

Improving the Quality of Chronic Care

Why Clinical Information Systems (CIS) Beat Electronic Medical Records (EMR) Technologies at Improving Care, Raising Provider Productivity, and Reducing Costs

Interest in Electronic Medical Records (EMR) technology has surged in recent years, fueled by a raft of new health care industry regulations and generous grants from Government and private sources. For many health care organizations, EMRs have become something of a panacea, offering the potential to lower costs and improve care quality for a growing number of chronically ill patients. But can EMRs deliver on this promise? Studies show that providers who expect to see quality improvements from deploying an EMR will be disappointed.

In a 2007 study published in the *Archives of Internal Medicine*, Jeffrey Linder, et al, found that the use of EMR technology made no difference in performance outcomes, measured using 17 ambulatory quality measures¹. Although the technology showed an immediate and direct impact on safety related concerns in an inpatient environment, EMRs were not associated with health care quality improvements in an outpatient setting.

So, how should a health care organization go about improving the quality of chronic care, raising provider productivity, and lowering costs?

A 2002 study of the CareSouth Carolina community health care organization documented an average 70 percent reduction in hospitalizations, 68 percent reduction in hospitalization costs, and close to 80 percent reduction in total costs per patient per year when compared to other community providers². CareSouth Carolina achieved these astounding improvements by using the Chronic Care Model (CCM), developed by Dr. Ed Wagner, et al³, and the PECSYS® Clinical Information System (CIS) software from The Aristos Group.

The Patient Electronic Care System (PECSYS) CIS software was developed by The Aristos Group for the U.S. Department of Health and Human Services Bureau of Primary Health Care (BPHC), specifically for use with the Wagner CCM framework. Design of the PECSYS system was guided by input from a national faculty of distinguished physicians and statisticians and a clinical advisory group representing health care providers, administrators, and support personnel from health care organizations participating in the BPHC Health Disparities Collaboratives. PECSYS integrates evidence-based guidelines and known best practices to give health care providers a dynamic, flexible, and powerful tool for raising the level of patient care. The technology is implemented in a fraction of the time taken to deploy an EMR and delivers immediate quality improvements as both a stand-alone system or used alongside an EMR solution. Unlike EMR software, which is primarily designed to aid medical documentation, the PECSYS CIS solution actively improves patient care.

¹ Linder, Jeffrey A., Bates, David W., Middleton, Blackford, Stafford, Randall S., "Electronic Health Record Use and the Quality of Ambulatory Care in the United States." *Archives of Internal Medicine*, Volume 167, Number 13. July 9, 2007.

² Piturro, Marlene, "The Chronic Care Model—A Quality Innovation", American Medical Directors Association, Volume 4, Number 9. September 2003. http://www.amda.com/publications/caring/september2003/chronic_care.cfm.

³ Wagner, E. H., "The Chronic Care Model: Improving Chronic Illness Care." http://www.improvingchroniccare.org/index.php?p=The_Chronic_Care_Model&s=2.

Table of Contents

IMPROVING CHRONIC HEALTH CARE	3
BUREAU OF PRIMARY HEALTH CARE (BPHC) HEALTH DISPARITIES COLLABORATIVES	3
HEALTH INFORMATION TECHNOLOGY (HIT)	4
<i>Electronic Medical Records (EMR) Software</i>	4
<i>Clinical Information Systems (CIS) Software</i>	5
EFFECTIVE CHRONIC HEALTH CARE IMPROVEMENT.....	5
PRESENTATION OF PATIENT DATA	5
STORAGE AND ORGANIZATION OF PATIENT DATA	6
RESPONSIVENESS TO CHANGE.....	6
THE PATIENT ELECTRONIC CARE SYSTEM (PECSYS) CIS.....	6
PRE-VISIT PLANNING	7
<i>The Encounter Note</i>	7
<i>Reminders</i>	8
<i>Visual Organization of the Encounter Note</i>	8
Demographic Data	8
Vitals	8
Problem or Condition	8
Medications	8
Laboratory Results.....	8
Other Diagnostic Tests	9
Vaccinations and Immunizations	9
Risk Factors.....	9
Other Measures.....	9
Consults and Education	9
Other Notes.....	9
Reminders.....	9
DURING THE VISIT	10
<i>Custom Data Items</i>	10
<i>Tracking Items with no CPT Code</i>	11
<i>Run Charts, Flow Sheets, and the Clinical Tracker Report</i>	11
Run Charts	11
Electronic Flow Sheets	11
The Clinical Tracker Report	12
PROACTIVE POPULATION-BASED CARE	13
<i>Adding New Subpopulations</i>	14
<i>Preventative Health Services</i>	14
<i>Patient Population Summary Reports</i>	14
<i>Population Report Drill Down</i>	17
<i>PECSYS Spreadsheet Reports</i>	17
CONCLUSION.....	18

Improving Chronic Health Care

The United States has the highest per capita health care spending in the world. According to 2004 World Health Organization (WHO) statistics⁴, the U.S. spent over 15 percent of Gross Domestic Product (GDP) on health care. By comparison Japan spent less than 8 percent of GDP on health care costs, and Australia, Canada, and the United Kingdom spent less than 10 percent. Yet, despite this sizeable gap in spending, the U.S. ranks below these countries, as well as France and Germany, in health outcome measures.

Life expectancy for an American female is 80 years, compared to 86 years for a Japanese female. Infant mortality in Sweden and Japan is 3 per 1000, compared to 7 per 1000 in the U.S. When measured on a wide range of health outcomes, U.S. citizens have the lowest health of modern industrialized societies.

Many reasons have been put forward to explain the discrepancy between U.S. health care spending and health outcomes, including: the size and heterogeneous nature of the American population; the patchwork of public, corporate, and individual insurance in the U.S. compared to nationalized insurance in other countries; and the differing role of primary care physicians in the U.S. and other nations.

In the U.S. a primary care provider is one of many health care providers seen by a chronically ill patient. In most other industrialized countries, the primary care provider plays a central role, and is responsible for coordinating patient care, tracking referrals, and consulting with specialists. There are undoubted efficiencies in making the primary care provider, or family doctor, responsible for a patient's health care.

Having a primary care provider coordinate care makes more effective use of the available medical resources and reduces the duplication of effort common when many specialist providers act independently. A central coordinator can also maintain fiscal discipline. For example, in England, a general practitioner (family physician) controls the flow of money to specialists and hospitals, and is responsible for the coordination of care.

The Chronic Care Model (CCM), developed by Dr. Ed Wagner et al. validates the role of a well-prepared and coordinated primary care provider and care team. The model emphasizes the use of evidence-based guidelines and coordinated, planned care to effect change in health systems. A framework for improving care at the community, organization, practice, and patient levels, the CCM transforms health care, changing it from a reactive system to a proactive system that produces better health outcomes.

Bureau of Primary Health Care (BPHC) Health Disparities Collaboratives

The U.S. Department of Health and Human Services Bureau of Primary Health Care (BPHC) Health Disparities Collaboratives has been using the CCM, combined with Clinical Information Systems (CIS) software, as a basis for improvement efforts⁵. The results have been impressive.

⁴ World Health Organization (WHO), WHO Statistical Information System (WHOSIS), 2004 data life expectancy/infant mortality, 2004 data for costs. <http://www3.who.int/whosis/core>.

⁵ U.S. Department of Health and Human Services (HRSA), Bureau of Primary Health Care Health (BPHC). "BPHC – Health Disparities Collaboratives." <http://www.healthdisparities.net/hdc/html/home.aspx>.

Table 1. Results from Institute for Healthcare Improvement study of CCM and CIS benefits.

CareSouth Carolina 2002 Statistics			
	CareSouth Carolina	Other community providers	Specialists
% Hospitalizations	2.08%	7.69%	9.52%
Average cost per hospitalization	\$3,546	\$10,894	\$12,025
Average office visit reimbursement	\$67.42	\$65.52	\$67.35
Average total cost per patient, per year	\$343	\$1,591	\$1,883
Source: Institute for Healthcare Improvement (IHI)			

In a 2002 publication⁶, the effects of using the Wagner CCM in a community based care setting were documented. CareSouth Carolina, a community health care organization, used the CCM framework, supported by the Patient Electronic Care System (PECSYS)[®] CIS from The Aristos Group. The PECSYS system was developed specifically for the U.S. Department of Health and Human Services BPHC to support the CCM and to facilitate health care improvement.

The study compared a variety of health care measures at CareSouth Carolina and at similar community health care providers and specialists. The combined use of CCM and CIS showed improved provider productivity, improved outcomes, and drastically reduced costs.

The results of the CareSouth Carolina study demonstrate a dramatic improvement in productivity, health care, and costs for providers who use the CCM and a CIS. On average, these providers experienced a 78.5 percent reduction in average total cost per patient, and maintained an average of 6,572 patient encounters, compared to 4,100 for health care providers nationally.

Health Information Technology (HIT)

The CareSouth Carolina study ably demonstrates that CIS technology offers a sustainable solution and substantially improves the quality of medical care when supporting an effective health care model. But, not all Health Information Technology (HIT) solutions show the same affinity for health care improvement.

Electronic Medical Records (EMR) Software

Electronic Medical Records (EMR) technology has been proposed as a solution for improving the quality of medical care. However, although these solutions have been shown to have an immediate, direct, and positive affect on safety in an inpatient setting, studies have concluded that EMRs are not associated with better quality ambulatory care⁷.

Designed as an aid to collecting and storing information needed for official medical records, EMRs also capture billing data, warn against possible medication interactions, and flag a

⁶ See note 2 above.

⁷ See note 1 above.

patient's overdue requirements. EMRs have proven invaluable in a hospital environment, where they support tasks like bar coding of medicines, but the requirements of an inpatient and outpatient setting are very different.

EMRs do not lend themselves to improving the continuum of care or improving patient activation, and the data collected by an EMR cannot easily be used to perform patient population and sub-population analysis and reporting. For example, a primary care provider using EMR technology will have difficulty generating a report of all patients who are female, diabetic, and of childbearing age. This type of analysis is critical for proactive chronic care. Although EMR vendors are often able to provide custom programming assistance to address this type of query, changes to the software are invariably slow and costly.

Clinical Information Systems (CIS) Software

Unlike EMR technology, CIS solutions are designed for the sole purpose of improving the quality of chronic health care. CIS technology, sometimes referred to as disease registries or Chronic Disease Management Systems (CDMS), gives the primary care provider and care team a patient-centric view of health care information. The software offers prompts and suggestions to help the team improve care, using evidence-based guidelines and known best practices.

CIS software provides reports on population-based information for use in proactive health care improvement efforts. For example, using a CIS solution, a provider who has a self-management idea for a female diabetic patient, who currently smokes and does not exercise, will be able to quickly create and run a report identifying all of the other patients meeting these criteria.

There are many different types of CIS. Some are disease specific, others are generalized to cover all conditions, and yet others are intended solely for prevention. Regardless of the focus, all CIS solutions share a common goal: to support improved health care by giving the primary care physician and care team better access to important clinical and demographic data.

Effective Chronic Health Care Improvement

Today's HIT solutions frequently combine attributes from both EMR and CIS. Modern EMR systems will often have some CIS attributes, and CIS solutions will have EMR attributes. But, despite this melding of functionality, the general case still holds: EMRs are intended to support the documentation of care, and CIS solutions are designed to support the improvement of care.

Evidence from various studies supports this general case. Substantial improvements in chronic care have been documented when a CIS solution is deployed, and studies have shown negligible improvement in care from deploying EMR solutions in an outpatient setting. So, why does a CIS solution show such marked improvement and an EMR solution not?

An effective way to highlight the differences between the two types of HIT is to take a look at the way these systems present and organize patient data and how they respond to changes in medical knowledge.

Presentation of Patient Data

With a focus on providing comprehensive medical records documentation, EMR technology relies heavily on predefined templates for data entry. The templates have fixed categories, like disease, age, and gender, and have many fields that require input before the form can be

saved. A health care provider must complete most, if not all, entries in the template before saving the information and closing the form.

Completing EMR templates is time consuming. For example, if a provider wants to record the name and dose of a patient's medication, but is forced to add other information, like frequency, route, and refills, to satisfy the needs of the template, they will have less time to spend with the patient.

By contrast, CIS software is much more flexible in the way it organizes data entry and displays patient information. Details are presented so that the most pertinent information is visible on a single screen or page, eliminating time consuming and inefficient scrolling through multiple screens of data.

The CIS software gives health care providers full flexibility and creativity in determining the level of detail stored in the system. Information is recorded quickly, with minimum distraction from attending to the needs of the patient. For example, when entering details about patient medications, the provider can choose whether to enter every detail or simply the medication name and dose.

Storage and Organization of Patient Data

EMR software restricts data entry to standard lists of coded—billable—data. Similarly, health care providers have access to guidelines and reports based on the coded data only. Entry of non-coded data items, such as smoking status, number of hours of television per week, or number of days exercise per week, is limited to freeform text and note fields in the EMR template. Although some EMR solutions permit users to add new data items, these are generally very limited. The inability to effectively store non-coded data makes it very difficult to perform population-based analysis with an EMR solution.

CIS software is specifically designed to support comprehensive population-based reporting and analysis, using both coded and non-coded data. These systems give an organization the flexibility to add new data items, of any type, as necessary. Coded and non-coded data can then be retrieved for use in analysis and reporting.

Responsiveness to Change

EMR systems are not designed for end-user modification. The complexity of medical records documentation requirements typically means that changes to an EMR system's data items, guidelines, and reports must be made by knowledgeable software programmers and system engineers. Very few individual organizations have the resources to support this type of modification. A primary care provider wanting to change the EMR system will have to engage the assistance of outside software developers or a value added reseller who maintains staff with specialized knowledge of the EMR system.

CIS solutions allow end-users to add and modify entries, guidelines, and reports, without the assistance of software programmers or engineers. This allows care providers to keep a CIS system current with the latest health care guidelines and measures. Ease of modification also encourages experimentation and creativity on the part of the health care provider. Clinical personnel can add items, update guidelines and best practices, and create new reports in a matter of minutes, to tailor the system to their individual needs.

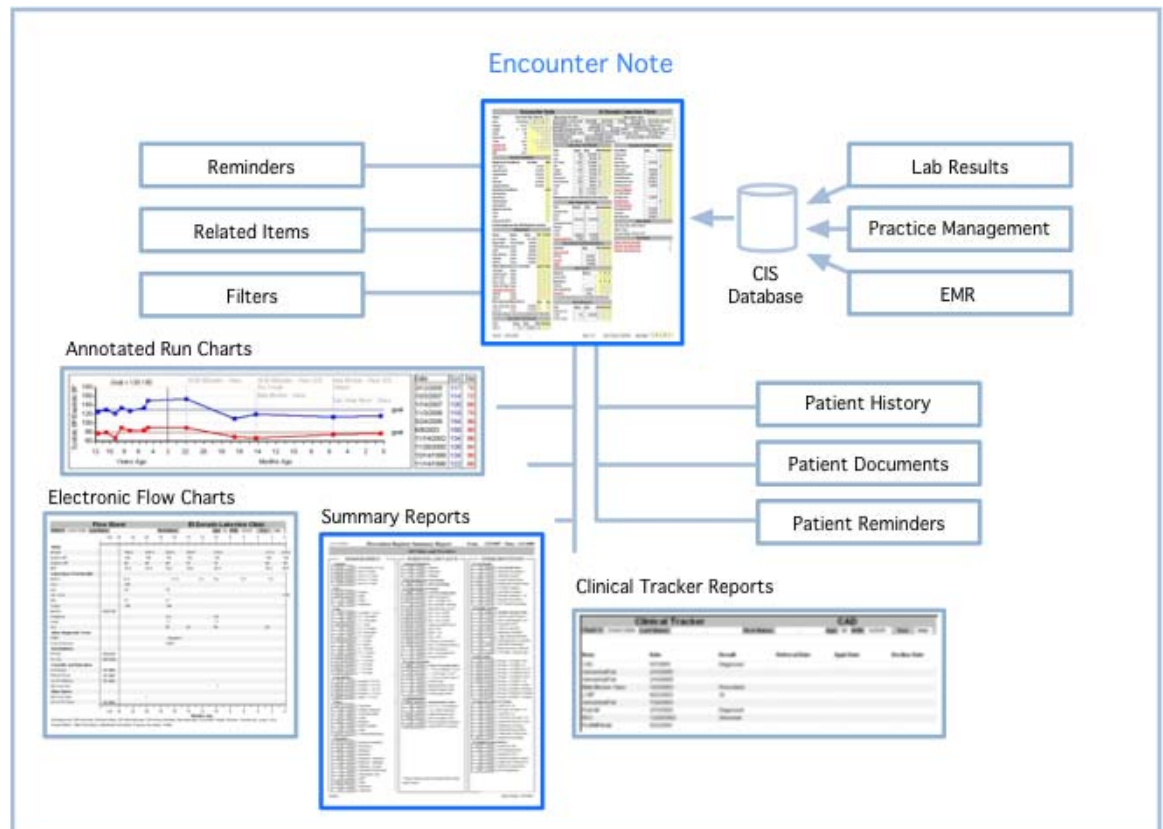
The Patient Electronic Care System (PECSYS) CIS

The Patient Electronic Care System (PECSYS) was developed by The Aristos Group to support the health care improvement efforts of the U.S. Department of Health and Human Services BPHC Health Disparities Collaboratives. Design of the PECSYS CIS software was

guided by a national faculty of distinguished physicians and statisticians from the Institute of Healthcare Improvement and a clinical advisory group representing health care providers, administrators, and support personnel from over five hundred health care organizations participating in the Health Disparities Collaboratives.

From the outset, PECSYS was designed to support the Wagner CCM. The software embeds evidence-based guidelines into daily clinical practice, facilitates individual patient care planning, ensures regular follow up by the care team, and offers timely reminders for providers and patients. Comprehensive and flexible reporting options help identify relevant sub-populations for preventative care, and the system monitors performance of the practice team and care system.

Figure 1. The PECSYS CIS Encounter Note displays all relevant patient information on a single screen.



Pre-Visit Planning

Health care providers plan for patient visits during regular review meetings. The review allows the care team to develop a plan to treat each patient’s outstanding health issues. With a holistic view of all issues facing the patient, the care team can optimize the visit and max-pack all relevant services, such as eye exams, cancer screenings, and immunizations.

The Encounter Note

The PECSYS Encounter Note provides all the essential information about a patient’s chronic care and prevention plan. The information is integrated and condensed on a single computer screen or printed page for easy reference. The Encounter Note gives the care team fast access to all of the information they need to answer the question: What else do we need to do today? This is the key to moving from a reactive, acute care system to a proactive, quality driven and prevention-oriented care system.

During pre-visit planning meetings, the care team can use PECSYS to drill-down from the Encounter Note into a patient’s medical history. PECSYS reports can then be used to drill-up into broader, population-based data, to see if the patient meets a particular demographic or medical profile. This type of population segmentation analysis is essential to proactive health care. The customizable displays of patient-centric data allow providers to query their patient population for any combination of characteristics. This improves comprehension of each patient’s situation and allows the provider to apply treatment plans across similar patient subpopulations.

Reminders

PECSYS uses a Reminder system that integrates evidence-based guidelines and protocols to guide the placement of items on the Encounter Note. The Reminders are value-based filters that automatically examine patient information and add necessary items to the Encounter Note. A simple wizard-driven interface allows even novice users to construct custom Reminders in minutes.

The Encounter Note Reminder system supports optional color-coding to help identify needed services. When a color-coded reminder is activated, the item shows up in red in the usual location on the Encounter Note. The Encounter Note also has a Reminders section containing all active Reminders. The color-coded Reminders give providers a visual indication of how well they are doing on evidence-based guidelines and protocols. Many PECSYS users talk of “getting the red out” as a motto for interacting with the Encounter Note.

Visual Organization of the Encounter Note

The PECSYS Encounter Note is a powerful tool for planning patient care. It integrates all information about a patient’s clinical and social issues, and has the intelligence to organize data into a comprehensive gestalt of the patient.

Demographic Data

Demographic information about the patient is always displayed in the upper right hand corner of the Encounter Note. This area includes the normal demographic data, such as patient name and address, and can incorporate information that is unique to the care organization, such as homeless and migrant status, level of poverty, language spoken, and race and ethnicity.

Vitals

Vitals are displayed to the left of the demographic data, and are in a specified order. This area displays normal vitals—weight, height, pulse, temperature, blood pressure, and BMI—and providers can additionally include others items, such as, office peak flow, waist circumference, and estimated gestational age.

Problem or Condition

The problem or condition list is displayed below the vitals. Diagnosed chronic conditions are displayed first, followed by the currently diagnosed acute conditions and evidence-based potential conditions that the care team should consider. Related conditions that do not apply to the patient can be simply removed.

Medications

Medications are displayed below conditions. Currently prescribed medications are listed first, followed by the contraindicated or discontinued medications and potential medications that should be considered, based on the patient’s current conditions and diagnosed conditions.

Laboratory Results

Laboratory results are displayed below medications. The list of lab results includes actual results, with the most recent value and date displayed, and recommended labs.

PECSYS determines recommended lab tests based on the clinical evidence available. For example, a patient diagnosed with hypertension will have Cholesterol, LDL, HDL, Triglycerides, and Creatinine listed. If any of these tests have not been performed, the item will appear on the Encounter Note in red with blank values.

Other Diagnostic Tests

Results of other diagnostic tests, such as pap smear, mammogram, and EKG, follow the laboratory tests. Actual test value and dates are displayed, along with tests suggested by evidence and guidelines based on the patient's conditions or medications.

The Other Diagnostic Tests data item emphasizes a critical distinction between EMR and CIS solutions. For example, pap smear test results are reported as text, with information about the description of the specimen, a final diagnosis, etc. For these results to be actionable, within the scope of the information system, they must be reported as a value not as a text string. PECSYS allows the pap smear Bethesda System value to be recorded as an actionable data item. This is not possible in an EMR system.

Vaccinations and Immunizations

The PECSYS Encounter Note vaccination and immunization list contains all appropriate vaccination and immunization items for childhood, adolescent, and adult patients. In addition, as new combination vaccinations become available, they can be easily added, either by the local care team user or as a system-wide update from The Aristos Group.

Risk Factors

The Encounter Note displays risk factors broken down by family history, personal risk history, and risk behaviors. PECSYS is delivered with over 75 risk factors, ranging from family history of breast cancer or diabetes to behaviors, such as smoking and alcohol abuse.

Other Measures

The Other Measures item allows providers to track processes that are core to quality and clinical improvement, but have no diagnostic or procedure code. For example, the number of cigarettes smoked per day or the number of hours of TV watched per day. Other Measures items are stored with a value and date.

Consults and Education

The Encounter Note Consults and Education category displays patient referrals, consults, and educational experiences.

Other Notes

The Other Notes section gives providers a place to write notes about specific items relating to the patient, such as a description of self-management goals or glucose metering type and procedure.

Reminders

The Encounter Note reminders section provides a single area where all active reminders are displayed. The reminder zone is an important focal point for care providers as they work to bring the patient's care issues into alignment with guidelines and protocols.

Figure 2. Sample PECSYS Encounter Note demonstrating multiple chronic conditions and active reminders.

Encounter Note				El Dorado Lakeview Clinic			
Vitals		Last Visit This Visit Hr		Encounter Provider		Encounter Type	
Date	2/18/2008			Chart #	CHA013508	Last	First
Weight	219.0			Clinic	EDL Clinic	PCP	Dr. Smith
Height	5' 5.0"			Address	3317 Topaz Lane		
Pulse	66			City	Shingle Springs	State	CA
Resp Rate	18			Zip	95682	Phone #	(530) 555-1212
Temp	98.2			Emer Contact #	(530) 555-1213		
Systolic BP	130			Emer Contact	Casey	Emer Contact #	(530) 555-1213
Diastolic BP	80			Race	White	Language	English
BMI	36.5			Homeless	Not Homeless		
Chronic Conditions				Laboratory Test Results			
Diagnosed Conditions	Dx Date	D/R		Test	Value	Date	PRef Ref Dec
DM Type 2	5/7/05			Chol	136	3/10/06	[1] [] []
Hypertension	3/15/03			LDL	75	9/7/06	[1] [] []
Dyslipidemia	3/15/03			LDL Goal	<100	2/18/08	[] [] []
CAD	5/7/05			HDL	31	9/7/06	[1] [] []
Post-MI	3/15/03			Triglyc	149	9/7/06	[1] [] []
AllergicRhinitis	9/10/05			MIaV/Cr	1.1	5/7/05	[1] [] []
Potential Conditions	Add			Potassium	4.0	4/5/07	[] [] []
Retinopathy				Fast Glucose	220	4/5/07	[1] [] []
MacAlburia				Creat	1.1	4/5/07	[1] [] []
Nephropathy				ALT	64	11/17/07	[] [] []
Neuropathy				AST	55	11/17/07	[] [] []
MetabSyndrome				PRef=previous referral, Ref=referral, Dec=declined			
PAD				Other Diagnostic Tests			
CHF				Test	Result	Date	PRef Ref Dec
DepressionNOS				CardiacCath			[] [] []
Dx Date=diagnosis date, DR=diagnosis resolved							
Medications				Other Notes			
Class	Name	Date	D/C C/I Dec	CardiacCath			[] [] []
AG Inhibitor	Class	9/11/04	[] [] []	Echo			[] [] []
Biguanides	Glucophage	6/9/06	[] [] []	EKG	Abnorm	12/20/02	[] [] []
TZD/Glitazone	Class	6/9/06	[] [] []	CardioStressTest			[] [] []
ARB	Class	6/9/06	[] [] []	Revasc			[] [] []
Beta Blocker	Class	10/3/03	[] [] []	O GTT			[] [] []
Nitrates	Class	3/15/03	[] [] []	FOBT	Negativ	9/16/06	[] [] []
Statins	Class	6/9/06	[] [] []	ColonCaScreen	FOBT	9/7/06	[] [] []
Other Medications to Consider	Add C/I Dec						
Glitnides	Class	[] [] []					
Sulfonylurea	Class	[] [] []					
DHP-CCB	Class	[] [] []					
NDH-CCB	Class	[] [] []					
Other BP Med	Class	[] [] []					
Antiplate/thrombASA	[] [] []						
Fibrate	Class	[] [] []					
Niacin	Class	[] [] []					
Discontinued Medications	Add Dec						
Calc Chan Blo	Class	10/3/03	[] [] []				
Diuretic	Class	3/10/06	[] [] []				
D/C=discontinue, C/I=contra-indicated, Dec=declined							
Laboratory Test Results				Vaccinations and Immunizations			
Test	Value	Date	PRef Ref Dec	Vac/Imm	Date	PRef Ref Dec	
HbA1c	7.9	11/29/07	[1] [] []	Hep B vac #1		[] [] []	
				PPV23	5/22/01	[] [] []	
				Flu Vac	6/10/04	[] [] []	
				Td/Qi	1/20/98	[] [] []	
				Risk Factors			
				General	Status	Y N U	
				FamHxDM	[] [] []		
				Behaviors	C P N		
				SM BG	[] [] []		
				Daily Weighing	current	[] [] []	
				Smoking	past	[] [] []	
				C=current,P=past,N=never,Y=yes,N=no,U=unknown			
				Other Measures			
Test	Value	Date	PRef Ref Dec	Test	Value	Date	PRef Ref Dec
Exercise wk			[] [] []	Exercise wk			[] [] []
LVEF	32	9/22/03	[] [] []	LVEF			[] [] []
NYHA Class			[] [] []	NYHA Class			[] [] []
				Reminders			
				Colon Cancer Screenin			1
				DM 40+ No ASA-Antith			3
				Fasting Lipid Panel not			3
Chart # CHA013508				Page 1 of 1 Date Printed: 2/20/2008 Next Visit [] [] [] [] [] []			

During the Visit

The PECSYS Encounter Note gives the care provider all of the information they need to assess a patient's status, on a single screen. Providers can then drill down into patient history, annotated charts, flow sheets, and clinical tracking history with a single click. Custom views can restrict the information displayed on the Encounter Note, allowing attention to focus on a specific condition.

Custom Data Items

The Encounter Note provides a flexible way to collect information during a patient visit to the care provider's office. The system is adaptable, allowing the care team to easily customize recorded information to monitor specific items of interest. For example, tracking self-management goals is increasingly common. PECSYS provides many items that a care team can use to track patient self-care, including: the Self-Management Goal Setting item, which can record the date of a self-care session; Self-Management Description item, a text field to

record specific goals; and SM Goal Achieved item, with yes or no values. The care team can access the information from these custom items to produce reports showing how many patients are achieving self-care goals.

Tracking Items with no CPT Code

The flexibility offered by PECSYS is especially important when recording information for which Current Procedural Terminology (CPT) codes do not exist. For example, when screening for colorectal cancer, a care provider will give the patient a Fecal Occult Blood Test (FOBT) card. PECSYS has a data item to record who has been given an FOBT card. However, there is no CPT code for handing a patient an FOBT card. EMR systems, which are designed to suit the medical records and billing processes, are unable to record this information.

There are many instances where care teams must collect information that exists outside of the CPT code system. PECSYS offers the flexibility to both record and report on this data.

Run Charts, Flow Sheets, and the Clinical Tracker Report

PECSYS provides a variety of options for visualizing patient data, in addition to the Encounter Note. The system can produce enhanced run charts that include annotations and goals. A single flow sheet, showing pertinent data over time for each patient, replaces multiple conventional flow sheets. And, a unique Clinical Tracker report displays the progress of a specific issue over time, such as CAD management and abnormal pap smear follow up.

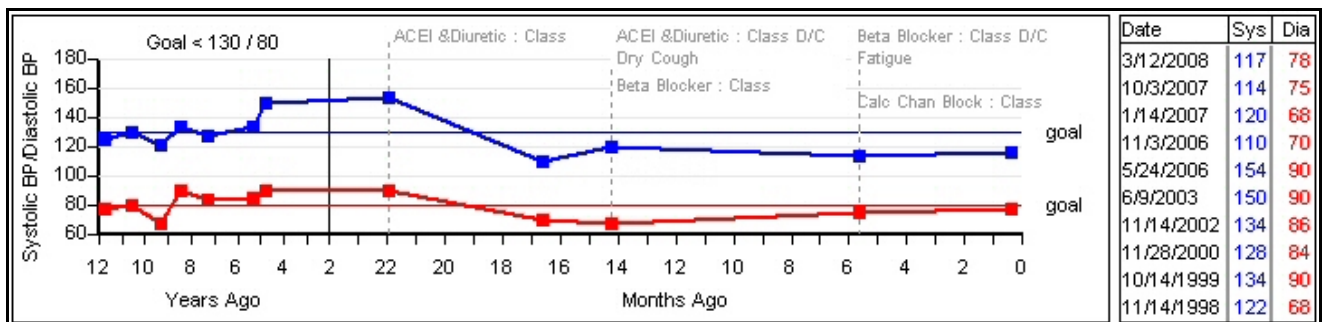
Run Charts

A provider can use Run Charts to gain a better understanding of patient data, and to engage the patient in their own care by showing progress over time. Run Charts are accessed from multiple places in PECSYS. From the Encounter Note, clicking on any numeric data and selecting **Chart Item** will display the Run Chart for that item.

Clicking the Run Chart menu at the top of the Encounter Note will display multiple Run Charts. Charted items are determined by the patient’s conditions. The rules governing which charts are displayed can be customized for the organization or for individual patients.

The care team can modify each Run Chart to include custom annotations and goals. For example, a chart can show a description of a medication on the same time line as the Run Chart. Changes to the rules for assigning annotations and goals to charts do not require software programmers or engineers, making it possible for a provider to simply add custom annotations and goals to charts for individual patients.

Figure 3. Example Run Chart showing blood pressure with annotations for related medications and goals for systolic and diastolic values.



Electronic Flow Sheets

Flow sheets are a powerful tool for displaying patient data over time. Unlike Run Charts, which display numeric data only, Flow Sheets can display both numeric and text information.

The PECSYS Electronic Flow Sheet is similar to a conventional paper flow sheet, but extends the amount of data displayed on a single sheet.

A conventional paper-based flow sheet will have between 3 and 10 items on the vertical axis and between 4 and 6 columns, each representing an encounter with a patient. For each patient visit, the provider records data in the cell for the appropriate column and row.

The Electronic Flow Sheet eliminates the need for columns. Using time on the horizontal axis, data items are placed exactly when they occurred. This allows many patient encounters to be displayed on a single sheet. Providers can add or remove data items from the Flow Sheet, as needed.

Figure 4. An example of the PECSYS Electronic Flow Sheet.

Flow Sheet		El Dorado Lakeview Clinic															
Chart #:	CHA013508	Last Name:		First Name:		Age:	66	DOB:	6/20/41	Sex:	Male						
			>24	24	22	20	18	16	14	12	10	8	6	4	2	0	
Vitals																	
Weight				198.0	206.0	205.0	208.5		218.0					217.0	219.0		
Systolic BP				140	150	132	130		130					140	130		
Diastolic BP				80	90	90	70		70					88	80		
BMI				33.0	34.4	34.2	34.8		36.4					36.2	36.5		
Laboratory Test Results																	
HbA1c				13.2		11.4		9.1	8.2		8.7			7.9			
Chol				136													
LDL				75		75											
LDL Goal																<100	
HDL				31		31											
Triglyc				149		149											
MiA/Cr		05/07/05															
Potassium						4.4			4.0								
Creat						1.1			1.1								
ALT						50		63	69						64		
Other Diagnostic Tests																	
FOBT																	Negative
ColonCaScreen																	FOBT
Vaccinations																	
PPV23		05/22/01															
Flu Vac		06/10/04															
Consults and Education																	
Foot Exam		No data															
Retinal Exam		No data															
Ca S-D Making		No data															
SM Goal Set																	+
Other Notes																	
SM Goal Desc																	+
Ca S-D FU Desc.		No data															
			>24	24	22	20	18	16	14	12	10	8	6	4	2	0	
Months Ago																	

Dx=diagnosed, D/R=resolved, Rx=prescribed, D/C=discontinued, C/I=contra-indicated, Dec=declined, C=current, P=past, N=never, U=unknown, y=yes, n=no
 0=Intermittent, 1=Mild Persistent, 2=Moderate Persistent, 3=Severe Persistent, +=Data

The Clinical Tracker Report

The PECSYS Clinical Tracker report was designed by the Health Disparities Collaboratives clinical advisory group and offers a unique display of patient data. The chronologically sequenced report shows medical data related to a common clinical issue, such as diabetes prevention, abnormal pap smear follow-up, or diabetic nephropathy follow-up.

Figure 5. An example PECSYS Clinical Tracker report.

Clinical Tracker			CAD			
Chart #:	CHA013508	Last Name:	First Name:	Age:	DOB:	Sex:
				66	6/20/41	Male
Item	Date	Result	Referral Date	Appt Date	Decline Date	
CAD	5/7/2005	Diagnosed				
AdviseQuitTob	2/10/2005					
AdviseQuitTob	2/10/2005					
Beta Blocker Class	10/3/2003	Prescribed				
LVEF	9/22/2003	32				
AdviseQuitTob	7/24/2003					
Post-MI	3/15/2003	Diagnosed				
EKG	12/20/2002	Abnormal				
PostMIRehab	5/22/2001					

As with the other data collection and reporting options in the PECSYS system, providers can easily customize existing Clinical Tracker reports and add new reports, as needed. The flexibility and ease of modification allows individual providers to craft the presentation of patient data to their specific requirements.

By providing practitioners with a range of flexible and customizable patient-centric data displays, and the ability to query population data for any combination of characteristics, the PECSYS CIS improves the comprehension of each patient’s specific situation, and facilitates the application of treatment plans across similar patient sub populations.

Proactive Population-based care

Proactive, population-based care is about paying attention to the health care needs of an entire population of patients, not just those that show up for acute appointments. Population-based care relies on a number of different support activities, including:

- Identifying health problems within a defined population of patients to create a subpopulation
- Defining and assuring evidence-based interventions for members of each subpopulation
- Regularly monitoring patient progress.

In a proactive population-based care environment, a single patient may belong to several different subpopulations. For example, a 65-year old woman with diabetes who smokes is in at least three subpopulations: people greater than 65; people with diabetes; and people who use tobacco. Identifying a specific subpopulation, and understanding their general planned care needs, is fundamental to a population-based care delivery system. Without identification of the subpopulation members, changes in care cannot be achieved.

The PECSYS reporting system is delivered with predefined reports that can identify relevant subpopulations for preventative care. These include: diabetes, cardiovascular diseases, asthma, depression, cancer prevention, and general prevention. Summary reports for these subpopulations can identify groups of patients who need additional care, and can facilitate performance monitoring and quality improvement efforts.

Adding New Subpopulations

If a health care organization's clinical team decides to track a condition that is not currently monitored by PECSYS, it is very easy to add the new population characteristics. These changes take only a few minutes and do not require the assistance of software programmers or application engineers.

For example, if the health center realizes they are seeing a number of patients with lupus, they can add lupus as a specific condition to PECSYS. Once added, the care team can associate other treatment items to the lupus condition, such as specific medications, recommended lab tests, and other diagnostic tests. Other items and reminders can be added based on good care practices for the specific condition.

Preventative Health Services

PECSYS uses Reminders to support data collection for prevention activities. The prevention Reminders analyze a patient's age, sex, and certain vitals, such as weight, and then the status of age and sex appropriate preventative health services.

PECSYS automatically identifies all due preventative services and places a color-coded item on the patient's Encounter Note. For example, the system contains twenty-five vaccination and immunization reminders, many of which are age appropriate, and reminders for cancer screening, smoking cessation, oral health services, lead testing, and weight management.

Patient Population Summary Reports

PECSYS summary reports provide a complete set of measures to gauge overall performance of treatment for diabetes, asthma, cardiovascular diseases, depression, cancer prevention, and general prevention over time. The summary reports were designed by the Health Disparities Collaboratives national faculty and Institute of Healthcare Improvement statisticians to provide a comprehensive overview of these patient populations. A custom summary report generator, allowing care providers to create additional summary reports, is planned for a future release of PECSYS.

Figure 6. An example PECSYS Diabetes Population Summary Report.

3.6.151-040605		Diabetes Registry Summary Report		From 1/22/2007 Thru 1/21/2008																																																							
All Clinics and Providers																																																											
DEMOGRAPHICS		VISIT INFO		TEST/DATA INFO																																																							
1. Patients <table border="1"> <tr><td>5631</td><td>2.59%</td></tr> <tr><td>1085</td><td>19.3%</td></tr> <tr><td>2406</td><td>42.7%</td></tr> <tr><td>1449</td><td>25.7%</td></tr> <tr><td>691</td><td>12.3%</td></tr> </table> <p>a. Total registry & Avg b. Pts w/ 0 visits c. Pts w/ 1-2 visits d. Pts w/ 3-5 visits e. Pts w/ 6+ visits</p>		5631	2.59%	1085	19.3%	2406	42.7%	1449	25.7%	691	12.3%	9. Blood Pressure <table border="1"> <tr><td>4142</td><td>73.6%</td></tr> <tr><td>131</td><td>7.5%</td></tr> <tr><td>2673</td><td>64.5%</td></tr> <tr><td>1395</td><td>33.7%</td></tr> <tr><td>1469</td><td>35.5%</td></tr> </table> <p>a. Patients w/ bp checked b. Avg systolic & Avg diastolic c. Patients BP >= 130/80 d. Patients BP >= 140/90 e. Patients BP < 130/80</p>		4142	73.6%	131	7.5%	2673	64.5%	1395	33.7%	1469	35.5%	13. HbA1c or Glycosylates Hb <table border="1"> <tr><td>3657</td><td>64.9%</td></tr> <tr><td>7.0</td><td>3642</td></tr> <tr><td>2329</td><td>63.7%</td></tr> <tr><td>656</td><td>17.9%</td></tr> <tr><td>268</td><td>7.3%</td></tr> <tr><td>168</td><td>4.6%</td></tr> <tr><td>236</td><td>6.5%</td></tr> <tr><td>1761</td><td>31.3%</td></tr> </table> <p>a. Patients with test b. Average HbA1c / n c. < 7.0 d. 7.0 - 7.9 e. 8.0 - 8.9 f. 9.0 - 9.9 g. >= 10 h. 2+ A1c 91 + days apart</p>		3657	64.9%	7.0	3642	2329	63.7%	656	17.9%	268	7.3%	168	4.6%	236	6.5%	1761	31.3%																		
5631	2.59%																																																										
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236	6.5%																																																										
1761	31.3%																																																										
2. Sex <table border="1"> <tr><td>2971</td><td>52.8%</td></tr> <tr><td>2629</td><td>46.7%</td></tr> <tr><td>1</td><td>0.0%</td></tr> <tr><td>30</td><td>0.5%</td></tr> </table> <p>a. Female b. Male c. Other d. Unspecified</p>		2971	52.8%	2629	46.7%	1	0.0%	30	0.5%	10. Medications <table border="1"> <tr><td>1250</td><td>22.2%</td></tr> <tr><td>1383</td><td>24.6%</td></tr> <tr><td>2526</td><td>44.9%</td></tr> <tr><td>1219</td><td>21.6%</td></tr> <tr><td>46</td><td>0.8%</td></tr> <tr><td>2235</td><td>39.7%</td></tr> <tr><td>832</td><td>14.8%</td></tr> <tr><td>2896</td><td>51.4%</td></tr> <tr><td>1862</td><td>33.1%</td></tr> <tr><td>957</td><td>17.0%</td></tr> <tr><td>46</td><td>0.8%</td></tr> <tr><td>35</td><td>0.6%</td></tr> <tr><td>1714</td><td>30.4%</td></tr> <tr><td>2605</td><td>46.3%</td></tr> <tr><td>2432</td><td>43.2%</td></tr> <tr><td>607</td><td>10.8%</td></tr> <tr><td>2515</td><td>48.6%</td></tr> <tr><td>2158</td><td>56.0%</td></tr> <tr><td>1808</td><td>34.9%</td></tr> <tr><td>2042</td><td>49.6%</td></tr> </table> <p>a. Insulin b. Sulfonylurea c. Biguanide d. TZD/Glitazones e. AG Inhibitor f. ACE Inhibitors g. ARB h. ACE or ARB i. Statins j. Beta Blocker k. Non DHP-CCB l. DHP-CCB m. Diuretic n. Antiplatelet/Antithrombotic o. Lipid lowerer p. Other BP q. Antiplat/Antithrom (>= 40) r. ACE or ARB (age >= 55) s. Statins (age >= 40) t. 12-70, not on ACE or ARB</p>		1250	22.2%	1383	24.6%	2526	44.9%	1219	21.6%	46	0.8%	2235	39.7%	832	14.8%	2896	51.4%	1862	33.1%	957	17.0%	46	0.8%	35	0.6%	1714	30.4%	2605	46.3%	2432	43.2%	607	10.8%	2515	48.6%	2158	56.0%	1808	34.9%	2042	49.6%	14. MicroAL/Creatinine Ratio <table border="1"> <tr><td>937</td><td>16.6%</td></tr> <tr><td>683</td><td>72.9%</td></tr> <tr><td>241</td><td>25.7%</td></tr> </table> <p>a. Patients with test b. Normal (<= 30) c. Abnormal (> 30)</p>		937	16.6%	683	72.9%	241	25.7%
2971	52.8%																																																										
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3. Age <table border="1"> <tr><td>0</td><td>0.0%</td></tr> <tr><td>17</td><td>0.3%</td></tr> <tr><td>161</td><td>2.9%</td></tr> <tr><td>982</td><td>17.4%</td></tr> <tr><td>2122</td><td>37.7%</td></tr> <tr><td>2080</td><td>36.9%</td></tr> <tr><td>269</td><td>4.8%</td></tr> <tr><td>5453</td><td>96.8%</td></tr> <tr><td>5176</td><td>91.9%</td></tr> <tr><td>3853</td><td>68.4%</td></tr> </table> <p>a. Age unspecified b. 0 - 14 c. 15 - 29 d. 30 - 49 e. 50 - 64 f. 65 - 84 g. >= 85 h. >= 30 i. >= 40 j. >= 55</p>		0	0.0%	17	0.3%	161	2.9%	982	17.4%	2122	37.7%	2080	36.9%	269	4.8%	5453	96.8%	5176	91.9%	3853	68.4%	15. Creatinine <table border="1"> <tr><td>2985</td><td>53.0%</td></tr> <tr><td>2661</td><td>89.1%</td></tr> <tr><td>251</td><td>8.4%</td></tr> <tr><td>73</td><td>2.4%</td></tr> </table> <p>a. Patients with test b. < 1.5 c. 1.5 - 2.5 d. > 2.5</p>		2985	53.0%	2661	89.1%	251	8.4%	73	2.4%																												
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4. Race <table border="1"> <tr><td>1865</td><td>33.1%</td></tr> <tr><td>41</td><td>0.7%</td></tr> <tr><td>22</td><td>0.4%</td></tr> <tr><td>54</td><td>1.0%</td></tr> <tr><td>197</td><td>3.5%</td></tr> <tr><td>6</td><td>0.1%</td></tr> <tr><td>29</td><td>0.5%</td></tr> <tr><td>3417</td><td>60.7%</td></tr> </table> <p>a. Caucasian b. African American c. American Indian d. Asian e. Hispanic f. Pacific Islander g. Other h. Race unspecified</p>		1865	33.1%	41	0.7%	22	0.4%	54	1.0%	197	3.5%	6	0.1%	29	0.5%	3417	60.7%	16. ALT <table border="1"> <tr><td>2826</td><td>50.2%</td></tr> </table> <p>a. Patients with test</p>		2826	50.2%																																						
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2826	50.2%																																																										
5. Insurance <table border="1"> <tr><td>5601</td><td>99.5%</td></tr> <tr><td>63</td><td>1.1%</td></tr> <tr><td>69</td><td>1.2%</td></tr> <tr><td>37</td><td>0.7%</td></tr> <tr><td>57</td><td>1.0%</td></tr> <tr><td>35</td><td>0.6%</td></tr> <tr><td>1</td><td>0.0%</td></tr> <tr><td>0</td><td>0.0%</td></tr> <tr><td>0</td><td>0.0%</td></tr> <tr><td>5285</td><td>94.4%</td></tr> <tr><td>84</td><td>1.5%</td></tr> </table> <p>a. Insurance indicated b. Private Ins c. Medicaid d. Medicare e. Medicaid + Medicare f. Medicare + Private g. CHAMPUS/TRICARE h. Catastrophic Only i. CHIP j. Other k. Uninsured</p>		5601	99.5%	63	1.1%	69	1.2%	37	0.7%	57	1.0%	35	0.6%	1	0.0%	0	0.0%	0	0.0%	5285	94.4%	84	1.5%	17. AST <table border="1"> <tr><td>2348</td><td>41.7%</td></tr> </table> <p>a. Patients with test</p>		2348	41.7%																																
5601	99.5%																																																										
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2348	41.7%																																																										
6. Type of diabetes <table border="1"> <tr><td>436</td><td>7.7%</td></tr> <tr><td>5235</td><td>93.0%</td></tr> <tr><td>1</td><td>0.0%</td></tr> </table> <p>a. Type 1 b. Type 2 c. Other</p>		436	7.7%	5235	93.0%	1	0.0%	18. Cholesterol Test <table border="1"> <tr><td>2566</td><td>45.6%</td></tr> <tr><td>184.5</td><td>2566</td></tr> <tr><td>808</td><td>31.5%</td></tr> </table> <p>a. Patients with test b. Average Cholesterol / n c. Patients >= 200</p>		2566	45.6%	184.5	2566	808	31.5%																																												
436	7.7%																																																										
5235	93.0%																																																										
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2566	45.6%																																																										
184.5	2566																																																										
808	31.5%																																																										
7. Special Populations <table border="1"> <tr><td>20</td><td>0.4%</td></tr> <tr><td>21</td><td>0.4%</td></tr> <tr><td>0</td><td>0.0%</td></tr> </table> <p>a. Migrant b. Homeless c. Refugee</p>		20	0.4%	21	0.4%	0	0.0%	19. Triglycerides Test <table border="1"> <tr><td>2512</td><td>44.6%</td></tr> <tr><td>189.1</td><td>2508</td></tr> <tr><td>762</td><td>30.3%</td></tr> </table> <p>a. Patients with test b. Average Triglyceride / n c. Patients >= 200</p>		2512	44.6%	189.1	2508	762	30.3%																																												
20	0.4%																																																										
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8. BMI <table border="1"> <tr><td>2826</td><td>50.2%</td></tr> <tr><td>308</td><td>10.9%</td></tr> <tr><td>678</td><td>24.0%</td></tr> <tr><td>726</td><td>25.7%</td></tr> <tr><td>522</td><td>18.5%</td></tr> <tr><td>592</td><td>20.9%</td></tr> </table> <p>a. BMI calculated b. < 25 c. 25 - 29.9 d. 30 - 34.9 e. 35 - 39.9 f. >= 40</p>		2826	50.2%	308	10.9%	678	24.0%	726	25.7%	522	18.5%	592	20.9%	20. HDL Test <table border="1"> <tr><td>2514</td><td>44.6%</td></tr> <tr><td>44.1</td><td>2512</td></tr> <tr><td>1477</td><td>58.8%</td></tr> </table> <p>a. Patients with test b. Average HDL / n c. Patients < 45</p>		2514	44.6%	44.1	2512	1477	58.8%																																						
2826	50.2%																																																										
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12. Specialty Care Received <table border="1"> <tr><td>918</td><td>16.3%</td></tr> <tr><td>420</td><td>7.5%</td></tr> <tr><td>697</td><td>12.4%</td></tr> <tr><td>269</td><td>4.8%</td></tr> <tr><td>9</td><td>5.2%</td></tr> <tr><td>1298</td><td>23.1%</td></tr> <tr><td>640</td><td>11.4%</td></tr> <tr><td>0</td><td>0.0%</td></tr> <tr><td>2721</td><td>48.3%</td></tr> <tr><td>1007</td><td>17.9%</td></tr> <tr><td>1316</td><td>23.4%</td></tr> <tr><td>2538</td><td>45.4%</td></tr> <tr><td>369</td><td>14.4%</td></tr> </table> <p>a. DM Education (ever) b. Self-Mgt Goal Set c. Nutrition Edu. (ever) d. Dental Exam e. Smoke Cess (smokers) f. Retinal Exam g. Depression Screening h. Sub Abuse Screening i. Pneumonia Vacc. (ever) j. Flu Vaccination k. Foot Exam l. BMI > 25 Doc'd m. Weight Reduction >= 10lb</p>		918	16.3%	420	7.5%	697	12.4%	269	4.8%	9	5.2%	1298	23.1%	640	11.4%	0	0.0%	2721	48.3%	1007	17.9%	1316	23.4%	2538	45.4%	369	14.4%	21. LDL Test <table border="1"> <tr><td>2170</td><td>38.5%</td></tr> <tr><td>105.0</td><td>2169</td></tr> <tr><td>310</td><td>14.3%</td></tr> <tr><td>1038</td><td>47.8%</td></tr> <tr><td>640</td><td>29.5%</td></tr> <tr><td>329</td><td>15.2%</td></tr> <tr><td>163</td><td>7.5%</td></tr> </table> <p>a. Patients with test b. Average LDL / n c. Patients < 70 d. Patients < 100 e. Patients 100 - 129 f. Patients 130 - 160 g. Patients > 160</p>		2170	38.5%	105.0	2169	310	14.3%	1038	47.8%	640	29.5%	329	15.2%	163	7.5%																
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1038	47.8%																																																										
640	29.5%																																																										
329	15.2%																																																										
163	7.5%																																																										
22. Microalbumin screening (Alb/creat ratio) <table border="1"> <tr><td>307</td><td>15.0%</td></tr> </table> <p>a. 12-70, not on ACE or ARB</p>		307	15.0%	23. HbA1c baseline <table border="1"> <tr><td>2719</td><td>48.3%</td></tr> <tr><td>1347</td><td>49.5%</td></tr> <tr><td>646</td><td>23.8%</td></tr> <tr><td>282</td><td>10.4%</td></tr> <tr><td>164</td><td>6.0%</td></tr> <tr><td>280</td><td>10.3%</td></tr> </table> <p>a. Patients with baseline b. baseline < 7.0 c. baseline 7.0 - 7.9 d. baseline 8.0 - 8.9 e. baseline 9.0 - 9.9 f. baseline >= 10</p>		2719	48.3%	1347	49.5%	646	23.8%	282	10.4%	164	6.0%	280	10.3%																																										
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24. HbA1c decrease from baseline <table border="1"> <tr><td>1602</td><td>58.9%</td></tr> <tr><td>580</td><td>43.1%</td></tr> <tr><td>443</td><td>68.6%</td></tr> <tr><td>209</td><td>74.1%</td></tr> <tr><td>133</td><td>81.1%</td></tr> <tr><td>237</td><td>84.6%</td></tr> </table> <p>a. Patients with decrease b. baseline < 7.0 c. baseline 7.0 - 7.9 d. baseline 8.0 - 8.9 e. baseline 9.0 - 9.9 f. baseline >= 10</p>		1602	58.9%	580	43.1%	443	68.6%	209	74.1%	133	81.1%	237	84.6%																																														
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Figure 7. An example PECSYS Prevention Population Summary Report.

3.6.151-092005		Prevention Registry Summary Report		From 1/22/2007 Thru 1/21/2008																																																																																																																																		
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DEMOGRAPHICS		SCREENING AND VACC'S		OTHER PREVENTION																																																																																																																																		
1. Patients <table border="1"> <tr><td>7236</td><td>2.20</td><td>a. Total registry & Avg</td></tr> <tr><td>1810</td><td>25.0%</td><td>b. Pts w/ 0 visits</td></tr> <tr><td>3198</td><td>44.2%</td><td>c. Pts w/ 1-2 visits</td></tr> <tr><td>1508</td><td>20.8%</td><td>d. Pts w/ 3-5 visits</td></tr> <tr><td>720</td><td>10.0%</td><td>e. Pts w/ 6+ visits</td></tr> </table>		7236	2.20	a. Total registry & Avg	1810	25.0%	b. Pts w/ 0 visits	3198	44.2%	c. Pts w/ 1-2 visits	1508	20.8%	d. Pts w/ 3-5 visits	720	10.0%	e. Pts w/ 6+ visits	7. Special Populations <table border="1"> <tr><td>23</td><td>0.3%</td><td>a. Migrant</td></tr> <tr><td>25</td><td>0.3%</td><td>b. Homeless</td></tr> <tr><td>0</td><td>0.0%</td><td>c. Refugee</td></tr> </table>		23	0.3%	a. Migrant	25	0.3%	b. Homeless	0	0.0%	c. Refugee	12. Oral Health <table border="1"> <tr><td>1</td><td>2.2%</td><td>a. Oral Health Index</td></tr> <tr><td>1</td><td>2.2%</td><td>b. Fluoride Assessment*</td></tr> <tr><td>0</td><td>0.0%</td><td>c. Fluoride Varnish*</td></tr> <tr><td>277</td><td>3.8%</td><td>d. Annual Dental Exam</td></tr> <tr><td>199</td><td>2.8%</td><td>e. Referred for Dental Exam</td></tr> <tr><td>0</td><td>0.0%</td><td>f. 1st Molar Sealants</td></tr> <tr><td>0</td><td>0.0%</td><td>g. 2nd Molar Sealants</td></tr> <tr><td>0</td><td>0.0%</td><td>h. Fluoride Adequate = No</td></tr> <tr><td>0</td><td>0.0%</td><td>i. Fluoride Prescribed</td></tr> <tr><td>4</td><td>0.1%</td><td>j. PCP Dental Counseling</td></tr> </table>		1	2.2%	a. Oral Health Index	1	2.2%	b. Fluoride Assessment*	0	0.0%	c. Fluoride Varnish*	277	3.8%	d. Annual Dental Exam	199	2.8%	e. Referred for Dental Exam	0	0.0%	f. 1st Molar Sealants	0	0.0%	g. 2nd Molar Sealants	0	0.0%	h. Fluoride Adequate = No	0	0.0%	i. Fluoride Prescribed	4	0.1%	j. PCP Dental Counseling																																																																											
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2. Sex <table border="1"> <tr><td>4151</td><td>57.4%</td><td>a. Female</td></tr> <tr><td>3045</td><td>42.1%</td><td>b. Male</td></tr> <tr><td>1</td><td>0.0%</td><td>c. Other</td></tr> <tr><td>39</td><td>0.5%</td><td>d. Unknown</td></tr> </table>		4151	57.4%	a. Female	3045	42.1%	b. Male	1	0.0%	c. Other	39	0.5%	d. Unknown	8. Self-management Goal Setting <table border="1"> <tr><td>445</td><td>6.1%</td><td>a. SM Goal Setting</td></tr> </table>		445	6.1%	a. SM Goal Setting	13. Healthy Lifestyle <table border="1"> <tr><td>0</td><td>0.0%</td><td>a. Healthy Lifestyle Index</td></tr> <tr><td>3</td><td>1.4%</td><td>b. Advise to quit Tobacco*</td></tr> <tr><td>0</td><td>0.0%</td><td>c. Pts w/ quit attempt (1 yr)</td></tr> <tr><td>7</td><td>0.1%</td><td>d. Exposed to ETS</td></tr> <tr><td>0</td><td>0.0%</td><td>e. Advise to quit ETS</td></tr> <tr><td>14</td><td>0.7%</td><td>f. Adult-Ref to HWMP*</td></tr> <tr><td>14</td><td>0.7%</td><td>g. Adult-Attended HWMP</td></tr> <tr><td>0</td><td>0.0%</td><td>h. Adult-Exercise Av min/wk</td></tr> <tr><td>0</td><td>0.0%</td><td>i. Kids-HW Counseling*</td></tr> <tr><td>0</td><td>0.0%</td><td>j. Kids-Exercise Av min/wk</td></tr> <tr><td>0</td><td>0.0%</td><td>k. TV/Video < 2hrs per day</td></tr> </table>		0	0.0%	a. Healthy Lifestyle Index	3	1.4%	b. Advise to quit Tobacco*	0	0.0%	c. Pts w/ quit attempt (1 yr)	7	0.1%	d. Exposed to ETS	0	0.0%	e. Advise to quit ETS	14	0.7%	f. Adult-Ref to HWMP*	14	0.7%	g. Adult-Attended HWMP	0	0.0%	h. Adult-Exercise Av min/wk	0	0.0%	i. Kids-HW Counseling*	0	0.0%	j. Kids-Exercise Av min/wk	0	0.0%	k. TV/Video < 2hrs per day																																																																																	
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The first column of the summary report describes the patient population distribution in terms of number of visits, sex, age, race, insurance, etc. The second and third columns describe measures related to the specific population. The prevention summary report incorporates a number of bundled index measures. Bundled indices are a new approach to evaluating health care where a patient must have all relevant best practices or outcomes for a specific condition to be included in the index.

Modifying the population summary reports allows analysis of any patient sub-population. For example, the diabetes summary report can be run for specific ethnicity, income, or insurance type. Modifying PECSYS summary reports takes less than a minute and allows care teams to explore patient data in ways unavailable with other HIT solutions.

Population Report Drill Down

The summary reports support drill down analysis, allowing care teams to identify patients whose care does not meet evidence-based guidelines or who are in need of additional care. Clicking on a measure in the digital report produces a patient list that can then be copied and used to generate customized patient call lists, letters, or emails.

PECSYS Spreadsheet Reports

In addition to the summary reports, PECSYS has over one hundred and seventy spreadsheet reports that can be customized to identify patients who are out of compliance with evidence-based guidelines or are in need of additional care. The spreadsheet reports support drill down from the patient's chart number into the patient's Encounter Note.

Spreadsheet reports also aid further analysis using external tools. For example, bringing data into Microsoft Excel allows providers to be evaluated and ranked across a range of condition-specific and prevention measures.

Figure 8. An example PECSYS Spreadsheet Report analyzing provider performance in Microsoft Excel.

December 2007	Goal %	All Providers	P1	Rank P1	P2	Rank P2
Total Number of Patients		10	3		1	
Men/Women		4/6	3/0		1/0	
Absolute Number with DM		7	1		1	
Absolute Number with HTN		5	2		0	
% Number with DM		70	33.3		100	
% Number with HTN		50	66.7		0	
Measures Diabetes						
***Patients with A1C < 7	60	42.9	0	3	0	3
***Patients with BP < 130/80	40	57.1	0	4	100	1
Patients with comp. foot exam in 1 year	90	28.6	100	1	100	1
Patients with 2 A1C's in 1 year	90	0	0	1	0	1
Patients on ACEi or ARB	75	57.1	0	4	100	1
Patients taking statins	60	57.1	0	4	100	1
***Patients with LDL < 100	70	57.1	0	4	100	1
Patients taking aspirin	80	57.1	0	4	100	1
Patients with an eye exam in 1 year	70	57.1	0	4	100	1
Patients with pneumovax	90	57.1	0	4	100	1
Patients with flu shot	90	57.1	0	4	100	1
Measures HTN						
***Patients with BP < 140/90	60	60	100	1	0	3
***Patients with LDL < 130	60	60	100	1	0	3
Measures Prevention						
Women ages > 42 with mammo < 2 yr	50	100	0	4	0	4
Patients > 51 with colonoscopy	30	80	33.3	5	100	1
Women ages > 21 pap < 3 yr	30	100	0	4	0	4
Men with PSA age 50-70	60	50	100	1	0	2
Patients with dT or tDap in past 10 yr	60	50	33.3	4	100	1
Patients age 65 with pneumovax	90	60	100	1	0	2
Patients age 50 flu shot	90	100	100	1	100	1
Women age > 65 with DEXA in 5 yrs	60	100	0	2	0	2
***Percentage of Smokers	20	10	0	1	0	1
Composite Score				62		37
Composite Rank				4		3
Outcomes Score				48		25
Outcomes Rank				5		3
Process Score				14		12
Process Rank				4		3
Composite Bundled Index		0		0		0
Composite Bundled Index Rank				1		1
Outcome Bundled Index		50		66.7		0
Outcome Bundled Index Rank				3		4
Process Bundled Index		0		0		0
Process Bundled Index Rank				1		1

Conclusion

As the baby boomer generation ages, health care providers are likely to see a dramatic rise in the number of chronically ill patients treated. Providing proactive, prevention-oriented, patient-centric care is the only way that health care organizations are going to be able to raise provider productivity while simultaneously lowering costs and improving the quality of the care they deliver. Frameworks, like the Wagner CCM, that use evidence-based guidelines and best practices care are essential to moving from a reactive, acute health care system to a proactive preventative health care system.

EMR technologies have a role to play in health care, but their focus is on documenting medical care in an inpatient setting, not on improving the quality of care in an outpatient environment. By contrast, CIS solutions have been developed with the specific aim of helping providers and their teams improve the quality of chronic care. These patient-centric solutions streamline the care delivery process and give providers fast access to the information they need.

The PECSYS CIS software provides the most powerful, most flexible, and most comprehensive solution for improving care for chronically ill patients. Developed to support the Wagner CCM framework, with design guidance from health care professionals at IHI and over five hundred organizations participating in the BHPC Health Disparities Collaboratives, PECSYS is the only CIS solution for proactive preventative health care.

For providers who have undertaken the considerable investment in time and money to implement an EMR, deploying the PECSYS CIS software will provide much needed flexibility and deliver chronic care improvements impossible to achieve with an EMR system alone. For organizations that have yet to implement an HIT solution, PECSYS CIS software provides a proven path to health care quality improvements, increased productivity, and lower costs. Implementing the PECSYS software will take a matter of days, compared to many months to deploy a typical EMR solution.

For more information about the PECSYS CIS software, please visit The Aristos Group on the web at <http://www.aristos.com/pecsys>, or call (866) 573-2797.