, administration, storage, and adverse reactions that might occur, as well as assist with medication management and adjustments in medication for patients not at goal

Few cost-effectiveness analyses have been performed but generally have found favorable costs for team-based care when considering the potential to reduce morbidity and mortality.

[https://www.cdc.gov/dhdsp/pubs/docs/science\\_in\\_brief\\_hypertension\\_team.pdf](https://www.cdc.gov/dhdsp/pubs/docs/science_in_brief_hypertension_team.pdf) ;  
<http://onlinelibrary.wiley.com/doi/10.1111/j.1751-7176.2011.00542.x/epdf>

## **Implementing Best Practices in Chronic Care Management: Health Care System Redesign**

Among the evidence-based practices that provider practices and health care organizations can implement to improve outcomes for patients with diabetes or hypertension are the following:

1. **Health Coaching:** Health coaching is a patient-centered approach to delivering care. Research has shown that half of patients leave medical visits without understanding the clinicians' advice. In only 10% of visits are the patients involved in making the decisions, and patients who are not involved in decision-making traditionally do not follow the clinician's advice. This can lead to poor health outcomes for the patient and frustration for

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<sup>2</sup> <http://www.pcori.org/assets/2013/12/PCORI-Hypertension-Workgroup-Topic-Briefs-120413.pdf>



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the clinician. Health coaching helps patients build the knowledge, skills, and confidence required to manage their chronic conditions and improve their health. Health coaches empower patients to play a central role in clinical encounters and to engage in self-management activities at home, work, and schools, where they spend most of their lives. Anyone on the care-team can conduct health coaching.

A recent review of the literature found that health coaching for those with diabetes is an effective intervention for improving glycemic control, which may be of greater benefit when offered in addition to existing diabetes care.<sup>3</sup> Health coaching has been shown to be more effective at promoting positive healthy lifestyle outcomes, such as smoking cessation or obesity and diabetes management, than traditional health education.<sup>4</sup> As opposed to health education, which is more of a one-way vehicle to deliver information to patients, health coaching involves an interactive dialogue that provides information AND engages and empowers patients to manage their own health.

Health coaching applies key skills to engage and empower patients to manage their own health, such as Ask-Tell-Ask (also known as Teach-Back), Action Planning (also known as collaborative goal-setting), and Motivational Interviewing. Several research studies provide evidence that these techniques are effective in improving outcomes for people with hypertension and diabetes.<sup>5</sup>

The Center for Excellence in Primary Care at the University of California, San Francisco, provides resources and training on health coaching.<sup>6</sup>

1. **Panel Management:** Panel management is a proactive way to ensure that patients get all of their preventive care, and those with chronic diseases like hypertension and diabetes receive extra help. For example, panel management identifies patients with diabetes who are due for their regular 3-6-month chronic care visit, an eye exam, or who have lab numbers that are high—and ensures they receive that needed care. Medical assistants, health workers, and nurses play a critical role in providing panel management. Recent studies demonstrate the power of panel management in reducing blood pressure and ensuring that elderly patients get needed care.<sup>7 8</sup>

Panel management is proactive because clinic staff identifies and contact patients about care that they may not know that they need. When staff call, or send letters to patients who do not have an upcoming appointment or have not been seen at the clinic recently,

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<sup>3</sup> [http://www.canadianjournalofdiabetes.com/article/S1499-2671\(15\)00847-3/pdf](http://www.canadianjournalofdiabetes.com/article/S1499-2671(15)00847-3/pdf)

<sup>44</sup> Cinar AB, Schou L., *Health promotion for patients with diabetes: Health coaching or formal health education?* Int Dent J 2014;64:20–6

<sup>5</sup> Schillinger et al, Arch Intern Med 2003;163:83-90; Naik et al, Arch Intern Med. 2011;171:453-439; Two Feathers et al, Am J Public Health 2005;95:1552-1560; Greenfield et al, J Gen Intern Med. 1988;3:448–457

<sup>6</sup> <http://cepc.ucsf.edu/health-coaching>

<sup>7</sup> Chuang, Elizabeth, et al. "Implementing panel management for hypertension in a low-income, urban, primary care setting." *Journal of primary care & community health* (2013): 2150131913516497

<sup>8</sup> Loo, Timothy S., et al. "Electronic medical record reminders and panel management to improve primary care of elderly patients." *Archives of internal medicine* 171.17 (2011): 1552-1558.



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this is called *outreach panel management*. Clinical staff can also alert patients about care gaps when they are in the clinic receiving care for an issue not related to the care gap in a process known as *inreach panel management*.

The Center for Excellence in Primary Care at University of California, San Francisco, provides resources and training on panel management.<sup>9</sup>

2. **Group Visits:** The **group medical care model (or group visit)** is an important interdisciplinary care delivery innovation to complement the individual medical visit that has become increasingly popular. A group visit brings together a group of patients with similar medical needs or conditions for medical care in an extended appointment with a health care provider. Groups have been used for patients with a range of medical conditions such as diabetes.

### Putting Group Visits into Practice

**Summary:** Patients with diabetes seen in group visits have shown improved adherence to standards of care, higher trust in their providers, significant improvements on clinical measures such as lowered glycosylated hemoglobin (HbA1c) levels, increased self-efficacy, increased satisfaction with care, and lower hospitalization rates. Medical group visits have also been linked to increased quality of life, increased diabetes knowledge, and decreased use of hypoglycemic agents.

To develop successful group visits, each practice must balance the needs of their target patient population with the resources, strengths, and staff available at each practice. While there are generalizable best practices, there is no magic formula for how best to deliver group visits in all cases. This report reviews the current state of group visits and provides a summary of experiences from those who have experimented with group visits in a variety of Mass General-affiliated practices. Overall, group visits can be useful for any practice group, regardless of medical or surgical specialty, and is especially robust in the primary care setting.

#### Group Visit Implementation Guide:

[http://www.massgeneral.org/stoecklecenter/assets/pdf/group\\_visit\\_guide.pdf](http://www.massgeneral.org/stoecklecenter/assets/pdf/group_visit_guide.pdf)

## Financial Impact of Diabetes Prevention Programs

According to the American Diabetes Association the total estimated cost of diagnosed diabetes in 2012 was \$245 billion, including \$176 billion in direct medical costs and \$69 billion in reduced productivity.<sup>10</sup> It is estimated that people with diabetes incur over 20% of U.S. healthcare costs.<sup>11</sup> The high cost of treating diabetes is driven in-part by inpatient care, medications, and office visits. Diabetes prevention programs are a tool being utilized and

<sup>9</sup> <http://cepc.ucsf.edu/panel-management>

<sup>10</sup> <http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html?referrer=https://www.google.com/>

<sup>11</sup> [http://care.diabetesjournals.org/content/36/4/1033?ijkey=bf8152b1e3dc05e5e7b5bed79d9fc4322cdd0976&keytype=tf\\_ipsecsha](http://care.diabetesjournals.org/content/36/4/1033?ijkey=bf8152b1e3dc05e5e7b5bed79d9fc4322cdd0976&keytype=tf_ipsecsha)



promoted across the country to reduce the incidence of diabetes and educate patients with significant risk factors. But what are the cost benefits and budgetary impacts of such programs?

To help address this question, the California Technology Assessment Forum (an Institute for Clinical and Economic Review (ICER) program) conducted a comparative review of published literature that has examined the economic value of diabetes prevention programs in the U.S. with full or pending recognition from the CDC Diabetes Prevention Recognition Program.<sup>12</sup>

A key finding of the Forum's review is that (in general) group based diabetes prevention programs result in the greatest cost savings. The literature shows programs provided in a group setting have "little or no apparent loss in effectiveness relative to individual coaching". Cost savings were quantified 'in cost per quality-adjusted life-year (QALY) gained' and compared across studies. One study reviewed estimated individual lifestyle intervention (using individual coaching) to cost \$32,000 per QALY gained. Whereas group based intervention is estimated to cost \$9,000 per QALY gained. Another study estimated that the group based "program would be cost-saving over a lifetime, even if effectiveness were reduced by 50%, as downstream savings from reduced diabetes incidence would still be greater than the cost of the group intervention".

It may be inferred from the Forum's report that both individual and group based lifestyle interventions are effective means to improve patient outcomes and reduce risk for progression to diabetes. From a cost perspective group based programs are less expensive to administer and therefore are observed to generate cost savings.

## **Cost Savings of Population Health and Disease Management**

As clinical guidelines and quality improvement efforts are considered by your organization, the cost of care and savings generated from disease management is an important topic to keep in mind. Disease management is defined as a set of activities aimed at improving the health and clinical outcomes of a population of patients, defined by a chronic medical illness.<sup>13</sup> Depending upon the effectiveness of the program, savings may be realized by reducing utilization of healthcare resources because of better disease management<sup>14</sup>. In other instances, a good disease management program may help to bend the cost curve of treating a disease by mitigating upward cost trends<sup>15</sup>.

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<sup>12</sup> [https://icer-review.org/wp-content/uploads/2016/05/CTAF\\_DPP\\_Draft\\_Evidence\\_Report\\_050916-1.pdf](https://icer-review.org/wp-content/uploads/2016/05/CTAF_DPP_Draft_Evidence_Report_050916-1.pdf)

<sup>13</sup> <http://www.aafp.org/about/policies/all/disease-management.html>

<sup>14</sup> <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/downloads/05summerpg1.pdf>

<sup>15</sup> <http://content.healthaffairs.org/content/23/6/63.full>



## Return on Investment in Disease Management: A Review

**Summary:** The results of 44 studies investigating financial impact and return on investment (ROI) from disease management (DM) programs for asthma, congestive heart failure (CHF), diabetes, depression, and multiple illnesses were examined. A positive ROI was found for programs directed at CHF and multiple disease conditions. Some evidence suggests that diabetes programs may save more than they cost, but additional studies are needed. For more information on this study, visit the following link:

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/downloads/05summerpg1.pdf>

## Can Disease Management Reduce Health Care Costs by Improving Quality?

**Summary:** This study illustrates the potential for disease management as one of multiple factors that may reduce the costs of care. Kaiser Permanente Medical Group in Northern California has implemented extensive disease management programs and while the predicted reduction in real costs did not occur, the study concluded that the rationale for disease management programs should rest on their value and effectiveness. By this assumption, we could conclude that without disease management, costs for the Coronary Artery Disease (CAD) population would have increased 28 percent rather than 19 percent from 1996 to 2002. Disease management arguably saved \$77 million for this condition in 2002 alone (\$1,100 per patient × 69,615 patients). Using this method for all four conditions, we can conclude that disease management saved more than \$200 million in 2002. For more information on this study, visit the following link:

<http://content.healthaffairs.org/content/23/6/63.full>

The literature agrees that additional studies are needed to define DM Return on Investment (ROI) and to better describe cost savings and/or cost avoidance. A 2011 study by The Cameron Institute suggests that cost savings may be realized to the greatest extent in populations with significant co-morbidities and advanced illness<sup>16</sup>. In another study, of PepsiCo's workplace Healthy Living Program, reductions in healthcare costs were realized resulting from fewer hospitalizations.<sup>17</sup> PepsiCo estimated a \$3.78 savings for every dollar invested into the program.

Multiple resources exist to assist organizations in building robust DM programs. Programs in the studies above include the following: physician-driven, employer-driven, lifestyle change programs, and patient self-management. The commonality across the studies above suggests that effective DM improves outcomes and may in turn lead to cost reductions in the long-term.

<sup>16</sup> <http://www.fightchronicdisease.org/sites/default/files/docs/Main%20Report%20-%20The%20effectiveness%20of%20DMPs%20in%20the%20Medicaid%20Pop%202011.pdf>

<sup>17</sup> <http://content.healthaffairs.org/content/33/1/124.full>



## Conclusion

In conclusion, provider practices and health care organizations are under increasing pressure to demonstrate high quality care, as evidenced by improved outcomes for patients with diabetes and hypertension. Doing so requires a dedication to adopting the foundational elements of quality improvement such as health information technology, setting measurable goals and rapid-cycle testing of change ideas.

Once a provider practice or health care organization adopts a quality improvement approach, there is no shortage of proven interventions to improve outcomes for patients with hypertension or diabetes that can be adapted to local circumstances, including: clinical guidelines, electronic medical records and clinical decision support, team-based care, health coaching, panel management, and group visits.

The benefits of delivering high quality care go beyond patient outcomes. Cost savings and cost avoidance captured by programs such as group based diabetes prevention and robust disease management are measurable and proven. Although seemingly daunting, implementing such programs with an incremental approach can help organizations realize the many benefits of quality improvement.