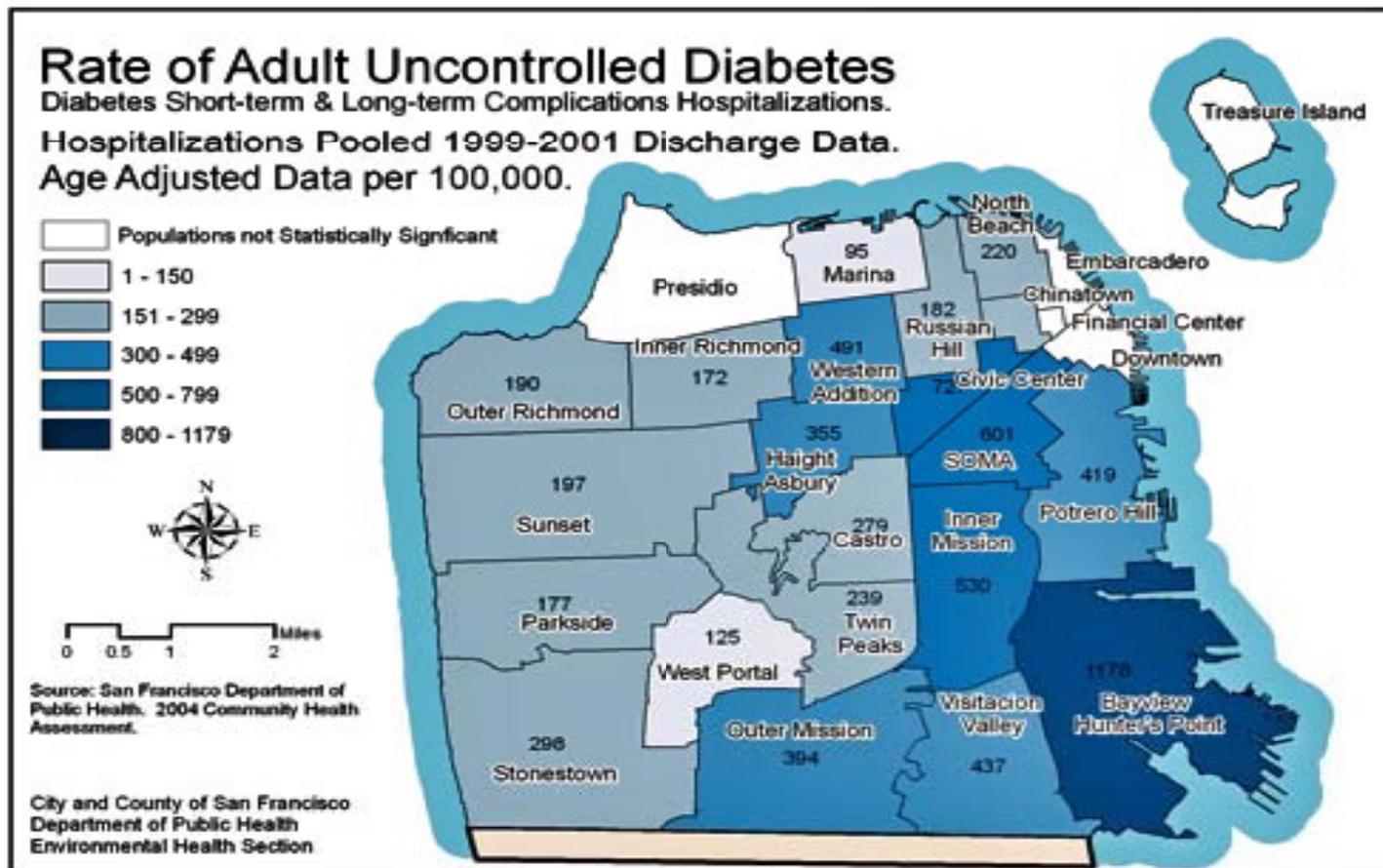


Literacy, Health Communication & Diabetes Disparities

Dean Schillinger, MD UCSF Professor of Medicine in Residence
Director, UCSF Center for Vulnerable Populations SF General Hospital
Chief, California Diabetes Program
CA Dept Public Health



Vulnerabilities Cluster within Individuals and Neighborhoods



Assessing for Vulnerabilities

- V** iolence
- U** ninsured
- L** iteracy and Language
- N** egllect
- E** conomic hardship/food insecurity
- R** ace/ethnic discordance, discrimination
- A** ddiction
- B** rain disorders, e.g. depression, dementia, personality disorder
- I** mmigrant
- L** egal status
- I** solation/Informal caregiving burden
- T** ransportation problems
- I** llness Model
- E** yes and Ears
- S** helter

UCSF Center for Vulnerable Populations @ SFGH

- Mission: Carry out innovative research to prevent and treat chronic disease in populations for whom social conditions conspire to promote chronic disease and make management more challenging.
- Practice-based research center to translate research into community and public health practice, infuse local practice back into research.
- Faculty have coordinated 7 randomized trials in community settings.
- Nationally and internationally known for research in health communication and health policy to reduce health disparities
- Houses 6 faculty investigators, 3 biostatisticians, Center Manager, 8 research staff. 2300 square foot space planned for renovation



Objectives

- Review statistics and definitions re literacy and 'health literacy' in US, esp safety net health systems
- Describe research that shows associations b/w health literacy and health outcomes, with diabetes as exemplar
- Argue that health communication is partial mediator of this relationship, and share some practice-based research re health communication interventions
- Stimulate discussion about how/whether health literacy affects ambulatory pediatric care

What is Health Literacy?

- “The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make [informed] health decisions.”
 - Institute of Medicine, 2004
- ?3 domains: oral (speaking, listening); written (reading, writing); numerical (quantitative).
- Capacity/Preparedness \leftrightarrow Demand Mismatch

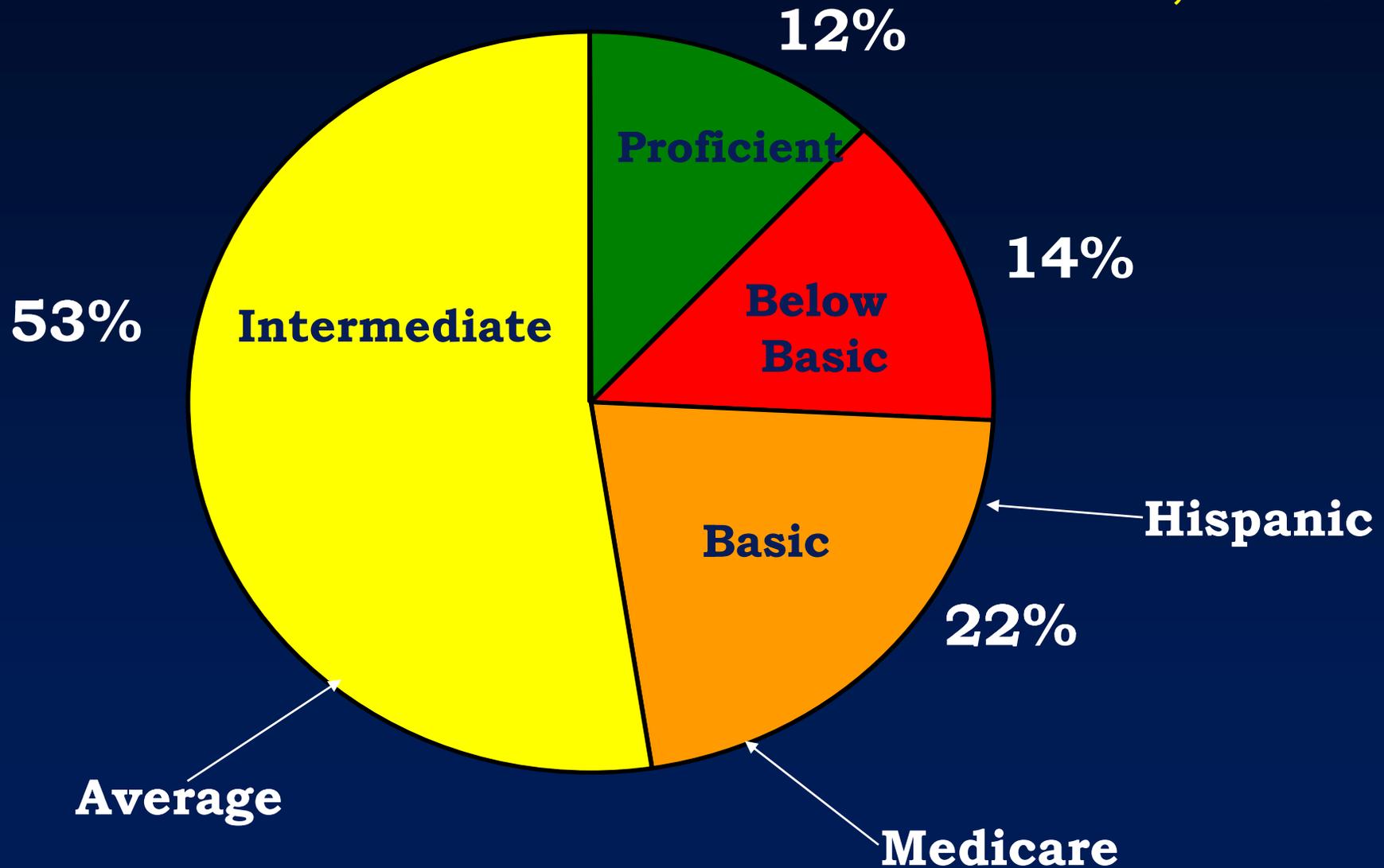
1st National Assessment of Health Literacy

n=19,714

- **Below Basic:** Circle date on doctor's appointment slip
- **Basic:** Give 2 reasons a person with no symptoms should get tested for cancer based on a clearly written pamphlet
- **Intermediate:** Determine what time to take Rx medicine based on label
- **Proficient:** Calculate employee share of health insurance costs using table

1st Health Literacy Assessment

n=19,714 U.S. Adults



National Assessment of Adult Literacy (NAAL): National Center for Educational Statistics, U.S. Department of Education, 2003.

Literacy and health

- **In elderly population, limited literacy associated with**
 - » worse self-rated access to care,
 - » lower self-rated health
 - » higher rates of some chronic diseases,
 - » higher adjusted mortality
- **In public hospital patients with diabetes, limited literacy associated with poor glycemic control/complications**

**Self-reported chronic conditions among an elderly cohort,
by literacy* (N=2, 512)**

	Limited literacy	Adequate literacy	P-value
Cancer	7.1%	7.8%	0.5
Hypertension	62.7%	54.7%	<.0001
Diabetes	25.2%	14.6%	<.0001
Obesity	31.1%	23.0%	<.0001
Heart Disease	21.5%	20.5%	0.6

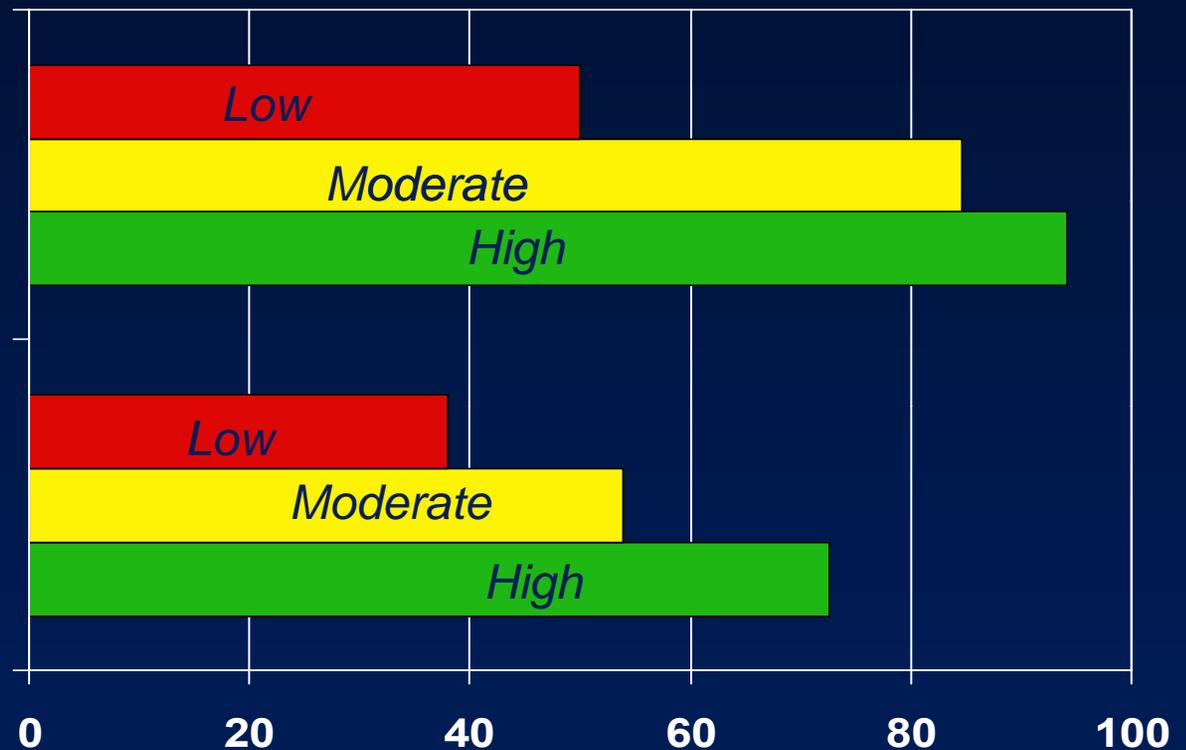
Patients with Diabetes and Low Literacy Less Likely to Know Correct Management

Need to Know:

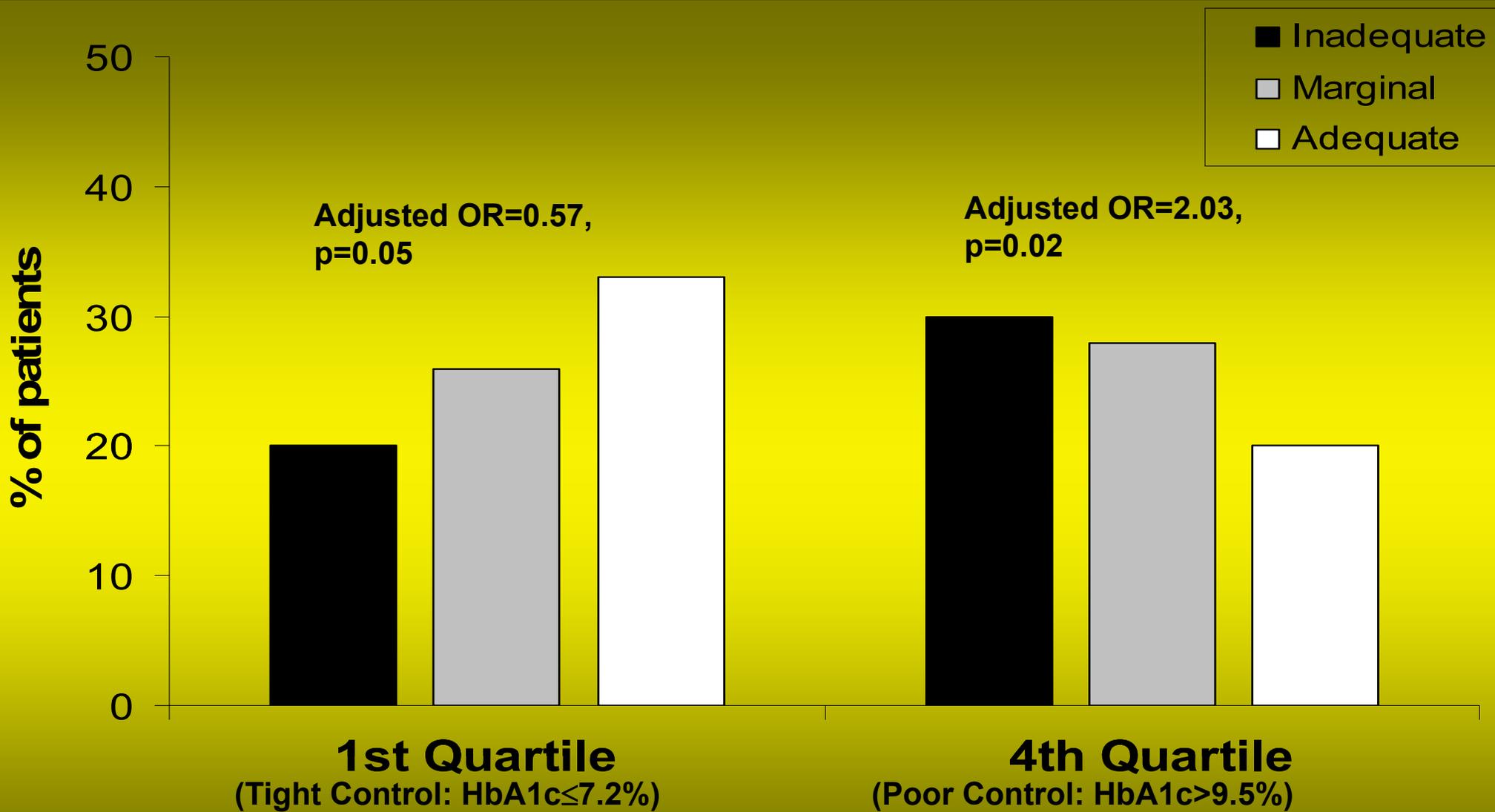
symptoms of low blood sugar (hypoglycemia)

Need to Do:

correct action for hypoglycemic symptoms



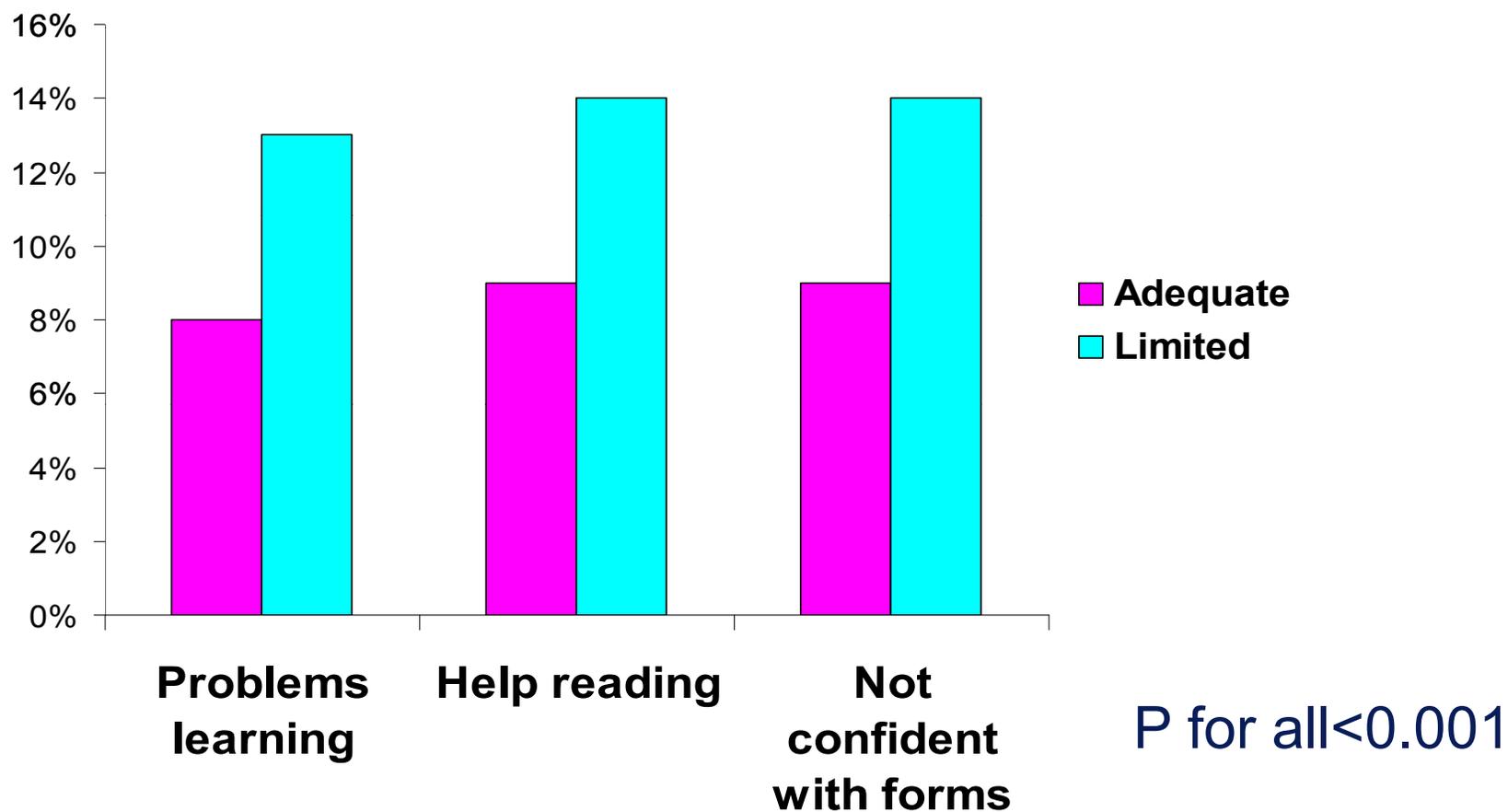
Literacy is Associated with Glycemic Control, N=408



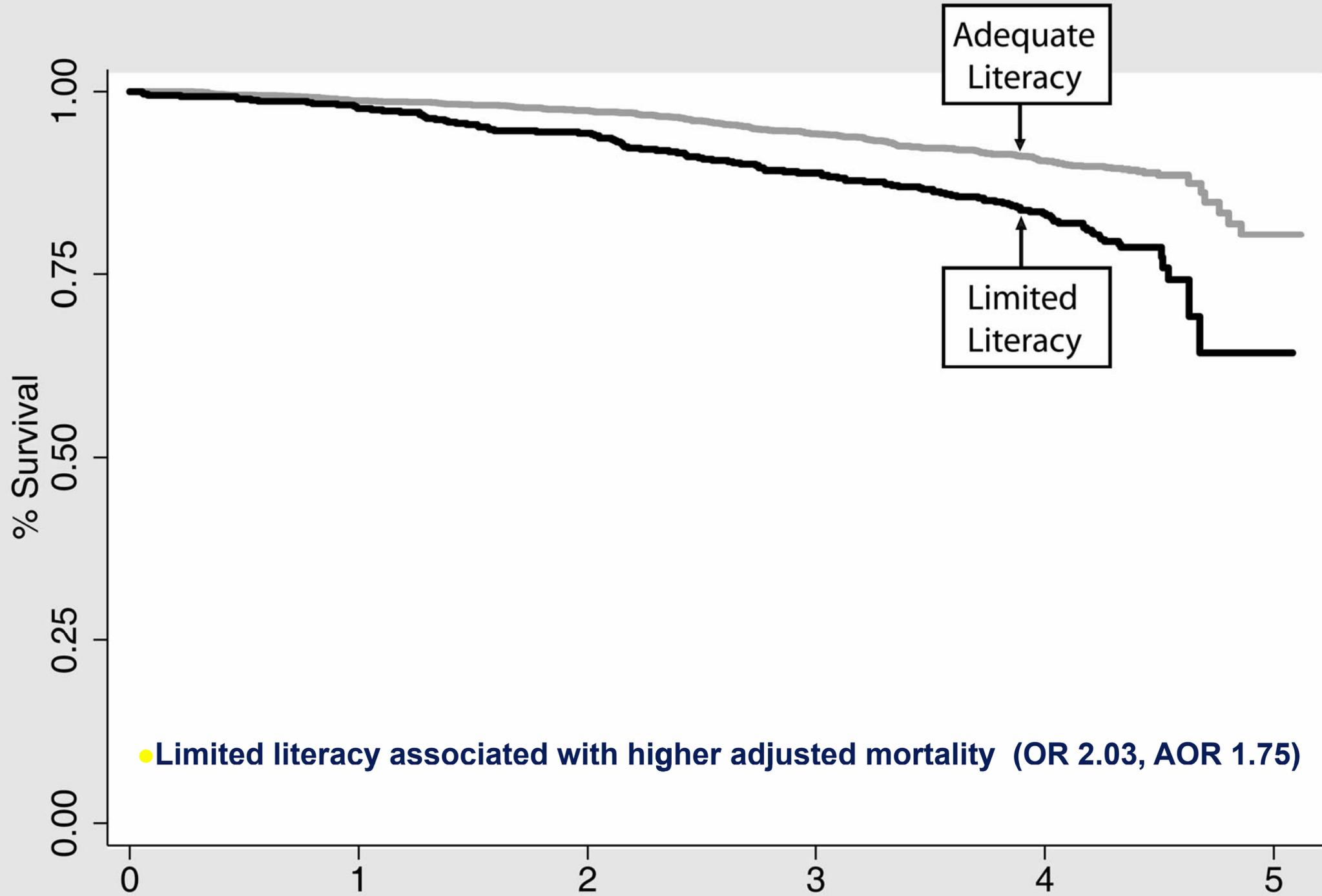
Adjusted odds of self-reported diabetes complications, for patients with inadequate vs. adequate literacy (N=408)

Complication	n**	AOR	95% CI
Retinopathy	111	2.33	(1.19-4.57)
Nephropathy	62	1.71	(0.75-3.90)
Lower Extremity Amputation	27	2.48	(0.74-8.34)
Cerebrovascular Disease	46	2.71	(1.06-6.97)
Ischemic Heart Disease	93	1.73	(0.83-3.60)

Limited Health Literacy Patients Experience more Hypoglycemia N=16,000



Sarkar, Adler, Schillinger, in review



● Limited literacy associated with higher adjusted mortality (OR 2.03, AOR 1.75)

How is Literacy Linked to Diabetes Outcomes? 4 hypotheses

1. **Confounding**

Limited literacy → confounders → illness

2. **Mediation at individual or community level**

Limited literacy → health mediators (behavior and exposure) → illness

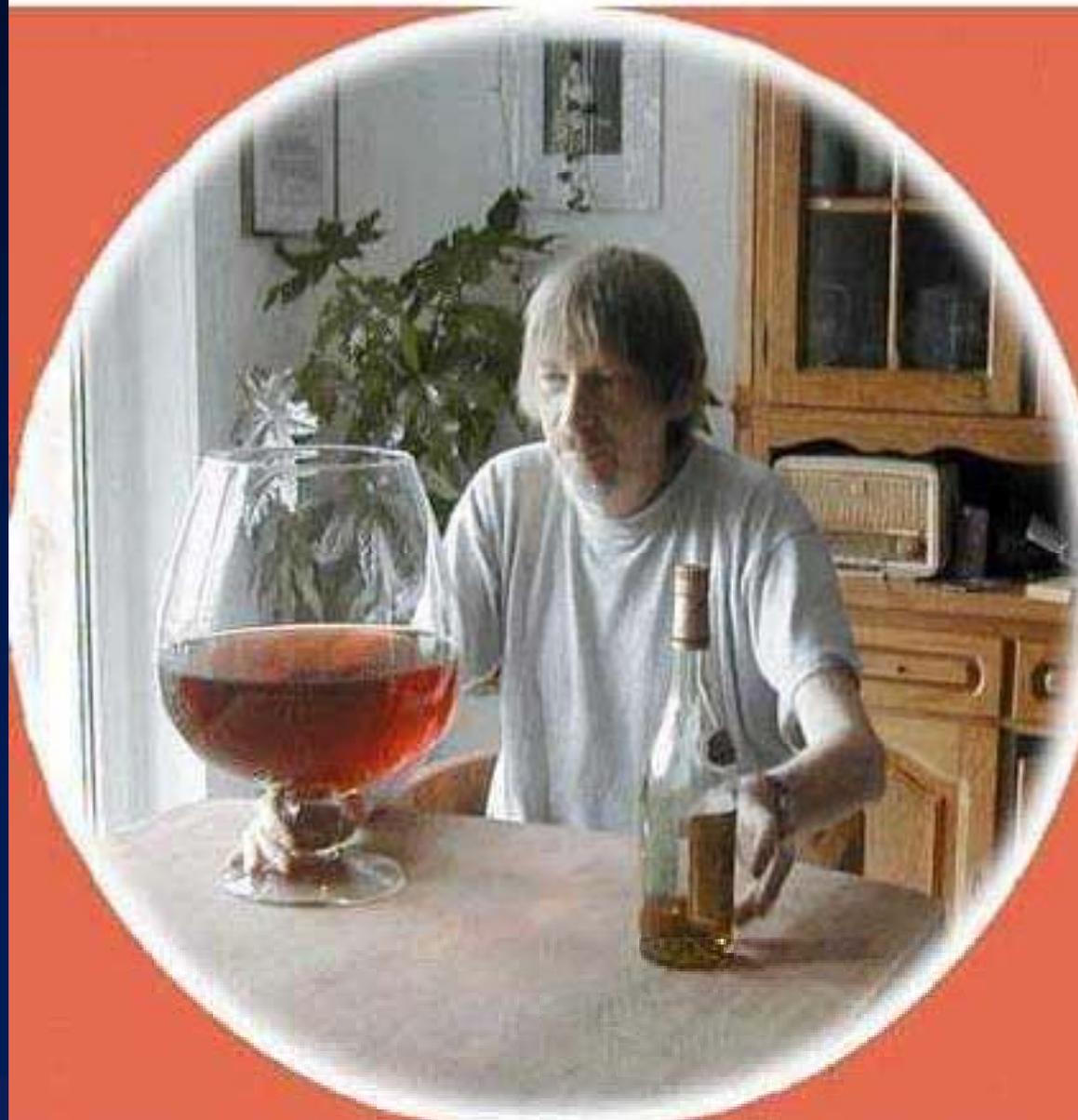
3. **Reverse Causation/cyclical**

Illness → limited literacy → worse health trajectory

4. **Effect Modification at Health Care System Level**

Limited literacy → poor quality of care → illness and premature death/morbidity

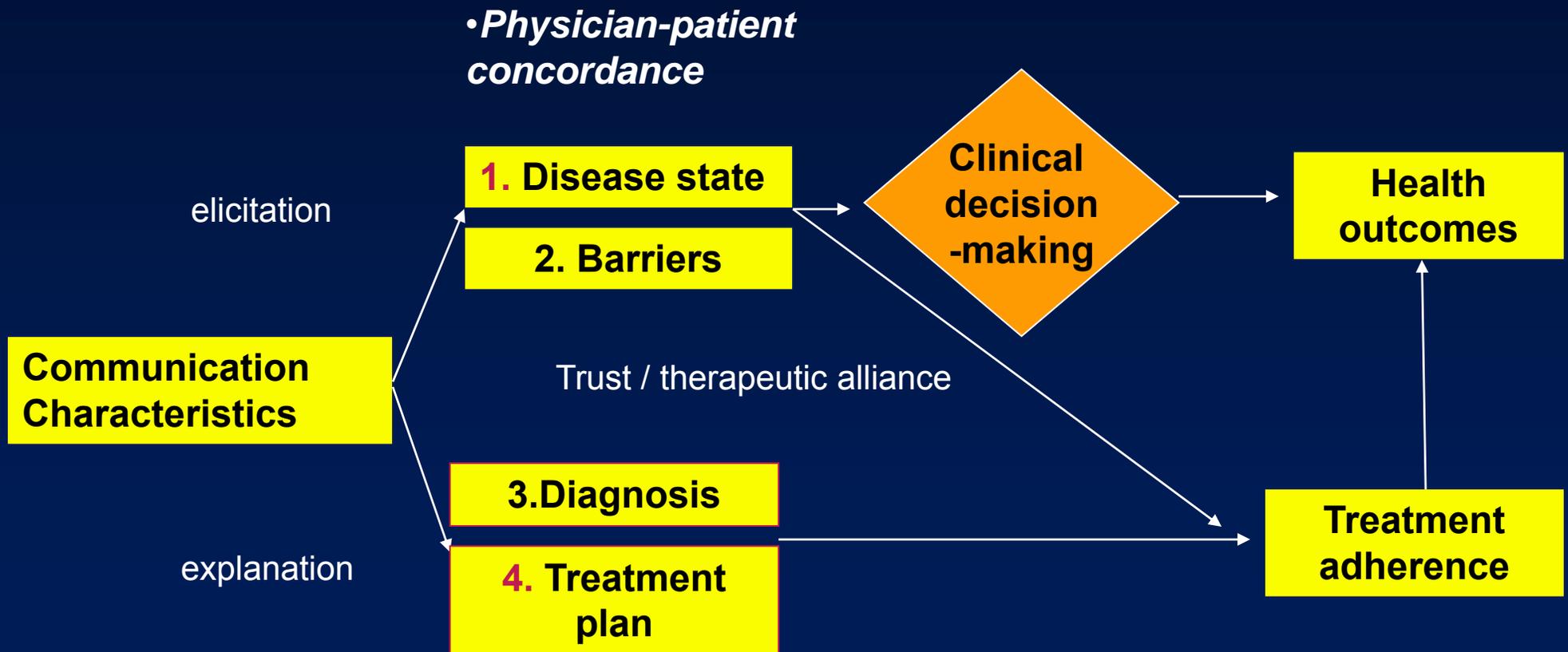
My Doctor said "Only 1 glass of alcohol a day". I can live with that.



Could poor communication be a mechanism?

- High self-management demands
- Increasing reliance on technology
- Large mismatch in training between health professionals and target populations (“health literacy”)
- Counterbalance role of mass media in consumerist society
- Strong inverse relationship between educational attainment and chronic illness burden

Conceptual framework: 4 basic functions of communication in diabetes care

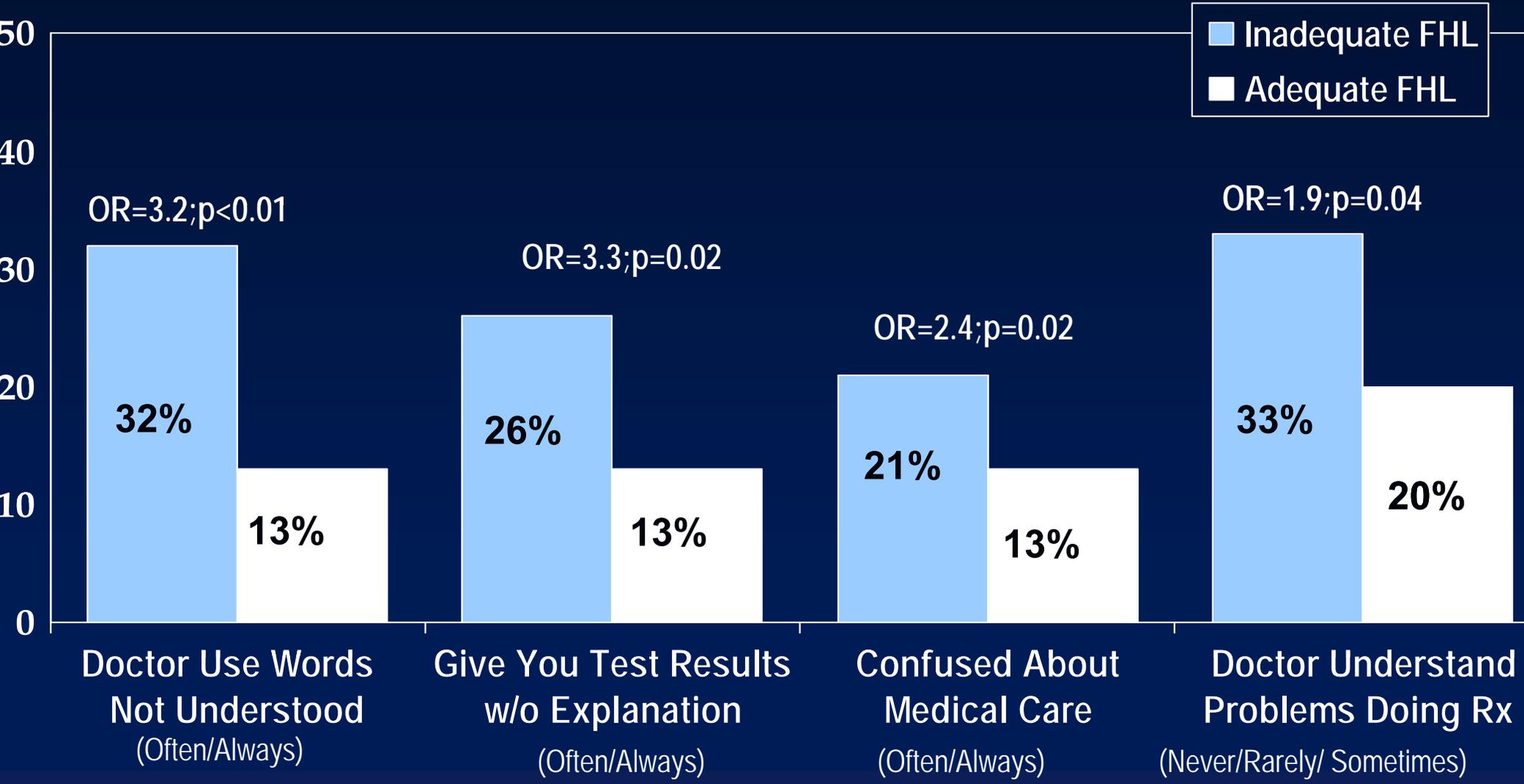


How Does Limited Literacy Affect (Verbal) Clinical Interactions?

- Impedes understanding of technical information and explanations of self-care
- Impairs shared decision-making
- Speed of dialogue, extent of jargon, lack of interactivity determinants of effectiveness of communication
- Impairs medication communication, jeopardizing patient safety (medication “discordance”)
- Interaction between limited Eng proficiency and limited literacy

Fang et al. 2006 JGIM
Schillinger et al. 2004 Pt Ed and Counseling
Castro et al, Am J Health Beh 2007
Schillinger et al. 2003 Arch Int Med
Schillinger et al 2004. AHRQ Advances in Patient Safety

Diabetes Patients with Limited Literacy Experience Poorer Quality Communication, N=408



Medical Jargon

GLUCOMETER

HEMOGLOBIN A1c

DIALYSIS

ANGINA

RISK FACTORS

CREATININE



Jargon Terms

...unclarified

- Glucometer
- Immunizations
- Weight is stable
- Microvascular complication
- System of nerves
- HbA1c
- EKG abnormalities
- Dialysis
- Wide Range
- Risk factors
- Kidney function
- Interact

...from Patient's own visit:

- benign
- blood drawn
- blood count

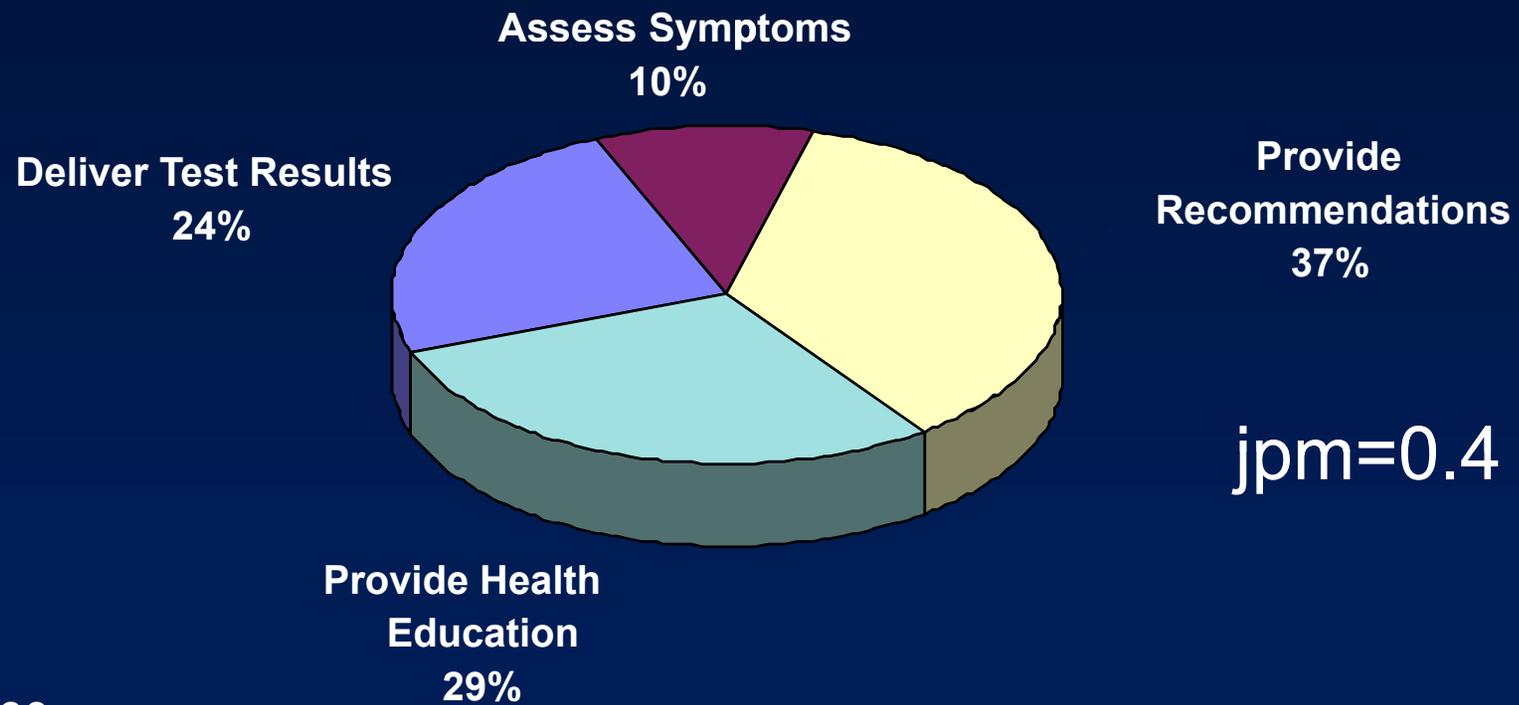
...clarified

- Angina
- Microalbuminuria
- Ophthalmology
- Genetic
- Creatinine
- Symptoms

- CAT scan
- blood count
- correlate
- stool was negative
- stool
- baseline
- respiratory tract
- polyp

- washed out of your system
- receptors
- short course
- renal clinic
- blood cells
- increase your R
- screening
- vaccine

Function of Jargon



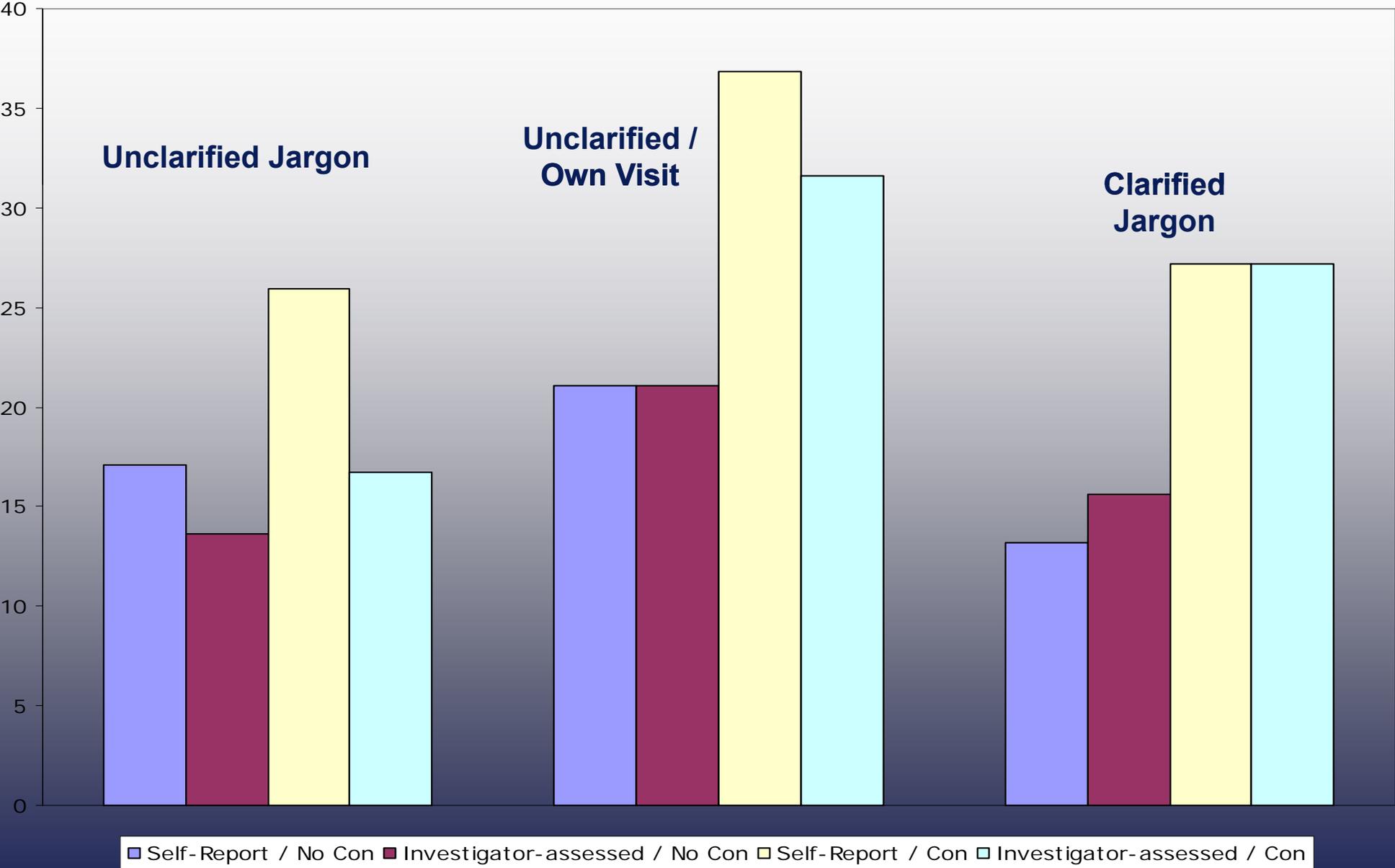
$jpm=0.4$

n = 60

Dialysis “Do you know what the number one cause for people in this country being on dialysis is? Diabetes”

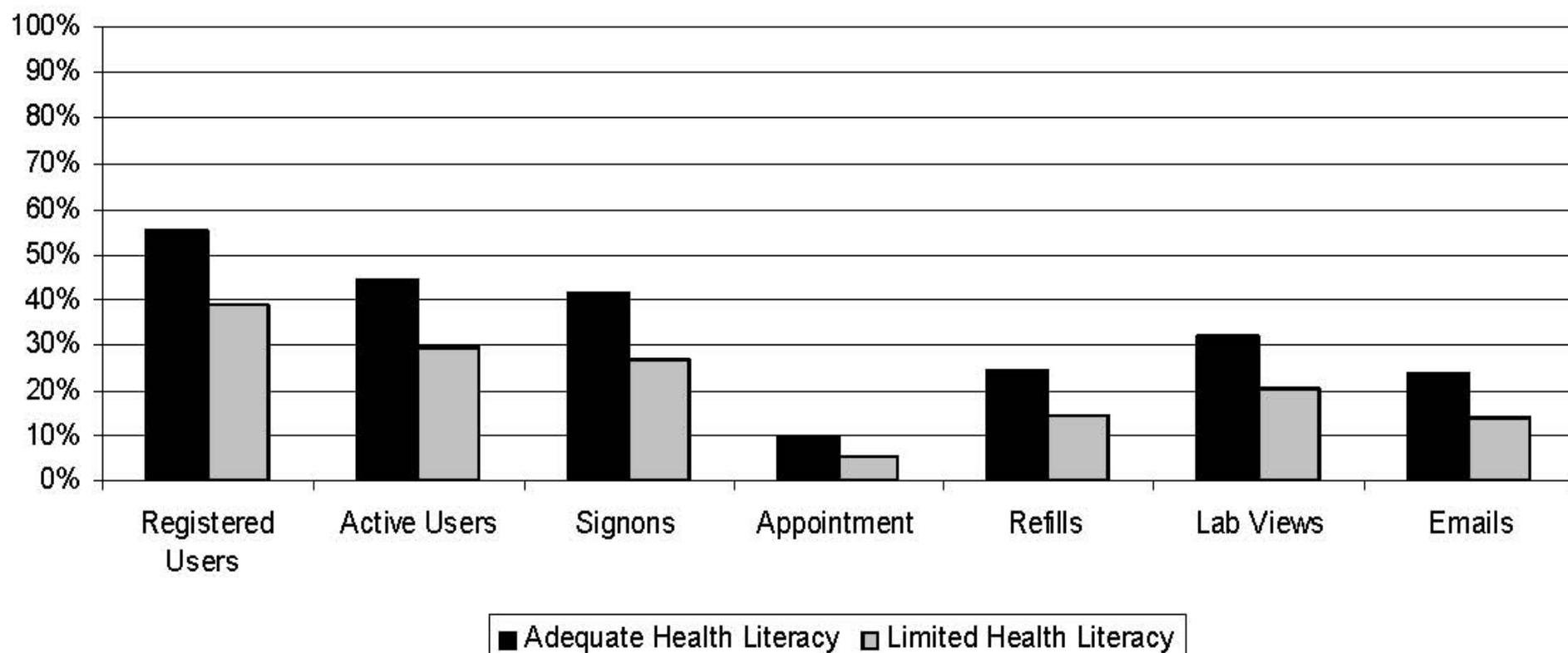
Would you please tell me in your own words what <u>dialysis</u> means?		In your own words, what do you think the doctor was trying to tell the patient?	
“Check something every day.”	1	“Sugar is too high.”	1
“What? Is that about you toes?”	1	“I can't say it.”	1
“It means that your diabetes is going worse that you have to exercise to make diabetes.”	1	“Means that more people are getting diabetes.”	1
“You got to get on machine to pump.. redo blood to come up to par.”	4	“That the sugar was not...hmm.”	1
“...regarding kidney.”	2	“Diabetes is one cause of kidney problems.”	3
“That is a warning...about the kidney...my doctor told me about those side effects of the diabetes.”	3	“About dialysis, because they are warning us, they are telling me about the complications...that if I'm having problems in my kidney, I'm going to have dialysis.”	4
“It's a way to clean blood get off toxins out the blood.”	4	“That you need to be on dialysis to cleanse blood or gonna die.”	4

Patient Comprehension of Jargon (% Some /Total Understanding)

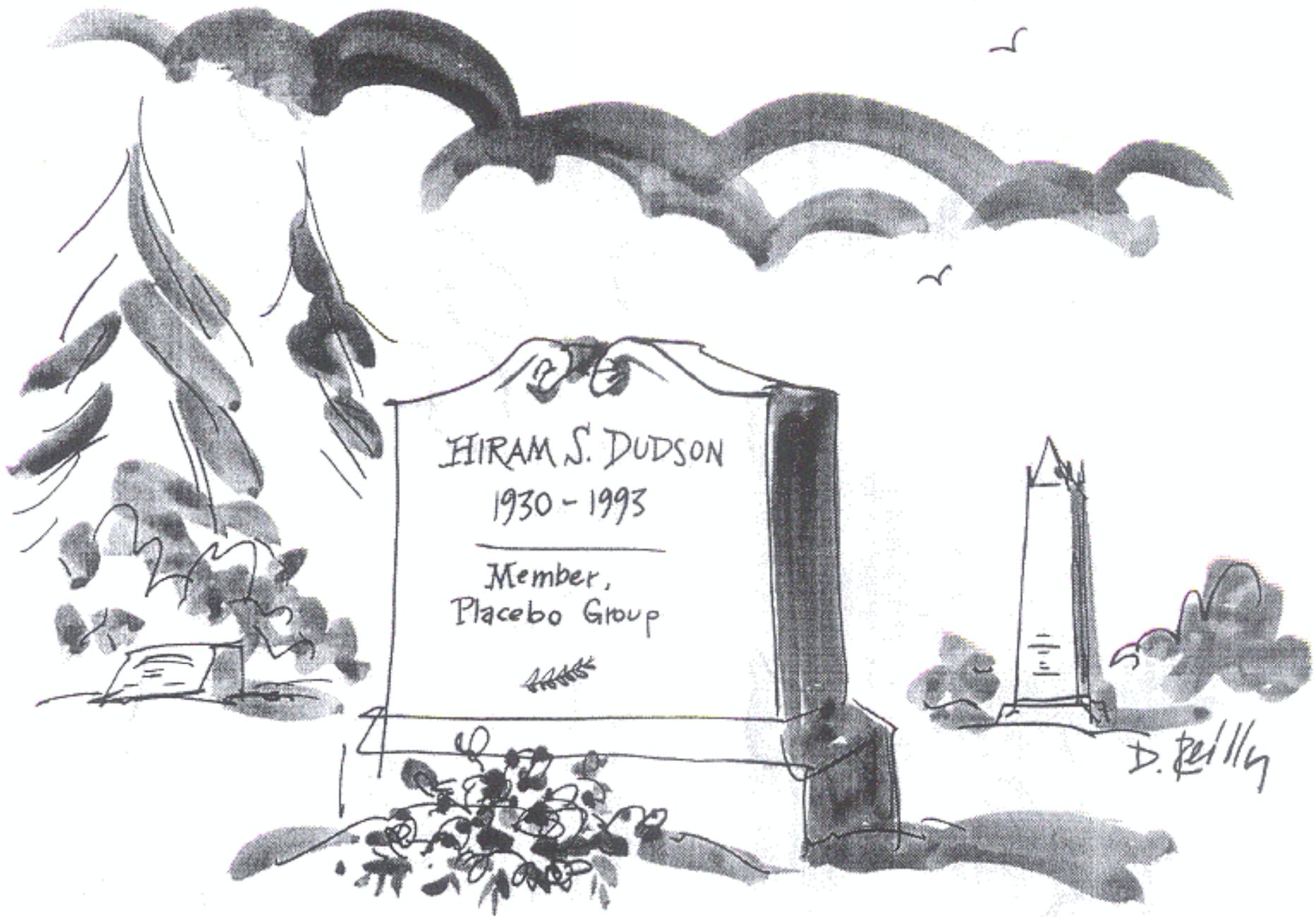


Literacy and the Digital Divide in Diabetes*

N= 14,102



*For difference between those with and without limited health literacy, p for all < 0.01



HIRAM S. DUDSON

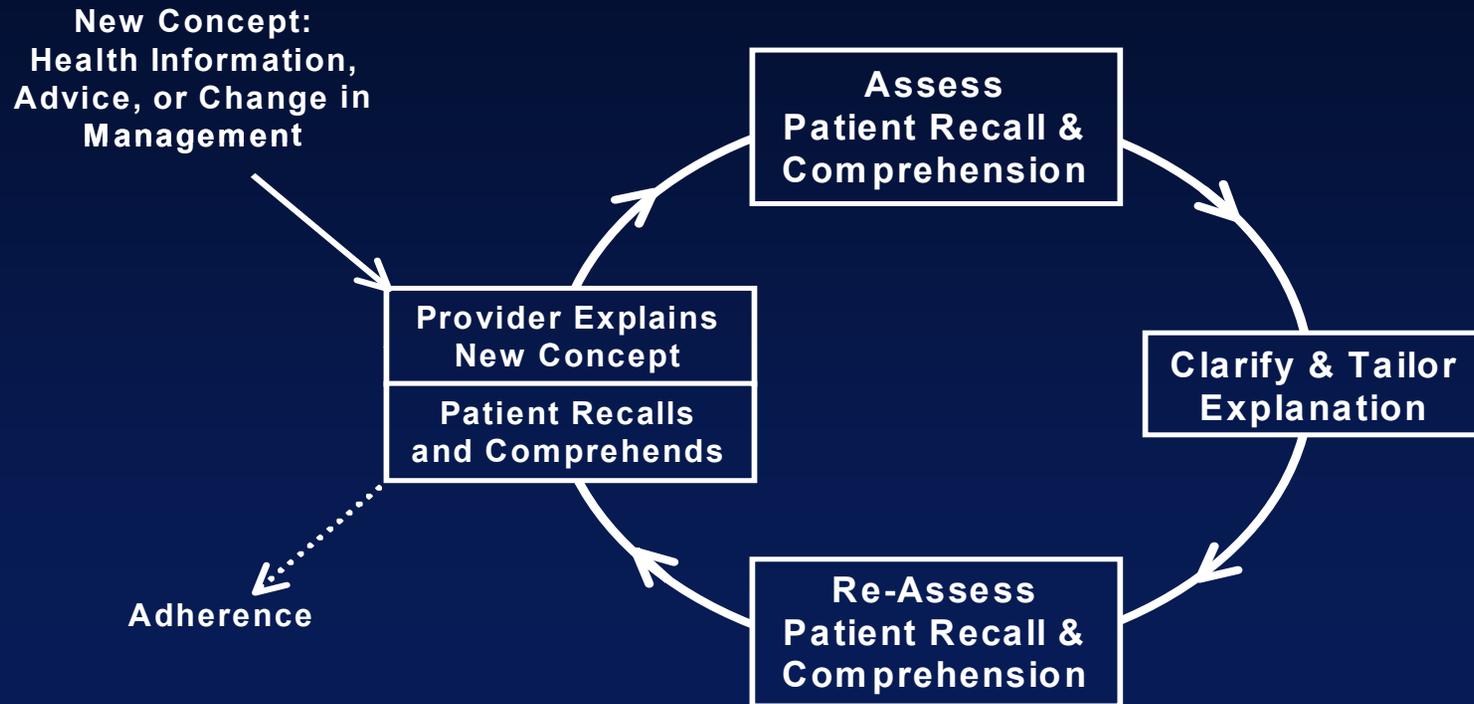
1930 - 1993

Member,
Placebo Group



D. Kelly

Closing the Loop: Interactive Communication to Enhance Recall & Comprehension



- Ensures info understood/integrated into memory; checks for lapses
- Opens dialogue re health beliefs; reinforces and tailors health messages
- Promotes a common understanding; elicits patient participation

Closing the Loop, aka “Teach-Back”

- Physicians assessed recall or comprehension for 15/124 new concepts (12%)
- When new concepts included patient assessment, patient provided incorrect response half the time (7/15=47%)
- Visits using interactive communication loop not longer (20.3 min. vs. 22.1 min)
- Application of loop associated with better HbA1c (AOR 9.0, p=.02)

A Diabetes Guide That Helps Patients Take Charge and Make Changes

Terry Davis, PhD

LSUHSC

Darren DeWalt, MD

UNC

Dean Schillinger, MD

Hilary Seligman, MD

UCSF



ACPF Guide is Practical and Personal

- Patients' voices illustrate concrete, practical tips
- Patients suggest achievable goals
- Authentic photos help tell the story

Snack attack!

What should you do when you get hungry between meals? Snack on these:



Keep foods like these close by so you can get to them easily when you feel hungry. Stay away from foods that are high in carbs or sugar (like chips, crackers, candy bars, or pretzels).



"I keep a little bag of nuts in my desk at work. I snack on them in the afternoon."



"I eat sugar-free gelatin for my snack and dessert. It is so easy to make!"



Focus is on Doing

- ‘You Can Do It’ checklist at end of each chapter
- Concrete examples of successful action plans
- Emphasis on small steps and patient choice

You Can Do It!

Choose one of these easy ideas or write down 1 or 2 things you will do for the next few weeks. Remember, little changes in your eating can make a big difference in your blood sugar.

- I will switch from juice or soda to diet soda.
- I will eat breakfast every morning.
- I will order regular size instead of super size at fast-food restaurants.
- I will pack a healthy lunch some days instead of eating out.
- I will keep healthy snacks on hand, like cottage cheese, carrot sticks, hard-boiled eggs, unbuttered popcorn, or sugar-free popsicles.
- I will eat slowly, and wait before getting a second serving.
- _____
- _____
- _____



“It was hard to stop drinking regular soda, but now I like diet drinks and water.”



Pictures Help Tell the Story

- Patients looked at pictures first
- Particularly liked pictures of food comparisons

Too much



Right size



Significant Improvement In Pre- and Post-tests*

- Knowledge
- Self-efficacy
- Diabetes distress
- Taking ownership of health care
- Self-reported diabetes management

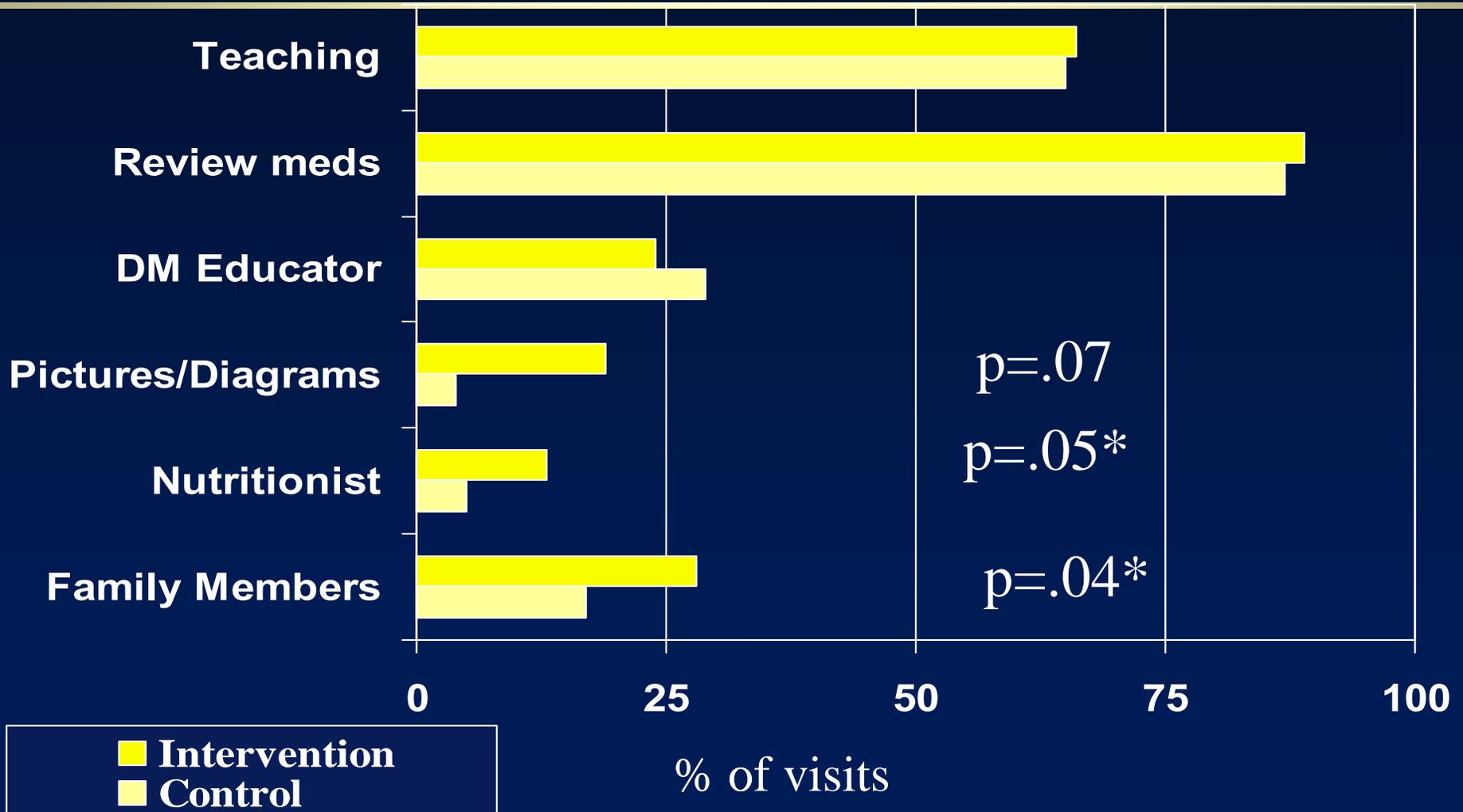


* $p < 0.01$

Should We Screen for Limited HL?

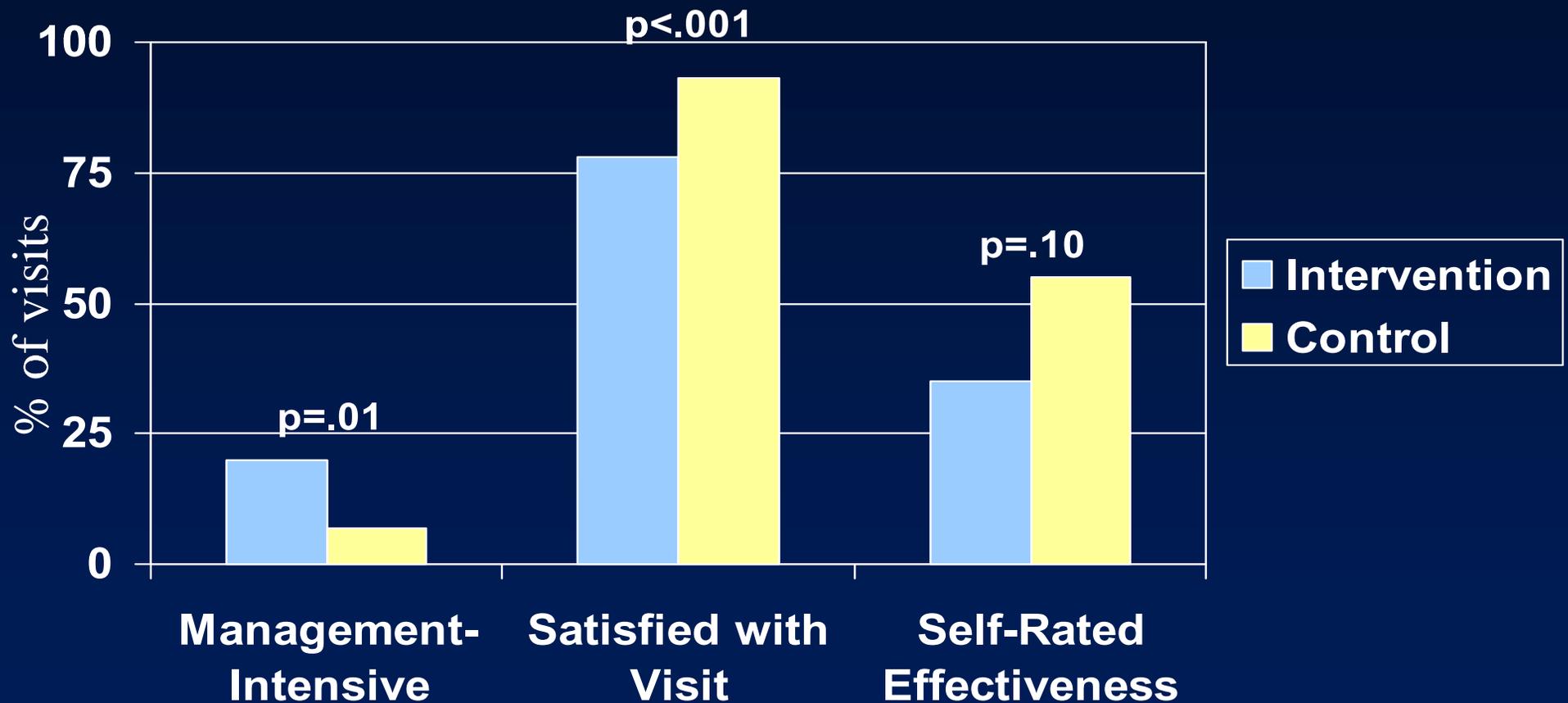
- RCT of screening and feedback of limited HL to primary care physicians

Individual Management Strategies

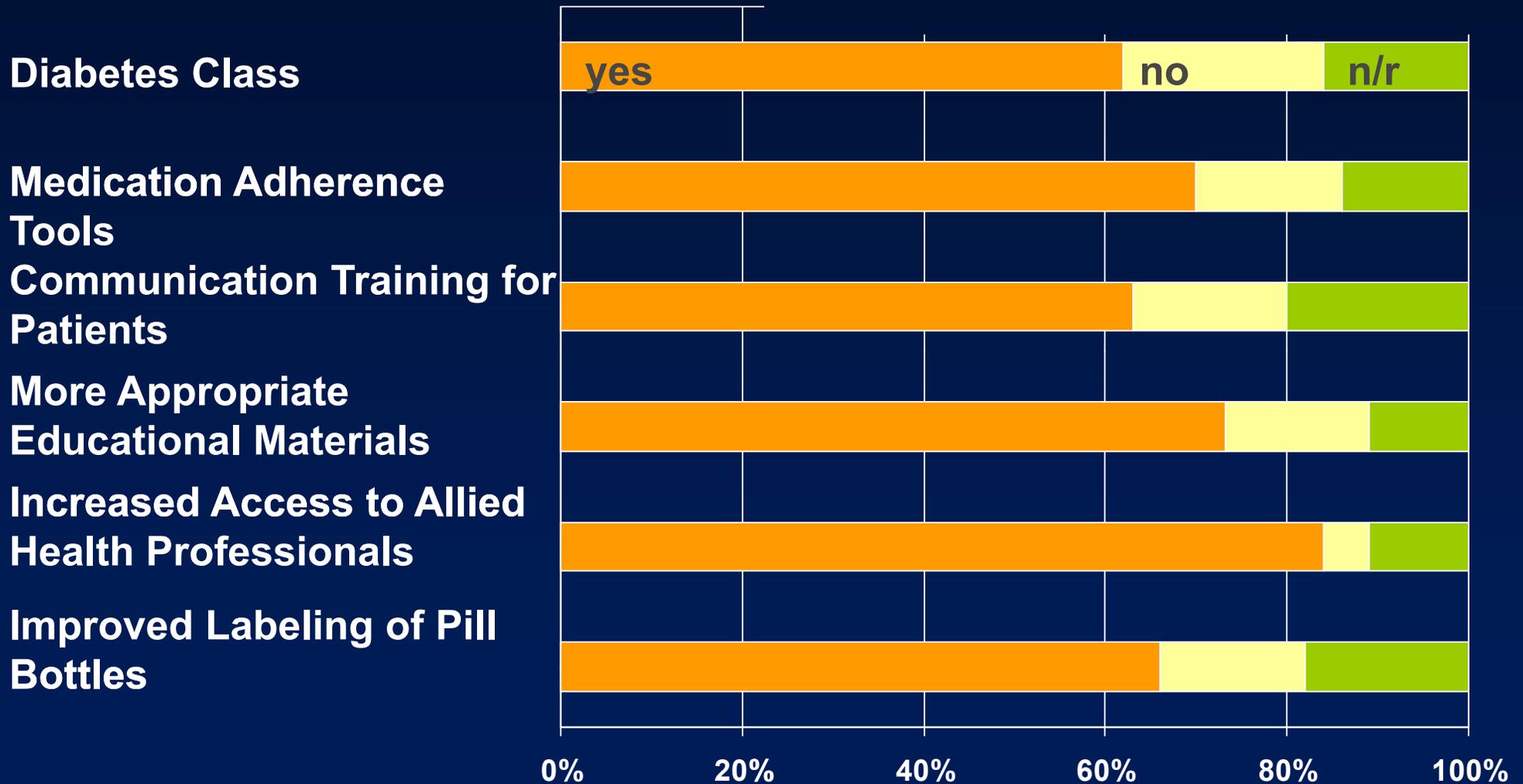


Seligman, Schillinger *JGIM*, 2005.

Physician Responses to HL Screening

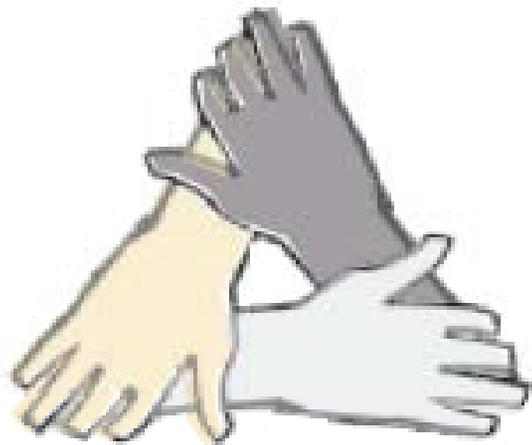


What Do Physicians Say They Need?



IDEALL Project:

Improving Diabetes Efforts Across Language and Literacy



EL PROYECTO DE SALUD IDEALL

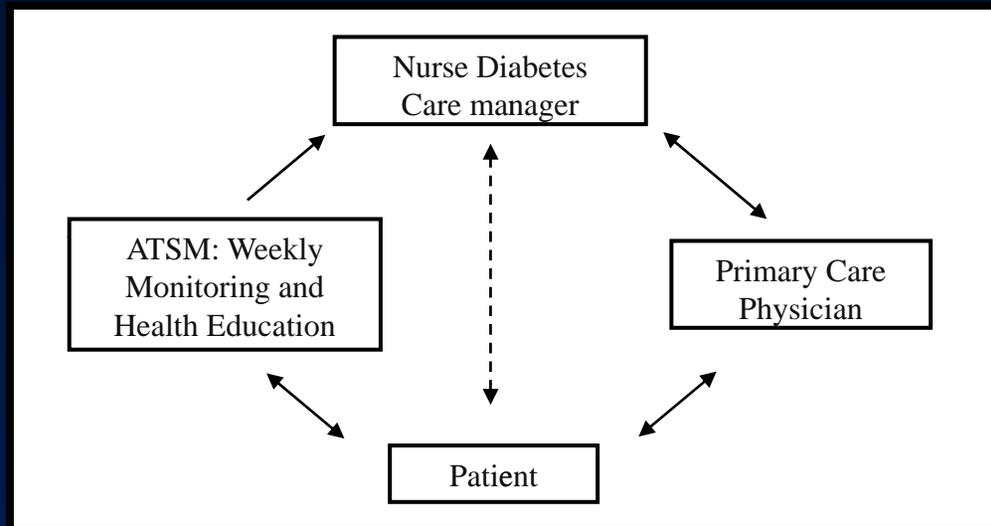
理想健康計劃

IDEALL HEALTH PROJECT

- Community Health Network of SF/DPH
- AHRQ
- CMWF, TCE, CHCF

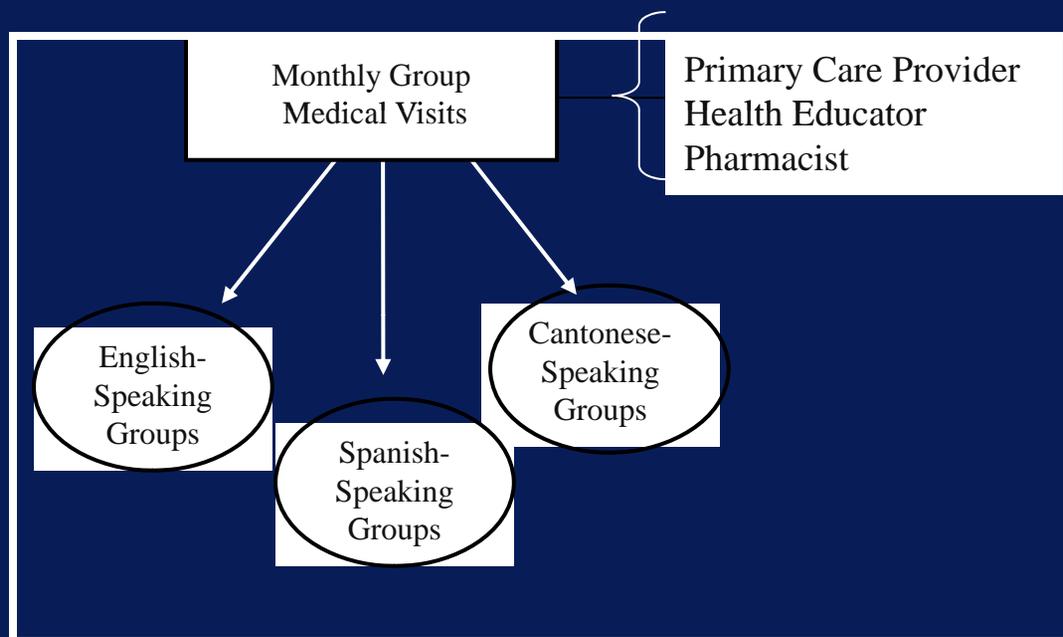
Schillinger Diab Care 2009

Automated Telephone Diabetes Self-Management Support (ATSM)



- Interactive health technology, touch tone response
- Weekly surveillance & health education (39 weeks=9 mos)
- In patients' preferred language (English, Spanish or Cantonese)
- Generates weekly reports of out of range responses
- Live phone follow-up through a bilingual nurse -> **behavioral action plans**

Group Medical Visits (GMVs)



- 6-10 patients in monthly group meetings (9 months)
- In patients preferred language (English, Spanish, or Cantonese)
- Facilitated by a bilingual health educator and a primary care provider
- A pharmacist present at end of each group visit
- Encourage patients to become active in self-care through participatory learning and peer education ->**behavioral action plans**

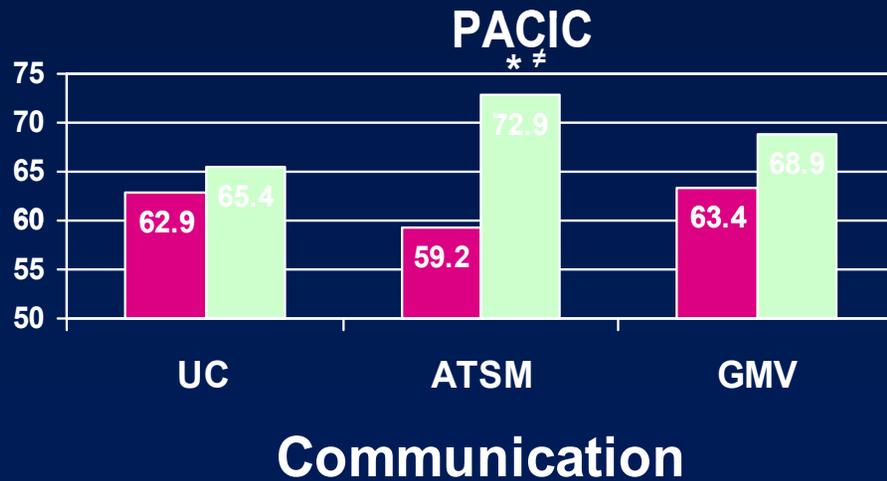
Key Findings of IDEALL Program , N=339

Estimating Public Health “Reach” of Programs

Composite reach product

	<u>ATSM</u>	<u>GMV</u>
■ Overall	22.1	4.8
■ English	20.0	6.4
■ Chinese	22.0	2.7
■ Spanish	24.3	4.0
■ Adequate Literacy	15.6	7.6
■ Limited Literacy	28.0	3.6

Results, N=339 : Structure and Process Measures



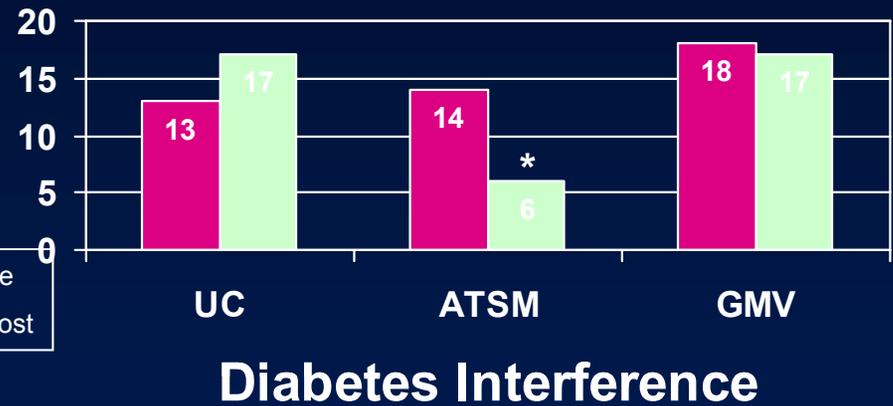
*P<.05.

Results: Functional Outcomes

Rate ratio 0.5 vs UC, 0.35 vs GMV



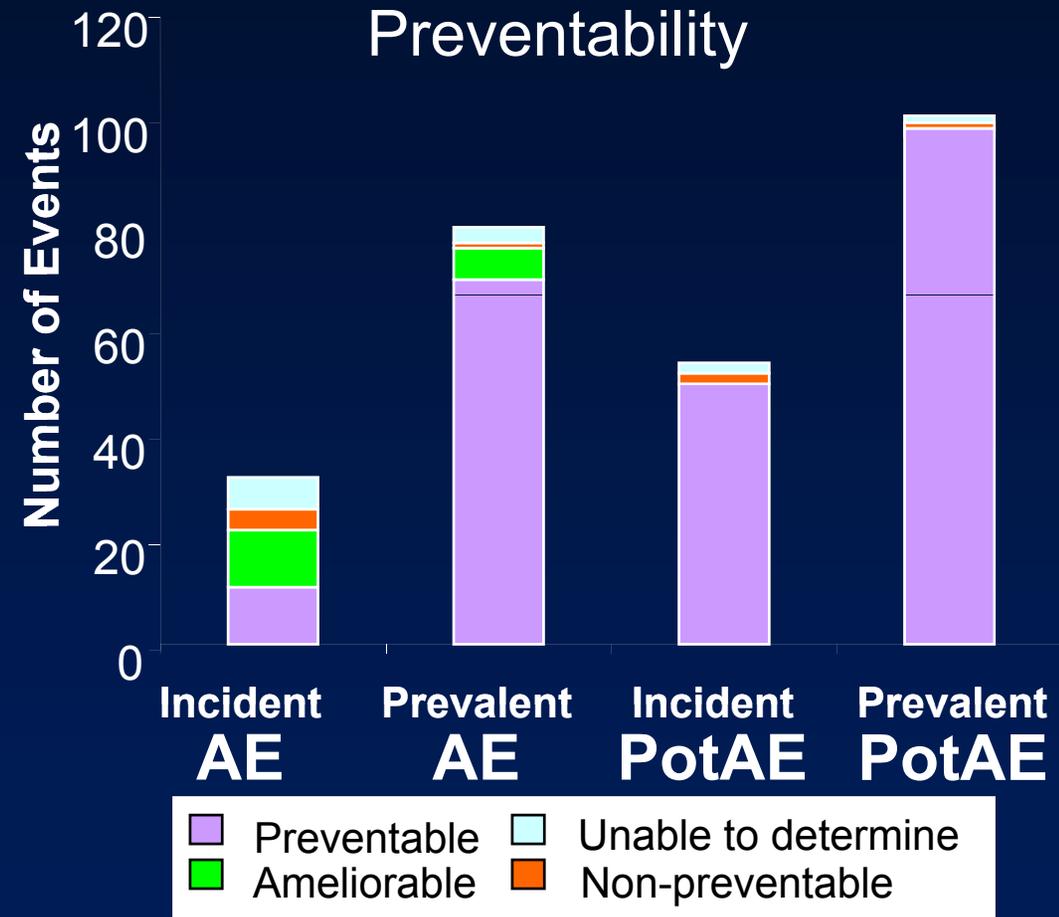
OR 0.37 vs UC



*P<.05

Automated telephony provides safety surveillance function

- 111 participants, 54% inadequate health literacy
- 264 events among 93 participants (86%)
- 111 AE's and 153 PotAE's



Clinician Survey Findings

- 87 of 113 (77%) physicians caring for 245 /330 (74%) patients (mean, 2.8 per physician).
- Compared to UC, patients exposed to ATSM were perceived as more likely to be **activated** to create and achieve goals for chronic care (standardized effect size, ATSM vs. UC, +0.41, p=0.05).
- Over half of physicians reported that ATSM helped overcome 4 of 5 common barriers to diabetes care
- Physicians rated **quality** of care as higher in ATSM compared to usual care (OR 3.6, p=0.003), and GMV (OR 2.2, p=0.06)
- Majority felt ATSM should be **expanded** to more patients with diabetes (88%)



"My question is: Are we making an impact?"



Current AHRQ Project

- Partner with a local Medicaid health plan: San Francisco Health Plan
- SFHP care managers will make ATSM response calls
- Test effectiveness when implemented in 'real-world'
- Compare ATSM-ONLY with ATSM-PLUS (medication activation)
- ATSM-PLUS involves merging pharmacy claims data with ATSM data to enable care manager counseling

SFHP Pre- Enrollment Post Card

English

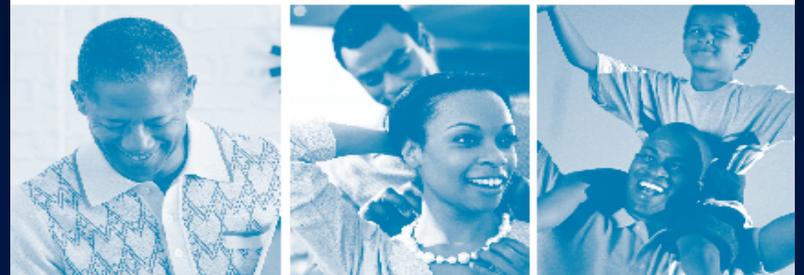


201 TOWER STREET, 2ND FLOOR
SAN FRANCISCO, CA 94108
www.sfhph.org

AN IMPORTANT MESSAGE ABOUT YOUR HEALTH

INSIDE:

An important message about your health



Help is here.

Diabetes is an important health condition that requires careful monitoring.

We have a program that can help you control your diabetes. You will get information about diabetes and ways to better control it.

A nurse who speaks your language will be available to answer your questions and help you manage your diabetes.

The program is **FREE** and it can help you feel better!

We will be **calling you** in a few weeks to tell you more about this program.

If you have questions, you may call us at **(415) 615-4522**.

We look forward to speaking with you soon!

6188 0506

Spanish



201 TOWER STREET, 7TH FLOOR
SAN FRANCISCO, CA 94108
www.sfp.org

AN IMPORTANT MESSAGE ABOUT YOUR HEALTH
Un mensaje importante acerca de su salud

INSIDE:

An important message about your health



ADENTRO:
Un mensaje importante acerca de su salud

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We will be **calling you** in a few weeks to tell you more about this program.

If you have questions, you may call us at **(415) 615-4522**.

We look forward to speaking with you soon!

La ayuda esta aqui.

La Diabetes es un estado de salud importante que requiere monitoreo cauteloso.

Tenemos un programa que puede ayudarle a controlar su diabetes.

Usted recibira información sobre la diabetes y la mejor manera de controlarla.

Una enfermera quien habla su idioma estara disponible para contestar sus preguntas y ayudarle a controlar su diabetes.

¡ El programa es **GRÁTIS** y puede ayudarle a sentirse mejor! Estaremos **llamandole** en unas semanas para decirle más sobre este programa.

Si usted tiene preguntas, puede llamarnos al **(415) 615-4522**.

¡Esperamos hablar con usted proximente!

Cantonese



201 TUNHO STREET, 7th FLOOR
SAN FRANCISCO, CA 94104
www.sfp.org

AN IMPORTANT MESSAGE ABOUT YOUR HEALTH
有關您的健康的重要訊息

INSIDE:

An important
message
about your
health

內文：
有關您的健康
的重要訊息



Help is here.

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If you have questions, you may call us at **(415) 615-4522**.

We look forward to speaking with you soon!

我們可為您提供協助。

糖尿病是一種嚴重疾病，需要密切監控病情。

我們提供一項可協助您控制糖尿病的計劃。您將獲得有關糖尿病及如何更好地控制病情的資料。

本計劃將安排一位能夠講您的語言的護士解答您的疑問，並協助您控制糖尿病。

本計劃完全**免費**，並有助於您改善健康！

我們將在幾週內**致電閣下**，告訴您有關本計劃的詳情。

如有疑問，請致電 **(415) 615-4522**。

我們期待儘早與您交談！

SFHP Wallet-Size Card

English, Spanish and Cantonese

Diabetes Program

Help is here!



Important Contact Information

(415) 615-4522 San Francisco Health Plan
Diabetes Project Nurse

(877) 273-6027 Toll free weekly call in

(415) 206-3696 UCSF Research Team

6188 0608

Programa para la diabetes

¡La ayuda está aquí!

Información de contacto importante



(415) 615-4522 Enfermera del Proyecto de
Diabetes del Plan de Salud de
San Francisco

(877) 273-6027 Número gratuito para llamadas
semanales

(415) 206-3696 Equipo de investigación
de UCSF

6188 0608

糖尿病計劃

我們可為您提供協助。



重要聯絡資料

(415) 615-4522 糖尿病計劃護士

(877) 273-6027 每週免費電話

(415) 206-3696 UCSF 研究團隊

6188 0608

Literacy and Diabetes: Conclusions

- Mechanisms by which limited literacy affect chronic illness outcomes likely multiple
- Apparent that improving literacy levels can achieve important public health objectives and reduce disparities
- Communication characteristics of health care system contribute to sub-optimal health care
- Re-structuring health care system (increasing interactivity, employing appropriate technology) can improve reach and effectiveness of health care, enhance quality, promote safety



p



DISTANCE
Diabetes Study of
Northern California

The Impact of Language Barriers on Poor Glycemic Control Among Insured Latino Diabetics: Data from DISTANCE Study

Fernandez A, Schillinger D, Warton M, Parker M, Adler N, Schenker Y, Moffet H, Salgado V, Ahmed A, and Karter A.



Glycemic Control of Latino Diabetics by English Language Ability and by Physician-patient Language Concordance

	English Speakers (n=2683)	All LEP (n=510)	<i>P</i> Value	LEP - LC (n=137)	LEP- LD (n=115)	<i>P</i> Value
A1c, mean (SD)	7.65 (1.71)	7.81 (1.85)	0.06	7.58 (1.62)	7.99 (1.92)	0.07
Proportion of group with A1c≥9% (%)	18.0	21.4	0.08	16.1	27.8	0.03

Abbreviations: PCP: Primary Care Physician; LEP: Limited English Proficient; LEP-LC: LEP with language concordant PCP; LEP-LD: LEP with language discordant PCP

Association of Patient English Proficiency and Language Concordant Physician with Poor Glycemic Control (A1c \geq 9%).

		Odds Ratio (95% C.I.)	
		OR	p value
Unadjusted	English	1.00	
	LEP	1.24 (1.01 - 1.52)	0.04
	English	1.00	
	LEP - LC	0.87 (0.53 - 1.43)	0.58
	English	1.00	
	LEP - LD	1.76 (1.06 - 2.93)	0.03
	LEP - LC	1.00	
	LEP - LD	2.21 (1.30 - 3.76)	0.003
Adjusted **	English	1.00	
	LEP - LC	0.89 (0.53 - 1.49)	0.66
	English	1.00	
	LEP - LD	1.76 (1.04 - 2.97)	0.04
	LEP - LC	1.00	
	LEP - LD	1.98 (1.03 - 3.80)	0.04

** GEE (generalized estimating equation) models accounting for clustering by physician and facility, and adjusted for age, sex, comorbidity index, diabetes duration and pharmacy benefits.

Abbreviations: LEP: Limited English Proficient; LEP-LC: LEP with language concordant physician; LEP-LD: LEP with language discordant physician; LS Means: Least Squares Means;