Implementation Research Workshop: Summary and Next Steps

Demystifying Implementation Research:
Basics and Beyond

Implementation Research is the scientific study of methods that promote systematic application of research findings in routine clinical practice. Implementation Science is a specialized field that evaluates strategies to enhance uptake of evidence-based practices into everyday care to improve health and health care.

Workshop Dates: January 30-31, 2020

UT Health
San Antonio

REPORT SUMMARY

◼ OVERVIEW

The Institute for Integration and Medicine and Science (IIMS) Community Engagement Group planned and guided the conduct of the Implementation Research Workshop on the UTHSA campus January 30-31, 2020. With the endorsement of the Office of Vice President for Research, funding from 10 different UTHSA sponsors supported participation of faculty scientists from the 4 CTSAs in Texas. The 2-day Workshop brought national and international Implementation Science leaders to San Antonio to engage 63 participants from all CTSAs across Texas.

The Workshop Goals included:
1. Build interprofessional scientific workforce capacity among faculty scientific teams and clinical partners to design and conduct relevant, rigorous, high priority studies in the emerging field of Implementation Science.
2. Enhance success in competing for D&I grants in NIH, AHRQ, DoD, and PCORI.
3. Position the UT System and Texas research partners as leaders in Implementation Research that improves healthcare.

◼ PARTICIPANTS

The Workshop Planning Group represented CTSAs from UTHSA, UTMB Health Galveston, and UTHealth Houston and included a wide representation of health disciplines. The 2 days of programming were led by nationally and internationally recognized experts in Implementation Science.

Workshop participants (n = 63) represented all 4 Texas CTSAs, faculty scientists from multiple disciplines, and included UTSA partners and key clinical partners of IIMS (University Health System, UT Health San Antonio, Military Health Institute, DOD/military health services) and 4 research support administrators. Workshop Presenters/Experts included national and international experts and hailed from each of the 4 Texas CTSAs and outside of Texas.

◼ PROGRAM DESIGN

The Workshop Program design is a key deliverable of this project. The 2-day curriculum and learning activities provide a comprehensive and foundational model for development of other Implementation Research training opportunities throughout Texas CTSAs.

Given the rise in emphasis on interprofessional Implementation Science and the shortage of training opportunities, IIMS Community Engagement undertook the design, resourcing, and conduct of this unique Implementation Research Workshop.

To ensure quality, currency, and generalizability of the Workshop, the Program was built on the established NIH/NCI curriculum, offering a standardized frame to advance the science. The NIH/NCI curriculum is used across the nation in intensive training programs to increase capacity of the Implementation Science workforce. However, admission into the NIH/NCI training program is severely limited, with demand far outstripping available training slots. By using the NIH/NCI curriculum, Workshop planners capitalized on the newly released NIH/NCI OpenAccess training materials, providing an ongoing opportunity for continued and expanded training within Texas CTSAs.

Applying classic curriculum design principles, learning activities were designed to enable participants to achieve the 11 learning objectives. These learning objectives align with the NIH/NCI curriculum and guided designation of topics, content, and speakers. Interactive Workshop activities included small-group discussion, frequent Q&A with the experts, and networking sessions. A key instructional feature was the use of a step-by-step guide for developing an

Implementation Research study. Daily summaries of accomplishments and participant-panel discussion stimulated participants' plans for Texas CTSAs and further collaboration. The final discussions explored "future of Implementation Research in Texas" and culminated in group recommendations for next steps.

EVALUATION

Formal Workshop evaluation was designed and accomplished using the 4-level Kirkpatrick Model for Evaluating Training programs. Workshop activities were implemented in a way that participants could self-evaluate achievement of the objectives. Prescribed pre-Workshop activities enabled participants to self-assess competencies and to become familiar with terminology and resources in this new field. Pre- and Post-Workshop competency self-assessments were completed by most of the participants. Details of evaluation data are presented later in this report.

SUMMARY

The Workshop was well-received and initiated action toward accomplishing the workshop goals. Participants indicated high interest in continuing to grow the capacity of the scientific workforce and accomplish cross-CTSA Implementation Research Studies. Additionally, participants indicated interest in continued training in the field.

To maximize the return on investment in the Workshop, several actions are planned. Web-ready resources assembled for the Workshop could be added to the IIMS website for or broader use for example, the NIH/NCI OpenSource modules, readings, and Workshop presentation slides. The IIMS Community Engagement Team is carrying through on exploring a "Texas Implementation Science Network ("Tex-IS Network"). Tex-IS could support continuing Implementation Research training opportunities and build a 'community of practice' across the Texas Regional CTSA Consortium. These accomplishments can be cited as meeting IIMS objectives for CTSA 3.0.

WORKSHOP PROGRAM HIGHLIGHTS

■ Topic

Implementation Research is the scientific study of methods that promote the systematic application of research findings in routine clinical practice. Implementation Science is a specialized field that evaluates strategies to enhance uptake of evidence-based practices into everyday care to improve health and health care.

■ Goals

1. Build interprofessional scientific workforce capacity among faculty scientific teams and clinical partners to design and conduct relevant, rigorous, high priority studies in the emerging field of Implementation Science.
2. Enhance success in competing for D&I grants in NIH, AHRQ, DoD, and PCORI.
3. Position the UT System and Texas research partners as leaders in Implementation Research that improves healthcare.

■ Objectives

The workshop is based on the established NIH/NCI curriculum and designed as an introductory-to-intermediate level workshop. Workshop participants will be given the opportunity to:

1. Assemble sufficient evidence of clinical intervention effectiveness and appropriate fit for a given clinical context.

2. Explain the evolution, current state, and future agenda of development of implementation science and its value to population health.

3. Define outcomes measures for both implementation strategy (system outcomes) and clinical intervention (patient/population outcome)

4. Select conceptual models and theoretical justification to support the choice of implementation strategy and inform the design, variables to be measured, analytic plan, and sustainment.

5. Describe implementation strategies for moving evidence into practice including existing taxonomies/classification schema.

6. State a research question addressing a gap in the provision of an evidence-based intervention, practice, or policy.

7. Summarize study designs used in implementation research and their relative strength.

8. Describe key elements in forming a business plan for sustainment, identifying implementation costs and quantifying benefits.

9. Apply principles of the "science of team science" broadly to enhance the productivity of multidisciplinary study teams and achieve adaptive implementation and sustainable change.

10. Outline an engagement process that will gain support from relevant stakeholders to ensure feasibility of the study plan.

11. Draft a prospectus plan targeted to one of the D&I funding opportunities from a variety of agencies.

SCHEDULE

Time	Topics	Objectives/Goals	Presenters
7:30am	Breakfast		
8:15am	Welcome		Andrea Giuffrida Robert Clark
8:30am	Workshop Goals and Group Activity		Robert Ferrer and Workshop Facilitators
9:15am	Locating and Appraising Best Evidence for Clinical Interventions	Obj. 1	Emme Lopez, Kathleen Stevens
9:45am	Break		
10:00am	Overview of Implementation Science Research Agenda and Outcomes in Implementation Science	Obj. 2 & 3	Maria Fernandez and Bijal Bala
11:00am	Conceptual Models and Theoretical Justification for Implementation Studies	Obj. 4	Maria Fernandez
11:30am	Implementation Strategies, Taxonomies and Selection	Obj. 5	Maria Fernandez
12:00pm	Lunch		
12:45pm	Hypotheses and Outcomes in Implementation Studies	Obj. 6	JD Smith
1:05pm	Research Designs, Methods, and Analysis in Pragmatic Trials	Obj. 7	JD Smith
2:45pm	Break		
3:00pm	Economic Approaches to Evaluating Cost/Benefit Relationships and Sustainability	Obj. 8	Dana Forgione
3:45pm	Summary and Day 2 Preparation		John Øvretveit

Day 2 - January 31, 2020   Location: ALTC Room # 2.205

| Time	Topics	Objectives/Goals	Presenters
7:30am	Breakfast		
8:30am	Mixed Methods in Implementation Research	Obj. 7	Erin Finley
9:00am	Combining Implementation and Improvement Science and Practice	Obj. 9	John Øvretveit
10:00am	Break		
10:15am	The Science of Team Science in Implementation Research	Obj. 10 & 11	Kevin Wooten
12:15pm	Lunch		
1:00pm	Crafting Successful Implementation Research Grant Applications	Obj.11	Maria Fernandez and Bijal Bala
1:45pm	Draft an Implementation Research Plan	Obj. 11	Participants and Workshop Facilitators
2:30pm	Break		
2:45pm	Building Scientific Workforce Capacity and Opportunities for Collaboration • Workshop Accomplishments • Needs, Resources and Shared Priorities • Activities to Maintain Momentum	Goals 1, 2, & 3	Polly Noël, Co-Moderator Erin Finley, Co-Moderator Simon Lee Tim Reistetter
3:30pm	Workshop Summary and Next Steps		Robert Ferrer

WORKSHOP FACULTY

WELCOME

Andrea Giuffrida, PhD
Vice President for Research
Professor of Pharmacology
UT Health San Antonio

Robert A. Clark, MD, MACP
Professor of Medicine
Assistant Vice President for Clinical Research
Director, Institute for Integration of Medicine & Science (IIMS)
UT Health San Antonio

WORKSHOP PRESENTERS (in alphabetical order)
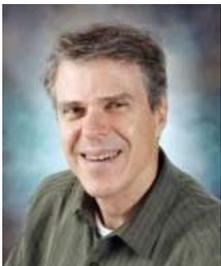
Robert L. Ferrer, MD, MPH
Community Engagement Director, IIMS
Dr. John M. Smith, Jr. Professor
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Maria E. Fernandez, PhD
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UT Health San Antonio: Graduate School of Biomedical Sciences, Translational Science PhD Program
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School of Public Health

Emme Lopez, MLS
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Department of Pediatrics
Northwestern University Feinberg School of Medicine
Associate Editor, *Prevention Science*
Associate Editor for Implementation Research, *Families, Systems, & Health*
Founding Editor, *TA Connection,* newsletter of the Therapeutic Assessment Institute
Faculty, NIH Training Institute in Dissemination and Implementation Research in Health (TIDIRH)

Kathleen R. Stevens, RN, EdD, ANEF, FAAN
Castella Endowed Distinguished Professor
School of Nursing
UT Health San Antonio
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Kevin Wooten, PhD
Faculty Chair and Professor of Management
College of Business - University of Houston Clear Lake
Department of Psychology - Rice University
Department of Preventative Medicine at UT Medical Branch at Galveston

WORKSHOP FACILITATORS AND PANELISTS

Simon Craddock Lee, PhD, MPH
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Professor/Research
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Timothy A. Reistetter, PhD, OTR, FAOTA
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Professor and Regional Dean
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Community Engagement Co-Investigator, IIMS

WORKSHOP PLANNING AND SUPPORT

Dr. Robert Ferrer, Chair
Dr. Kathleen Stevens, Convener
Elisabeth de la Rosa, Event Manager
Dr. Erin Finley
Dr. Bertha "Penny" Flores
Dr. Dana Forgione

Samantha Gonzalez
Dr. Polly Noël
Dr. Timothy Reistetter
Dr. Melissa Valerio-Shewmaker
Dr. Kevin Wooten

PRE-WORKSHOP PREPARATION

THINGS TO DO BEFORE YOU COME

1. **Complete the Pre-Workshop Self-Assessment** of *Competencies in Dissemination & Implementation Sciences*. These competencies were systematically created[1] and provide an opportunity to reflect on the terminology and concepts common in the Implementation Science field. The data are valuable to the continued planning for additional workshops. https://redcap.uthscsa.edu/REDCap/surveys/?s=YPCF3H4YRP

2. **Review the ImpRES Tool**[2] and have a copy handy on your electronic device. The **Tool** can be used throughout the Workshop to guide step-by-step development of Implementation Research Studies. Access the **Tool** and accompanying **Guide** by scrolling down at this URL: http://www.kingsimprovementscience.org/ImpRes (copy and paste URL)

3. **View this video**: *Orientation to the Science of Dissemination & Implementation.* This National Cancer Institute – Training Institute for Dissemination and Implementation Research in Cancer (TIDIRC) video provides is an introduction to the science of dissemination and implementation. Featured speakers include: Rinad Beidas, PhD – University of Pennsylvania, Cara Lewis, PhD – Kaiser Permanente, and Byron Powell, PhD 9 University of North Carolina, Chapel Hill. https://cancercontrol.cancer.gov/IS/training-education/orientation.html

4. **Save this video link i**n your resource file. These six (6) OpenAccess TIDIRC modules will be useful to support work prior, during, and following the Workshop: https://cancercontrol.cancer.gov/IS/training-education/tidirc/openaccess.html

5. **Save the following Recommended Resource List** in your resource file.

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[1] Padek, Margaret, Graham Colditz, Maureen Dobbins, Nikolas Koscielniak, Enola K. Proctor, Anne E. Sales, and Ross C. Brownson. "Developing educational competencies for dissemination and implementation research training programs: an exploratory analysis using card sorts." Implementation Science 10, no. 1 (2015): 114.

[2] Hull, Louise, Lucy Goulding, Zarnie Khadjesari, Rachel Davis, Andy Healey, Ioannis Bakolis, and Nick Sevdalis. "Designing high-quality implementation research: development, application, feasibility and preliminary evaluation of the implementation science research development (ImpRes) tool and guide." Implementation Science 14, no. 1 (2019): 80.

RECOMMENDED RESOURCE LIST

The following list of resources has been adapted from the National Cancer Institute (NCI) Training Institute for Dissemination and Implementation (TIDRIC) OpenAccess available at https://cancercontrol.cancer.gov/IS/training-education/tidirc/openaccess.html .

■ **MODULE 1:** *Introduction to Dissemination & Implementation*
Dr. Russ Glasgow, University of Colorado School of Medicine, Denver (32 mins.)

<u>Suggested Readings</u>

1. Bauer MS, Damschroder L, Hagedorn H, Smith J, Kilbourne AM. An introduction to implementation science for the non-specialist. *BMC Psychol*. 2015;3:32. doi:10.1186/s40359-015-0089-9.
2. Darnell D, Dorsey CN, Melvin A, Chi J, Lyon AR, Lewis CC. A content analysis of dissemination and implementation science resource initiatives: what types of resources do they offer to advance the field? *Implement Sci*. 2017;12(1):137. doi:10.1186/s13012-017-0673-x.
3. Pinnock H, Barwick M, Carpenter CR, et al. Standards for reporting implementation studies (StaRI) statement. *BMJ*. 2017;356:i6795. doi:10.1136/bmj.i6795.
4. Proctor EK, Powell BJ, Baumann AA, Hamilton AM, Santens RL. Writing implementation research grant proposals: ten key ingredients. *Implement Sci*. 2012;7:96. doi:10.1186/1748-5908-7-96.

<u>Web Resources</u>

1. DCCPS Implementation Science Sample Grants - https://cancercontrol.cancer.gov/IS/sample-grant-applications.html
2. Sample Grants hosted by UNC - https://tracs.unc.edu/index.php/services/proposal-development/sample-applications
3. NIH Anatomy of a Specific Aims Page - http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx

1. What changes, if any, would you make to your aims page considering the resources and readings provided? Use online resources of funded grants as potential models for thinking through how aims could be revised.

▨ MODULE 2: *Fidelity & Adaptation*
Dr. David Chambers, National Cancer Institute (38 mins.)

Suggested Readings

1. Chambers DA, Glasgow RE, Stange KC. The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. Implementation Science. 2013 Dec;8(1):117.
2. Fernandez ME, Dolan Mullen P, Leeman J, Walker TJ, Escoffery C. Evidence-based cancer practices, programs, and Interventions. In: Chambers DA, Vinson CA, Norton WE, eds. *Advancing the Science of Implementation Across the Cancer Continuum*. New York, NY: Oxford University Press; 2018:21-40.
3. Stirman SW, Baumann AA, Miller CJ. The FRAME: an expanded framework for reporting adaptations and modifications to evidence-based interventions. *Implement Sci*. 2019;14(1):58. doi:10.1186/s13012-019-0898-y.

Self-Reflection Questions

1. Will you need to make any adaptations to your evidence-based intervention? If so, what aspects might need to be adapted, and what process would you use to guide those adaptations? Will you be considering how the intervention is likely to be adapted as it is delivered?
2. Will you be measuring and monitoring the fidelity with which the evidence-based intervention is delivered? If so, how? If not, why? To what degree is there evidence that associated level of fidelity with patient outcomes?

▨ MODULE 3. *Overview of Dissemination & Implementation Models*
Dr. Wynne Norton, National Cancer Institute (26 mins.)

Suggested Readings

1. Chambers DA, Glasgow RE, Stange KC. The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implement Sci*. 2013;8:117. doi:10.1186/1748-5908-8-117.
2. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009;4:50. doi:10.1186/1748-5908-4-50.
3. Harden SM, Smith ML, Ory MC, Smith-Ray RL, Estabrooks PA, Glasgow RE. RE-AIM in clinical, community, and corporate settings: perspectives, strategies, and recommendations to enhance public health impact. *Front Public Health*. 2018;6:71. doi:10.3389/fpubh.2018.00071.
4. Moullin JC, Dickson KS, Stadnik NA, Rabin B, Aarons GA. Systematic review of the Exploration, Preparation, Implementation, Sustainment (EPIS) framework. *Implement Sci*. 20195;14(1):1. doi:10.1186/s13012-018-0842-6.

5. Strifler L, Cardoso R, McGowan J, et al. Scoping review identifies significant number of knowledge translation theories, models, and frameworks with limited use. *J Clin Epidemiol*. 2018;100:92-102. doi:10.1016/j.jclinepi.2018.04.008.

Web Resources
1. Dissemination & Implementation Models Site - http://www.dissemination-implementation.org/
2. EPIS Framework Site - https://episframework.com/
3. CFIR Guide - https://cfirguide.org/

Implementation Science Webinars Recordings on D&I Models:

1. Consolidated Framework for Implementation Research (CFIR) by Laura Damschroder https://www.youtube.com/watch?v=KAJ-oCJyWcs
2. Exploration, Preparation, Implementation, Sustainment (EPIS) by Greg Aarons - https://www.youtube.com/watch?v=OYw6g0F1rTs
   Interactive Systems Framework (ISF) by Abe Wandersman - https://www.youtube.com/watch?v=Ike0t6Fd_1k
3. Knowledge to Action Framework (KTA) by Sharon Straus - https://www.youtube.com/watch?v=ASQhwjfOYhw
4. Promoting Action on Research Implementation in Health Services Framework (PARIHS) by Alison Kitson & Gill Harvey - https://www.youtube.com/watch?v=t4Joti5RTzA

Self-Reflection Questions
1. Which model or combination of models is most applicable to your proposed study and why?
2. How might your selected model(s) guide or inform other aspects of your study (e.g., hypotheses, measures, outcomes, processes, selection of strategies, etc.)?

MODULE 4. *Introduction to D&I Measures*
Dr. Cara Lewis, Kaiser Permanente (35 mins.)

Suggested Readings

1. Palinkas LA, Mendon SJ, Hamilton AB. Innovations in mixed methods evaluations. *Annu Rev Public Health*. 2019;40:423-442. doi:10.1146/annurev-publhealth-040218-044215.
2. Proctor E, Silmere H, Raghavan R, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm Policy Ment Health*. 2011;38(2):65-76. doi:10.1007/s10488-010-0319-7.
3. Rabin BA, Lewis CC, Norton WE, et al. Measurement resources for dissemination and implementation research in health. *Implement Sci*. 2016;11:42. doi:10.1186/s13012-016-0401-y.

Self-Reflection Questions
1. What outcomes are you measuring in your study, how are you measuring them, and why are you measuring them?
2. What processes are you measuring in your study, how are you measuring them, and why are you measuring them?

MODULE 5. *D&I Designs Overview*
Dr. Greg Aarons, Univ. of California San Diego (65 mins.)

<u>Suggested Readings</u>

1. Brown CH, Curran G, Palinkas LA, et al. An overview of research and evaluation designs for dissemination and implementation. *Annu Rev Public Health*. 2017;38:1-22. doi:10.1146/annurev-publhealth-031816-044215.
2. Curran GM, Bauer M, Mitman B, Pyne JM, Stetler C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012;50(3):217-226. doi:10.1097/MLR.0b013e3182408812.
3. Palinkas LA, Aarons GA, Horwitz S, Chamberlain P, Hurlburt M, Landsverk J. Mixed method designs in implementation research. *Adm Policy Ment Health.* 2011;38(1):44-53. doi:10.1007/s10488-010-0314-z.

<u>Web Resources</u>

1. NCI Implementation Science Webinars on D&I Models: Hybrid Designs by Geoff Curran
   https://www.youtube.com/watch?v=qrOKhS1RWZk
2. Community Based Participatory Approaches by Nina Wallerstein & Bonnie Duran
   https://www.youtube.com/watch?v=OGJiAzlcnQA

<u>Self-Reflection Questions</u>

1. What is your proposed study design? Why is that the best design to answer your research questions or hypotheses?
2. Will you be incorporating a mixed methods design into your study? If so, what design? If not, why?

MODULE 6. *Implementation Strategies*
Dr. Prajakta Adsul, National Cancer Institute (19 mins.)

<u>Suggested Readings</u>

1. Lewis CC, Klasnja P, Powell BJ, et al. From classification to causality: advancing understanding of mechanisms of change in implementation science. *Front Public Health*. 2018;6:136. doi:10.3389/fpubh.2018.00136.
2. Powell BJ, Fernandez ME, Williams NJ, et al. Enhancing the impact of implementation strategies in healthcare: a research agenda. *Front Public Health*. 2019;7:3. doi:10.3389/fpubh.2019.00003.
3. Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting**.** *Implement Sci*. 2013;8:139.

<u>Self-Reflection Questions</u>

1. What are the specific implementation strategies that you will be focusing on in your proposed research and how have you selected them?
2. How might you link specific implementation strategies to the context in which your work is set?
3. Bonus: Pick at least one implementation strategy of relevance to your work and describe it using Proctor's specifications.

PARTICIPANT BACKGROUNDS

A total of 63 individuals participated and/or presented at the workshop of whom 55 were faculty and 2 were nurse scientists. Three non-faculty UT staff participated in the event as well as 3 additional staff who coordinated the event. Affiliation with a Clinical Translational Science Award (CTSA) site was required to participate in the workshop. **Table 1** includes a list of the academic institutions represented at the event.

Table 1: Institutions Represented by Participants and Presenters

Institution Name	Number
Brooks Army Medical Center (BAMC)	2
UT Health San Antonio	36
UTHealth Houston	4
UT Health Tyler	1
UT San Antonio	1
UT Southwestern Medical Center	6
UTMB Health Galveston	10
Duke University	1
Northwestern University	1
Karolinska Institutet	1
Total	63

Various backgrounds were represented by the workshop participants including health care practitioners and academic researchers. **Table 2** summarizes the doctoral degrees of the attendees and participants.

Table 2: Doctoral Degrees Represented Among Participants and Presenters

Degree	Number
Bachelors of Dentistry (BDS)	1
Doctorate of Business (DB)	1
Doctorate Nurse Practitioner (DNP)	2
Doctor of Education (EdD)	1
Medical Doctor (MD)	12
Doctorate of Philosophy (PhD)	39
Doctorate of Psychology (PsyD)	1
Doctorate in Speech Language Pathology (DSLP)	1
Total	57

WORKSHOP EVALUATION

Participants were encouraged to complete a Pre and Post Self-Assessment aid in the development of this workshop and future workshops. Figure 1 describes the overall D&I research expertise of participants before and after attending the workshop. Pre to post-workshop, there was a decrease among those who considered themselves to be novices. Also, important, there was an increase among those who consider themselves to have intermediate and advanced expertise.

Figure 1: How would your describe your experience with D&I research?
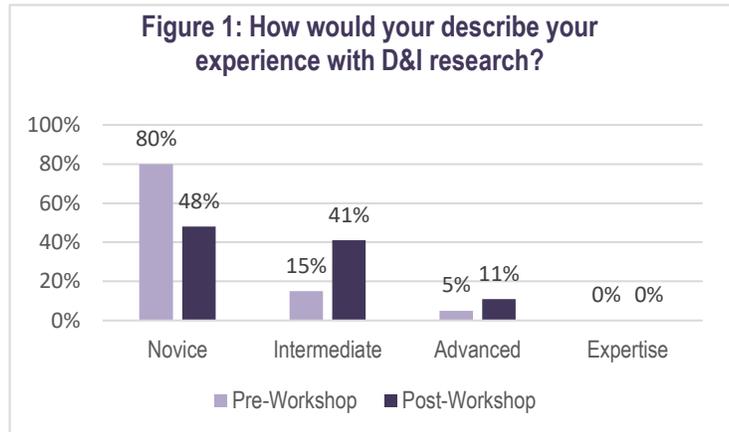
The *Pre-Workshop Self-Assessment* also assessed familiarity with D&I Frameworks and D&I competencies as established by Padek M. et. al. **See Appendix 1 and 2**. The *Post-Workshop Self-Assessment* consisted of the same measures, plus additional items to assess whether objectives were met and overall satisfaction with the workshop. **See Appendix 3**. A total of 40 *Pre-Workshop and 27 Post-Workshop Self-Assessments* were completed. **Table 3** describes the level of familiarity with various D&I research frameworks. There was an increase in familiarity with all the theories listed after attending the workshop.

Table 3: Participant Familiarity with D&I Research Frameworks, Pre and Post-Workshop Assessments

Framework	Not familiar		Somewhat familiar		Familiar		Very familiar	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Consolidated Framework for Implementation Research (CFIR)	58%	3.7%	15%	40.7%	18%	37%	10%	19%
Exploration, Planning, Implementation, and Sustainment	52.5%	11%	32.5%	52%	10%	26%	5%	11%
Replicating Effective Programs (REP) Framework	77.5%	7.4%	22.5%	59.3%	0%	33.3%	0%	0%
Diffusion of Innovation	60%	14.8%	12.5%	44.4%	10%	25.9%	18%	14.8%
RE-AIM (by R. Glasgow)	50%	3.7%	22.5%	37%	20%	40.7%	7.5%	18.5%
PCORI Dissemination and Implementation Framework	40%	14.8%	40%	55.6%	15%	22.2%	5%	7.4%

Other D&I frameworks familiar to the workshop participants included, "Proctor Implementation Outcomes," "Pahris," "NIRN Implementation Drivers," "Interactive Systems Framework," and "Shift Evidence."

In 2015, Padek et al., published several educational competencies for dissemination and implementation research training programs. Each competency index is named according to four domains: *Definition, Background, and Rational; Theory and Approaches; Design and Analysis;* and *Practice-Based Considerations*. Within each domain, index items can be categorized as basic (1), intermediate (2),and advanced (3). Group means were calculated for each individual index item. **Tables 4-7** display the group pre and post means for each index item. Post group means increased for all index items, in each domain.

Table 4: D&I Research Competency Domain – Definition, Background, and Rational

Competency	Pre - Group Mean	Post - Group Mean
a. Define and communicate D&I research terminology.	1.174	1.739
b. Define what is and what is not D&I research.	1.261	1.783
c. Differentiate between D&I research and other related areas, such as efficacy research and effectiveness research.	1.174	1.739
d. Identify the potential impact of disseminating, implementing, and sustaining effective interventions.	1.217	1.783
e. Describe the range of expertise needed to conduct D&I research (e.g., mixed method experience, economic, organizational, policy, clinical).	1.130	1.783
f. Determine which evidence-based interventions are worth disseminating and implementing.	1.261	1.652
g. Assess, describe, and quantify (where possible) the context for effective D&I (setting characteristics, culture, capacity, and readiness).	1.174	1.773
h. Identify existing gaps in D&I research.	1.087	1.522
i. Identify the potential impact of scaling down (aka de-implementing) an ineffective but often used intervention.	1.087	1.478
j. Formulate methods to address barriers of D&I research.	1.130	1.522

Table 5: D&I Research Competency Domain – Theory and Approaches

Competency	Pre - Group Mean	Post - Group Mean
a. Describe a range of D&I strategies, models, and frameworks.	1.043	1.609
b. Identify appropriate conceptual models, frameworks, or program logic for D&I change.	1.087	1.565
c. Identify core elements (effective ingredients) of effective interventions and recognize risks of making modifications to these.	1.217	1.609
d. Describe a process for designing for dissemination (planning for adoption, implementation, and sustainability during the intervention development stage).	1.217	1.565
e. Describe the relationships between various organizational dimensions (e.g., climate, culture) and D&I research.	1.217	1.652
f. Explain how knowledge from disciplines outside of health (e.g., business, marketing, and engineering) can help inform further transdisciplinary efforts in D&I research.	1.130	1.652
g. Identify and articulate the interplay between policy and organizational processes in D&I.	1.174	1.478

Table 6: D&I Research Competency Domain – Design and Analysis

Competency	Pre - Group Mean	Post - Group Mean
a. Describe the core components of external validity and their relevance to D&I research.	1.174	1.609
b. Identify common D&I measures and analytic strategies relevant for your research question(s).	1.130	1.739
c. Identify and measure outcomes that matter to stakeholders, adopters, and implementers.	1.261	1.696
d. Describe the application and integration of mixed-method (quantitative and qualitative) approaches in D&I research.	1.174	1.565
e. Apply common D&I measures and analytic strategies relevant for your research question(s) within your model/framework.	1.130	1.522
f. Identify possible methods to address external validity in study design reporting and implementation.	1.087	1.435
g. List the potential roles of mediators and moderators in a D&I study.	1.130	1.435
h. Identify and articulate the trade-offs between a variety of different study designs for D&I research.	1.130	1.478
i. Describe how to frame and analyze the context of D&I as a complex system with interacting parts.	1.130	1.565
j. Effectively integrate the concepts of sustainability/sustainment and the rationale behind them in D&I study design.	1.217	1.565
k. Describe gaps in D&I measurement and critically evaluate how to fill them.	1.043	1.348
l. Effectively explain and incorporate concepts of de-adoption and de-implementation into D&I study design.	1.043	1.565
m. Incorporate methods of economic evaluation (e.g., implementation costs, cost-effectiveness) in D&I study design.	1.130	1.435
n. Evaluate and refine innovative scale-up and spread methods (e.g., technical assistance, interactive systems, novel incentives, and 'pull' strategies).	1.130	1.137

Table 7: D&I Research Competency Domain – Practice-Based Considerations

Competency	Pre- Group Mean	Post - Group Mean
a. Describe the importance of incorporating the perspectives of different stakeholder groups (e.g., patient/family, employers, payers, healthcare settings, public organizations, community, and policy makers).	1.522	1.739
b. Describe the concept and measurement of fidelity.	1.261	1.696
c. Articulate the strengths and weaknesses of participatory research in D&I research.	1.174	1.652
d. Determine when engagement in participatory research is appropriate with D&I research.	1.130	1.739
e. Describe the appropriate process for eliciting input from community-based practitioners for adapting an intervention.	1.217	1.609
f. Identify and apply techniques for stakeholder analysis and engagement when implementing evidence-based practices.	1.261	1.609
g. Identify a process for adapting an intervention and how the process is relevant to D&I research.	1.217	1.522
h. Explain how to maintain fidelity of original interventions during the adaption process.	1.130	1.652
i. Identify sites to participate in D&I studies, and negotiate or provide incentives to secure their involvement.	1.217	1.652
j. Identify and develop sustainable partnerships for D&I research.	1.261	1.565
k. Describe how to measure successful partnerships for D&I research.	1.087	1.652
l. Use evidence to evaluate and adapt D&I strategies for specific populations, settings, contexts, resources, and/or capacities.	1.217	1.225

Twelve workshop objectives were developed based on the NIH/NCI curriculum. Table 8 below describes whether participants agreed that the objectives were met. Most participants (59% to 96%) agreed that workshop met all of the objectives. **See Table 8.**

Table 8: Post-Workshop Assessment - Workshop Objectives Met per Participants

Objective statement	Disagree	Neutral	Agree
1. Explain the evolution and current state of development of implementation science and its value to population health.	0%	4%	96%
2. State a research question addressing a gap in the provision of an evidence-based intervention, practice, or policy.	0%	19%	81%
3. Assemble sufficient evidence of clinical intervention effectiveness and appropriate fit for a given clinical context.	4%	26%	70%
4. Select conceptual models and theoretical justification to support the choice of implementation strategy and inform the design, variables to be measured, analytic plan, and sustainment.	22%	4%	74%
5. Outline an engagement process that will gain support from relevant stakeholders to ensure feasibility of the study plan.	7%	33%	59%
6. Describe implementation strategies for moving evidence into practice using existing taxonomies/classification schema and justify selection of strategies to use in an implementation study.	4%	29%	67%
7. Specify strategies that promote sustainment of change, including cost/benefit of change and implementation.	7%	26%	67%
8. Apply principles of the "science of team science" to enhance the productivity of multidisciplinary study teams.	0%	22%	78%
9.Summarize study designs used in implementation research and their relative strength.	7%	19%	74%
10. Define outcome measures for both implementation strategy (system outcomes) and clinical intervention (patient outcomes).	0%	26%	74%
11. Draft a prospectus plan targeted to one of the D&I funding opportunities from a variety of agencies.	4%	37%	59%

Despite the distance traveled by some, participants reported that the *location of the event* was excellent or good (63% and 33% respectively). Also, *networking opportunities* were reported as excellent – 52%, good – 33%, and fair 7%.

BUILDING SCIENTIFIC WORKFORCE CAPACITY & OPPORTUNITIES FOR COLLABORATION

At the end of Day 2, one representative from each Texas CTSA was invited to participate in an informal panel discussion titled *Building Scientific Workforce Capacity and Opportunities for Collaboration.* Panel moderators sought the ideas and feedback of the workshop participants as well. Below is a summary of ideas shared by various panelists and participants. Also included within the summaries are open-ended responses collected via the online evaluation.

■ Workshop Accomplishments

This workshop has made me think about how we build teams and projects. In science we are oriented to strive for the PI role but serving as a co-investigator is just as important. Think about the scale and scope of your research goals. What you are doing now to reach your professional research goals, 7 to 10 years from now? What are your long- and short-term goals and how can investigators from other disciplines help you develop and fortify your research? Identify other investigators who will help you develop your program of research over the long term. What roles can you take now to help you reach your long-term research goals? Recognize the importance and value of taking turns leading research projects. Give others an opportunity to showcase and further develop their disciplinary expertise.

Implementation issues are unique in different settings. Our School of Health Professions is different in that it includes Emergency Health Sciences. Policies are mandated by local city and county agencies such as the fire department. What they say goes. There is no time to think about what the best way is to implement a new strategy. This workshop has made me think about how the information that I learned can be modified and applied in different settings. Also, I often think of mapping implementation strategies. This workshop has taught me that I should also map to a theory and model and consider the inner setting.

This workshop has made me rethink how to use mixed methods in Implementation Science. Grant reviewers oftentimes critique the sequence of methods. Is the qualitative informing the quantitative or vice versa? The sequence of each method matters and has implications for a study. The concurrent activities are also just as important. What are the outcomes associated with each piece?

Overall, I consider this to be a successful workshop because we have laid groundwork for collaborations that could lead to possible grant opportunities.

I do not have a strong Implementation Science background. It was useful seeing frameworks for different intervention strategies. Knowing that I can measure the middle piece instead of approaching from a diagonal of multiple things that could confound or mediate was useful.

The explanation of the theories was great and helpful.

It was useful to talk about context in terms of facilitators and barriers. The implementation of future studies will be more informed if more time is spent describing the context in which studies are completed. For example, we should be more descriptive and not just say, 'This study was done at a medical center.' What kinds of things are specific to your medical center than helped or hindered your study? What red tape did you have to go through to make the study work?

Read: Nilsen, P., Bernhardsson, S. [Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes](#). *BMC Health Serv Res* 19, 189 (2019). https://doi.org/10.1186/s12913-019-4015-3

Having experts in an informal setting to explain Implementation Science to novices like myself was great. The resources that were compiled are incredible. This program and workshop have provided me huge takeaways.

What's the next right thing to do? We do not know what the next RO1 is but what's the little section that will keep you moving forward? How can we support each other in these tasks? We don't have to figure this out right now, but let's not lose this momentum.

Going forward, how can we make people aware of each other to allow for the development of natural collaborations? I am surprised by how many people from my institution who are interested in Implementation Research are here that I had never met.

Thank you all for a nice welcome! The amount of information presented during the workshop was such a help in starting to understand the role and importance of implementation science. I look forward to future communication and possible collaboration.

▮ Needs, Resources, & Shared Priorities

Consultation opportunities would be very welcome. Access to a local Implementation Science listserv as well as a library of funded and non-funded Implementation Science grant applications would be helpful.

As a user of Implementation Science, it would have helped to know who to go to for help. To have had someone to review my work and/or bounce ideas off of would have been great. Sometimes we just do not know where to go – a clearinghouse of experts would be helpful.

I would like one-on-one consultations regarding effective strategies toward adoption when planning a I&D study.

There has been a lot of talk focused on the need for methods consultations. Most of our institutions have internal grant review committees. It seems that within this there lies an opportunity to convene collective implementation research expertise to oversee review process to increase funding scores.

How could the UT System provide consultations and make it sustainable and fundable? See: Brownson, R. C., Proctor, E. K., Luke, D. A., Baumann, A. A., Staub, M., Brown, M. T., & Johnson, M. (2017). Building capacity for dissemination and implementation research: one university's experience. *Implementation science: IS*, *12*(1), 104. https://doi.org/10.1186/s13012-017-0634-4

There have been a lot of conversations focused on rotating workshops within the CTSA network, but there are a lot of potential partnerships within the UT. What is the role of the UT System for support, visibility and connections etc. to help facilitate and further roll out Implementation Science? There is a lot of expertise in this room, but also across the state. It seems like there would be opportunities to implement high value, high impact interventions in other settings across the state.

Great conference. State-funded D&I grants (like the UT System quality and safety grants) should be considered to spread successful interventions/programs across UT institutions.

According to a recent national survey, Implementation Science plays a small role in CTSA activities. There are four CTSAs in Texas. There has been a growth in interest. The idea of connecting multiple sites for the creation of a collective, critical mass is important. Dr. Erin Finley recently shared a document detailing how few D&I grants are awarded to teams Texas. A network of clinical sites in Texas could serve to build scientific capacity.

Since implementation research requires multiple sites, the suggestion is to develop formal collaboration across the Texas CTSAs

◼ Activities to Maintain Momentum

How can we support efforts to create a group(s) of like-minded IS investigators in San Antonio, the TRCC, and Texas who can work together to accomplish more?

How do we sustain this energy? We have looked at TIDRH and TIDRC in other institutions. What do workshop participants need going forward? Could we create virtual forum (open by subscription) such as a Texas IS Wiki page to create a space where we can tag peers and share helpful resources with investigators from the TRCC and other institutions as well? It has been a big indulgence for us to attend this workshop for two days. We do not want to lose contact with the we have met. We need the space to keep that exchange, locally and across institutions.

Can we build a Texas Team and have monthly video conference to share progress, success stories, problems in ongoing projects, etc...?

Yes, a virtual platform would be very helpful. Also, as we planned for this workshop, there was mention that perhaps another Texas CTSA could host the next IS meeting. If so, there could be different topics in these workshops such as the role of dissemination and/or technology. IT plays an important role within Implementation Science. Investing time to better understand this interface would be helpful. For example, what is involved in the script necessary for a flow sheet to work?

I have just recently started getting involved in Implementation Research at UTMB. I am working with the Stroke MTT project with Dr. Reistetter. I also have been working with UTMB hospital stakeholders on a Malnutrition project which has been working to integrate validated screening tools into the hospital workflow to increase the proper screening and identification of malnutrition in hospitalized patients. This "QI" project has spurred my interest in I&D research, and I was hoping to connect with other I&D researchers that could possibly help mentor me in this area‐ thinking about a possible K01 submission topic. We discussed at the wrap-up of the meeting a listserv which we could "seek support" and "ask questions." I think this would be amazing. Also planning to attend the I&D meeting in May in Houston to further my knowledge. Would love to hear about other workshops or seminars too!

The Institute for Integration of Medicine & Science (UT Health SA – CTSA) has promised to support D&I Research efforts not only at UT Health SA, but also among our institutional partners such as University Health System, the Military Health Institute, and UT Medicine. Our hope is that you all will serve as the workforce behind this vision so that together you are best equipped to address difficult health and health care scenarios in the community. Having an Implementation Research workforce would allow us to create a righteous match between a scholar with a research interest and a community partner who has a pressing need. We are very serious about this as the CTSAs are not only about research, but also about improving the health and well-being of communities.

WORKSHOP SUMMARY & NEXT STEPS

▪ General Evaluation

I would like more frequent workshops but maybe just one day (more frequent, less time).

Very insightful workshop!

This was a fantastic workshop!!!!! Thanks for putting together such a wonderful conference. The speakers were all so engaged and the flow of the days were great.

Wonderful workshop, thank you for inviting exceptional speakers and planning content that could help us immediately!

Looking forward to more of these interdisciplinary cross institutional D&I meetings! More time for networking is always welcome!

One of the best conferences I have attended in a while. The speakers were dynamic and, being new to the topic, I found it very informative and interesting.

This has been a phenomenal workshop.

More information on restaurants/surrounding location would be helpful for those arriving the night before the conference starts.

▪ Texas Implementation Science (TEX-IS)

In the coming months we will convene additional discussions to further develop a working structure we call Texas Implementation Science (TEX-IS). TEX-IS is envisioned as a learning and working collaborative dedicated to increasing capacity for high quality implementation science within the Texas CTSA's. The collaborative would assemble shared resources that promote D&I training. We also envision the formation of working groups that share focus areas, either topic or methodology. We plan to use the TRCC as a convener for these conversations.

NETWORKING OPPORTUNITIES

During registration, workshop participants were asked to provide a possible Implementation Research project title. Below is a list of participants and their project titles. Please use this list as a starting point for making connections.

Name	Institution	Project Title
Angela Samosorn	BAMC/UTHSA	*Implementation of a Comprehensive Nursing Competency Program*
Shelia Savell	BAMC/UTHSA	*Casualty Triage and Resource Utilization by Medics for Prolonged Field Care in Austere Environments*
Eric Eisenstein	Duke University	*eSource Site Start-Up*
Eileen Nehme	UTHealth Tyler	*Catalyzing primary care and social services integration in Texas*
Gordon Shen	UTHealth Houston	*Customizing technology for health in the nascent Houston innovation ecosystem*
Rebecca Wells	UTHealth Houston	*Building the evidence base for TeamSTEPPS effects on outpatient health care teamwork, safety, and quality*
Timothy Reistetter	UTHSA	*Use of visual analytic to information chronic disease self-management following stroke*
Polly Noel	UTHSA	*Linking older primary care patients & their caregivers to home & community-based services*
Ana Allegretti	UTHSA	*The use of a ride-on toy car as means of providing self-direct mobility*
Alex Bokov	UTHSA	*Clinical Open Dashboard for Electronic Health Records: dissemination to ACT informatics teams and the researchers they serve*
Walter Calmbach	UTHSA	*Primary Prevention of Obesity-Related Cancers: a Practice-Based Intervention Designed To Address Obesity/Body Fatness and Reduce Cancer Risk.*
Yan Du	UTHSA	*Response to an Individualized and Digital Enhanced Lifestyle Intervention in Diabetes Patients with and without Diabetic Kidney Disease: A Precision Health Approach*
Penny Flores	UTHSA	*Culturally competent cervical cancer prevention intervention among Hispanic women and their male partners*
Rozmin Jiwani	UTHSA	*The Effects of Multiple Behavioral Lifestyle Intervention on Frailty and Patient-Reported Outcomes in Older Adults with Type 2 Diabetes using Mobile Health Technology.*
Kathryn Kanzler	UTHSA	*Acceptance Based Coping (ABC) Skills Delivered by Promotores for Hispanic/Latino Patients with T2DM*
Angela Kennedy	UTHSA	*An interprofessional community engagement pilot project: Speech and language screenings in the San Antonio area and surrounding counties*
Jisook Ko	UTHSA	*Constructing Personalized DASH for Hypertensive Patients using a Precision Health Approach*
George Kudolo	UTHSA	*Environmental toxicants as major players in the prevalence of diabetes across the Health Service Regions of Texas.*
Holly Lanham	UTHSA	*A multisite implementation of EHR-to-eCRF electronic data capture systems to facilitate clinical trials (with Meredith Zozus)*
Moonju Lee	UTHSA	*Improving Cancer Screening Rates by trained Community Health Workers among Korean Americans using the ECHO (Extended Community Health Outcome) model*
Rahma Mungia	UTHSA	*The Implementation of E-Cigarette Cessation Counseling in a Dental Practice-Based Research Network*
Rocio Norman	UTHSA	*Language performance in Adults with Mild Traumatic Brain Injury*
Bridgett Piernik-Yoder	UTHSA	*Implementation of a home evaluation intervention to reduce fall risk for homebound seniors or Veterans*

Chethan Ramamurthy	UTHSA	*GU GENE: Enhancement of Genetic Testing in GU Cancer patients*
Gerardo Ramos	UTHSA	*Assessment of Cannabidiol (CBD) and Mitragynine (Kratom) prevalence in pain management patients and their consequences on therapeutic outcomes*
Ruben Restrepo	UTHSA	*Does Training on Waveform Analysis Improve Recognition of Patient-Ventilator Asynchrony?*
Kristen Rosen	UTHSA	*Texas Medication for Opioid Use Disorder (TxMOUD): Implementing medication services in Texas OUD treatment programs.*
Mary Salazar	UTHSA	*Utilization of a Geriatric Oncology Screening Assessment Tool (G8) in an Academic Oncology Practice serving a Large Latino Population.*
Suyen Schneegans	UTHSA	*Texas Medication for Opioid Use Disorder (TxMOUD): Standing up a training and technical assistance center in Texas for opioid use disorder treatment*
Amita Shah	UTHSA	*Identification of pre-operative factors affecting breast conserving therapy surgical outcomes*
Casey Taliancich-Klinger	UTHSA	*An interprofessional community engagement pilot project: Speech and language screenings in the San Antonio area and surrounding counties*
David Wampler	UTHSA	*Deployment of a Regional Clinical Operating Guideline for Thrombolysis at the Referral Center followed by Immediate Transfer to PCI in ST-Elevation Myocardial Infarction*
Meredith Zozus	UTHSA	*Development, demonstration, implementation and evaluation of direct EHR-to-eCRF data collection in multicenter clinical trials*
Kathleen Stevens	UTHSA	*Identifying Frailty in Older Population*
Robert Clark	UTHSA	*Clinical implementation of Parkinson's disease research*
Rachel Deer	UTMB	*Self-Management Program for Stroke Rehabilitation; Integrating low-cost screening tools into EMR workflows for early detection of cognitive decline*
Jeff Farroni	UTMB	*Clinical ethics - navigating morally complex/ambiguous issues in patient care and communication*
Kimberly Hreha	UTMB	*Feasibility of a Stroke Specific Self-Management Program*
Chih-Ying Li	UTMB	*UTMB Institute for Translational Science: Stroke Implementation Science Multidisciplinary Translational Team*
Hoang Nguyen	UTMB	*An integrated clinician and technology-based system to prevent relapse for patients with major depression*
Monique Pappadis	UTMB	*Comparative effectiveness of pelvic floor physical therapy and medications in older women with urinary incontinence: an effectiveness-implementation design*
Rebekah Penton	UTMB	*Translating Research into Practice: A Multi-Hub CTSA Collaboration to Implement Mobility Programs that Reduce Harm and Improve Health in Older Adults*
Huey-Ming Tzeng	UTMB	*Develop a mechanism to help older adults find their voice when seeking support for self-care to navigate through the healthcare system.*
Simon Craddock Lee	UTSW	*Enhancing care team communication to optimize cancer survivorship care*
Zahid Ahmad	UTSW	*Implementing cascade screening for familial hypercholesterolemia in the US*
Michael Bowen	UTSW	*Implementation of an EHR-based Dysglycemia Risk Score in Primary Care Practices within an Integrated, Safety-Net Health System*
Una Makris	UTSW	*Improving Outcomes for Older Adults with Comorbid Chronic Musculoskeletal Pain and Depression*
Rebecca Vigen	UTSW	*A Simple Intervention to Promote High-Value Care that does not Burden Clinicians*
Bijal Balasubramanian	UTSW	*Sustaining hypertension quality improvement strategies in primary care*
Adrian Juarez	UTMB	*Expanding HIV Testing in a Federally Qualified Health Center Located on the Texas-Mexico Border.*
Lisa Kipela	UTHSA	*Binge Eating Spectrum Treatment in Older Women (BESTOW): An investigation and Intervention-Tailoring Tool*

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Access presentations and handouts at:

http://tinyurl.com/ImplementationResearchWorkshop (abbreviated link)

https://drive.google.com/drive/folders/1yAyotsinHQ0VOFF0D2tG5wBVVPdvMJQO?usp=sharing (full link)

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