

Engaging dental practices in clinical research and dissemination:

Lessons and future direction for the National Dental Practice-Based Research Network

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Co-Investigator Network Coordinating Center
National Dental PBRN

11/10/2020



NationalDentalPBRN.org

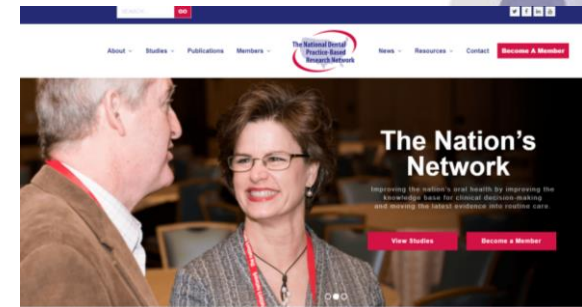
Organization of today's seminar

- Describe the National Dental PBRN
 - Goals
 - Learning Health System structure
 - Network results
 - Productivity and key study results
 - Lessons learned
 - Upcoming research
- Let's address questions as they arise
 - Chat function or voice
 - DPH topics – how to address in the Network?

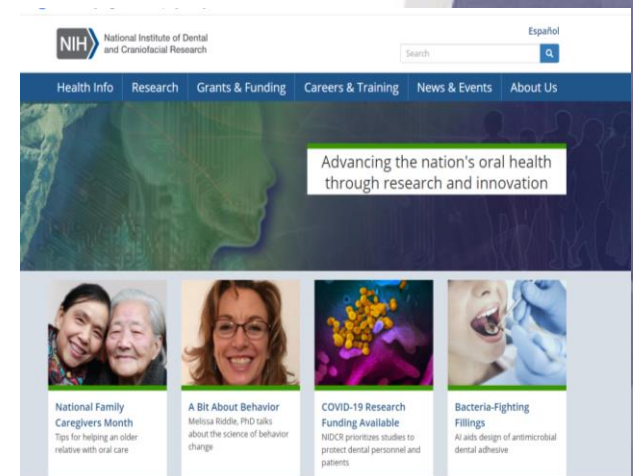
Funding for the National Network

National Institute of Dental and Craniofacial Research (NIDCR) is the U.S. government's lead agency for scientific research on oral, dental, and craniofacial health and disease. NIDCR is one of the National Institutes of Health.

- Administrative and Resource Center (ARC)
 - Director: Dr. Gregg Gilbert (UAB)
- Network Coordinating Center
 - Director: Dr. Mary Ann McBurnie (KPCHR)
- Funding cycles 2012-19; 2019-26
 - Infrastructure (6 regional/1 specialty nodes)
 - Practitioner recruitment/engagement
 - Conduct individual studies
- Project Officer: Dr. Dena Fischer



www.nationaldentalpbrn.org



www.NIDCR.NIH.gov

Regional Nodes for the National Network

Western Region

Kaiser Permanente Center for Health Research

Midwest Region

HealthPartners Institute
For Education and Research

Northeast Region

University of Rochester
Rochester, New York

NCC

Portland

Minneapolis

Rochester

South Atlantic Region

University of Florida

Birmingham

San Antonio

Gainesville

Southwest Region

University of Texas Health Science
Center at San Antonio

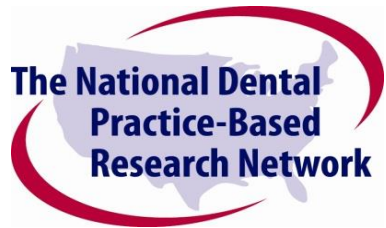
South Central Region

University of Alabama at Birmingham



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Specialty Node: University of Illinois-Chicago



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The National Dental Practice-Based Research Network

- What is practice-based research?
 - Research done with practitioners
 - Conducted in dental offices within clinic flow
 - On issues relevant to clinical practice
- Network goals
 - Conduct national studies that improve practice and patient oral health
 - Establish specialty and patient population nodes
 - *Engage dental practitioners* in research and disseminating best practices
 - Promote *continuous learning*



The nation's network

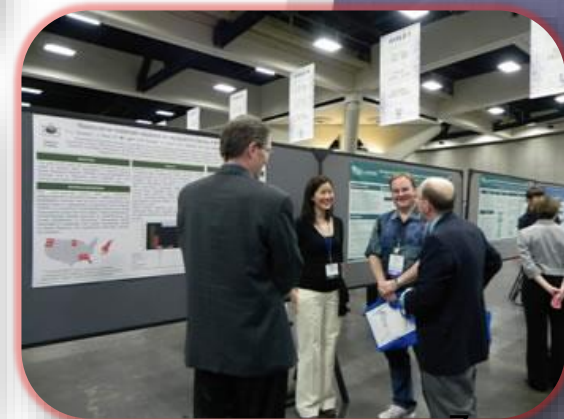
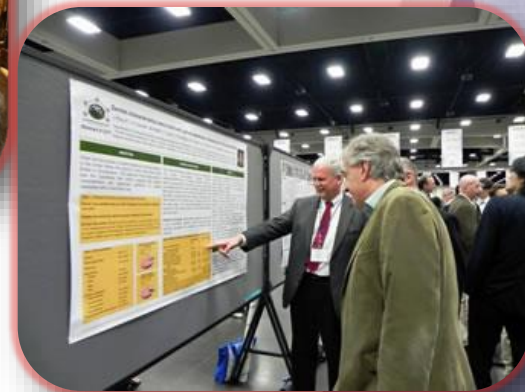
Key to the Network: Engage practitioners at every step

- Generating ideas for studies
- Developing study design
- Designing data collection forms
- Feasibility testing
- Pilot testing



Engage practitioners at every step – cont'd

- Data collection
- Data analysis
- Results interpretation
- Dissemination
 - Presentations
 - Publications
- Implementation



Members choose their participation level

ACTIVITIES	LEVEL 1: Informational	LEVEL 2: Limited	LEVEL 3: Full
Receive Information and Updates	✓	✓	✓
Participate in Quick Polls	✓	✓	✓
Suggest a Study Topic	✓	✓	✓
Attend Network Meetings		✓	✓
Participate in a Questionnaire Study		✓	✓
Participate in a Clinical Study			✓
Participate in Network Committees			✓

The Network as a Learning Health System

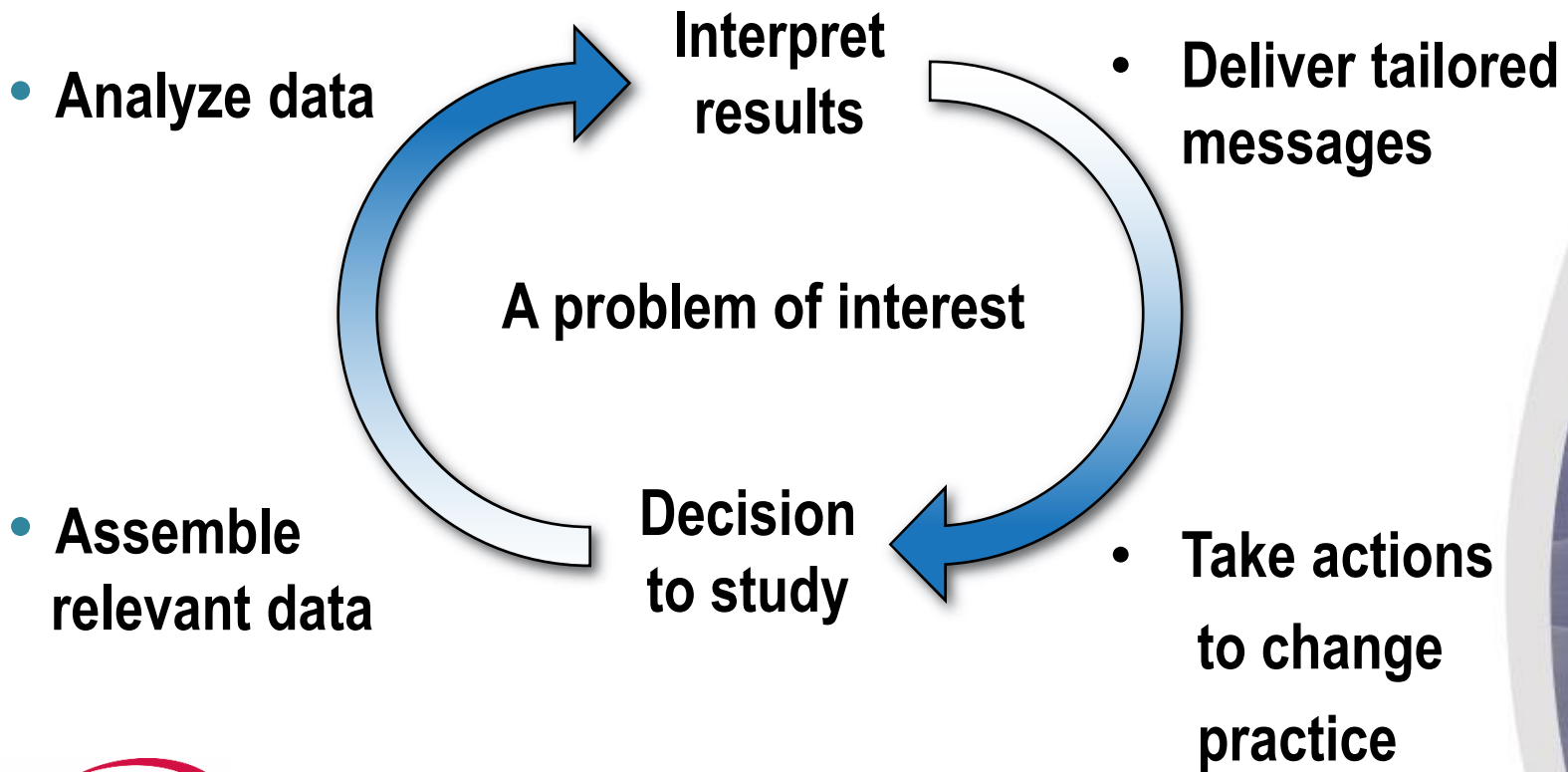
The Institute of Medicine's definition of an LHS:

*An organization where “science, informatics, incentives, and culture are aligned for **continuous improvement and innovation** – with best practices seamlessly imbedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience.” (IOM, 2015)*

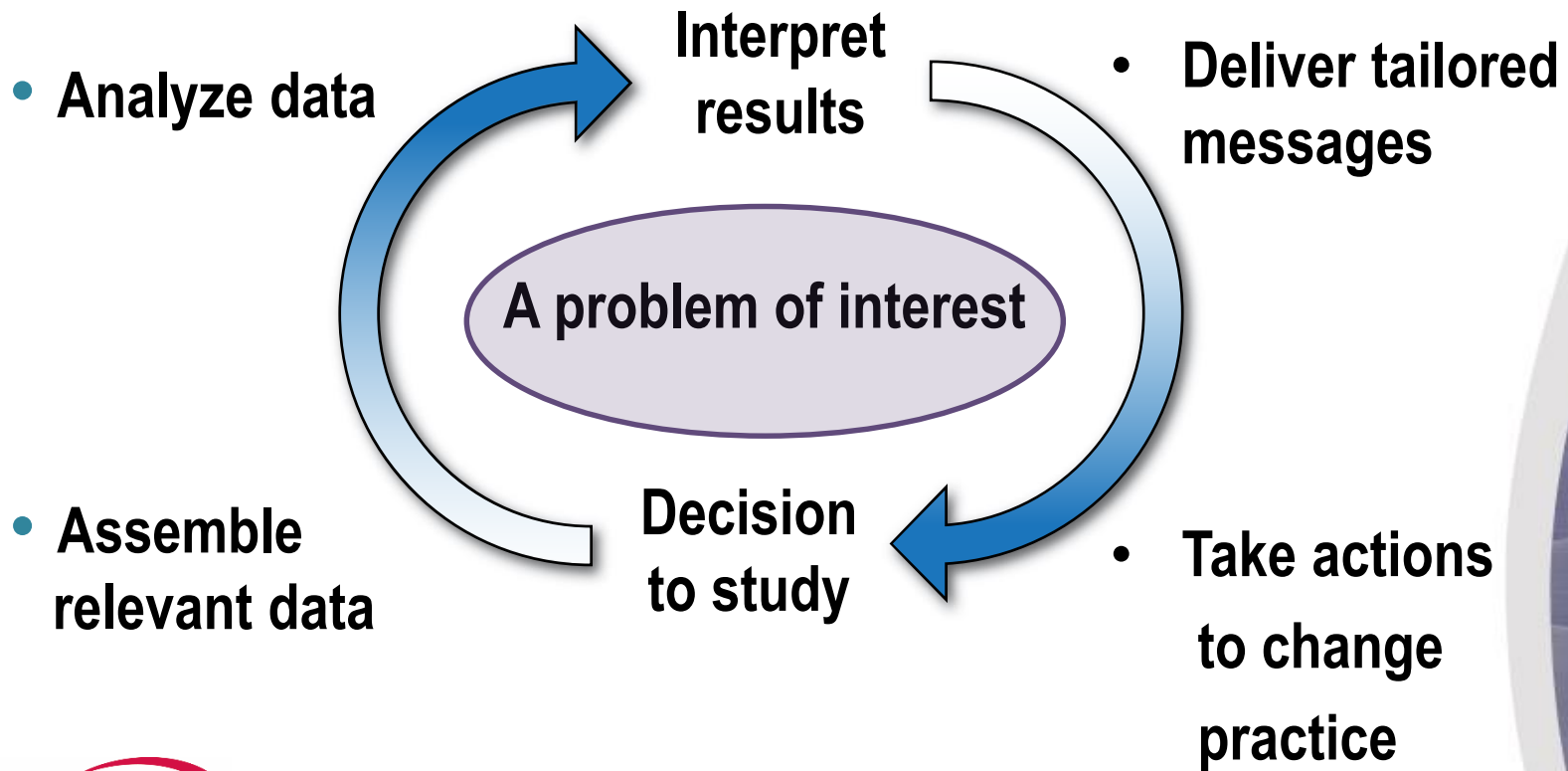
Greene et al. (Ann Int Med, 2012)

- LHS reflects a **bi-directional, virtuous cycle** where “research informs practice and practice informs research”
- The LHS is a multi-phased, iterative process
 - Problem identification, analysis, evaluation, dissemination, and implementation activities
 - Technology supports activities
 - Innovations are refined over time

'Virtuous cycle' of a Learning Health System



The National Dental PBRN virtuous cycle

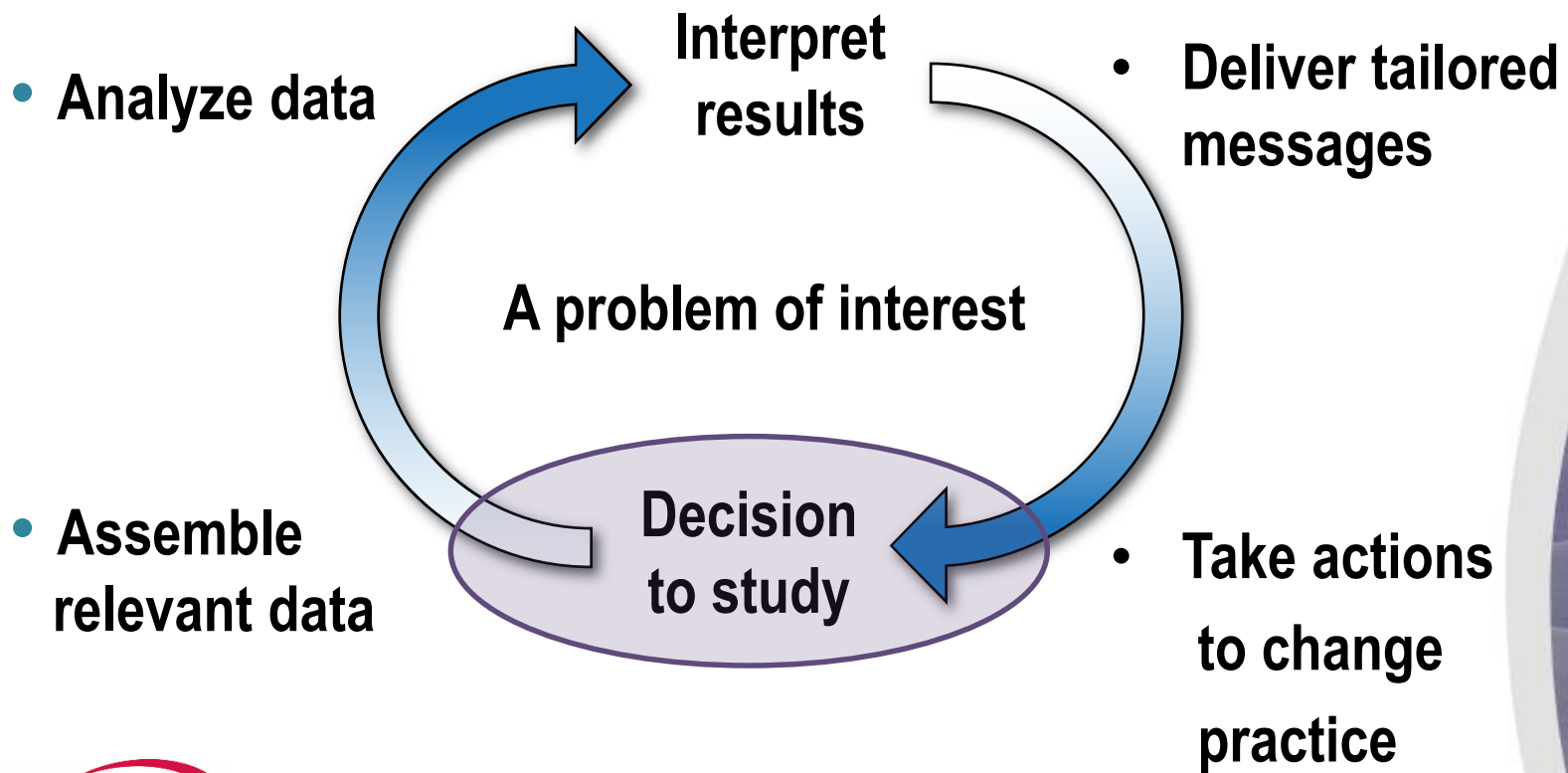


LHS: Identifying a problem of interest

The process of identifying problems of interest is multifactorial involving multiple stakeholders and methods of identification

- Practitioners identify problems affecting their patients
- Professional dental organizations ID problems affecting broad groups of dental practitioners/patients
- Clinical researchers identify problems based on expertise/experience
- NIDCR staff identify problems of interest to NIH affecting broad groups of dental practitioners/patients

The National Dental PBRN as a Learning Health System



LHS: Making a decision to study

- PI/team prepares a study proposal for NIH review
 - Topic reflects priorities for the field
 - Relevant to daily practice
 - Results will provide actionable data
 - Satisfies the “so what” question
- PI/team may seek Network assistance with the proposal

Want to propose a study? We can help with that.

The screenshot shows a web browser window with the URL nidcr.nih.gov/research/clinical-trials/researchers-proposing-study-idea. The browser's address bar and tabs are visible at the top. The website's navigation menu includes 'Health Info', 'Research', 'Grants & Funding', 'Careers & Training', 'News & Events', and 'About Us'. The 'Research' menu item is selected, and a 'Research' label is overlaid on a background image of a hand holding a pipette. The main content area features a breadcrumb trail: 'Home > Research > Clinical Trials'. To the right of the breadcrumb is a 'Share' button with icons for Facebook, Twitter, LinkedIn, and Email. The main heading is 'Researchers Proposing a Study Idea' in green. Below the heading is a sub-heading: 'Are you a researcher interested in proposing a study to be conducted within the National Dental PBRN?'. The text explains that resources are available through the National Administrative and Resources Center and the National Coordinating Center for all potential applicants. It states that potential applicants should prepare a Specific Aims page (1 page) and an overview of the study design and procedures (1 page), including the number of practitioners and patients involved. The text concludes with 'Potential applicants should review the following.' and lists one item: '1. Download and review the [Menu of National Dental PBRN Resources \[Excel 19KB\]](#), available to all potential applicants.'

Home > Research > Clinical Trials

Share [f](#) [t](#) [in](#) [✉](#)

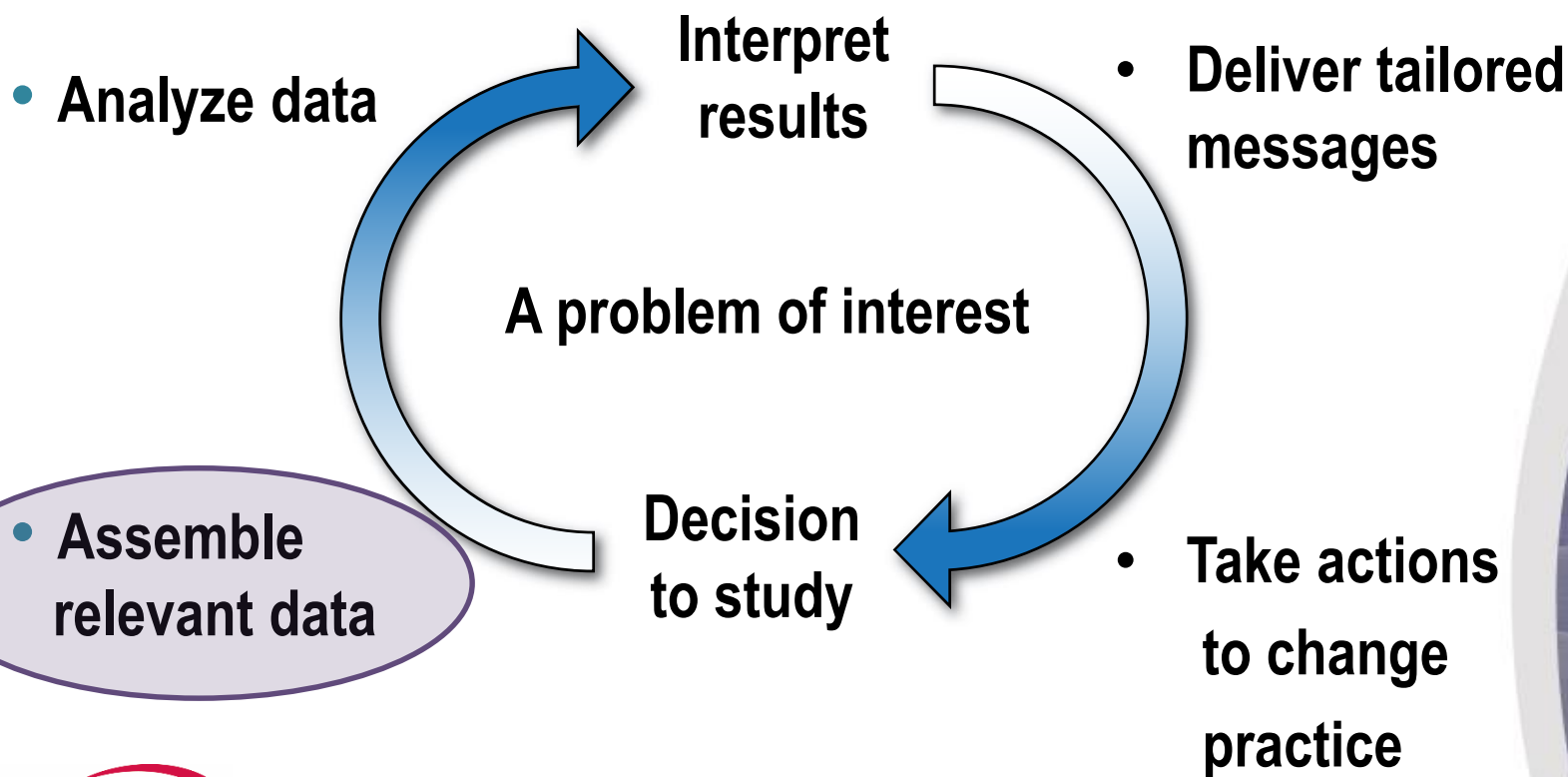
Researchers Proposing a Study Idea

Are you a researcher interested in proposing a study to be conducted within the National Dental PBRN?

There are resources available through the National Administrative and Resources Center and National Coordinating Center for all potential applicants interested in proposing a study to be conducted within the National Dental PBRN. As a first and important step, potential applicants should prepare a Specific Aims page (1 page) and overview of the study design and procedures (1 page), including the number of practitioners and patients involved in the study. Potential applicants should review the following.

1. Download and review the [Menu of National Dental PBRN Resources \[Excel 19KB\]](#), available to all potential applicants.

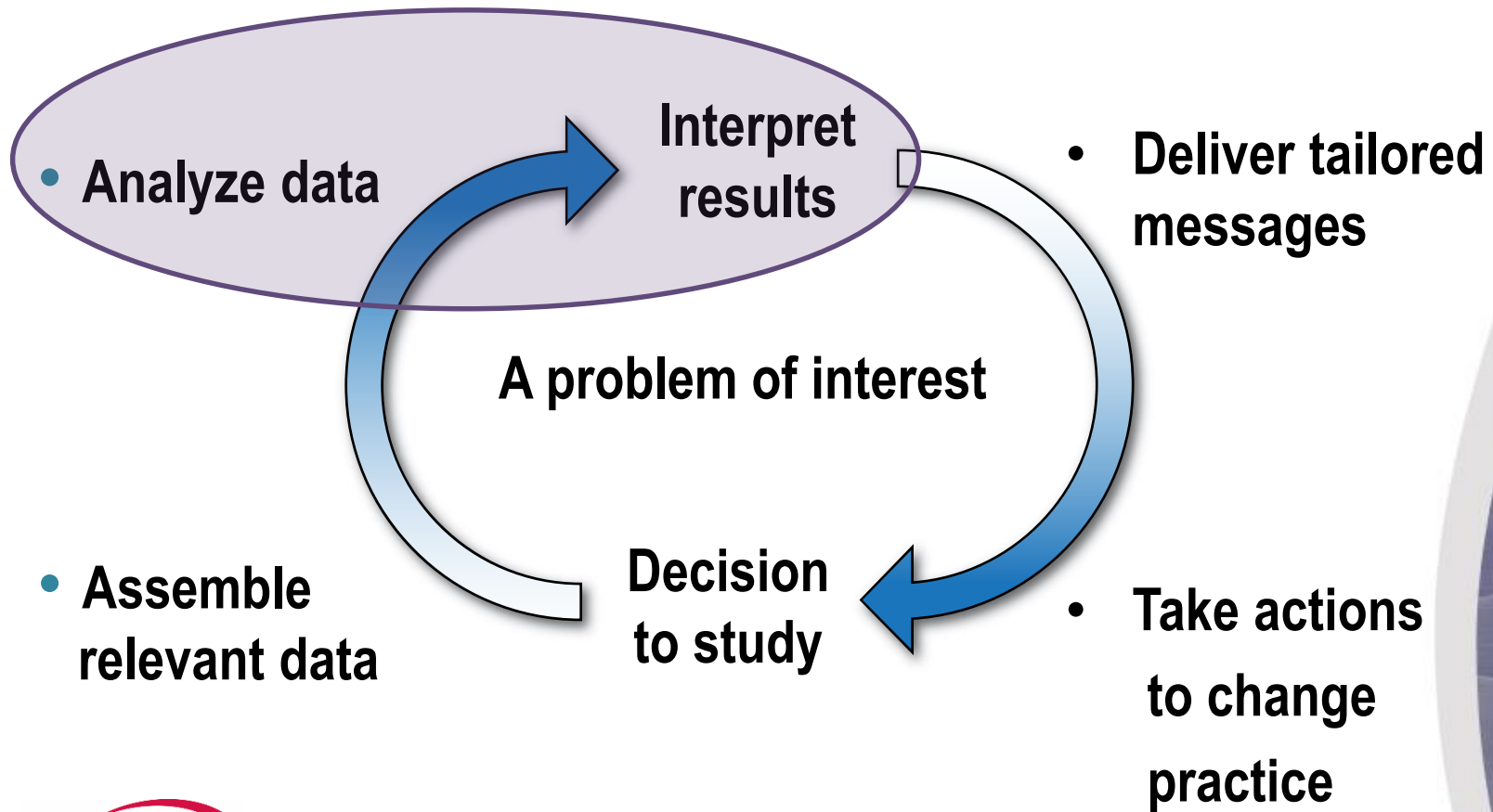
The National Dental PBRN as a Learning Health System



LHS: Assembling relevant data

- Studies are team-based
 - Study investigators, regional staff, practitioners
 - Team balances research and practice needs
- Match the design to the clinical question
 - Cohort/case-control
 - Retrospective/prospective
 - Clinic/provider vs. patient randomization
- Minimize impact on clinic operations/patient flow
 - Design and data collection: focus on “must have” data

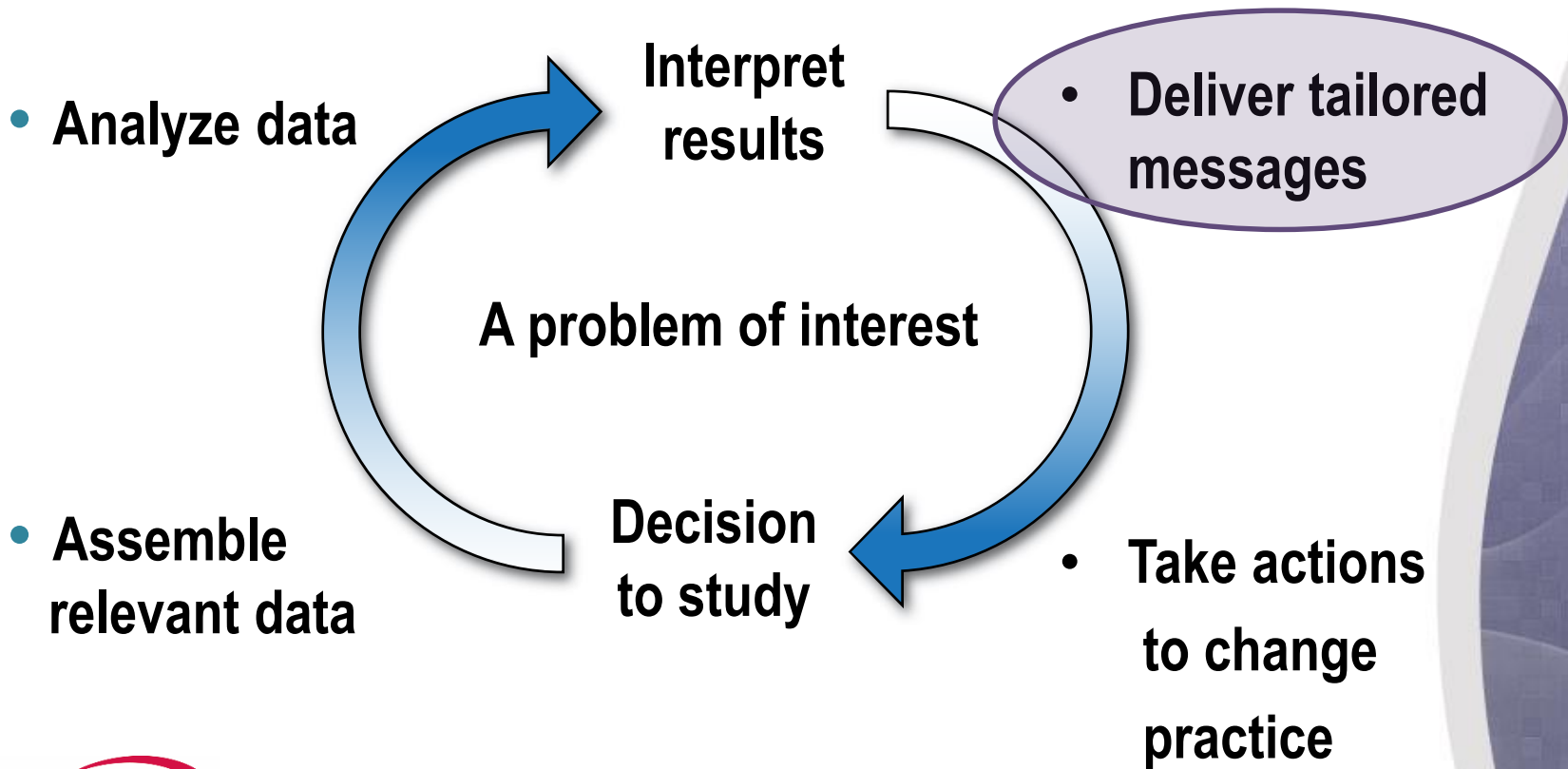
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LHS: Analyzing data and Interpreting study results

- Network study team evaluation
- Internal review and comment from practitioners on implications for practice
 - Annual regional meetings
 - Local meetings of practitioners
 - Practitioner Advisory Committee member review
 - Other venues/opportunities
- Professional dental organization review
- NIDCR staff comment

The National Dental PBRN as a Learning Health System



Deliver tailored messages (dissemination)

- Publish results in peer-reviewed manuscripts and presentations
- Disseminate research
 - Participating practitioners – clinic summaries
 - Social media (monthly newsletters, Facebook, etc.)
 - Professional organizations
- Conduct workshops and annual meetings
 - IADR/AADR Network symposia (2013-present)
 - Annual regional Network meetings
 - Local professional meetings

Provide research updates

U Home IADR Home Video Conferencing... NDPBRN Hub Sign in - Google Ac...

About ▾ Studies ▾ Publications Members ▾



News ▾ Resources ▾ Contact

Become A Member

Research Updates

- › Dental Care for Patients Taking Bone Protecting Drugs
- › How Best to Treat a Filling Gone Bad
- › Probing the Conundrum of Cracked Teeth
- › Root Canal to the Rescue
- › Screening for Diabetes at the Dentist's Office
- › When it Looks Like a Cavity, But Doesn't Need a Filling
- › Protecting Dental Patients From the Dangers of Opioids

- › Go Easy on Sensitive Teeth
- › Do You Need a Crown?
- › Looking for Oral Cancer (for patients)
- › Looking for Oral Cancer (for practitioners)
- › Pain After a Root Canal (for patients)
- › Pain After a Root Canal (for practitioners)

Our Mission

Links



Research UPDATES

FOR PATIENTS



Pain After a Root Canal



Your dentist is part of the National Dental Practice-Based Research Network, a group of dental practices that treat patients and also do dental research. For more information go to www.nationaldentalphrn.org.

You've probably heard people say they have a "high tolerance for pain" and others who admit to being a wimp when it comes to pain associated with a dental procedure.

Pain tolerance is a lot more complicated than how wimpy or tough you are. There are many different inherent characteristics of people and of dental procedures that can affect how much pain we might feel.

Dentists in the National Dental Practice-Based Research Network are studying differing levels of pain in their patients after a root canal. Their goal is to better understand and treat post-procedure pain.



What is a root canal?

Root canal therapy is a common procedure performed when tooth decay, cracks, chips, or other damage leads to an infection of the pulp (tissues inside the tooth), which is made up of tiny blood vessels and nerves. During root canal treatment, a dentist removes the pulp and bacteria from inside the tooth. Without treatment, the tooth would likely cause pain and/or infection resulting in the need to remove the tooth. Pain after a root canal is usually manageable with over-the-counter medications such as ibuprofen and acetaminophen. It usually goes away within a week or less.

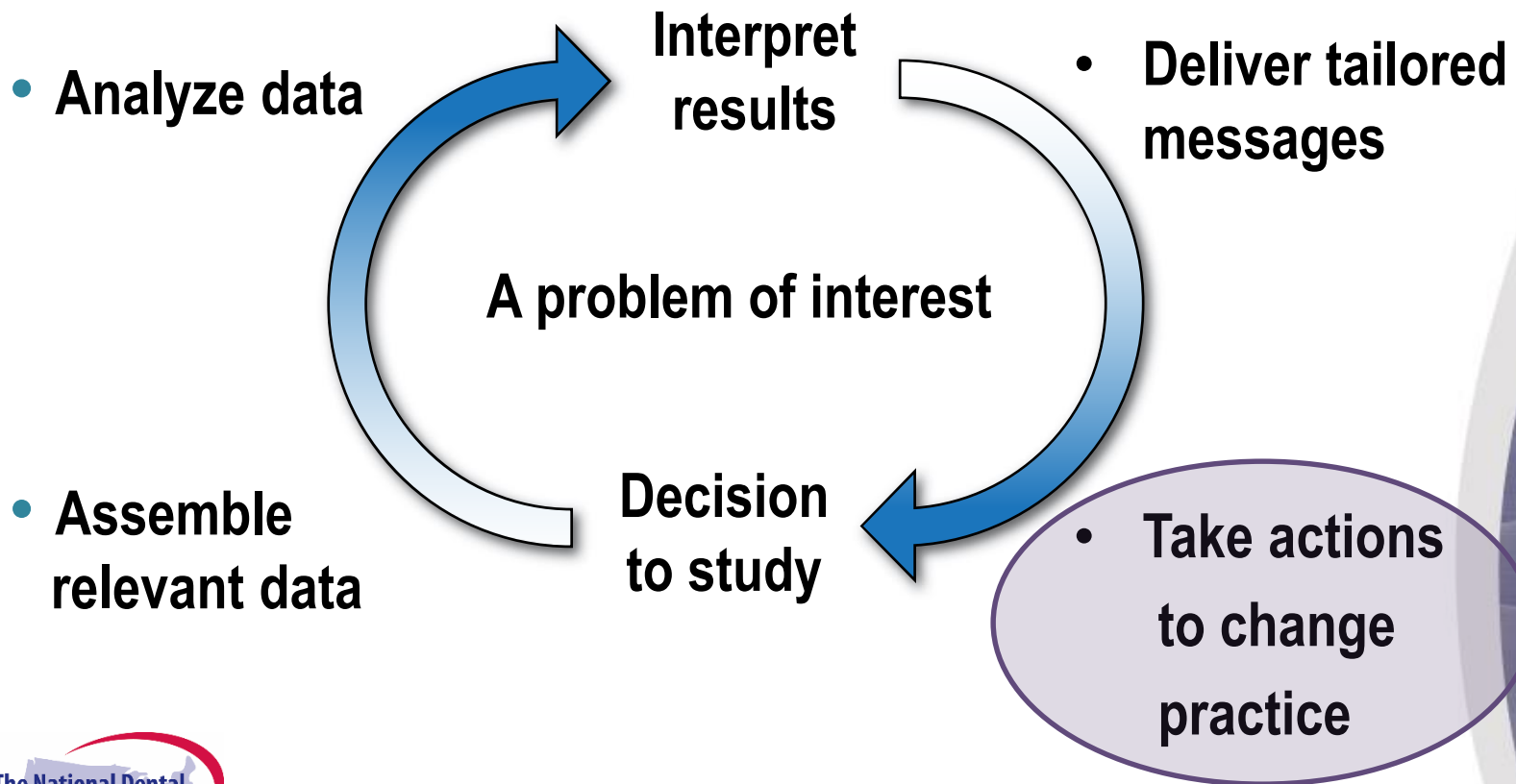


What affects how much pain you feel?

Studies show that when you're hurt, your body sends messages to your brain. Sometimes the wrong message is sent and it makes you perceive the pain as worse than you should. Genetic differences may account for some differences in how much pain is felt. Anxiety and how you think about pain also contribute.

Remember: Having these traits doesn't mean you would definitely have a lot of pain after a root canal. Always talk

The National Dental PBRN as a Learning Health System



Take action to change practice (implementation)

- Identify and share best practices
- Work with national, state, local professional organizations to affect policy and improve practice guidelines
- Develop measures to assess practice change among Network practitioners
 - Periodic, longitudinal surveys
 - Pre-post evaluations integrated into studies
- Develop strategies for implementing practice change among Network practitioners
- Evaluate impact of practice change strategies on practitioner treatment decisions and patient oral health outcomes

Implementation science is a focus of our future work!

Results

What have we accomplished?

What have we learned?

What are the next steps?



the nation's network

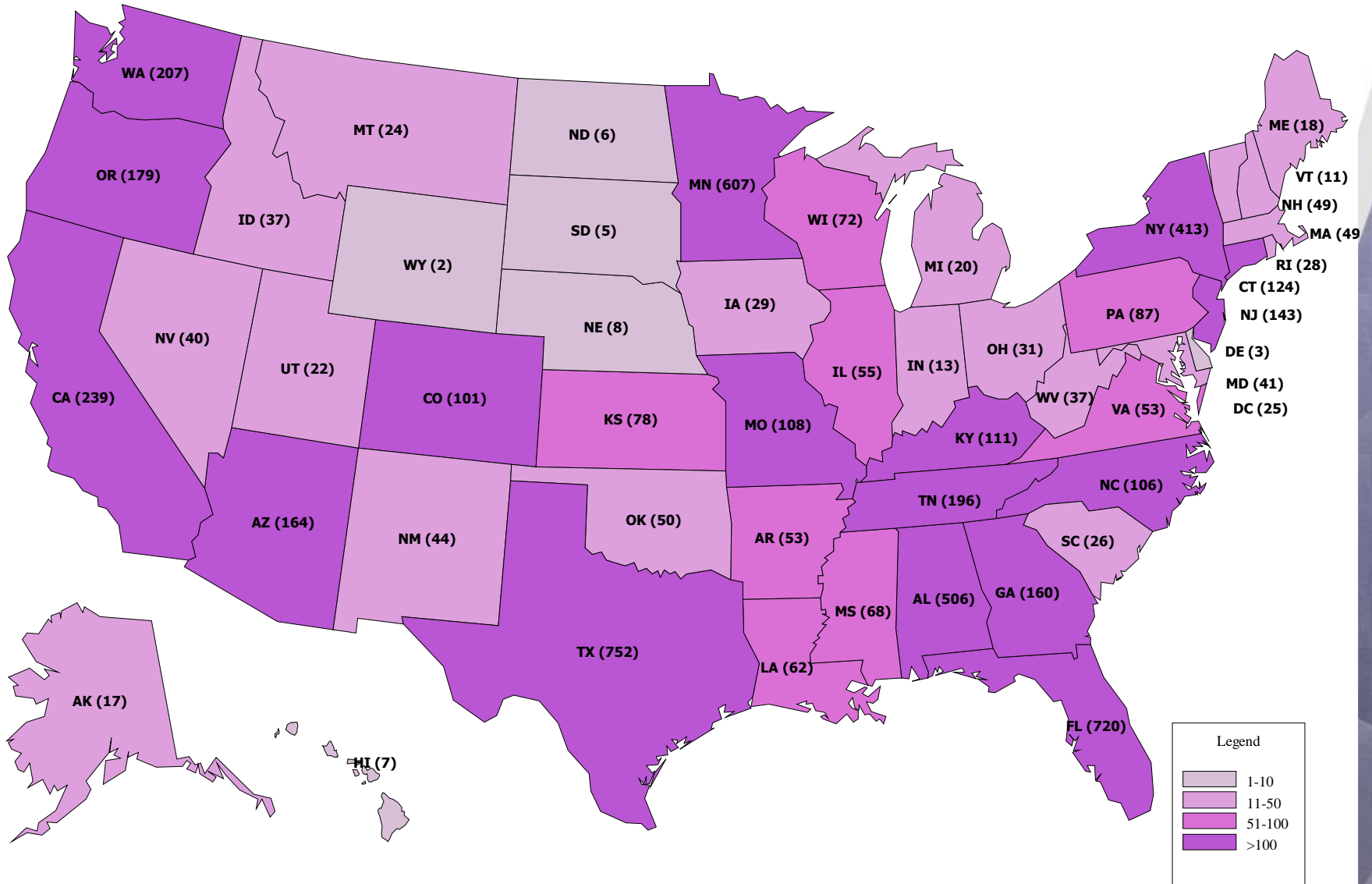
Enrolled active practitioners – November 2020

<u>Region</u>	<u>Dentists</u>	<u>Hygienists</u>	<u>Total</u>
Western (CHR)	729	210	939
Midwest (HP)	639	305	944
Southwest (UTSA)	951	275	1226
South Central (UAB)	759	368	1127
South Atlantic (UFL)	523	460	983
Northeast (UR)	870	160	1030
Total	4471	1778	6249

There are 170 dentists in PH practice, CHCs, or publicly funded clinics

National Dental PBRN

Map of All Practitioners Enrolled in the Network by State as of August 24, 2018 (Total = 6006)

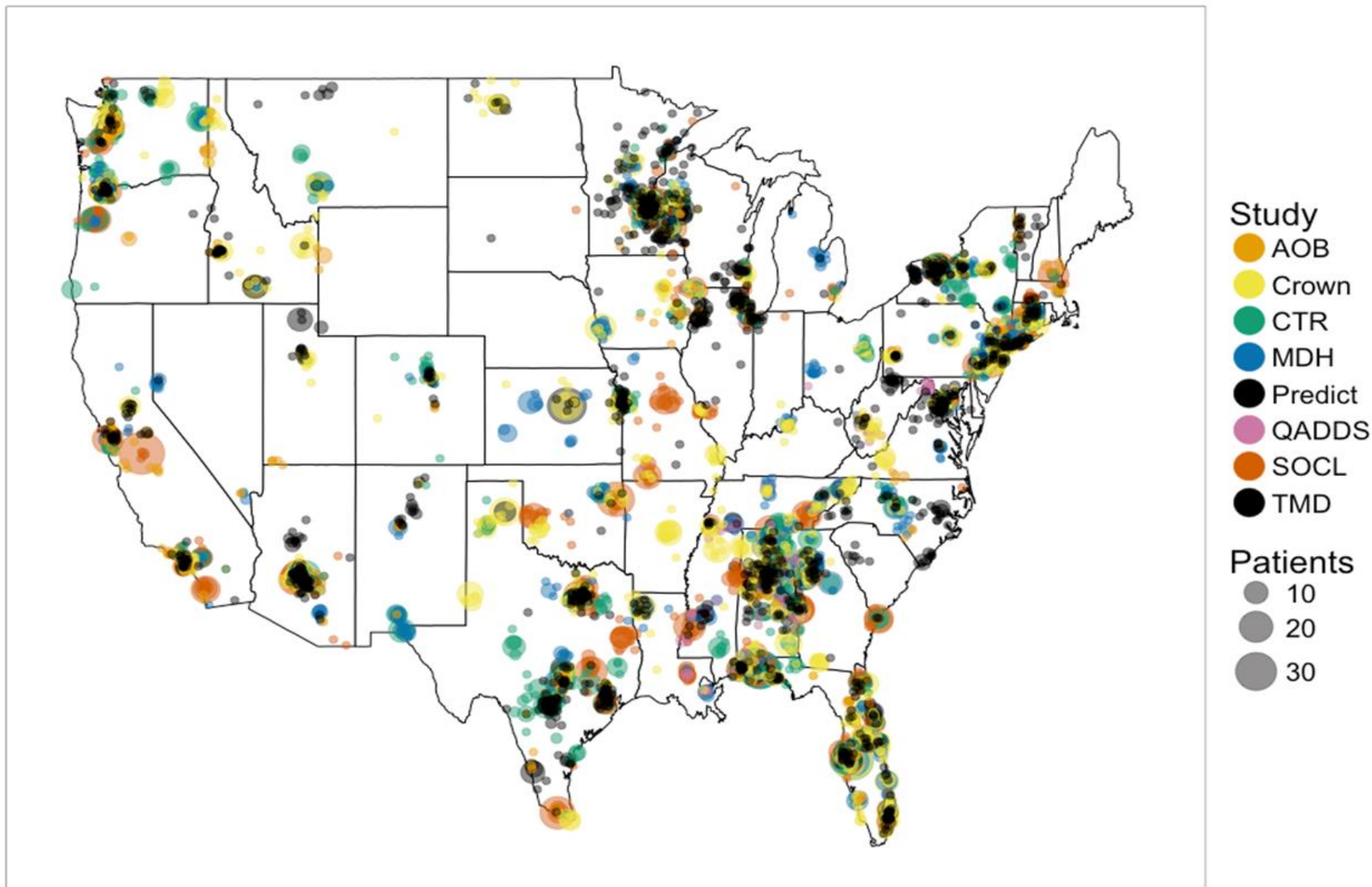


Network productivity

Since 2005

- 38 studies developed and/or completed
- Peer-reviewed publications in 43 different journal titles, representing a broad range of scientific areas in oral health and general health
- 174 peer-reviewed scientific journal articles
- 227 peer-reviewed scientific presentations
- 1,232 non-peer-reviewed presentations and publications

Distribution of 15,462 patients enrolled in 8 Network studies: CTR, SOCL, MDH, QADDS, AOB, Crowns, PREDICT, TMD



Methods lessons learned: Study scope is everything!

(Minimize impacts on the practice)

- Limit data collection
 - You have 10 mins max, use it well
 - Collect only “must have” data – role in analysis?
 - Collect data outside the office visit
 - Use short versions of validated instruments (2-4 items?)
- Electronic data collection is more efficient
 - Tablets can eliminate paper forms, signature mgt
- Randomization
 - Is a randomized trial warranted? e.g. 6m vs. 12m recall
 - If RCT, Practice > patient ; Step-wedge designs work well



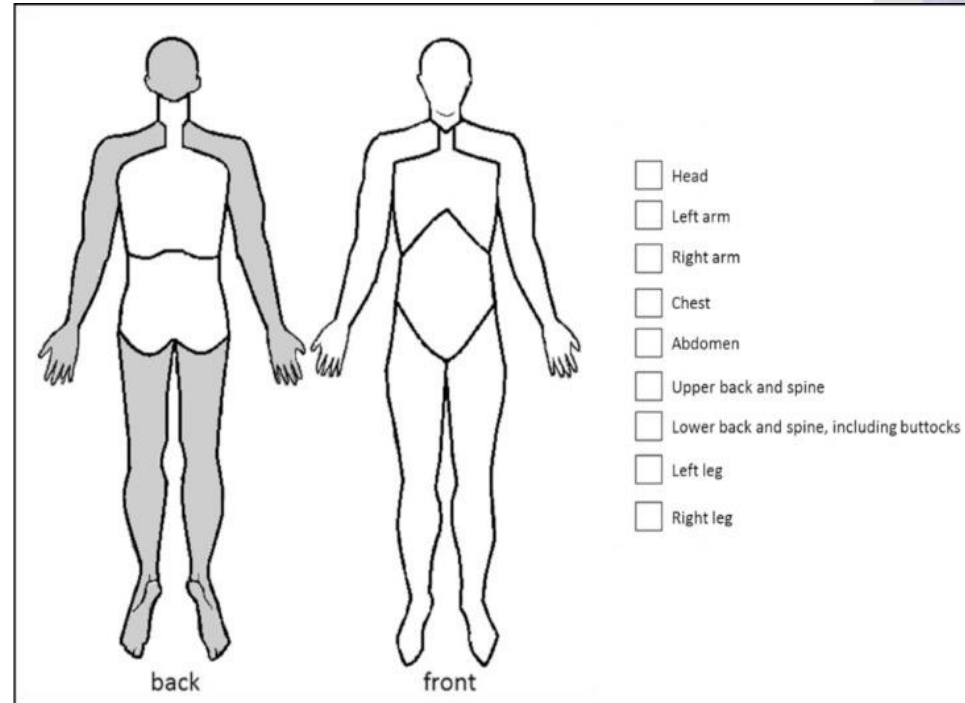
Simplifying data collection: example

A Network study of TMJ pain assessed chronic systemic pain using the figures on the right. →

- Patients electronically recorded pain type and location during an office visit
- Data were used as a control variable as a predictor of fibromyalgia

Issues:

1. TMJ study focused on chronic pain
2. Very challenging to program into tablet-based data form
3. TMJ patients took time to record pain levels



Source: Arnold et al. AAPT Diagnostic Criteria for Fibromyalgia. *J Pain*. 2019 Jun;20(6):611-628. Epub 2018 Nov 16. PMID: 30453109.

For the PREDICT study of acute pain:

Q: “Have you ever been told by a doctor that you have fibromyalgia?”

Network's Isolation Techniques study



Distribution Information

AAE members may reprint this position statement for distribution to patients or referring dentists.

About This Document

The following statement was prepared by the AAE Clinical Practice Committee.

Dental Dams

AAE Position Statement

The American Association of Endodontists is dedicated to excellence in the art and science of endodontics and to the highest standards of patient care. The accumulated clinical knowledge and judgment of the practitioner

care. The accumulated clinical knowledge and judgment of the practitioner supported by evidence-based scientific research is the basis for endodontic treatment. **Tooth isolation using the dental dam is the standard of care;** it is integral and essential for any nonsurgical endodontic treatment.

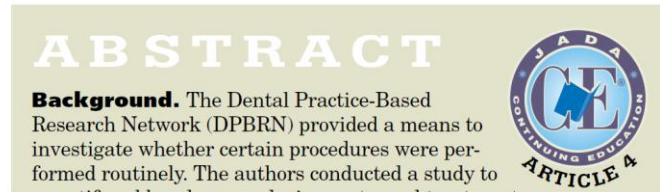
A dental dam is a latex or nonlatex sheet with a hole punched in the material to allow placement around the tooth during the endodontic procedure. One of the primary objectives of endodontic treatment is disinfection of the root

Rubber dam use during root canal treatment

Findings from The Dental Practice-Based Research Network

Mona F. Anabtawi, DDS, MS; Gregg H. Gilbert, DDS, MBA; Michael R. Bauer, DDS; Gregg Reams, DMD; Sonia K. Makhija, DDS, MPH; Paul L. Benjamin, DMD; O. Dale Williams, MPH, PhD; for The National Dental Practice-Based Research Network Collaborative Group

The rubber dam has been used in dental care for decades. It is considered the reference standard in root canal treatment (RCT) because of the advantages that it offers with regard to infection control, patient protection and treatment efficacy.¹⁻⁴



- 44% use rubber dam (RD) for all root canal treatments (RCT)
- 15% never use RD for RCT
- Some practice types use RD nearly 90% for all RCT
- Endodontist use RD for 100% for all RCT

Impact on patient care: Many patients receiving RCT by general dentists do so without the use of RD. There is an opportunity significantly improve the community standard of care through routine use of RD during RCT.

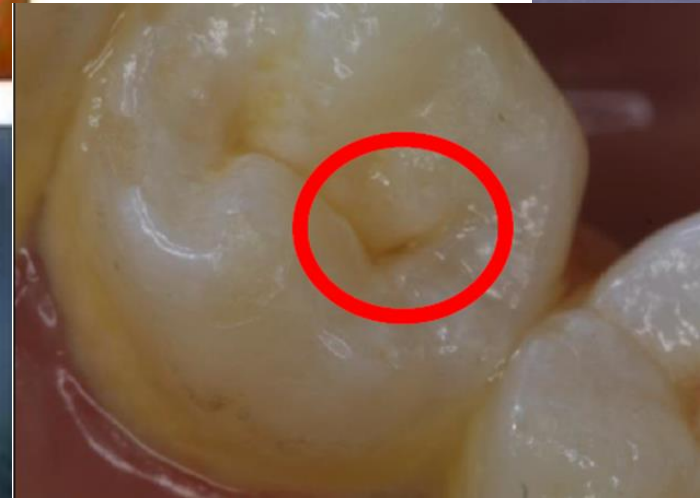
Rubber Dam: Can we make it the default choice?

- Obtain necessary materials for regular use of RD
- Review RD use and placement with staff
- Set the expectation with staff (and your self!) that whenever files are use - a RD is used
- Education patients that use of RD is the standard of care in dentistry

Questionable/Suspicious Occlusal Caries



Non-cavitated
carious lesion (enamel)



Guideline on Restorative Dentistry

Originating Committee

Clinical Affairs Committee – Restorative Dentistry Subcommittee

Review Council

Council on Clinical Affairs

Adopted

1991

Revised

1998, 2001, 2004, 2008, 2012, 2014

Purpose

The American Academy of Pediatric Dentistry (AAPD) intends this guideline to help practitioners make decisions regarding restorative dentistry.

The assessment of ev
modification of the An
of recommendations: str

Recommendations:

1. Based on a meta-analysis and Cochrane reviews, sealants should be placed on pit and fissure surfaces judged to be at risk for dental caries or surfaces that already exhibit incipient, non-cavitated carious lesions to inhibit lesion progression.
2. According to a systematic review and a randomized clinical trial, sealant placement methods should include

The prevalence of questionable occlusal caries

Findings from The Dental Practice-Based Research Network

Sonia K. Makhija, DDS, MPH; Gregg H. Gilbert, DDS, MBA; Ellen Funkhouser, DrPH; James D. Bader, DDS, MPH; Valeria V. Gordan, DDS, MS, MS-CI; D. Brad Rindal, DDS; Michael Bauer, DDS; Daniel J. Pihlstrom, DDS; Vibeke Qvist, DDS, PhD, DrOdont; for The National Dental Practice-Based Research Network Collaborative Group

Despite considerable improvements in oral health,¹ dental

ABSTRACT

Background. Questionable occlusal caries (QOC) can be



Original Paper

Caries Research

Caries Res 2014;48:200–207
DOI: [10.1159/000354841](https://doi.org/10.1159/000354841)

Received: January 9, 2013
Accepted after revision: August 2, 2013
Published online: January 29, 2014

Characteristics, Detection Methods and Treatment of Questionable Occlusal Carious Lesions: Findings from The National Dental Practice-Based Research Network

S.K. Makhija^a G.H. Gilbert^a E. Funkhouser^b J.D. Bader^c V.V. Gordan^d D.B. Rindal^e
D.J. Pihlstrom^f V. Qvist^g for The National Dental PBRN Collaborative Group

- 34% of all patient have questionable occlusal caries (QOC)
- 11% of all unrestored occlusal surfaces
- Nearly 30% of teeth treated invasively had no caries or arrested caries

Impact on patient care: The prevalence of QOC is high. Following an evidence-based guideline on management of QOC will result in significant health improvements for patients.

The Evidence Supporting Alternative Management Strategies For Early Occlusal Caries and Suspected Occlusal Dentinal Caries

James D. Bader, DDS, MPH, Daniel A. Shugars, DDS, PhD

From Operative Dentistry, University of North Carolina, Chapel Hill, NC

Objective To assess the strength of the evidence describing the effectiveness of alternative strategies to the detection and management of early occlusal caries and suspected occlusal dentinal caries.

Methods Nine detection and intervention decision points were identified as being central to the management of early occlusal caries and suspected

- The strength of the evidence for effectiveness of nonsurgical management is weak while the strength of surgical management is strong
- The evidence suggests sealants are the most effective non-invasive approach for treatment of both enamel caries and suspected occlusal dentinal caries

Suspicious Occlusal Caries: Complex problem with lots of choices

- Consider how often you open occlusal pit and fissures and observe caries beyond the CEJ.
- If you do open start at the site with the highest likelihood for dentinal involvement (i.e. biopsy approach)
- Consider trade-offs of surgical management (i.e. re-restore cycle)
- Consider only 10-20% may progress to dentinal caries over 12 months

Opioid prescribing and risk mitigation implementation in the management of acute pain

Results from The National Dental Practice-Based Research Network

Jenna L. McCauley, PhD; Renata S. Leite, DDS, MS; Valeria V. Gordan, DDS, MS; Roger B. Fillingim, PhD; Gregg H. Gilbert, DDS, MBA; Cyril Meyerowitz, DDS, MS; David Cochran, DDS, MS, PhD, MMSci; D. Brad Rindal, DDS; Kathleen T. Brady, MD, PhD; The National Dental Practice-Based Research Network Collaborative Group

ABSTRACT

Background. Minimal information exists regarding the consistency and correlates of dentists' implementation of risk mitigation strategies when prescribing opioids, including risk screening, prescription drug monitoring program (PDMP) use, and patient education.

Impact on patient care: Dentist who frequently prescribe opioids should assess their prescribing practices against guidelines. Use of NSAIDs as first line therapy will reduce risks to patients.

- Most dentists rarely or seldom prescribe opioids
- Highest rate for care at single visit or emergency appointment
- Dentists who prescribed opioids the most used the PDMP or patient education the least

National Dental PBRN studies impact our patients when:

- We study topics that address common problems in dental practice
- We understand variations in clinical practice - including our own
- We compare study results and our own clinical practice against published guidelines and the best available evidence
- We make a commitment to use results to improve the care of our patients

Network studies in development

UG3/UH3 studies

- Post-Operative Pain Study (POPS) PI: E. Kalenderian
- Effectiveness of Nicotine Replacement Therapy Sampling in Dental Practices (Fresh) PI: S. Japuntich
- Deep Caries Removal Strategies PI: M. Jurasic

X01 studies (developmental)

- Treatment of Patients on Anticoagulants (TOP-AC) PI: S. Elad

SARS-CoV-2 pandemic X01 studies

- Innovative mDentistry eHygiene strategy amid the COVID-19 pandemic (eHygiene) PI: J Xiao
- COVID-19 Research (CORE) Registry PI: J. Fellows

CORE Registry Aims

Aim 1 (primary): ID effective approaches and associated costs Network practitioners use to mitigate SARS-CoV-2 (SC2) transmission risks, by practice type, location, and specialty, periodically over 9 months.

Aim 2: Estimate the effects on practitioner's SC2 mitigation approaches following the dissemination of CORE Registry study data (Aim 1) and changes in knowledge of COVID-19 and guidelines for dental care delivery.

Aim 3: Quantify practitioner-reported comfort levels with SC2 mitigation approaches and costs, at baseline and following dissemination of CORE Registry study results (Aim 1), and identify factors associated with changes in comfort levels, by practice type, location, and specialty.

Aim 4: Establish a modular infrastructure to support the design and conduct of additional multilevel clinical and implementation science research.


Enroll now to participate in the CORE Registry study

What CORE changes are you making to keep people safe during the pandemic?

Join the **COVID-19 Research (CORE) Registry Study** to share approaches you are using to reduce the risks of SARS-CoV-2 transmission in your dental practice.

The purpose of the study is to collect and rapidly disseminate information about the approaches used by Network practitioners to reduce the risks of SARS-CoV-2 transmission in dental offices, mitigation costs, and practitioner comfort levels with these approaches. *U.S. dentists and hygienists are eligible to participate in this survey study.*





The National Dental Practice-Based Research Network

The nation's network

