

Practical use of dissemination and implementation outcomes, theories, and research designs

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COLLEGE OF PUBLIC HEALTH

Research objectives

To support innovative approaches to identifying, understanding, and overcoming barriers to the adoption, adaptation, integration, scale-up and sustainability of **evidence-based interventions**, tools, policies, and guidelines.

The National Institutes of Health Dissemination and Implementation Research in Health program announcement (<https://grants.nih.gov/grants/guide/pa-files/PAR-13-055.html>)



Implementation Outcomes

Implementation Outcomes

Acceptability
Adoption
Appropriateness
Costs
Feasibility
Fidelity
Penetration
Sustainability

***IOM Standards of Care**

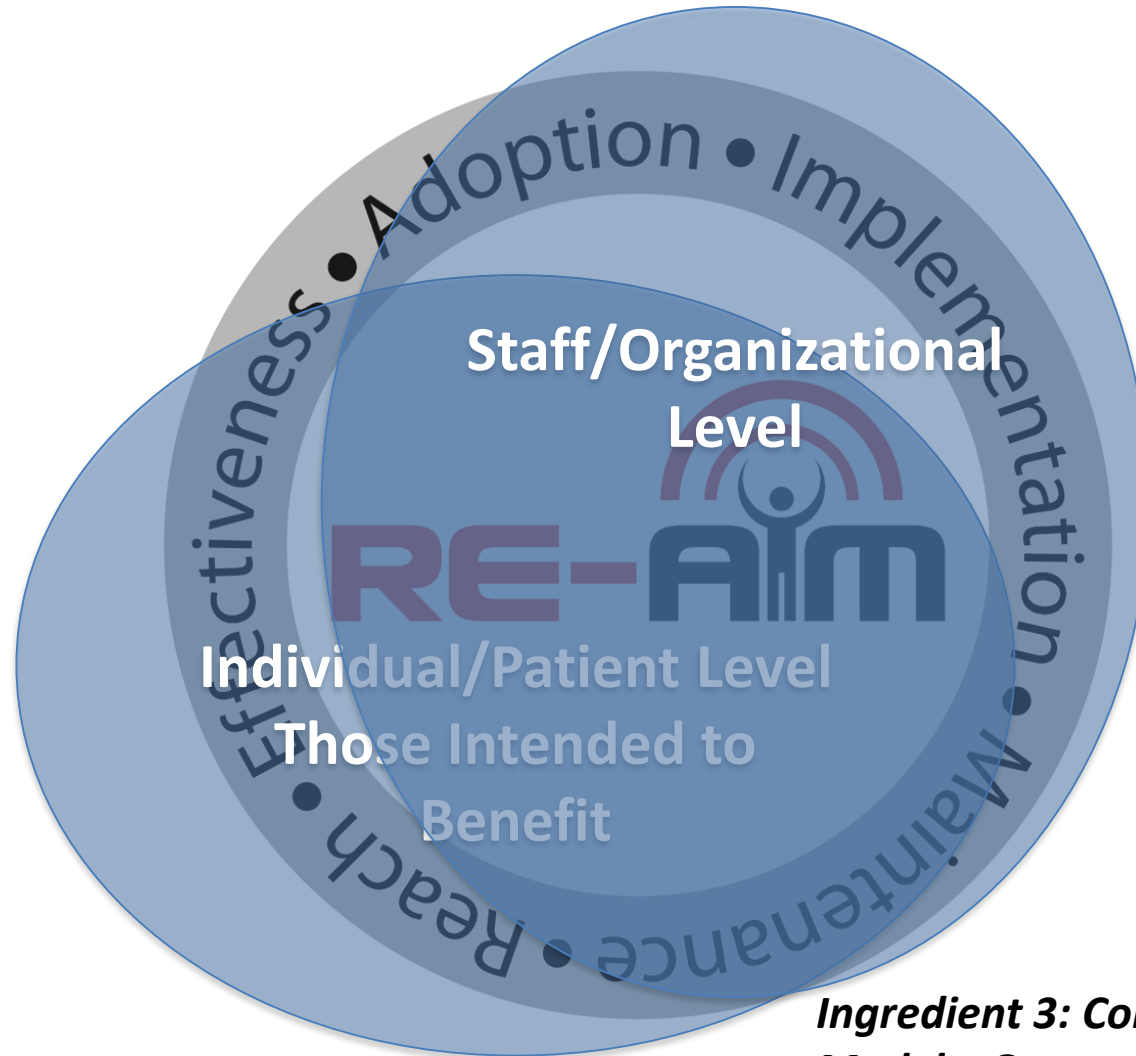
Table 1 Taxonomy of implementation outcomes

Implementation outcome	Level of analysis	Theoretical basis	Other terms in literature	Salience by implementation stage	Available measurement
Acceptability	Individual provider Individual consumer	Rogers: "complexity" and to a certain extent "relative advantage"	Satisfaction with various aspects of the innovation (e.g. content, complexity, comfort, delivery, and credibility)	Early for adoption Ongoing for penetration Late for sustainability	Survey Qualitative or semi-structured interviews Administrative data Refused/blank
Adoption	Individual provider Organization or setting	RE-AIM: "adoption" Rogers: "trialability" (particularly for early adopters)	Uptake; utilization; initial implementation; intention to try	Early to mid	Administrative data Observation Qualitative or semi-structured interviews Survey
Appropriateness	Individual provider Individual consumer Organization or setting	Rogers: "compatibility"	Perceived fit; relevance; compatibility; suitability; usefulness; practicability	Early (prior to adoption)	Survey Qualitative or semi-structured interviews Focus groups
Feasibility	Individual providers Organization or setting	Rogers: "compatibility" and "trialability"	Actual fit or utility; suitability for everyday use; practicability	Early (during adoption)	Survey Administrative data
Fidelity	Individual provider	RE-AIM: part of "implementation"	Delivered as intended; adherence; integrity; quality of program delivery	Early to mid	Observation Checklists Self-report
Implementation Cost	Provider or providing institution	TCU Program Change Model: "costs" and "resources"	Marginal cost; cost-effectiveness; cost-benefit	Early for adoption and feasibility Mid for penetration Late for sustainability	Administrative data
Penetration	Organization or setting	RE-AIM: necessary for "reach"	<i>Level of institutionalization? Spread? Service access?</i>	Mid to late	Case audit Checklists
Sustainability	Administrators Organization or setting	RE-AIM: "maintenance" Rogers: "confirmation"	Maintenance; continuation; durability; incorporation; integration; institutionalization; sustained use; routinization;	Late	Case audit Semi-structured interviews Questionnaires Checklists

Fig. 1 Types of outcome



An Implementation Science Outcome Model



Ingredient 3: Conceptual Model—Outcomes



You can't get to practical without practice: co-production of evidence

- **Integration of scientific and community/clinical systems** to address questions that are scientifically innovative *and* have practical implications for stakeholders.
- A process of developing sustainable program, practice, or policy approaches **using a vertical and horizontal systems approach**.
- Research synthesis focuses on **evidence-based principles (i.e., active ingredients)** rather than products.
- Organizational or system governance, values, resources, strategies and structure are leveraged to **design for scale and sustainability**.



Co-Production of Research: A Process Model/Integrated Research-Practice Partnerships

Evidence-Based Strategies

Tested in

Multiple Settings

Critical Elements

Peer Sharing
Group feedback
Sense of Distinction
Group goal setting
Group Roles

Frequent Contact

Research Staff Delivery

Diverse Samples

Fit

Walk Kansas
Re-invention of
intervention retaining
critical elements but
reducing contact

Design Fit

Demonstration Project

Delivery Sites

Organization

Cooperative Extension

Extension Office

Agents

Space Limits

Limited Staff Time

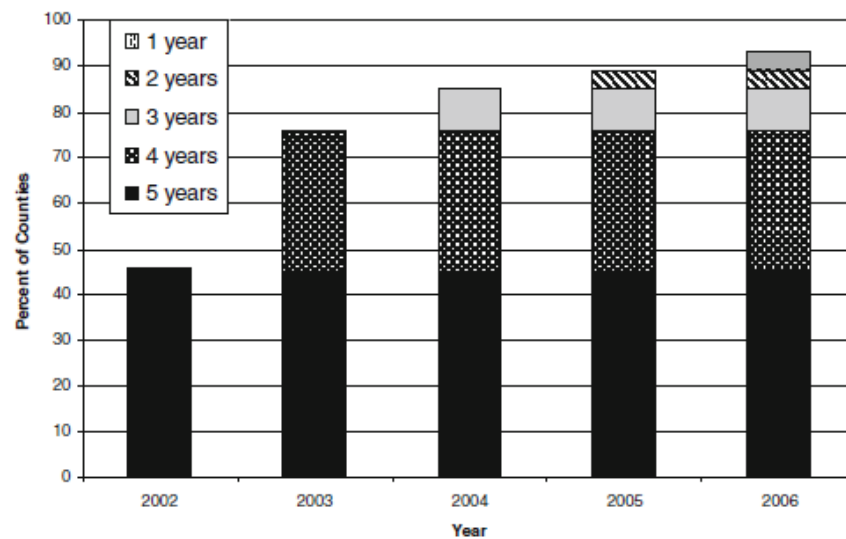
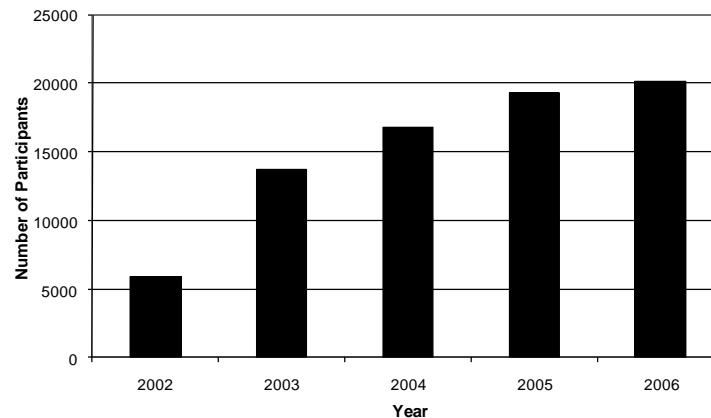
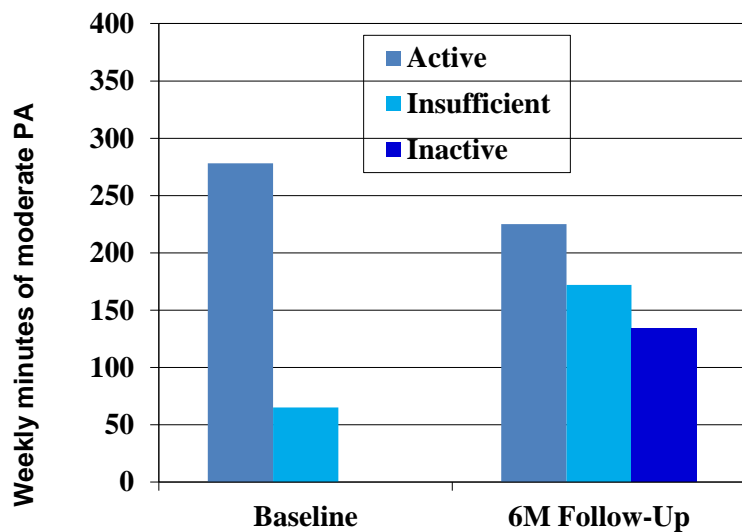
Available Resources

Office Staff Engagement

Scheduling & Cost of Delivery

*Ingredient 3: Conceptual
Model—Process*







Diffusions of Innovation: An Explanatory Model

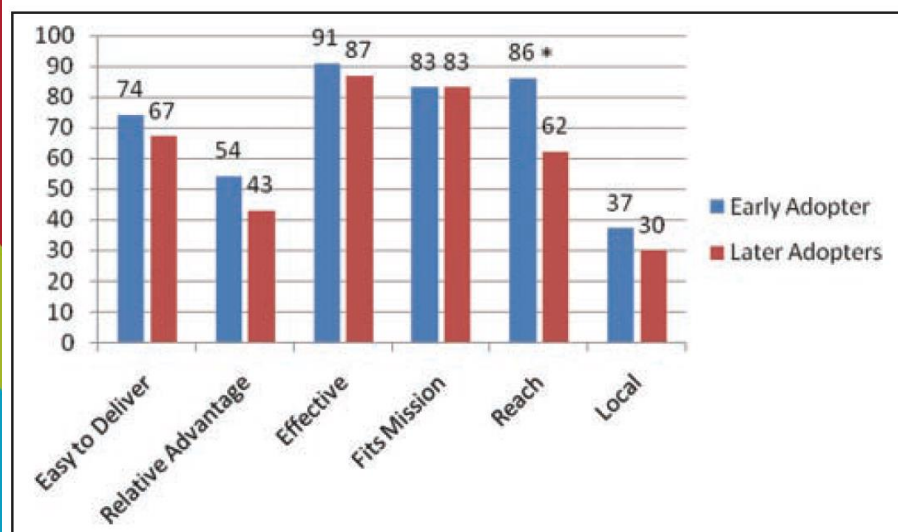


FIGURE 1 Extension Agent Perceptions of Walk Kansas Attributes by Early and Later Adopters

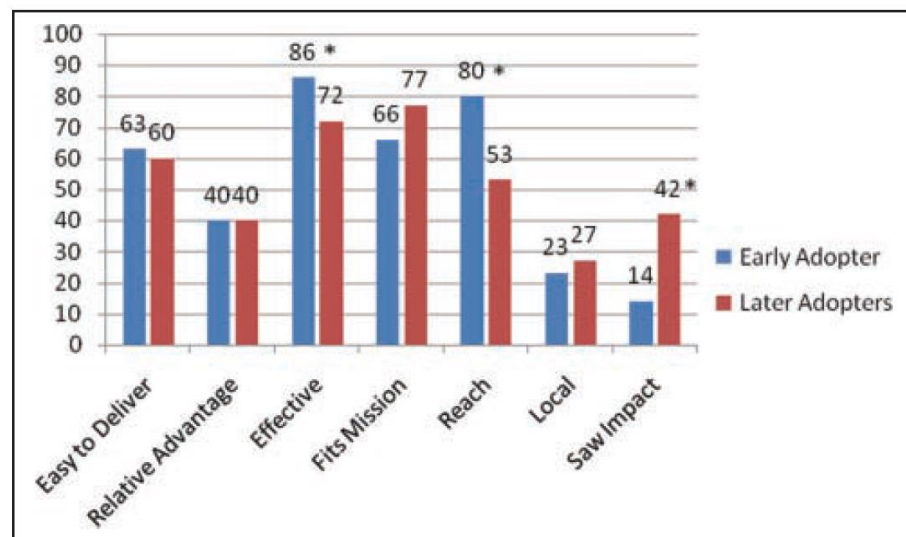
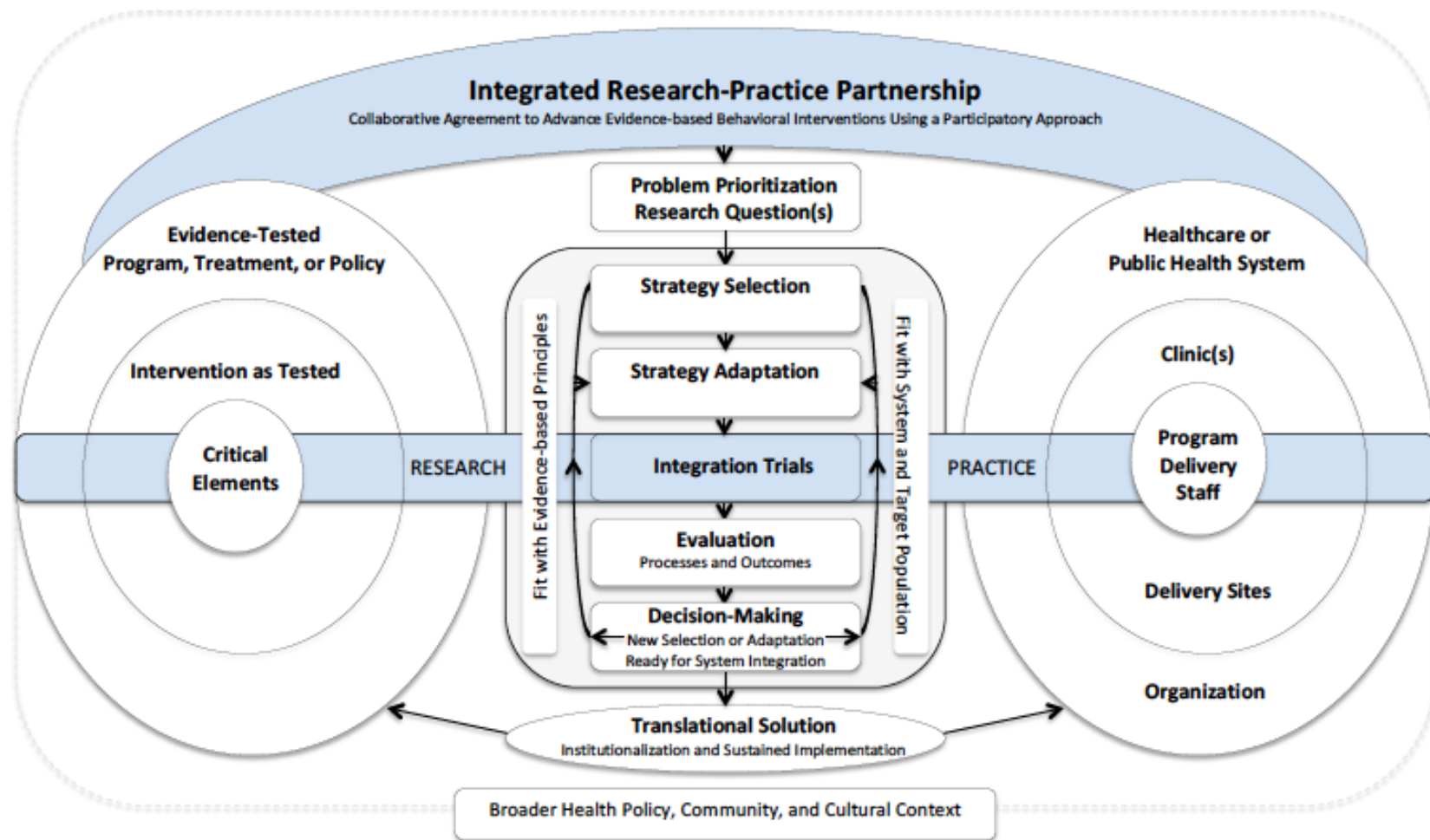


FIGURE 2 Attributes of Walk Kansas Used in the Decision-Making Process by Early and Later Adopters

***Ingredient 3: Conceptual
Model—Explanatory***





Ingredient 3: Conceptual Model—Process

Estabrooks, Harden, Almeida, Hill, Johnson, Greenawald, in progress



Who is involved?

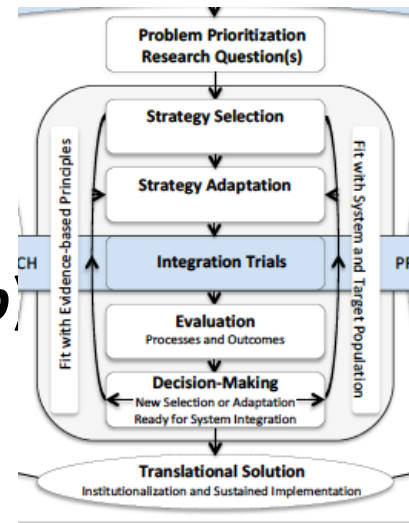
*Ingredient 4: Demonstrate
Stakeholder Priorities and
engagement in change*



Carilion Healthy Lifestyle Study

Problem Prioritization & Research Questions

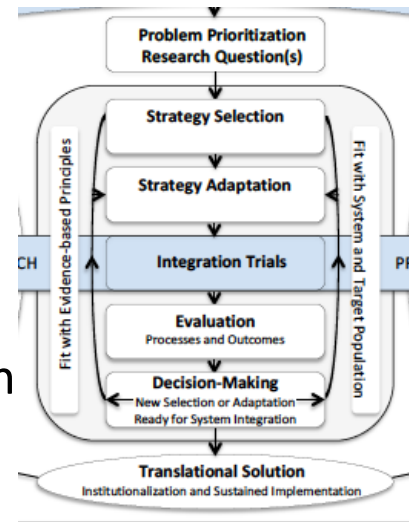
- Problem Prioritization (*Ingredient 1: Quality Gap*)
 - 68% of patients have a BMI >25 (target population) and ask nurse care coordinators about weight loss.
 - Patient education handouts to support weight loss.
 - Nursing leadership would like a systematic approach
- Research Questions
 - What is the best way to increase evidence-based weight management support through Care Coordinators?
 - How feasible is it?
 - Can an adapted evidence-based approach help patients lose a clinically meaningful amount of weight?



Carilion Healthy Lifestyle Study

Strategy Selection & Adaptation

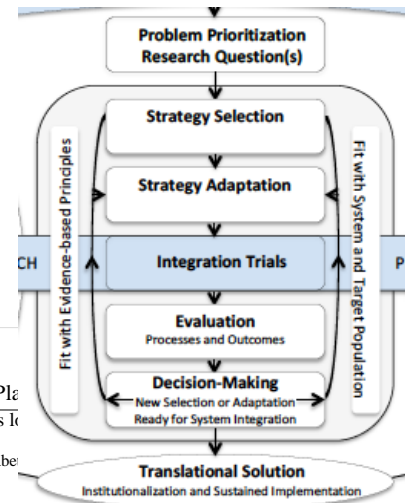
- Strategy selection (***Ingredient 2: EB Intervention***)
 - Clinical Intervention—lifestyle intervention that can be reimbursed--DPP Lifestyle Intervention
 - Implementation strategy-consultee centered approach.
- Strategy Adaptation (***Ingredient 6: Implementation Strategy***)
 - DPP materials moved to telephone and one-on-one sessions (scripted, manualized, and process evaluation tools).
 - Integrate counseling tools into electronic health record.
 - Consultee centered approach developed from principles (completely 'new' intervention) and integrating evidence-based 5 A's principles-to facilitate goal setting, barrier resolution, and feedback



Carilion Healthy Lifestyle Study

Integration Trial (*Ingredient 8: Design Feasibility*)

- Quasi Experimental Type 3 HEI Design
- 3 Regions
- 2 received 1, 2 hour CME
- 1 received CME plus, 1 month, 3 month, 6 month, and 12 month follow-up integrated in regular staff meetings
- Intervention region purposefully selected to not be health system 'hub' region



Carilion NRV Care Coordinator Action Plan

- Why do we think it is important to help our patients live healthier lives?
- To improve the health of patients and the community
 - To help prevent and manage chronic diseases, such as diabetes
 - To improve patients' quality of life and happiness
 - To improve patients' self-confidence
 - To provide motivation and accountability for patients to help themselves

Our plan to engage patients in the Healthy Lifestyles program will be:

- Recruit **13** patients over the next month.
- Recruit **40** patients over the next 3 months.
- Recruit **79** patients over the next 6 months.
- Recruit **157** patients over the next 12 months.

What are our **3** biggest obstacles that could get in the way of achieving our goal?

1. Time—both to fit in 30-45 minute sessions and interruptions during sessions
2. Provider Support
3. Patient Commitment

What can you do to get past these obstacles? (Write 3 strategies for each obstacle)

Time:

1. Schedule during time when providers are not seeing patients (e.g., 1-1:45)
2. Block of protected slots on schedule
3. Schedule provider 'drop-offs' at another time so they don't interrupt sessions

Provider Support:

1. Highlight role of changes in weight and related outcomes on score card indicators
2. Using weekly provider meetings to provide education and share program fliers
3. Schedule provider 'drop-offs' at another time so they don't interrupt sessions
4. Share success stories with providers
5. Conduct one-on-one meetings with providers

Patient Commitment

1. Use program contract
2. Write BMI on schedule
3. Send patient a letter
4. Make the sessions convenient

What tools do we have that can help us meet our goals?

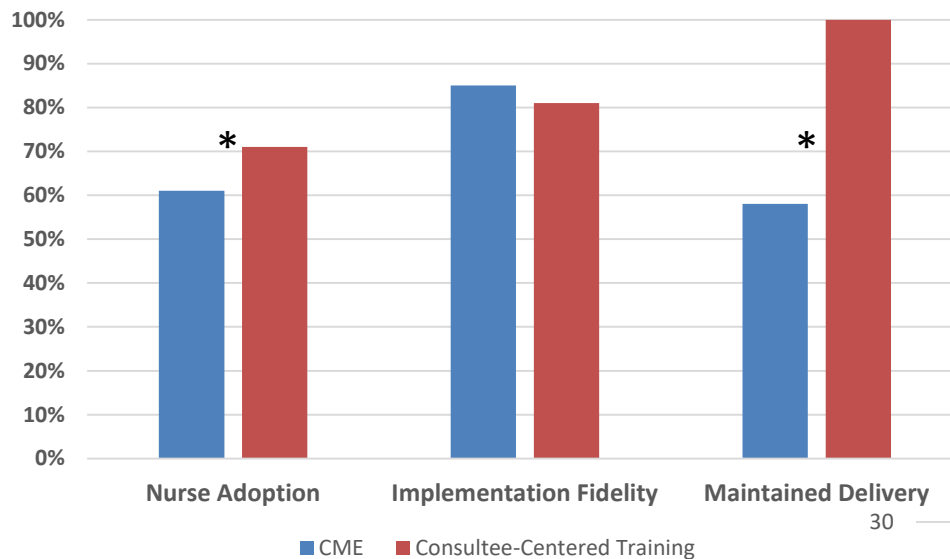
People who will support us: Other care coordinators; care coordinator leadership; weight loss program partners.

Materials that can help: Workbook, lesson plans, call scripts, program evaluations

Resources that we can use: Clinic space, appendices from workbook

Carilion Healthy Lifestyle Study Evaluation

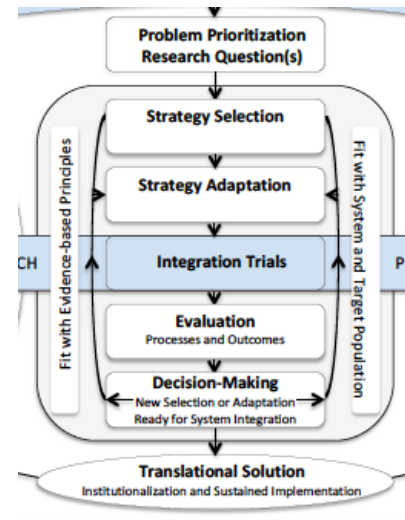
Nurse Training Outcomes



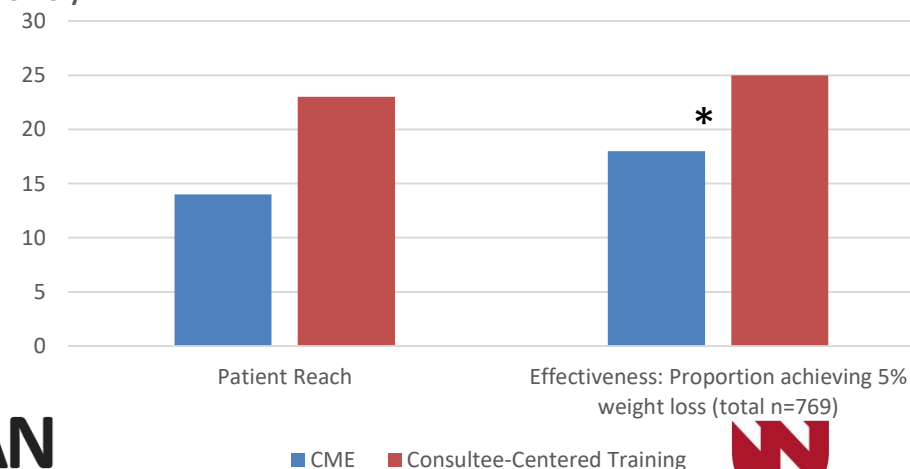
Ingredient 9: Measurement and Analysis



"The most important thing I will do today is to make a commitment to myself and develop a personal plan of action to achieve a healthy weight!"



Patient Outcomes



Carilion Healthy Lifestyle Study

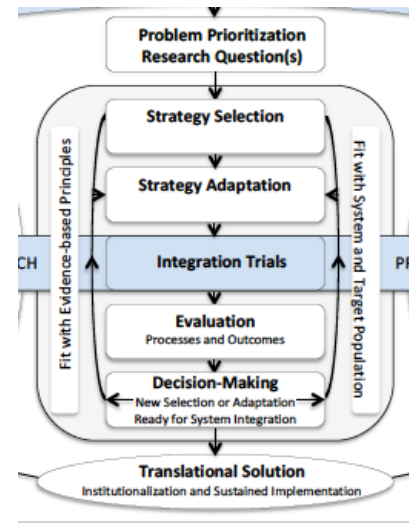
Decision Making (*Ingredient 10: Policy Environment Support*)

Clinical intervention

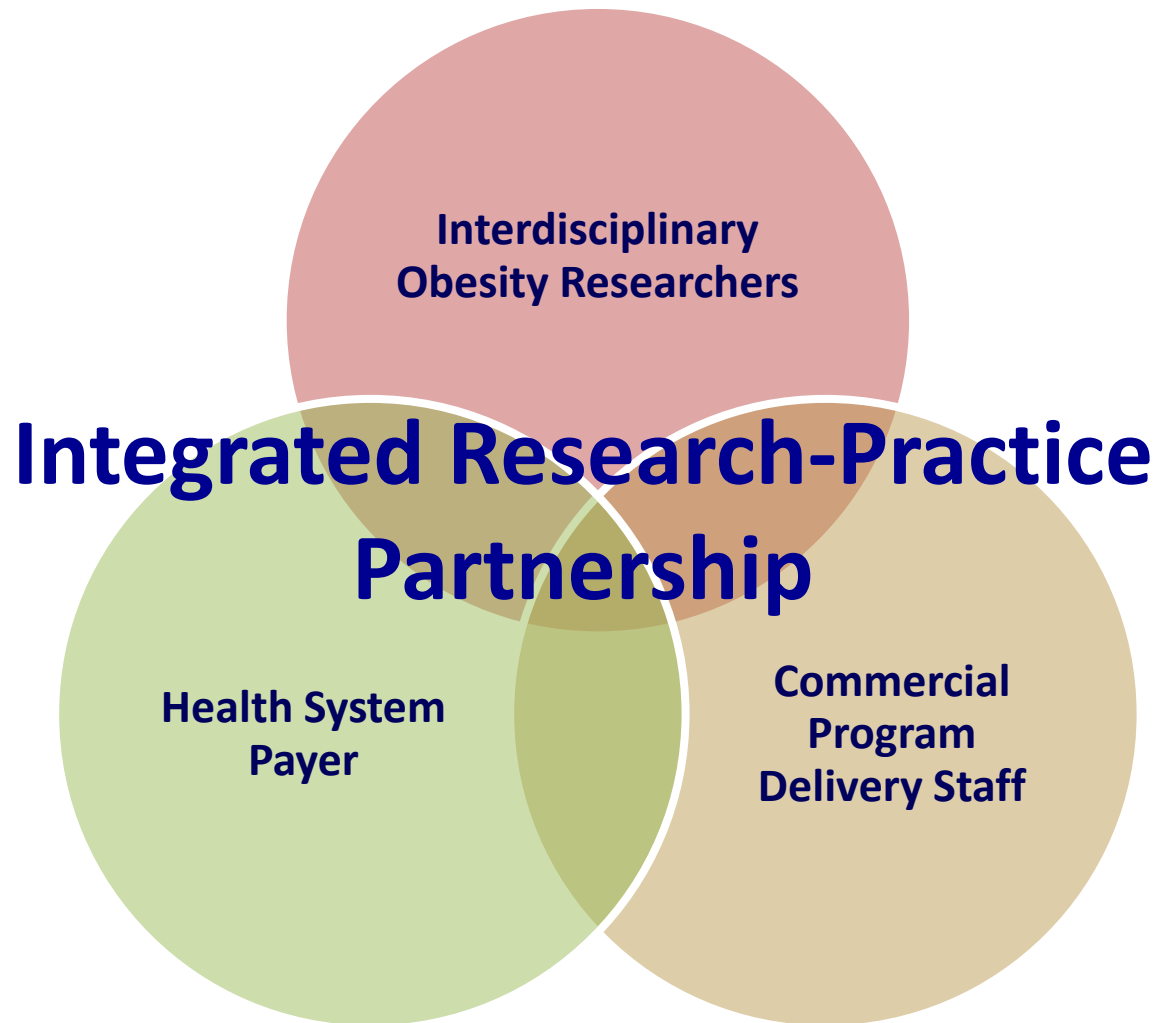
- Effective and feasible
- Additional program adaptations needed
- Changes to EHR coding would improve the efficiency of reporting
- **Decision to maintain implementation and continue to scale across clinics.**

Implementation Strategy

- Improved adoption, reach, and sustainability... an proportion of patients achieving a clinically meaningful weight loss (at 1 year)
- Future training may need adaption to focus on patient engagement and retention strategies
- **Training facilitator needed—and job description created, budgeted, posted and hired**



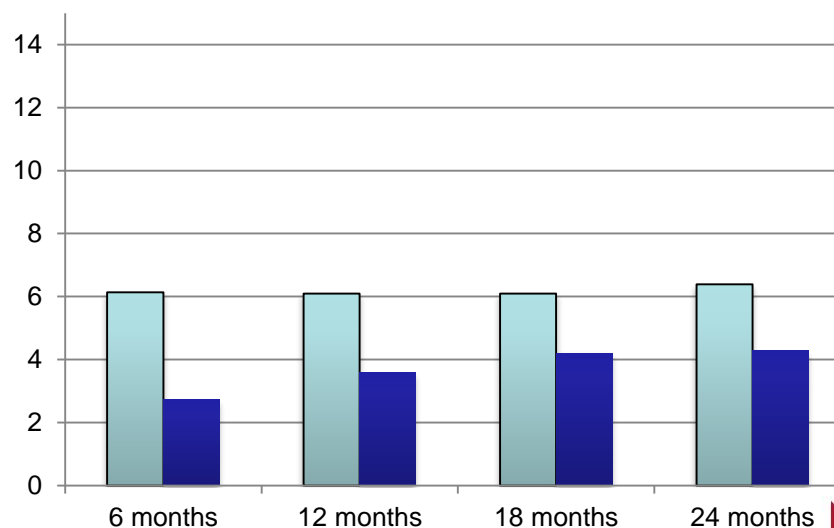
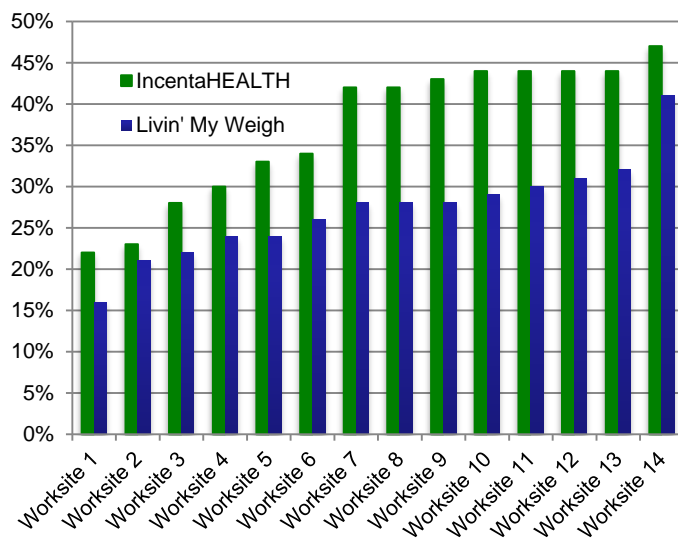
Moving outside of the healthcare setting (mostly)



Early work of the partnership

Problem Prioritization & Research Questions

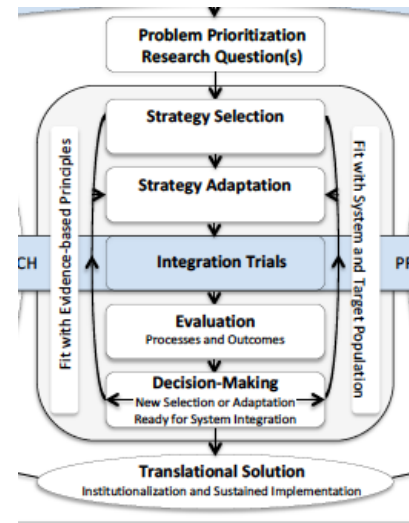
- Targeted email, internet, and financial incentive-based workplace weight loss program compared to a primarily self-guided, informational intervention without incentives.
- 28 worksites, ~6400 employees
- Significant impact on reach; non-significant difference in proportion of overweight and obese employees that lost 5% of initial body weight



Weigh and Win

Problem Prioritization & Research Questions

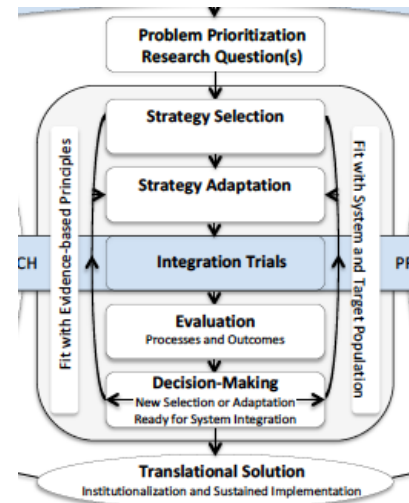
- Problem Prioritization
 - High prevalence of obesity (even in Colorado).
 - Community benefit goal of health systems.
 - Need for scalable interventions (increasing reach at limited incremental costs)
- Research Questions
 - How many people will participate in an incentive, internet, and community-based weight loss program?
 - What proportion will lose a clinically meaningful amount of weight and at what cost?



Weigh and Win

Strategy Selection & Adaptation

- Strategy selection
 - Social cognitive theory targeted approach to behavior change.
 - Light environmental intervention (marketing/kiosks)
 - Behavioral economics to improve reach (\$)
- Strategy Adaptation
 - Community marketing rather than worksite.
 - Incentive amounts changed slightly.
 - Kiosks in community settings rather than workplaces



Goal Weight

30% reduces
=140 lbs  \$ 150


25% reduce
=150 lbs  \$ 105

20% reduce
=160 lbs  \$ 75

15% reduce
=170 lbs  \$ 45

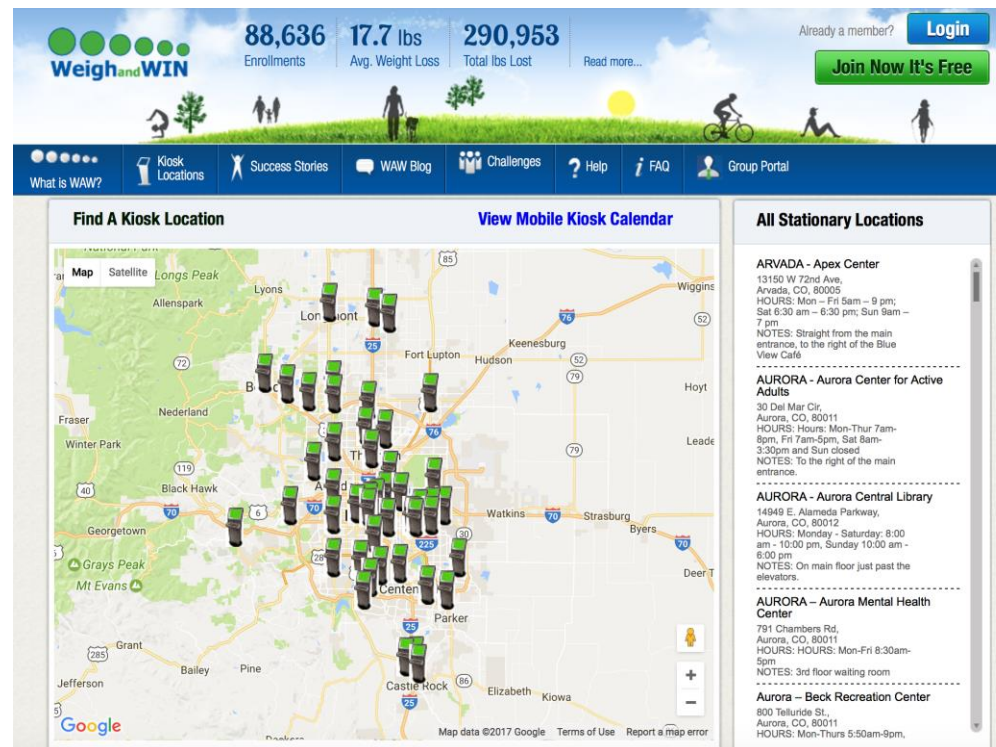
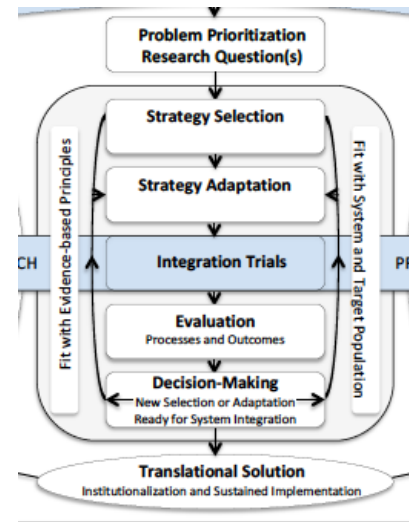
10% reduce
=180 lbs  \$ 30

5% reduce
=190 lbs  \$ 15

Baseline Weight =
200 lbs  \$ 0

Weigh and Win Integration Trial

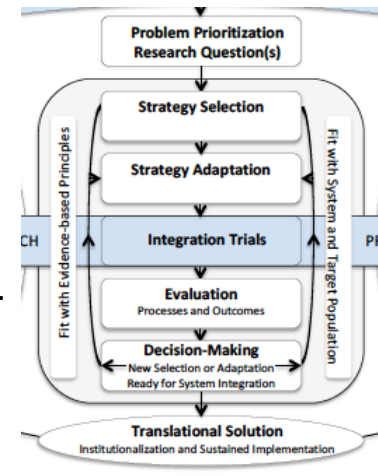
- Longitudinal Quasi-Experimental without Control
 - Objective assessment of weight
 - Partnership developed outcomes



Weigh and Win

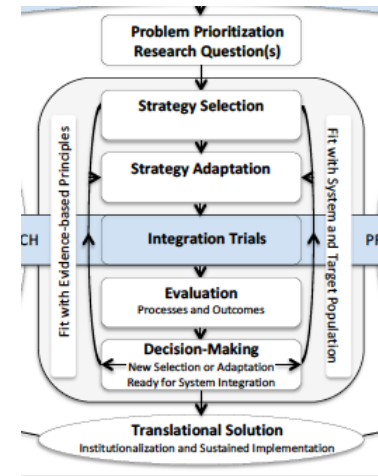
Evaluation-Reach, Effectiveness, Cost

- 40,308 (79% female; 73% white) between 2011 and 2014
 - Ave Age: 43.9 (SD=13.1)
 - Ave BMI: 32.3 (SD=7.44)
 - Cost per participant \$62.50 (BMI<25); \$71.50 (BMI>25)
- Weight Loss: Using baseline-value-carried-forward analysis
 - 2.1kg (SD=6.47)
 - 46% of participants losing weight
 - 27% lost 3% of initial body weight
 - 19% lost 5% of initial body weight
 - \$373 per 5% weight loss
- African American participants vs Non African American participants:
 - 37% more likely to lose 3% body weight
 - 38% more likely to maintain that WL for > a year
 - \$272 per 5% weight loss



Weigh and Win Decision Making

- Consideration for continued funding Weigh and win:
 - (a) demonstrated broad reach and may contribute to reducing health disparities experienced by African Americans
 - (b) had a cost per participant that rates favorably against other commercial weight loss programs
 - (c) the costs per participant that achieved a clinically meaningful weight loss appear to be modest
- Conclusion was sustained funding for the initiative.



Practicality and explanatory value of the co-production of evidence model

- Establishing or using existing monitoring and evaluation systems to reduce complexity and increase observability and trailability
- A focus on resources and costs that can document relative advantage
- Engaged implementers and systemic decision makers to ensure compatability with organizational structure, values, and resources.
- Tailoring the an approach to the local context to enhance compatability of initiative to specific populations and settings
- Systematic use of evidence from practice and research to enhance relative advantage
- Improved infrastructure capacity to support implementation
- Systemic ownership, initiative champions



Lessons Learned

Practical use of D&I outcomes, designs, and theory

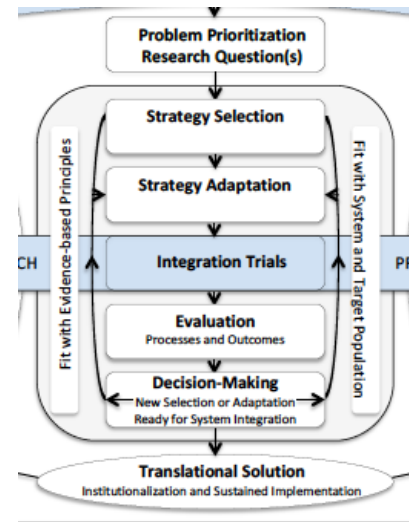
- Integrated processes provide opportunity to justify decisions that include
 - Using existing data that is likely more generalizable to other settings, but often less precise than traditional research outcomes
 - Identify implementation outcomes that are meaningful for decision making
 - Focus on explanatory processes that align with the extant literature, but are selectively assessed based on setting context
 - Using a variety of research designs and those most compelling for a given practice partner to make sustainability decisions



Summary

10 Ingredients

- Integrated research-practice partnerships that include a horizontal and vertical systems-based approach explicitly address 8/10 key ingredients to writing successful D&I grants
- What's not explicitly addressed?
 - ***Ingredient 5: Settings readiness to adopt a new intervention***
 - ***Ingredient 7: Team experience with the setting, treatment, implementation process, and review environment.***



Acknowledgements

- The partners whose work I shared in the talk
 - Kansas State Cooperative Extension
 - Carilion Clinic Dept of Family and Community Medicine and the Chronic Care Coordination Leadership and Nurses
 - Kaiser Permanente Colorado
 - IncentaHealth
- Our research team and students (Gwenn Porter and Gina Schweiger)
- Funding support from the National Institutes of Health





"We have time for just one long-winded, self-indulgent question that relates to nothing we've been talking about."

