

Effectiveness of Integrative Medicine Interventions Provided to Patients on Pain Outcomes: via Practice Based Research

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February 8, 2019

Pain Burden in the United States

- Pain affects an estimated 100 million adults in the United States.¹
- Annual cost related to pain in the US is estimated to be between \$560 to \$635 billion.^{1,2}
- Pain is a public health problem, a major driver of health care seeking and for taking medications, a major cause of disability, and a key factor in quality of life and productivity.¹
- In 2012, there were 50 times more opioid prescriptions than the rest of the world combined,³ reflecting a persistent national epidemic associated with 130 deaths daily.⁴

Sources:

- 1- Institute of Medicine, Committee on Advancing Pain Research, Care and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. Washington (DC): National Academies Press (US); 2011.
- 2- Gaskin DJ, Richard P. The economic costs of pain in the United States. *J Pain*. 2012;13(8):715-724.
- 3- Manchikanti L, Helm S, 2nd, Fellows B, et al. Opioid epidemic in the United States. *Pain Physician*. 2012;15(3 Suppl):ES9-38.
- 4- hhs.gov. Help, resources and information: national opioids crisis; the opioid epidemic in numbers. 2018; <https://www.hhs.gov/opioids/> Accessed January 6, 2019

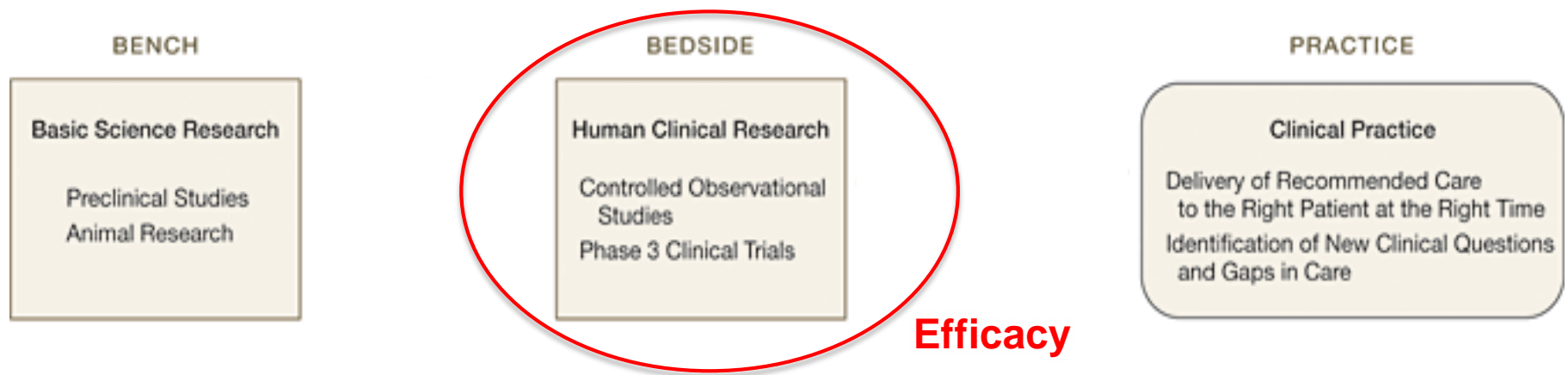
Phases of Research



Westfall, J. M. et al. JAMA 2007;297:403-406.

JAMA

Phases of Research



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JAMA

Phases of Research

BENCH

Basic Science Research

Preclinical Studies
Animal Research

BEDSIDE

Human Clinical Research

Controlled Observational
Studies
Phase 3 Clinical Trials

PRACTICE

Clinical Practice

Delivery of Recommended Care
to the Right Patient at the Right Time
Identification of New Clinical Questions
and Gaps in Care

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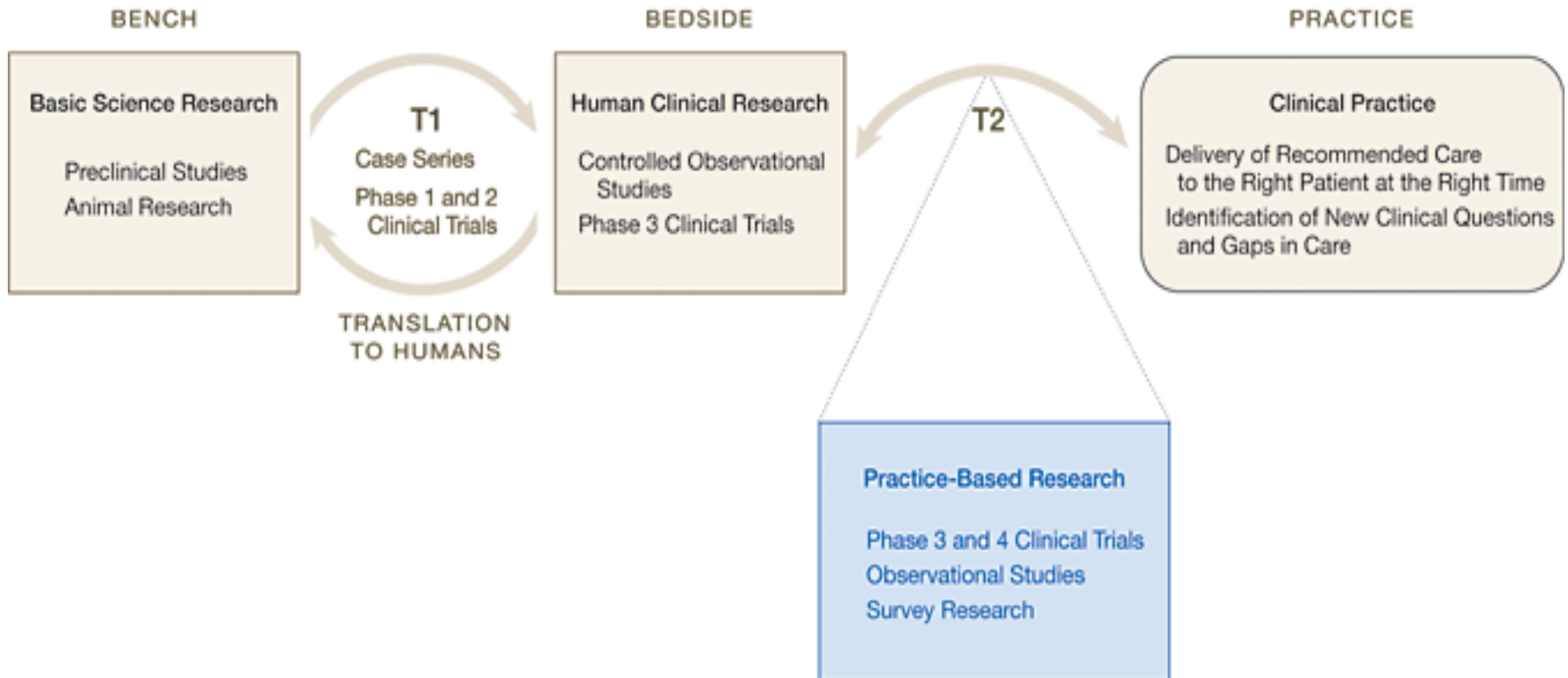
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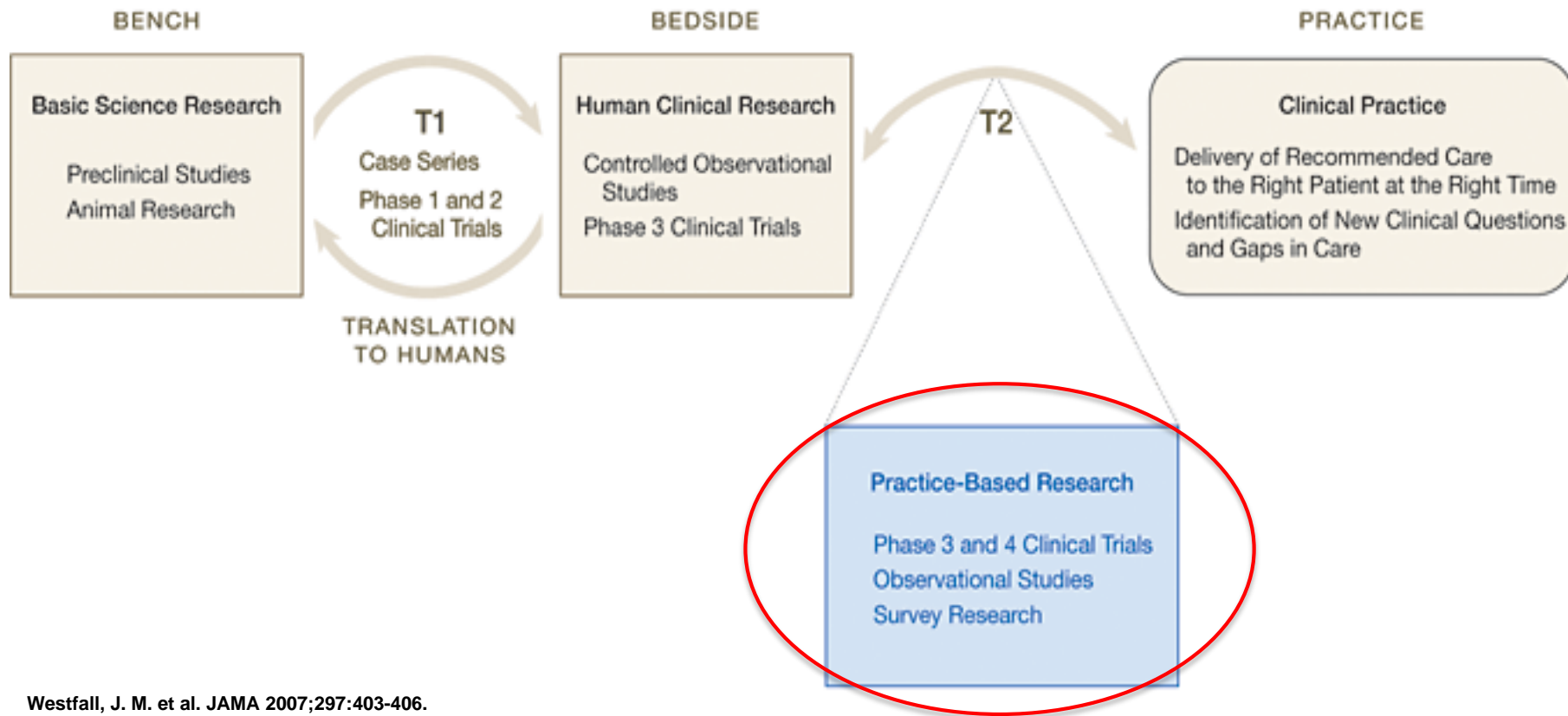
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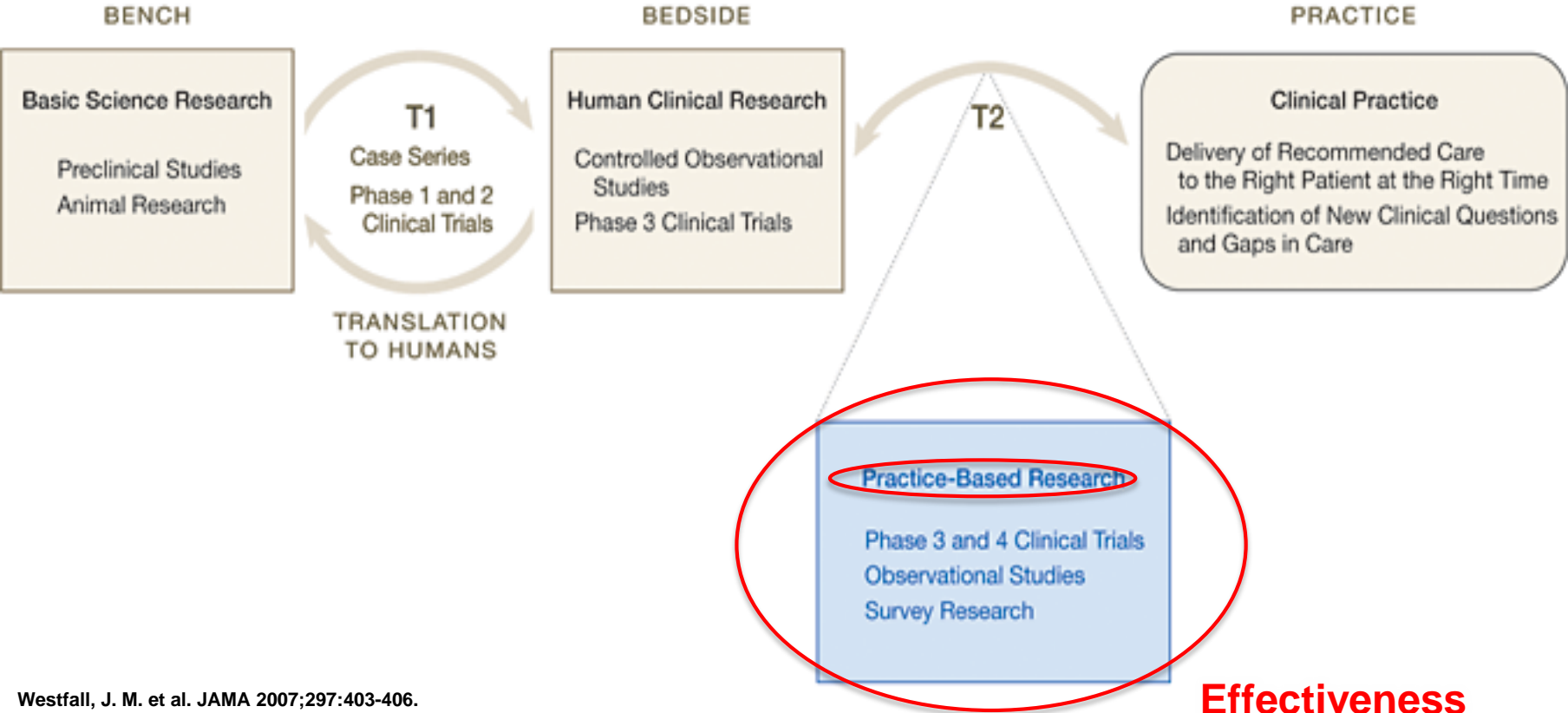
Practice-Based Research



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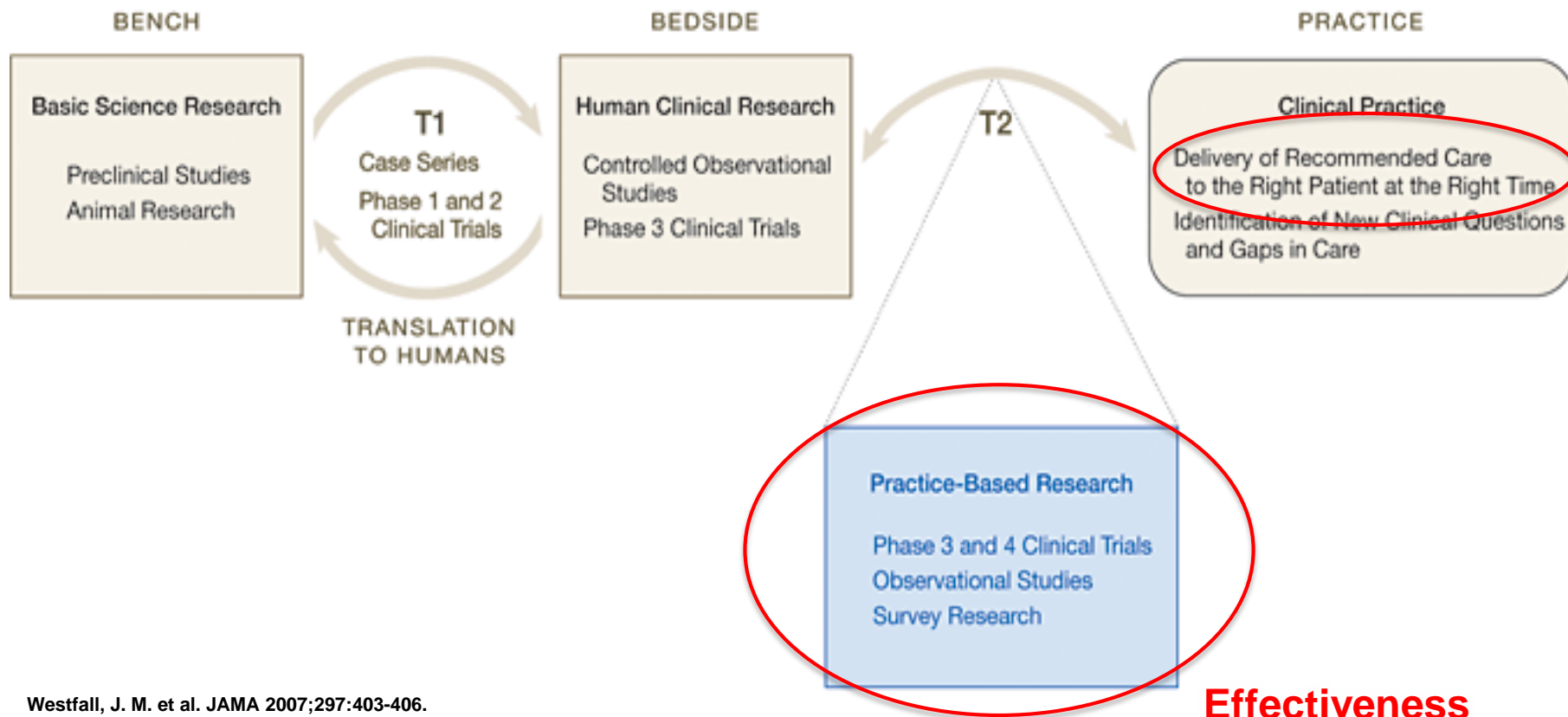


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JAMA

Effectiveness

Practice-Based Research



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JAMA

What is Practiced-Based research?

- Research that occurs in the office, clinic or hospital, where patients generally receive clinical care.
- Method to study the interventions as they are routinely delivered clinically.

Advantages?

- Examine whether interventions with proven efficacy are truly effective and sustainable when provided in real-world setting
- Captures data on representative patients who are receiving representative treatments
- Possible to assess utility of an intervention provided by clinicians with a broad range of training and expertise
- Possible to obtain clinically detailed, patient-level data

Disadvantages?

- Limited ability to infer causality given the lack of randomization
- Data collection may be performed by clinicians who may lack specialized research training
- Electronic health record is a clinical tool and not designed for research purposes

Practice Based Research: Integrative Medicine

- Integrative Medicine provided at Abbott Northwestern Hospital (ANW)
 - Acute pain
- BraveNet Practice Based Research Network (PBRN)
 - Chronic Pain

Effectiveness of Integrative Medicine

Integrative Medicine (IM) provided at Abbott Northwestern Hospital

- 630 bed tertiary care hospital
- Penny George Institute (PGI) started providing IM services in 2003
 - ~10,000 IM sessions annually (circa 2016)
 - IM services are provided at no cost to patient
 - Average 31 minutes per session
 - 1.5 sessions per patient per hospital admission



IM Care and Practitioners (circa 2016)

- Patients receive individualized IM care including:
 - Acupuncture, acupressure
 - therapeutic medical massage, reflexology
 - mind/body therapies (e.g. relaxation response)
 - energy healing (e.g. Reiki, healing touch)
 - music therapy
 - aromatherapy
- 15 practitioners (11.5 FTEs)
 - 6.3 FTE massage therapists
 - 3.5 FTE acupuncturists
 - 0.9 FTE music therapist
 - 0.8 FTE Nursing

Penny George Institute: IM Process

- Physician or nurse referrals via EPIC electronic health record (EHR)
 - Acupuncture must be referred by MD
- Triage Meeting of IM providers
- EHR review by IM provider
- IM Treatment Session (conducted within 24-36 hrs)
 - Intake
 - Baseline data collection (e.g., pain, anxiety, nausea, coping)
 - IM therapy provided
 - Follow-up data collection
- IM provider documents the baseline and follow-up results in EHR

EPIC- specialized flowsheet

Hyperspace - IHHA PAT ACCESS HBC - Allina Playground Environment - ADAM R.

Harper, JeanMarie

Harper, JeanMarie PCP: Docson, Dougie
 MRN: 9990003005 Sex: Female
 DOB: 07/06/1980
 Age: 35 y.o.

Allergies: Morphine, Ragweed

WT: 59 kg (130 lb 1.1 oz)
 HT: 1.68 m (5' 6.14")
 BP: 120/80
 P: 76
 Resp: 20
 T: 99.8 °F (37.7 °C)

SaO2: 99%
 BMI: 20.90 kg/m²

LMP: 08/23/2015
 OB/Gyn Status: Postmenarcheal

Insurance: MEDICA
 Type: Allina A...

FYI: FYI
 HM: Due

MyChart Inactive
 AVS:...

Flowsheets

Snapshot, Summary, Chart Review, Results Review, Problem List, History, Notes, Demographics, Medications, Allergies, Manage Orders, Order Review, Immunizations, MAR, Flowsheets, Care Plan, Patient Events, Forms, ED Navigator, FYI

FlowSheet: AMB ALLERGY INJECTIONS, PHQ DEPRESSION SCREEN..., Vital Signs, SEPSIS tPA, ED Nursing Flowsheet, Primary Assessment, Secondary Assessment, Therapeutic Session

Mode: Accordion Expanded View All

Category	Item	Value	Time
PRE-THERAPEUTIC SESSION	PRE-SCORES	1300	9/29/15
POST-THERAPEUTIC SESSION	POST-SCORES		
SERVICES PROVIDED	Services Provided	Acupuncture	
ORIENTAL MEDICINE	Diagnosis	Qi, Blood, Yin, Yang Diagnosis	
OTHER ORIENTAL MEDICINE DIAGNOSIS	Channel Obstruction	Due to Trauma	

09/29/15 1300

Pain Score

Select Single Option: (F5)

0=0 - No pain
 1=1
 2=2 - Mild pain
 3=3
 4=4 - Moderate pain
 5=5
 6=6 - Severe pain
 7=7
 8=8 - Very severe pain
 9=9
 10=10 - Worst pain ever
 Not rated

Comment (F6)

Row Information

The Pain Score indicates the patient's perception of their level of global, physical discomfort. Ask the patient the question "On a scale from 0 - 10, in which 0 is 'no pain' and 10 is 'the worst pain imaginable', please rate your pain at this moment?" Synonyms include:

- Discomfort
- Soreness
- Stiffness
- Ache

Within ANW, if the pain score is a 1 or greater, please call this patient into the Research line at x30335.

Any value or comment documented in this row will create a Pain Reassessment Due task timed 1 hour after the time column it was entered in. Documentation in the Post Score Pain Score row in a time column 30 minutes to 90 minutes after this row is documented will clear the task.

ADAM R. Future/Standing Orders

1:31 PM 9/29/2015

EPIC- specialized flowsheet

Hyperspace - IHHA PAT ACCESS HBC - Allina Playground Environment - ADAM R.

Home | Chart | Hosp Chart | Pt Lists | Encounter | Nurse Only Encounter | Telephone Call | Triage Call | Provider Finder

Harper, JeanMarie

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MRN: 9990003005 Sex: Female
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Age: 35 y.o.

Allergies Morphine Ragweed
As of: 08/23/15
TOB: Never Assessed

WT: 59 kg (130 lb 1.1 oz)
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Flowsheets

File | Add Rows | Add LDA | Cascade | Add Col | Insert Col | Show Device Data | Lst Filed | Reg Doc | Graph | Gg to Date | Values By | Refresh | Legend

AMB ALLERGY INJECTIONS | PHQ DEPRESSION SCREEN... | Vital Signs | SEPSIS | tPA | ED Nursing Flowsheet | Primary Assessment | Secondary Assessment | Therapeutic Session | Therapeutic Session

Jump to where I left off | Mode: Accordion | Expanded | View All

Session	Date	Points
PRE-THERAPEUTIC SESSION	9/29/15	1300
POST-THERAPEUTIC SESSION		
ACUPUNCTURE POINTS USED		
Signed Acupuncture Consent Form		Yes
ElectroAcupuncture		
Low Level Light Therapy (aka Laser)		
Lung (LU)		7 right
Large Intestine (LI)		4 left
Stomach (ST)		36 bilate...
Spleen (SP)		6 left
Heart (HT)		
Small Intestine (SI)		
Bladder (BL or UB)		
Kidney (K)		
Pericardium (P or PC)		
San Jiao (SJ)		
Gall Bladder (GB)		
Liver (LV)		3 bilateral
Du Mai (DU)		
Ren Mai (RN)		
Extra Points Used		Yin Tang Shen Men
Bilateral Auricular Points Used		
Left Auricular Points Used		
Right Auricular Points Used		
Scalp Points Used		
Tung Points Used?		Yes
TUNG POINTS USED		
Tung 11.00 (Finger)		
Tung 22.00 (Palm/Dorsal Hand)		22.04 lef...
Tung 33.00 (Forearm)		
Tung 44.00 (Arm)		
Tung 55.00 (Sole)		
Tung 66.00 (Dorsal Foot)		
Tung 77.00 (Leg)		
Tung 88.00 (Thigh)		

09/29/15 1300

Visit Start Time: 1307

Comment (F6)

Value Information: 1307
Taken by: Reinstein, Adam S at 09/29/15 1300 (today)
Recorded by: Reinstein, Adam S at 09/29/15 1307 (today)

Row Information: Visit start time is defined as the earliest of these times:
A. The time you entered the patient's room to provide services.
B. The time you entered the patient's room and no services were provided.
C. The time you entered the patient's room to attempt a visit, but the patient was unavailable.
D. The time you arrived and then waited until another practitioner completed their work with the patient - note the time you arrive.

DAM R. | Future/Standing Orders | 1:33 PM 9/29/2015



Impact of IM on Pain Management

- Participants: 1837 patients hospitalized between January 1, 2008 and June 30, 2009.
- Measurements: Pretreatment and post-treatment pain scores on a verbal numeric rating scale (0 to 10).
- Results: Most patients (66%) had not previously received any integrative services.
- The average reduction in pain was 1.9 points and the average percentage in pain reduction was 55%.
- No differences across clinical populations (due to small sample size).

Source: Dusek JA, Finch M, Plotnikoff GA, Knutson L. The Impact of Integrative Medicine on Pain Management in a Tertiary Care Hospital. *J Pat Safety* 2010; 6(1):48-51.

Unanswered Questions...

- Is the 1.9 unit decrease reproducible ?
- Which patients receive IM?
- Does pain relief differ by IM therapy?
- Does pain relief differ by clinical population?
- Might specific therapies effect greater pain relief in certain clinical populations?
- Is IM cost effective in pain population?
- What is the duration of pain relief?
- Does concurrent use of opioids influence pain relief in the IM patients?

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National Institute of Health grant: 2011-2016

Project Number: 5R01AT006518-03
Title: EFFECT OF COMPLEMENTARY AND ALTERNATIVE MEDICINE ON PAIN AMONG INPATIENTS

Contact PI / Project Leader: [DUSEK, JEFFERY A](#)
Awardee Organization: ALLINA HEALTH SYSTEM

Abstract Text:

DESCRIPTION (provided by applicant): Effective and safe pain management is a major health priority for the US healthcare system. Pharmaceutical interventions remain the primary approach to pain management, despite their well documented risk of adverse events, potential for addiction, and adverse impact on recovery if used excessively. Nowhere is this more evident than in the post-operative period where roughly 80% of patients report moderate to severe pain after surgery even after receiving pharmaceutical interventions. In inpatient settings, finding an effective non-pharmacologic intervention to augment narcotic medications would be a significant benefit. National surveys indicate that complementary and alternative medicine (CAM) interventions are currently used by 15% of American hospitals. Most often, these therapies are employed to address specific unmet clinical needs, the most frequent of which is pain. Eleven clinical trials have demonstrated the efficacy of CAM therapies to reduce pain (short- and long-term) in hospitalized patients along with traditional pharmaceutical interventions. Generating additional evidence of the effectiveness of these therapies for pain relief would advance knowledge and potentially affect practice patterns. In a preliminary study, we retrospectively studied 1,837 patients who received CAM therapies at Abbott Northwestern Hospital. We found an average reduction in immediate pain of 56% and roughly 33% reported complete pain relief after the initial CAM visit. We recognize inadequacies of this study that limit both our knowledge of how adjunctive CAM therapies are implemented in hospitals and the effect of various CAM therapies on pain management, which can only be answered with prospective data collection. Using a prospective, **observational** design, we propose a large scale study to build on this exploratory work. It will document predictors of CAM referral, service delivery, and therapy selection for pain management. It will also examine the impact of CAM therapies as adjuncts to traditional interventions on short and long-term changes in pain across clinical groups in a hospital setting. The setting for this study of CAM is the Penny George Institute for Health and Healing at Abbott Northwestern Hospital. The George Institute is uniquely suited for this work as it is the nation's largest inpatient CAM program serving over 19,000 patients since 2004. The proposed study has 3 aims: 1) quantitatively describe a model for delivering CAM therapies to understand selection of patients and CAM therapies for pain management, 2) examine the effects of selected CAM therapies on immediate change in pain, and 3) examine the effects of selected CAM therapies on duration of pain change. Positive results from this study will assist hospitals in the integration of usual care and CAM therapy for pain reduction. Findings may also drive future research on the cost effectiveness of these therapies for pain management, as well as impact on patient outcomes such as length of stay and use of narcotics.



R01 Aims:

- Aim 1: Understand selection of patients and IM therapies (n=~6,000 admissions)
- Aim 2: Examine the effects of therapies on immediate change in pain (n=~6,000 admissions)
- Aim 3: Examine the effects on duration of pain management (n=~3,575 admissions)

Update on Status of NIH R01

- Initial database: 7/09 to 12/12
 - Electronic Health Record (EHR) flowsheet developed
 - Focus on certain clinical populations.
 - Total joint replacement, oncology, and cardiology.
 - Cost analysis

 - Acupuncture in the Emergency Dept.
 - Observational proof of concept
 - Pilot RCT

- Study data collection: 7/12 to 12/14
 - Databases undergoing additional analyses.
 - Presentations & manuscripts: 2018 & 2019.

Joint Replacement: Pain Analysis

Pre- to post-IM therapy percent decrease in pain scores

Any Treatment	No.	1,977
	Unit Decrease in Pain	-1.91 (-45.2%)
	95% CI	(1.83-1.99)
	p-value	<0.001

Joint Replacement: Pain Analysis

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Any Treatment	No.	1,977
	Unit Decrease in Pain	-1.91 (-45.2%)
	95% CI	(1.83-1.99)
	p-value	<0.001
Day 1	No.	1,259
	Unit Decrease in Pain	-1.79 (-38.8%)
	95% CI	(1.69 – 1.89)
	p-value	<0.001
Day 2	No.	718
	Unit Decrease in Pain	- 2.14 (59.9%)
	95% CI	(2.01 – 2.26)
	p-value	<0.001

Source: Crespin DJ, Griffin KH, Johnson JR, Miller C, Finch MD, Rivard RL, Anseth S, Dusek JA. Acupuncture Provides Short-Term Pain Relief for Patients in a Total Joint Replacement Program. Pain Med. 2015 Jun;16(6):1195-203.

Oncology: Pain and Anxiety Analysis

Pre- to post-IM therapy change in pain and anxiety scores

No. Pain Observations	1,514
% Change in Pain	-46.9
p-value	<0.001
<hr/>	
No. Anxiety Observations	1,074
% Change in Anxiety	-56.1
p-value	<0.001

Source: Johnson JR, Crespín DJ, Haven KM, Finch MF, Dusek JA. Effects of Integrative Medicine on Pain and Anxiety Among Oncology Inpatients. J Natl Cancer Inst Monogr. 2014 Nov;2014(50):330-7.

Cardiovascular: Pain and Anxiety Analysis

Pre- to post-IM therapy percent decrease in pain and anxiety scores

No. Pain Obs		5,981
	% Decrease in Pain	-46.5
	95% CI	(45.5 – 47.4)
	p-value	<0.001
No. Anxiety Obs		3,109
	% Decrease in Anxiety	-54.8
	95% CI	(53.7 – 55.9)
	p-value	<0.001

Source: Johnson JR, Crespín DJ, Griffin KH, Finch MD, Rivard RL, Baechler CJ, Dusek JA. The effectiveness of integrative medicine interventions on pain and anxiety in cardiovascular inpatients: a practice-based research evaluation. BMC Complement Altern Med. 2014 Dec 13;14:486.

Cost implications of IM for Pain Relief

- A retrospective analysis including data from an EPIC-based electronic health record (EHR)
 - Patient demographics,
 - Length of stay (LOS), and
 - All Patient Refined Diagnosis Related Groups (APR-DRG) severity of Illness
- Total of 2730 patients received IM for pain and met eligibility criteria
- Regressed the demographic, change in pain, LOS, and APR-DRG variables with changes in pain on total cost for the hospital admission.
- Pain was reduced by an average of 2.05 points.
- Pain reduction was associated with a cost savings of \$898 per hospital admission.

Source: Dusek JA, Griffin KH, Finch MD, Rivard RL, Watson D. Cost Savings from Reducing Pain Through the Delivery of Integrative Medicine Program to Hospitalized Patients. *J Altern Complement Med.* 2018 Feb 23. doi: 10.1089/acm.2017.0203.

Acupuncture in an Outpatient Clinic



- Spacious
- Relaxed
- Quiet Instrumental Music
- Softly Lit
- Pleasant Smelling

Acupuncture in the Emergency Department



- Cramped
- Stressful
- Loud Beeping (screaming?)
- Brightly Lit
- Offensive Smelling

Acupuncture in ED: Acceptability & Outcomes

- Would MDs refer?
 - Yes: 73% of MDs referred for AQ.
- Would patients accept acupuncture?
 - Yes: 89% of patients accepted AQ. (248/279)
- Would acupuncture provide pain relief?
 - The final sample: 182 patients with acute pain received acupuncture and had a post-treatment score.
 - 49% (88/182) of patients received pain medications before AQ
 - 6.88 on the pain pre-score and a change of -2.68 units (SD 2.23).
 - 51% (94/182) received no pain medications before AQ
 - 6.71 on the pain pre-score and a change of -2.37 units (SD 2.23).
 - As a -2.0 unit decrease in pain on NRS is considered clinically significant, patients in both groups exceeded this threshold.
- Any effect on pain medication use?
 - Yes: 62% were discharged from ED w/o any additional pain meds.
 - 25% received an opioid and 13% received a NSAID

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Pain Medicine 2015; 16: 1195-1203
Wiley Periodicals, Inc.



Acupuncture Provides Short-Term Pain Relief for Patients in a Total Joint Replacement Program

Daniel J. Crespin, MSPH,*
Kristen H. Griffin, MA, MPH,¹
Jill R. Johnson, PhD, MPH,¹ Cynthia Miller, RN, LAc,¹
Michael D. Finch, PhD,² Rachael L. Rivard, BS,¹
Scott Anseth, MD,¹ and Jeffery A. Dusek, PhD¹

DOI:10.1093/pm/monographs/igv030

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Effects of Integrative Medicine on Pain and Anxiety Among Oncology Inpatients

Jill R. Johnson, Daniel J. Crespin, Kristen H. Griffin, Michael D. Finch, Jeffery A. Dusek

Correspondence to: Jill R. Johnson, PhD, MPH, Penny George Institute for Health and Healing, 800 East 28th Street, MR 33540, Minneapolis, MN 55407-3739 (e-mail: Jill.Johnson@allina.com)

Background Few studies have investigated the effectiveness of integrative medicine (IM) therapies on pain and anxiety among oncology inpatients.

Methods Retrospective data obtained from electronic medical records identified patients with an oncology International Classification of Diseases-9 code who were admitted to a large Midwestern hospital between July 1, 2009 and December 31, 2012. Outcomes were change in patient-reported pain and anxiety, rated before and after individual IM treatment sessions, using a numeric scale (0-10).

Results Of 10 948 hospital admissions over the study period, 1833 (17%) included IM therapy. Older patients had reduced odds of receiving any IM therapy (odds ratio [OR]: 0.97, 95% confidence interval [95% CI] = 0.96 to 0.98) and females had 63% (OR: 1.63, 95% CI = 1.38 to 1.92) higher odds of receiving any IM therapy compared with males. Moderate (OR: 1.97, 95% CI = 1.61 to 2.41), major (OR: 3.54, 95% CI = 2.88 to 4.35), and extreme (OR: 5.96, 95% CI = 4.71 to 7.56) illness severity were significantly associated with higher odds of receiving IM therapy compared with admissions of minor illness severity. After receiving IM therapy, patients averaged a 46.9% (95% CI = 45.1% to 48.6%, $P < .001$) reduction in pain and a 56.1% (95% CI = 54.3% to 58.0%, $P < .001$) reduction in anxiety. Bodywork and traditional Chinese medicine therapies were most effective for reducing pain, while no significant differences among therapies for reducing anxiety were observed.

Conclusions IM services to oncology inpatients resulted in substantial decreases in pain and anxiety. Observational studies using electronic medical records provide unique information about real-world utilization of IM. Future studies are warranted and should explore potential synergy of opioid analgesics and IM therapy for pain control.

J Natl Cancer Inst Monogr 2014;50:330-337

Pain is a common, often debilitating symptom of cancer and a... The evidence base for integrative oncology among inpatients

Johnson et al. BMC Complementary and Alternative Medicine 2014, 14:486
http://www.biomedcentral.com/1472-6882/14/486



RESEARCH ARTICLE

Open Access

The effectiveness of integrative medicine interventions on pain and anxiety in cardiovascular inpatients: a practice-based research evaluation

Jill R. Johnson^{1,2}, Daniel J. Crespin², Kristen H. Griffin¹, Michael D. Finch³, Rachael L. Rivard¹, Courtney J. Baehnie¹ and Jeffery A. Dusek¹

Abstract

Background: Pain and anxiety occurring from cardiovascular disease are associated with long-term health risks. Integrative medicine (IM) therapies reduce pain and anxiety in small samples of hospitalized cardiovascular patients within randomized controlled trials; however, practice-based effectiveness research has been limited. The goal of the study is to evaluate the effectiveness of IM interventions (i.e., bodywork, mind-body and energy therapies and traditional Chinese medicine) on pain and anxiety measures across a cardiovascular population.

Methods: Retrospective data obtained from medical records identified patients with a cardiovascular ICD-9 code admitted to a large Midwestern hospital between 7/1/2009 and 12/31/2012. Outcomes were changes in patient-reported pain and anxiety, rated before and after IM treatments based on a numeric scale (0-10).

Results: Of 57,295 hospital cardiovascular admissions, 6,589 (11.5%) included IM. After receiving IM therapy patients averaged a 46.5% (p-value < 0.001) decrease in pain and a 54.8% (p-value < 0.001) decrease in anxiety. There was no difference between treatment modalities on pain reduction; however, mind-body and energy therapies (p-value < 0.01), traditional Chinese medicine (p-value < 0.05), and combination therapies (p-value < 0.01) were more effective at reducing anxiety than bodywork therapies. Each additional year of age reduced the odds of receiving any IM therapy by two percent (OR: 0.98, p-value < 0.01) and females had 96% (OR: 1.96, p-value < 0.01) higher odds of receiving any IM therapy compared to males.

Pain Medicine Advance Access published February

Pain Medicine 2016; 0: 1-10
doi: 10.1093/pm/pnv114

Original Research Article

Acceptability, Adaptation, and Clinical Outcomes of Acupuncture Provided in the Emergency Department: A Retrospective Pilot Study

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*Integrative Health Research Center, Penny George Institute for Health and Healing, Allina Health, Minneapolis, Minnesota; ¹Emergency Department, Abbott Northwestern Hospital, Minneapolis, Minnesota; ²Medical Industry Leadership Institute, Carlson School of Management, University of Minnesota, Minneapolis, Minnesota, USA.

Correspondence to: Adam S. Reinstein, MAOM, L.Ac., Penny George Institute for Health and Healing, 800 East 28th Street, MR 33540, Minneapolis, MN 55407-3799, USA. Tel: (612) 863-8404; Fax: (612) 863-9769; E-mail: adam.reinstein@allina.com.

Funding sources: This work was partially supported by the National Center for Complementary & Alternative Medicine of the National Institutes of Health (grant number R01AT006518-01 to JD). The work was also supported by the Abbott Northwestern Hospital Foundation, the Robt and Kris Johnson Family Foundation and the Penny George Institute Foundation.

Conflicts of interest: The authors declare no conflicts

Design: Observational, retrospective pilot study.

Setting: Abbott Northwestern Hospital ED, Minneapolis, MN.

Methods. Retrospective data was used to identify patients receiving acupuncture in addition to standard medical care in the ED between 11/1/13 and 12/31/14. Feasibility was measured by quantifying the utilization of acupuncture in a novel setting and performing limited tests of its efficacy. Patient-reported pain and anxiety scores were collected by the acupuncturist using an 11-point (0-10) numeric rating scale before (pre) and immediately after (post) acupuncture. Efficacy outcomes were change in pain and anxiety scores.

Results. During the study period, 436 patients were referred for acupuncture, 279 of whom were approached by the acupuncturist during their ED visit. Consent for acupuncture was obtained from 89% (248/279). A total of 182 patients, who had a pre-pain score ≥ 0 and non-missing anxiety scores, were included in analyses. Of the 52% (94/182) who did not have analgesics before or during the acupuncture session, the average decrease of 2.37 points (95% CI: 1.92, 2.83) was not different ($p > 0.05$) than the mean decrease of 2.68 points for those receiving analgesics (95% CI 2.21, 3.15). The average pre-anx-

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DOI: 10.1089/acm.2017.0203



ORIGINAL ARTICLE

Cost Savings from Reducing Pain Through the Delivery of Integrative Medicine Program to Hospitalized Patients

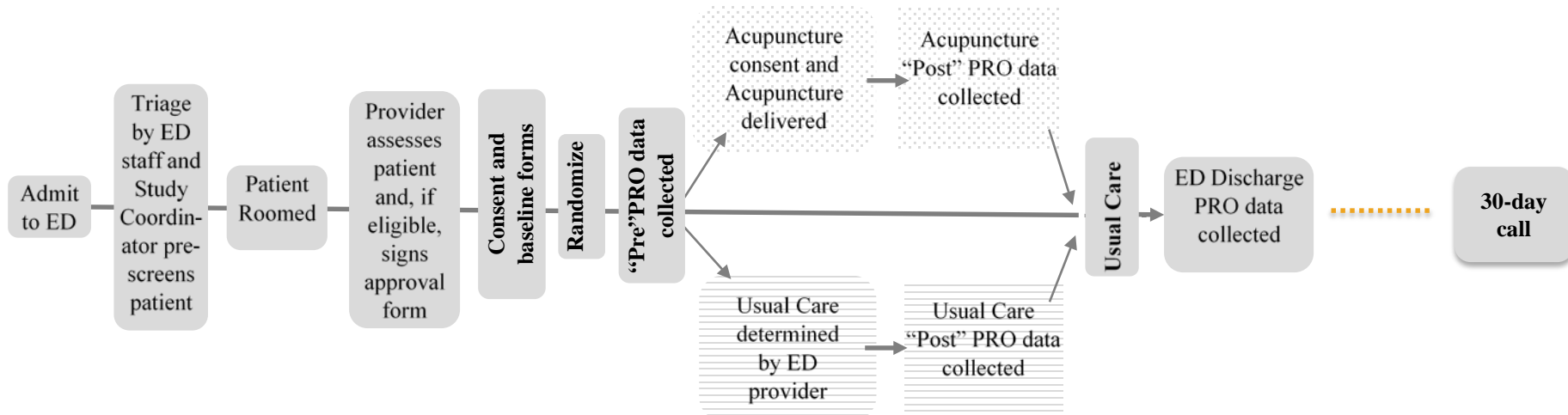
Jeffery A. Dusek, PhD,¹ Kristen H. Griffin, MA, MPH,¹ Michael D. Finch, PhD,² Rachael L. Rivard, MPH,¹ and David Watson, PhD²

Acupuncture in ED: Concerns

- There was no control group nor any randomization;
- The acupuncturist was involved in data collection; and
- Patients were referred to acupuncture by their physicians.
- To overcome these limitations, we conducted a pilot RCT

Source: Reinstein AS, Erickson LO, Finch MD, Rivard RL, Kapsner CE, Dusek JA. Acceptability and Clinical Outcomes of Acupuncture provided in the Emergency Department: A Retrospective Pilot Study. *Pain Med.* 2017; 18(1): 169-178.

Acupuncture in ED Pilot RCT: Flow



Acupuncture in ED Pilot RCT: Outcomes

- Would patients (pain ≥ 4) enroll?
 - Yes: 78% of patients enrolled. (46/59)
- Subjects were randomized to either AQ (n=23) or Usual Care (n=23)
 - The average age was 36.3 (15.5 SD), 78% were female and 55.0% were non-white.
 - Acupuncture:
 - pre-pain: **8.18** (SD 1.62)
 - post-pain: **-3.0** (SD 2.51)
 - ED discharge: **-2.71** (SD 1.86)
 - 30-day: **-5.28** (SD 3.0)
 - Usual Care:
 - pre-pain: **7.91** (SD 1.41)
 - post-pain: **-1.56** (SD 2.37)
 - ED discharge: **-2.53** (SD 2.27)
 - 30-day: **-3.41** (SD 4.0).

Source: Presented at International Congress on Integrative Medicine & Health, Baltimore MD (May 2018). Article in preparation.

Update on Status of NIH R01

- Initial database: 7/09 to 12/12
 - Electronic Health Record (EHR) flowsheet developed
 - Focus on certain clinical populations.
 - Total joint replacement, oncology, and cardiology.
 - Cost analysis
 - Proof of concept: acupuncture in the Emergency Dept.
- Study data collection: 7/12 to 12/14
 - Databases undergoing additional analyses.
 - Presentations & manuscripts: 2018 & 2019.

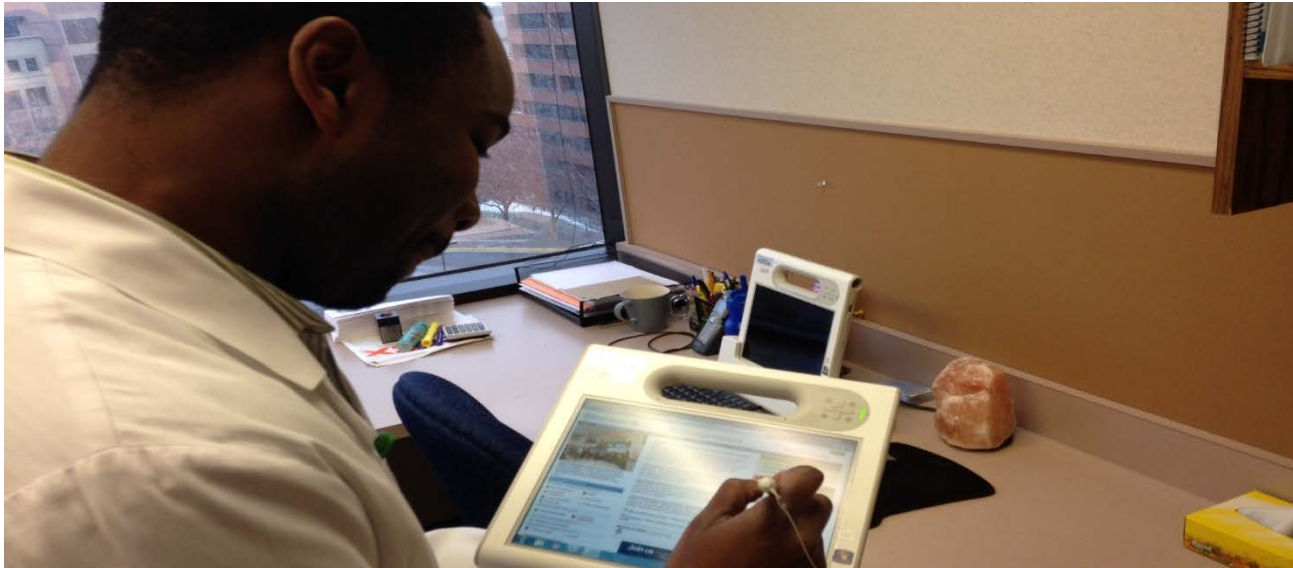


R01 Aims:

- Aim 1: Understand selection of patients and IM therapies
- Aim 2: Examine the effects of therapies on immediate change in pain
- Aim 3: Examine the effects on duration of pain management

Methods

- Collect six post-IM therapy pain scores:
 - 30 minutes
 - 1, 2, 3, 4 and 5 hours



Specialized database

Therapy Interview Tracker

Current User: Ali Kolste

Study Referral

Version 1-1 Beta

View: Add new only | View Schedule | Intake Patients | Run Reports | Setup Users | System Tools | Exit System

Patient Information

Date: 2/18/2013
 Time of Referral: 4:59 PM
 Practitioner: Kim
 Patient's Last Name: Kolste
 Patient's First Name: Alison
 Patient Room #: H4000
 Pre-Therapy Pain Score: 5
 Therapy Session End Time: 3:59 PM
 Patient's MRN: 100000000
 Patient's HAR: 9000000

Eligibility:

- Research form = Yes
- 18 years or older
- English speaking
- Pre-Therapy pain score >= 1
- Therapy between 9 AM - 4 PM
- No 3 previous declines
- No hard decline
- No 2nd call same day
- Maximum 6 visits same HAR
- Patient Is Eligible? Yes

Isolation precautions ID: 8
 Nurse Contacted Has edits
 Research Assistant Assigned: Unassigned
 Schedule Timepoints | Save w/o Schedule

Current Interview Status:

Next Interview Time:
 Interview Status: New
 DELETE THIS INTAKE

Intake Notes:

Interview Results

Edit Results...

	30 Min		1 Hour		2 Hours		3 Hours		4 Hours		5 Hours	
Consent?:	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx
Unknown												
Scheduled Time												
Arrived Time												

Record: 1 of 1 | Unfiltered | Search

Windows Taskbar: Patient first name and optional middle initial | Num Lock | 5:07 PM 2/18/2013

Specialized database

The screenshot displays the 'Therapy Interview Tracker' application. The main window shows a 'Master Schedule' with columns for 'Interviewer', 'Next Time', 'Room', and 'Patient'. Below this is a 'Timepoints' section with a 'Refresh' button. A central 'Interview Results Popup' window is open, titled 'Record Interview Results' for 'Patient: Duck, Daisy - Interview Timepoint: 1 hour'. It contains dropdown menus for 'Pain' (set to 5) and 'Anxiety' (set to 5), a 'Nurse Contacted?' section with checkboxes for 'Physician', 'Nurse', 'Family', and 'Other', and a 'Notes for this interview:' text area. To the right, a table shows 'Intake Notes?' with columns for 'Pain', 'Anx', '4 Hours', and '5 Hours'. The bottom of the screen shows a Windows taskbar with various application icons and a system tray with the date '2/19/2013' and time '2:07 PM'.

Current User: Ali Kolste

Master Schedule

Refresh

Timepoints

Interviewer	Next Time	Room	Patient
Testing	2:00 PM	W3500	Duck
Testing	2:40 PM	H8000	Mous
Testing	2:42 PM	E3000	Duck

Unassigned Pa

Interviewer	Next Time	Room	Patient
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Interview Results Popup

Record Interview Results

Patient: Duck, Daisy - Interview Timepoint: 1 hour

Pain: 5 Anxiety: 5

Nurse Contacted?

Who was in the room during the interview?

Physician Family
 Nurse Other

Notes for this interview:

Intake Notes (shared across all interviews):

Save

Hours	4 Hours	5 Hours	Intake Notes?	
Pain	Anx	Pain	Anx	
			No	View...
			No	View...
			No	View...

Version 1-1 Beta

Tools Exit System

Num Lock 2:07 PM 2/19/2013

Specialized database

Therapy Interview Tracker | Current User: Ali Kolste | Version 1-1 Beta

Study Referral

View: **Session end Today** | View Schedule | Intake Patients | Run Reports | Setup Users | System Tools | Exit System

Patient Information

Date: 2/19/2013
 Time of Referral: 1:04 PM
 Practitioner: Kelly
 Patient's Last Name: Mouse
 Patient's First Name: Mickey
 Patient Room #: H8000
 Pre-Therapy Pain Score: 8
 Therapy Session End Time: 12:40 PM
 Patient's MRN: 2000000000
 Patient's HAR: 8000000

Eligibility:

- Research form = Yes
- 18 years or older
- English speaking
- Pre-Therapy pain score >= 1
- Therapy between 9 AM - 4 PM
- No 3 previous declines
- No hard decline
- No 2nd call same day
- Maximum 6 visits same HAR
- Patient Is Eligible? Yes

Isolation precautions ID: 11
 Nurse Contacted Has edits
 Research Assistant Assigned: Testing

Current Interview Status:

Next Interview Time: 5:48 PM
 Interview Status: Complete
 DELETE THIS INTAKE

Intake Notes: Wants to sleep for 2 hours

Interview Results

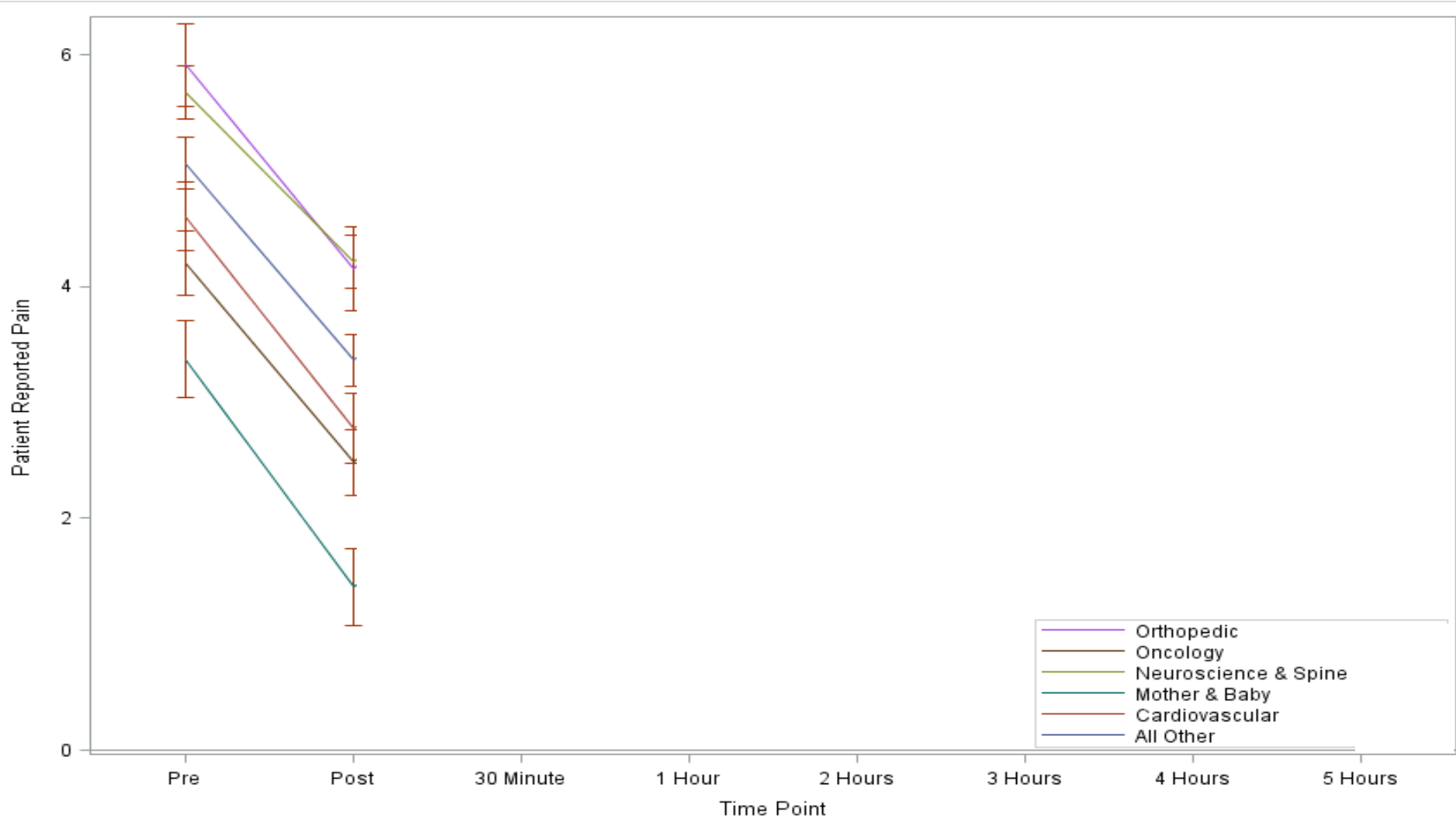
Consent?:	30 Min		1 Hour		2 Hours		3 Hours		4 Hours		5 Hours	
	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx	Pain	Anx
Yes	Missed	Missed	6	8	Missed	Missed	Missed	Missed	Missed	Missed	4	8
Scheduled Time	1:10 PM		1:40 PM		2:40 PM		3:40 PM		4:40 PM		5:40 PM	
Arrived Time	1:27 PM		1:28 PM		5:00 PM		5:00 PM		5:00 PM		5:49 PM	

Record: 1 of 4 | Filtered | Search

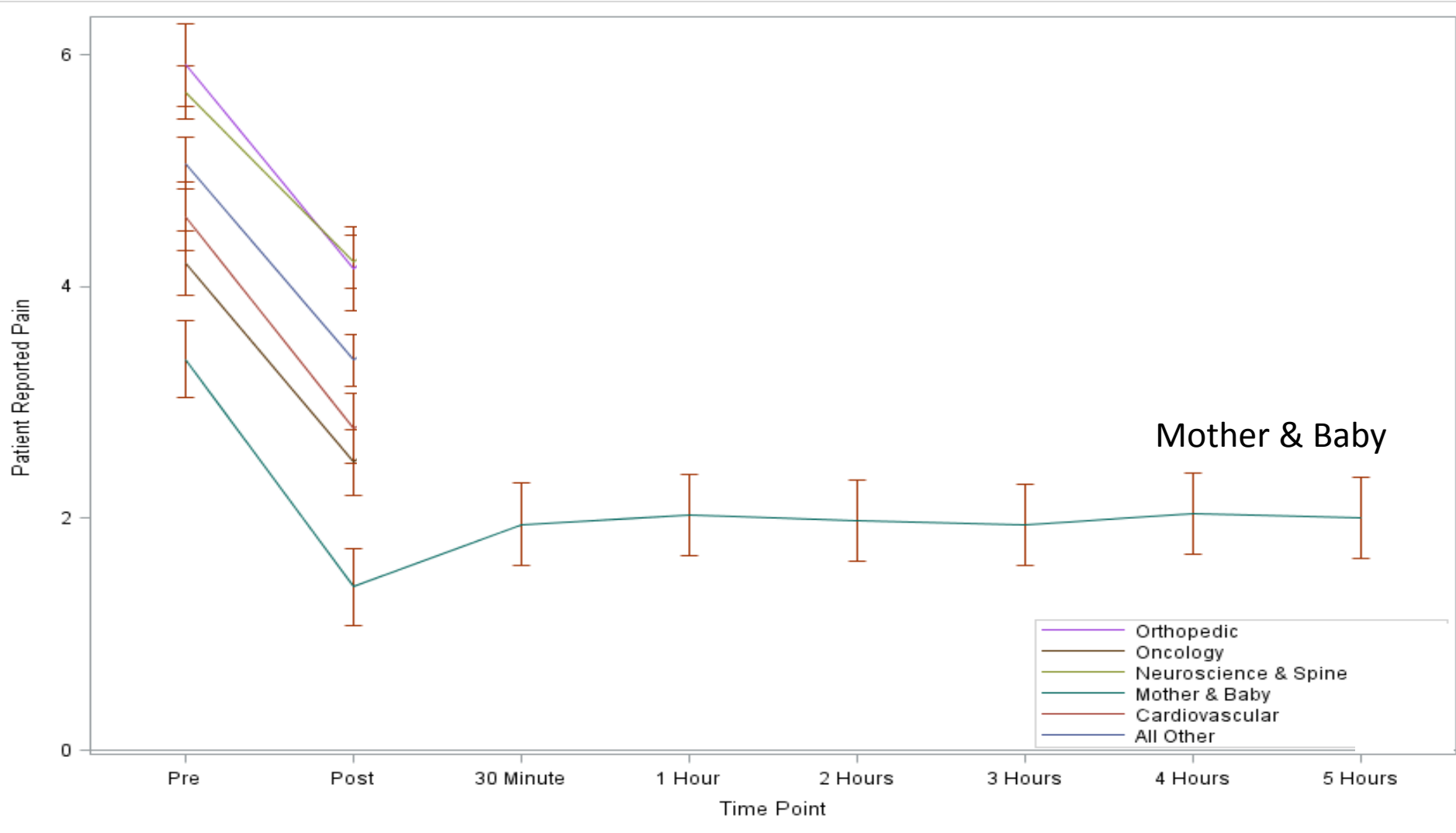
Date/time referral was received

Num Lock | Filtered | 5:50 PM 2/19/2013

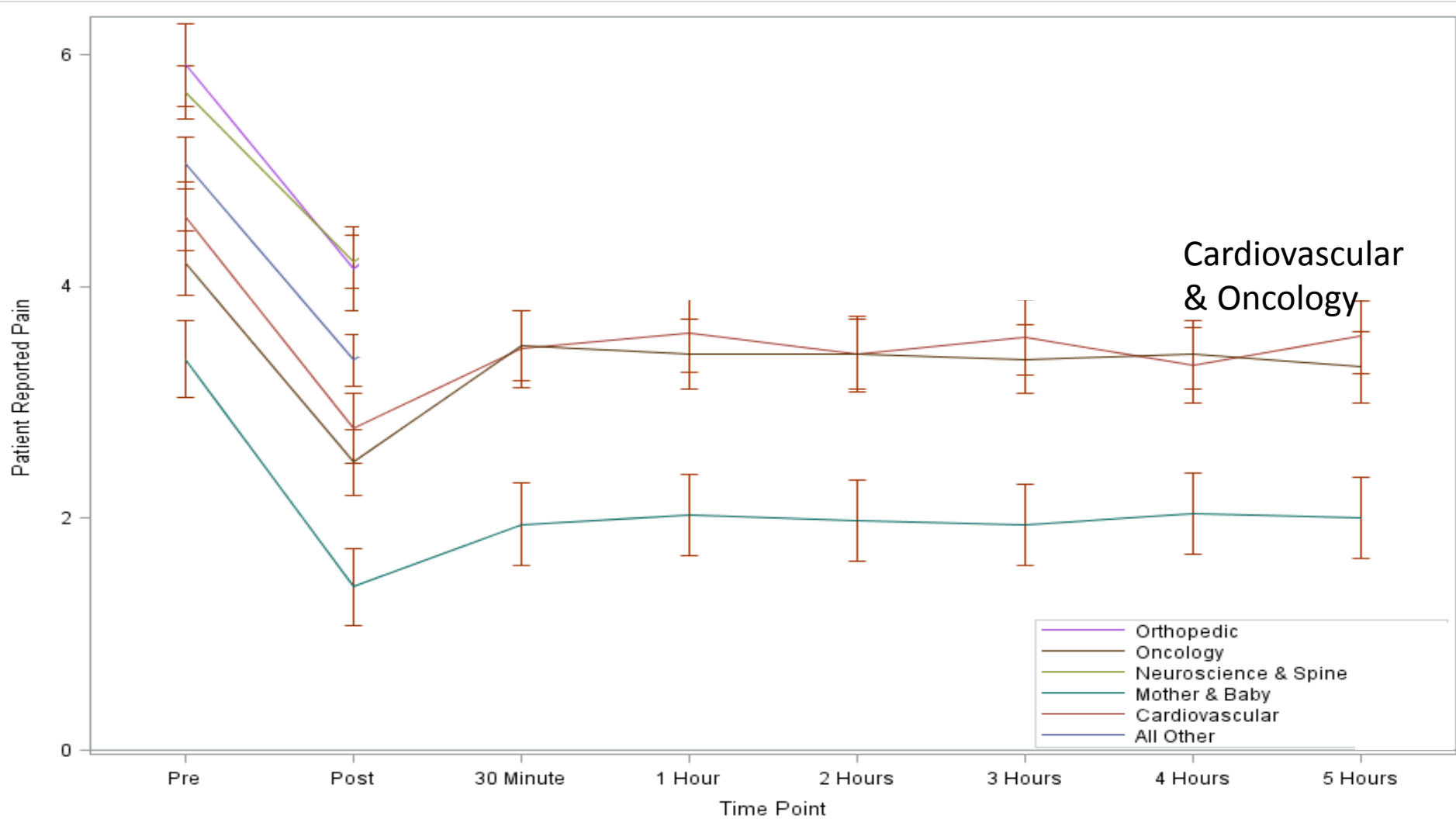
Duration of Pain Outcomes



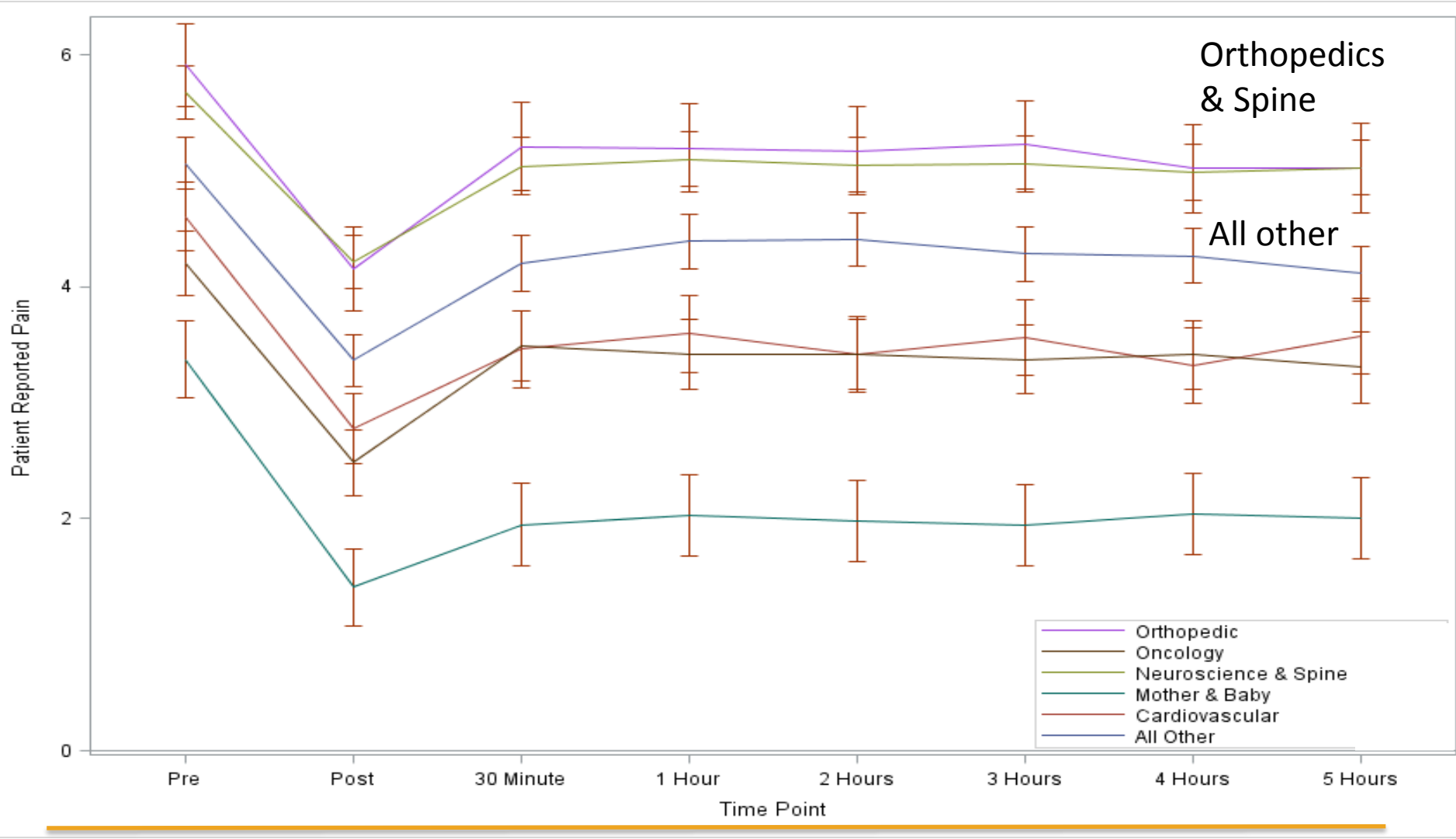
Duration of Pain Outcomes



Duration of Pain Outcomes



Duration of Pain Outcomes



Source: Presented at International Congress on Integrative Medicine & Health, Las Vegas (May 2016). Article in preparation.



Conclusions

- IM therapies
 - Reduce short-term pain and anxiety among various inpatients.
 - Longer-term pain relief is exhibited across clinical populations.
 - Reduce hospital costs for pain inpatients responding to IM.
 - Are well liked by providers and patients (Emergency department) with potential impact on pain intensity.

- Future studies are warranted and could explore:
 - Multi-site, feasibility of AQ in the ED is next step.
 - Definitive study of AQ in ED is final goal.
 - Potential synergy of opioid analgesics and IM therapy.
 - Longer-term effects of IM on pain and anxiety.
 - Optimal cost effectiveness delivery of IM therapy for inpatients and ED.
 - Biological mechanisms of action.

Collaborators and Funding Source

- Jon Christianson PhD, Economist
- Michael Finch PhD, Methodologist
- Rachel Rivard, Biostatistician
- Alison Kolste, Study Coordinator
- Kristen Griffin MA, MPH, Scientific Advisor
- Adam Reinstein MaOM, LAc Acupuncturist

- Pamela Jo Johnson PhD, Co-Investigator
- Jill Johnson PhD, Epidemiologist
- Desiree Trebesch MA, Study Coordinator
- Kelly McBride LAc, Acupuncturist
- Dan Crespino, Methodologist
- Robert Jones, Senior Research Assistant
- Caitlin Dreier, Research Assistant
- Stephanie Wallerius, Research Assistant
- Nichole Janssen, Research Assistant
- Sirri Ngwa, Research Assistant

•The project was partially supported by grant R01 AT006518 from the National Center for Complementary and Integrative Health (NCCIH) to JD.

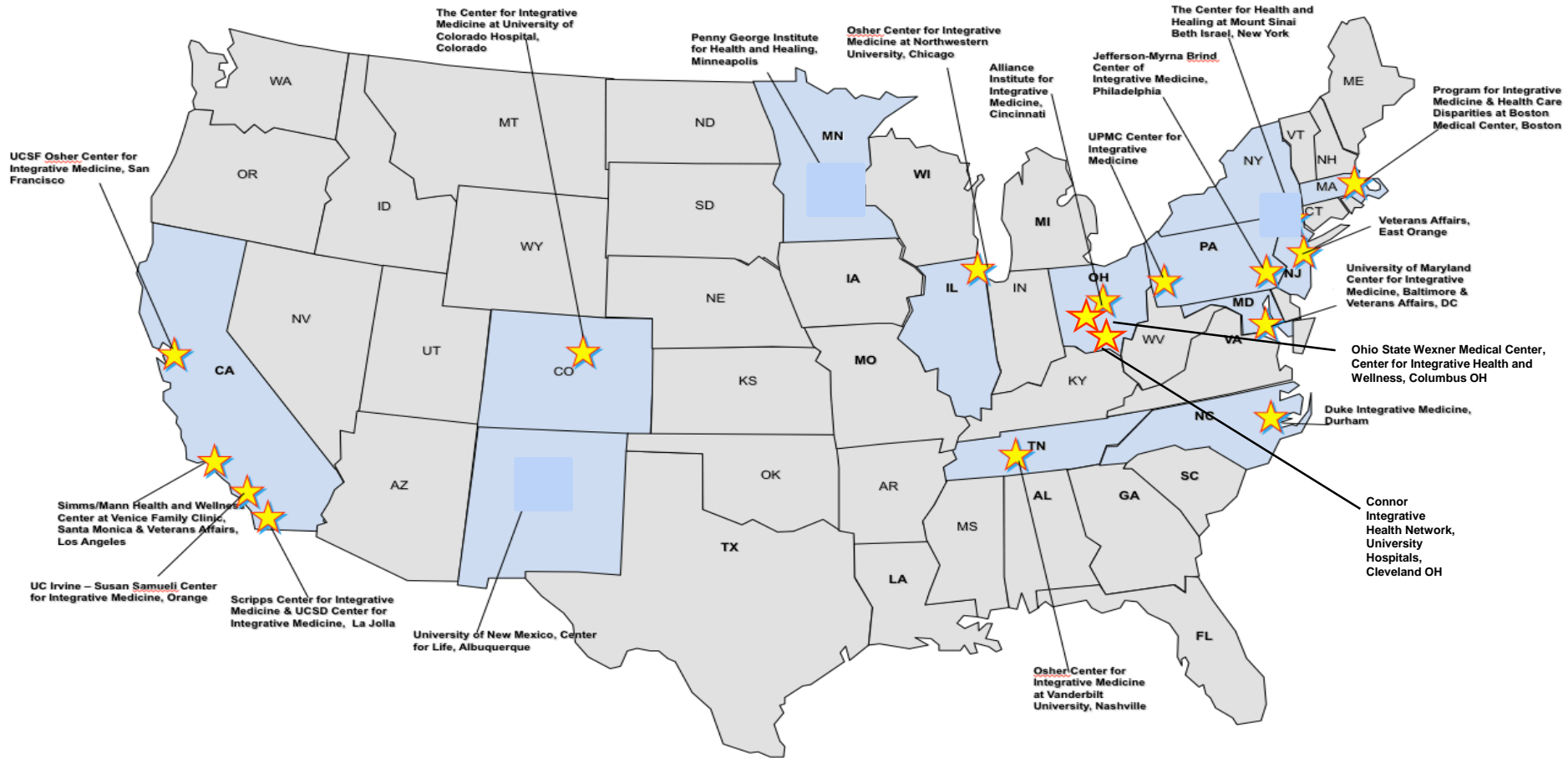
Practice Based Research: Integrative Medicine

- Integrative Medicine provided at Abbott Northwestern Hospital (ANW)
 - Acute pain
- BraveNet Practice Based Research Network (PBRN)
 - Chronic Pain

About BraveNet

- BraveNet is the only national practice-based research network of IM
- Currently comprised of 15 leading Integrative Medicine clinics plus VAMC (3 sites)
- Founded in 2007
- Expanded in two waves of enrollment from 8 initial member sites
- Expansion focus:
 - Ethnic, racial, and economic diversity
 - Actively funded researchers
 - Geographic range

BraveNet Member Clinics



BraveNet Publications

ORIGINAL RESEARCH

PATIENTS SEEK INTEGRATIVE MEDICINE FOR PREVENTIVE APPROACH TO OPTIMIZE HEALTH

Ruth Q. Wolever, PhD,^{1,*} Donald I. Abrams, MD,² Benjamin Kligler, MD,³ Jeffery A. Dusek, PhD,⁴ Rhonda Roberts, MSPH,⁵ Joyce Frye, DO, MBA, MSCE,⁶ Joel S. Edman, DSc,⁷ Steve Amoils, MD,⁸ Elizabeth Pradhan, PhD,⁶ Myles Spar, MD, MPH,^{9,10} Tracy Gaudet, MD,¹ Erminia Guarneri, MD,¹¹ Peter Homel, PhD,³ Sandra Amoils, MD,⁸ Roberta A. Lee, MD,³ Brian Berman, MD,⁶ Daniel A. Monti, MD,⁷ and Rowena Dolor, MD, MHS⁵

ORIGINAL RESEARCH

INTEGRATIVE MEDICINE PATIENTS HAVE HIGH STRESS, PAIN, AND PSYCHOLOGICAL SYMPTOMS

Ruth Q. Wolever, PhD^{1,*} Nikita S. Goel, MS² Rhonda S. Roberts, MSPH³ Karen Caldwell, PhD⁴ Benjamin Kligler, MD⁵ Jeffery A. Dusek, PhD⁶ Adam Perlman, MD⁷ Rowena Dolor, MD⁸ and Donald I. Abrams, MD⁹

Brief Report

Characteristics of Cancer Patients Presenting to an Integrative Medicine Practice-Based Research Network

Joel S. Edman, DSc¹, Rhonda S. Roberts, MS², Jeffery A. Dusek, PhD³, Rowena Dolor, MD², Ruth Q. Wolever, PhD², and Donald I. Abrams, MD⁴

Integrative Cancer Therapies
1-6
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DOI: 10.1177/1534735414537876
ict.sagepub.com



Abrams et al. *BMC Complementary and Alternative Medicine* 2013, 13:146
<http://www.biomedcentral.com/1472-6882/13/146>



RESEARCH ARTICLE

Open Access

The BraveNet prospective observational study on integrative medicine treatment approaches for pain

Donald I. Abrams^{1*}, Rowena Dolor², Rhonda Roberts³, Constance Pechura³, Jeffery Dusek⁴, Sandi Amoils⁵, Steven Amoils⁵, Kevin Barrows¹, Joel S. Edman⁶, Joyce Frye⁷, Erminia Guarneri⁸, Ben Kligler⁹, Daniel Monti⁶, Myles Spar¹⁰ and Ruth Q. Wolever¹¹

Patients Receiving Integrative Medicine Interventions Effectiveness Registry

NCT 01754038

Study Protocol published

Dusek et al. *BMC Complementary and Alternative Medicine* (2016) 16:53
DOI 10.1186/s12906-016-1025-0

BMC Complementary and
Alternative Medicine

STUDY PROTOCOL

Open Access



Patients Receiving Integrative Medicine Effectiveness Registry (PRIMIER) of the BraveNet practice-based research network: study protocol

Jeffery A. Dusek^{1*}, Donald I. Abrams², Rhonda Roberts³, Kristen H. Griffin¹, Desiree Trebesch¹, Rowena J. Dolor³,
Ruth Q. Wolever^{4,5}, M. Diane McKee⁶ and Benjamin Kligler⁷

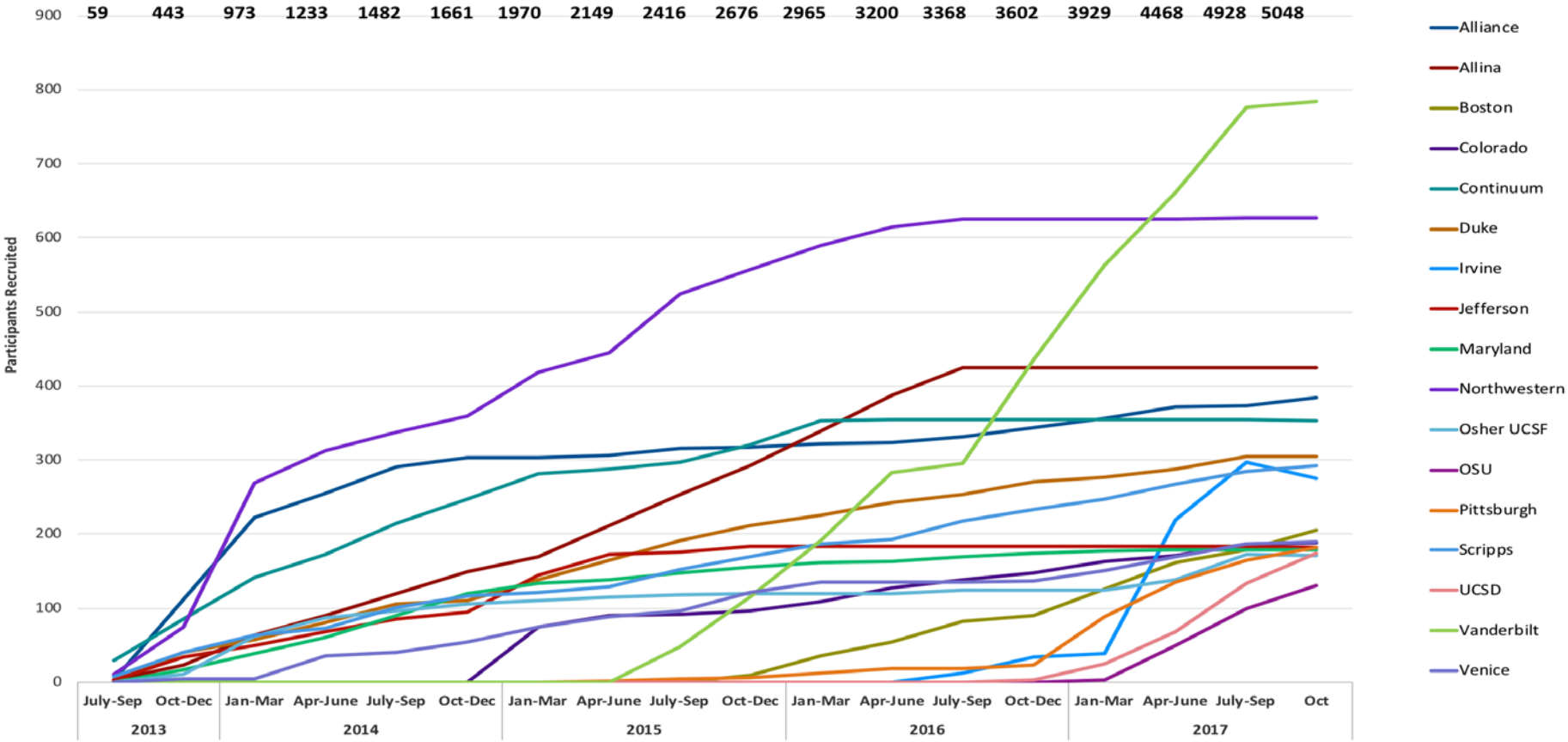
PRIMIER Overview

- Prospective, non-randomized, observational evaluation conducted at all BraveNet clinical sites.
- Participants complete patient-reported outcome measures at enrollment, 2, 4, 6, 12 months.
- Extractions from participants' health records include
 - IM services received
 - ICD diagnostic codes
 - CPT codes

PRIMIER OBJECTIVES

- PRIMARY To evaluate the change in patient-reported outcomes (PROs: quality of life, mood and stress) over time
- SECONDARY To evaluate PROs differ by baseline characteristics (e.g. demographics, clinical condition, pain interference or IM intervention sought)
- TERTIARY To evaluate whether specific IM interventions differentially impact PROs over time.

Final PRIMIER Participants Recruited by Site



PRIMIER DATA COLLECTION: Self-reported

- Enrollment Date
- Patient Demographics
- PROMIS-29
- PROMIS Perceived Stress Scale (PSS-4)
- Patient Activation Measure © (PAM)
- Primary Conditions and Symptoms
- IM Services Utilized
- New patient status

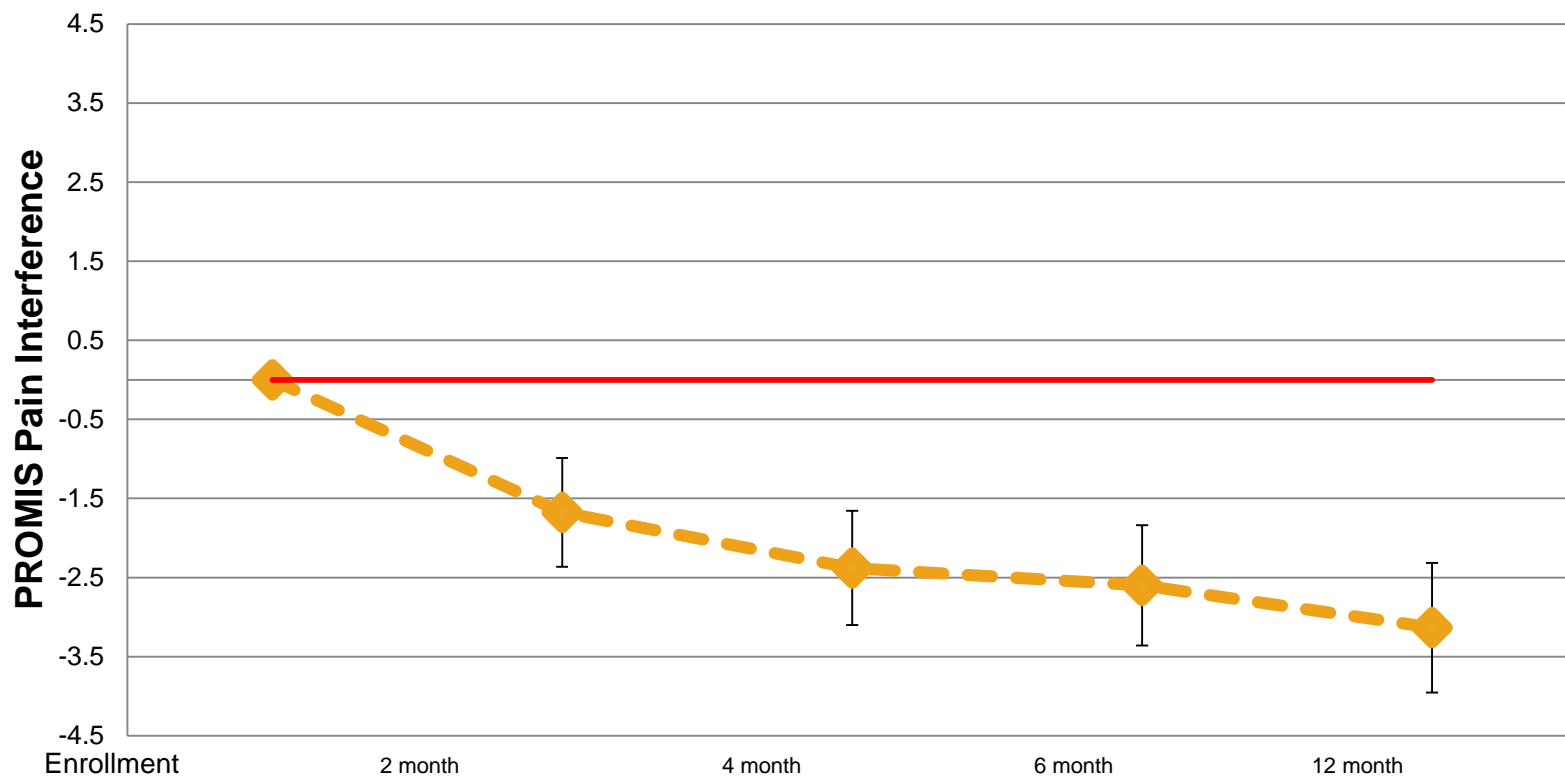
<u>Pain Interference</u>						
In the past 7 days...		Not at all	A little bit	Somewhat	Quite a bit	Very much
PAININ9	How much did pain interfere with your day to day activities?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAININ22	How much did pain interfere with work around the home?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAININ31	How much did pain interfere with your ability to participate in social activities? .	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAININ34	How much did pain interfere with your household chores?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Chronic Pain Cohort: Enrollment

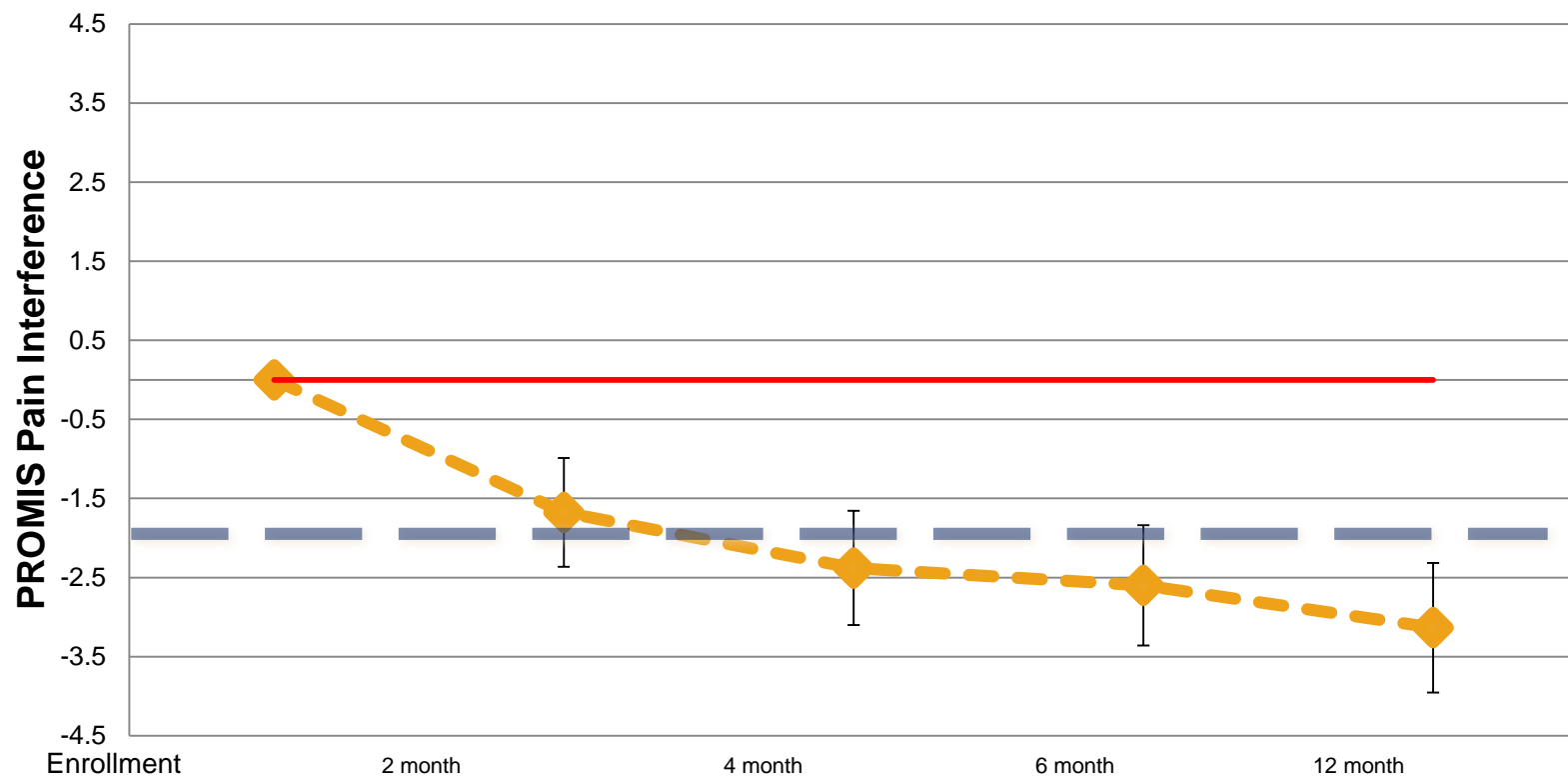
- Report pain (4 or greater on a scale of 0 to 10) for 3 months or longer (n=969)
- Participants with at least 2 surveys completed
- Participants with complete EMR data

Cohort	Baseline	2 Months	4 Months	6 Months	12 Months
Chronic Pain	969	693	559	490	421

Pain Interference: Change Over Time



Pain Interference: Change Over Time



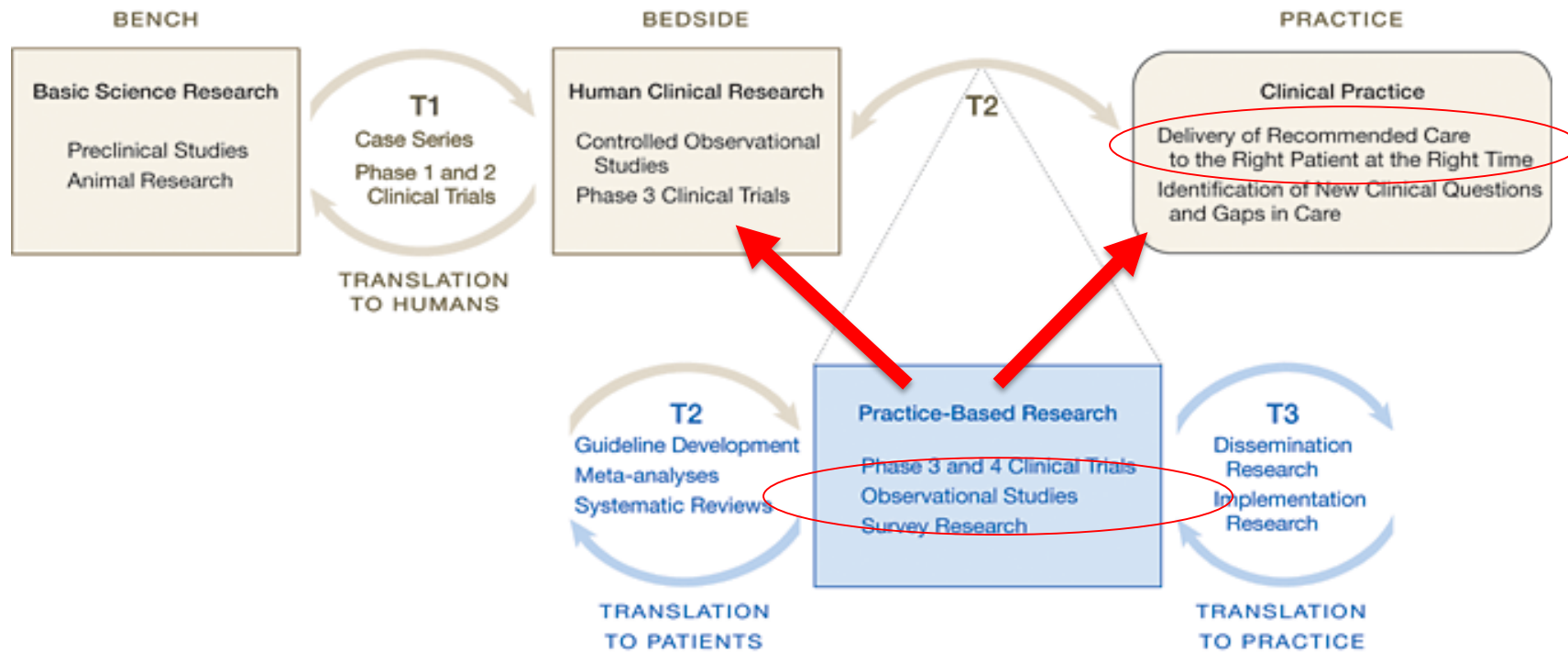
Conclusions

- PRIMIER Chronic pain cohort achieved important reductions in pain interference.
- Future PRIMIER analyses will identify:
 - Which IM therapies are associated with the best pain relief.
 - Optimal dose of IM therapies for pain reduction

Summary: Practice-Based Research

- Practice based research provides invaluable information for the field of complementary and integrative health
 - Research, clinical practice and operations.
- Answers derived from this research can be used in various ways
 - Inform future randomized trials
 - Uncover best clinical practice
 - Optimize operations

Practice-based Research



Westfall, J. M. et al. JAMA 2007;297:403-406.

2016 NIH, NCCIH Systematic Review

SYMPOSIUM ON PAIN MEDICINE



Evidence-Based Evaluation of Complementary Health Approaches for Pain Management in the United States

Richard L. Nahin, PhD, MPH; Robin Boineau, MD, MA; Partap S. Khalsa, DC, PhD; Barbara J. Stussman, BA; and Wendy J. Weber, ND, PhD, MPH

[Mayo Clin Proc. 2016;91\(9\):1292-1306](#)

News & Analysis

Medical News & Perspectives

As Opioid Epidemic Rages, Complementary Health Approaches to Pain Gain Traction

Jennifer Abbasi

[JAMA](#). 2016 Nov 2. doi: 10.1001/jama.2016.15029. [Epub ahead of print]

News & Analysis

Medical News & Perspectives

As Opioid Epidemic Rages, Complementary Health Approaches to Pain Gain Traction

Unlike a typical systematic review that assigns quality values to the studies, the investigators conducted a narrative review, in which they simply looked at the number of positive and negative trials. “If there were more positives than negatives then we generally felt the approach had some value,” Nahin

Based on a “preponderance” of positive vs negative trials, complementary approaches that may offer pain relief include acupuncture and yoga for back pain; acupuncture and tai chi for osteoarthritis of the knee; massage therapy for neck pain; and relaxation techniques for severe headaches and migraine.

[JAMA](#). 2016 Nov 2. doi: 10.1001/jama.2016.15029. [Epub ahead of print]

Perspective from NIH, NCCIH

A next step for the NCCIH, Shurtleff said, is to conduct “pragmatic” studies that look at the effectiveness of complementary health strategies for pain outside of the strict inclusion/exclusion criteria of RCTs. “We’re looking to see how this works in real time in the real world, with all the warts and things that go along with that,” he said.

Perspective from NIH, NCCIH

A next step for the NCCIH, Shurtleff said, is to conduct “pragmatic” studies that look at the effectiveness of complementary health strategies for pain outside of the strict inclusion/exclusion criteria of RCTs. “We’re looking to see how this works in real time in the real world, with all the warts and things that go along with that,” he said.

“At the end of the day, if an approach is successful you’ll be able to generalize it more to everyone with the disease, versus a very small cohort of individuals,” Nahin added.

Questions and Answers