Implementation Research: Practical Application of Frameworks and Strategies for Evidence-Based Practice Implementation

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Disclosure

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Professor: UCSD
Director: Child and Adolescent Services Research Center

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  Mixed-Methods Study of EBP Sustainment
- R01MH092950 (PI: Aarons)
  Interagency Collaborative Teams to Scale up EBP
- R01MH087054 (PIs: Patterson & Aarons)
  Implementation of an Efficacious Intervention for High-Risk Women
- R21MH098124 (PI: Ehrhart)
  Development and Validation of Implementation Climate Measures
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  Center for Prevention Implementation Methodology

CDC
- R01CE001556 (PI: Aarons)
  Dynamic Adaptation Process to Implement EBP
Agenda

- Implementation conceptual frameworks
- Illustrate implementation phases and levels
- Describe implementation outcomes
- Describe some study designs in different settings
Traditions that Inform Implementation

- Management Science
- Organizational development
- Organizational psychology
- Business Quality Improvement
- Health Care Quality Improvement
- Public health
- Population health
- Education
- Ethnography
- Informatics
- Economics
- Engineering/Systems Dynamics
Implementation Framework:
– A proposed model of factors likely to impact implementation and sustainment of EBP
  (Aarons, Hurlburt, & Horwitz, 2011; Damschroder et al., 2009; Tabak et al., 2012)

Implementation Strategy:
– Systematic processes to adopt and integrate evidence-based innovations into usual care.
  (Powell et al., 2011)
Implementation Strategies

Address specific factors identified in implementation frameworks

Discrete implementation strategies
- Clinical reminders, training only

Multifaceted implementation strategies
- Training + reminders
- Training + fidelity monitoring + coaching

Blended implementation strategies (comprehensive)
- Community Development Team strategy (CDT)
- Interagency Collaborative Team strategy (ICT)
- Dynamic Adaptation Process strategy (DAP)
- Leadership and Organizational Change for Implementation (LOCI)

## Domains of Strategies

<table>
<thead>
<tr>
<th>Type of Strategy</th>
<th>Description</th>
<th>Context Level</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Info gathering, leadership, relationships</td>
<td>Outer/Inner</td>
<td>n=17</td>
</tr>
<tr>
<td>Education</td>
<td>Training, materials, influence stakeholders</td>
<td>Inner/Outer</td>
<td>n=16</td>
</tr>
<tr>
<td>Financing</td>
<td>Incentives, financial support</td>
<td>Inner/Outer</td>
<td>n=9</td>
</tr>
<tr>
<td>Restructuring</td>
<td>Change roles, create teams, alter record systems, create relationships</td>
<td>Inner/Outer</td>
<td>n=7</td>
</tr>
<tr>
<td>Quality Management</td>
<td>MIS + feedback, clinical reminders, decision support, PDSA cycles</td>
<td>Inner/Outer</td>
<td>n=16</td>
</tr>
<tr>
<td>Policy Change</td>
<td>Licensure, accreditation, certification, mandates</td>
<td>Outer/Inner</td>
<td>n=3</td>
</tr>
</tbody>
</table>

Why Frameworks?

As proposed by the project sponsor.

As specified in the project request.

As designed by the senior analyst.

As produced by the programmers.

As installed at the user’s site.

What the user wanted.
Review of Models
(Tabak, et al., 2012)

Reviewed 61 models
- Models (aka “theories” or “frameworks”)

- Frameworks evaluated on:
  - Construct flexibility
    - Broad $\rightarrow$ highly operationalized
  - Focus on dissemination vs. implementation
    - D-only $\rightarrow$ D=I $\rightarrow$ I-only
  - Socioecologic framework level
    - Individual $\rightarrow$ Community $\rightarrow$ System

Most frameworks also are adapted or modified in practice

Common Elements of Frameworks

- **Multiple Levels**
  - Implementation occurs in complex systems
  - Need to identify concerns at different levels

- **Multiple phases**
  - Implementation occurs over time
  - There may be relatively discrete phases or stages
Why Consider Levels of Change?

Four Levels of Change for Assessing Performance Improvement

- Larger System/Environment
  - Reimbursement, legal, and regulatory policies are key

- Organization
  - Structure and strategy are key

- Group/Team
  - Cooperation, coordination, & shared knowledge are key

- Individual
  - Knowledge, skill, and expertise are key

Assumptions about Change


Why Consider Multiple Phases?

- Characterizes process of implementation
- Develops a way to think about what supports are needed during the implementation process
- Helps in providing a “long-term view”
- Helps in planning

Consolidated Framework for Implementation Research (CFIR)

The five CFIR domains are:

- Intervention characteristics
- Outer setting
- Inner setting
- Characteristics of the individuals involved
- Process of implementation

# ARC Org Improvement Model
(Availability, Responsiveness, Continuity)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Component</th>
<th>Phase</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>I Problem Identification</td>
</tr>
<tr>
<td>Collaboration</td>
<td>1. Leadership</td>
<td>→</td>
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<td></td>
<td>2. Personal Relationships</td>
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<td>4. Team Building</td>
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<td>5. Information and Assessment</td>
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<td></td>
<td>11. Job Redesign</td>
<td>→</td>
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<td></td>
<td>12. Self-Regulation</td>
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Exploration, Preparation, Implementation, Sustainment (EPIS) Model

- Key phases of the implementation process

- Multilevel

- Frames implementation factors across levels within each phase

- Enumerates common and unique factors across levels and across phases

Adapted EPIS Model

**EXPLORATION**
- Outer Context
  - Sociopolitical Context
  - Funding
  - Interorganizational networks
  - EBT Fit
  - Internet use
  - Insurance availability
- Inner Context
  - Organizational characteristics
  - Individual adopter characteristics
  - EBT fit with client characteristics
  - Fiscal viability

**PREPARATION**
- Outer Context
  - Sociopolitical
  - Leadership at policy level
  - Funding
  - Interorganizational networks
  - Availability of EBT materials
- Inner Context
  - Organizational culture and climate
  - Leadership
  - Staffing and staff characteristics
  - EBT Fit
  - EBT Adaptation
  - Fiscal viability & resources
  - Medication dose control
  - Training availability

**IMPLEMENTATION**
- Outer Context
  - Sociopolitical
  - Funding
  - Intervention developer engagement
  - Leadership
  - Interorganizational networks
  - External ratings/report cards
- Inner Context
  - Organizational culture and climate
  - Leadership
  - Staff attitudes to EBT
  - Individual adopter characteristics
  - Incentivizing providers
  - Fiscal viability
  - Fidelity monitoring & support

**SUSTAINMENT**
- Outer Context
  - Sociopolitical
  - Funding
  - Leadership
- Inner Context
  - Organizational culture and climate
  - Training
  - EBT fit
  - Fidelity monitoring/support
  - Staffing
  - Child & parent outcomes
  - Fiscal viability
  - Technology supported practice

Phases and Transition Points in the EPIS Model

**Exploration Phase**
- Evaluate EBP Fit
- Assess outer context issues
- Assess inner context issues

**Preparation Phase**
- Marketing EBP to stakeholders
- Address outer context issues
- Address inner context issues

**Implementation Phase**
- Leadership and support for EBP
- Alignment of outer context support
- Problem solving inner context issues

**Sustainment Phase**
- EBP quality assurance
- Alignment and contingency management
- Supervision incentivization turnover mgmt

**Problem Solving Orientation**
Different philosophical bases

Qualitative

Who would’ve thought that a structure of steel could be so beautiful... strong and delicate at the same time.

Quantitative

It shortens my commute to work by 12.7 mile.
Mixed-Methods Research Offers Several Advantages over Single-Method Approaches

- Combine the qualitative and quantitative approaches into the research methodology of a single study or multi-phased study

- Simultaneously answer confirmatory and exploratory questions, and therefore verify and generate theory in the same study

  – Teddlie & Tashakkori, 2003
Mixed-Methods Study of Statewide EBP Implementation (NIMH PI: Aarons)

- Implementation of SafeCare® in Oklahoma’s Statewide Children’s Services System
- Organizational and provider focused
- Mixed Methods
  - Quantitative, qualitative, and mixed
- Longitudinal at organization/team level
- Requires collaboration and ongoing relationship building and maintenance
Mixed-Methods EBP Implementation Study
NIMH 5R01MH072961 (PI: Aarons) Implementation
NIMH 5R01MH065667 (PI: Chaffin) Effectiveness

Legend

- EBP SafeCare
- Usual Care
### SafeCare Effectiveness Study
NIMH 5R01MH065667 (PI: Chaffin) Effectiveness
NIMH 5R01MH072961 (PI: Aarons) Implementation

<table>
<thead>
<tr>
<th></th>
<th>Monitored</th>
<th>Non-Monitored</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SafeCare</strong></td>
<td>SafeCare + Coaching</td>
<td>SafeCare Protocol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Coaching</td>
</tr>
<tr>
<td><strong>Services as</strong></td>
<td>Services as Usual + Coaching</td>
<td>Usual Care</td>
</tr>
<tr>
<td><strong>Usual</strong></td>
<td></td>
<td>No Coaching</td>
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</tbody>
</table>
Figure 1. Integrative Model for Study of Implementation of EBP in Human Service Organizations. (Adapted from Aarons, Woodbridge, & Carmazzi, 2003; Frambach & Schillewaert, 2002; Knudsen, Johnson, & Roman, 2002); Note: SC-ES=SafeCare Effectiveness Study
Implementation Outcomes
Effect of EBP Implementation on Staff Retention

Figure 1. Kaplan-Meier Survival Function Estimates (Retention Probability) by Study Condition. Note: SC/M = participating in SafeCare and fidelity monitoring; SC/Non = participating in SafeCare, but not fidelity monitoring; SAU/M = services as usual and receiving fidelity monitoring; and SAU/Non = services as usual and not receiving fidelity monitoring. N=153.

<table>
<thead>
<tr>
<th>Method</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td><em>Does SC implementation lead to increased turnover?</em></td>
<td><em>Does low rate of turnover signify satisfaction with SC?</em></td>
</tr>
<tr>
<td>Answer</td>
<td>Home based providers in the SC/M condition had a greater likelihood of staying with their agencies for a longer period of time.</td>
<td>Yes: Some providers loved the structure provided by the EBP. Yes: Many providers felt that there was some value to the EBP and some felt it benefited their families. No: Some providers disliked having to implement some of the EBP modules. No: Many providers felt that the EBP was not appropriate for all families. No: Some providers felt the EBP detracted from dealing with more immediate issues (e.g., crises).</td>
</tr>
</tbody>
</table>

| Question | *Does monitoring lead to increased turnover?* | *Does low rate of turnover signify satisfaction with monitoring?* |
| Answer | Home based providers in the SC/M condition and the UC/M condition had a greater likelihood of staying with their agencies for a longer period of time. | Yes: Some providers loved the supervision that came with monitoring. No: Some providers resented being monitored. According to administrator interviews, some of those providers subsequently left the agency. No: Some providers disliked their ongoing consultants. |

| Question | *Does lower perceived job autonomy lead to increased turnover?* | *Did SC increase or decrease autonomy?* |
| Answer | Yes: Lower perceived autonomy predicted greater turnover. | Decrease: Some providers reported use of the EBP reduced their ability to respond to more immediate demands like substance abuse or unemployment. Increase: Most providers reported that the EBP gave them more structure to do what they were already doing, making them feel more competent at their jobs (thus increasing perceived autonomy). |

| Question | *Do higher turnover intentions lead to increased turnover?* | *Did SC increase or decrease turnover intention?* |
| Answer | Yes: Higher turnover intention predicted greater turnover. | No: Most newer providers came in with the EBP as part of the work milieu and the service model so it did not impact turnover intentions. Yes: Some experienced staff felt that they already had the knowledge and tools to provide effective services. |

OK Qualitative Results – Service Providers

6 primary factors associated with EBP implementation

– Acceptability of the EBP to the caseworker and to the family
– Appropriateness of the EBP to the needs of the family
– Caseworker motivations for using the EBP
– Experiences with being trained in EBP
– Extent of organizational support for EBP
– Impact of the EBP on process and outcome of case management

OK Qualitative Results – Management/Executive Directors

6 primary factors associated with EBP implementation

- Availability of resources
- Positive external relations
- Support of agency leadership for EBPs
- Creating high motivation/low resistance in staff
- Tangible benefits for staff
- Perceived benefits outweigh perceived costs

Figure 1. Multigroup Clustered Path Analysis: Association of Transformational Leadership and Leader-Member Exchange with Team Climate for Innovation and Team Climate for Innovation with Staff Attitudes Toward Innovation Adoption During Innovation Implementation compared to Services as Usual. Note: N=140; Teams Implementing the SafeCare (n=85) / Teams Providing Services as Usual (n=55);

$\chi^2 (4) = 1.105; p = .894; CFI = 1.000, TLI = 1.037, RMSEA = 0.000, SRMR = 0.013; * p < .05, ** p < .01, *** p < .001$

OK SafeCare Trial: Effectiveness Results

Hybrid Designs

Hybrid Type I
Test clinical intervention
observe/gather information on implementation

Hybrid Type II
Test clinical intervention

Hybrid Type III
Test implementation intervention
observe/gather information on clinical intervention and outcomes

Implementation of an Efficacious Intervention for High Risk Women in Mexico (R01MH087054 PIs: Patterson & Aarons)

Proyecto Mujer Segura
Proyecto Mujer Segura • Universidad de California & Mexfam • Investigadores de la Universidad de California, visitaron Clínicas de Servicios Médicos Mexfam en Revolución, en Veracruz y las Oficinas de apoyo de Mexfam. Leer más...

Detención oportuna
CÁNCER CERVICOTERINO
1,500 mujeres serán beneficiadas con la implementación de un proyecto que promoverá el autocuidado para la detección oportuna del Cáncer Cervicouterino...

Prevención
VIH/SIDA
En 2010 Mexfam fue seleccionada para ser propietaria del concepto dance4life en México. El objetivo es contribuir en la prevención del VIH entre la juventud...

Campaña Social
DERECHOS SEXUALES Y REPRODUCTIVOS
Entre mujeres nos cuidamos es una campaña social que ayuda a mujeres de bajos recursos a realizarse gratuitamente el examen de Papanicolaou...

Leer más
Implementation Sites
Revolucion
Nezahualcoyotl
Veracruz
Guadalajara
Naranjos
San Luis Potosi
Ixtaltepec
San Luis de La Paz
Tuxtla Gutierrez
Tlapa
Iguala
Huajuapan de Leon
Tepeji del Rio
R01MH087054: Patterson & Aarons

Effectiveness Trial Methods

HIV Prevention Control Condition

Hybrid Type 1 Design

Implementation Research Methods

Implementation Strategy

HIV Prevention Strategy

Implementation Methods Follow-up

Figure 1. Mujer Segura Implementation Model: Organizational and Individual Factors Impacting training and Evidence-Based Intervention Attitudes, Fidelity, and Outcomes (Adapted from Aarons, 2005)

**ORGANIZATIONAL FACTORS**
- Org Culture
- Org Climate
- Leadership
- Org Support
- Social Influence

**PROVIDER CHARACTERISTICS**
- Job Satisfaction
- Org. Commitment
- Turnover Intentions
- Turnover

**STAFF DEMOGRAPHICS**

**ATTITUDES TOWARD EBP**

**PERSONAL DISPOSITIONAL INNOVATIVENESS**

**SOCIAL NETWORK INFLUENCE** (Perceived value of Mujer Segura)

**TRAIN THE TRAINER**
- **Phase 1.** Practice experts train & certify an “internal trainer” at each CBO
- **Phase 2.** The CBO’s “internal trainer” trains CBO staff to deliver Mujer Segura

**INTERVENTION FIDELITY AND COUNSELOR COMPETENCY**

**IMPLEMENTATION OUTCOMES**
- Efficiency
- Outreach

**FSW OUTCOMES**
- Behaviors
- STIs

**OUTCOMES**
- Behaviors
- STIs
- Efficiency
- Outreach
Cascading Models

- Address scale-up issues

- May have different hypotheses
  - e.g., may be interested in equivalence
    - Fidelity
    - Clinical outcomes
Cascading Dissemination of a Foster Parent Intervention
(NIMH Services Research Branch R01 MH60195)

**Phase 1**
Development of the intervention
Oregon 3 County Study ($N = 70$)

**Phase 2**
Original developers train and supervise
Cohort 1 Interventionists in San Diego ($n = 508$).

**Phase 3**
Cohort 1 Interventionists from San Diego train
Cohort 2 Interventionists ($n = 192$).
Developers supervise Cohort 1’s supervision of
Cohort 2, but have no direct contact with Cohort 2 Interventionists.

Cascading Implementation outcomes

- Baseline rates of behavior problems did not differ for phase 2 and phase 3 children.

- No differences between rates of child problems at treatment termination for phases 2 and 3.

- Assignment to the KEEP intervention group was associated with a significant decrease in child problems from baseline to termination.

- No decrement in treatment effect when intervention developers pulled back and had the staff trained in phase 2 provide training and supervision for phase 3 interventionists.

- With proper training and ongoing supervision, KEEP can be transported to third generation interventionists not directly trained or supervised by the intervention developers.

Interagency Collaborative Teams to Scale-Up Evidence-Based Practice (NIMH R01MH092950 Aarons & Hurlburt)

San Diego County Child Welfare System

United Way

Seed Team (Community Based)

Intervention Developers

Academic Partners

SC Team

SC Team

SC Team

SC Team

---------IMPLEMENTATION----------FLOW----------OVER----------TIME----------

### ARC Org Improvement Model
(Availability, Responsiveness, Continuity)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Component</th>
<th>Phase I: Problem Identification</th>
<th>Phase II: Direction Setting</th>
<th>Phase III: Implementation</th>
<th>Phase IV: Stabilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration</td>
<td>1. Leadership</td>
<td>➔</td>
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<td>2. Personal Relationships</td>
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<td></td>
<td>3. Network Development</td>
<td>➔</td>
<td>➔</td>
<td></td>
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<tr>
<td>Participation</td>
<td>4. Team Building</td>
<td>➔</td>
<td>➔</td>
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<td>5. Information and Assessment</td>
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<td>6. Feedback</td>
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<td></td>
<td>7. Participatory Decision-Making</td>
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<td>8. Conflict Management</td>
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<td>Innovation</td>
<td>9. Goal Setting</td>
<td>➔</td>
<td>➔</td>
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<td>10. Continuous Improvement</td>
<td>➔</td>
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<td></td>
<td>11. Job Redesign</td>
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<td>➔</td>
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<tr>
<td></td>
<td>12. Self-Regulation</td>
<td>➔</td>
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<td>➔</td>
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</tr>
</tbody>
</table>

Significant reduction in out of home placements for ARC and MST separately (no interaction)
Greater reduction in child behavior problems for ARC combined with MST
Reductions in staff turnover
No differences in adherence (coded tapes, client report, supervisor report)

Adaptation

- How do local contexts need to adapt to be ready for EBP implementation?

- What types of adaptations may be needed to fit EBPs to local context?

- How can we conduct adaptation in a planned and efficient way keeping fidelity to EBP core elements?

- How can we use data feedback to support ongoing implementation and sustainment?

- What do we really need to know about system and organizational readiness to implement EBP prior to implementation?
Dynamic Adaptation to Implement an Evidence-Based Child Maltreatment Intervention

(CDC R01CE001556, PI: Aarons)

- Phased approach to implementing EBP
  - Allows for appropriate intervention adaptations
  - Allows system and organization adaptations
  - Minimize drift

- Pre-implementation assessment
  - System, organizations, provider, consumer

- Multi-stakeholder ”implementation resource team”

- Ongoing outcomes and fidelity/satisfaction data feedback

- Data feedback to IRT and coaches

- Randomize multiple cohorts into ADAPTS vs. usual implementation

Note: Adapted from Aarons, Hurlburt and Horwitz (2011), Aarons and Green (2010), and Aarons, Green, Palinkas, Self-Brown, Whitaker, and Lutzker (In preparation). The contents of boxes do not capture every contingency or issue, but contents are exemplars. The Implementation Resource Team and stakeholders collaborate to make system, organization, and intervention delivery adaptations without compromising core elements of an EBP.

Where to from Here?

- Research designs and methods should match research questions of interest

- Formative work may need qualitative or mixed-methods

- Are questions primarily about treatment outcomes or implementation outcomes?

- Consider at what levels (system, organization, client) key questions are posed

- Explore which implementation framework best encompasses your service/research context
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