

Maximizing the Utility of Information Technology in Chronic Care Management

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Disclosure of Financial Relationships

Adam Wilcox

Has no relationships with any proprietary entity producing health care goods or services consumed by or used on patients.

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David Dorr

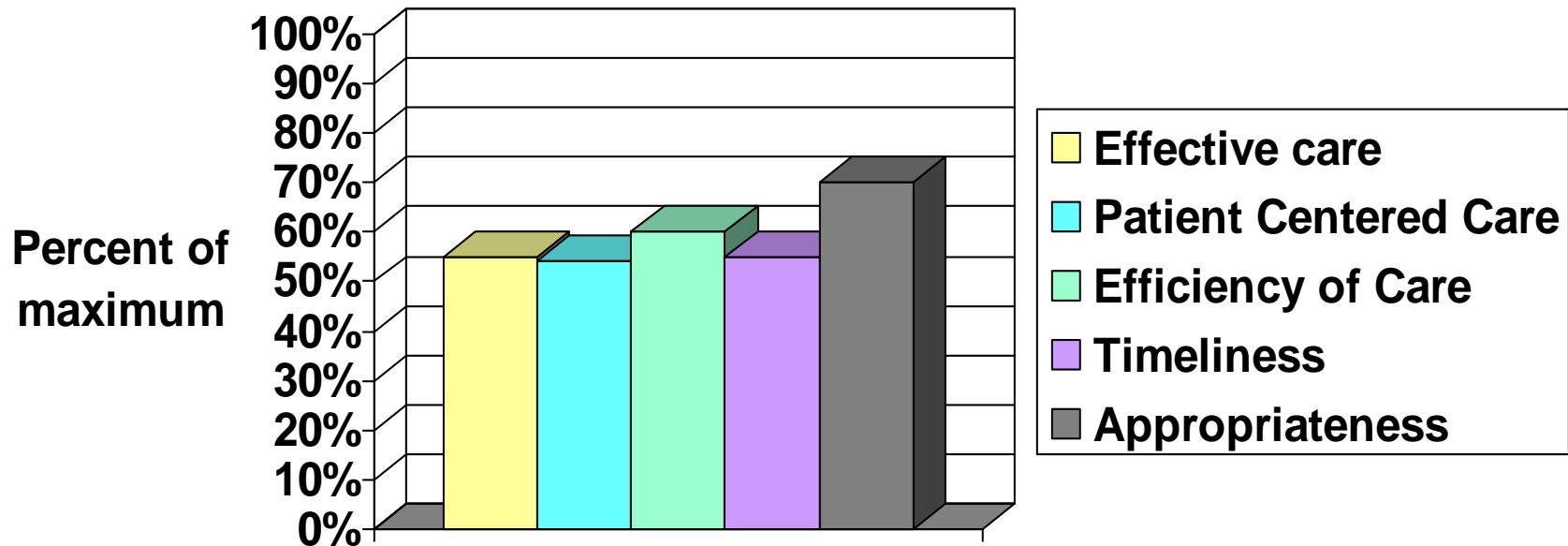
Has no relationships with any proprietary entity producing health care goods or services consumed by or used on patients.

Our primary goals for this class.

- **Introduce a number of concepts related to Information Technology use in Chronic Illness management**
- **Have you think about your own organizational strategies for managing these patients.**
 - **Electronic health record vs. registry**
- **Encourage you to learn more and do more in the use of IT in caring for these conditions.**
 - **Why? Quality, satisfaction, efficiency, and reimbursement changes.**

- **What are the Clinical goals of information systems around Chronic Care?**
- **What functions are needed?**
- **What IT is available with these functions? (Clinical Information System vs. Registry vs. Other tracking)**
- **How can you adapt these functions into your practice? Interpret the results?**

Why bother? Because the Quality of Health Care in the United States is mediocre (or poor) in a number of categories.



Usual Information Technology goals vs. Chronic Care

Usual

- Documentation
- Billing
- Episode completion
- Logistics tracking
- Efficiency (overall, not individual MDs)

Chronic care

- Patient summary
- Population management
- Longitudinal care
- Patient involvement

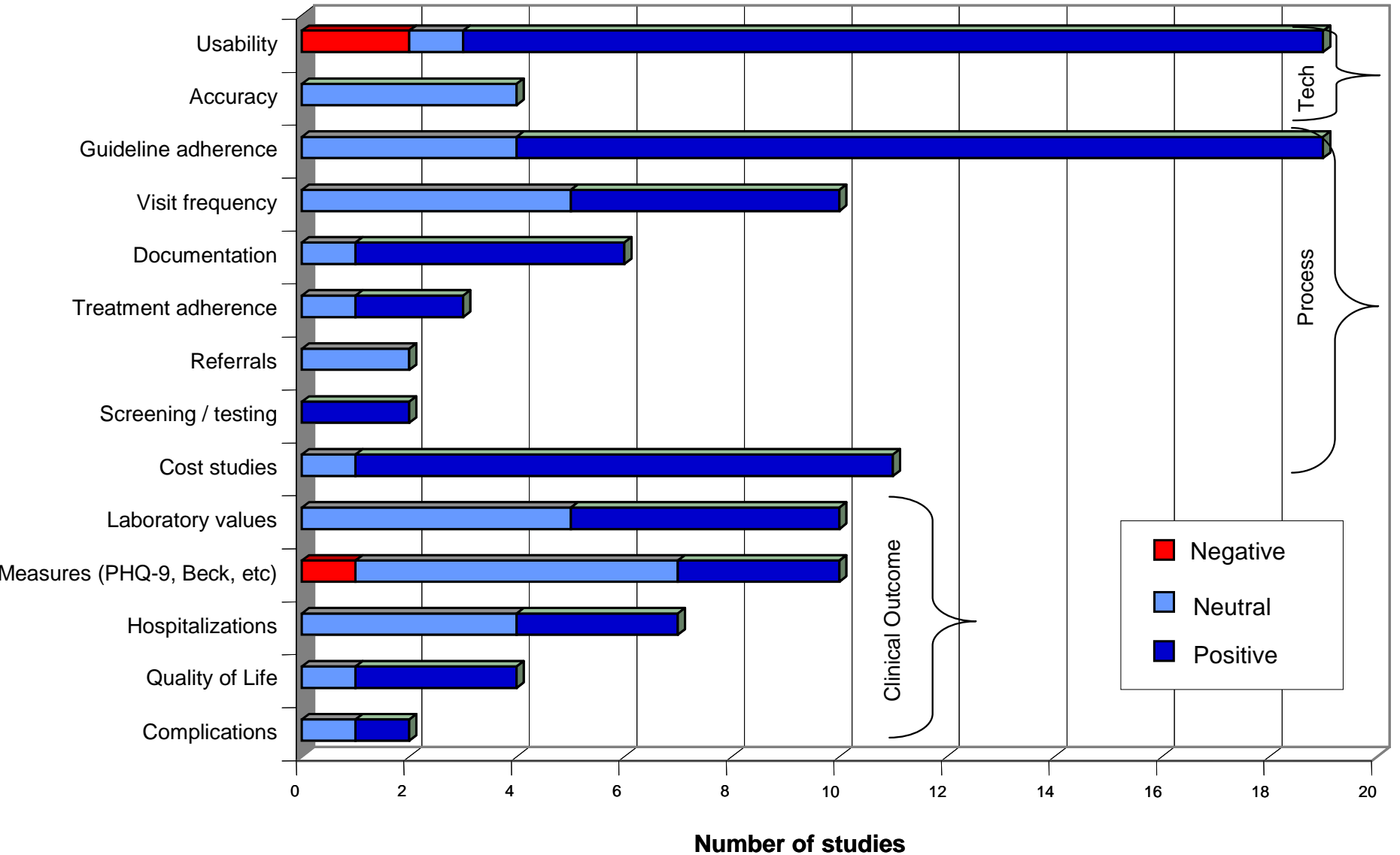
Caution: ignoring the usual reasons can lead to financial and workflow challenges.

Miller, Health Affairs, 2005

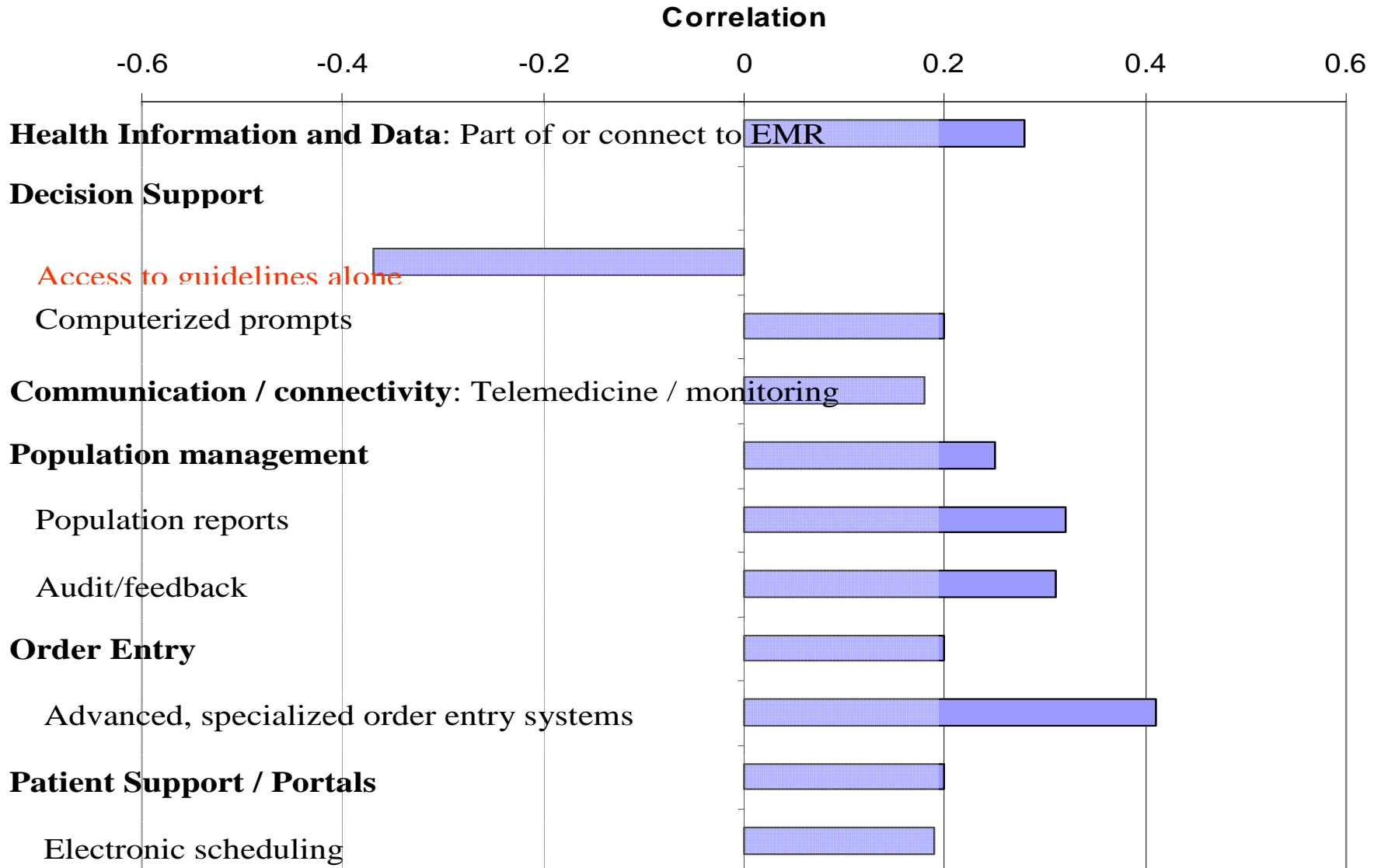
Three pillars of collaborative IT use

1. **Shared Access, care plans, and information / population management**
2. **Best practices – protocols, tracking, and reminders**
3. **Communication – closed loops, role specific, patient and family**

Summary of the Literature



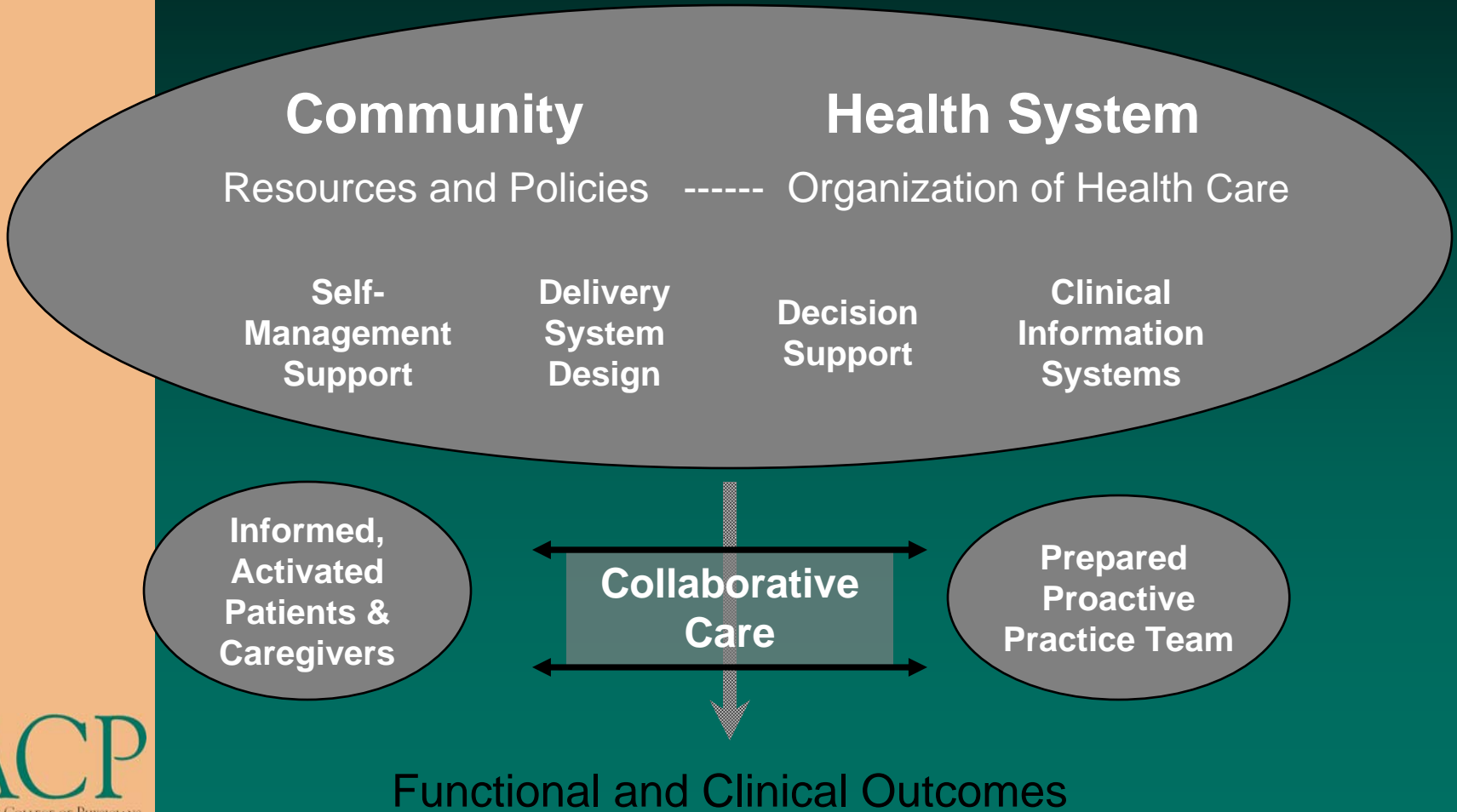
Some approaches work better than others.



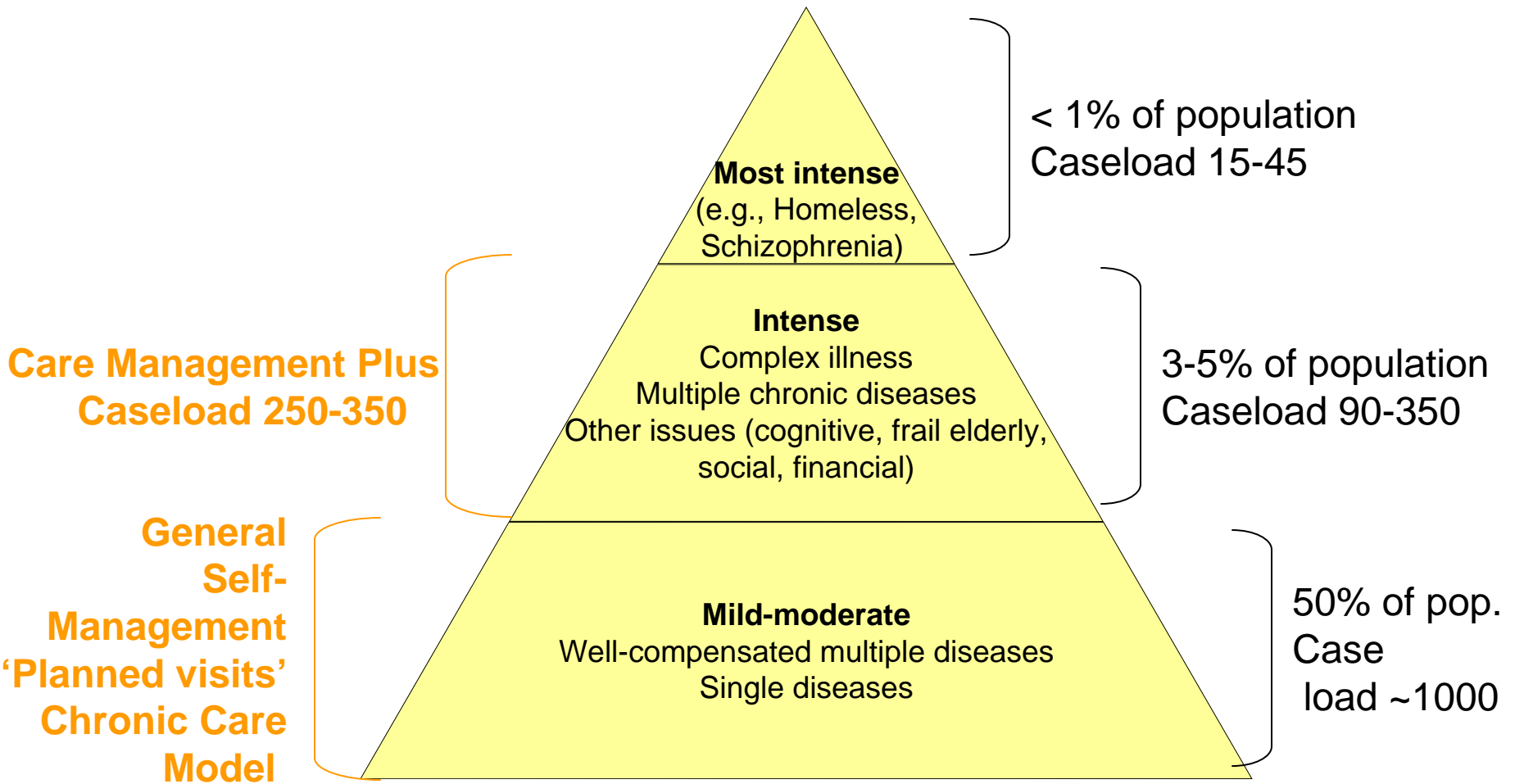
A workflow system of care is required for success

- **Chronic Care Model**
- **Care Management model**
- **Patient self-management tracking**
- **Physician practice redesign**

The Chronic Care Model (and Improving Chronic Illness Care) helps create effective teamwork for chronic illness.

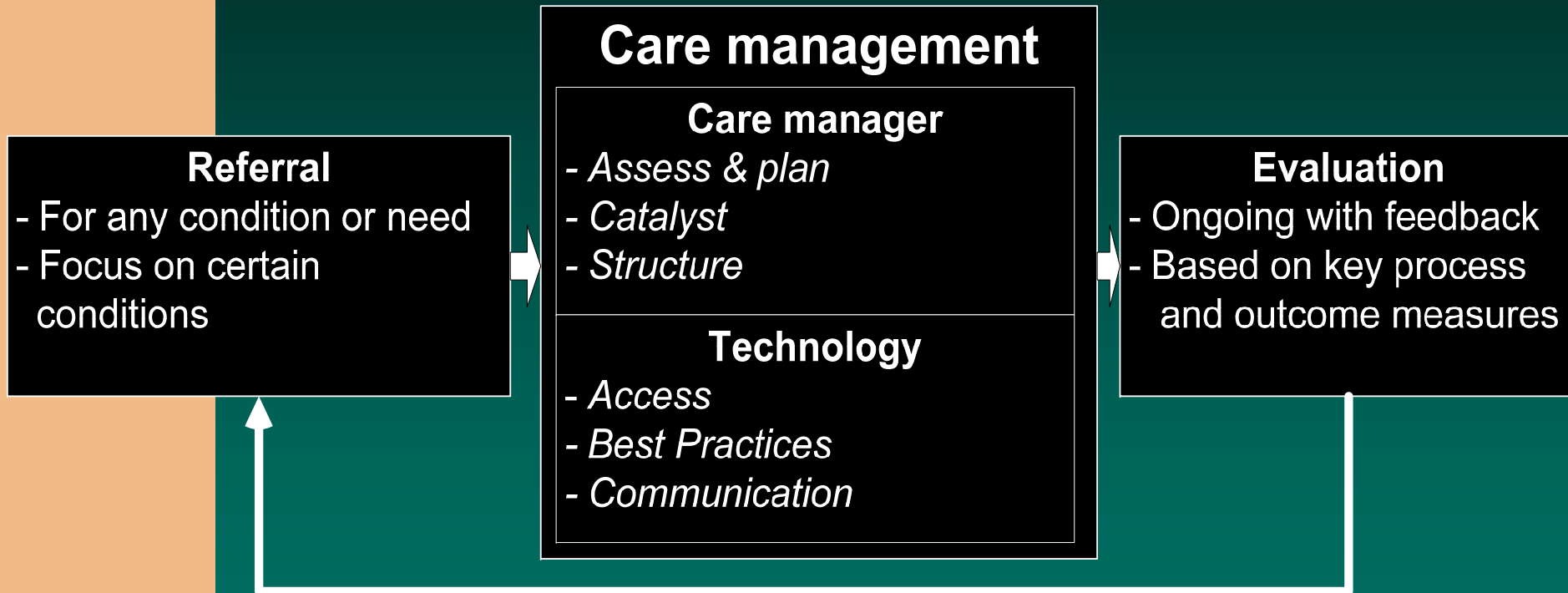


Care management varies by intensity and function for different populations and needs.



A care management system can improve quality and efficiency, like Care Management Plus

In primary care clinics



But they all need information systems to meet specific needs.

- **How is the patient doing now (and in the recent past)?**
 - **Diagnosis**
 - **Prognosis**
 - **Status/stage**
 - **Complexity**
 - **Trends (improving, declining)**
- **What is the evolving care or treatment plan?**
 - **Current plan**
 - **Guidelines**
 - **Literature about condition**
 - **Possible adjustments to plan / available treatments**
- **What are the patient's resources/abilities?**
 - **Adherence to guidelines**
 - **Self management goals and ability**
 - **Caregiver support**

Tools to address information needs

- **Clinical information systems**
 - Allows review and entry of patient status variables
- **Registries**
 - Organizes data within a condition around guidelines and adherence
- **Messaging systems**
 - Allows communication with others about patient status and adjustments to care plan
- **Tracking and reminder systems**
- **Patient education materials**
 - May facilitate patient self-management
 - May improve caregiver support

Clinical Information Systems / EHRs

- **Current usage is low (~20% of providers), but incentives for EHR adoption are accelerating**
- **Recent standardization efforts on EHR functionality**
 - “Key Capabilities of an Electronic Health Record System”, Institute of Medicine, 2003
 - Certification Commission for Healthcare Information Technology, 2006

[Logout](#) 3131313 • SANDIEGO, CARMEN • 1977-06-14 • 29y M • (-) • [\(Multiple OCPs\)](#) [MRN](#) • [Name](#) • [List](#) • [Add to list](#)

[Lab summary](#)
Lab update
[12h](#) | [36h](#) | [72h](#) | [Days](#)
[Admin summary](#)

All results
 Before date

- [Laboratory](#) Feb 16
- [Radiology](#) Jan 03
- [Pathology](#) 2005
- [Disch Sum](#) 2010
- [Signed notes](#) Mar 09
- Op/Clinical
- [Operative](#) Mar 11
- [Consult](#) 1997
- [Clin Sum](#) Dec 14
- [Eclipsys](#) 2004
- [Neurophys](#) 1997
- [Ob/Gyn](#) 2003
- [GI Endo](#) 2006
- [Cardiology](#) Feb 02
- [HEENT](#) 1997
- [Pharmacy](#) Dec 04
- [Pulmonary](#) 2003
- Derm Path
- Non-chart

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Laboratory • (2007-02-16 to 2006-12-06) • Newer • • Older

LIPID PROFILE	2007-02-16 11:21	F
URINALYSIS	2007-02-16 11:21	F
CULTURE, ROUTINE STOOL	2007-02-12 14:46	F
BASIC METABOLIC PANEL	2007-02-12 08:30	F
MISCELLANEOUS CHEMISTRY DISPLAY	2007-02-12 08:30	P
DIGOXIN	2007-02-12 06:30	F
MISCELLANEOUS CHEMISTRY DISPLAY	2007-02-12 06:30	F
Ext Glucose	2007-02-05 14:13	F

BASIC METABOLIC PANEL 2007-02-12 08:30			
Test	Result	Range	Unit
NA ⓘ	124	136-146	mM/l
K ⓘ	4.1	3.6-5.0	mM/l
CL ⓘ	100	102-109	mM/l
CO2 ⓘ	24	24-35	mM/l
BUN ⓘ	15	7-20	mg/dl
GLUCOSE ⓘ	9	70-105	mg/dl
CREATININE ⓘ	2.1	0.6-1.2	mg/dl
CALCIUM ⓘ	0.9	8.7-10.0	mg/dl

Collection time: 2007-02-12 08:30 Received time: 2007-02-12 13:26
 Last updated: 2007-02-12 14:53
 Status: Final, Accno: M53793BMET 072C
 3131313. SANDIEGO, CARMEN. 1977-06-14. M

- [Logout](#)
- [Self Rep Lab 2007](#)
- [Self Rep VS 2006](#)
- [Refresh dates](#)
- [Diagnoses](#)
- [Demographics](#)
- [Insurance](#)
- [Visits](#)
- [Tele Visits](#)
- [IDEATel Messaging](#)
- [Providers](#)
- [Out Pat Meds](#)
- [Edit Signout](#)
- [Add Note](#)
- [Fall Risk](#)
- [Add DSUM](#)
- [All data](#)
- [Feedback](#)
- [How to print](#)
- [GE Web](#)
- [EzVac](#)
- [IDEATel](#)
- [Health Resources](#)
- [On Call Consult](#)
- [Physician Directory](#)

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Out Patient Medications • Show Active Hold Stopped All

Status	Drug Name	Dose	Last Changed	Provider
A	One-time Prescription	testing notes display testing notes display testing notes display	2007-03-13 15:17	Li, Jianhua
A	Asparaginase 10,000 U Vial	MONDAY-WEDNESDAY-FRIDAY	2007-02-07 13:28	Willoughby, Vonda
A	Aspirin 300 mg Ec Tab	1 Tablet(s) QD/OD (ONCE A DAY) PO (BY MOUTH)	2007-01-26 15:53	Hripsak, George
A	Inderal 10 mg Tab	1 Tablet(s) QD/OD (ONCE A DAY) PO (BY MOUTH)	2006-05-24 11:04	Hu, Yiping
A	Ciprofloxacin 500 mg Tab	1 Tablet(s) QD/OD (ONCE A DAY) PO (BY MOUTH)	2006-05-24 11:04	Li, Jianhua

Rx Aspirin 300 mg Ec Tab

Drug Dose Units:	1 Tablet(s)	Refills:	5
Route:	PO (BY MOUTH)	Quantity Dispensed:	30 Tablet(s)
Frequency:	QD/OD (ONCE A DAY)	Label In Spanish:	N
Duration:		Non Child Proof:	N
PRN:	N	DAW:	N
Order Time:	2007-01-26	Provider:	Hripsak, George
Doctor's Instructions:			
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- [Self Rep Lab](#) 2002
- [Self Rep VS](#) 2006
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Diagnoses • (2007-03-01-18.18.00 to 2002-03-21-11.05.00) • Newer • Older

Diagnoses				
Admit date	Discharge date	ICD9	Diagnosis	Type
2007-03-01		250.00	DMII WO COMP NT ST UNCNTR ⓘ	Primary
2007-02-16	2007-02-16	039.2	ABDOMINAL ACTINOMYCOSIS ⓘ	Primary
2007-02-16		039.2	ABDOMINAL ACTINOMYCOSIS ⓘ	Primary
2007-02-12		210.0	BENIGN NEOPLASM LIP ⓘ	Primary
2007-02-07		039.2	ABDOMINAL ACTINOMYCOSIS ⓘ	Primary
2007-01-30		039.2	ABDOMINAL ACTINOMYCOSIS ⓘ	Primary
"		210.0	BENIGN NEOPLASM LIP ⓘ	Secondary
2006-08-17	2006-08-17	379.91	PAIN IN OR AROUND EYE ⓘ	Primary
2006-07-31		V70.9	GENERAL MEDICAL EXAM NOS ⓘ	Primary
2006-07-30		V70.9	GENERAL MEDICAL EXAM NOS ⓘ	Primary
2006-05-10	2006-05-10	V70.0	ROUTINE MEDICAL EXAM ⓘ	Primary
2005-05-16		123.0	TAENIA SOLIUM INTESTINE ⓘ	Primary
2005-02-13	2005-02-13	123.0	TAENIA SOLIUM INTESTINE ⓘ	Primary
2004-11-14			SICK	Admitting
2004-10-29		550.90	UNILAT INGUINAL HERNIA ⓘ	Primary
2004-09-30	2004-09-30	202.80	OTHR LYMPHOMAS, UNSPCFD, EXTRA ⓘ	Primary
2004-04-27	2004-04-27	250.00	DIABETES UNCOMPL ADULT NSAU ⓘ	Primary
2004-04-27		250.00	DIABETES UNCOMPL ADULT NSAU ⓘ	Primary

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Initial Visit Note • [Submit](#) • [Clear](#) • [Cancel](#)

This facility is intended for intradepartmental unsigned communication among physicians and special health professionals. Notes written here are NOT part of the legal medical record. To make this note a part of the medical record, it should be complete and accurate, and it MUST be printed, signed manually, and placed in the paper chart.

Webforms

Load Data Save Clear

Date: 2/23/2004 9:49

Select Patient

Form: IHC A Comprehensive SOAP Note

Clinician: CHRISTENSEN, KENT

Lab

POC: Central Office

Encounter: Not Encounter Related

Micro

Clinical Notes

Radiology

Allergies

Medications

Problems

Vital Signs

Height/Weight

Demographics

ECG

Insurance

Message Log

Inpatient Reports

Lab Order Entry

Alert Review

Web Forms

Cardio. Discharge

ICU Prog. Note

Hot Text

Hot Text Entry

Orders

HELP/Tandem

Report Manager

Flowsheet

Patient Summary

OTG Images

Protocols

Sample

E-Resources

WT	HT	TEMP	HR	RR	SBP	DBP	SaO2	HC	WC

Chief Complaint

Subjective

Objective

Assessment and Plan

Allergies: (a) = active, (m) = modified, (r) = reviewed, (+) = new, (-) = resolved / inactive

Load Allergies

- (a) Cats; Reaction(s): hives
- (a) Sulfa; Reaction(s): Nausea, Rash
- (a) Dust; Reaction(s): Cough, Headache, Wheeze
- (a) PENICILLIN G; Reaction(s): Anemia, Angina, Anxiety
- (a) Acacia; Reaction(s): Anxiety

Meds: (a) = active, (m) = modified, (+) = new, (-) = inactive

Load Meds

- (a) Tylenol (APAP), 325mg, Tablet, 2 TABLET, PO, QD, Qty: 10
- (a) Aspirin, 325mg, Tablet, 1 TABLET, PO, QD, Refill: 0
- (a) Nitrostat (Nitroglycerin), 0.4mg, Tab Subl, 1 TABLET, PO, QD, Qty: 10
- (a) Phenylalanine (Amino Acids), Tablet, Oral, PO, BID, Qty: 10
- (a) Nitro-Bid (Nitroglycerin), 6.5mg, Capsule SA, PO, QD, Qty: 10
- (a) Accupril (Mag Carb/Quinapril HCl), 10mg, Tablet, 1 TABLET, PO, QD, Qty: 10
- (a) Test, 1
- (a) Digoxin, 0.125mg, Tablet, 1 TABLET, PO, QD, Qty: 10

Problems: (a) = active, (m) = modified, (r) = reviewed, (+) = new, (-) = resolved / inactive

Load Problems

- (a) Asthma, Possible

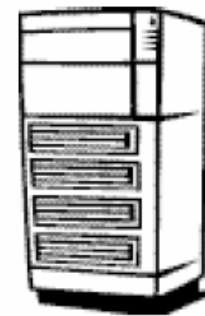
Registries

- **For managing a population of patients with chronic disease**
 - Track condition-specific information
- **Supplement individual medical records**
 - Manage only selected information relevant to the specific chronic disease(s)
 - Designed for tracking patients outside of the point of care



Condition-specific patient information is entered into the registry (in the physician practice or by a program manager at another location)

Registry provides reports or displays



Electronic patient information from external systems is sometimes also extracted and fed into the registry via an interface



For use at the point of care



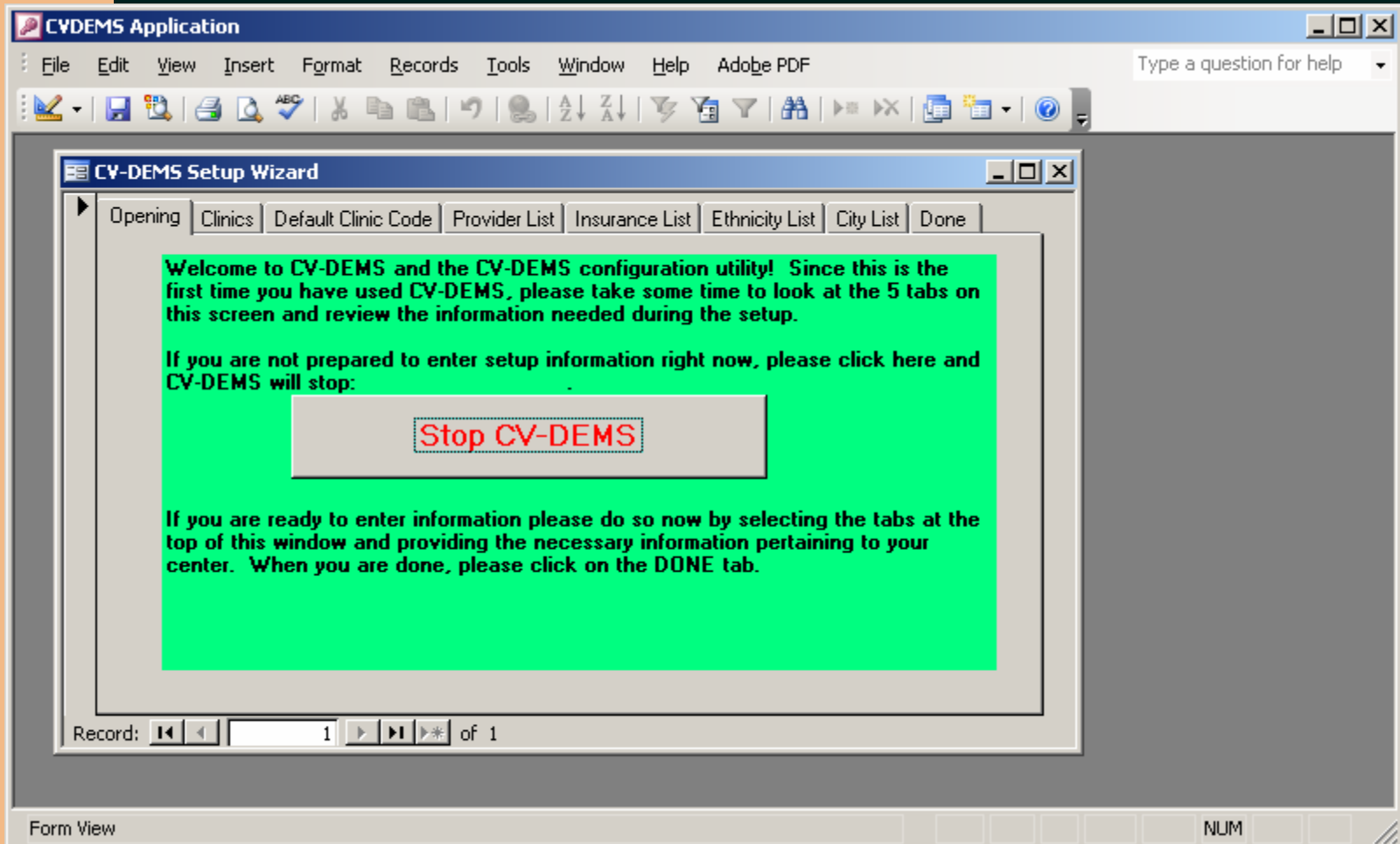
To use in identifying patients who may need follow-up care



To provide status reports on the care program:

- As feedback to physicians about their performance
- To track programs with population management

CVDEMS



Access

■ Structured data entry

CVDEMS Application

File Edit View Insert Format Records Tools Window Help Adobe PDF

Add/Edit Visit 1 Chart # 1 Patient Smith, Jones

Visit Date mm/dd/yy Vitals Wt (lbs) Pulse BP sys/dia

Health Profile		Medications		Referrals and Education	
DM Type I	Yes <input type="radio"/> No <input checked="" type="radio"/>	Insulin	Yes <input type="radio"/> No <input checked="" type="radio"/>	Diabetes Education	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
DM Type II	Yes <input type="radio"/> No <input checked="" type="radio"/>	Sulfonylurea	Yes <input type="radio"/> No <input checked="" type="radio"/>	CVD Education	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
DM Other	Yes <input type="radio"/> No <input checked="" type="radio"/>	Glucophage	Yes <input type="radio"/> No <input checked="" type="radio"/>	Self Mgmt Goal Set	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Hypertension	Yes <input type="radio"/> No <input checked="" type="radio"/>	Glitazones	Yes <input type="radio"/> No <input checked="" type="radio"/>	Nutrition Education	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Post-MI	Yes <input type="radio"/> No <input checked="" type="radio"/>	Prandin	Yes <input type="radio"/> No <input checked="" type="radio"/>	Dental Exam	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
CHF	Yes <input type="radio"/> No <input checked="" type="radio"/>	AG Inhibitor	Yes <input type="radio"/> No <input checked="" type="radio"/>	Retinal Exam	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
CVA	Yes <input type="radio"/> No <input checked="" type="radio"/>	ACE Inhibitor	Yes <input type="radio"/> No <input checked="" type="radio"/>	Smoke Cessation	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
PVD	Yes <input type="radio"/> No <input checked="" type="radio"/>	ARB	Yes <input type="radio"/> No <input checked="" type="radio"/>	Foot Check	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Hyperlipidemia	Yes <input type="radio"/> No <input checked="" type="radio"/>	ASA/antiplatelet	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depression Screen	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Nephropathy	Yes <input type="radio"/> No <input checked="" type="radio"/>	Coumadin	Yes <input type="radio"/> No <input checked="" type="radio"/>	Sub Abuse Screen	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Neuropathy	Yes <input type="radio"/> No <input checked="" type="radio"/>	Beta Blocker	Yes <input type="radio"/> No <input checked="" type="radio"/>	Meds SM Training	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
CAD	Yes <input type="radio"/> No <input checked="" type="radio"/>	Diuretic	Yes <input type="radio"/> No <input checked="" type="radio"/>	Hospitalization	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Family CHD	Yes <input type="radio"/> No <input checked="" type="radio"/>	Digoxin	Yes <input type="radio"/> No <input checked="" type="radio"/>	Post-MI Rehab	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Retinopathy	Yes <input type="radio"/> No <input checked="" type="radio"/>	Lipid lowerer	Yes <input type="radio"/> No <input checked="" type="radio"/>	Pneumococcal Vac	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Depression	Yes <input type="radio"/> No <input checked="" type="radio"/>	Spirolactone	Yes <input type="radio"/> No <input checked="" type="radio"/>	Influenza Vac	Ref <input type="checkbox"/> Dec <input type="checkbox"/>
Renal Failure	Yes <input type="radio"/> No <input checked="" type="radio"/>	anti-arrhythmic	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Other Health Issues		Cal Chn Block	Yes <input type="radio"/> No <input checked="" type="radio"/>	Notes	
Self Mon BG	Yes <input type="radio"/> No <input checked="" type="radio"/>	Other BP med	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Exercise x/wk		Nitrates	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Smoker	Unk <input checked="" type="radio"/> Nvr <input type="radio"/> Pst <input type="radio"/> Cur <input type="radio"/>	Hydralazine	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Foot Risk (0-3)		Anti-depress	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Daily Weighing	Yes <input type="radio"/> No <input checked="" type="radio"/>	Smk Cessas	Yes <input type="radio"/> No <input checked="" type="radio"/>		
NYHA Cls (1-4)		Next Visit Date			

Create Record

Cancel

Delete Visit

Form View NUM

Population reporting

- **Graphs**
- **Summary lists**
- **To do Lists**

Jump To:
[Report Home](#)
[Provider Summary](#)
[Provider Detail](#)
[Patient List](#)

[Hide Menu](#)

Diabetes Summary Report

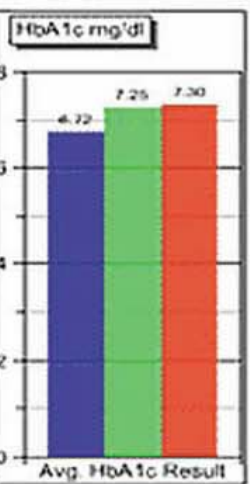
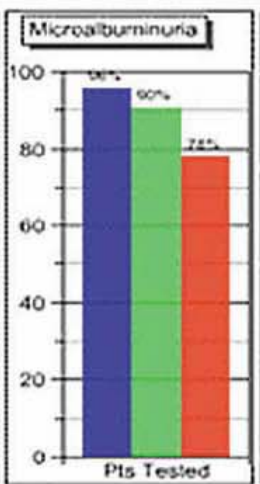
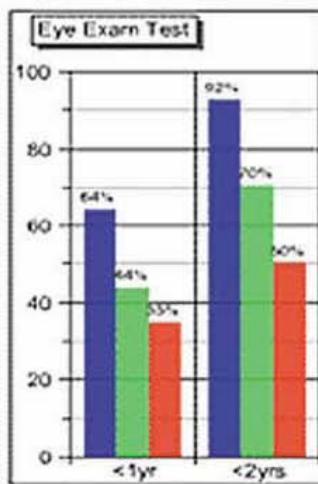
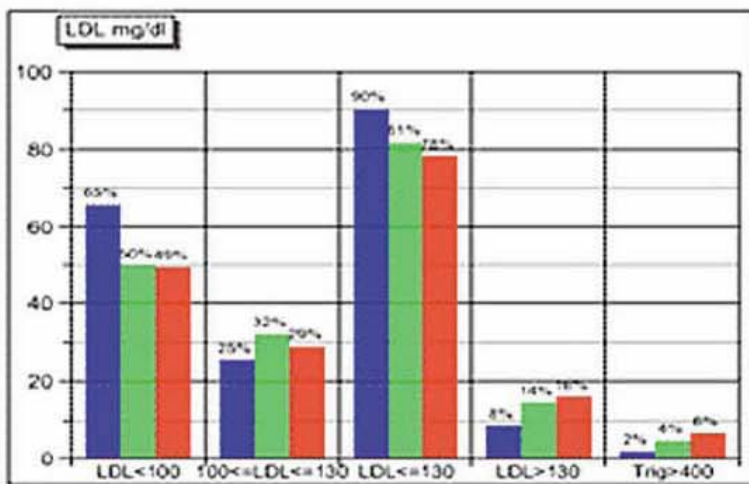
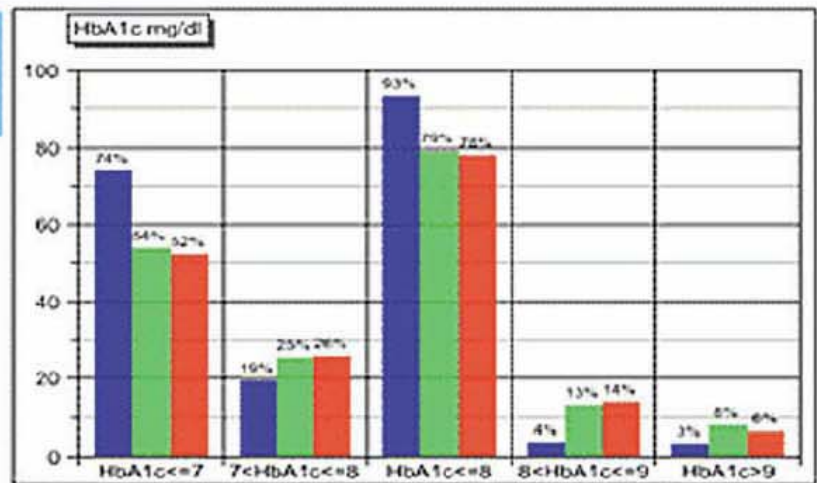
Provider: Smith, John

Period: Jul 2002 - Jun 2003

Patients Tested (Prop of Tot Pts %) - All Patients

	Provider	Region	System
HbA1c	193(96%)	1,385(88%)	19,791(81%)
LDL/Trip ¹	196(98%)	1,441(92%)	20,085(82%)
Eye Exam ²	25(64%)	140(44%)	3,306(35%)
Microalbuminuria ³	192(96%)	1,418(90%)	18,908(78%)
Tot Patients	201	1,568	24,344

¹LDL measures represent two years ending in the chosen period.
²Eye exam % calculated using IHC Health Plans patients only.
³Includes spot microalbuminuria or 24 hour microalbuminuria or positive UA tests for protein, within the reporting period, or any history of treatment for nephropathy.



CONFIDENTIAL: This material is prepared pursuant to Utah Code Ann. 26-25-1 et. Seq. or Idaho Code Ann. 39-1392 et seq. for improvement of the quality of hospital and medical care rendered by hospitals or physicians.

Clinical Messaging and Notification

■ Like Email

- Asynchronous
- Fast
- Notification

■ With the following:

- Secure
- Within clinical workflow
- Patient context
- Alerts driven by patient data

Menu Preferences

Select Patient

- Allergies
- Clinical Notes
- Demographics
- ECG
- Height/Weight
- Inpatient Reports
- Insurance
- Lab
- Lab Order Entry
- Medications
- Message Log
- Micro
- Problems
- Radiology
- Vital Signs

- Lit. Review
- Help
- Password

- Logout
- Comments
- Help2 Info

Message Log

Preferences

Log Messages

Review Messages

From		To		Regarding Patient	
Patient:	<input type="text"/>	Clinician:	<input type="text"/>	Patient:	<input type="text"/>
Clinician:	<input type="text"/>	Facility:	Lake Park IHC	Encounter:	<input type="text"/>
Other:	<input type="text"/>				
Home Phone:	<input type="text"/>				
Work Phone:	<input type="text"/>				
Other Phone:	<input type="text"/>				

Message Type		Priority	Private
<input checked="" type="radio"/> Medications	<input type="radio"/> Lab Results	<input type="radio"/> High	<input type="checkbox"/> Mark Private
<input type="radio"/> Sick	<input type="radio"/> Referral	<input type="radio"/> Medium	
<input type="radio"/> Informational	<input type="radio"/> Other	<input checked="" type="radio"/> Low	

Message	
<div style="border: 1px solid gray; width: 100%; height: 100%;"></div>	

Registry Example: CDEMS

- **Chronic Disease Electronic Management System (www.cdems.com)**
- **Developed by Washington State Diabetes Prevention and Control Program**
- **Precoded for diabetes and adult preventive health**
- **Can be customized for other conditions**
- **MS Access application**
- **High scoring public registry product (California Healthcare Foundation study, 2004)**

Diabetes Visit Note

OP

ID

Last Visit

Date mmddyy

Weight (pds)

BP-Sys/Dia /

This Visit

<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

LN Follower	FN Frankey
Address 1 Main Street, Well City	Phone
PLanguage Spanish	Ethnicity Asian
Insurance SelfPay	PCP Dooright, Gec
Meter Accuscan	DM Dx date 1/1/1992

Age 58	DOB 01/01/49
Sex M	Type DM 2
Ht 67.0	BMI 38.0
Mig N	Homeless N

Medications	Rx	Add	D/C
Insulin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfonylurea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glucophage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glitazones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prandin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AG Inhibitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACE Inhibitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lipid lower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ASA/ Coumadin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BP Medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinic-Med	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Health Profile	Dx	Add	D/C
Cerebrovascular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heart Disease/CAD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hyperlipidemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nephropathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neuropathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P. Vascular Dis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retinopathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self monitors BG	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exercise x/awk	<input type="text"/>	<input type="text"/>	<input type="text"/>
Smoker	<input type="text" value="unknown"/>	Nvr <input type="checkbox"/>	Pst <input type="checkbox"/>
Clinic-Profile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Refer/Ed	LastDate	PRef	Rcvd Date	Ref	Dec
DM Educ	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
NutEduc	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Retinal Ex	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Smke Ce	<input type="text" value="d03/97"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pne Vac	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Flu Vac	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Dental	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
SM Goal.	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Foot chk	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Foot Risk (0-3)	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Clinic-Care	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Tests	Last Value	Date	PRef	New Value	Ref
HbA1c	<input type="text" value="11"/>	<input type="text" value="12/30/99"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
MiA/Cr	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Creat	<input type="text" value="1.8"/>	<input type="text" value="12/30/99"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
LFT	<input type="text" value="108"/>	<input type="text" value="09/01/97"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Chol	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Triglyc	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
HDL	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
LDL	<input type="text" value="140"/>	<input type="text" value="12/30/99"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
24hrUP	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
CI-Lab	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Next Visit Date	<input type="text"/>				

NOTE

NEW NOTE (leave blank if no change)

Add New Visit

OP

Chart #

Visit Date mm/dd/yy

Wt (pd)

BP sys/dia /

Insulin Yes No

Sulfonylurea Yes No

Glucophage Yes No

Glitazones Yes No

Prandin Yes No

AG Inhibitor Yes No

ACE Inhibitor Yes No

Lipid Lower Yes No

ASA/Cmdin. Yes No

BP Med Yes No

Clinic-Med Yes No

Cerebrovascular Yes No

Heart Dis/CAD Yes No

Hypertension Yes No

Hyperlipidemia Yes No

Nephropathy Yes No

Neuropathy Yes No

Periph Vascular Yes No

Retinopathy Yes No

Self Monitors BG Yes No

Exercise w/wk

Smoker Unk Nvr

Pst Cur

Clinic-Profile Yes No

DM Educ Ref Dec

NutrEduc Ref Dec

Retinal Ex Ref Dec

Smke Ces Ref Dec

Pne Vac Ref Dec

Flu Vac Ref Dec

Dental Ref Dec

SM Goal Ref Dec

Foot Chk Ref Dec

Foot Risk (0-3)

Clinic-Care Ref Dec

Note

Next Visit date

Create Record 

Cancel 

Diabetes Visit Note

OP

ID

Last Visit This Visit

Date mmddyy

Weight (pds)

BP-Sys/Dia

LN Follower FN Frankey Age 58 DOB 01/01/49

Address 1 Main Street, Well City Phone

PLanguage Spanish Ethnicity Asian Meter Accuscan Ht 67.0 BMI 38.0

Insurance SelfPay PCP Dooright, Ged DM Dx date 1/1/1992 Mig N Homeless N

Medications Rx Add D/C

Insulin

Sulfonylurea

Glucophage

Glitazones

Prandin

AG Inhibitor

ACE Inhibitor

Lipid lower

ASA/ Coumadin

BP Medication

Clinic-Med

Health Profile Dx Add D/C

Cerebrovascular

Heart Disease/CAD

Hypertension

Hyperlipidemia

Nephropathy

Neuropathy

P. Vascular Dis

Retinopathy

Self monitors BG

Exercise x/awk

Smoker Nvr Pst Cur

Clinic-Profile

Refer/Ed	LastDate	PRef	Rcvd Date	Ref	Dec	Tests	Last Value	Date	PRef	New Value	Ref
DM Educ						HbA1c	11	12/30/99			
NutrEduc						MiA/Cr					
Retinal Ex						Creat	1.8	12/30/99			
Smke Ce	d03/97					LFT	108	09/01/97			
Pne Vac						Chol					
Flu Vac						Triglyc					
Dental						HDL					
SM Goal						LDL	140	12/30/99			
Foot chk						24hrUP					
Foot Risk (0-3)						CI-Lab					
Clinic-Care											

Next Visit Date

Add New Visit

OP Chart # 1

Follower, Frankey Visit Date mm/dd/yy

Wt (pd)

BP sys/dia /

Insulin Yes No

Sulfonylurea Yes No

Glucophage Yes No

Glitazones Yes No

Prandin Yes No

AG Inhibitor Yes No

ACE Inhibitor Yes No

Lipid Lower Yes No

ASA/Cmdin. Yes No

BP Med Yes No

Clinic-Med Yes No

Cerebrovascular Yes No

Heart Dis/CAD Yes No

Hypertension Yes No

Hyperlipidemia Yes No

Nephropathy Yes No

Neuropathy Yes No

Periph Vascular Yes No

Retinopathy Yes No

Self Monitors BG Yes No

Exercise x/wk

Smoker Unk Nvr Pst Cur

Clinic-Profile Yes No

DM Educ Ref Dec

NutrEduc Ref Dec

Retinal Ex Ref Dec

Smke Ces 03/97 Ref Dec

Pne Vac Ref Dec

Flu Vac Ref Dec

Dental Ref Dec

SM Goal Ref Dec

Foot Chk Ref Dec

Foot Risk (0-3)

Clinic-Care Ref Dec

Note

Next Visit date

Create Record Cancel



CDEMS Progress Note 12345

Pilot

Last Visit		This Visit	
Date mmddyy	04/21/04		
Weight (pds)	215	pds	
Height (ins)	68	inches	
BP-Sys/Dia	160/98		

LN	Finketonless	FI	Fred	DOB	10/10/23	Sex	M
Address	1 Star Wars Lane, Union	Phone	(360) 123-4567	Age	81	BMI	32
PLanguage	English	Ethnicity	White	PCP	Dudley Dooright	Migrant	N
Other	diagnosed 07/73						

Conditions	Dx	D/C	Add	Services	LDate	LResult	NDate	NResult	Ref	Dec	Labs	LDate	LResult	NDate	NResult	Ref	Dec
Periph vascul	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DM Educ							HbA1c	04/04	8.6				
Cerebrovasci	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exer Ass							24HrUrinePro						
DM-2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flu Vac							ALT (SGLT)						
Heart	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Foot chk							AST (SGOT)						
HTN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Foot risk Ass							MiAI/Crea rati						
Hyperlipidemi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NutEduc							Protime						
Nephropathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pne Vac							Ser. Creatinir						
Neuropathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Retinal Ex							Cholesterol	04/04	270				
Retinopathy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SM Goal							HDL	04/04	95				
				Smke Ass							LDL	04/04	150				
				Smke Ce	03/04						Triglyceride						

Meds	Rx	D/C	Add
ACE Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AG Inhibitor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ASA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BP Med	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coumadin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glitazones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glucophage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lipid Agent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfonylurea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

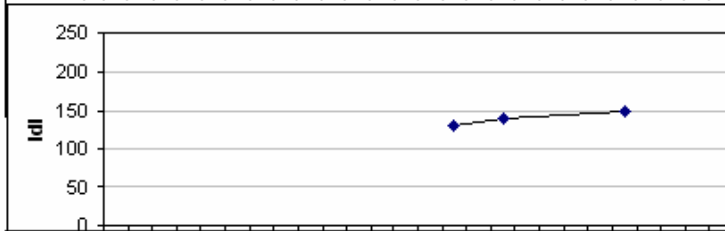
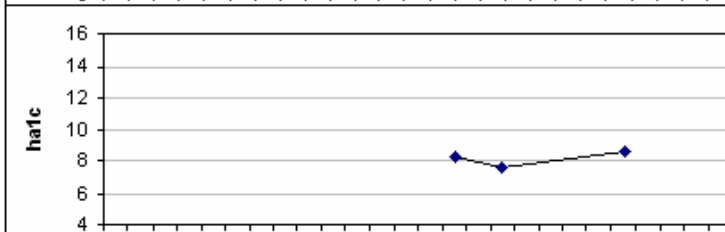
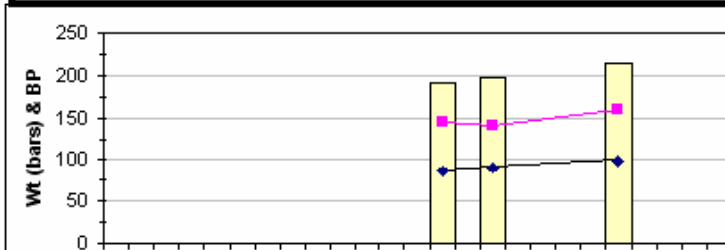
NOTE

NEW NOTE (leave blank if no change)

Next Visit Date Provider

Recommendations

Test/Treatment Type	Standard for your care	Last Done	Additional Information
Complete foot exam	Every 12 months		Complete exam every 12 months
Discuss smoking status	Cessation offered if smoker		Smoking causes high risk of heart attack, stroke, and amputations
GlycoHgb (HbA1c)	Check q 6mo.: Goal<=7	04/04: 8.6	Checks for control of your blood sugars over past 3 months.
Influenza vaccine	Every 12 months in Fall		Helps prevent influenza infection.
LDL "Bad" Cholesterol	check q12 mos.: Goal<=100	04/04: 150	Checks for "bad" cholesterol that can cause heart attacks.
Pneumonia vaccine	Once in all diabetes		Prevents common type of pneumonia, meningitis, and sepsis.
Retinal (eye) exam	Dilated exam every 12 mo		Checks for eye damage from diabetes (can cause blindness).
Self management goal	Discussed/documentd in all		Helps you set your own goals for controlling your diabetes.
Urine MicroAlbumin	Check q12mo: Goal<=20		Checks for protein in your urine (sign of kidney damage.)



Your Blood pressure and Weight

Date	Sys	Dia
04-21-04	160	98
11-12-03	140	90
09-30-03	146	87

Date	Wt
04/21/04	215
11/12/03	198
09/30/03	192

ha1c

Date	result
04/21/04	8.6
11/12/03	7.6
09/30/03	8.2

ldl

Date	result
04/21/04	150
11/12/03	140
09/30/03	130

crea

Date	result

Queries

Clinic Selected SKCN

Clinic's in List SKCN

Select Clinic

- Outstanding Plan (style 2)
- Sweet K Clinic North (style 3)**
- tot
- West Valley Clinic (style 1)

Queries Available

- 13f List pts no Flu Vaccination in last xx days
- 13g List pts no Dental in last xx days
- 13h List pts no SM Goal in last xx days
- 13i List pts no Foot Check in last xx days
- 14a List pts no HbA1c in last xx days
- 14b List pts last HbA1C value at or above xx.x**
- 14c List pts with pre-post HbA1C change \geq 1
- 18d List pts last LDL at or above xx
- 00 List values that are not numbers

[Run]

Close

Electronic Documentation

- **There is a trade-off between convenience and structure**
 - Can't structure everything
 - Structured documentation is time-consuming
 - Free-text cannot support other functions
- **Documentation templates allow for structured documentation in an EHR**
 - Usually allow for some free-text
 - Often, data that could be structured is stored as free text


What are the issues of structured documentation for:

- Problems?
- Medications?
- Vital signs?
- External labs?
- Assessments?
- Preventive care screening?
- External procedures?

Summary Reports

- **Patient summary reports are useful for providing a comprehensive view of the patient**
- **Both registries and EHRs support summary reports**
- **Based on structured data**
- **May include reminders or alerts**

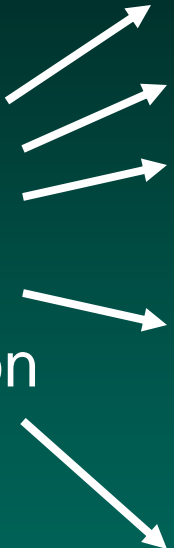
Patient Worksheet

11 July 2003		 Patient Worksheet				v1.0.21
PATIENT NAME TEST, A A		SEX F	DOB 09/01/1964	MMI# 545073664	MRN# 545073664	
Problems						
Hyperthyroidism status post appendectomy Diabetes mellitus type 2, insulin treated			Hypertension Appendectomy Coronary artery disease			
Active Medications						
1. - Digitoxin, 0.1mg, Tablet; 3 TABLET 2. - Entex LA (Guaifenesin/PPA HCl), 400-75mg, Tablet SA; 1 TABLET; BID						
Preventive Care						
CV Risk		Pap Smear				
5%*(1.4x)**		No Data -				
Clinical Laboratory Data						
HgbA1c (<=7.0)		UA Protein		uAlb/Cr (<30)		24 Urine Albumin (<30)
No Data -		06/01/2001 Negative 12/18/2000 Positive 11/06/2000 Negative		No Data -		No Data -
Serum Cr		Serum K		Lipid Profile		LDL (<100)
04/26/2003 1.1		04/26/2003 4.2		04/26/2003 107		93
10/25/2002 2.0		02/05/2003 6.0		04/06/2003 154		85
02/27/2002 1.6		10/25/2002 4.5		02/24/2003 149		151
10/03/2001 2.3		01/29/2002 6.1		02/06/2003 168		189
TC/HDL Ratio		HCT		hsCRP		Homocysteine
04/26/2003 3.5		02/05/2003 35.9 %		04/09/2003 0.6 mg/l		04/06/2003 6 mcml/l
04/06/2003 5.2		10/02/2002 37.7 %		02/24/2003 1.2 mg/l		
02/24/2003 5.4		08/23/2002 45.0 %				
02/06/2003 7.2		07/19/2002 29.9 %				
Fasting Glucose						
						02/25/2003 127
						12/19/2002 127
						01/02/2002 127
						12/20/2001 127
Clinic Data						
Date	Weight	BMI (<25)	Weight Class	Blood Pressure (<130/80)		Heart Rate
No Data	-	-	-	01/25/2001 145/74 mmHg		01/25/2001 86
Last foot exam:		No Data -				
Last dilated retinal exam:		No Data -				
Reminders						
Preventive						
* Predicted % Risk over 10 years of a cardiovascular event (MI, revascularization, CVA, death). ** Relative Risk over 10 years of a cardiovascular event compared to lowest risk category. Pap and pelvic suggested every 3 years after three normal yearly Pap tests. For Patients with known Cardiovascular Disease, target LDL < 100. Blood Pressure measurement is suggested for adults every two years. Suggested follow-up for missing data: - Pap Smear Pneumovax suggested for all patients age 65 and above, and all patients over age 2 with systemic chronic disease.						
Diabetes						
Suggest repeat Urine Albumin Test more than (>) 1 year since last test. Last ALT = 28 on 4/26/2003 & AST = 66 on 4/26/2003 Suggested follow-up for missing data: - HgbA1c - Dilated Retinal Exam - Foot Exam - Weight						
Hypertension						
ACE Inhibitors (ACEI) or if ACEI intolerant, Angiotensin II Receptor Blockers (ARBs) or the combination of ACEI or ARBS and Diuretics are the recommended initial drug therapy for patients who are diagnosed with hypertension in conjunction with Diabetes.						

Patient Worksheet

11 July 2003		Patient Worksheet			v1.0.21	
PATIENT NAME TEST, A A		SEX F	DOB 09/01/1964	MMI# 545073664	MRN# 545073664	
Problems						
Hypothyroidism, Hypertension, Diabetes mellitus type 2, treated, Coronary artery disease						
Active Medications						
1. - Digiloxin, 0.1mg, Tablet; 3 BLU 2. - Entex LA (Guaifenesin/PPA) 100mg, Extended Release Tablet, 600						
Preventive Care						
CV Risk Pap Smear						
5%*(1.4x)** No Data						
Clinical Laboratory Data						
HgbA1c (<=7.0)		UA Protein		uAlb/Cr (<30)		24 Urine Albumin (<30)
No Data -		06/01/2001 Negative 12/18/2000 Positive 11/06/2000 Negative		No Data -		No Data -
Serum Cr		Serum K		Lipid Profile		LDL (<100)
04/26/2003 1.1		04/26/2003 4.2		04/26/2003 10		93
10/25/2002 2.0		02/05/2003 3.0		04/26/2003 15		50
02/27/2002 1.6		10/25/2002 5.5		02/27/2002 14		41
10/03/2001 2.3		01/29/2002 6.1		02/05/2003 168		189
TC/HDL Ratio		HCT		hsCRP		Homocysteine
04/26/2003 3.5		02/05/2003 35.9 %		04/09/2003 0.6 mg/l		04/06/2003 6 micromol/l
04/09/2003 5.2		10/02/2002 37.7 %		02/24/2003 1.2 mg/l		02/25/2002 127
02/24/2003 5.4		08/23/2002 45.0 %				12/19/2002 127
02/06/2003 7.2		07/19/2002 29.9 %				01/02/2002 127 12/20/2001 127
Clinic Data						
Date		Weight		BMI (<25)		Weight Class
No Data -		-		-		-
Blood Pressure (<130/80)		Heart Rate				
01/25/2001 145/74 mmHg		01/25/2001 86				
Last foot exam:		No Data				
Last dilated retinal exam:		No Data				
Reminders						
Preventive						
* Predicted % Risk over 10 years of a cardiovascular event (MI, revascularization, CVA, death). ** Relative Risk over 10 years of a cardiovascular event compared to lowest risk category. Pap and pelvic suggested every 3 years after three normal yearly Pap tests. For Patients with known Cardiovascular Disease, target LDL < 100. Blood Pressure measurement is suggested for adults every two years. Suggested follow-up for missing lipid = 1 year since last test. Pneumovax suggested for all patients aged 65 and older, and for patients 50 and older with chronic conditions.						
Diabetes						
Suggest repeat Urine Albumin Test more than 1 year since last test. Last ALT = 28 on 4/26/2003, AS = 86 on 4/26/2003 Suggested follow-up for missing retinal = 1 year since dilated retinal exam, Foot Exam, Weight						
Hypertension						
ACE Inhibitors (ACEI) or if ACEI intolerant, Angiotensin II Receptor Blockers (ARBs) or the combination of ACEI or ARBs and Diuretics are the recommended initial drug therapy for patients who are diagnosed with hypertension in conjunction with Diabetes.						
						Page 1 of 2

General patient status information



Problems and chronic conditions

Medication profile

Preventive care summary

Pertinent labs

Pertinent exams

Passive reminders

Organized by illness

Disease-specific information



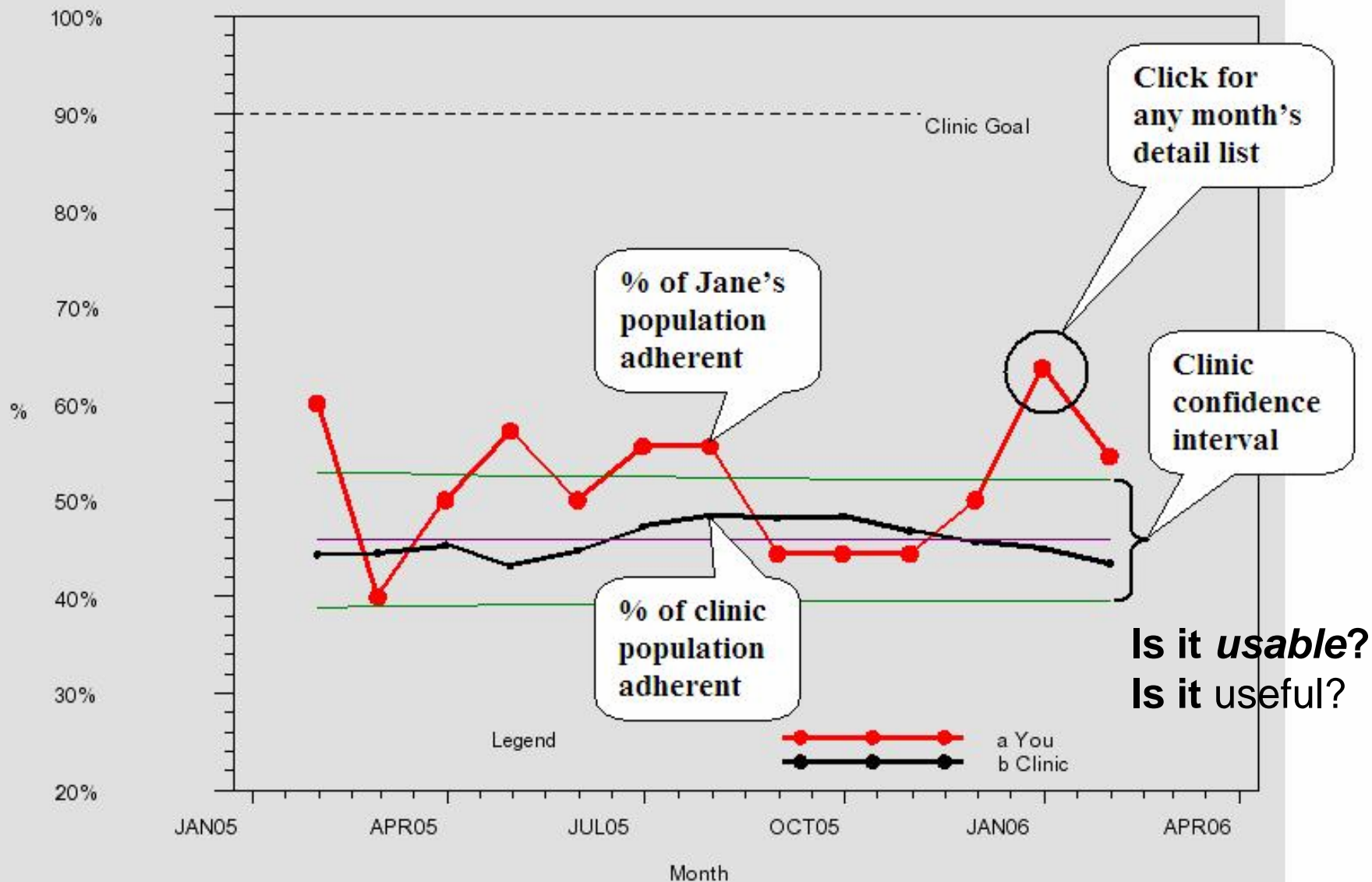
Population exercise

- Sheet marked “ population management – data interpretation plan”
- You are Jo(e) Smith – what is the data telling you? what will you focus on next? What else do you need to make a decision?
- Please work with a partner.
- SM = self-management goal
- Flu vacc = flu vaccine

Statistical process control charts need means and error ranges with comparisons and goals.

Adherence for PCP Jane Doe

of Foot exam < 1yr



Calling a patient *only* once and prioritizing patients can be aided by summary tables.

Complete list of patients for PCP Entire Clinic
 For explanation/feedback, [click here](#)

MRN	Last name	Phone	HbA1c test < 6mo	HbA1c < 7	LDL test < 1yr	LDL < 100	bp < 130/80	eye exam < 1yr	foot exam < 1yr	Doc SM goals	flu vaccine	pneumovax	microalbumin	albumin < 1 yr			
<p>HIPAA Screen (don't peek!)</p>			X	X	X	X	X	X	X	X	X	X	X	X			
			X	X	X	X	X	X	X	X	X	X	X	X	X		
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	+	X	X	X	X	X	X	X	X
			X	+	X	X	X	X	X	X	X	X	X	X	X	X	X

Sorted by most X's

Tables may be confusing and take too long to interpret.

To do lists are a familiar item and may be more easily understood (usability).

For Patient [Give Feedback](#)

The patient should be notified of tests or visits needed. Please fill out SmartForm if needed

Process

1. Order **HbA1c test** (suggested every 6 months): Last *Unknown*
2. Order **LDL test** (due every 12 months): Last *06/06/02*
3. Order **Microalbumin test** (due every 12 months): Last *Unknown*
4. Order/check on **eye exam** (due every 12 months): Last *Unknown*
5. Check for **monofilament foot exam**, bring in if not done (due every 12 months): Last
6. Check on / order **flu shot** (due every 12 months): Last *Unknown*
7. Check for / order **pneumovax** (due every 5 year): Last *Unknown*

Only list non-adherent measures

Outcomes

1. Intensify **hypoglycemic control**: Last HbA1c *Unknown*
2. Intensify **Blood Pressure control**: Last BP *J.*
3. Intensify **cholesterol treatment**: Last LDL *120*
4. Monitor for nephropathy: Last microalbumin *Unknown*

Separate outcome actions

For Patient [Give Feedback](#)

The patient should be notified of tests or visits needed. Please fill out SmartForm if needed

1. Etc ...