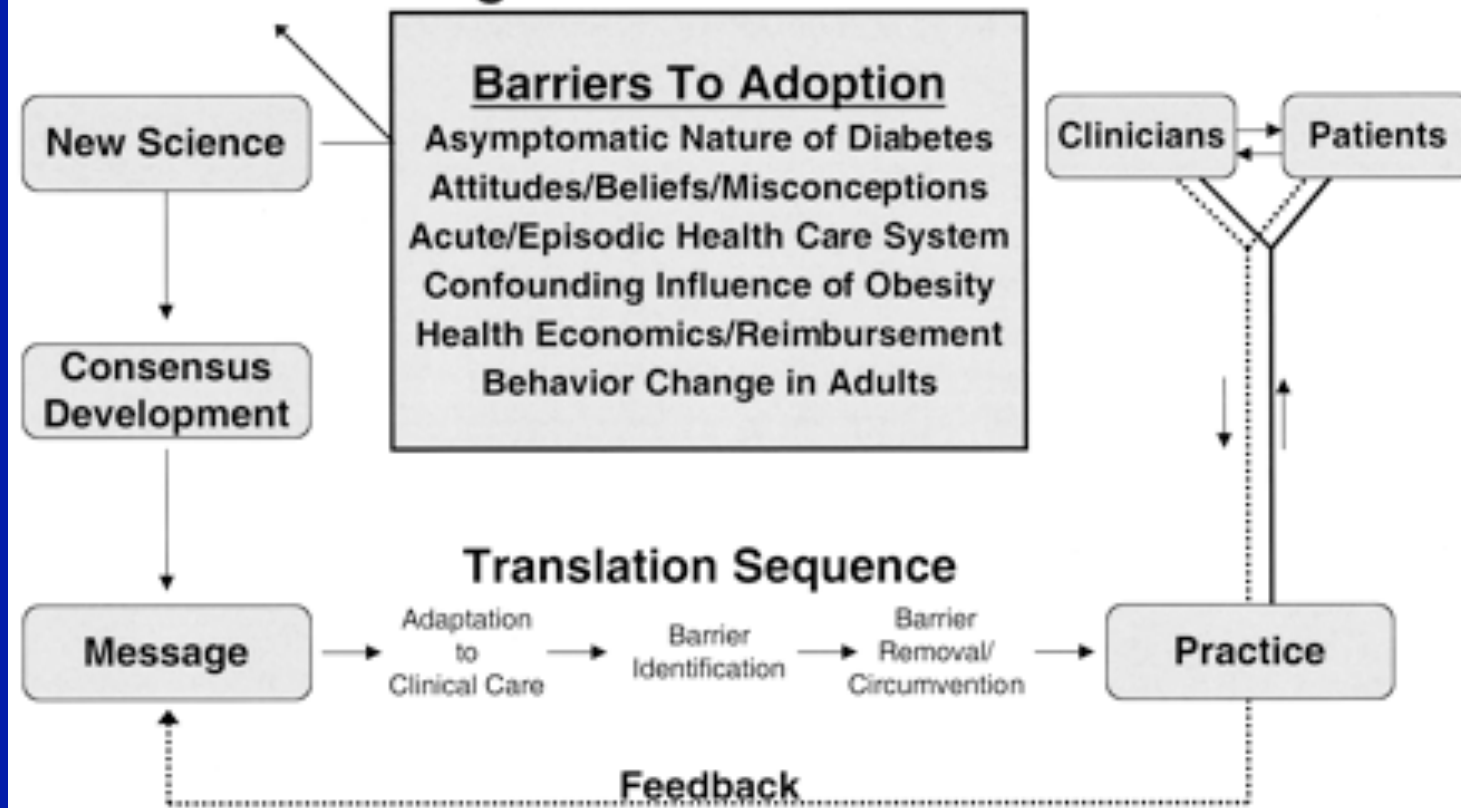


# Barriers to Optimal Diabetes Care: A Primary Care Perspective

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# TRANSLATION

## Putting New Science To Work



# Themes

- Factors
  - Patient / Provider / Systems
- Competing Demands
- Knowledge and Attitudes

# Barriers

# Patient Factors

- Facilitators:
  - Patient Anxiety – Drives desire to learn more
- Barriers
  - Lack of acceptance of DM as a chronic disease
  - Asymptomatic state
  - Lack of adherence – poor motivation
  - Poor attitudes – fatalistic
  - Comorbidities
  - Cost of medications
  - Cultural issues

## Patient Factors (other)

- Illiteracy
- Innumeracy
- Eyesight
- Fear of needles
- Cost / Insurance issues (formulary issues)
- Understanding about disease

# Adherence

- Patients follow treatment regimens more readily if they:
  - involve medications rather than lifestyle changes
  - if the perceived severity of the disease is high
  - including a direct connection between symptoms and disease
  - if medications alleviate uncomfortable symptoms and minimize the risk of hypoglycemia
  - if the regimen is simple rather than complex
  - If they believe the recommended treatment will enable them to delay or avoid complications

# Physician Factors

- Facilitators
  - CME
  - Electronic Reminders / Information Systems
  - Team Based Care
- Barriers
  - Knowledge: diabetic diet, initiating insulin etc
  - Practice organization – tracking/registry
    - Dedicated personnel for calling (if registry exists)
    - Lack of protocols
    - Lack of team based approach



## Physician Factors (other)

- Lack of understanding of disease progression
- Fear of hypoglycemia
- Multiple competing demands
- ? Inertia

# Systems Factors

- Facilitators
  - Diabetes Education Centers
- Barriers
  - Time factors
  - Reimbursement
  - Overwhelmed with number of guidelines
    - “The new guidelines make me feel awful. I have enough trouble doing what I’m doing and then trying to do menopausal counselling, osteoporosis counselling, smoking cessation counselling, hormonal therapy counselling, car seat counselling for babies, sunscreen counselling, drug counselling, sexually transmitted disease counselling and, then put in more new guidelines [for diabetes] it makes me think I might scream.”
  - Limited services available for special populations such as the elderly and cultural groups at DEC

## Systems Factors (Other)

- Patient Volume
  - Length of office visit: 10-15 minutes
- Poor coordination of care
  - Lack of use of protocols
  - Lack of use of team based care
- Reimbursement considerations
  - Lack of payment for telemedicine, emails etc

**To Much To Do?**  
**Clinical Inertia vs Competing  
Demands**

# Too Much to Do!

**Table 1. Estimated Patient Populations in the Model Practice, Based on US Census Data (2002)**

Age-groups	US Population	Patients
< 18 y	72,894,483	632
18-24 y	28,341,732	246
25-29 y	18,971,891	164
30-34 y	20,956,412	182
35-39 y	21,914,882	190
40-44 y	23,001,724	199
45-49 y	21,302,064	185
50-54 y	18,781,873	163
55-59 y	14,990,542	130
60-64 y	11,611,184	101
65-69 y	9,580,927	83
70-74 y	8,693,288	75
75 y +	17,327,696	150
Total	288,368,698	2,500

From: United States Census Bureau.<sup>15</sup>

# Too Much to Do!

**Table 2. Summary of Primary Care Time Requirements for 10 Chronic Diseases, Assuming the Disease is Stable and in Good Control**

Disease	Number of Cases	Visits Per Year	Minutes Per Visit	Minutes Per Disease Per Year	Hours Per Year
Hyperlipidemia	511	2	10	20	170
Hypertension	472	2	10	20	157
Depression	118	4	10	40	92
Asthma	183	2	10	20	61
Diabetes	145	2	10	20	48
Arthritis	381	2	10	20	127
Anxiety	279	2	10	20	107
Osteoporosis	140	1	10	10	23
COPD	131	1	10	10	22
CAD	120	1	10	10	20
Total hours per year					828
Total hours per work day					3.5

Note: Patients with more than 1 of the 10 diseases appear more than once. Summary of time assuming that the disease is "stable," "in control," "at goal," or "in maintenance phase."

COPD = chronic obstructive pulmonary disease; CAD = coronary artery disease.

# Too Much to Do

**Table 3. Effect of Disease Control Status on Time Requirements for 5 Chronic Diseases**

Disease	Total Cases	No. (%) of Cases		Number of Visits		Minutes per Visit	Hours Per Year
		Uncontrolled	Controlled	Uncontrolled	Controlled		
Hyperlipidemia	511	417 (81.6)	94 (18.4)	8	2	10	587
Hypertension	472	312 (66)	160 (34)	12	2	10	704
Depression	118	58 (49)	60 (51)	12	4	10	156
Asthma	183	62 (33.6)	121 (66.3)	4	2	10	82
Diabetes	145	91 (63)	54 (37)	4	2	10	79
Total hours per year							1,581
Total hours per work day							6.7

**Table 4. Factors Not Accounted for in Estimates of Time Required for Chronic Disease Management in Primary Care**

1. Other chronic diseases not included in Table 2
2. Initial visits for assessment and diagnosis
3. Initiation of new drug regimen (eg, insulin)
4. Patient ability to comply with instructions
5. Treatment of complications and sequelae

# Interviews from the Field

- METHODS: In-depth interviews 10 FP and 9 internists in Ct
  - RESULTS:
    - Physicians' goals were congruent with current guidelines
    - Physicians noted the challenge of balancing the multiple goals of ideal diabetes care and the realities of patient adherence, expectations, and circumstances.
    - Majority of physicians described a patient-centered management style,
    - A substantial minority described a more paternalistic approach.
    - Physicians did not identify or describe office systems for facilitating diabetes management.
  - CONCLUSIONS:
    - The complexity of diabetes care recommendations coupled with the need to tailor recommendations to individual patients produces wide variation in diabetes care. Improvement in care may depend on
      - (1) prioritizing diabetes care recommendations for patients as individuals,
      - (2) improving physicians' motivational counseling skills and enhancing their ability to deal with challenging patients,
      - (3) developing office systems and performance enhancement efforts that support cost-effective practice and patient adherence.



# Direct Observation

- **METHODS:**
  - Direct observation of 20 primary care clinics for 211 patients with DM2.
  - Quality of diabetes care = % services delivered during the encounter if not offered in >1yr
  - Foot examination, referral for an eye examination, (HbA1c) measurement, a lipid panel, and a urine microalbumin test.
- **RESULTS:**
  - All indicated services were performed in 33% of encounters.
  - Chronic vs acute illness management: 4.8 (95% CI, 1.95%-12.01%) times more likely to receive 100% of all indicated services.
  - For chronic disease follow ups - length of encounter was associated with percentage of services delivered,
  - Encounters during which 100% of all indicated services were delivered had a mean length of 19.4 minutes.
- **CONCLUSIONS:**
  - Competing demands during primary care encounters require patient and physician to prioritize services delivered and defer indicated services to subsequent visits.
  - Current models of patient care in primary care settings are inadequate to address the multitude of tasks facing clinicians, especially among patients with complex chronic illnesses. Innovative approaches and new models are needed to improve the quality of diabetes care.

**Encounters by patients with type 2 diabetes--complex and demanding: an observational study.**

**Parchman ML**, *.Ann Fam Med.* 2006;4(1):40-45

**Table 1. Characteristics of Patients and Encounters (N = 177)**

Characteristic	Mean (SD) or %
Age, years	59.0 (13.3)
Female, %	51.3
Hispanic, %	59.2
Hemoglobin A <sub>1c</sub> level	
>7.0%	55.4,
>8.0%	34.5
Length of encounter, minutes	17.0 (8.4)
Number of patient concerns	2.0 (1.9)
Encounters with a change in hypoglycemic medication, %	
All	26.7
With hemoglobin A <sub>1c</sub> level >7%	35.6
With hemoglobin A <sub>1c</sub> level >8%	42.9
With hemoglobin A <sub>1c</sub> level >9%	46.4
Days to next scheduled appointment	60.9 (43.2)

Hemoglobin A<sub>1c</sub> = glycosylated hemoglobin.

**Table 2. Changes in Medication by Patient and Encounter Characteristics if Hemoglobin A<sub>1c</sub> Value Was Greater Than 7% (n = 98)**

Characteristic	Change in Medication Mean (SD) or %	No Change in Medication Mean (SD) or %	P Value
<b>Patient characteristics</b>			
Age, years	57.5 (13.2)	56.7 (13.5)	.76
Female, %	54.9	50.0	.55
Hispanic, %	60.8	59.6	.88
Number of comorbidities	4.8 (2.2)	4.3 (1.9)	.22
Hemoglobin A <sub>1c</sub> , %	8.6 (2.1)	7.3 (1.7)	<.001
Previous hemoglobin A <sub>1c</sub> level worse, %	51.5	50.9	.95
Number of long-term medications	7.09 (3.14)	5.51 (2.92)	.02
<b>Encounter characteristics</b>			
Number of patient concerns	1.5 (1.3)	2.4 (2.1)	.04
Number of topics discussed by physician	13.4 (4.49)	11.3 (5.05)	.05
Length of encounter, minutes	19.4 (7.2)	15.4 (7.8)	.02
Number of days since last measured hemoglobin A <sub>1c</sub>	70.8 (94.8)	110.2 (170.5)	.07
<b>Percentage of encounter devoted to:</b>			
Discussing nutrition	5.23 (6.25)	2.91 (4.76)	.07
Discussing exercise	1.50 (2.24)	1.71 (3.20)	.77
Discussing medication compliance	7.47 (6.26)	7.79 (6.09)	.83
<b>Percentage of encounter time until:</b>			
Evaluation/feedback of test results	48 (0.29)	0.62 (0.80)	.44
Discussion of planning treatment	74 (0.28)	0.80 (0.43)	.57

Hemoglobin A<sub>1c</sub> = glycosylated hemoglobin.

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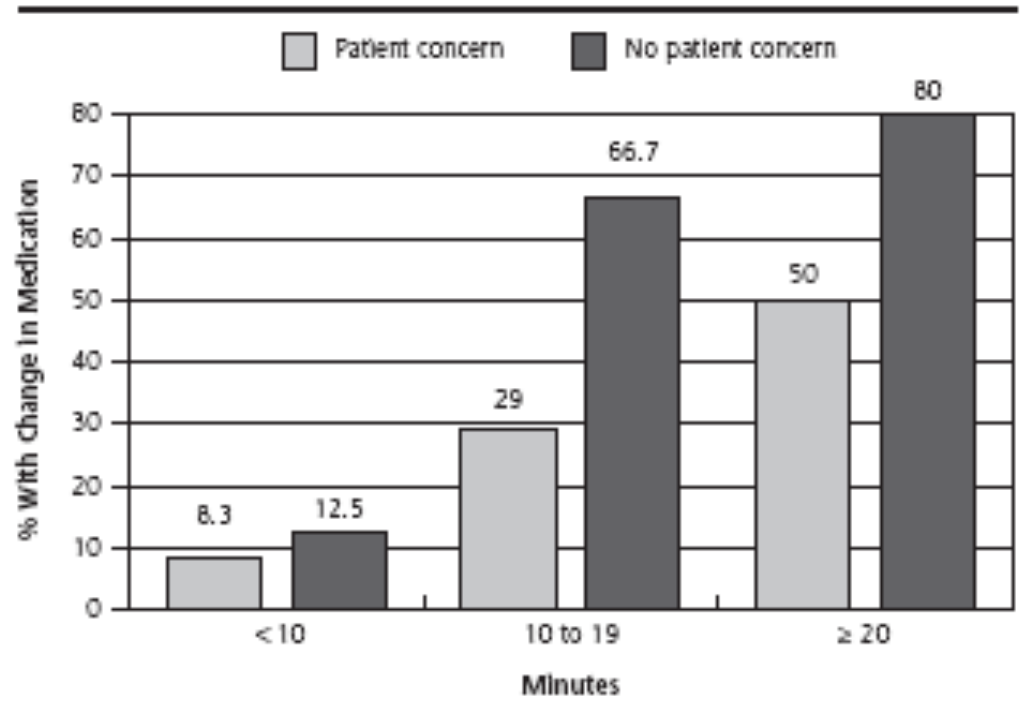
**Table 3. Predictors of Change in Medication**

Predictor	If A <sub>1c</sub> >7% (n = 98)		If A <sub>1c</sub> >8% (n = 61)	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Number of patient concerns	0.51	0.40-0.65	0.52	0.33-0.83
Number of clinician topics	1.02	0.93-1.12	1.00	0.90-1.10
Length of encounter in minutes	1.08	1.00-1.17	1.00	0.93-1.09
Most recent hemoglobin A <sub>1c</sub> value	1.11	0.83-1.48	1.15	0.77-1.74
Number of long-term medications	1.10	0.93-1.31	1.03	0.86-1.24
Days since last hemoglobin A <sub>1c</sub>	1.00	0.99-1.00	1.00	1.00-1.00

CI = confidence interval; hemoglobin A<sub>1c</sub> = glycosylated hemoglobin.

- Each additional patient concern led to a 49% drop in likelihood of medication change
  - Encounters >4 concerns – no med changes
  - A1C>8 had similar results

**Figure 1. Percentage of patients with a change in medication, by encounter length and presence of patient concerns.**



Note:  $\chi^2$  across Patient concern: 7.26 ( $P = .03$ );  $\chi^2$  across No patient concern: 6.93 ( $P = .03$ ).

# Knowledge vs Attitude

# Attitudes after CME Sessions.

- OBJECTIVE:
  - To explore if attitudes, rather than knowledge, may impede primary care provider adherence to standards of care.
- RESEARCH DESIGN AND METHODS:
  - 31 primary care providers attending an eight-session CME program on diabetes.
  - Providers rated on a 10-point scale how the treatment of diabetes compared with that of five other chronic conditions (hypertension, hyperlipidemia, angina, arthritis, and heart failure; 1 = easier to 10 = harder; midpoint 5.5).
  - In a subsequent open-ended qualitative interview, providers explained their scale ratings.
- RESULTS:
  - Diabetes was rated as significantly harder to treat than hypertension (24 of 30 >5.5;  $P < 0.001$ ) and angina (20 of 30 >5.5;  $P = 0.03$ ). A majority also rated hyperlipidemia (18 of 30) and arthritis (18 of 30) as easier to treat than diabetes. Explanatory themes underlying provider frustrations with diabetes include characteristics of the disease itself and the complexity of its management, and a perceived lack of support from society and the health care system for their efforts to control diabetes.
- CONCLUSIONS:
  - CME that addresses provider attitudes toward diabetes in addition to updating knowledge may be more effective than traditional CME in promoting adherence to standards of care.

Diabetes Care. 1998 Sep;21(9):1391-6

# Physician Attitude and Comfort

Table 2—Attitudes toward the treatment of diabetes: scale results

	>5.5	5.0 or 5.5	<5.0	P value
Comparison of difficulty of treatment for diabetes with that of other chronic illnesses (1 = easier to 10 = harder)				
Hypertension	80 (24)*	17 (5)	3 (1)	<0.001
Angina	67 (20)*	13 (4)	20 (6)	0.03
Hyperlipidemia	60 (18)*	27 (8)	13 (4)	0.06
Arthritis	60 (18)*	20 (6)	20 (6)	0.06
Heart failure	50 (15)*	20 (6)	30 (9)	0.29
Beliefs about diabetes treatment (1 = strongly agree to 10 = strongly disagree)				
Treatment efficacious	0 (0)	0 (0)	100 (31)	<0.001
Confident in own abilities	3 (1)	19 (6)	77 (24)	<0.001
Enough time and resources	45 (14)	6 (2)	48 (15)	0.29

Data are % (n). P values were determined by the nonparametric quartiles test. \*One individual did not answer this set of scales.

1=AGREE, 10 DISAGREE



Table 3—Why diabetes is harder to treat than other diseases: qualitative themes

Theme	Explanation
1. Medication	Not as effective. May increase symptoms. Aimed at underlying problem versus symptoms. Not as many alternatives.*
2. Glycemic control	Constant fluctuations. Labor intensive.
3. Lifestyle change	Patients become lax in following recommendations. Outside of provider control. Diet and exercise change difficult for patients. Inadequate provider training to motivate behavioral change.
4. Complexity of treatment	Many components to coordinate with patients. Comorbidities and complications require different therapies and specialists.
5. Symptoms	Often asymptomatic. Treatments that alleviate symptoms are easier to titrate and more gratifying to use. Treatments may cause symptoms.
6. Discrepancy between provider and patient perceptions	Patients do not share providers' sense of urgency to control diabetes. Lack of public health campaigns negatively affects patient awareness of diabetes.
7. Unclear diagnosis and treatment protocols	Difficult to know when and how to alter treatment. Too many controversies over how to manage diabetes effectively.
8. Inexorable decline	Patient will get complications no matter what. Provider cannot cure it or control it.
9. Time and expense	Extra time required for diabetes care not supported by clinic administrators. Neither clinics nor patients can afford the cost of comprehensive care. Limited reimbursement for diabetes care and supplies from government programs.

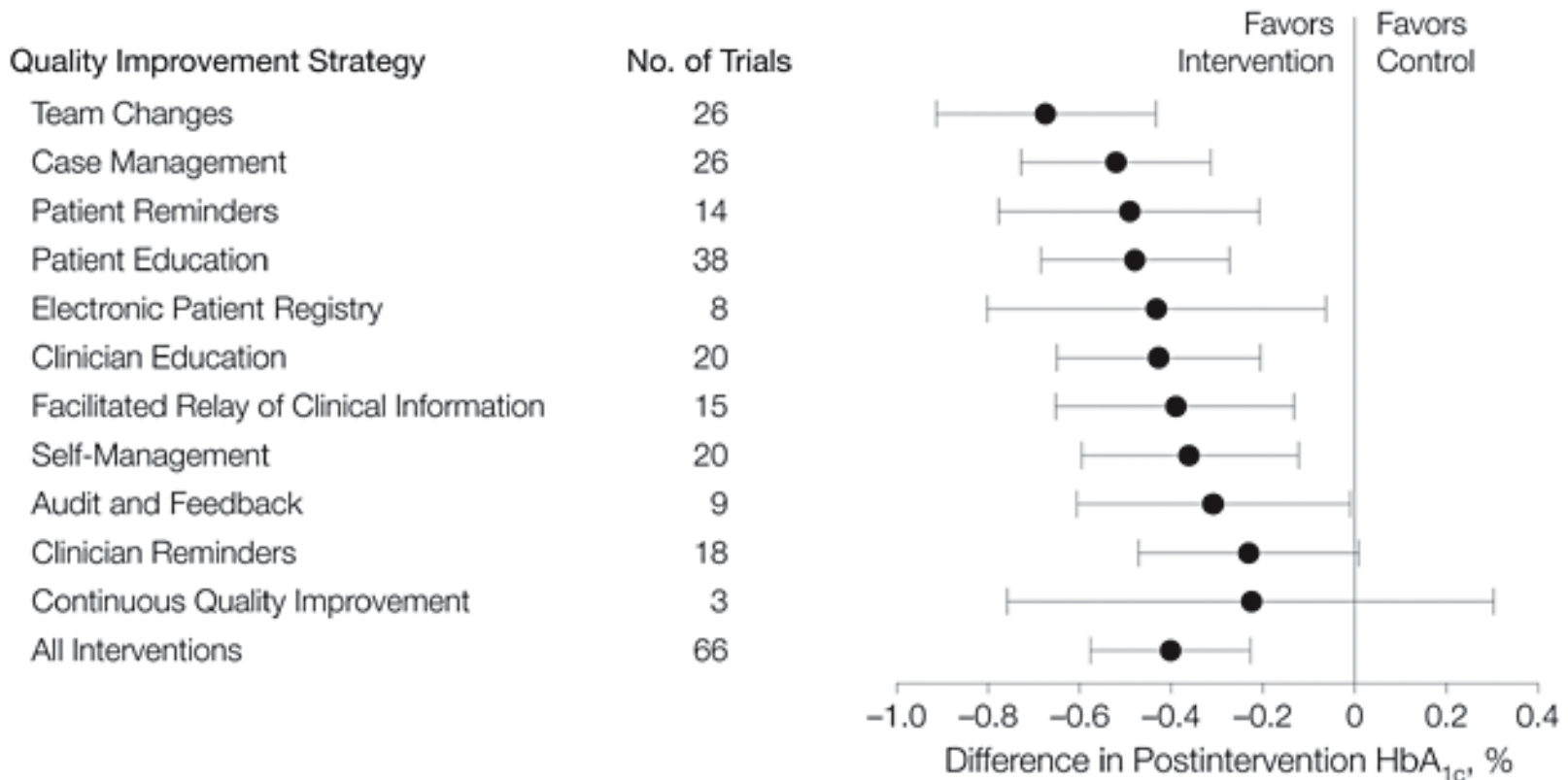
\*This study took place before the release of metformin, acarbose, and troglitazone.

# A Need: Address Knowledge and Attitude

- Scaled responses:
  - Treatments are efficacious
  - Therapeutic actions and advice result in improved outcomes.
- Interviews
  - Providers actually doubted the efficacy of diabetes treatment
  - Providers doubted their abilities to carry out diabetes treatment
- Such information is vital to plan effective educational programs that, in addition to updating provider knowledge, address emotional dimensions of care .

There are Some Things We  
Can Do!

# A Meta-Regression Analysis



11 trials in which case managers could make medication changes without waiting for physician approval. In 4 of these trials, case managers followed treatment protocols that specified only target blood glucose values, but in 5 trials the protocols included guidance for medication adjustments

A key ingredient in the success of case management interventions was the ability of case managers to make medication changes without waiting for physician approval. Interventions in which case managers could make independent medication changes achieved a mean reduction in HbA<sub>1c</sub> values of 0.80% (95% CI, 0.51% to 1.10%), compared with only 0.32% (95% CI, 0.14% to 0.49%) for all other interventions /

- **Case Management.**

- Any system for coordinating diagnosis, treatment, or ongoing patient management (eg, arrangement for referrals, follow-up of test results) by a person or multidisciplinary team in collaboration with or supplementary to the primary care clinician.

- **Team Changes.**

- Adding a team member or "shared care," eg, routine visits with personnel other than the primary physician (including physician or nurse specialists in diabetic care, pharmacists, nutritionists, podiatrists).
- Use of multidisciplinary teams, ie, active participation of professionals from more than 1 discipline (eg, medicine, nursing, pharmacy, nutrition) in the primary, ongoing management of patients.
- Expansion or revision of professional roles (eg, nurse or pharmacist plays more active role in patient monitoring or adjusting medication regimens).

# TRANSLATE: Practice Redesign A Randomized Trial

- 24 practices, 238 providers
- Type 2 DM
- Data from 69,965 visits from 8,405 adults
- Intervention – practice redesign for chronic care model
- Control – usual care

**Table 1—Essential components of the intervention**

Intervention component	Description
Target high risk	Identify and begin with patients at highest risk.
Registry	Create a registry for data collection, reporting, and support.
Administration	Set up administration to oversees changes in roles and responsibilities and enhance continuity during staff turnover.
Notify and remind	Notify patients of targets and appointments. Remind providers at time of visit with patient-specific alerts.
Site coordinator	Identify a site coordinator to facilitate the clinic operations.
Local physician champion	Identify a lead provider to work with the site coordinator and facilitate the intervention with colleagues.
Audit and feedback	Audit and review monthly. Provide feedback to improve progress.
Track	Track process measures, outcomes, and operational activity.
Education	Educate and update all staff in diabetes management techniques.

# Intervention details

- A senior administration personnel identified a site coordinator and local physician champion
  - A small sticker was affixed to medical records of patients with diabetes
  - An electronic diabetes registry was placed on a computer,
  - Site coordinator was trained in its use of the registry.
  - Laboratory values were initially updated manually, electronic interfaces were rapidly introduced.
  - Site coordinator facilitated previsit planning and printed patient-specific physician reminders before every visit by a diabetes patient.
  - Reminders for unscheduled appointments were printed by the medical assistant when the patient was roomed.



# Intervention Details

- Reminders graphed A1C, SBP, and LDL values versus time and indicated whether the patient had achieved targets.
- An "alert" identified all incomplete or overdue tests.
- Foot examinations, blood pressure, and eye examinations were recorded on the reminder by clinic staff, collected after the patient visit, and entered manually.
- The site coordinator notified patients of scheduled visits and contacted high-risk patients with elevated A1C or SBP.
- The site coordinator used the registry to provide a monthly summary describing operational activity and tracking clinical measures.
- Reports were reviewed monthly at a 1-hour staff meeting chaired by the LPC. The LPC also coordinated two diabetes educational updates for staff.

•

**Table 3—Percentage of patients meeting diabetes performance measures at baseline and after intervention, with change, net difference, and statistical significance of the net difference in performance between control and IMPACT clinics**

	Baseline	Intervention period	Change	Net difference (I2 – I1) – (C2 – C1)	P value*
Blood pressure monitoring					
IMPACT clinics	95.1 ± 0.8	96.4 ± 0.6	1.3 ± 0.9	3.5 ± 1.7	0.050
Control clinics	94.3 ± 1.1	92.2 ± 1.2	–2.1 ± 1.4		
Renal testing					
IMPACT clinics	40.9 ± 4.4	64.1 ± 4.2	23.2 ± 5.0	28.5 ± 7.0	<0.001
Control clinics	37.1 ± 4.3	31.8 ± 4.0	–5.3 ± 4.6		
Annual eye examination					
IMPACT clinics	35.5 ± 3.0	62.5 ± 3.1	27.0 ± 2.9	25.9 ± 4.2	<0.001
Control clinics	24.8 ± 2.5	26.0 ± 2.6	1.2 ± 2.3		
Foot examination					
IMPACT clinics	39.4 ± 4.2	68.8 ± 3.8	29.4 ± 5.6	35.0 ± 5.6	<0.001
Control clinics	39.1 ± 4.2	33.5 ± 3.9	–5.6 ± 5.4		
A1C testing					
IMPACT clinics	88.2 ± 1.5	90.1 ± 1.1	2.8 ± 0.9	8.1 ± 1.5	<0.001
Control clinics	87.5 ± 1.5	82.3 ± 1.9	–5.3 ± 1.2		
LDL cholesterol testing					
IMPACT clinics	69.6 ± 3.0	78.0 ± 2.4	8.9 ± 1.3	8.6 ± 1.9	<0.001
Control clinics	64.3 ± 3.2	64.6 ± 3.2	0.3 ± 1.6		

Data are means ± SEM. \*P value based on d.f. = 22. C1, control practices at baseline; C2, control practices at 12 months; I1, intervention practices at baseline; I2, intervention practices at 12 months.

# TRANSLATE Results

	Intervention	Control
Target SBP	45%	40.60%
Target A1C	49%	43.80%
Target LDL	43%	35.50%
Combined	12.60%	8.50%

- Questions?