

Medical Devices
Patient Engagement in Real World Evidence:
Lessons Learned and Best Practices

Patients and Patient Group Perspective
Presentation by Terrie Cowley, President and Co-Founder,
The TMJ Association

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University of Maryland School of Pharmacy, Baltimore, MD

Thank you for inviting me to give you patient's perspectives on temporomandibular disorders, some history of TMJ devices; tell you about the TMJ Patient-Led RoundTable that we developed in response to implant problems. I think you'll see patient's needs and even solutions interspersed throughout my talk.

We refer to the temporomandibular joint as TMJ, but TMD when referring to the complex condition.

- 36 million people are affected to some degree
- Almost 90% are women in their childbearing years
- A multitude of treatments are recommended to patients, most without evidence of safety or efficacy
- There is no TMD specialty in either medicine or dentistry
- There are no drugs or biologics labeled for TMD
- A study dating back to 1992 estimated the annual cost of TMD treatments to be 32 billion dollars (today 52 billion w/ inflation)
- We are talking about a set of conditions that are under-researched and poorly understood.

Temporomandibular disorders cause pain and dysfunction in the jaw joint and muscles that control jaw movement. With increasing severity, a person's ability to speak, chew, swallow, make facial expressions, and even breathe becomes compromised.

This joint is the most complex in the body but subject to the same problems that affect other joints. The most common problem is tearing or displacement of the cartilagenous disc that acts as a cushion between the skull and the mandible. To address this problem, in the 70's and 80's two materials were introduced to replace the disc – Dow Corning Dacron reinforced Silastic sheeting and Vitek's Teflon-coated Proplast. Both frequently failed resulting in a range of serious reactions including giant cell formation, fibrosis, calcification, perforation, fragmentation and migration, shattering of the materials, foreign body synovitis, severe pain and development of systemic conditions. The FDA issued a Class I recall of the Vitek implant in 1991 because the material penetrated the skull and migrated into the brains of patients. The manufacturer moved his patents off shore and fled to Switzerland to avoid prison and resume his business. FDA was left to handle its first Class 1 recall. Dow Corning discontinued labeling Silastic

for TMJ trismus after a 1992 Congressional hearing titled, “Are FDA and NIH Ignoring the Dangers of TMJ Implants? Both materials had been cleared by the FDA. There were no registries and few patients were notified by FDA, surgeons, or manufacturers.

Currently three TMJ device manufacturers have FDA-approved total joint devices. In 2011 the FDA conducted an analysis of MedWatch Reports on these devices and issued a 522 order to the manufacturers to conduct post-market surveillance studies. They found that 52%— had to be explanted less than three years after implantation because of pain and device problems which include loosening, noise, fracture, and breaking. There is no registry for these devices.

I co-founded The TMJ Association in 1986 in Milwaukee, as a patient support group after having TMJ implants in 1982. We’ve been the 911 for patients ever since. We understand their needs and take their plight everywhere – to professional meetings, to the Hill, to the media, and to multiple government agencies. With the help and support of outspoken individuals we are making progress. (Inches make Champions)

One such person was Dr. Jeffrey Shuren Director of the Center for Devices and Radiological Health. I took my idea of bringing all TMJ stakeholders to the table so that we could hear each other out, discuss the problems we face and ultimately solve them. I asked for FDA’s inclusion and his response was, “If you get all the right people to the table, I’m in.” With the backing of Drs. Shuren, Marinac-Dabic, Eloff and many others, the RoundTable was born and all stakeholders were at the table - FDA, NIH, the Agency for Health Care Research and Quality, the American Association of Oral and Maxillofacial Surgeons, TMJ device manufacturers, clinicians, scientists, other pertinent experts and most important - patients.

There were compelling reasons for developing the TMJ Patient-Led RoundTable at this time. As device problems mounted, so too was the animosity, distrust, frustration, anger and betrayal patients felt. They were betrayed by the government whose job is to protect the health of the public, betrayed by providers whom patients trusted with their lives and from whom they expected no harm. And when the harm occurred, there were no solutions for the disfigurement, the paralysis, inability to chew, swallow, talk, and the severe pain and subsequent medical conditions they experienced. Their medical doctors knew nothing about TMD or TMJ implant related medical issues. Patients were essentially, left to their own devices.

They responded by educating themselves, reading professional journals, wondering why their problems were never mentioned in these journals, attending professional webinars and meetings, exchanging experiences within chat rooms and boards, discussing the pros and cons of various surgeons and procedures, and questioning why TMJ devices and other treatments led to certain problems and why were they so sick with other medical conditions. Basically patients questioned everything about how TMJ is perceived, researched and treated. They wanted accountability and they wanted answers; and they want them now more than ever!

At the first RoundTable meeting, held in June of 2016 at the FDA, 12 TMJ patients relayed their tortuous journey through TMJ treatments, including multiple surgeries and

implants and the impact this had on their lives. The physical distance traveled fails to speak to the days of recovery that would follow just to be present at this meeting. They also paid their travel expenses even though most were treatment poor. They also highlighted the many areas of TMJ needing a total paradigm shift. The reason given by these patients for being involved in the RoundTable is so that this never happens to anyone else again. The other stakeholders were interested in hearing and learning from the patients about how to “do better.”

A Steering Committee and 4 Working Groups were formed to address the issues raised. Patients are equal partners; serve on the Steering Committee, as co-chairs of the working groups and members. Nobody is addressed by their title. There are no experts here. The initial goal was to explore ways to improve TMJ implant treatment outcomes. However, in planning meetings it became clear that the scope of the project had to expand if we were to fully understand and address what was happening with devices.

- A UK study found that 39% of TMJ patients are sensitive to the implant materials. Response to a survey we conducted of patients found 43% had allergies before TMJ. Patients develop sensitivity issues from day 1 or years after implantation. And the presence of the implant appears to trigger a cascade of health problems. So it makes sense that we should learn the environment into which a device was implanted. In other words, what are the characteristics of a patient’s physiological systems that are likely to predict whether the patient will benefit from or be adversely affected by the presence of an implant of certain materials in their body. So we needed to summarize the state of TMJ science and determine if we have the information to answer that question.
- Learn what outcomes are important to the patients (perhaps it’s no big deal if you live in Green Bay and have frostbite in the shape of the implant on your face in winter, but it is important if the pain is leading you to suicide or you are so deformed that children in a grocery store ask their mother, why is that lady so ugly?)
- Learn if the routinely prescribed TMJ treatments lead a patient on a path to increasingly aggressive treatments such as implants and whether these treatments are evidence based
- Learn what protocols, guidelines, best practices direct the practitioners and if these are evidence based and patient centered.
- Learn how TMD is taught in dental, medical and other health care disciplines and if the information is evidence based and patient-centered.

The second RoundTable meeting was held in May of this year. Each group presented results of their research.

From Group 1: We learned that there is insufficient scientific information to ascertain who will or won’t benefit from TMJ implants. That group is already developing a research plan to address the gaps they identified across all of TMJ research.

Group 2: is in the process of developing patient reported outcomes using information provided by patients. This information will be used to inform patient and professional decision making.

In the 1930s TMD was turfed to dentistry. Group 3 found there are brief scientific statements, parameters of care, but no formal guidelines for TMD treatment formulated by professional groups. That information was gleaned from reviewing 24 dental professional organizations that profess to diagnose and manage TMD. In spite of recent scientific progress demonstrating that TMDs are complex, multi-factorial, multi system disorders with a complicated etiology and pathology, multiple comorbid pain conditions, non-pain conditions, outdated mechanistic therapies that lack evidence of safety and efficacy and can lead to harmful irreversible changes in occlusal relationships and jaw positions continue to dominate TMD practice. In other words, for many, we are treating a systemic problem by focusing only on teeth and jaws. As for education, there is no formal Commission on Dental Accreditation requirement to teach TMD - hence, no educational standards. TMD is not taught in medical schools.

Group 4: will incorporate results from Working Groups 1-3 into a coordinated data network to develop comprehensive patient-centered information.

The two years of RoundTable research have opened other areas patients would like to be addressed.

One is the joint itself. We have already developed such research questions as; what impact does chiseling and sawing heterotopic bone away from the skull, drilling screw holes into the skull have on the brain? And what causes heterotopic bone to grow in so many patients? Do microscopic implant particles pass the blood brain barrier? What about the leached fluid from the corroding metals? The jaw joints are a meager quarter inch from the brain. The group will look to future solutions such as the potential for regenerative medicine that could eliminate the use of material devices.

We need to revisit the consent process. All too often we hear from patients with failed implants that there is no way they could comprehend the outcomes they experienced from simply reading them on paper. As one patient said, "If I knew I would be tied to an oral surgeon for the rest of my life, I never would have signed that form." Pain, desperation and trust in the surgeon can veil the possibility of what can happen to them.

Burden of the disease. We need an updated study of the costs to individuals and society at large of implant failures and associated medical costs, and out of pocket expenses. Related to that are insurance company policies on all treatments for TMJ, find out if they're evidence based.

Perhaps the greatest device related problem is on the lives of the patient and their loved ones. The psychological damage is all too often neglected and it is the one thing that permeates every aspect of a patient's and loved one's lives.

We began by simply wanting to know how many patients are helped by TMJ devices and how many are harmed but learned if we got that information it wouldn't tell us why. And when we asked why we learned that the success or failure of implantable devices depends upon many factors in the ecosystem and all are important and interdependent.

The science - physiological systems of the patient and natural history of the condition, the existence of professional guidelines, implant procedure protocols and whether or not they are based upon evidence and adhered to, and scrupulous tests of the device itself to establish clinical evidence of safety and effectiveness. And most of all, what outcomes that affect the rest of their lives patients find important.

RoundTable patients had much to say about what they wanted about future oversight on devices but their primary demand was for an implant registry. A registry is imperative so that implant recipients can be quickly notified of any potential harm that is found associated with a particular device. The registry could be a powerful resource to contribute to the science of a condition and predict who will or won't do well with an implant, if it collected health information and biomarkers of the implant recipient before and following implantation. The registry should follow the life of a recipient after explanation for we have learned that implant particles have remained and continue to cause serious problems for years.

Implant retrieval analysis would inform about device design, structural and material problems. In terms of the mechanics of establishing the registry, each stakeholder should be assured privacy in entering information into his or her unique portal. We expect there will be discrepancies among the reports which could then be investigated; however the fact that privacy will be protected will eliminate the emotional blackmail patients feel when their reports are viewed by their surgeons or manufacturers.

Information obtained from ongoing registry analysis could become the "Gold Standard" of information that professionals and patients could go to for the most current and credible information on a specific device.

All conditions and their related implants which you may be involved with may differ greatly from TMJ but I do hope you'll find some ideas that you can apply to your area of expertise.