

**BUILDING BRIDGES FROM  
SCIENCE TO PRACTICE:**

**“RE-AIMING” DIABETES  
SELF-MANAGEMENT INTERVENTIONS AND  
EVALUATIONS FOR PUBLIC  
HEALTH IMPACT**

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# ACKNOWLEDGEMENTS AND INDEBTEDNESS

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**Jackie Glasgow**

# THE GAP BETWEEN RESEARCH AND PRACTICE

**“The world of politics is  
always 20 years behind the  
world of thought.”**

**John Jay Chapman**

# OVERVIEW

- **RE-AIM Model**
- **Diabetes Research Illustrating Application of RE-AIM**
  - **Early basic and efficacy studies**
  - **Recent and ongoing effectiveness research**
- **Summary and Implications**

# INFLUENCES AND BACKGROUND

- **Precede – Proceed Model**  
**Green and Kreuter**
- **Reach x Efficacy = Impact**  
**Abrams, et al**
- **Diffusion of Innovations Theory**  
**Rogers**

# OTHER PRECEDENTS AND INFLUENCES

**Steckler, Goodman, McLeroy, et al  
Institutionalization**

**Oldenburg, Owen, Sallis, et al  
Diffusion/Policy Implementation**

***“If you steal from one author, it’s plagerism; if you steal from many, it’s research.”***

**Wilson Mizner**

# PURPOSES OF RE-AIM

- **To broaden the criteria used to evaluate health promotion programs to include external validity**
- **To evaluate issues relevant to program adoption and implementation**
- **To help close the gap between research studies and practice by**
  - **Informing design of interventions**
  - **Providing guides for adoptees**

## RE-AIM Evaluation Dimension

**% *Reach*** (what proportion of the panel of patients will receive or be willing and able to participate in this intervention)

**X % *Efficacy/Effectiveness*** (results if implemented as intended; defined as positive outcomes minus negative outcomes)

.....

**X % *Adoption*** (how many settings, practices, and plans will adopt this intervention?)

**X % *Implementation*** (to what extent is the intervention implemented as intended in the real world?)

.....

**X % *Maintenance*** (extent to which a program is sustained over time)

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**= Public Health Impact (population-based effect)**

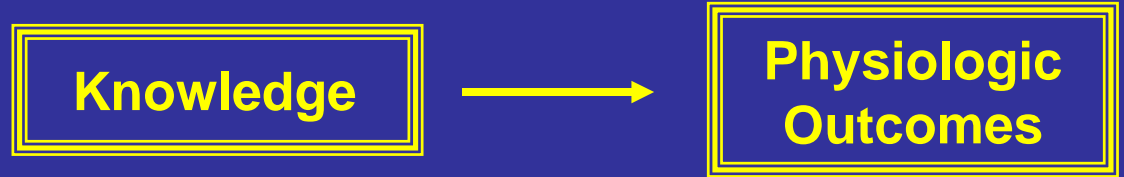
# ESTABLISHING A SOCIAL COGNITIVE MODEL

Russ Glasgow and Kevin McCaul (1982-1984)

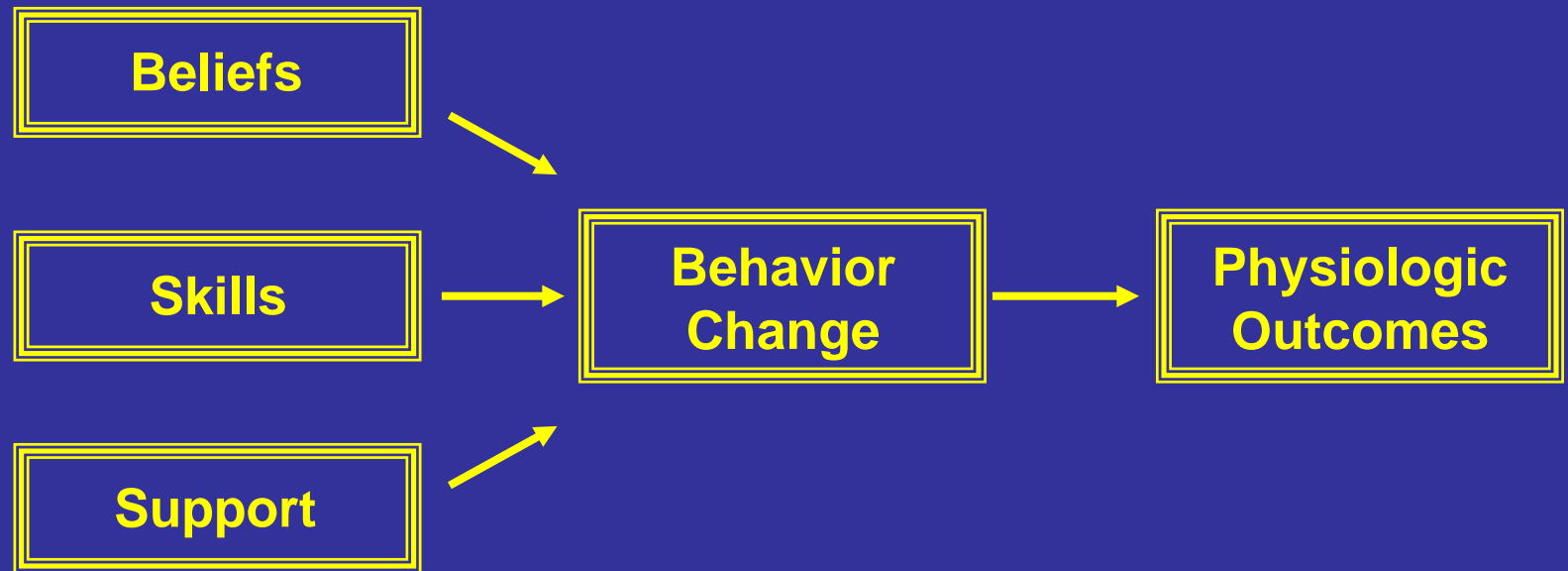
- **Developing instruments for Diabetes Adherence (type 1 and 2)**
  - **Knowledge**
  - **Expectations**
  - **Skills**
  - **Support**

Funded by NIDDK Grant #35524

Traditional:



Early Social  
Cognitive  
Model:



# ASSESSMENT RESULTS – REPLICATED WITH TYPE 1 AND TYPE 2

- **Key social-cognitive factors that prospectively predicted self-management**
  - **Problem-solving skills**
  - **Self-efficacy**
  - **Family support**
- **Complexity and relative independence of regimen areas**

# QUESTION

*So what?*

*Can we modify these factors  
to improve diabetes self-management?*

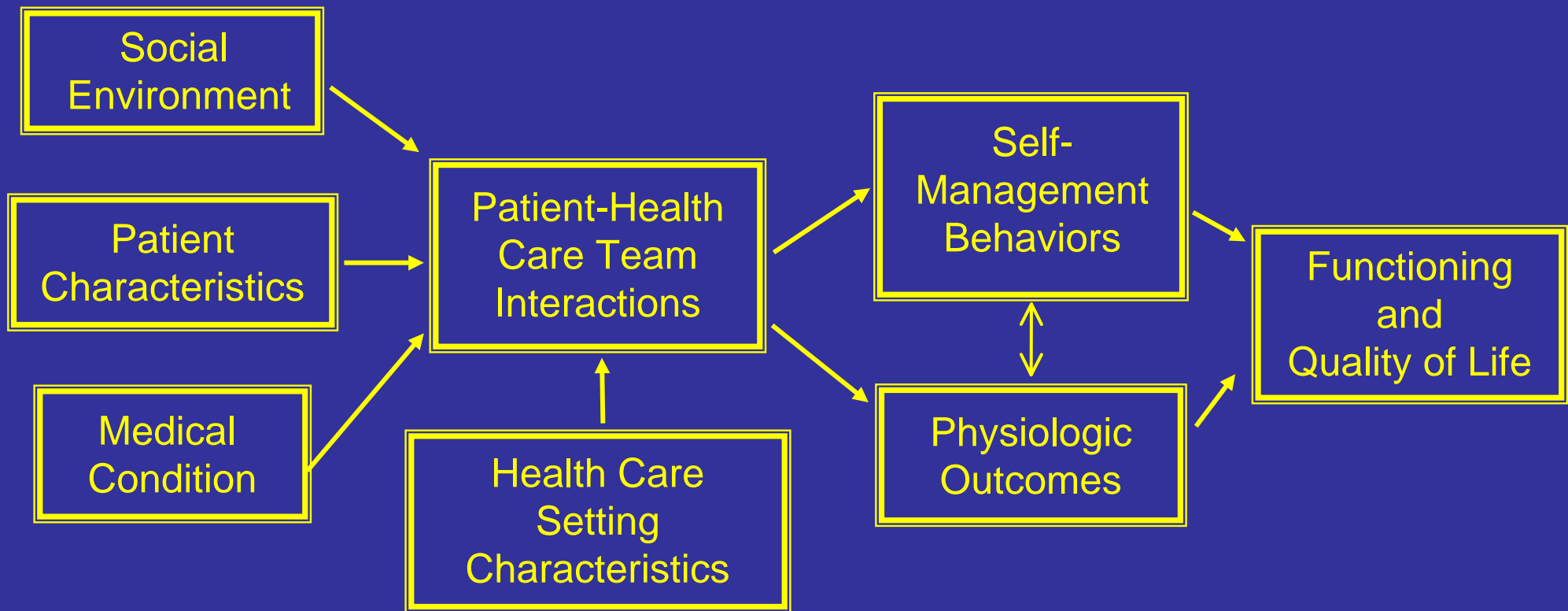
# INCREASING REGIMEN ADHERENCE

Russ Glasgow, Matthew Riddle (1984-1987)

## SCOPE

First intervention study: targeting  
key social learning variables.  
Traditional group sessions.

# MORE ELABORATE CONCEPTUAL MODEL



# CONTRIBUTIONS AND LESSONS LEARNED

- **Significant improvement in randomized trial vs no-treatment / usual care in nutrition and weight**
- **Link between behavior and physiologic outcomes not real strong**

***“Do not do unto others as you would have them do unto you.” G.B. Shaw***

# RE-AIM CONCLUSIONS

**REACH:** Unknown (minimal)

**EFFICACY:** Moderate for narrow range of targeted outcomes (depends on control / comparison condition)

**ADOPTION:** Unknown / Ignored

**IMPLEMENTATION:** Good...but by 100% research funded staff

**MAINTENANCE:** OK at short-term follow-up / NA at setting level

# **“60 – SOMETHING”**

## *Enhancing REACH*

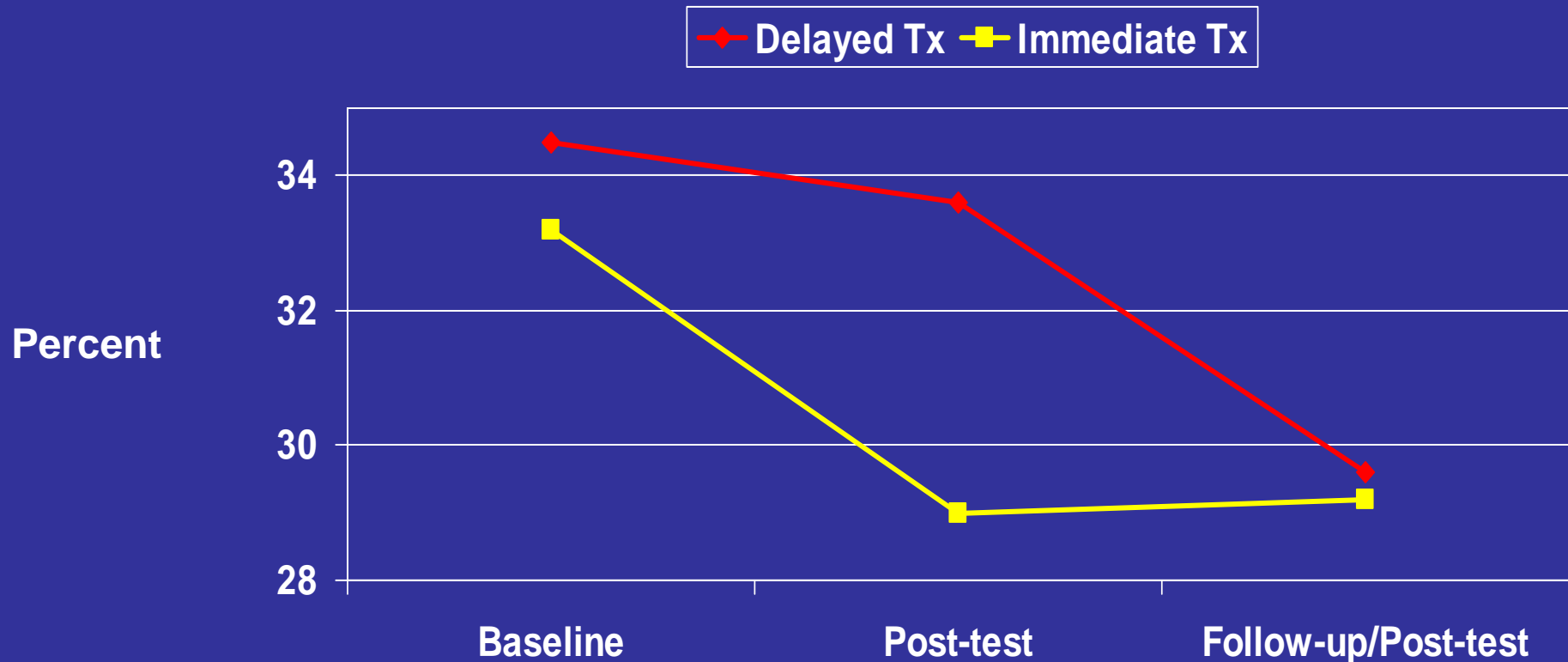
**Russ Glasgow, Pete Lewinsohn, Matthew Riddle  
(1988–1991)**

### **SCOPE**

- **Older adults with diabetes were ignored;**
- **Assumed could not learn new tricks.**
- **Applied SCT to older adults in small RCT;  
8 group sessions**

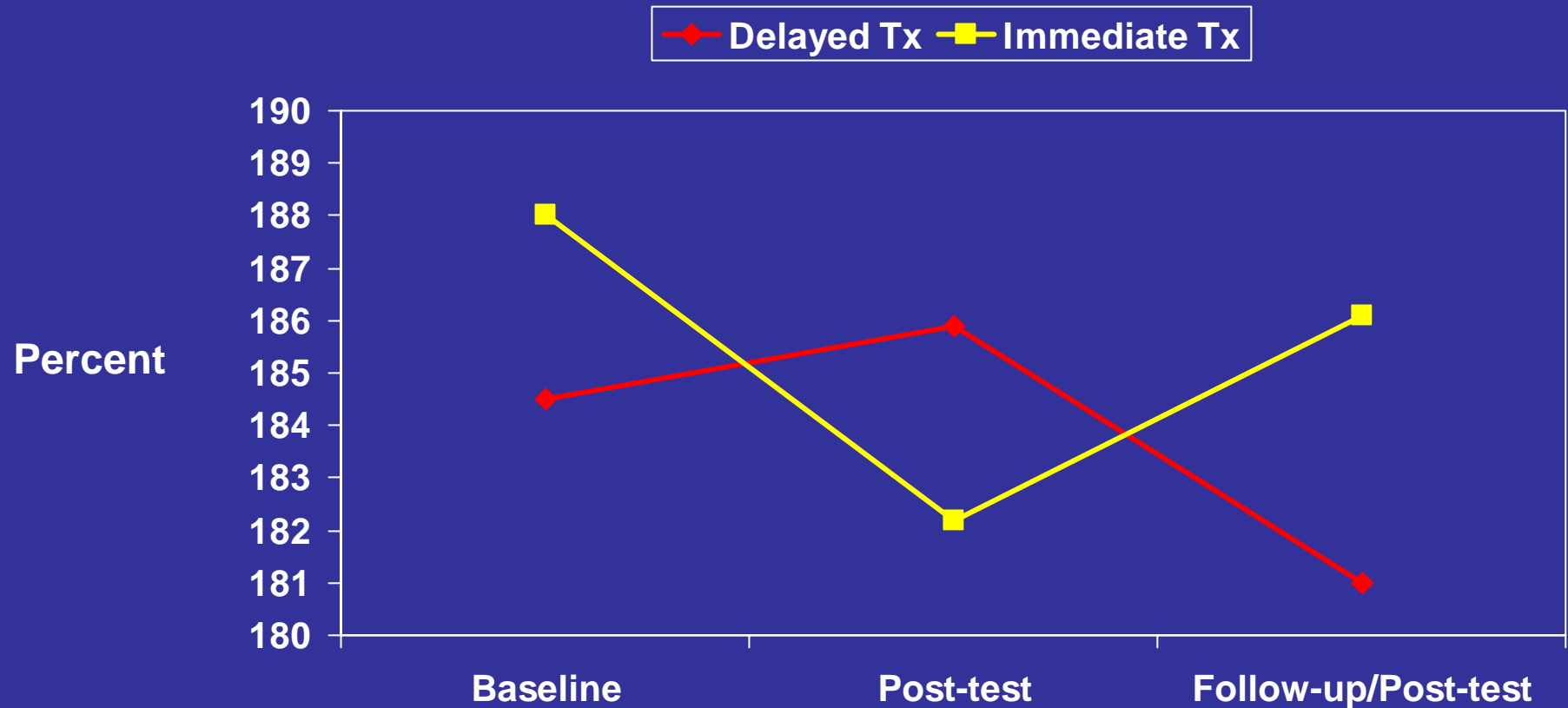
# 60-SOMETHING

## Percent Calories from Fat (n=48 and 49/condition)



# 60-SOMETHING

Weight (n=48 and 49/condition)



# CONTRIBUTIONS AND LESSONS LEARNED

- **Barriers-based, tailored problem solving worked for older adults also!**
- **Group support and problem solving were important processes**

*“If you build it, they will not necessarily come.”*

# **BRIEF MEDICAL OFFICE-BASED INTERVENTION**

**Russ Glasgow, Sarah Hampson, John Noell  
(1992-1996)**

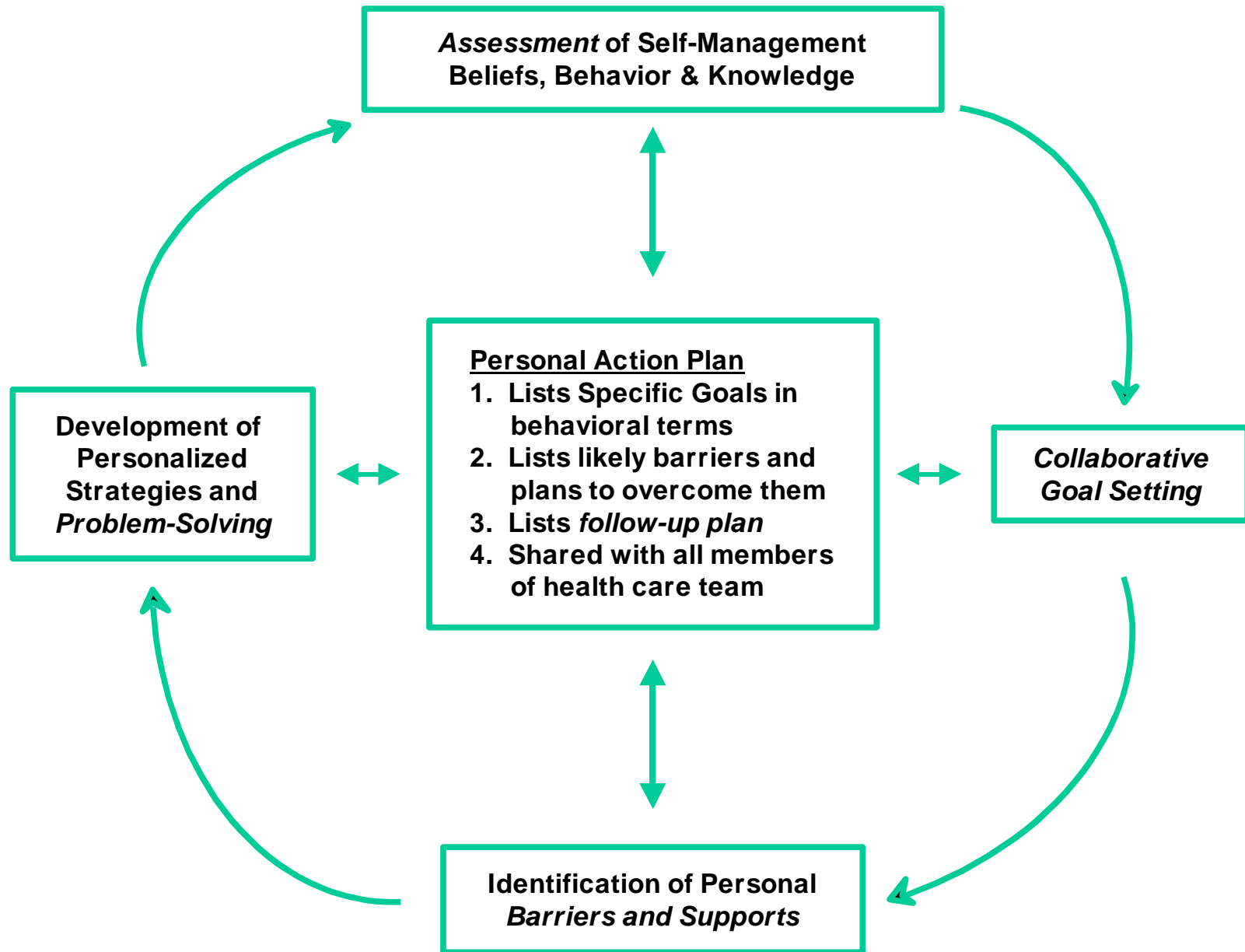
## **SCOPE**

**Trying to reach those who would not  
otherwise attend during primary care visit  
and condense multiple-session  
program into 20 minutes**

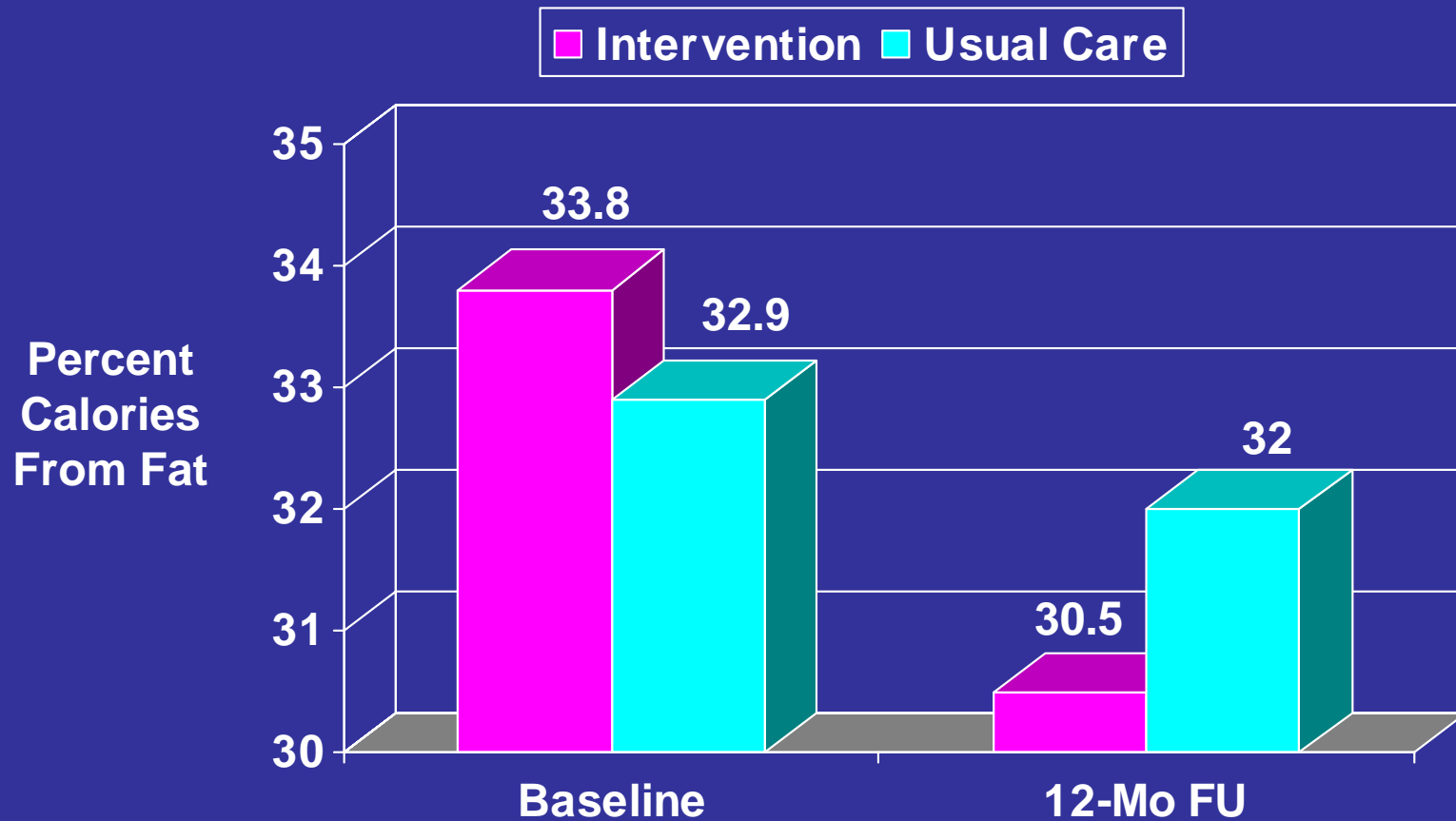
**Funded by NIDDK Grant #35524**

# PURPOSE AND INTERVENTION

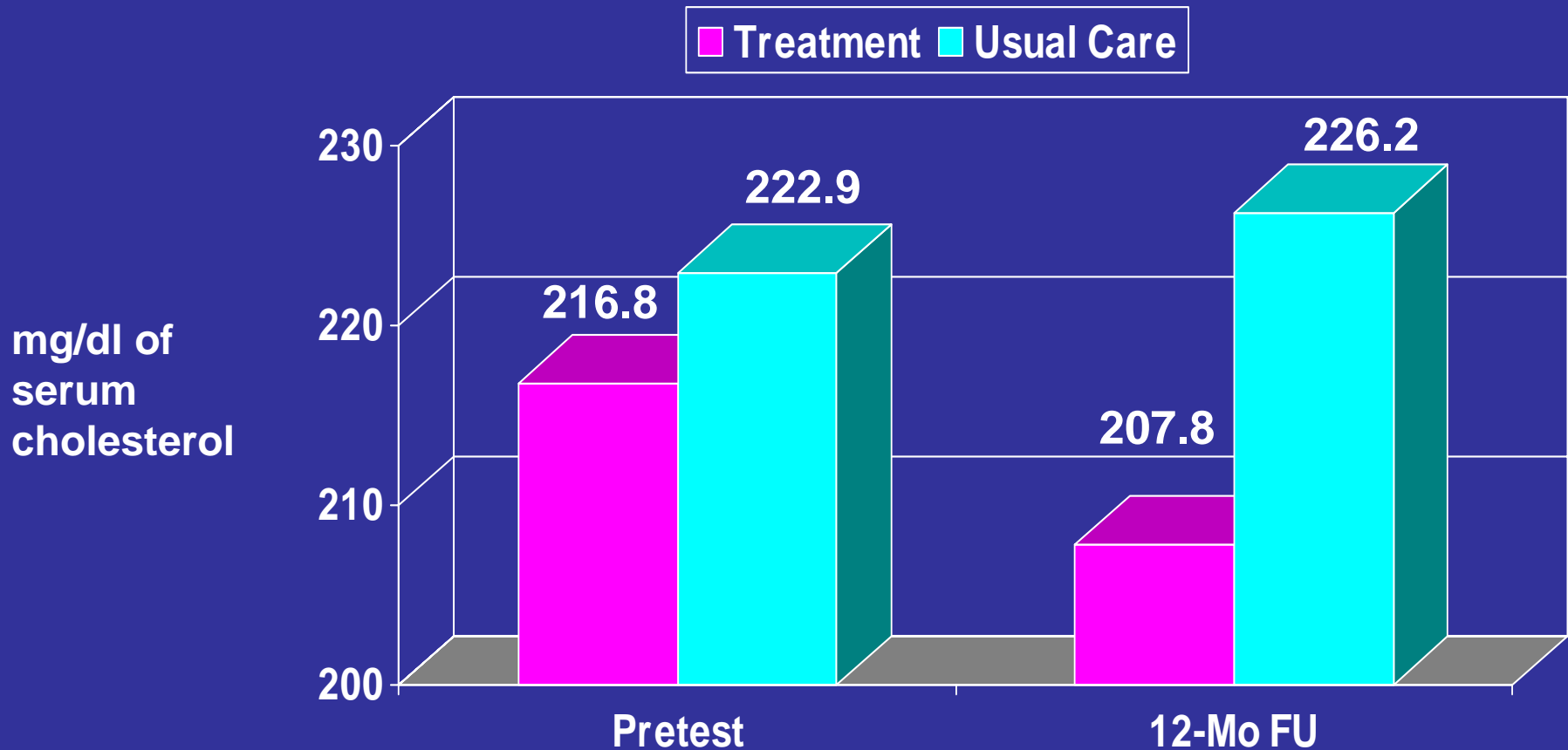
- Evaluation in an RCT, the **REACH** and **EFFECTIVENESS** of a brief intervention guided by a patient-computer intervention
- Intervention began with 15-minute interaction with multi-media touchscreen computer program
- Focus on goal setting, identification of barriers, tailored problem-solving (with educator) and follow-up support



# BASELINE AND 12-MONTH FOLLOW-UP LEVELS OF PERCENT OF CALORIES FROM FAT BY CONDITION



# PRETEST TO FOLLOW-UP CHANGES IN SERUM CHOLESTEROL



# RESULTS

- **REACH:** 62% participation in primary care
- **EFFICACY:** Improvements vs assessment control in behavior and cholesterol--not A<sub>1c</sub>
- **ADOPTION:** Unknown: only 2-3 physicians in one office
- **IMPLEMENTATION:** High, but a) physician asked only to give motivational statement and b) research staff
- **MAINTENANCE:** Individual level--good out to 12 months. Setting level--kept computer; dropped phone calls

# CONTRIBUTIONS AND LESSONS LEARNED

- **First experience with “bleeding edge technology”**
- **Were able to reach over 60% and representative sample**
- **Feasible to combine with Usual Care**

# CONTRIBUTIONS AND LESSONS LEARNED (cont.)

- **Importance of systemizing protocol and power of feedback**
- **Demonstrated reductions in cholesterol and cost effectiveness**

***“It’s not the patient’s fault;  
it’s not the doctor’s fault;  
it may be the system.”***

# ***“CHOOSING WELL”*** **HEALTH PLAN-BASED** **SELF-MANAGEMENT**

**Russ Glasgow, Deborah Toobert, Sarah Hampson, Garth McKay  
(1996–2000)**

## **SCOPE**

**Extending and replicating Offbase with  
larger sample and many practices;  
testing components**

**Funded by NIDDK grant #35524**

# GOAL

To enhance ADOPTION,

evaluate GENERALIZATION,

and IMPLEMENTATION

across diverse clinics and counselors

# ***“CHOOSING WELL”* DESIGN**

**Randomized Trial (n = 320)**

- **Basic Condition = Computer-assisted goal setting and follow-up**
- **Telephone Follow-up = 8 calls**
- **Community Resources = Guidebook and 8 newsletters**

# RESULTS

- **REACH:** 76% participation; representative
- **EFFECTIVENESS:** Overall significant improvement in dietary behavior, A<sub>1c</sub> and cholesterol, QOL; few between condition differences
- **ADOPTION:** High--40 of 42 physicians approached and 13 of 13 offices
- **IMPLEMENTATION:** Over 90% of components delivered consistently by each of 4 interventionists
- **MAINTENANCE:** At individual level, good at 12 months

# CONTRIBUTIONS AND LESSONS LEARNED

- Importance of collaborative goal setting and follow-up
- Refining intervention technology (CD-ROM) and patient choices
- High **REACH, ADOPTION, IMPLEMENTATION**, across different interventionists

***“More is not necessarily better.”***

# DIABETES PRIORITY PROGRAM

(Russ Glasgow, Paul Nutting, et al, 2000-2004)

**OBJECTIVE:** Work with both primary care offices and patients to enhance accomplishment of ADA Provider Recognition Program criteria

**ADOPTION:** To date, over 40 family physicians across the state of Colorado have agreed to conduct the study in their offices

# DIABETES PRIORITY PROGRAM

**KEY OUTCOMES:** Accomplishment of ADA PRP criteria on:

- a) medical / lab
- b) patient self-management / behavioral activities

**DESIGN:** Nested design with practices matched and randomized to Intervention or Touchscreen Computer Assessment Control

## RE-AIM Evaluation Dimension

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**= Public Health Impact (population-based effect)**

# CHRONIC ILLNESS SUPPORT

**Russ Glasgow, Deborah Toobert,  
Liz Eakin, Lisa Strycker (1997-1998)**

## **SCOPE**

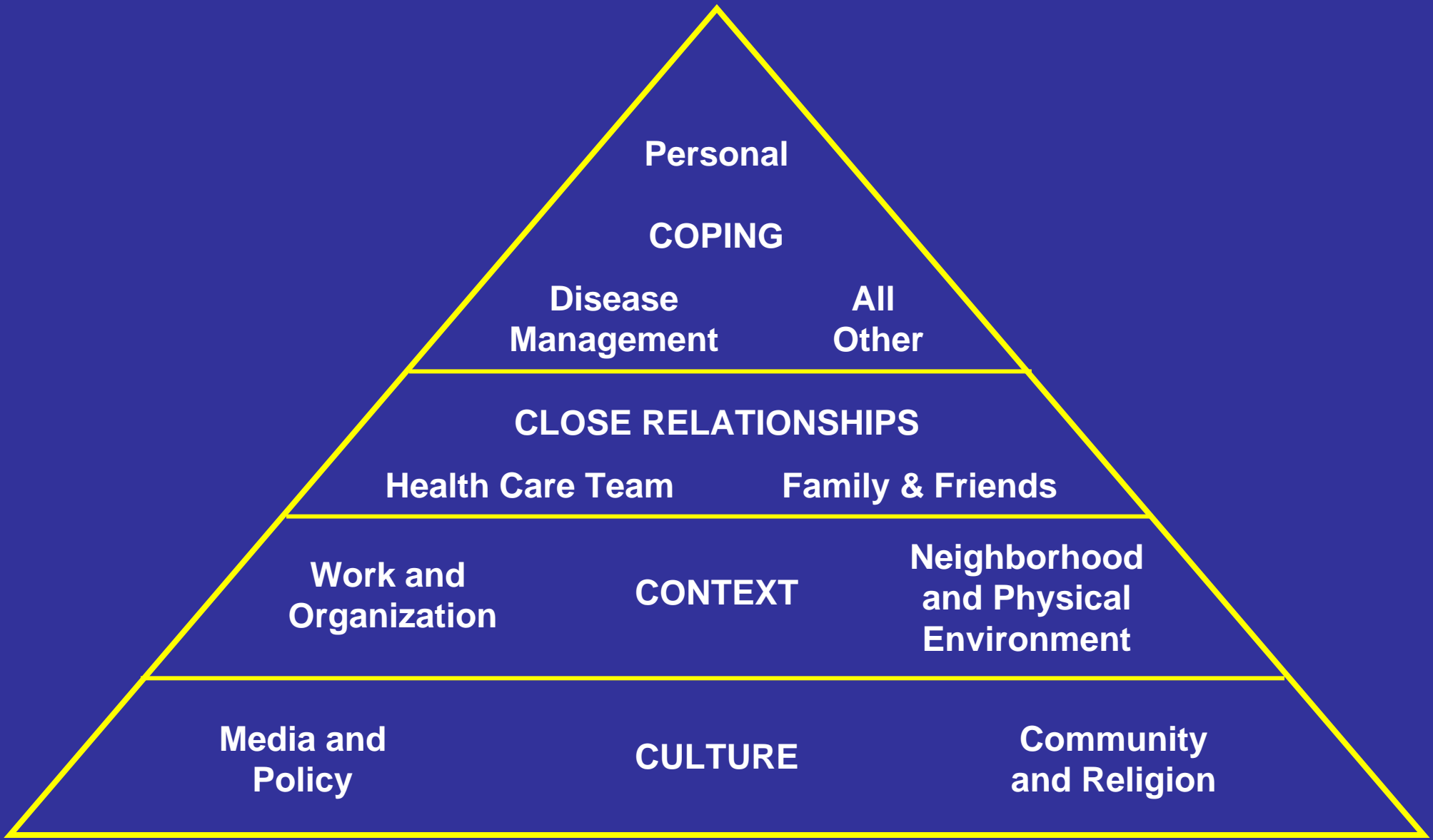
**Development instrument for multi-level  
assessment of social support  
and community resources; applicable  
across different chronic illnesses**

**Funded by grant from Robert Wood Johnson Foundation**

# BROADENING THE SCOPE

## PURPOSE:

1. Apply a “Pyramid Model” of social-environmental resources to increase **REACH** and **MAINTENANCE**
2. Apply to multiple chronic illnesses and multiple lifestyle behavioral risk factors



# CHRONIC ILLNESS RESOURCES SURVEY

## SAMPLE QUESTION

**Over the past 3 months, to what extent:**

**Has your doctor or other health advisor provided support between visits such as phone calls, reminder letters or newsletters?**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Not at all</b>		<b>A moderate amount</b>		<b>A great deal</b>

# RESULTS AND LESSONS LEARNED

- **“CIRS” scale prospectively predicts self-management better than more narrow support scales**
- **Can (hopefully) be used to tailor support interventions across chronic conditions**

***“Real men don’t use no support  
(but will check out resources).”***

# MAINTENANCE: CIRS-BASED INTERVENTION

- **Study conducted in community health center in metro Denver**
- **Low-income patients had one or more chronic illness (M = 3.6)**
- **Small randomized pilot study (n=28) in which patients set goal (e.g., increasing exercise, reducing fat intake)**

# MAINTENANCE: CIRS-BASED INTERVENTION

- **Intervention = 1 face-to-face meeting around CIRS to develop tailored resources plan**
  - **One follow-up phone call on implementation**
  - **Two newsletters**

# CHANGE SCORES IN CIRS INTERVENTION (MEAN and S.D.)

<u>Measure</u>	<u>1-Month Follow-up</u>	<u>3-Month Follow-up</u>
<u>Community Involvement</u> (n=21) (CIRS average score)		
- Immediate Tx	0.14 (.18) <sup>a</sup>	0.30 (.13) <sup>a</sup>
- Delayed Tx	-0.06 (.11) <sup>b</sup>	0.01 (.18) <sup>b</sup>
<u>Minutes / week Physical Activity</u> (n=13)		
- Immediate Tx	198 (18) <sup>a</sup>	191 (12) <sup>a</sup>
- Delayed Tx	26 (23) <sup>b</sup>	34 (40) <sup>b</sup>

Different letters indicate significance between condition differences on ANCOVA, covarying out baseline scores and gender

# RESULTS AND CONCLUSIONS

- **REACH** = 46% participation
- Brief intervention significantly increased use of resources (CIRS) and physical activity levels compared to control
- Improvements maintained from 1- to 3-month short-term follow-up
- Next steps: Replicate in multiple settings for other target behavior outcomes

# ADOPTION AND IMPLEMENTATION: THE IMPROVING CHRONIC ILLNESS CARE (ICIC) BREAKTHROUGH SERIES

- **12 – 14 month “collaborative” to assist health care systems to improve care**
- **Combine GHC Chronic Care Model interventions with IHI change technologies (e.g., PDSA cycles)**
- **Work to date with over 250 health care systems nationwide, including large number of community health centers**

# Organization of Health Care

**Community  
Linkages**

**Clinical  
Information  
Systems**

**Self-  
Management  
Support**

**Delivery  
System  
Design**

**Decision  
Support**

**Informed,  
Activated  
Patient**

**Productive  
Interaction**

**Prepared,  
Proactive  
Practice Team**

**Functional and Clinical Outcomes**

# WHY IS SELF-MANAGEMENT THE KEY TO SUCCESS?

- Regimen Plan is the Patient's (whether we like it or not)
- Self-management is component of care left out most often
- Because of its position in the Chronic Care Model

# ICIC BREAKTHROUGH SERIES RESULTS TO DATE

- **Consistent improvements across:  
chart reviews of both process and  
outcome measures, quality of care  
surveys, and faculty ratings**
  - **Different types of health care systems**
  - **Different chronic illnesses (diabetes,  
CHF, asthma, depression)**

***“Every system is perfectly  
designed to produce exactly  
the results it gets.”***

**Don Berwick**

# ICIC BREAKTHROUGH SERIES RESULTS TO DATE

- To date encouraging but uncontrolled quality improvement data
- Integrates self-management with other key components of care

# BCC LITERATURE REVIEW AND TRANSLATION PROJECT

- Review health promotion literature on physical activity, dietary change, and smoking cessation along RE-AIM dimensions
- Work with 15 NIH-funded BCC projects to evaluate **REACH**, to develop, and share plans for **ADOPTION** of successful interventions
- Develop guidelines and checklists for both potential adoptees and researchers

Supported by the Robert Wood Johnson Foundation, Grant # 039756

*“A worldview is a frame of reference from which we view the world... a way of organizing information about the nature of events.*

*It affects the questions we ask, the manner by which we seek, process and organize information, and how we interpret its meaning.”*

# QUESTION

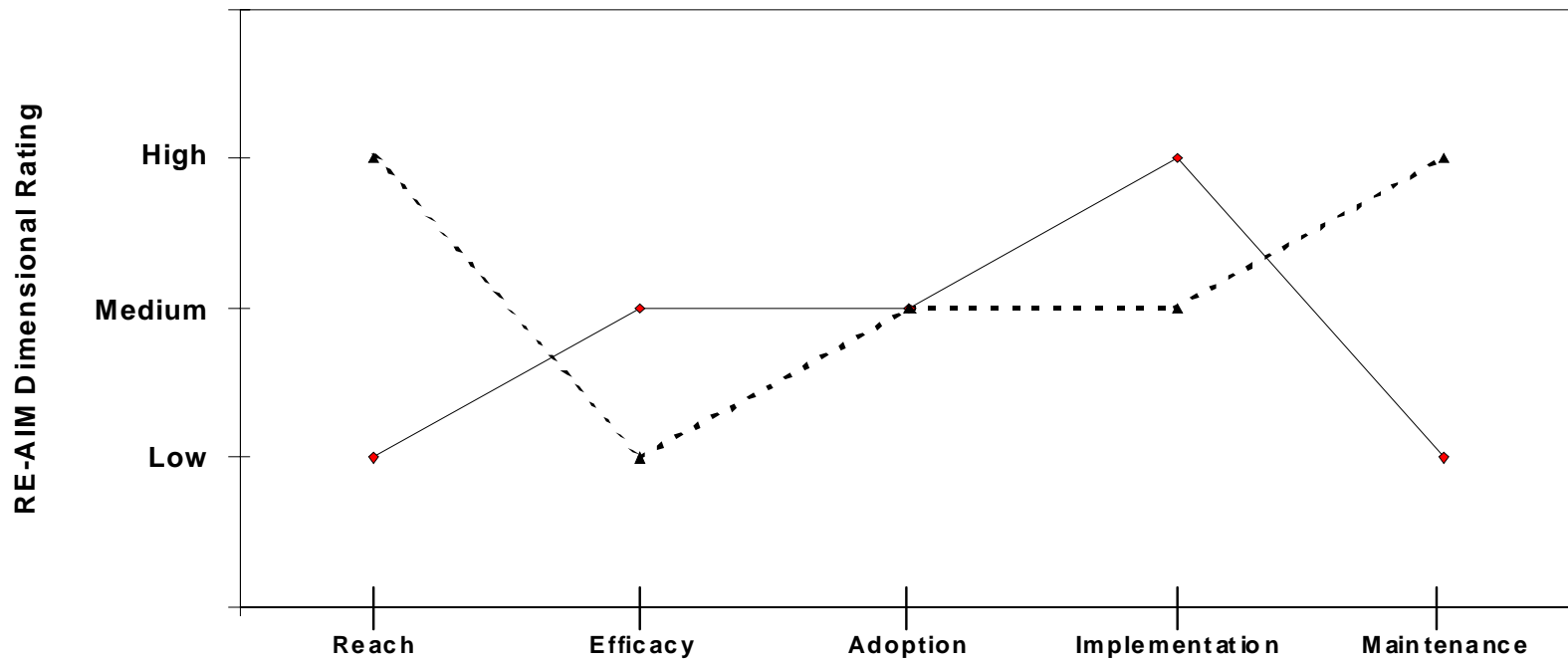
**Do we have the most adaptive worldview regarding scientific method...to make significant progress (at the current time) in closing the gap between research and practice?**

# RECOMMENDATIONS

- Appears to be an inverse relationship between **REACH** and **EFFICACY / EFFECTIVENESS**.  
Need study of relations among other RE-AIM dimensions.
- Most intervention modalities have both strengths and limitations on RE-AIM criteria.  
Need greater graphical displays.

# RATINGS ON RE-AIM DIMENSIONS

— Hospital-Based Group Counseling  
- - - System-Wide Health Policies



# RECOMMENDATIONS

- Need more ***EFFECTIVENESS*** studies  
(***EFFICACY/EFFECTIVENESS***)
- Should NOT attempt to oversimplify,  
but study issues of context and challenges  
in population-based research

# RECOMMENDATIONS (cont.)

- **Need greater study of “AIM”**  
***(ADOPTON, IMPLEMENTATION, MAINTENANCE)***
  - **Conceptual model behind intervention**
  - **Intervention structure and intensity**
  - **Adaptability**
  - **Marketing and packaging**
  - **Economic factors**
  - **Fit between interventions and settings**

# CONCLUSIONS

- ✓ In attempts to emulate pharmacologic research, we have neglected external validity issues
- ✓ The representativeness of settings and agents (**ADOPTION**) is as important as that of participants (**REACH**)
- ✓ We generally have not reported on our interventions in ways that address concerns of potential adoptees

***“The significant problems we  
face cannot be solved by the  
same level of thinking that  
created them.”***

***A. Einstein***