



IT use for interdisciplinary training: experience from Academics

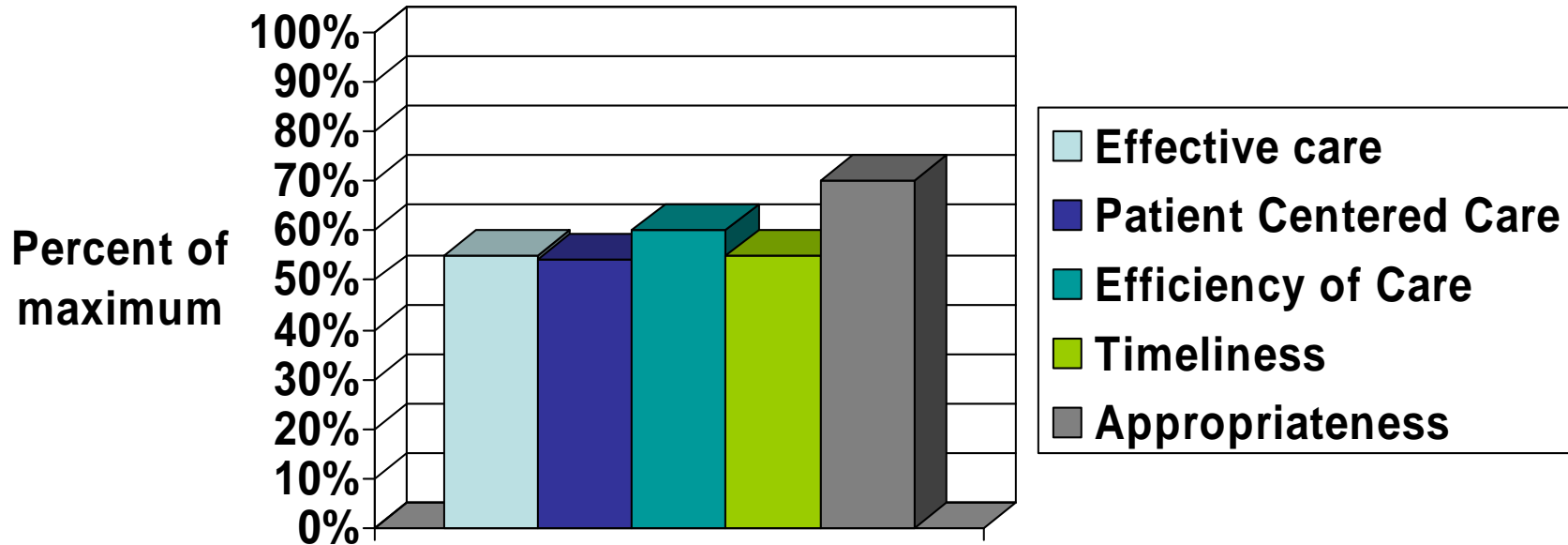
David A. Dorr
ABICBL

June 25th, 2007

Outline

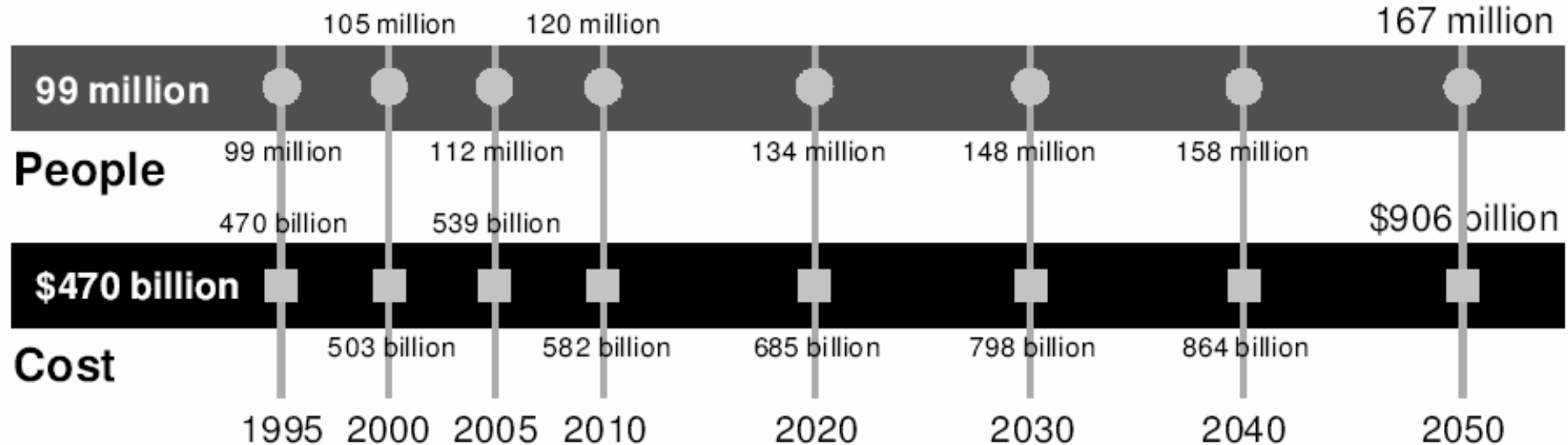
- Focus areas for training
 - Resident physicians : Chronic illness management
 - Nurses : Care Management (+ chronic illness)
- Special populations to consider
 - Complex illness (multiple comorbid illnesses; other confounding factors)
 - Older adults
- Goals
 - Transformed health care system (of tomorrow) that works today!

Why focus? Because the Care of Chronic illness is mediocre (or poor).



And the incidence (and burden) of chronic illness is growing

Estimated Number of Persons with Chronic Conditions and Direct Medical Costs for Persons with Chronic Conditions, Selected Years, 1995–2050



Diabetes Care in Academic Health Centers

	General Medicine	Diabetes/Endocrinology
HbA1c<7%	34%	34%
BP<130/80	30%	38%
Foot exam in past year	35%	64%
Eye exam in past year	42%	55%

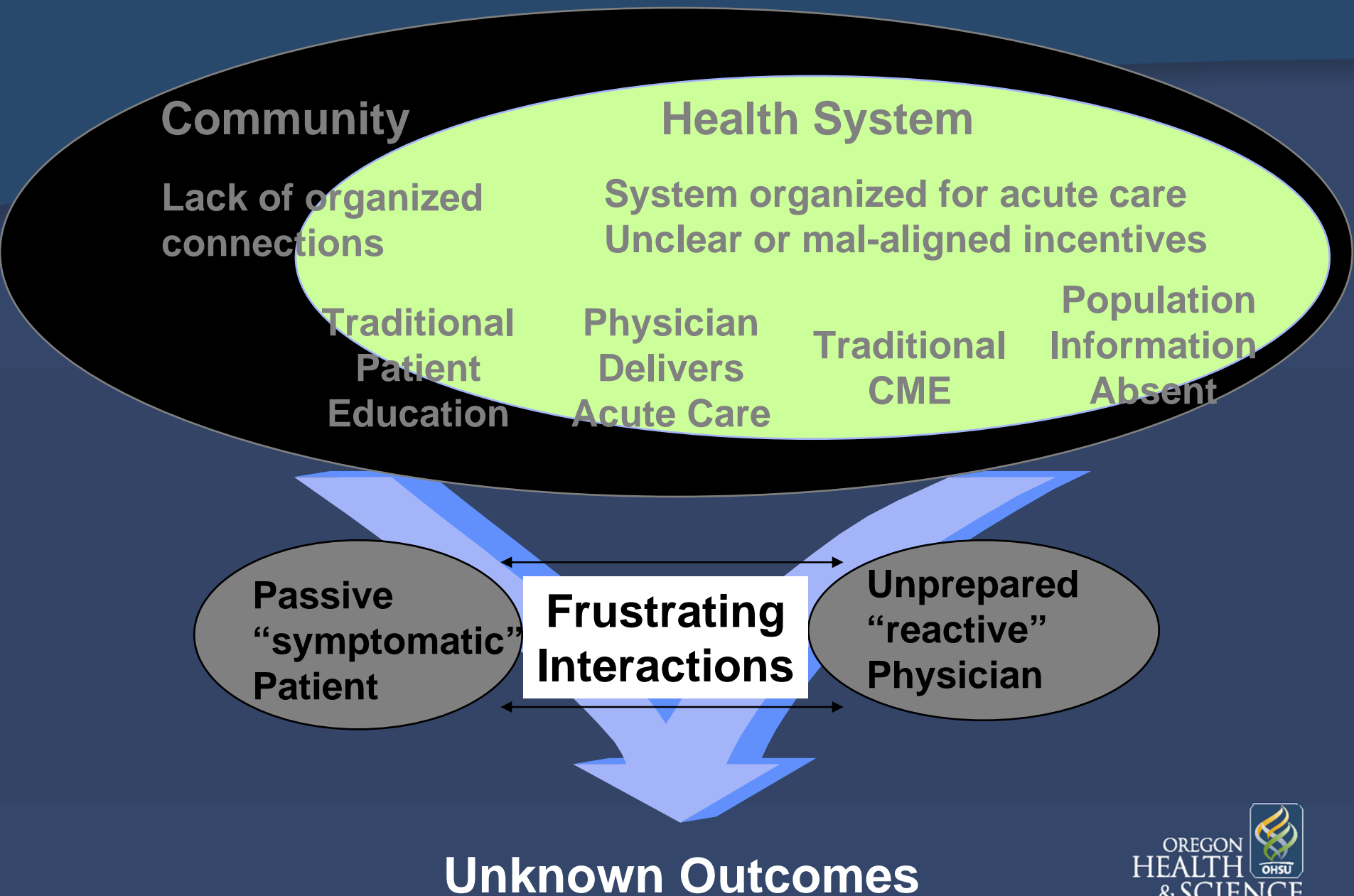
Grant et al., Diabetes Care, March, 2005

Features known to improve diabetes quality

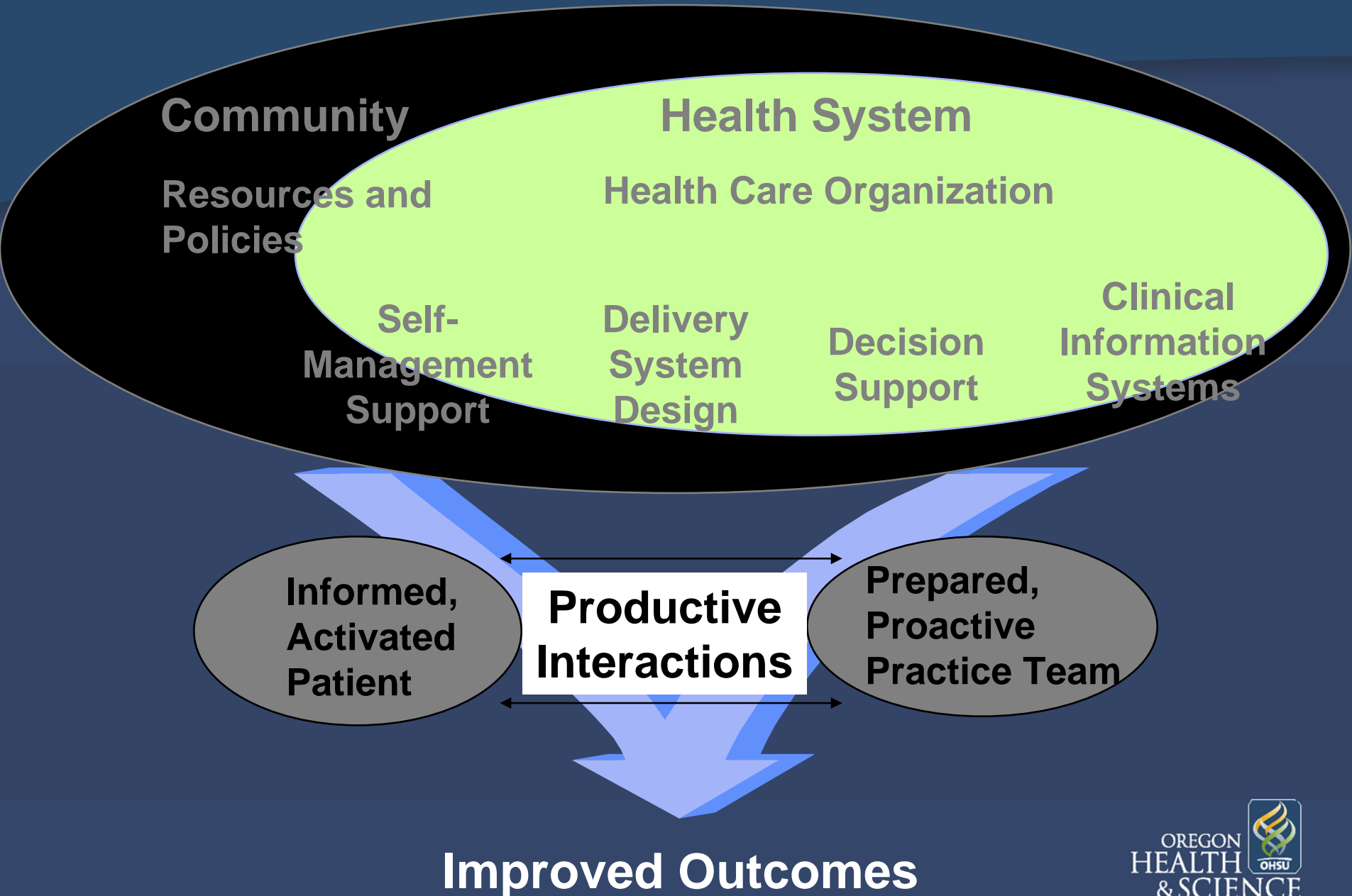
- Computerized reminders of guidelines
- Clinician education (mixed)
- Practitioner involvement on QI teams
- Formal patient self-management programs
- Population database (registry)
- Nurse care/case manager for complex needs

Fleming et al., AJMC 10:934, 2004; Shojania & Grimshaw, Health Affairs 2006

Usual Care Model



Chronic Care Model



Resident education: General Internal Medicine Chronic Illness Management Clinic

Oregon Health & Science University; led by
Judy Bowen and Albert Dipiero

Core Elements

- Team-based approach
- Quality Improvement (Plan-do-study-act)
- Longitudinal, chronic illness care
- Information Systems essential to success
(and challenges!)

Chronic Care Model

ACGME Competencies

- Patient Care
- Medical Knowledge
- **Practice-based Learning & Improvement**
- Interpersonal & Communication Skills
- Professionalism
- **Systems-based Practice**

Improved Outcomes

Internal Medicine Residency Program

90 Residents

60 "Senior" Residents (PGY2 or PGY3)

30 w/ Continuity
Clinic at OHSU

30 w/ Continuity
Clinic at VA

580 Patients with
Diabetes Mellitus
In Resident-Faculty
Practice

Required
"Chronic Illness Management"
Block Rotation (4 weeks)
2 faculty supervisors
1-3 residents per block

288
Referred to CIM
for consult or
co-management

Mean age 69 years
27% commercial insurance
61% female
26% non-white
27% with Depression

Block Rotation Details

(Two example sessions)

- Session 1

- 8:00 a.m. to 8:45 a.m.
 - Team PDSA meetings
 - Registry
- 8:45 a.m. to 9:00 a.m.
 - Team “huddle”
- 9:00 a.m. to 11:45 a.m.
 - Planned visits
- 11:45 a.m. to noon
 - Team “huddle” to plan follow up

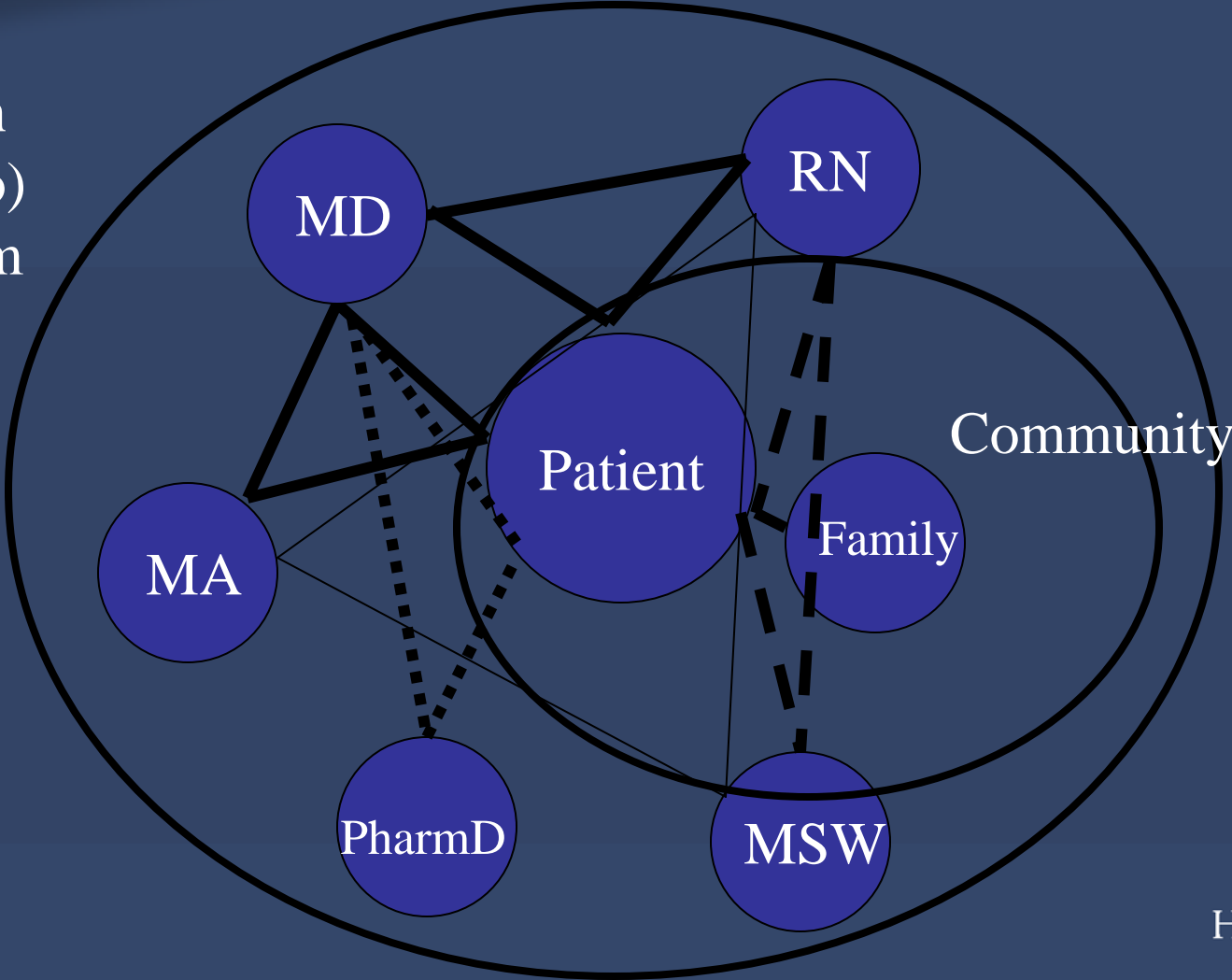
- Session 2

- 8:00 a.m. to 8:45 a.m.
 - Teaching
 - Learner presentations
- 8:45 a.m. to 9:00 a.m.
 - Team “huddle”
- 9:00 a.m. to 11:45 a.m.
 - Planned visits
- 11:45 a.m. to noon
 - Team “huddle” to plan follow up

Teamwork

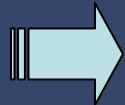
Communication, Trust, Respect

Health
(micro)
System



PDSA Example: Monofilament Exam

600+
Patients
with DM



CIM-DM
800 visits
per year

Residents'
Practice
6300 visits
per year

Resident-Faculty Practice
25,000 visits per year

*Monofilament exam
delegated to MA
*MA prompted by DM
summary sheet to use
planned visit protocol
every time a DM patient
has any appointment
*Updates process
measures at every visit

Clinical Information Systems

- Patient registry
 - Managing the 600+ DM population
- ***Summary sheet at point-of-care***
 - Caring for each patient
 - Registry data over time
 - Using evidence and guideline
- Improvement team meetings
 - Using “run charts” to evaluate change

Diabetes Registry

Diabetes Type

Type 1 Type 2 MODY

Diagnosis Date:

Last Visit Date:

None

Current Treatment

Insulin
 Oral Meds
 Diet Only

Blood Pressure

BP Today:

Goal:

Weight

BMI today:

Goal:

Tobacco Use:

Yes No

Counseled:

Renal Protection

ACE Inhibitors
 ARB
 Exempt

Yes No

Coumadin

Aspirin

Yes
 No
 Exempt

Foot Care

Brief Foot Inspection

Complete Foot Exam
 with Monofilament

Never done
 Normal
 Abnormal

Date of Complete Exam

Pneumovax Date

Declined

Flu Vaccine Date

Declined

Eye Care Date

Diabetes Education

Language spoken
 at home:

Yes No

Hospitalized Last 6
 Months

Where:

ER Visit Last 6
 Months

Where

Goals

	Date Discussed	Goal
Exercise	<input type="text"/>	<input type="text"/>
Diet	<input type="text"/>	<input type="text"/>
Meds	<input type="text"/>	<input type="text"/>
Glucose	<input type="text"/>	<input type="text"/>
Foot Check	<input type="text"/>	<input type="text"/>
Weight Loss	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>

Add to Registry

Accept

Cancel

Hospitals and Clinics

Diabetic Care Summary

Report Date: 10/20/2006

Patient Name:

Date of Birth:

PCP:

Clinic: Internal Medicine

Current Treatment: Insulin, Oral Meds (10/16/06)

Diagnosis Date:

Current Meds: ARB, Aspirin (10/16/06)

Diabetes Type: Type 2

Comorbidities: HTN (08/04/05), Hyperlipidemia (08/04/05), Nephropathy (10/19/05)

Last Visit Date: 10/16/06

BLOOD PRESSURE/WEIGHT/BMI

DATE	07/03/06	07/27/06	08/07/06	08/24/06	09/25/06	10/02/06	10/09/06	10/10/06	10/16/06
BP	152/80	126/78	154/84	140/90	140/84	126/80	144/72	164/94	122/80
Wt (lbs)	233	233	235	236	233	235	238		235
BMI	34.4		34.7	34.8	34.4	34.7	35.1		34.7

GLYCOHEMOGLOBIN

DATE	08/11/05	10/10/05	10/24/05	11/04/05	11/19/05	11/21/05	12/19/05	05/11/06	05/12/06
HgA1c	14.9	10.2	11.2	13.7	12	12.4	10.6	12.2	12.2

LIPID CONTROL

DATE	02/16/01	08/11/05	12/19/05	05/11/06	08/28/06				
LDL	141	140	172	171	174				

EYE CARE

DATE	12/07/05								
Result	Done								

RENAL CARE

DATE	08/11/05	08/11/05	11/19/05	08/07/06	08/07/06				
Text	MicroA	SpotMicro	MicroA	MicroA	SpotMicro				
Result	126	178	<3	580	569				

FOOT CARE

DATE	06/05/06	07/03/06	07/27/06	08/07/06	08/24/06	09/25/06	10/02/06	10/09/06	10/16/06
Exam	Brief	Brief	Brief	Brief	Brief	Brief	Brief	Brief	Brief
Result									

TOBACCO USE

DATE	10/02/06								
Uses									
Counsel	Yes								

VACCINATIONS


DATE	11/30/2000	11/30/2000	08/04/2005	08/15/2005	10/20/2005				

Summary sheet GIM

Not To Be Filed In The Medical Record

Summary Sheet: Patient Worksheet

Wilcox, Proc of AMIA Symp, 2005

16 November 2006		 Patient Worksheet Selected to Print for: All Patients, All Sections, Last Clinical Note			u1.070 Comprehensive Version
PATIENT NAME TEST, BED		SEX F	DOB 01/01/1911	MRN# 650730	MRN# 5992114
Problems					
Diabetes Mellitus, Type 2 Hype rlipidem ia		Chronic conditions			
Active Medications					
1. - Glucophage (Metformin HCl), 500mg, Tablet, 1 TABLET, Daily 2. - Simvastatin, 10mg, Tablet, Oral; 1 TABLET Daily 3. - Lisinopril, 10mg, Tablet, Oral; No dose for 1 day 4. - Calcium Carbonate/Vitamin D3 (Calcium 500 (w/Vitamin D3), 500-200, Tablet, 1 TABLET, BID					
Allergies					
(-) Penicillins - A Drug Allergy Group; Reaction(s): Rash					
Disease Management					
ADL Pain Score (0-10) WMS E 11/16/2006 5 11/16/2006 4 11/16/2006 2		Functional status			
Preventive Care					
Pap Smear Mammogram No Data No Data		Preventive care summary			
Clinical Laboratory Data					
HgbA1c (<7.0) UA Protein uAib/Cr (<30) 24 Urine Albumin (<30) Serum Cr No Data - No Data - No Data - No Data - No Data		Pertinent labs			
Serum K Lipid Profile LDL (<100) Trig (<150) HDL (>45) CHDL (<200) TC/HDL Ratio No Data - No Data - - - - - No Data -					
HCT HsCRP Homocysteine No Data - No Data - No Data -					
Clinic Data					
Date Weight BMI (<25) Weight Class Blood Pressure (<130/80) Heart Rate 01/16/2006 144 lbs 23 Normal 01/16/2006 122/74 mmHg 01/16/2006 74 01/11/2005 155 LBS 25 05/12/2003 50.00 N/A -		Pertinent exams			
Last foot exam: 11/2005 Abnormal Last dilated retinal exam: 11/2005 Abnormal					
Reminders					
Lab					
<input type="checkbox"/> Creatinine - Patient on Metformin product(s) and so Creatinine on record. <input type="checkbox"/> HgbA1C - Urine Albumin Test - HCT - Serum Cr (should be done on all Patients with Diabetes) <input type="checkbox"/> HCT - Serum K (should be done on all Patients with Diabetes)					
Procedure					
<input type="checkbox"/> Mammogram - Suggested yearly for women age 40 and above, every 1-2 years age 50 and above. <input type="checkbox"/> Pap smears - Suggested for all Patients with a cervix. For women age 21 and above, every 1-3 years. <input type="checkbox"/> Testis Examination - Suggested for men age 50 and above. <input type="checkbox"/> DEXA Screening - Suggested for women age 65 and over. Follow-up screening for those treated for osteoporosis recommended every 2-3 years. <input type="checkbox"/> Colon Cancer screen - Suggested yearly fecal test or sigmoidoscopy Q 5 years, or colonoscopy Q 10 years.					

What lessons are available from the PDSA?

- Information technology barriers and affordances
- Process success and maintenance

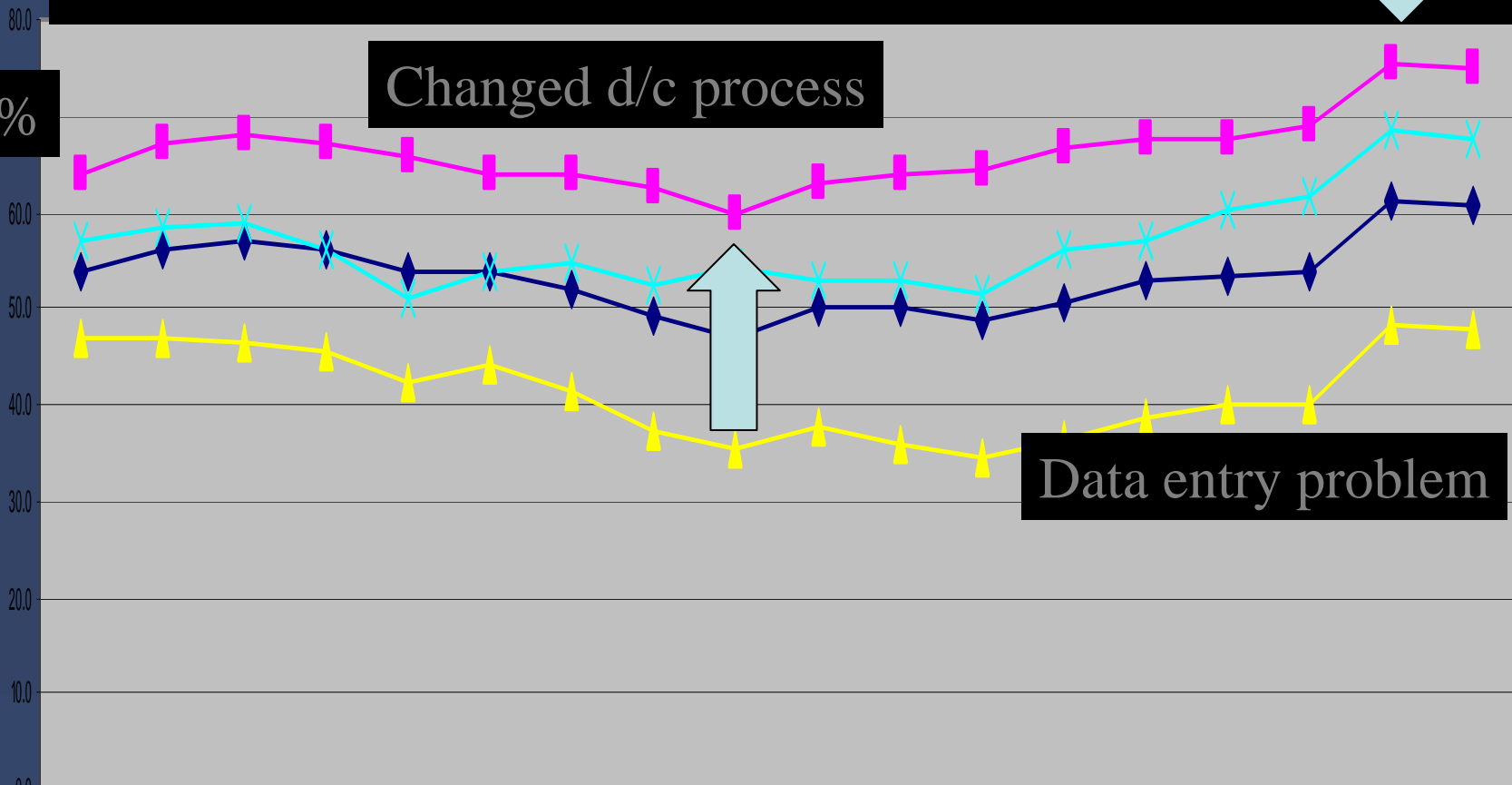
% Patients with Annual Dilated Eye Exam



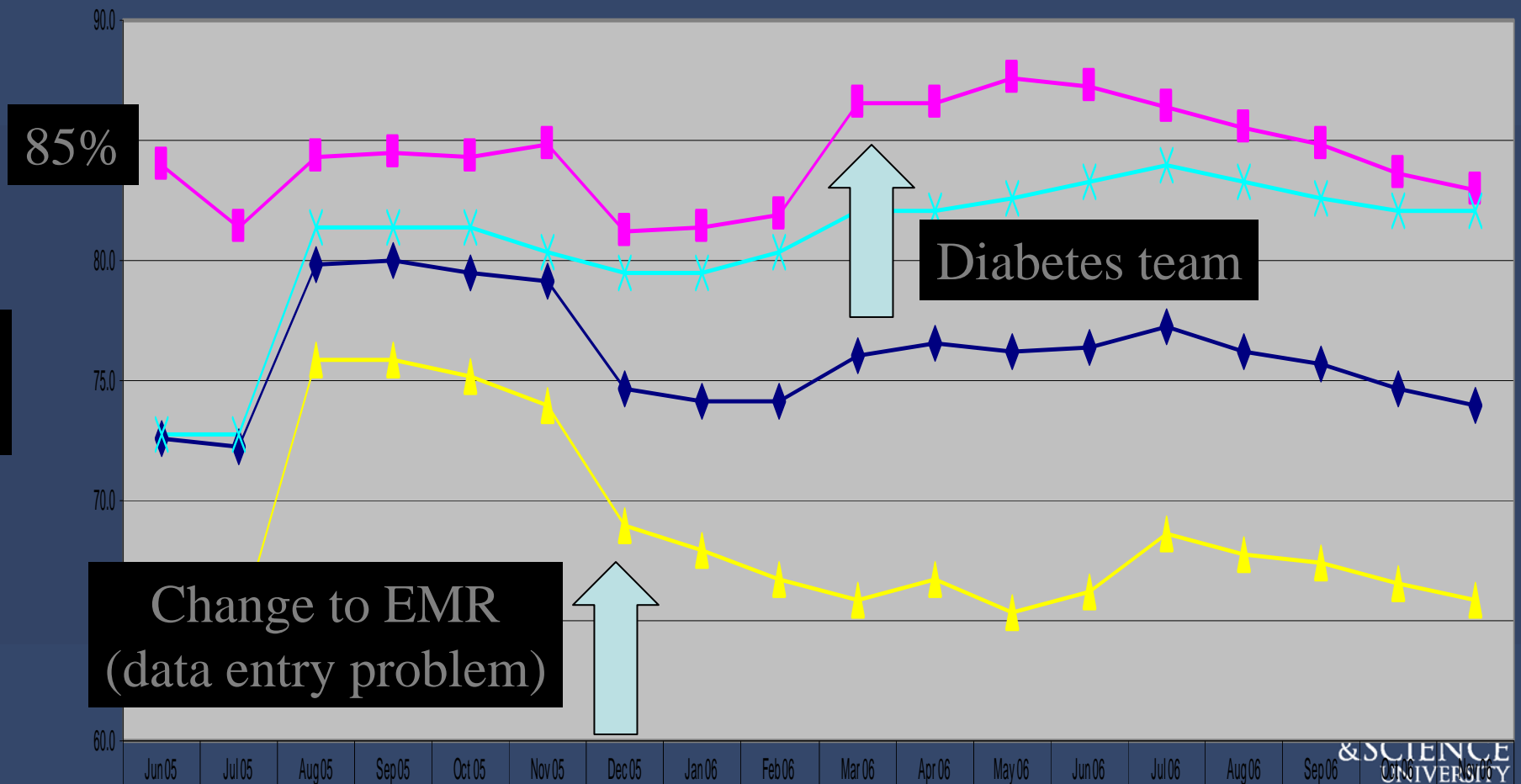
70%

Changed d/c process

Data entry problem



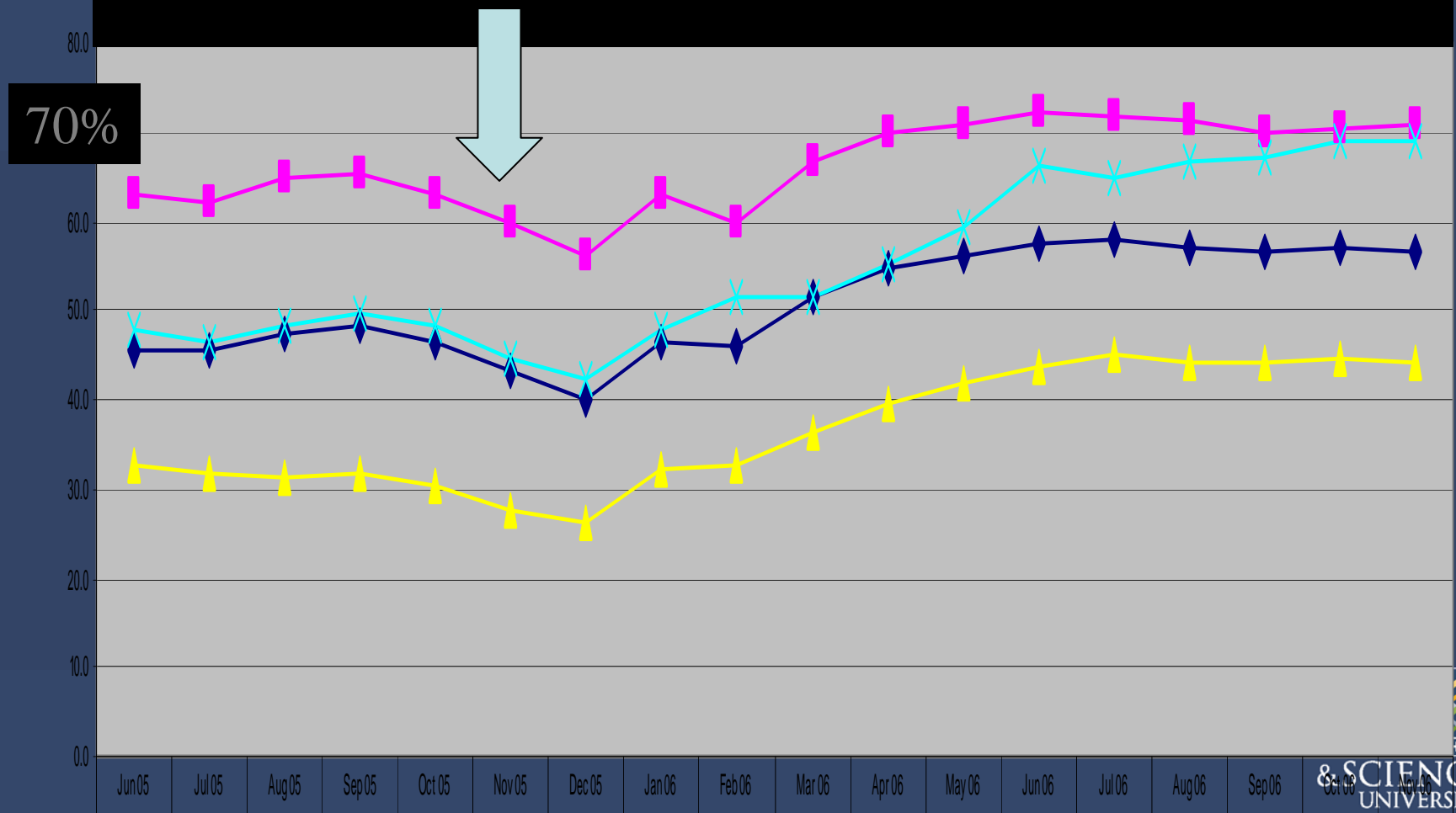
% Patients on Aspirin or Coumadin



Delivery System Design

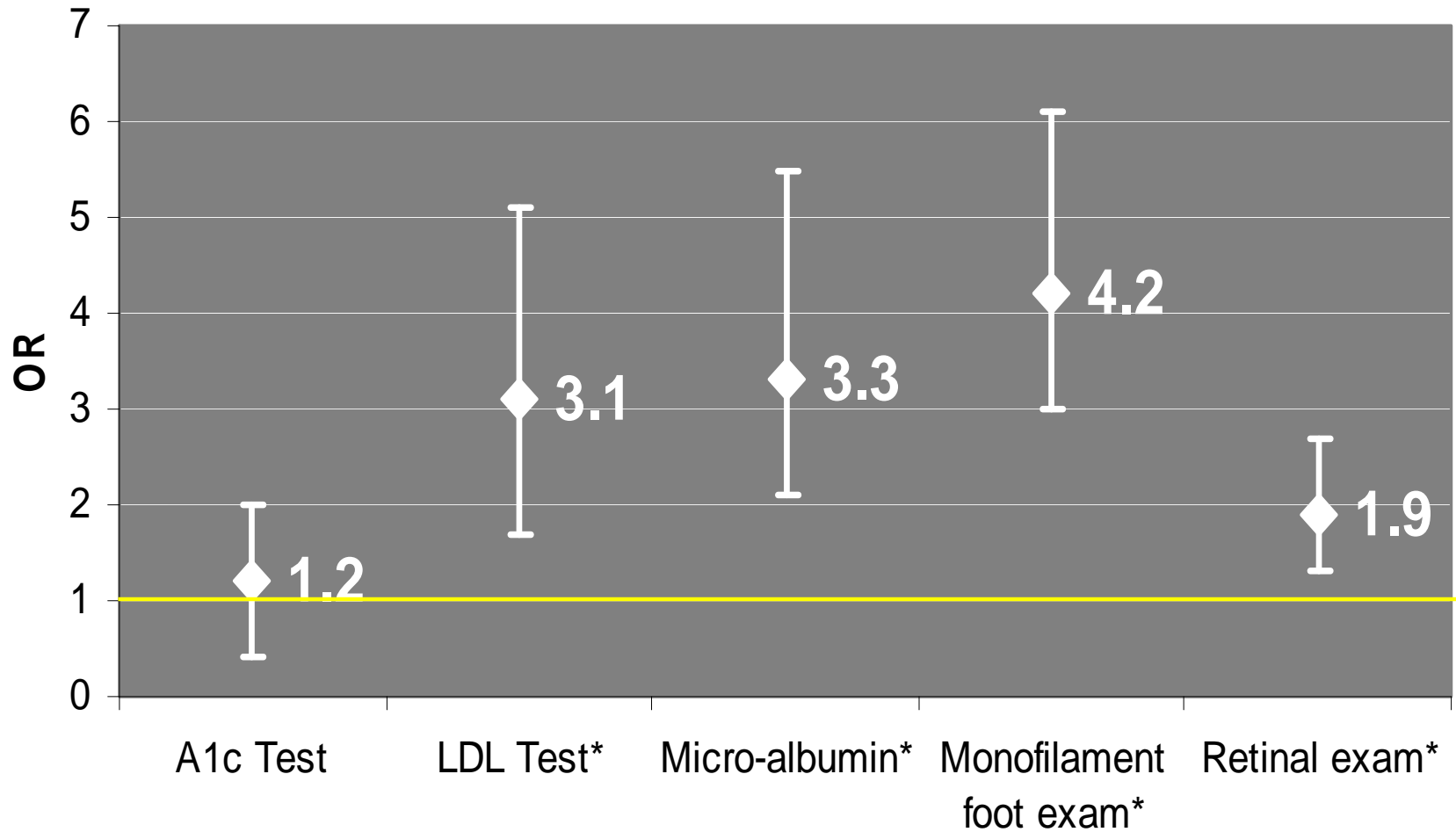
- Build the team
- Delegate care tasks to the most qualified team member
 - Physicians: translate evidence into practice
 - Medical Assistants: vitals, BMI, monofilament foot exam, flu shots
 - Nurse Care Managers: between visit care, following up on self-management action plans
 - Social worker: linking patients/families to resources
- Measure impact of changes
- Add team members

% Patients with Annual Monofilament Foot Exam

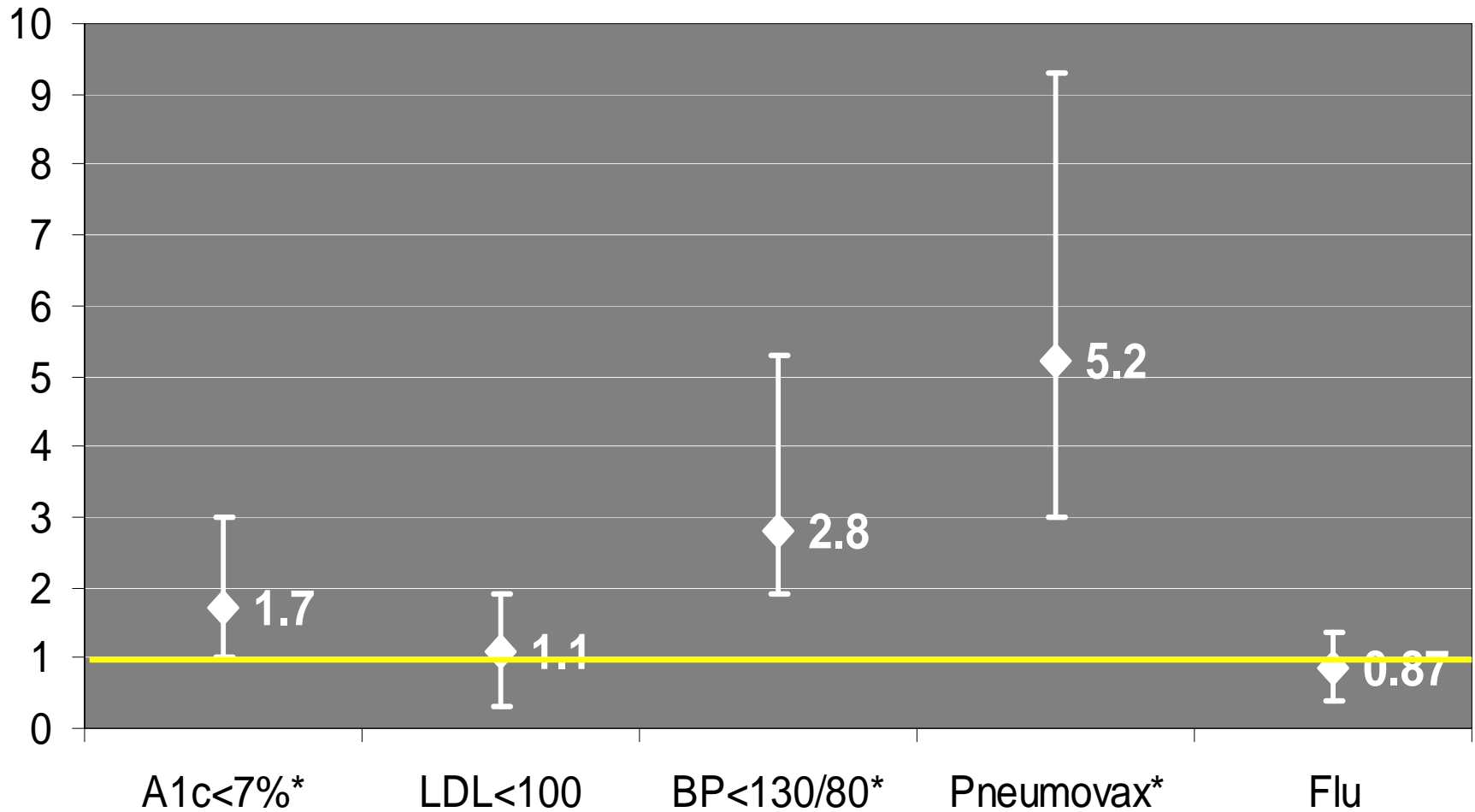


Results from GIM Chronic Illness Management

Odds of Achieving Process Measures CIM vs. Usual Care



Odds of Achieving Outcome Measures CIM vs. Usual Care



Phase II : Care Management

- Being a Care Manager in a primary care setting is challenging:
 - System created for episode (visit) based care
 - Most of the ‘action’ happens outside the visit
 - Coordination requires lots of information (care plan, patient needs, other treating physicians) over time
 - Patients benefit from coaching / motivation, self-management, education – all happening over time
 - Usually the only one focusing on this over time
- How can you build capacity in the clinic? How can you learn how to do this?

Case study: patient with complex needs

Ms. Viera

a 75-year-old woman with diabetes, systolic hypertension, mild congestive heart failure, arthritis and recently diagnosed dementia.

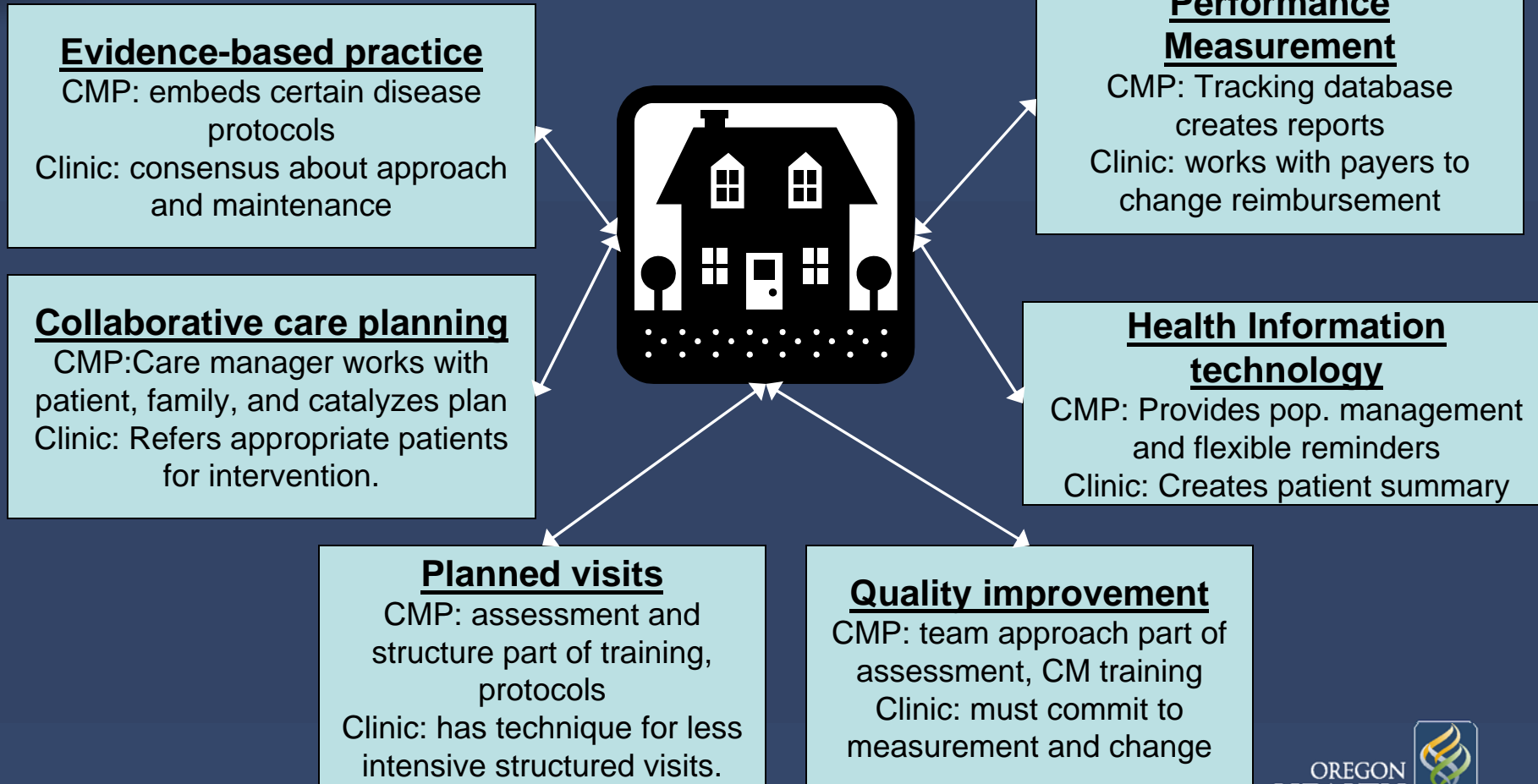
She comes to her primary care provider (1 of 13 amb physicians) with 5 medical and 2 socioeconomic issues.

Patients like her account for 42% of Medicare spending. Some utilization seems to be due to lack of care management / coordination of care.



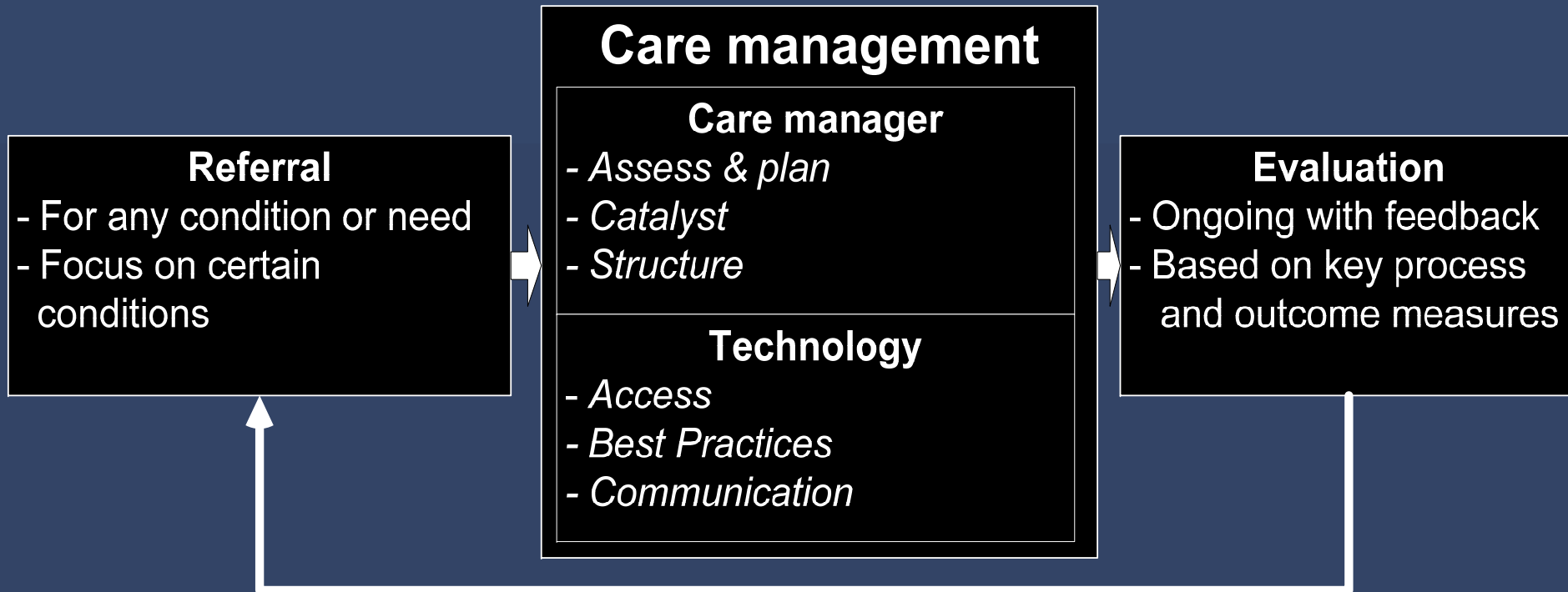
Care Management Plus can help create a medical home.

Care Managers act as a guide, coordinator, and helper to facilitate patients receiving coordinated, sensitive care.



Care Management Plus fills in core gaps in many clinics through a proactive, flexible system.

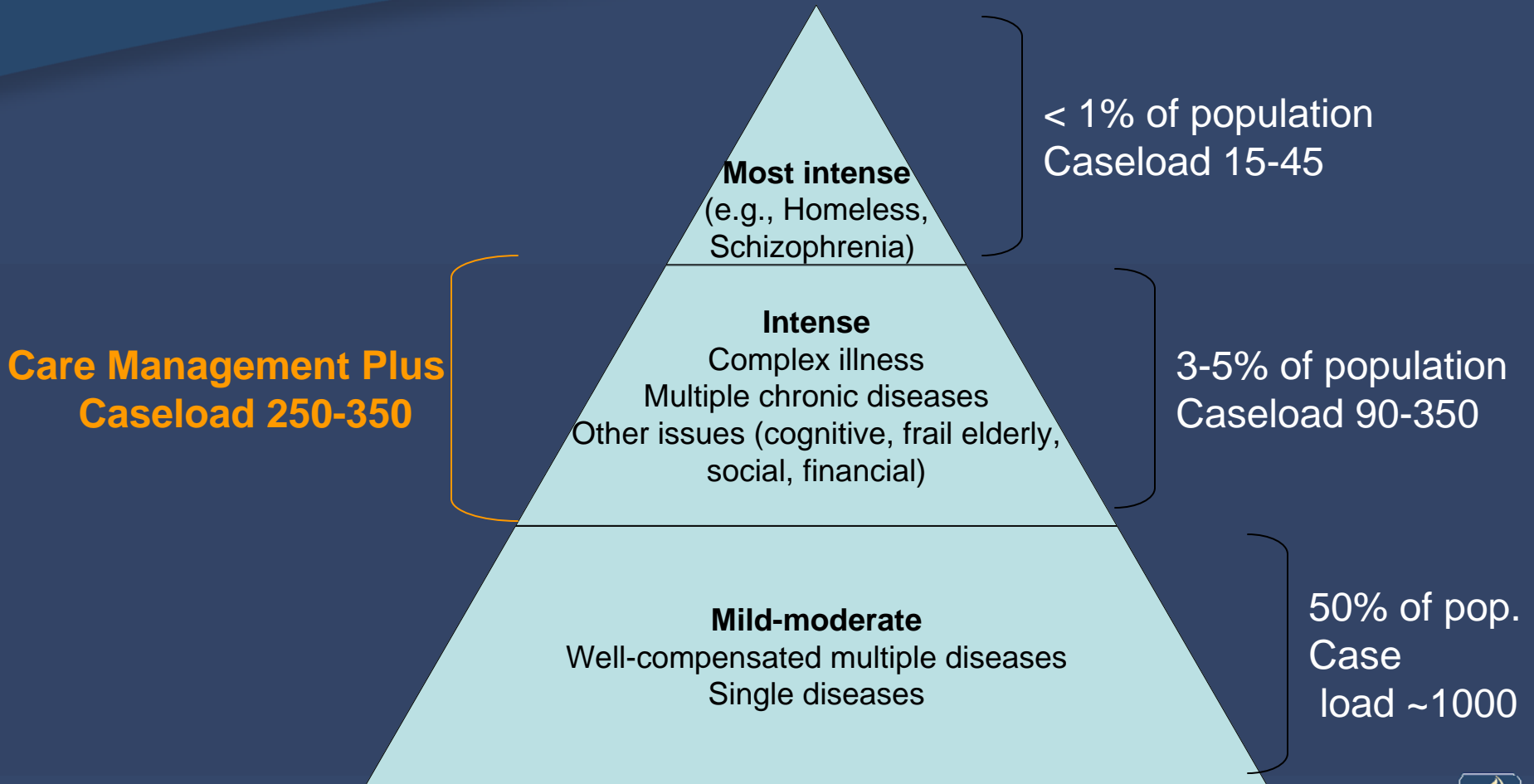
In 15 primary care clinics at Intermountain Healthcare



Larger infrastructure: Electronic Health Record, quality focus

Primary Care Clinical Programs: sets standards, teams adhere

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



Curriculum Content

Topical Area	Delivery Strategy	Methods
Orientation, Role, Technology training	~10 hours in person (divided)	Power point presentation; Case examples, role playing
Managing Chronic Illnesses Mental Health Issues Senior Patient Management Patient Coaching	On-Line (~10 hours, divided) Case studies	Asynchronous and Synchronous faculty discussion. Posted power-point slides.
Community Resource Acquisition Final Case Study (See evaluation)	In-Person Seminar	Internet search activities Case Study Presentations

Call

Care Manager Encounter Tickler List

Care Manager: Ann Larsen

Sched. Dt. and Time	Encounter Type	Enc. Reason	MMH	First Name	Last Name	Phone Number	Pri
2/17/04	Telephone Contact	DM F/U				(801)	Wo
2/17/04	Telephone Contact	DM F/U				(801)	Wo
2/17/04	Telephone Contact	DM F/U				(801)	Wo
2/17/04	Telephone Contact	DM F/U				(801)	Wo
2/17/04	Telephone Contact	Depression F/U				(801)	Obi
2/17/04	Telephone Contact	Dep F/u				(801)	Sm
2/17/04	Telephone Contact	DM F/U				(801)	Wo
2/17/04 8:30 AM	CM Office Visit					(801)	Wo
2/17/04 9:00 AM	Class					(801)	Smt
2/17/04 9:00 AM	Class					(801)	Met
2/17/04 9:00 AM	Class					(801)	Obi
2/17/04 9:00 AM	Class					(801)	Wo
2/17/04 10:40 AM	MD Office Visit	DM F/U				(801)	Wo
2/17/04 1:50 PM	MD Office Visit	DM F/U				(801)	Rur
2/17/04 3:00 PM	CM Office Visit					(801)	Wa
2/17/04 3:50 PM	MD Office Visit					(801)	Wo

Population Tickler

Before 3/10

IHC. Also detail

Do. wait pay at home

pm fees \$10-33 us

5 people

pcp appears

Test

who 14 people

Home - do impant

Back - heal

Turn on 5' 11" 160 lbs

7-10 days 3 mos.

If from cat office

Dr. McBride

Patient Information

ID Number: Last Name: First Name:
 DOB: * Age: Race: Sex:

Phone: Cell Phone: Email:
 PCP: PCP Phone:

Insurance: Facility:
 Diab Collaboration FPP:

Date of Referral: * Care Mgr: Status:

Patient Search

ID Number:
 Last Name:
 First Name:
 Care Mgr:

Diag	Date	Diagnosis	Status	Sched Date	Sched Time	Encounter Type	Status
		CHF	Active			Telephone Contact	Pending
Edit	3/30/2004	Anxiety	Active			Home Visit	Resolved
Edit	3/30/2004	Depression	Active			Telephone Contact	Resolved
Edit	1/26/2005					Telephone Contact	Resolved
Edit	10/18/2004					Telephone Contact	Resolved

MH Packet	Date	Symp	Severity	Fctnal	Diff	Dysth.	Q9	Suicide State	Suicide Risk	[Mood 1 2 3]	MoodImp	MoodSx	AnxImp	AnxSx
Edit	1/26/2005	1	3	Somewhat	<input checked="" type="checkbox"/>	0		No Risk						
Edit	9/1/2004	0	4	Not	<input checked="" type="checkbox"/>	0		No Risk		16	45	14	52	
				1. Thoughts Only				Low Risk						

Diab Assess Date

Diagnosis

Encounter

Meds

MH Instruments

Pediatric Assess

Diabetes History

Diab Pre/Post Knowledge Assess

Patient Goals

HF Follow-Up

New Patient

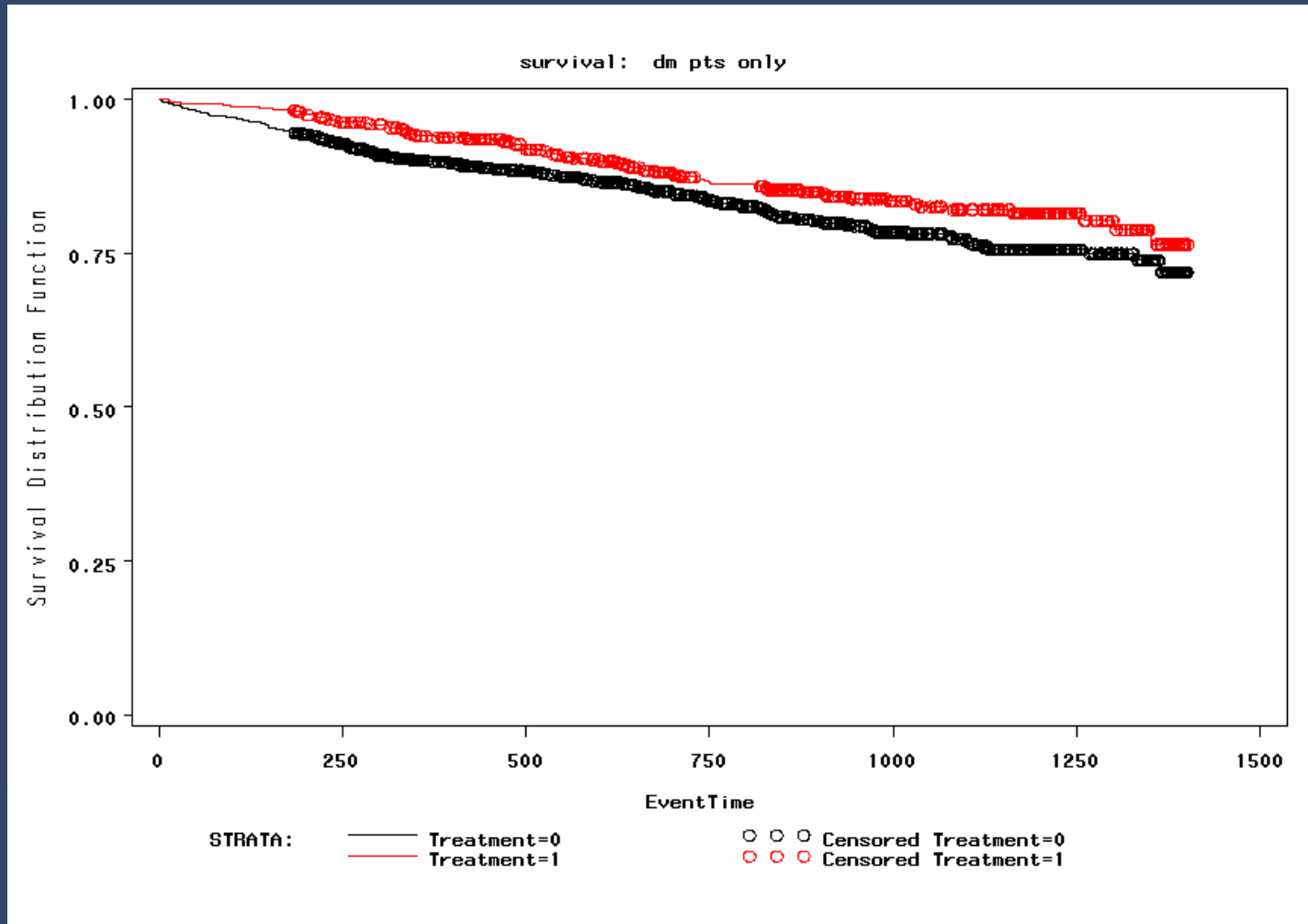
Save Patient

Delete Patient

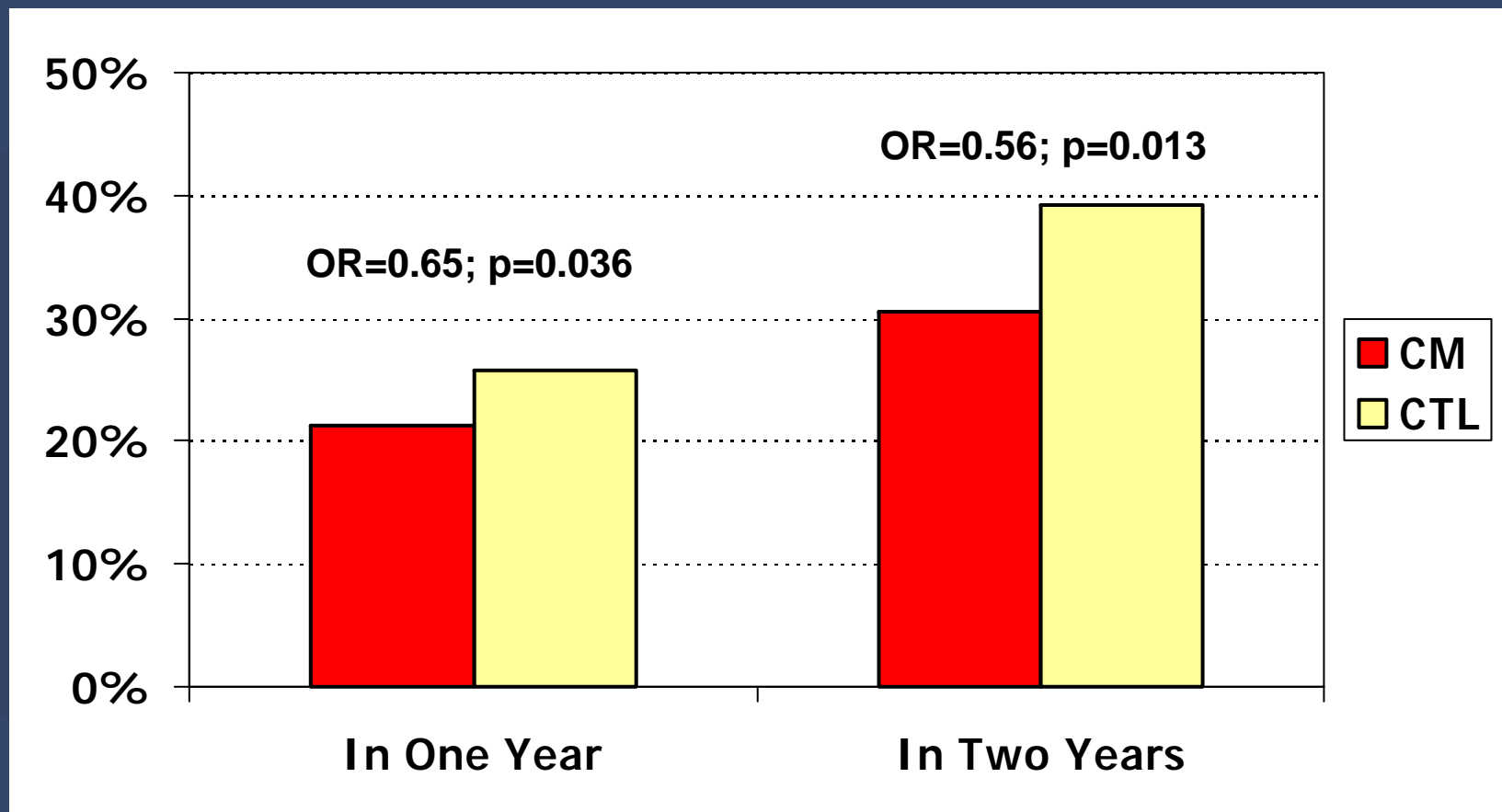
Generate Clinical Note by Date

CMT database - example

Odds of dying were reduced significantly.



Odds of admission (any cause) were reduced by 27-40%.



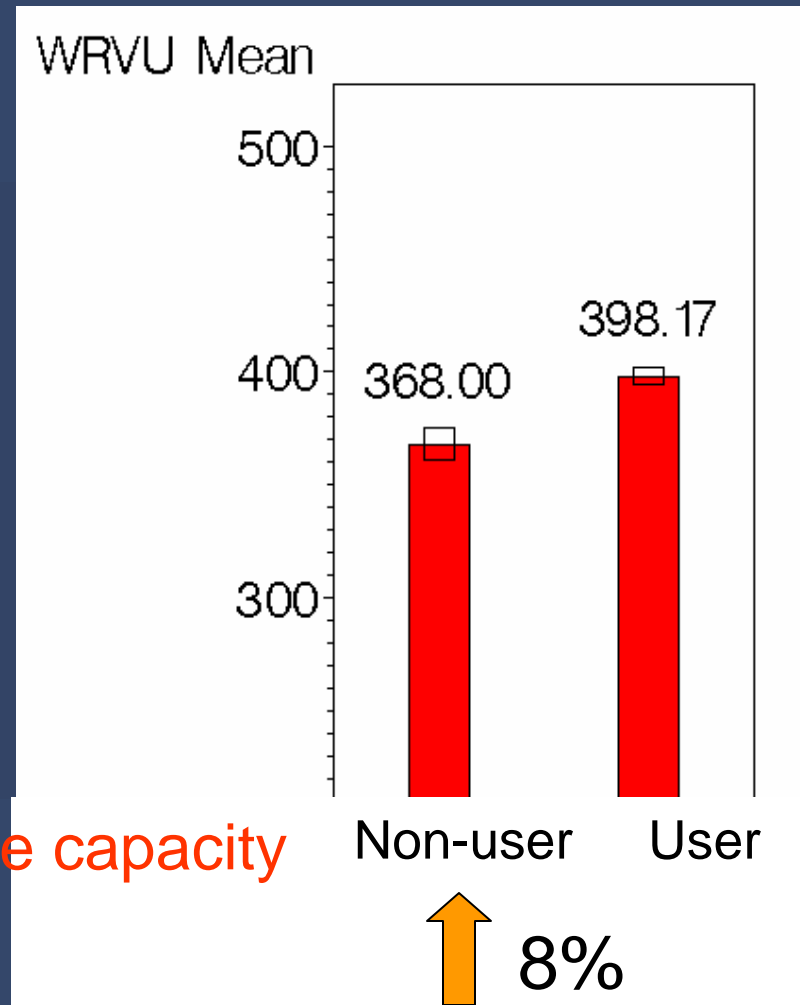
Physicians were more efficient through better documentation, a slight increase in visits, and a change in practice pattern.

- Physicians who referred to care managers:

8% more productive

- Than peers in same clinic

Use efficiency gains to increase capacity



Given the increase in productivity, a clinic in the right environment could pay for the care manager.

Costs/Clinic	
Salary + training + admin	\$92,077
Benefits/Clinic	
Productivity (7 MD's)	\$99,986
<i>Utilization</i> ↓ *	\$0
Nurse visits	\$10,394
Benefits sum	110,380
Total (benefits – cost)	+\$18,303

* Society would save, per clinic, \$230,000 in reduced utilization.

Dorr et al, AJMC, 2007

Note: overhead costs, IS costs are assumed to be constant. Equipment costs included.

Thank you!

The Care Management Plus Team

Funded by the John A. Hartford Foundation

- OHSU
 - David Dorr, MD, MS
 - K. John McConnell, PhD
 - Kelli Radican
 - Hanh Tran
 - Rachel Burdon
 - John Welte
- Intermountain Healthcare
 - Cherie Brunner, MD
- Columbia University
 - Adam Wilcox, PhD

Advisory board

- Larry Casalino
- Tom Bodenheimer
- Cheryl Schraeder
- Heather Young

www.caremanagementplus.org ; dorrd@ohsu.edu

Resources

- Care Management Plus
www.caremanagementplus.org
- CDEMS (Chronic Disease Electronic Management System)
 - www.cdems.com
- Improving Chronic Illness Care
 - <http://www.improvingchroniccare.org/>