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National Institutes of Health
National Institute of Dental and Craniofacial Research

60-Minute Focus Group with Practicing Dentists

MODERATOR'S GUIDE

July 12, 2016

Segmentation of Focus Groups

	Washington, DC, Area	Chicago	
Young dentists (Those who graduated from dental school <10 years ago)	2 focus groups	2 focus groups	
Older dentists (Those who graduated from dental school 10+ years ago)	2 focus groups	2 focus groups	
Total number of focus groups	4 focus groups	4 focus groups	8 total focus groups

Each focus group will be composed of approximately nine participants. Discussions are optimal with nine participants present. We will recruit 12 participants and seat nine per focus group to account for a 20 percent standard no-show rate. If more than nine participants show, we will excuse individuals so that the greatest demographic diversity is represented among those who remain. All participants who check in will receive the incentive. Participants in each focus group will represent a mix of genders, races/ethnicities, and general practitioners/specialists.

[During the screening process, participants will be asked to reserve 90 minutes for the focus group. Before the beginning of the discussion, all participants will complete an informed consent form.]

DISCUSSION BACKGROUND AND GUIDELINES (5 minutes)

- Thank dentists for taking the time to participate in the focus group.
- Introduce self (independent researcher).
- Sponsors of project: The American Dental Association (ADA) and the National Institutes of Health's (NIH) National Institute of Dental and Craniofacial Research (NIDCR). The NIDCR is the nation's leading supporter of dental, oral, and craniofacial research.
- The purpose of today's discussion is to hear what you think are the most exciting new developments in dentistry – what they are, how you learn about them, and when you integrate them into your practice. We'd also like to hear what you do when an unusual case comes up in your practice: For example, where do you go to get more information and who might you talk to about it?
- There are no right or wrong answers—your personal experiences as dentists are what is important for this discussion.
- The discussion ends at X:XX. To stay on schedule, I may need to interrupt you to move the conversation forward.
- Please allow each other to get more or less equal "air time."
- Speak one at a time.
- This discussion is being audio-recorded.
- An observer is taking notes and there are colleagues observing from behind the mirror.
- Re: confidentiality: We will use first names only during the discussion. The report will be in summary form, and no individual names will be connected to individual comments.
- Please share your honest opinions. Again, there are no right or wrong answers.
- [Verbal consent] Do I have your permission to proceed? [Allow everyone to respond.]

PARTICIPANT SELF-INTRODUCTIONS (5 minutes)

All of you here are currently practicing dentists. Let's go around the table and please introduce yourself by letting us know:

a) Your first name (we are not recording last names).
b) Your dental specialty, if you have one.
c) Whether you are in a solo or group practice.
d) One aspect of being a dentist that you enjoy.

[All participants will have a card tent with their first names in front of them. If the room has a flip chart, the above will be written on it for participants to see—the flip chart is not to record each participant's responses; the flip chart will only the list (a) through (d) above.]

During the discussion, please state your first name before each comment you share so the audio recording and notes will be easier to follow.

DENTAL, ORAL, AND CRANIOFACIAL SCIENCE TOPICS OF INTEREST (15–20 minutes)

(1) Let's start with a broad question. What do you think is the most exciting development in dentistry today? Why?

[Responses to this question could be wide in range—from insurance, electronic health records, and business/staff issues to dental school debt, patient care, and staying current with technology and other science related issues.]

(2) [If science has not come up, ask] How about new scientific developments in the dental field?

Probe:

- Are there any new research findings that have caught your attention lately?
  - What do you find interesting about this topic?
- Are there science topics you'd like to know more about?

[Listen for the science behind diseases/conditions, technologies, techniques, materials, and treatments. For example, if "dental materials" comes up: What about this is of interest? How can science help you with this issue? See list in Appendix 1.]

[If the science conversation is not progressing well, skip to Activity 1.]

(3) [After the science discussion has run its course, ask] Where do you go for information on new scientific developments in dentistry?

[The discussion may focus on product/procedure reviews. Acknowledge this but try to go to research issues surrounding diseases/conditions or new technologies and materials. (NIDCR does not review products, although ADA does to some degree).]

Probe:

- What sources do you trust?

[See Appendix 2 for a list of potential sources.]

(4) Where do you go for continuing education on dental science?

Probe:

- Where do you go to learn about new technologies, techniques, and procedures?
- What are your preferred communication channels or tools for ongoing learning and continuing education?

[Listen for:

- In-person conferences
- Journal articles (print and online)
- Webinars (Probe: How important is it that they offer continuing education credits?)
- Workshops at dentists' meetings
- Onsite trainings/simulations]

(5) If the NIDCR (National Institute of Dental and Craniofacial Research) and the ADA (American Dental Association) were to produce science information specifically for dentists, what topics would you want to see?

COMMUNICATION FROM THE NIDCR

ACTIVITY #1 (10 minutes)

The NIDCR is in fact considering developing new science information materials for dentists. I'm going to pass around an example of the kinds of information they're thinking of producing, and I'd like to get your thoughts on it. This is just a draft, on dental adhesives. Please take a few moments to read this fact sheet.

[Distribute copies of the fact sheet (Appendix 3) to each dentist and allow a few minutes for them to read it.]

(1) What are your initial reactions to this piece?

Probe:

- What do you like about it?
- What do you dislike about it?

(2) If the NIDCR were to move this information into production, what format(s) would you like to see this information in?

Probe:

- Fact sheets
- Podcasts
- Videos
- Webinars
- Other

COMMUNICATION FROM DENTISTS (15 minutes)

We've talked about the NIDCR communicating research findings to dentists. Now I'd like to flip the conversation to how dentists might communicate unique findings from practice to researchers, with the goal of advancing scientific research. There are a number of examples where observations from practice have sparked new lines of research in the past. Two examples are fluoride in the prevention of caries and the connection between bisphosphonates and osteonecrosis of the jaw.

ACTIVITY #2

I'm going to pass around a picture of an x-ray from a case a few years ago. Take a minute to look at it, and then we'll discuss.

[Pass out the photocopy of the x-ray (Appendix 4) to each participant. Give them a minute to examine it.]

This x-ray was taken as part of a patient's comprehensive examination. The patient was at the NIH Clinical Center. What do you notice from this picture?

[If asked about the x-ray reply, "I'm not a dentist, but I'm told there are unusual bone malformations in the jaw."]

[Note: Participants may also comment that the x-ray was taken with an expensive machine. Have them focus on the x-ray, not the technology.]

(1) What would you do if this were one of your patients?

(2) What if you saw this malformation in two patients who were siblings?

[Note: this condition was seen in two sisters who came to the NIH Clinical Center because of a rare bone disease.]

(3) How would you seek more information about this unusual observation?

(4) Would you try to report this to anyone? Who might you report it to?

[See if the National Dental Practice-Based Research Network (NDPBRN) comes up. No need to mention it yet if it does not.]

Probe:

- Would you consider contacting a clinician or researcher who works on bone development?

(5) What could the NIDCR and the ADA do to make it possible for you to communicate unusual findings like this to researchers?

[If the participants are slow to answer, move to the final discussion points.]

CLOSE (5 minutes)

(1) Before we wrap up, do you have any final comments on how the NIDCR and the ADA might encourage more dialogue between dentists and researchers?

(2) What I'd like to do next is ask the observers if they have any additional questions or need clarification on any of the issues we've discussed.

While I do that I'll send around two bits of information related to our discussion here today, which you're welcome to take home with you:

1) A handout on the NIDCR-funded National Dental Practice-Based Research Network which provides practitioners with the opportunity to conduct studies in the "real world" environment of their dental practices to help answer research questions that are directly relevant to clinical practice.
2) A recent commentary from the *Journal of the American Dental Association* that the NIDCR Director wrote on bridging research and practice.

[Ask any questions from the observers.]

Thank you very much for your time and valuable input. Your contributions today will help the NIDCR and the ADA as they work to enhance communication between dentists and researchers, and to bring these two groups closer together.

APPENDIX 1 – Potential Topics for Science Discussion

Disease Areas

- Burning mouth syndrome
- Cleft lip and palate
- Cracked teeth/outcomes of cracked teeth
- Dentin hypersensitivity
- Diabetes and oral health
- Dry mouth (xerostomia)
- Gum/periodontal diseases
- Heart disease and oral health
- HIV/AIDS
- Occlusal carious lesions
- Oral cancer
- Oral human papillomavirus infection
- Osteonecrosis of the jaw (ONJ)
- Pain (oral, facial)
- Pregnancy
- Saliva and salivary gland disorders
- Sjögren's syndrome
- TMJ (temporomandibular joint and muscle disorders)
- Tobacco (novel tobacco products)
- Tooth decay (caries)

Techniques/Technologies

- Composite dentistry
- Crown placement
- Digital radiography
- Fillings (amalgams)
- Genetics/genetic services/genomics/DNA testing
- Imaging/new imaging technologies
- Implants
- Lasers
- Tissue regeneration/mechanisms for bone regeneration
- Ultrasonics

Materials

- Ceramic and bonding material
- Dental adhesives
- Dental materials
- Fluoride
- Invisaline™
- Probiotics in toothpaste
- Sealants

APPENDIX 2 – Potential Sources of Science Information for Dentists

- Journals (e.g., *JADA [Journal of the American Dental Association], Journal of Dentistry, Journal of Dental Research, Journal of Dental Sciences, Dentistry, British Dental Journal, Journal of the California Dental Association, Dental Abstracts, Dental Cadmos, Dental Clinics, Dental Products Report, Dental Economics, Practical Periodontics and Aesthetic Dentistry, The Lancet, JAMA*)

- Cochrane Reviews

- Conferences/meetings

- Webinars/continuing education courses

- American Dental Association (ADA)

- NIH/NIDCR

- Academy of General Dentistry
- American Academy of Periodontology
- American Association of Endodontists
- American Association of Oral and Maxillofacial Surgeons
- American Association of Orthodontists
- American Board of Pediatric Dentistry
- International Association for Orthodontics
- International Association of Dental Research
- National Maternal and Child Oral Health Resource Center
- National Museum of Dentistry
- Oral Health America

- Other dentists/doctors/pharmacists/colleagues

- Online Dental Sites:
    - Dr. Bicuspid
    - Dentaltown
    - Dental Elf
    - Gordon Christenson

APPENDIX 3 - BUILDING A BETTER BOND

Experts estimate that more than half of the composite dental restorations done every year will have to be replaced, often within 7 to 10 years.

The lifespan of a composite restoration depends on a number of factors that can cause the restoration to fail, including mechanical stress caused by mastication, and the bacteria and bacterial enzymes in saliva that can degrade the composite as well as the adhesive used to attach it.

Because the composite material used for restorations is too viscous to bond directly with the dentin of the tooth surface, a thin layer of adhesive is applied to help seal the bond between tooth and filling. This makes the integrity of the restoration dependent upon the strength and tightness of the seal formed between the adhesive, the composite filling, and the dentin.

This thin line of adhesive often becomes the weakest link in the restoration. If tiny crevices open up anywhere along the seal, bacteria have a way to get past the seal and into the tooth. Inflammation and additional decay will eventually undermine the stability of the restoration.

The ideal dental adhesive should make a nontoxic, strong bond between composite and dentin that is impervious to the wet environment of the mouth. Current adhesives work well enough, but NIDCR supported researchers in labs across the country are figuring out how to make adhesives that are stickier, stronger, and more moisture resistant -- and they are looking for solutions in some surprising places.

One of those places is in the rocky outcroppings of ocean shorelines, where the common mussel sets up housekeeping by clinging tenaciously to slippery surfaces in intertidal areas. Even though salt water severely limits what can bind and where, the mussel is able to make exceptionally strong bonds with wet surfaces.

The bysuss (what we commonly call the mussel's beard) is a tangle of threads the bivalve uses to securely attach itself to any stable surface in water. Each byssal thread is tipped with an adhesive plaque. Once the plaque attaches to a solid surface, the threads secrete proteins --researchers call them mussel adhesion proteins, or MAPs. MAPs contain an amino called DOPA (L-3,4-dihydroxyphenylalanine) that is unique to mussels and acts to crosslink and connect other proteins into a difficult to dislodge bond between the mussel and its new home.

Two groups of researchers at the Universities of California at Santa Barbara and at Berkeley are characterizing the adhesive chemistry employed by mussels and exploring how to mimic the biochemistry of MAPs using synthetic polymers that can be turned into dental adhesives.

One of these adhesives uses a variant of DOPA called *catechol* to add strength. However, instead of crosslinking proteins as MAPs do to make their bond, this adhesive uses catechol to crosslink medical-grade plastic polymers. The group at Berkeley has recently patented a polymer composite than can be injected or delivered in a liquid form and is hardened using the usual process of photocuring. Additional studies are looking into the unique structural properties of byssal threads that enhance adhesive strength, and seeking ways to translate those insights into tougher adhesives.

On the edge

Recurrent decay is the primary reason for restoration failure, and most recurrent decay happens at the gingival margin of the composite. Here, the adhesive and its bond with dentin is the only barrier between the restored tooth and the bacteria found in saliva. When the bacterium *Streptococcus mutans* attaches to these surfaces, it creates an environment that supports the subsequent attachment and growth of other bacteria. This forms what scientists call a biofilm – a micro-ecosystem of bacteria – and what we commonly call dental plaque. Biofilms appear to accelerate the degradation of dental composites.

Biofilm can't be completely eliminated in the mouth, but an NIDCR supported researcher at the University of Kansas and her group are working to develop an adhesive that combats the pathogenic impact of biofilm at the gingival margin. They are engineering an adhesive that limits the ability of *S. mutans* to attach to dentin and neutralizes the micro-environment around it to prevent damage to the adjacent tooth structure.

Such an adhesive formulation should make a restoration that is more resistant to decay and degradation.

Battling bacteria

Another group funded by an NIDCR Small Business Technology Transfer (STTR) grant is already conducting Phase I testing to establish the effectiveness and commercial potential of an adhesive that incorporates copper iodide particles polymerized with polyacrylic acid (PAA-CuI) that could provide long-term antimicrobial protection at the edges of the bond between tooth and composite.

The development of this adhesive also addresses the weak point of the composite restoration – the area where the adhesive bonds the composite to the dentin. Preliminary testing has shown that the addition of PAA-Cul to the adhesive gives it antimicrobial activity against *S. mutans* for up to a year, compared to other products currently on the market that provide protection for only 14 days at the most.

Additional testing will hopefully confirm that this kind of protection against harmful bacteria in the mouth will actually reduce or prevent decay around the margins of composite fillings. The scientists will also have to confirm that the addition of PAA-Cul doesn't have a long-term effect on the integrity of the bond between the composite and the tooth.

Further studies will focus on gaining FDA clearance to conduct human clinical trials. If successful, this product could significantly advance the field of dental adhesive technology by inhibiting decay and extending the lifespan of composite restorations.

APPENDIX 4 – X-ray