Using a Diabetes Registry to Improve Care & Outcomes

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Today's Presentation

- What is a disease-specific registry?
- How does it improve care?
- What is the evidence base for registry effectiveness?
- Different registry structures
- Registry content
- Ways to use registry information
- Outcome assessment & improvement

Disease Registry

- An electronic database containing data from paper and electronic medical records
- Focused on patients with specific types of chronic diseases & medical conditions
- Used by care providers, patients, & administrators to facilitate delivery of health care and implement evidence-based medicine

(Ortiz, 2006)

Registries help providers overcome fragmented care…

- Allows for identification and tracking of patients with a specific chronic condition
- Enables individual disease management through notifications of abnormal test results, missed appointments, & up to date information for patient encounters
- Tracks the progress of high-risk patients
- Promotes use of evidence-based care
- Facilitates health outcomes management at both the individual and clinic levels

(Hummel, 2000)

Registries - advantages to patients

- Allows pts to see all their test results in one place
- Enables pts to compare their test results & health outcomes with others
- Permits pts to share results with other providers for better care coordination
- Helps pts see their results over time to assess improvement & identify areas of concern

Registries offer a different perspective

"A physician who opens the chart may see that the patient's blood sugar is up. But that doesn't tell the clinician that out of 200 patients with diabetes, 10 are out of control."

Iowa Department of Public Health
Disease Registry Issue Brief, 2010

Diabetes registry research

- 82 patients at a community clinic (registry) compared to 63 patients in same practice group (no registry)
- Found significant increases in the % receiving evidenced-based care for registry pts
  - Ø serum creatinine, lipid, & hemoglobin A1C checks
  - Ø foot and retinal examinations
  - Ø patient establishment of self-management goals
- No significant increases were observed in the comparison group

(East et al., 2003)

Diabetes registry research (cont.)

- Overall completion of evidence-based care processes increased by 26% in the intervention group compared to 3% in the comparison group
- Adherence to care standards occurred 82% of the time in the intervention group but only 51% of the time in the comparison group.

(East et al., 2003)

Diabetes registry research

Diabetes registry introduced in 9 primary care clinics

- Found increases in the percentage with good LDL-C control from 35% prior to 52% after registry use began
- Showed reduction in the proportion of patients with poor hemoglobin A1C levels, from 12% prior to 9% after introduction of the registry

(Toh et al., 2009)

Diabetes registry research

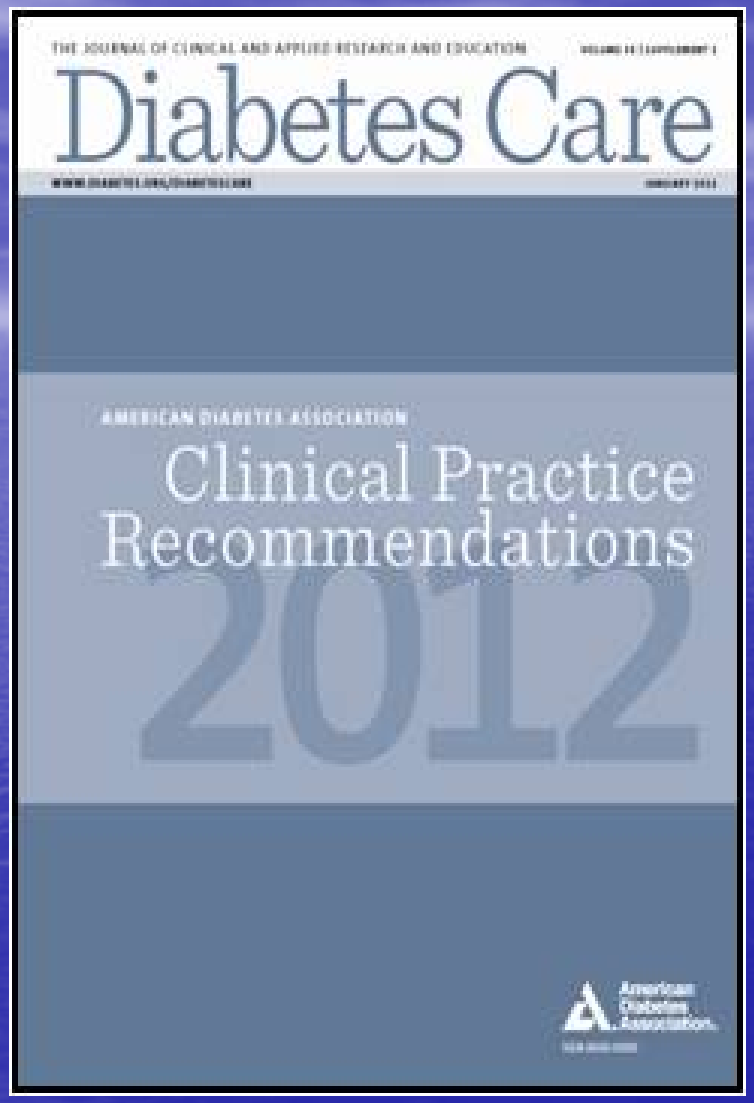
Effects of a diabetes registry containing clinical & administrative data on 600,000 VA patients was examined to assess changes within individual patients

- Found that case-mix-adjusted Hemoglobin A1C levels among veterans with diabetes decreased significantly, by 31%, over a 2-year period
- Improved glycemic control over time was not attributable to recruiting healthier patients

(Thompson et al., 2005)

Registry content

- ü Pt demographics
- ü Practice, clinic, other administrative identifiers
- ü Test results and dates (glycemic control)
- ü Coronary risk factors - blood pressure, lipids (total cholesterol, high-density lipoprotein [HDL], low-density lipoprotein [LDL], triglycerides), smoking status
- ü Medications
- ü Services meeting ADA practice standards
- ü Other co-morbidities



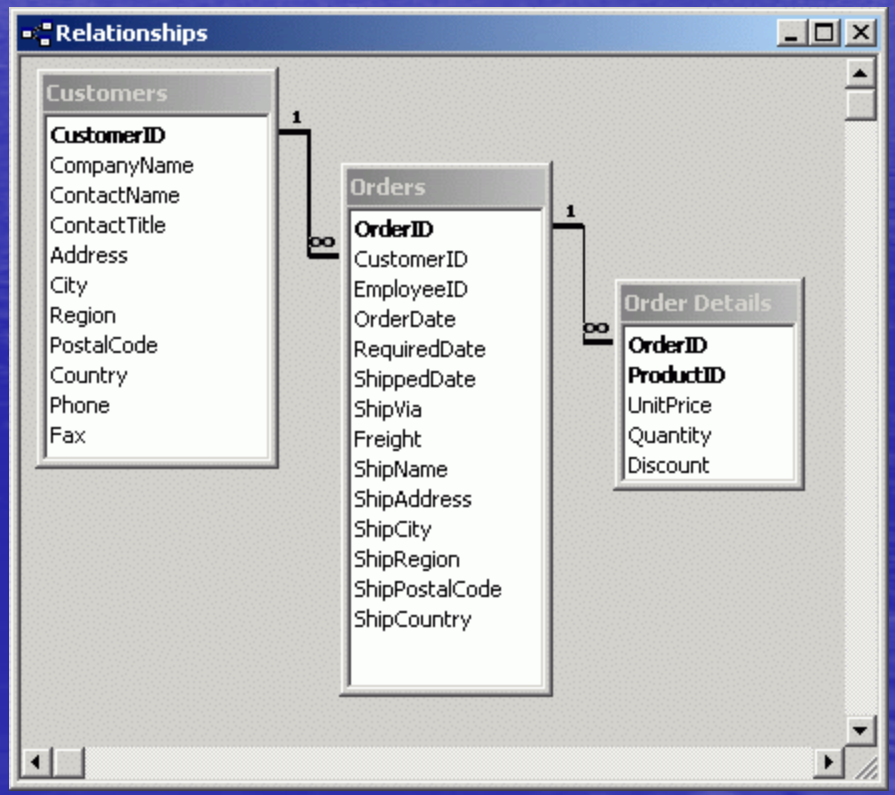
ADA Care Standards – Changes Call For Registry Revision

Registry Structure?

Spreadsheet vs. Relational Database

F16 $f(x)$ Σ =

	A	B	C	D	E	F
1						
2						
3	Date	Start time	End time	Pause	Sum	Comment
4	2007-05-07	9,25	10,25	0	1	Task 1
5	2007-05-07	10,75	12,50	0	1,75	Task 1
6	2007-05-07	18,00	19,00	0	1	Task 2
7	2007-05-08	9,25	10,25	0	1	Task 2
8	2007-05-08	14,50	15,50	0	1	Task 3
9	2007-05-08	8,75	9,25	0	0,5	Task 3
10	2007-05-14	21,75	22,25	0	0,5	Task 3
11	2007-05-14	22,50	23,00	0	0,5	Task 3
12	2007-05-15	11,75	12,75	0	1	Task 3
13						
14						
15						
16						
17						
18						



Spreadsheet

- Advantages
  - Visibility
  - Ability to interact with the data
  - Simplicity
  - Ease of data entry & data cleaning
- Disadvantages
  - Difficulty of macros
  - Labor-/time-intensiveness
  - Unwieldiness when used for multiple disease registries
    - Use a single spreadsheet for all diseases?
    - Use different spreadsheets for separate diseases?

Relational Database

Advantages

- Automation
- Roll up/Drill down features
- Facility of multiple disease management programs

Disadvantages

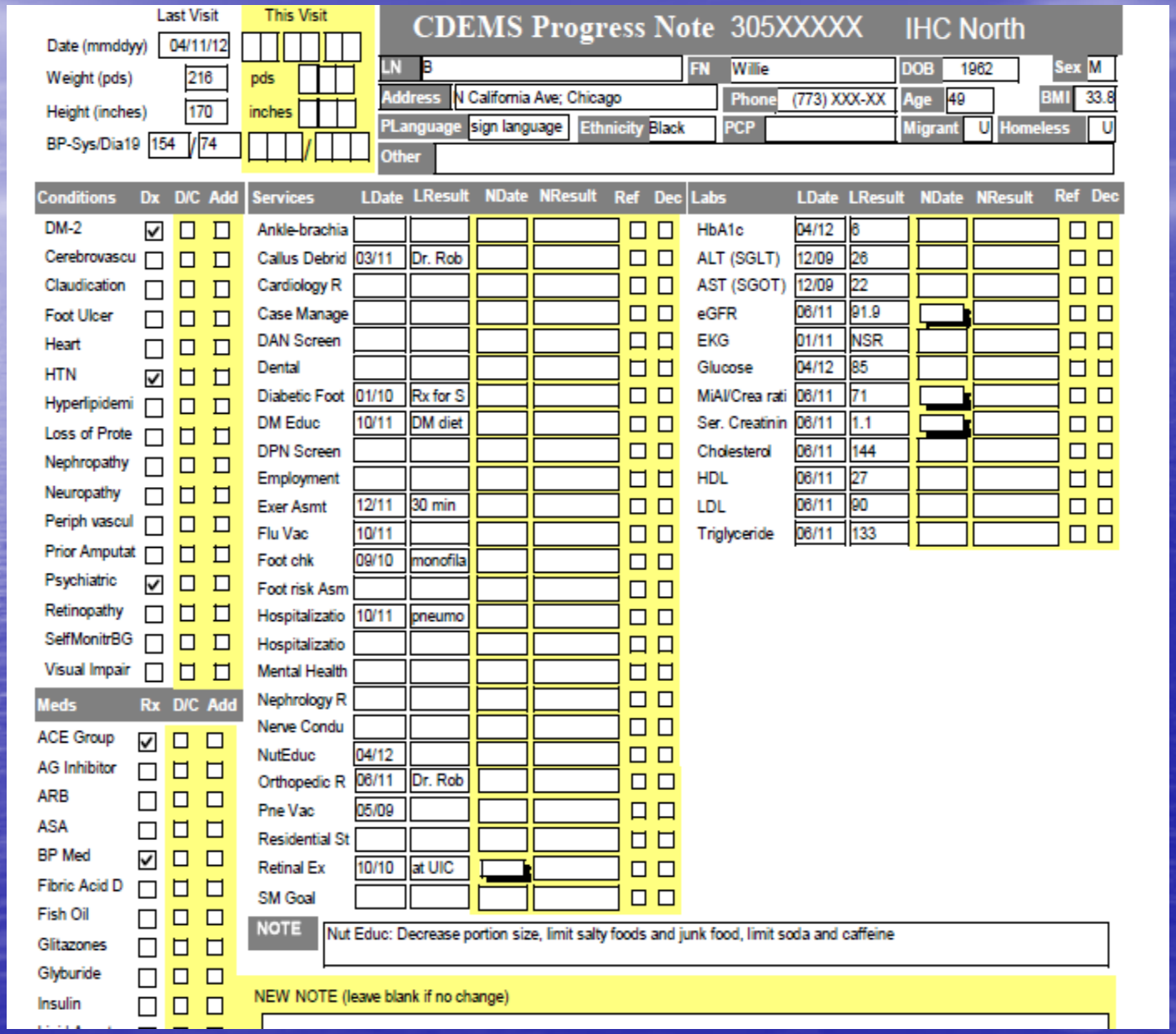
- Complexity
- Difficulty of error identification
- Expense of data entry tools
- System instability

SAMPLE DIABETES TRACKING SPREADSHEET

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Diabetes Tracking Worksheet**															
2	NOTE: DO NOT COPY AND PASTE DATA FROM CELL TO CELL AS THIS MAY UNDO IMPORTANT FORMATTING.															
3	KEY: A1c = hemoglobin A1c; DFE = dilated fundoscopic exam; BMP = basic metabolic panel; BP = blood pressure															
4	Patient name	Sex	Date of birth	ID number	Prov ider	A1c	Date of last A1c	Date of last DFE	Date of last foot exam	Date of last BMP	LDL	Date of last lipids test	Sys BP	Dia BP	Date of last BP	Co-morbidities
5	Adams,	F	03/14/56	111-11-1111	Ortiz	6.5	1-Mar-06	1-Apr-05	1-Mar-06	1-Mar-06	75	23-Nov-05	140	90	23-Nov-05	HTN, obesity
6	Baker, J	M	10/05/70	222-22-2222	Ortiz	5.7	24-Feb-06	12-Dec-05	24-Feb-06	24-Feb-06	90	24-Feb-06	110	75	12-Dec-05	
7	Brown, J	F	02/22/63	333-33-3333	Ortiz	6.3	23-Jan-06	24-Jul-05	23-Jan-06	23-Jan-06	103	23-Jan-06	105	85	23-Jan-06	HTN, Retinopathy
8	Carter, J	M	07/05/73	444-44-4444	Ortiz	7.8	16-Feb-06	20-Mar-05	16-Feb-06	12-Nov-05	98	12-Nov-05	131	75	16-Feb-06	
9	Doe, Jar	F	08/06/66	555-55-5555	Ortiz	6.8	24-Oct-05	21-Jul-05	24-Oct-05	24-Oct-05	88	24-Oct-05	120	80	24-Oct-05	
10	Douglas	M	07/01/49	666-66-6666	Ortiz	7.5	6-Aug-05	2-Feb-05	9-Jan-06	9-Jan-06	87	9-Jan-06	130	80	9-Jan-06	HTN
11	Jones, J	F	10/01/42	777-77-7777	Ortiz	6.2	19-Dec-05	16-May-05	19-Dec-05	19-Dec-05	99	19-Dec-05	128	77	19-Dec-05	
12	Lane, Jc	M	01/01/64	888-88-8888	Ortiz	6.4	31-Jan-06	31-Jan-06	31-Jan-06	31-Jan-06	67	31-Jan-06	115	80	31-Jan-06	
13	Smith, J	F	07/31/38	999-99-9999	Ortiz	6	17-Dec-05	17-Dec-05	17-Dec-05	17-Dec-05	100	17-Dec-05	130	80	17-Dec-05	
14	White, J	M	02/28/53	000-00-0000	Ortiz	7	29-Dec-05	18-May-05	29-Dec-05	29-Dec-05	76	29-Dec-05	120	75	29-Dec-05	
15																

Download for free ~ http://www.aafp.org/fpm/2006/0400/p47.html

Sample Patient Specific Report - Relational Database



CDEMS Progress Note 305XXXXX IHC North

	Last Visit	This Visit
Date (mmddyy)	04/11/12	
Weight (pds)	216	pds
Height (inches)	170	inches
BP-Sys/Dia19	154 / 74	/

LN	B	FN	Willie	DOB	1962
Address	N California Ave; Chicago	Phone	(773) XXX-XX	Age	49
PLanguage	sign language	Ethnicity	Black	PCP	
Migrant	U	Homeless	U	Other	

Sex M BMI 33.8

Conditions	Dx	D/C	Add
DM-2	☑	☐	☐
Cerebrovascu	☐	☐	☐
Claudication	☐	☐	☐
Foot Ulcer	☐	☐	☐
Heart	☐	☐	☐
HTN	☑	☐	☐
Hyperlipidemi	☐	☐	☐
Loss of Prote	☐	☐	☐
Nephropathy	☐	☐	☐
Neuropathy	☐	☐	☐
Periph vascul	☐	☐	☐
Prior Amputat	☐	☐	☐
Psychiatric	☑	☐	☐
Retinopathy	☐	☐	☐
SelfMonitrBG	☐	☐	☐
Visual Impair	☐	☐	☐

Meds	Rx	D/C	Add
ACE Group	☑	☐	☐
AG Inhibitor	☐	☐	☐
ARB	☐	☐	☐
ASA	☐	☐	☐
BP Med	☑	☐	☐
Fibric Acid D	☐	☐	☐
Fish Oil	☐	☐	☐
Glitazones	☐	☐	☐
Glyburide	☐	☐	☐
Insulin	☐	☐	☐

Services	LDate	LResult	NDate	NResult	Ref	Dec
Ankle-brachia					☐	☐
Callus Debrid	03/11	Dr. Rob			☐	☐
Cardiology R					☐	☐
Case Manage					☐	☐
DAN Screen					☐	☐
Dental					☐	☐
Diabetic Foot	01/10	Rx for S			☐	☐
DM Educ	10/11	DM diet			☐	☐
DPN Screen					☐	☐
Employment					☐	☐
Exer Asmt	12/11	30 min			☐	☐
Flu Vac	10/11				☐	☐
Foot chk	09/10	monofila			☐	☐
Foot risk Asm					☐	☐
Hospitalizatio	10/11	pneumo			☐	☐
Hospitalizatio					☐	☐
Mental Health					☐	☐
Nephrology R					☐	☐
Nerve Condu					☐	☐
NutEduc	04/12				☐	☐
Orthopedic R	06/11	Dr. Rob			☐	☐
Pne Vac	05/09				☐	☐
Residential St					☐	☐
Retinal Ex	10/10	at UIC	[redacted]		☐	☐
SM Goal					☐	☐

Labs	LDate	LResult	NDate	NResult	Ref	Dec
HbA1c	04/12	8			☐	☐
ALT (SGLT)	12/09	26			☐	☐
AST (SGOT)	12/09	22			☐	☐
eGFR	06/11	91.9	[redacted]		☐	☐
EKG	01/11	NSR			☐	☐
Glucose	04/12	85			☐	☐
MiAl/Crea rati	06/11	71	[redacted]		☐	☐
Ser. Creatinin	06/11	1.1	[redacted]		☐	☐
Cholesterol	06/11	144			☐	☐
HDL	06/11	27			☐	☐
LDL	06/11	90			☐	☐
Triglyceride	06/11	133			☐	☐

NOTE: Nut Educ: Decrease portion size, limit salty foods and junk food, limit soda and caffeine

NEW NOTE (leave blank if no change)

Registries Can Promote Better Care Across Clinics

All Population Diabetes Data: 1/1/08-12/31/08									
Clinic	Beaverdale	Campus	East FP	Jefferson	North FP	Panora	South	Urbandale	West FP
Total Patients	760	597	832	592	1113	80	890	840	997
Process goals:									
HgAlc last 12 mo.	89.7%	93.1%	90.5%	75.0%	93.6%	95.0%	93.4%	88.3%	85.0%
LDL last 12 mo.	85.0%	87.9%	85.1%	43.0%	86.4%	92.5%	88.1%	81.4%	82.2%
Microalb last 12 mo.	74.7%	78.2%	72.1%	37.3%	76.6%	85.0%	74.6%	77.4%	68.5%
Eye Exam last 12 mo.	41.7%	31.7%	44.4%	21.6%	48.4%	40.0%	37.9%	48.8%	35.1%
Outcome goals: Not done in the last 12 mo. Indicates a failure									
% HgAlc ≤ 8.0	76.6%	69.2%	76.3%	61.7%	77.5%	70.0%	79.0%	78.0%	72.0%
% HgAlc ≤ 7.0	59.1%	50.1%	61.4%	45.6%	56.1%	47.5%	58.9%	59.2%	50.6%
% LDL < 130	72.5%	70.4%	69.8%	37.0%	78.0%	73.8%	74.2%	74.4%	73.9%
% LDL < 100	52.5%	51.3%	50.8%	27.2%	59.2%	52.5%	58.2%	62.5%	55.4%
% BP < 140/80	56.7%	62.3%	66.8%	31.0%	49.4%	63.8%	52.4%	64.5%	55.5%
All Population HTN Data: 1/1/08-12/31/08									
Clinic	Beaverdale	Campus	East FP	Jefferson	North FP	Panora	South	Urbandale	West FP
Total Patients	1852	995	839	417	3311	46	733	813	2455

Patient Report Card
uses pt-friendly language, shows progress

Age: 59 **Sex: Male** **MR #: 0003395**

	Goal	Dec 2009	Mar 2009	Jul 2008
Weight		168	161	158
BP	Less than 130/80 Best 120/80	122/68	158/80	150/70
Tests				
HbA1c (Sugar for 3 months)	Less than 7 Best if 6	6.9	6.8	5.8
LDL (Lousy or bad cholesterol)	Less than 100 Best if 70		117	98
HDL (Happy or good cholesterol)	Greater than 40		58	57
Triglycerides (another bad fatty substance)	Less than 150		177	59
Medication				
Aspirin or Anti-coagulant (to prevent heart attacks)	Take daily	No	No	No

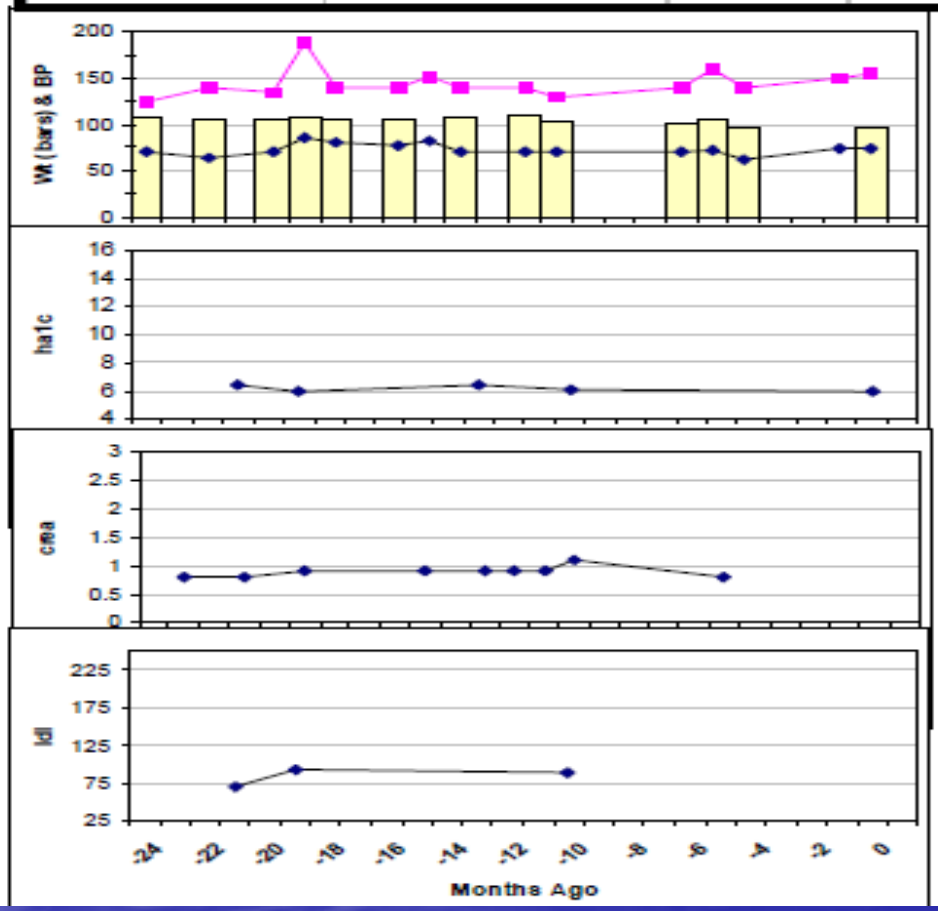
Important Yearly Activities	Goal	Status	Next Test Due	Most Recent Test
Eye Check (to prevent blindness)	1 time a year	Completed	3/25/2010	3/25/2009
Foot Check (to check for numbness and sores)	1 time a year	OVERDUE		
Urine Micro Albumin (to check for kidney failure)	1 time a year	Completed	3/25/2010	3/25/2009
Flu Shot (to prevent flu)	1 time a year	OVERDUE		

Special Vaccine	Goal	Status
Pneumovax (to prevent a special pneumonia: given once in a lifetime - twice if first was given before age 65)	1st	Incomplete

Patient Report Card ~ Visual & Numerical Results

Recommendations

Test/Treatment Type	Standard For Your Care	Last Done	Additional Information
Complete foot exam	Every 12 months	09/10 monofilam	Complete exam every 12 months
Discuss smoking status	Cessation offered if smoker	01/10 current	Smoking causes high risk of heart attack, stroke, and amputations
GlycoHgb (HbA1c)	Check 6mo; Goal<=7	04/12: 6	Checks for control of your blood sugars over past 3 months.
LDL "Bad" Cholesterol	Check 12 mo; Goal<=100	06/11: 90	Checks for "bad" cholesterol that can cause heart attacks.
Pneumonia vaccine	Once in all diabetes	05/09	Prevents common type of pneumonia, meningitis, and sepsis.
Retinal (eye) exam	Dilated exam every 12 mo	10/11	Checks for eye damage from diabetes (can cause blindness).
Self management goal	Discussed/documented in all		Helps you set your own goals for controlling your diabetes.
Urine MicroAlbumin	Check 12mo: Goal<=20	11/11: n/a	Checks for protein in your urine (sign of kidney damage.)



Your Blood Pressure and Weight

Date	Sys	Dia
04-11-12	154	74
04-09-12	163	55
04-02-12	157	71
03-23-12	161	71
03-07-12	150	74
03-02-12	154	73

Date	Wt
04/11/12	98
12/30/11	98
11/18/11	104
11/04/11	98
10/03/11	101
09/08/11	98

ha1c

Date	result
4/11/2012	6
6/24/2011	6.1
3/10/2011	6.4
9/9/2010	5.9
7/7/2010	6.4
4/1/2010	6.9

crea

Date	result
11/4/2011	0.8
6/30/2011	1.1
6/24/2011	0.9
6/2/2011	0.8
5/5/2011	0.9
4/21/2011	0.9

ldl

Date	result
6/24/2011	90
9/9/2010	94
7/7/2010	70
12/14/2009	83

'Birthday Letter'

Registry information used to generate personalized letters sent to patients in Lorain, OH with high or missing LDL-C values during their birthday month. Underlined text is inserted using expert logic.

Cleveland VA **July 27, 2007**

Dear JOHN DOE,
Happy Birthday! Your VA health care providers want you to have many more!
We are sending you your latest diabetes test results because our VA records show that your blood test for cholesterol is either too high, or needs to be rechecked.

Your LDL-cholesterol (the 'bad' kind of cholesterol) should be less than 100 to protect you from stroke or heart attack. Even if your last test was good, you are due to have it checked again.

Your primary provider at the VA Lorain clinic would like you to call L W to go over your results, set up a fasting blood test, or set up a visit.

Please call (440) 244-3833 EXT 2247 to schedule. If you come for a clinic visit, please bring in all of your medication bottles, your blood glucose meter, and any glucose records if you have them. Thanks!

Individualized Diabetes Report Contained in the 'Birthday Letter'

The values, messages, and smiley faces are driven by expert logic.

	Your Test	What it Means	Next Test	
Blood Pressure (average of your last 3 blood pressures)	**113 / 70**	Your top number is good. The target is between 110 and 135 The bottom number is good. The target is between 50 and 80	**November 2007**	☺
A1c	**8.7**	Your blood sugar runs too high on average. The VA's target is between 7 and 8.	**August 2007**	
LDL-cholesterol	**168**	Your LDL-cholesterol is too high. Keeping your LDL cholesterol under 100 lowers your risk for heart attack and stroke.	**February 2008**	
Eye Exam	**Done on schedule**	Most people with diabetes need a full eye exam at least once every year.	**February 2008**	☺
Foot Exam	**Done on schedule**	Everyone with diabetes needs a full foot exam once a year.	**January 2008**	☺

JOHN DOE
212 MORAN RD
LORAIN, OHIO 44055

VA Medical Center, Cleveland, OH

Diabetes Registry Used to Create an Online Social Networking Community

http://www.tudiabetes.org/opensocial/ningapps/show?appUrl=http%3A%2F%2Ftuanalyze.chip.org%2Ftuanalyze%2FdiabetesGadget.xml%3Fning-app-status%3Dnetwork&owner=askmanny

Registry Alone is Not Enough

Use with one (or more) of the following…

- Care coordinator
- Shared medical appointments (group visits)
- Benchmarks & physician reminders
- Patient illness self-management education

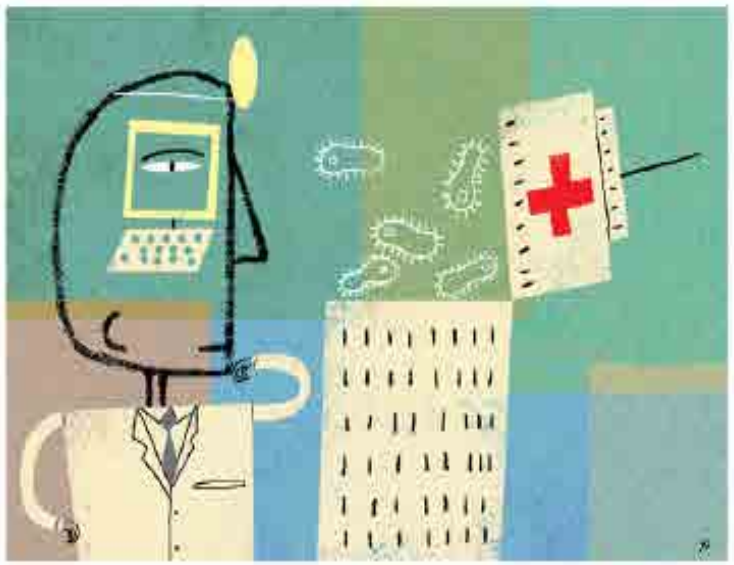
Registries Used for Other Diseases

- Asthma (used by 31.2%)*
- Congestive Heart Failure (used by 34.8%)*
- Depression (used by 15.7%)*
- Diabetes (used by 40.2%)*

*of those surveyed by Casalino et al. 2003, *JAMA*

Next Steps

- What kind of registry?
- For what purposes?
- Who are your users?
- Preferred structure?
- Who will maintain it?
- Will you use public domain software or a commercial product?



California HealthCare Foundation

Chronic Disease Registries:
A Product Review

ihealthreports

Prepared by NAS Consulting Services
May 2004

USEFUL RESOURCE

Available for free download from California HealthCare Foundation website http://www.chcf.org/

- Reviews public domain registry software & commercial software products
- Presents product profiles
- Offers product comparisons

To Reach Us…

- Visit our website

  www.cmhsrp.uic.edu/health/index.asp
- Learn about our registry study

  http://www.cmhsrp.uic.edu/health/medical_home_registry.asp