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Case Western Reserve University
School of Medicine

Moving Telemedicine from "Research" to "Just the Way We Do Business"

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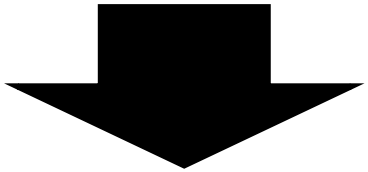
“I doubt that there is a general need to the close the gap between researchers and practitioners.”

Reviewer #2 commenting on a paper; received 5/11/11

Priority #1: **Increase Research Capacity**

Priority #2: Improve Veteran Health Care



Priority #1: **Improve Veteran Health Care**

Priority #2: Increase Research Capacity

"The State of HSR&D"

Seth Eisen, MD,MSc

Director, Health Services Research & Development

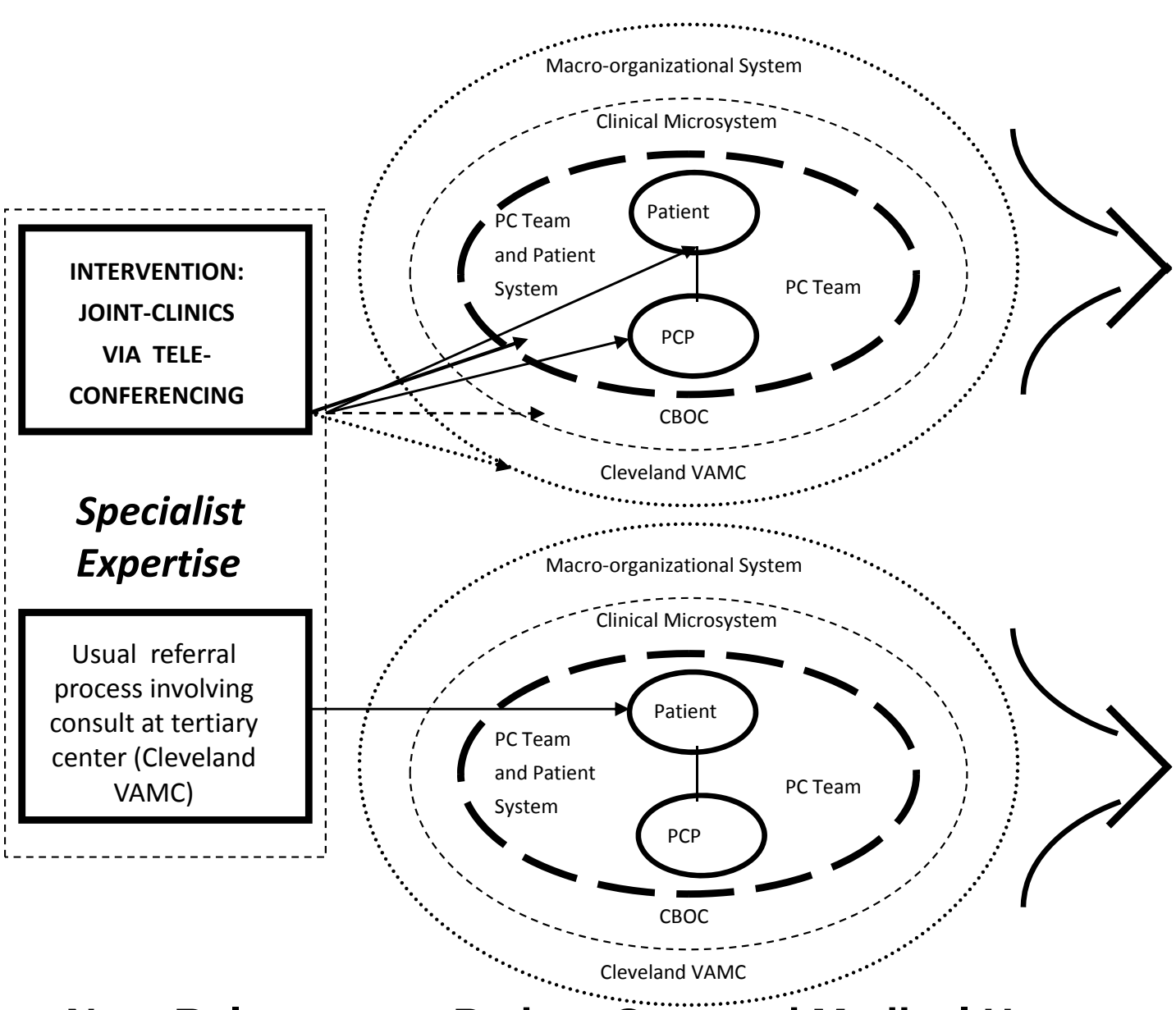
Background

- Rapid increase in primary care in general
- Rapid increase in primary care delivered in community-based outpatient clinics (CBOCs)
- Access to specialist expertise increasingly problematic: limited numbers of specialists; longer distances from primary care

Aims

- Compare the impact of outreach consultation through using joint-clinics via teleconferencing to the usual consultation process on self-efficacy and clinical outcomes
- Compare processes and change in processes associated with the specialist joint-clinic teleconsultations to usual outpatient consultation process
- Evaluate *short-term* medical care utilization and costs associated with the intervention
- Compare the impact of DM joint-clinic teleconsultation to usual consultation process on outcomes related to providers' care of other patients with DM

Conceptual Model based on Clinical Microsystems



OUTCOMES

PCP Team and Patient Level:

Patient (Cohort I)
- -Care Satisfaction
- -Care Self-Efficacy
- -*Clinical Outcomes*

Patient Cohort II
- -*Clinical Outcomes*

PCP
- -Diabetes Treatment Efficacy
- - Night-time regimen management

PC Team
- -Diabetes Treatment Efficacy

Cleveland VAMC
- **-** Waiting time for referrals

CBOC Microsystem Level: Changes in structure and processes of care (e.g., inter-dependence of the care team)
- - *Referral rates*

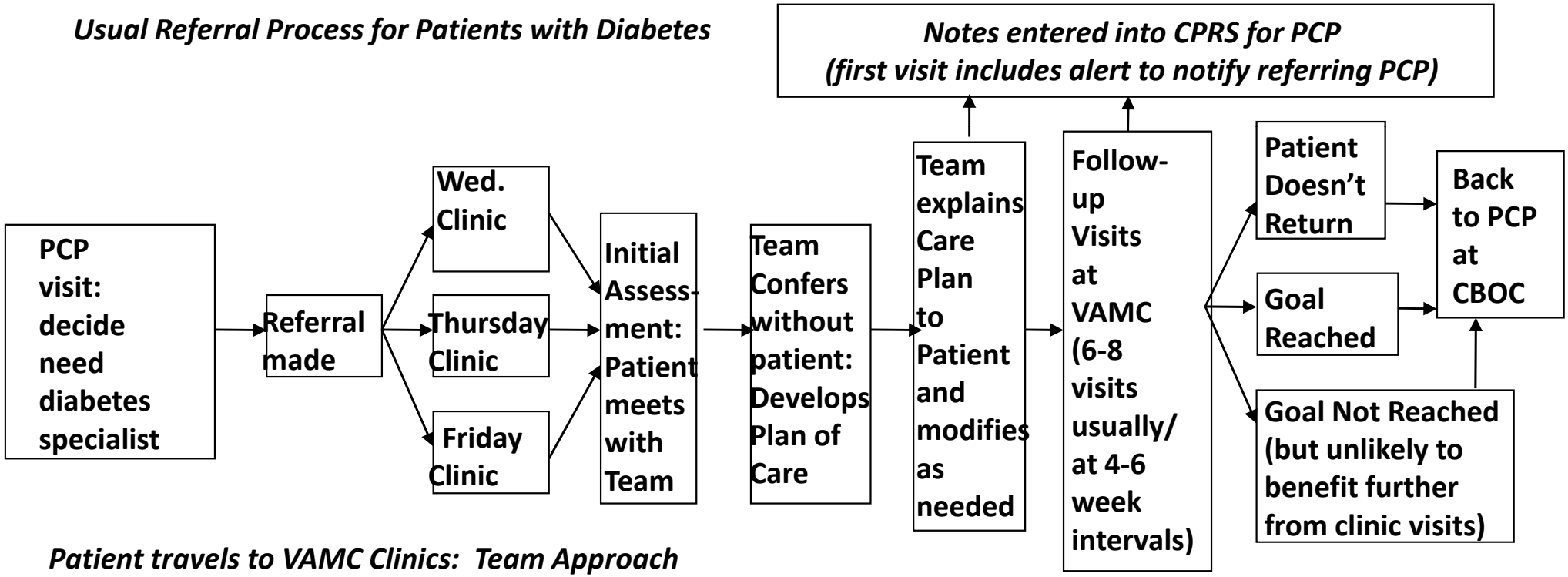
Costs

Note Relevance to Patient-Centered Medical Home

Methods

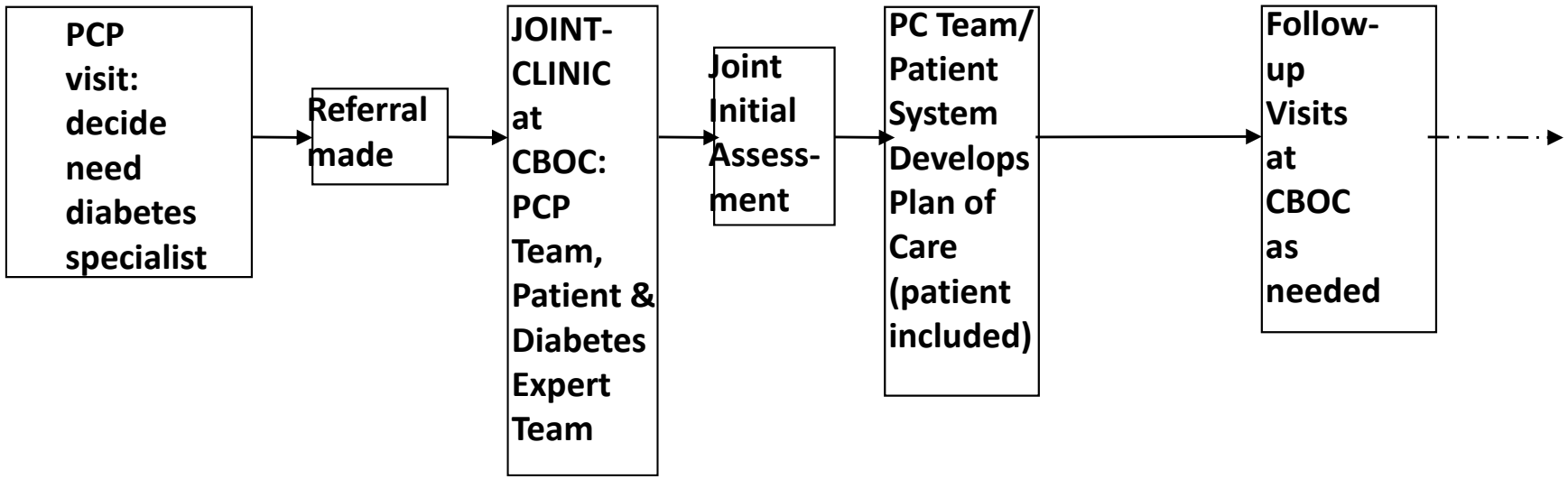
- Population: Patients referred to Diabetes Clinic (staffed by Endocrinologists)
- Setting: 11 Community-based outpatient clinics linked to a tertiary care center
- Design: Cluster Randomized Controlled Trial – CBOCs randomization stratified by size
- Measures and Analyses: Mixed Methods

Usual Referral Process for Patients with Diabetes



Patient travels to VAMC Clinics: Team Approach (includes Endocrinologist, CDE/RN,& PharmD, and, on Thursdays, Residents)

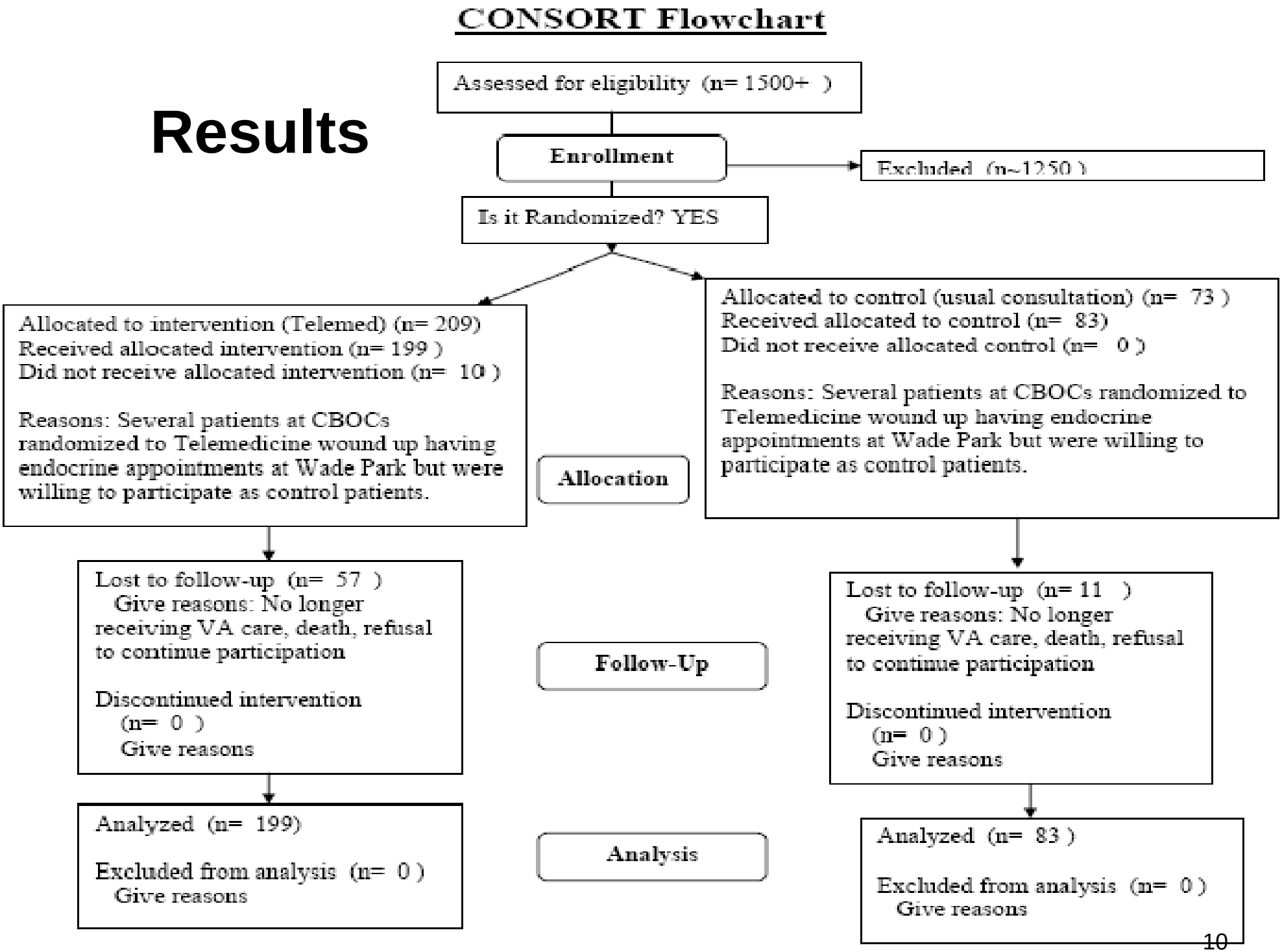
INTERVENTION Process for Patients with Diabetes



Joint-Clinic Telemedicine Intervention

- One half-day/month for each CBOC ~ 6 patients/session
- Conducted by an endocrinologist and a diabetes nurse education/ specialist
- The primary care teams (including PCP and nurse) were invited to participate in the telemedicine intervention.
- F/U endocrinology specialist visits involving the teleconsultation group took place via teleconferencing.

Results


CONSORT Flowchart
Assessed for eligibility (n= 1500+)
Enrollment
Excluded (n=1250)
Is it Randomized? YES
Allocated to intervention (Telemed) (n= 209)
Received allocated intervention (n= 199)
Did not receive allocated intervention (n= 10)
Reasons: Several patients at CBOCs randomized to Telemedicine wound up having endocrine appointments at Wade Park but were willing to participate as control patients.
Allocated to control (usual consultation) (n= 73)
Received allocated to control (n= 83)
Did not receive allocated control (n= 0)
Reasons: Several patients at CBOCs randomized to Telemedicine wound up having endocrine appointments at Wade Park but were willing to participate as control patients.
Allocation
Lost to follow-up (n= 57)
Give reasons: No longer receiving VA care, death, refusal to continue participation
Discontinued intervention (n= 0)
Give reasons
Lost to follow-up (n= 11)
Give reasons: No longer receiving VA care, death, refusal to continue participation
Discontinued intervention (n= 0)
Give reasons
Follow-Up
Analyzed (n= 199)
Excluded from analysis (n= 0)
Give reasons
Analyzed (n= 83)
Excluded from analysis (n= 0)
Give reasons
Analysis

Demographics

	Intervention	Control	p
	mean±SD / %	**mean±SD / %**	
age	61.54±9.5	61.31±9.8	ns
gender (male)	90.50%	98.80%	ns
race (white)	69.30%	75.90%	ns
education (some college)	57.30%	63.90%	ns
marital status (married)	49.70%	67.50%	ns
income (<$40,000/yr)	63.80%	59.00%	ns
Lives with someone	65.80%	79.50%	ns

Baseline Intermediate Clinical Outcomes

	Intervention		**Control**		
	mean	**range**	**mean**	**range**	p
Baseline A1c	10.1	6.4 - 14.9	9.32	5.3 - 15.9	P=0.05
Baseline Creatinine	1.18	.6 - 4.3	1.31	.6 - 6.7	ns
Baseline LDL	101.49	33 - 241	100.04	46 - 258	ns
Baseline Systolic	128.34	93 - 198	131.46	102 - 184	ns
Baseline Diastolic	71.91	40 - 98	70.31	45 - 90	ns

Other Characteristics at Baseline

- There were no differences in comorbidities (coronary artery disease and heart failure).
- The control group had more end-organ damage ($p=0.052$), specifically neuropathy and retinopathy ($p<0.001$).
- There were no differences in baseline use of insulin, glucosidase inhibitors, and thiazolidinediones, but intervention patients were more likely to be using sulfonylureas and biguanides ($p<0.001$).
- There were no differences in self-rated health, barriers to self-care, self-efficacy or treatment satisfaction.

Qualitative Analysis of Baseline Interviews

- 22 interviews
- themes:
  - Prior to the telemedicine intervention the referral of the diabetic patient to an endocrinologist was essentially a “black box” for the CBOC, in that they would make the referral and were then unsure what happened from the patient perspective.
  - When asked about the impending telemedicine intervention, respondents were generally positive, but unease about uncertainty and concern about logistics.

Results: Intermediate Clinical Outcomes of Diabetes Care

- Patients in the intervention (teleconsultation) group had a greater decrease in A1c values than those in the control (usual consultation) group (-1.14% and -0.64%, respectively, p=0.098).
- There was a significant difference in the change in systolic blood pressure: -4.5 and +3.9 mmHg for intervention and control groups respectively ($p<0.005$).
- There were no significant changes in LDL-cholesterol or serum creatinine.

Patient Reported Outcomes

- Ease of communication with the specialist – no difference; (97.2% of the usual care group felt that that were no difficulties in communication with the specialist vs. 98.8% in the teleconsultation group).
- Degree of difficulty seeing the specialist - no differences, but difficulty hearing the specialist was less frequent in the usual care group (1.4% vs 13.3%, p=0.004).

Patient Reported Outcomes

- Patients in the teleconsultation group responded positively to a question about whether the specialist was able to understand their situation more frequently than those in the usual care group (97.0% vs 88.4%, p=0.009).
- In the teleconsultation group, 99.3% agree that telemedicine made it easier to get medical care and <2% would have preferred to see the specialist in person.

Patient Reported Outcomes

- Satisfaction with visits (very satisfied or somewhat satisfied) were the same in both groups (76.6% vs 76.7% for usual care vs. teleconsultation, respectively), though the proportion of patients who were very satisfied with the consultation was greater in the teleconsultation group (61.2%,) compared to usual care (40.8%) - p=0.004).
- Patients in the teleconsultation group were more (very) comfortable with the number of providers (83.0%) vs usual care (72.3%) - $p<0.001$.
- Usual care patients were more likely to disagree or strongly disagree with the statement that they benefited from the specialist visit (14.1%) vs teleconsultation (2.4%) - $p<0.001$.

Qualitative Analysis of Post Intervention Interviews Theme: Changes in Referral Process

- Travel was a significant issue and it is important to note the burden placed on the patients for getting themselves to the consultation visit at the VAMC.
  - *"I would say less than 10% of our patients would be willing to be referred to Wade Park because of the distance. It's just really a cumbersome situation." [Nurse]*
- The lack of desire for travel to Wade Park to see a specialist also had the potential to lead to fragmented care for the patient, who would chose a local, non VA-affiliated specialist, and then come to the CBOC for medication. "
  - *See, a lot of them don't have a problem with their primary care provider being at the VA but they don't want to go Cleveland for their specialist." [Nurse]*

Qualitative Analysis of Post Intervention Interviews Theme: Alignment of Role and Training

- **During the intervention, another change occurred:** each CBOC has a nurse (usually a certified diabetes educator) to handle most of the more complicated diabetes patients.
  - *"At one time we did not have a diabetic case manager here and really, it was hard… Because the patients need to be seen more than once every three months. If you start seeing them more than once every three months your schedule is so bogged down doing something that should be done by somebody who is not paid as much money, you know, instead of me being the diabetic educator." [PCP]*

Qualitative Analysis of Post Intervention Interviews Theme: Alignment of Role and Training

- Post intervention: Primary care physicians also expressed satisfaction in being able to “hand over” diabetic patients that needed more attention to the nurses. The nurses reported increased satisfaction associated with having a greater role in caring for patients. The telemedicine intervention is an education intervention for the participants.

Qualitative Analysis of Post Intervention Interviews: Other Themes

- Communication
  - Complaints about communication before the telemedicine
- Patient Focused Care
  - Care is provided in a setting familiar to the patient and the consultation results in better communication for the entire care team. *"It means more to the patient to hear it from the specialist. I could have been telling them for years about what they need to do, but as soon as they hear it from the specialist on the t.v., it means something." [PCP]*
  - *"The patients seem to like the t.v.! It's me, the patient, the NP, and the physician. Four people focused on the patient – the patient feels like they are getting a lot of attention." [Nurse]*

Qualitative Analysis of Post Intervention Interviews: Other Themes

- Patient Care / Compliance with Care Plan
  - In the post-intervention interviews, providers related stories that support the current process that uses telemedicine consultation, but PCPs expressed frustration with patient compliance that hasn't changed over the study period.

Summary

- Consultation between a patient with diabetes and a specialist team by teleconferencing is feasible, consistent with principles of the Patient Centered Medical Home, and at least as good as consultation in person.

- Many positive changes resulting from teleconsultation. To quote a PCP:
  - *"From my personal experience, this has been an excellent change. It's a win-win situation for providers and for patients."*

- This project also illustrates some of the challenges in accomplishing that, especially in determining attribution of effects. The implementation of the telemedicine project played out while a variety of other diabetes-related interventions were going on; fortunately, the interventions applied equally to control and intervention sites.

What kind of study was this?

Efficacy study?

Effectiveness study?

QI?

My Answer

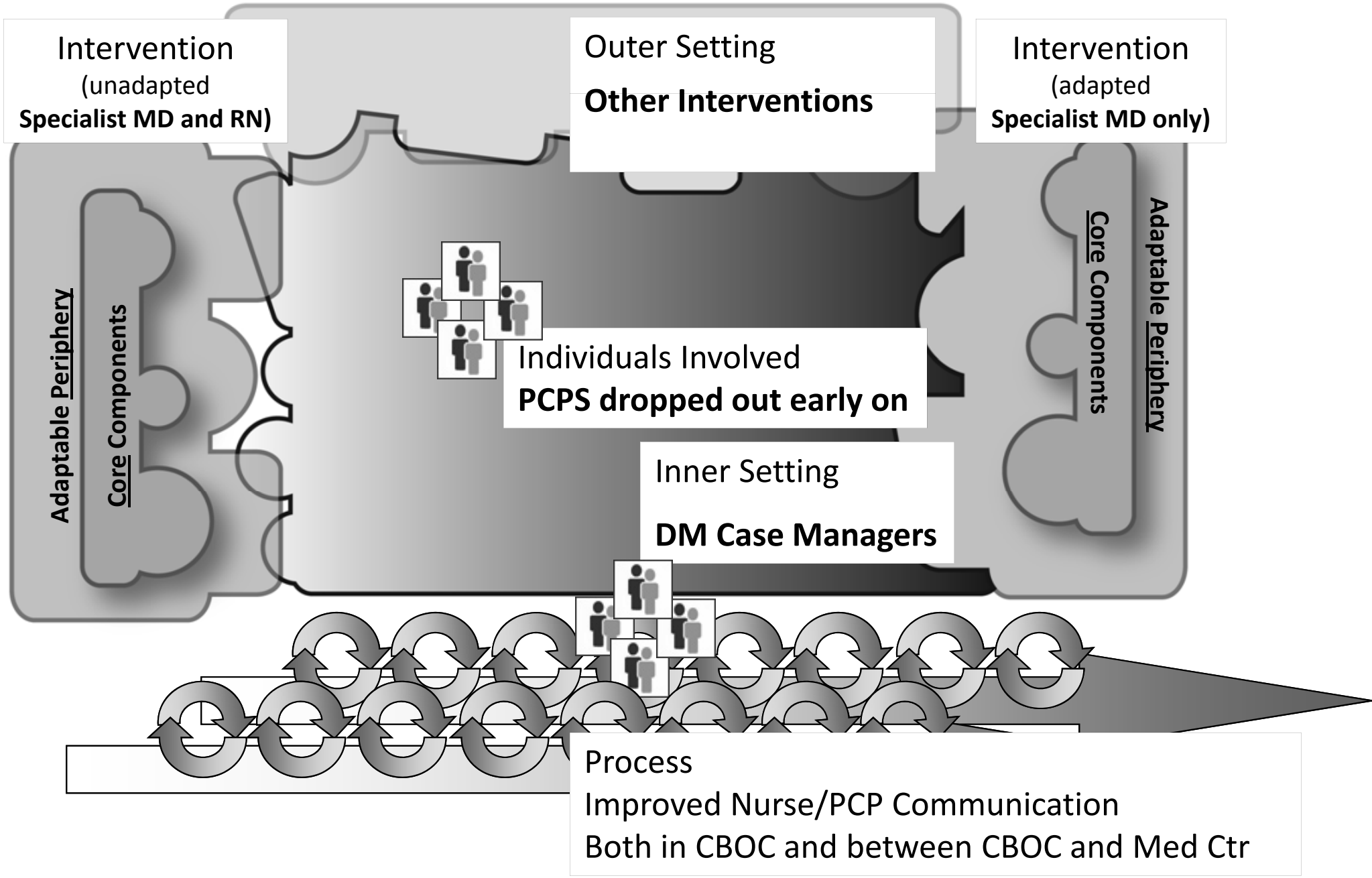
?

The best proof that the intervention "worked"

- After the intervention phase was completed, the intervention CBOCs as a group DEMANDED that the service be continued and the control CBOCs DEMANDED that they be given equal access.
- Teleconsultation is now one of the ways we do business.

- How did that happen?
  - Two reflections.

Consolidated Framework for Implementation Research – CFIR (Damschroder et al.)



What is the work of Implementation?

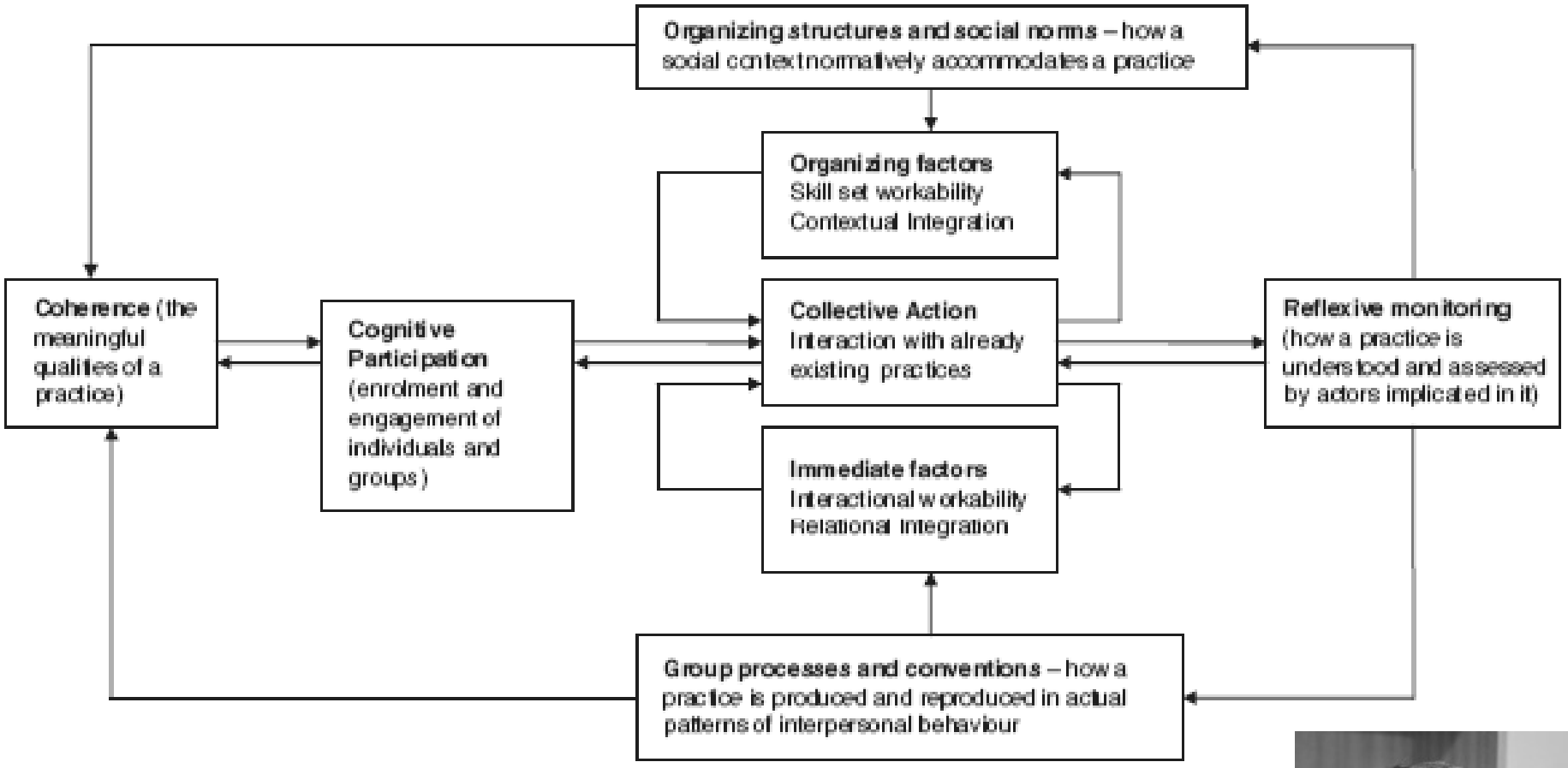


Figure 1 Model of the components of normalization process theory

Normalization Process Theory

Carl R. May, PhD

www.normalizationprocess.co.uk

Remember:

There is NO SUCH THING AS A “BEST PRACTICE” … INDEPENDENT OF THE CONTEXT IN WHICH IT IS CONDUCTED. There are only POTENTIALLY BETTER PRACTICES.

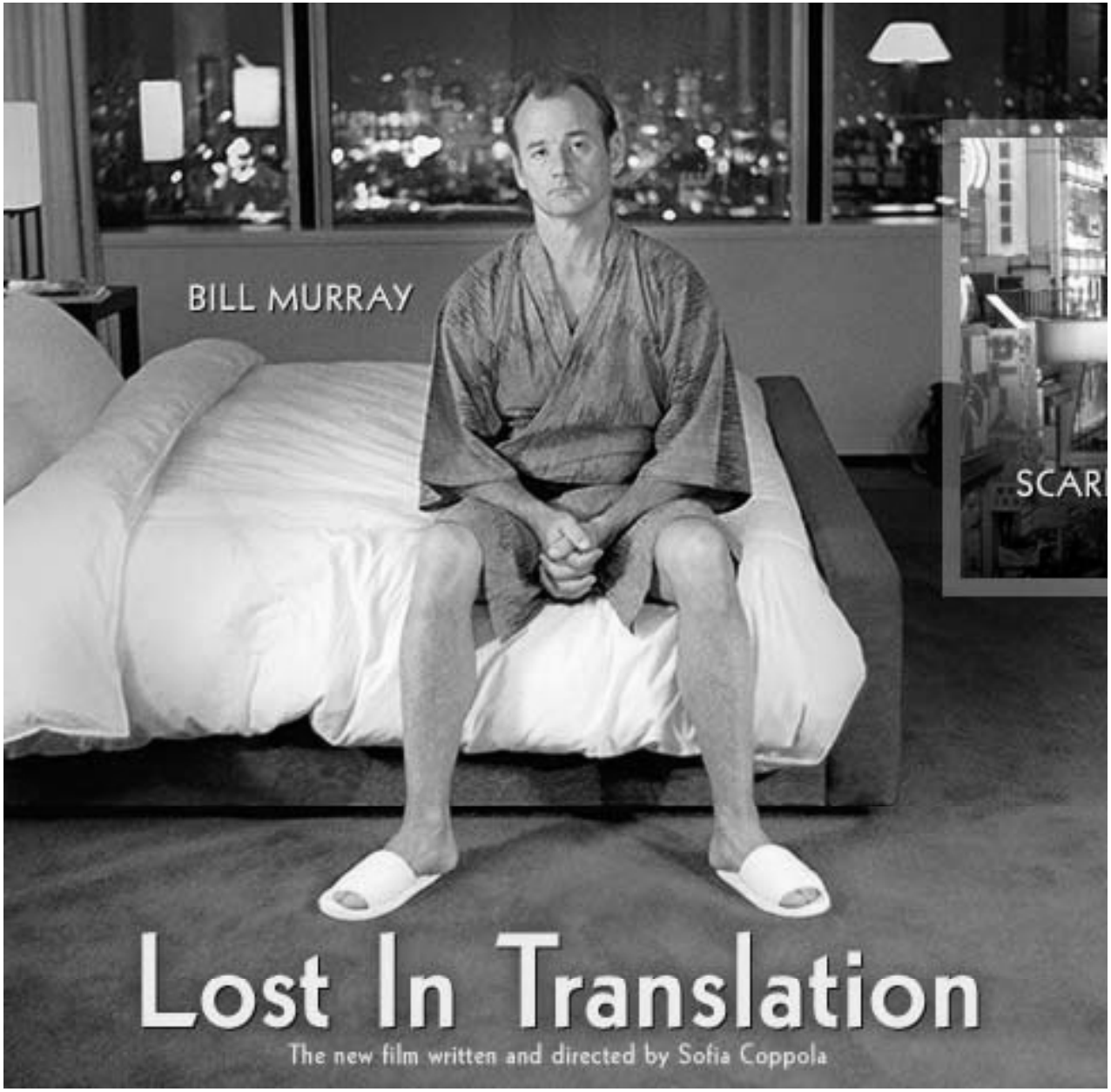
Key Part of the Context: Thanks to: Ajay Sood, MD, Sharon Watts, RN, DNP, CDE, Katherine Thweatt, PhD, Stacey Hirth, Jan Solomon, RD, CDE, Scott Ober, MD, MBA and others.

The Researcher-Practitioner Divide

Many suppliers and users of social research are dissatisfied, the former because they are not listened to, the latter because they do not hear much they want to listen to (Lindblom & Cohen, 1979).

- Research-practice gap
- Science-practice gap
- Knowledge-practice gap
- Academic-Management gap

How the research-practice gap is usually depicted: a knowledge transfer (translation) gap.



3 Conceptualizations of the Gap Between Research & Practice

Knowledge Transfer Gap: Practitioners need to receive the lessons of research and put them into practice.

Research and practice are entirely separate disciplines and each must develop their own answers to their own problems

Knowledge Production Gap - Research and practice have complementary perspectives and skills that need to be used together to address the real need, collaborative knowledge production.

Van De Ven A, Johnson P. Knowledge for theory and practice. *Academy of Management Review.* 2006;31(4).

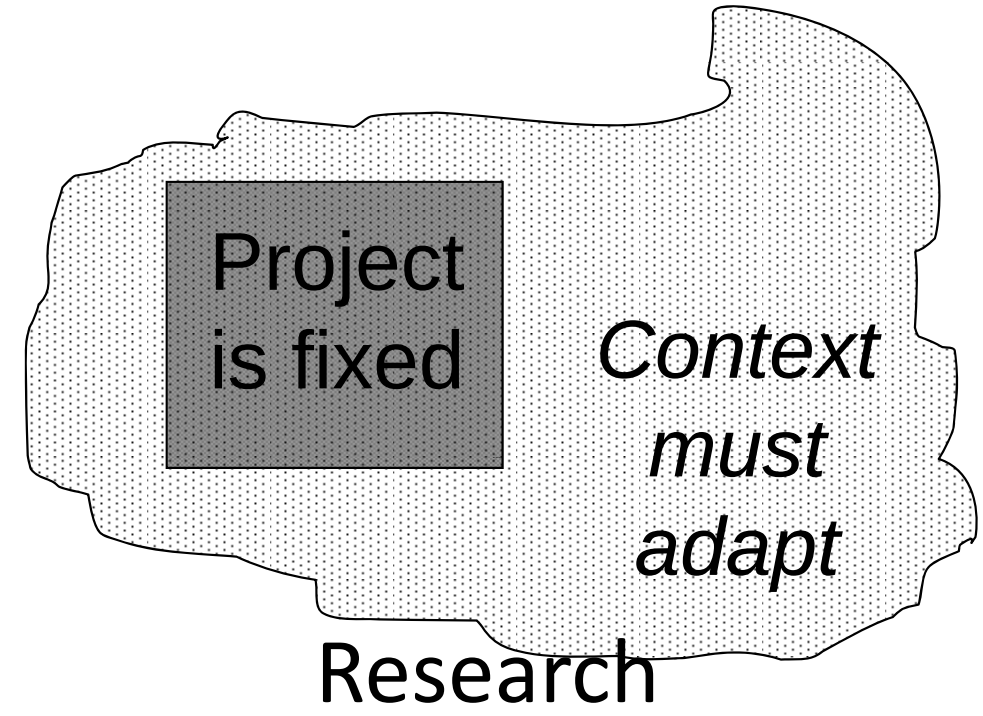
Differing World Views

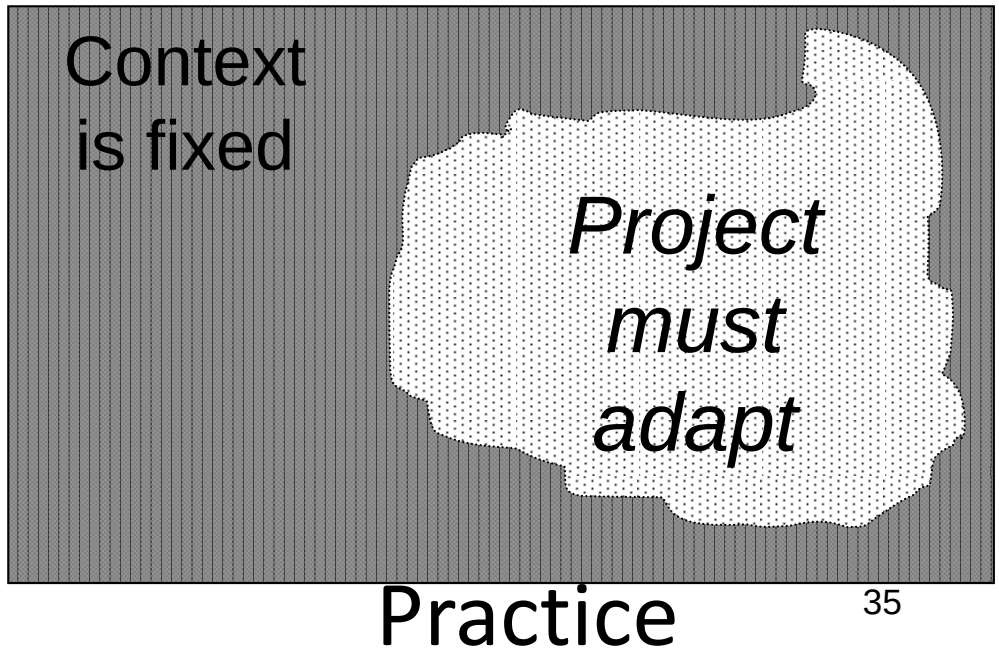
	Practice	Research
Notions of evidence	Colloquial (Contextual) Anything that seems reasonable p<0.5? Practice relevant	Scientific' (Context free) Proven empirically-rigorously p<0.05? Theoretically driven
Time frames for results	Timely	As long as it takes
Languages for communication	Clear Message Practitioner jargon	Caveats and qualifications Research jargon
Work environment	Focus on service delivery Influenced by the need to respond to the immediate reality of human need	Focus on strict adherence to research rules that give objective validity to results and publication of research findings Influenced by academic achievement, international research reputation, sources of funding

- Based on Davies et al. (2000b); Pyra (2003); Shonkoff (2000).

Differing World Views

- Rigor vs. relevance
- Internal vs. external validity
- Isolation of a phenomenon from context (so that it can be more rigorously studied) when context matters
- Our methods, theories, world view don't match the problems or apparent solutions



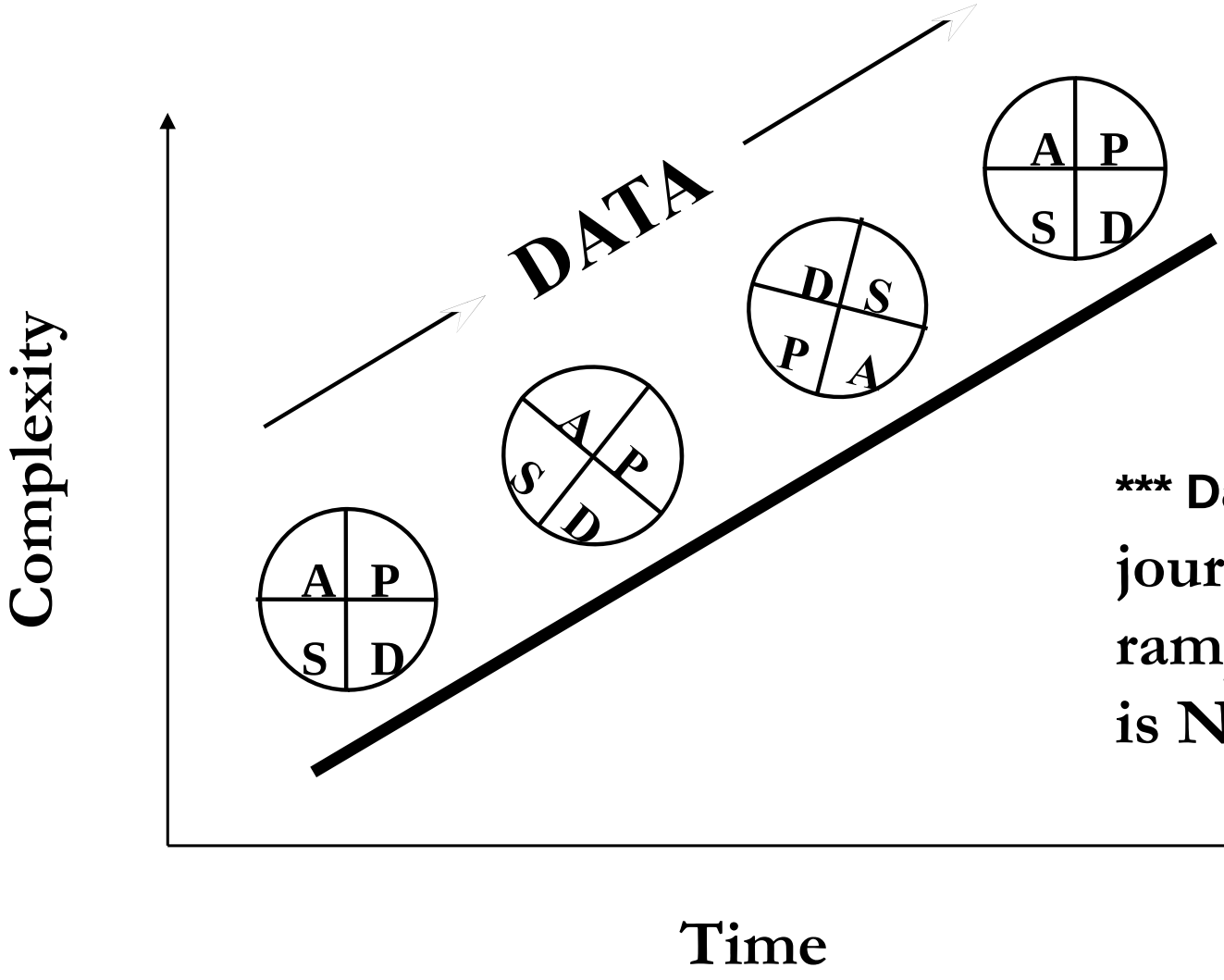


T. Greenhalgh

A different reviewer for a different paper (grant actually)

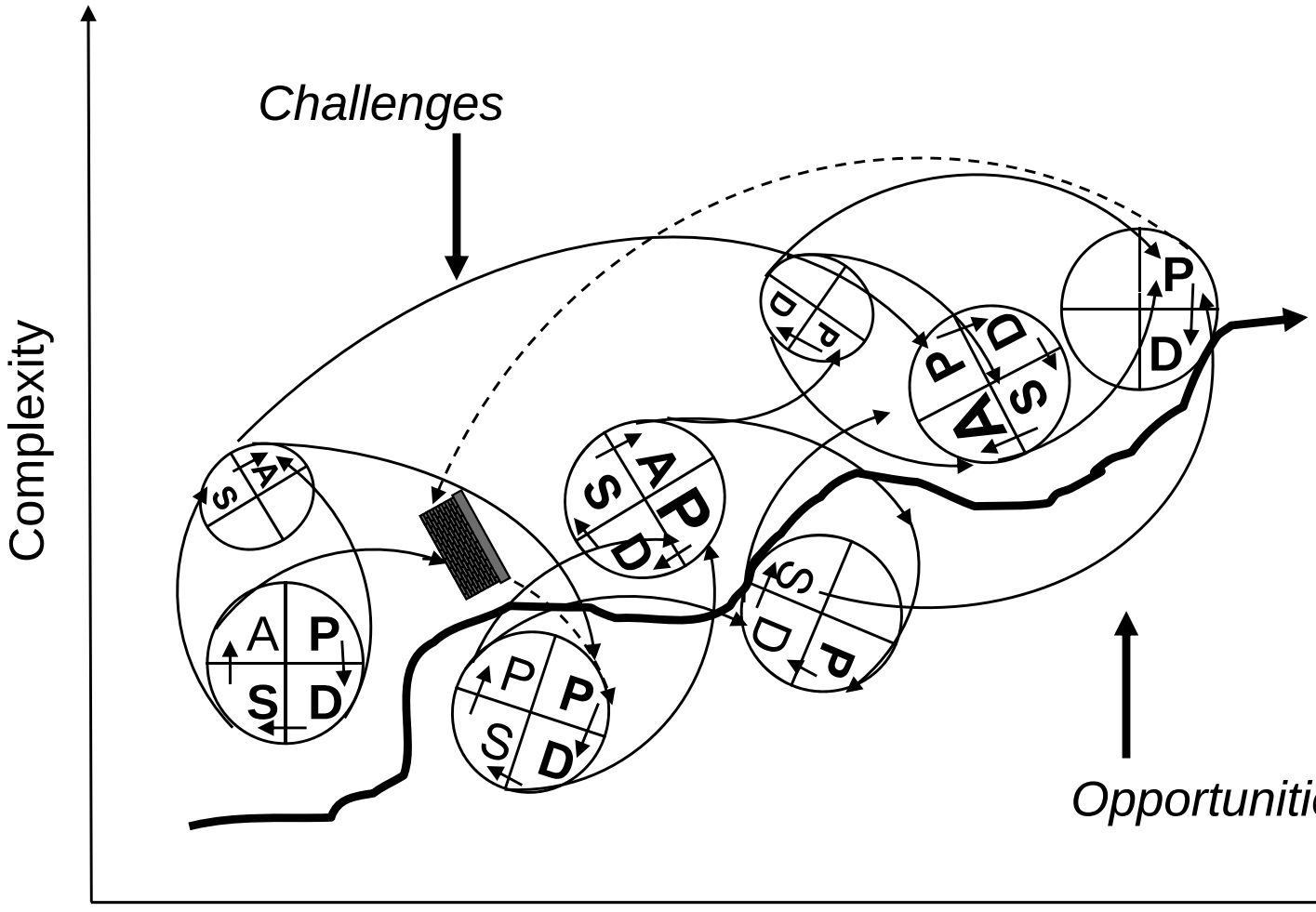
Good efficacy and effectiveness data on _____ are needed before implementation should be considered.

Ideal QI/Research?



***** Danger ***** The journey up the ramp of complexity is NOT linear.

Reality



Legend:

P=Plan D= Do = Barrier = Direct flow of impact

S=Study A=Act ------ = Lingering background impact Arrowhead = Feedback or feedforward

Different Sizes of letters and cycles and bolding of letters = denotes differences in importance/impact

Continuum of Quality Improvement and Research: Rigor vs. Relevance

Operations

"Relevant"
Context-Dependent
Problem Solving
Quantitative >, <, or =
Qualitative
Pre-test post-test or
Quasi-experimental designs
Tends to be NON-LINEAR

Potential Synergy

Research

"Rigorous"
Identify generalizable knowledge, i.e.,
Eliminate Context
Publishable
Quantitative>Qualitative
RCTs Rule
Tends to be LINEAR

- Continuum not a dichotomy
- Goal is relevance with as much rigor as possible.

Some questions to ponder:

1. What does efficacy really mean when it comes to a complex social intervention?
2. What do linear models of implementation have to do with a non-linear world?
3. Is implementation research served well by adopting the assumption of “state dependence” as opposed to “path dependence”?