Early Treatment of TMJ May Prevent Chronic Pain and Disability

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An estimated 75% of Americans will experience symptoms of temporomandibular joint and muscle disorder (TMJMD) in their lifetime. Studies show that the prevalence of TMJMD varies widely. In any given year, approximately 20 million adults (10% of women and 6% of men) have TMJMD pain. About 5.3 million people seek treatment for TMJMD within 6 to 12 months after onset of symptoms, with direct costs of treatment alone conservatively estimated at $2 billion annually.

Although adequate data are lacking on indirect costs, research indicates that 28% of TMJMD patients report disability and limitations, as well as unemployment. Assuming that indirect costs would most likely exceed direct costs, projections from research put the total cost of TMJMD in excess of $4 billion per year. Thus, TMJMD is clearly a fiscal burden to both patients and society.

For many, symptoms of TMJMD resolve on their own without significant medical intervention; however, 5% to 10% of adults suffering from TMJMD symptoms require professional treatment. If pain persists beyond 3 to 6 months, the condition is considered chronic. Clinicians would benefit from an evidence-based method of determining which patients are at increased risk for developing chronic pain, as well as from empirically supported clinical interventions aimed at preventing acute pain from becoming chronic.

The goal of this article is to review clinical studies to identify high-risk patients and suggest early interventions that may be used successfully during the acute phase of TMJMD.

The Problem of Pain
Temporomandibular joint (TMJ) pain is part of a broad category of disorders involving the muscles of mastication and the hard and soft tissues of the TMJ. A complex disorder, TMJMD may involve disc displacement, muscle disorders, internal derangement and/or degenerative changes in the joint, or combined muscle-joint disorders. According to Glaros and Lausten, the primary symptoms of TMJMD are: pain in the muscles of mastication in the preauricular area or in the TMJ; clicking, popping, or grating sounds in the joint; difficulty in opening the mouth wide; patients’ perception that their occlusion or bite is “off”; and jaw locking in the open or closed position.

Patients often cite pain as the principal reason for seeking medical or dental care. Managed care treatment costs per year for orofacial pain range from $12,000 to $20,000 per person. Von Korff, Lin, Fenton, and Saunders studied 372 TMJMD patients over a 3-year period, concluding that this pain population visited more healthcare providers than controls. As healthcare costs continue to escalate, research indicates that some cognitive-behavioral treatments offer a significant medical cost offset. Thus, not only are there physical and psychosocial benefits associated with preventing the progression from acute to chronic TMJMD, there are financial benefits, as well.

Clearly, there is a need for more effective and economic treatment modalities. More than a decade has passed since Stohler and Zarb urged the scientific community to adopt a “low-tech, high prudence therapeutic approach” to assessing and treating TMJMD. Since then, attention has shifted toward a behavioral medicine approach for treatment of TMJMD.

As the duration of pain increases, patients become more unresponsive to intervention. Conventional treatment of TMJMD includes surgery, occlusal adjustments, and pharmocotherapeutic techniques. Intra-
oral appliances, nocturnal alarms, and physical therapy have also been used; however, conventional treatments fail to address the psychosocial factors of this painful, complex disorder. A comprehensive biopsychosocial (BPS) model and guidelines for applying the model to diagnosis and treatment is needed.

The similarities between TMJMD and low back pain (LBP) were first published by Dworkin. The prognoses for both disorders are normally recurrent and often chronic. Furthermore, the severity of pain and related unhealthy behaviors are highly inconsistent both between patients and over time. As noted by Von Korff, TMJMD, like LBP, can be described as “an illness in search of a disease.” Low back pain and TMJMD often are idiopathic in nature. Invasive treatments have not been shown to be as beneficial or cost-effective as hoped. Because of the similarities between the disorders, several TMJMD studies have paralleled the clinical research program on LBP by Gatchel et al.

**Study Outcomes**
Mishra, Gatchel, and Gardea compared the effectiveness of biofeedback (BFB), cognitive-behavioral therapy (CBT), combined biofeedback and CBT, and nonintervention on patients with TMJMD. Biofeedback was shown to be the most effective in pain reduction. The three treatment groups also had significantly reduced pain scores (from pre- to post-treatment) and significantly better mood scores relative to the nonintervention group.

The same researchers followed the original study with a 1-year outcome evaluation. All treatment groups sustained therapeutic gains from pre-treatment through 1-year follow-up, relative to the nonintervention group. At one year, the greatest improvements were found in the BFB/CBT group, relative to the group that received BFB alone. The researchers concluded that treatment received in the BFB group was directly associated to the patients’ primary physical pain complaint and likely contributed to greater significant gains immediately post-treatment. This association may have influenced patient motivation to complete in-session treatment and comply with home practice.

Improvements noted in the combined BFB/CBT group at 1 year may be due to the amalgamation of short-term benefits of BFB and long-standing benefits realized after CBT, resulting in a modification of lifestyle. Resulting change following CBT requires more time to fully understand, accept, and put changes into practice. Immediate positive outcomes provided by BFB intervention, combined with longer-term gains provided by the CBT treatment, were thought to elucidate the increased improvement in both physical and emotional functioning of the 1-year BFB/CBT group.

**Early Intervention vs. Nonintervention**
The aforementioned studies initiated the trend toward a biopsychosocial treatment approach. This low-cost and noninvasive therapeutic method stimulated a series of studies supported by the National Institutes of Health of acute patients with TMJMD. The first issue addressed in this series of studies was whether the progression from acute to chronic TMJMD pain could be prevented by early intervention with patients considered at risk for developing chronic pain. Epker, Gatchel, and Ellis created a statistical algorithm (based on a logistic regression model) using certain components of the Research Diagnostic Criteria/Temporomandibular Disorders (RDC/TMD).

It was found that this algorithm could successfully categorize the risk status of 91% of these patients for developing chronic TMJMD at one-year follow-up. In subsequent studies, it was hypothesized that early intervention with high-risk (HR) patients would produce lower levels of pain at 1-year follow-up, compared with patients not receiving early intervention. It was further theorized that the early-intervention patients should result in increased levels of coping and decreased emotional distress at 1-year follow-up.
A study by Gatchel, Stowell, Wildenstein, Riggs, and Ellis\textsuperscript{20} clearly supported these hypotheses. Early intervention significantly lowered the prevalence of chronic pain and emotional distress, relative to those patients at high-risk for chronic TMJMD who did not receive early intervention. The outcome data, reviewed in the Table, showed significant differences between the HR early intervention and the HR nonintervention groups at 1-year follow-up.

As shown in the Table, patients classified as HR-acute TMJMD who received early intervention exhibited significantly fewer signs of chronicity on measures of pain, healthcare utilization related to jaw pain, and emotional distress (as measured by symptoms of maladaptive coping styles and psychopathology, including depression), in contrast to patients categorized as HR-acute TMJMD who did not receive early intervention. Early intervention had a major impact in diminishing emotional distress and for prospectively yielding a reduction in healthcare costs. Additionally, researchers noted more healthcare visits related to jaw pain by patients who did not receive early intervention.

To evaluate the cost-effectiveness of early intervention vs. nonintervention, Stowell, Gatchel, and Wildenstein\textsuperscript{21} launched a comprehensive study. Healthcare costs related to jaw pain were collected from all patients for the duration of the study (ie, initial complaints of pain to the 1-year milestone of the study). Expenses included costs for healthcare visits, treatments requiring appliances/splints, travel distance and time to visits, medication, and the like. When compared with the intervention group, there were significantly greater costs associated with the nonintervention group. The nonintervention group spent an average of $422.91 per person, whereas the early intervention spent an average of $131.84. These costs do not include averages at the initial intake, as there were no differences between the two groups.
To determine if early BPS intervention and the benefits achieved at 1 year in patients with acute TMJMD pain were maintainable, Robinson studied long-term (2 to 6 years) follow-up post-treatment results. Her findings supported sustainability, with the early intervention group exhibiting reduced pain and fewer indicators of depression at long-term follow-up, compared with the nonintervention group. Moreover, patients who received early intervention reported a continuation in use of coping/management skills long-term. Patients rated early intervention as helpful, with 96% very likely or likely to recommend intervention to others. Also, as demonstrated in the Figure, patients who received early intervention had fewer visits to healthcare professionals for jaw-related pain compared with patients who did not receive intervention. These results are quite promising and underscore the efficacy and sustainability of early biopsychosocial intervention.

Cognitive-behavioral therapy in combination with BFB is effective in the treatment of TMJMD pain, as initially demonstrated in a meta-analysis by Morley, Eccleston, and Williams. Other research demonstrates that BPS intervention is effective, regardless of medical diagnoses. The efficacy of CBT for TMJMD patients has been shown in a number of studies, further validating the clinical value of this treatment.

**Barriers in Clinical Practice**

What might prevent efficacious, cost-effective interventions from becoming the standard of care in clinical practice?
Secondary gain needs to be considered when treating patients who are disabled as a result of chronic pain. Long considered a factor that can perpetuate chronic pain and disability, secondary gain has been widely explored in the literature.\textsuperscript{31,32}

A less-studied concept that may explain continued illness and disability in chronic pain patients is the concept of tertiary gain. First defined by Dansak in 1973,\textsuperscript{33} tertiary gain is defined as those gains sought or received by someone other than the patient as a direct result of the patient’s illness. To illustrate this concept, Dersh described gains that a patient’s spouse may receive (eg, greater freedom in day-to-day activities and increased control or power within the spousal relationship).\textsuperscript{34} Unfortunately, spouses and family members are not the only potential beneficiaries of a patient’s illness. Healthcare professionals, healthcare systems, pharmaceutical companies, and even the government also can obtain tertiary gain from chronic illness.\textsuperscript{35}

**Conclusions**

The last decade began with a call to find cost-effective treatments and early interventions that could prevent musculoskeletal disorders from moving beyond the acute phase into an intractable chronic phase. Linton\textsuperscript{36} posited that we must find ways to identify patients at high risk for chronicity and deliver treatment early. Interventions for acute LBP and acute TMJMD have been developed; thus, a great deal of progress has been made. However, we must remain focused on bridging the gap between research and implementation into clinical practice.

Our next challenge is to persuade constituents to embrace cost-effective, evidence-based approaches for early intervention in TMJMD. Collaboration between primary care providers and pain management specialists must be encouraged. Standards for interdisciplinary pain management teams need to be developed to ensure an integrated, consistent treatment approach and accurate tracking of outcomes. According to Frohm and Beehler,\textsuperscript{37} bringing healthcare stakeholders to the table to form a consensus is an important step in making systemic change. Even as consensus is found, change to a healthcare system as large as that of the United States is likely to occur slowly. As daunting as the task may be, it must be done if we are to provide the best outcomes for patients suffering from such complex disorders as chronic pain.

**References:**

11. Stohler CS, Zarb GA. On the management of temporomandibular disorders: A plea for a low-tech,
high-prudence therapeutic approach.  


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