June 1999

TMD Treatment and Coverage Issues: A Survey of Connecticut Dentists

Rene N. Lopez

Follow this and additional works at: https://opencommons.uconn.edu/uchcgs_masters

Recommended Citation
https://opencommons.uconn.edu/uchcgs_masters/70
TMD Treatment and Coverage Issues: 
A survey of Connecticut dentists

Rene N. Lopez

B.A., University of Rhode Island, 1993

A Thesis
Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Public Health
at the
University of Connecticut
1999
Master of Public Health Thesis

TMD Treatment and Coverage Issues: 
A survey of Connecticut dentists

Presented by

Rene N. Lopez, B.A.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval Page</td>
<td>ii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>iv</td>
</tr>
<tr>
<td>List of Figures</td>
<td>v</td>
</tr>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>2. Methods</td>
<td>3</td>
</tr>
<tr>
<td>3. Results</td>
<td>6</td>
</tr>
<tr>
<td>4. Discussion</td>
<td>11</td>
</tr>
<tr>
<td>5. Conclusion &amp; Recommendations</td>
<td>18</td>
</tr>
<tr>
<td>6. References</td>
<td>21</td>
</tr>
<tr>
<td>7. Appendices</td>
<td>22</td>
</tr>
<tr>
<td>A. TMJ Treatment Coverage: A survey of dentists</td>
<td>23</td>
</tr>
<tr>
<td>B. Tables</td>
<td>28</td>
</tr>
<tr>
<td>C. Figures</td>
<td>31</td>
</tr>
</tbody>
</table>
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>App.B.I.</td>
<td>Five issues explored by questionnaire</td>
<td>29</td>
</tr>
<tr>
<td>App.B.II.</td>
<td>Diagnostic imaging</td>
<td>30</td>
</tr>
</tbody>
</table>
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>App.C.I</td>
<td>Connecticut oral health provider response rates for TMD treatment issues survey</td>
<td>32</td>
</tr>
<tr>
<td>App.C.II</td>
<td>Mean number of TMD patients seen per year by Connecticut dentists over past 5 years</td>
<td>33</td>
</tr>
<tr>
<td>App.C.III</td>
<td>Percentage of TMD patients that the dentist treated, treated with referral, or directly referred</td>
<td>34</td>
</tr>
<tr>
<td>App.C.IV</td>
<td>Primary reason for dentist to refer TMD patients to another provider for treatment</td>
<td>35</td>
</tr>
<tr>
<td>App.C.V</td>
<td>Percentage of dentists who use diagnostic imaging for TMD treatment</td>
<td>36</td>
</tr>
<tr>
<td>App.C.VI</td>
<td>Diagnostic imaging: Patterns of use by dental provider group</td>
<td>37</td>
</tr>
<tr>
<td>App.C.VII</td>
<td>Relative importance of “patients’ difficulties in handling the costs associated with appropriate care” in the providers’ decision to treat or refer TMD patients</td>
<td>38</td>
</tr>
<tr>
<td>App.C.VIII</td>
<td>Percentage of dentists who experienced patients declining treatment or referral due to a lack of insurance reimbursement for TMD care</td>
<td>39</td>
</tr>
<tr>
<td>App.C.IX</td>
<td>Providers’ perception of whether lower income patients declined TMD treatment more often than middle and upper income patients</td>
<td>40</td>
</tr>
<tr>
<td>App.C.X</td>
<td>Percentage of dentists who experienced difficulties in collecting payment due to a lack of insurance reimbursement for TMD care</td>
<td>41</td>
</tr>
</tbody>
</table>
Introduction:

Temporomandibular disorders (TMD) are a collection of related disorders involving the masticatory musculature, temporomandibular joint (TMJ) and associated structures, or both that share many common symptoms. (McNeill, 1997) The pain reported by TMD patients is typically located in the muscles of mastication, in the preauricular area or in the TMJ. The pain caused by TMD is recognized as the most common non-tooth related chronic orofacial pain conditions and accounts for approximately 40% of all cases seen in major pain clinics. (McNeill, 1997) A U.S. national survey found that 33% of the population present with at least one TMD symptom, while 40% to 75% have at least one sign of joint dysfunction. (Okeson et al., 1996) However, due to a lack of an agreed upon definition for TMD, prevalence figures should be interpreted carefully. (Rough and Solberg, 1985)

The symptoms of TMD are often self-limiting or remittent, and it is estimated that only 3.6% to 7% of the population with signs or symptoms need treatment. (Okeson et al., 1996) However, the pain and disability associated with TMD can be great. Disabling TMD costs society an estimated 17.8 workdays per year for every 100 full-time working adults. (Okeson et al., 1996)

Due to the varied symptoms of TMD, patients may seek care from an array of health care providers, including dentists, physicians, psychiatrists, chiropractors and physical therapists due to possible head, neck, shoulder, and/or back pain. (Glaros et al., 1995) There has been considerable research on the prevalence, diagnosis, and treatment of TMD. (Shimshak and DeFeria, 1998) While there has been some
research into the insurance utilization of TMD patients, such research has focused on the cost of TMD care, but not upon the ramifications of cost on care. In fact, a search of the literature found no articles on the influences of economic and professional parameters upon the patterns of care provided to TMD patients. Within dental and medical journals numerous “letters to the editor” have appeared voicing concerns over the disparity in third party coverage that exists for TMD in comparison to the coverage that exists for the afflictions of other joints. These concerns are not isolated to these editorials; personal communications with dental providers have elicited similar remarks. Due to concerns based on this matter, the Connecticut State Dental Association (CSDA) and the Connecticut Society of Oral and Maxillofacial Surgeons (CSOMS) requested and funded this survey of their membership.

The specific aims of this descriptive mail survey were to describe the patterns of care provided to TMD patients by Connecticut dentists and the factors that determine those patterns of care, especially the professional and economic parameters. The primary underlying research question was “Is the treatment of people afflicted with TMD impacted by a lack of third party coverage for TMD?”
Methods:

An investigator-developed questionnaire was generated in collaboration with the CSDA and the CSOMS. The focus of the questionnaire was to assess the status and perceptions of Connecticut oral health care professionals on issues associated with the care and management of TMD patients. The issues identified for examination were: 1) the number of TMD patients seen; 2) professional education on TMD; 3) TMD referral options; 4) economic implications for providers and patients; and 5) treatment and patient management patterns utilized by providers for TMD.

The study subjects were drawn from general dentists and oral and maxillofacial (OMF) surgeons practicing in Connecticut. The sample for the general dentists was obtained utilizing unabridged member listings of the CSDA, while the sample of OMF surgeons was provided by the CSOMS. A third sample (comprised of general dentists from Connecticut) self-identified and defined as “high TMD interest” dentists was obtained through the director of a Connecticut-based TMD advocacy group. Overall, the final sample contained 509 general dentists (a 30% random sample of the CSDA stratified by local society), 85 OMF surgeons (a 100% sample of the CSOMS), and 133 “high TMD interest” dentists (a 100% self-identified convenience sample). Prior to the 30% random draw from the CSDA membership list, the general dentists that had been self-identified as “high TMD interest” were removed from the CSDA membership list to avoid duplication. Each selected provider was then assigned a unique identification number that categorized the subject into one of the above three dental care sub-divisions.
The authors developed the survey instrument in consultation with the CSDA and CSOMS. During these consultations, conceptual dimensions were identified based upon the underlying main research question of “Is the treatment of people afflicted with TMD impacted by a lack of third party payment?” Further meetings focused on converting the conceptual dimensions into operational variables for analysis. The self-administered questionnaire was composed of 11 questions. The majority of question responses were close-ended and varied from simple yes/no responses to five point Likert scales. Where applicable, secondary open-ended questions were used to allow for additional commentary by the respondents. The questionnaire (Appendix A) was pilot tested in multiple rounds with discussion sessions to increase the instrument’s content validity. Questionnaire completion time was kept below 10 minutes to increase the return response rate. The questionnaire was first mailed to all selected providers on January 21, 1995. Per the protocol, three rounds of mailings were completed by March 14, 1995 to maximize the return response rate.

The overall focus of the questionnaire was to assess, for Connecticut, the views of dentists concerning the nature and constraints of TMD care, and their implications for patients, providers and upon the care being prescribed and pursued. To this end the questionnaire was designed to ascertain the perceptions of oral health providers on five issues pertinent to the care of patients with TMD. (Table 1) The first issue dealt with the current treatment and management regimens utilized for the care of TMD patients in Connecticut, as well as the provider estimated volume of
TMD patients being seen yearly by Connecticut providers. Secondly, the questionnaire attempted to gain insight into the providers’ perceptions on the status of current TMD treatment resources in Connecticut with the main focus being on professional education and referral options for TMD care.

The third issue explored the providers’ perceptions of their patients’ ability to pay for TMD care either indirectly (i.e. through third party payers) or directly (i.e. through personal “out of pocket” expenditures) and whether these economic variables contributed to their treatment and/or referral decisions. The fourth issue looked into the providers’ perceptions of the potential economic burden that patients may face in their pursuit of TMD care. Lastly, providers were also questioned about their experiences obtaining reimbursement for rendered TMD services.

The data were entered and analyzed utilizing the Statistical Package for the Social Sciences, SPSS. Parametric data were tested for statistical significance using ANOVA while non-parametric data were tested with Chi-square, Fischer’s exact test being used where appropriate.
Results:

The survey had an overall return rate of 74% (n = 539) with similar response rates for each of the three sampled groups. The specific return rates for each of the sub-groups were: 1) 73% (n= 371) for CSDA general dentists; 2) 76% (n= 65) for the CSDA self-identified “high TMD interest” dentists; and 3) 77% (n= 103) for OMF surgeons. (Fig. 1)

The results will be presented for the overall group of Connecticut dentists with only notable differences between the three groups being mentioned. Throughout this report the CDSA dentists, not self-identified as having a high interest in TMD, will be referred to as general dentists. Those CSDA dentists that did self-identify themselves as having a high interest in TMD, will be referred to as “high TMD interest” dentists and OMF surgeons will be referred to as oral surgeons.

The overall sample reported seeing an average of 38.9±57.9 TMD patients a year over the past five years. General dentists reported seeing the lowest number of TMD patients (*i.e.* 27.8 TMD patients per year) while “high TMD interest” dentists reported seeing 1.6 times more TMD cases (*i.e.* 45.6 TMD patients seen per year) than did the general dentists (*p*=.006). (Fig. 2) Oral surgeons reported seeing the highest number of TMD cases, seeing almost 2.7 times more TMD cases than did general dentists (*i.e.* 74.6 TMD patients seen per year) (*p*=.000). The difference in the mean number of TMD patients seen per year between the three provider groups was statistically significant (*p* = .000).
Approximately 50% of each of the three provider groups responded that they treat TMD patients without referral. General dentists were 3 times more likely than oral surgeons to not treat TMD cases, but to directly refer them to other providers for care (38.6% vs. 13.0%, respectively, \( p=.000 \)). (Fig. 3) Oral surgeons, however, were 3 times more likely than general dentists and 2 times more likely than “high TMD interest” dentists to report the use of consultation referral in the care of their TMD patients (\( p=.000 \) for both). The differences between the three provider groups in percentages for “treated with consultation referral” and “directly referred to other providers for care” were statistically significant (\( p = .000 \) for both).

Figure 4, displays the response patterns that resulted from a question asking about the providers’ primary reason for TMD patient referral. Overall the most frequent response option chosen by providers as their primary reason for referral was a “lack of training to treat TMD”. Oral surgeons were the least likely to chose this option among the three provider groups, but still 20.9% selected this option. General dentists, however, responded the highest to this option at a rate 2 times greater than oral surgeons (41.9%). Overall, the second most frequently responded to option for primary reason for referral was that of being “unwilling to treat patients who require long-term, complex care.” Over 30% of each of the three provider groups selected this option. Overall, the third most frequent response was to the option of “specialty referral relieves you from the responsibility of TMD management”. Roughly 20% of each of the three provider groups gave this response. Overall, the least frequently chosen response was that of payment for TMD care being either unavailable or
limited. Oral surgeons were the most likely to cite this as their primary reason for referral, being 4 times more likely than general dentists, or 2 times more likely than “high TMD interest” dentists to choose this response (16.4% vs. 3.8% and 8.2%, respectively). The differences between the provider groups in response to their primary reason for referral were statistically significant ($p = .000$).

When the three groups of oral health providers were questioned as to whom they referred their TMD patients, the most common response among the surveyed oral health providers (at 40.0%) was that they referred to a combination of “medical and dental and non-traditional health providers”. The second most common response (at a similar frequency of 38.0%) was that they referred their TMD patients solely to non-traditional health providers. The dual combination categories of “dental and non-traditional” and “medical and non-traditional” were the next most frequent responses at 12% and 8.5%, respectively. The categories of “dental only”, “medical only”, or “medical and dental only” had individual response rates of below 0.4%.

Figure 5, displays the reported use of diagnostic imaging in TMD patient management among dentists that reported treating TMD. Oral surgeons reported that they always utilize diagnostic imaging in their TMD patient management. However, roughly one-fifth of “high TMD interest” dentists and two-fifths of general dentists reported that they do not use diagnostic imaging in their TMD patient management practices. The differences between and among the three provider groups were statistically significant (overall, $p=.000$; general and “high TMD interest” dentists vs. oral surgeons, $p=.000$; and general dentists vs. “high TMD interest” dentists, $p=.001$).
For the practitioners that reported using diagnostic imaging there was a difference between the provider groups in the type(s) of imaging used. (Fig. 6) “High TMD interest” dentists and oral surgeons were most likely to report obtaining a combination of both dental and medical imaging (see Table 2 for a detailed list of imaging techniques), while general dentists most frequently reported solely utilizing medical diagnostic imaging in their TMD patient management practices.

The results in Figure 7 indicate that roughly 70% of the surveyed providers take into account their perception of the TMD patient’s “ability to handle the cost of appropriate care” when making TMD care plan decisions. No statistically significant differences were found between the provider groups. The economics of the TMD patient had further ramifications on TMD care received by patients, due to patient non-compliance with prescribed treatments and referrals. Figure 8, shows that over 65% of the surveyed providers reported having experienced patients declining treatment and/or referrals due to a lack of insurance coverage. Oral surgeons were most likely to report patients declining both TMD treatment and referral due to a lack of insurance reimbursement (91.9% and 86.8%, respectively). “High TMD interest” dentists and general dentists reported having had patients declining TMD treatment and referrals at somewhat lower rates, though never below 65%. The differences between and among the three provider groups were statistically significant for the provider reported patient decline of both treatment (overall, \( p=.000 \); general dentists vs. oral surgeons, \( p=.000 \); “high TMD interest” dentists vs. oral surgeons, \( p=.020 \); and general dentists vs. “high TMD interest” dentists, \( p=.054 \)) and referral (overall,
Providers also noted differences among the patients who declined TMD treatment and referral across patient economic status. Seventy-one percent of the providers reported that their lower income patients decline TMD treatment and/or referral more often than do their middle and upper income counterparts. (Fig. 9) No statistically significant differences were found between the provider groups. Of the 71%, over half perceived that these were major differences between the choice of treatment pathways between lower income vs. middle or upper income patients.

Overall, the surveyed dentists also reported that a lack of insurance reimbursement for TMD care had a direct economic effect on their ability as providers to collect fees. As seen in Figure 10, oral surgeons at 91.9%, “high TMD interest” dentists at 74.2%, and general dentists at 59.3% all reported that they have experienced difficulties in collecting payment as providers for TMD services that they had rendered. The differences between and among the three provider groups were statistically significant (overall, $p=.000$; general dentists vs. oral surgeons, $p=.000$; “high TMD interest” dentists vs. oral surgeons, $p=.002$; and general dentists vs. “high TMD interest” dentists, $p=.018$).
Discussion:

The purpose of this study was to describe the patterns of care provided to TMD patients by Connecticut oral health providers, as well as the economic and professional influences that determined those patterns of care. To this end, a mail survey instrument was sent out to members of the CSDA and CSOMS; the response rates exceeded 70% for each of the Connecticut oral health provider groups. There was a general trend in the answer patterns obtained by the questionnaire, in which the CSDA self-identified “high TMD interest” dentists tended to fall in between general dentists and oral surgeons in the answers that they provided to survey questions.

Overall, the provider groups reported seeing a mean of 38.9±57.9 patients with TMD complaints per year, with each of the provider groups seeing on average more than 2 patients per month with TMD complaints (i.e. > 24 TMD patients per year). Oral surgeons reported seeing the highest number of TMD patients, seeing greater than 6 TMD patients per month. Overall, the range of TMD patients seen per year was reported to be 0 to 500, the resultant variation was reflected within the standard deviation being greater than the mean. Overall, the median number of patients seen was 20 per year and when the values reported within the top and lower ten percent were removed, the mean fell to 29.3±25.1. The observed variation may reflect a myriad of factors, such as referral patterns, treatment offered, or the physical office location.

It is probable that within the care of TMD there is a natural progression of treatment that is inherent in the care of most diseases, in which manageable cases
remain at the primary provider level for treatment while more severe cases are
referred to secondary providers. Each of the three provider groups reported treating
roughly 50% to 60% of their TMD patients without referral or consultation. The
TMD treatment pattern utilized to treat the remaining 40% to 50% of their TMD
cases, along with the volume of patients seen by each type of provider may be
indicative of the provider group’s respective TMD training and the resources for
TMD care at the provider’s disposal. General dentists directly referred roughly 40%
of the remainder of their TMD patients and treated with referral and/or consultation
another 10%. The patients who were treated by general dentists without referral,
most likely represent the TMD cases that were manageable at the provider’s level of
TMD expertise. This could be due to most TMD cases, if not advanced, being
treatable through non-invasive means due to its self-limiting nature. (Okeson, 1996)
These findings complement those of Glaros et al. (1995) who reported that 40% of
general dentists do not treat patients with TMD symptoms, and that 50% frequently
refer such patients elsewhere.

The self-identified “high TMD interest” dentists reported treating the highest
percentage of TMD patients without the use of referral and/or consultation (59.4%).
This group also reported treating a greater number of patients with the use of
referral/consultation than did general practitioners, however this rate was not as high
as that reported by oral surgeons. “High TMD interest” dentists also reported that
they directly refer 25.5% of their TMD patients, roughly 2 times that reported by oral
surgeons (p = .009). It is unknown due to a lack of questioning whether, or not, this
self-identified group obtained any additional TMD training outside of recognized specialty programs. However, the additional TMD treatment by this group may indicate the pursuit of TMD training via continuing education due to self-motivation and interest. The existence of a limited number of general dentists who “specialize” in TMD was noted by Rugh and Solberg in their 1985 review article.

Oral surgeons represent the referral endpoint within the fields of dentistry. Overall, oral surgeons reported treating roughly 87% of the TMD patients who presented for care, 39% of which were treated with referral/consultation. The treatment with referral/consultation among oral surgeons was roughly 3 times that reported by general dentist and 2 times that of “high TMD interest” dentists ($p=.000$ for both). This progressive increase in the use of referral/consultation with treatment may represent the broader needs of the more advanced or chronic TMD, while the difficulty of treating chronic/advanced TMD may be inferred from the number of cases referred to/seen by oral surgeons. Oral surgeons see almost 2.7 times as many TMD cases as do general dentists and 1.6 times as many as “high TMD interest” dentists ($p=.000$ and .022, respectively). This may be due to some general dentists referring TMD patients first to fellow general dentists who “have a high interest in TMD” before they refer to oral surgeons. Both of these groups trained as general dentists refer to oral surgeons. This logical referral pattern is supported by the survey finding that the magnitude of the number of TMD patients seen by each of the provider groups was inversely related to the reporting of a “lack of training” for the primary reason for referral.
Among the reported primary reasons for referral was an observation that initially seemed strange: 42.9% of “high TMD interest” dentists reported that they primarily refer due to an unwillingness to provide long-term, complex care. However, one possible explanation for this may be that, due to experience the “high TMD interest” dentists may recognize that given their knowledge base, they may only be able to treat less advanced cases of TMD, and therefore upon recognition of these cases refer the patient. A lack of training in TMD issues was the second most common response to the question on primary reasons for referral. While oral surgeons were half as likely than general dentists and a quarter less likely than “high TMD interest” dentists to cite a lack of TMD training as their primary reason for referral, 21% of oral surgeons, the end-point of dental referral, still cited “lack of training” as their reason for referral.

Due to the heterogeneity of the multiple symptoms of TMD many authors have advocated the use of a multidisciplinary model in the treatment of TMD. (McNeill, 1997) When referral was utilized, the reported referral patterns reflect that this multiple provider approach is being followed with 40% of the overall respondents reporting that they refer to all three provider groups of “medical, dental and other”. Studies by Glaros et al. (1995), and Turp et al. (1998), reported that TMD patients saw a mean of 3.23\(\pm\)1.66 and 4.88 providers, per respective study, for TMD treatment.

Within the response choices of “always” or “usually”, the overall respondents reported referring their TMD patients to other dentists 4 times more often than they
did to medical practitioners. The higher referral rate to dentists is consistent with the findings of Glaros et al. (1995), who reported that TMD patients had an 85.4% probability of seeing “any dentist” and a 40.4% chance of seeing “any physician”. Within the dental provider categories, most referrals were to orthodontists and oral surgeons.

It was interesting that 38% reported referring solely to an array of “other” providers. However, this finding may correspond to the finding of Eisenberg et al. (1993), who reported that an individual seeing a doctor for chronic pain had a 34% probability of also using unconventional therapy. Turp et al. (1998) reported a somewhat lower use of unconventional therapy, but still reported that 29% of TMD patients had been seen by a chiropractor or osteopath, 16% had biofeedback or relaxation training, and 8% had experienced acupuncture.

Overall, among the three provider groups, dental-based imaging was “always” or “usually” used twice as often as medical-based imaging. However, “high TMD interest” dentists and oral surgeons were more likely to use dental-based imaging in combination with medical-based imaging, 66% and 93% respectively. On the other hand, general dentists were the most likely to report using, solely, medical based imaging (48%).

The use of diagnostic imaging varied among provider groups with oral surgeons always obtaining imaging while 21% of “high TMD interest” dentists and 43% of general dentists never obtain imaging in the management of TMD. The cause of these discrepancies in the use of and mode of diagnostic imaging are unknown due
to a lack of in-depth questioning. However, four factors may be put forward to explain these differences. First and foremost is the lack of universally accepted TMD treatment plans. Secondly, differences in the utilization of diagnostic imaging may be attributable to the type or severity of TMD treated by the provider group. Thirdly, the differences could be due to a lack of TMD training. Lastly, providers may find that due to a lack of third party coverage for TMD, diagnostic imaging is cost prohibitive at the level of treatment that is being provided.

The results from this survey indicated that the personal economic status of the TMD patient may negatively impact both the TMD care that was prescribed by oral health care providers and that which was pursued by the TMD patient. The patients’ personal finances played a heightened role in TMD care, due to a lack of third party payment resources for TMD services. In the absence of third party payment for TMD care, the ability to pursue or receive appropriate TMD care becomes dependent upon the individual patient’s own ability to pay for such care, as the costs are shifted to the patient through personal “out-of-pocket” expenditures. The cost of care and its associated economic realities (i.e. potential for economic burden) may be recognized by both the patient and provider, which creates an inequitable system of care based upon patient finances that unquestionably permeate into patient and provider TMD based judgements and decisions.

Perhaps the most relevant survey results were found in providers’ responses to a series of questions that asked how the economics of TMD patients impacted their (provider) treatment and referral decisions and patients’ compliance with appropriate
TMD care. Approximately 70% of each of the surveyed oral health care provider groups reported that they incorporate their perception of the patients’ ability to handle the cost of care into their TMD care decisions. In addition, over 65% of the providers reported having had patients decline both TMD treatment and referral due to a lack of insurance reimbursement. Further, 71% of the providers reported that their lower income patients declined TMD referral or treatment at higher rates than did those of middle to high incomes. The results of this study indicate that a lack of third party payment for TMD services may have an impact upon patient and provider TMD decisions, creating an unequal system of care based upon the individual patient’s ability to bear the economic burden associated with the prescribed care.
Conclusion and Recommendations

The lack of professional TMD training and referral resources, along with the lack of third party coverage for TMD, are primarily derived from the problem central to TMD, i.e., limited knowledge of the etiology and epidemiology of TMD based upon a clear case definition. This definition and information would ultimately allow for the creation of accepted standards for TMD care. (Glass and Glass, 1996) In turn, this would both facilitate TMD professional training, possibly creating a subspecialty, and solidify the argument for third party coverage for TMD, by establishing its status as a medical necessity. (Glass and Glass, 1996) In 1995 Connecticut oral health providers reported seeing a median of 20 TMD patients per year, who required efficacious treatment under available technology and knowledge and fee payment systems. The results of the current survey indicate that for the treatment of these patients, deficiencies existed within TMD: 1) professional training and resources; and 2) third party coverage.

The lack of professional TMD training and referral resources affected both the mode of treatment provided by the practitioner group and the referral pattern that they utilized. The number of TMD patients seen and the use of direct referral to treat TMD were both inversely related to the providers’ perception of their TMD training. This was apparent in that oral surgeons and “high TMD interest” dentists saw, respectively, almost 2.7 and 1.6 times as many TMD cases than general dentists. In addition, general dentists directly referred their patients 40% of the time, which was
roughly 3 times that of oral surgeons and 1.5 times that of “high TMD interest” dentists.

The self-identified “high TMD interest” dentists represent a middle ground resource for TMD patients. The survey answers of this group consistently fell between those of oral surgeons and general dentists. They also fell between the two groups in respect to TMD patient load both in the magnitude of patients that they saw and the percent they treated.

It is generally recognized that the personal economics of the patient are an important factor in virtually all aspects of dental care. This study has attempted to quantify the degree to which the personal economics of the patient influence TMD care decisions.

The results indicated that the personal economic status of the TMD patient appear to have an impact upon both the TMD care that was 1) prescribed by oral health care providers and 2) pursued by the TMD patient. In the absence of third party payment for TMD care, the ability to pursue or receive appropriate TMD care become dependent upon the individual patient’s own ability to pay for such care, as the costs were shifted directly to the patient. The potential economic implications of this cost shift may have been recognized by both the patient and provider and factored into both patients’ and providers’ TMD care decisions. The introduction of the non-health based variable of a patient’s finances into TMD care decisions, would create an inequitable system of care for TMD. These statements are supported by the findings that approximately 70% of each of the surveyed oral health care provider groups
reported that they incorporate their perception of the patients’ ability to handle the cost of care into their TMD care decisions. They are also substantiated in that over 65% of the providers reported having had some patients decline both TMD treatment and referral due to a lack of insurance reimbursement. Lastly, 71% of the providers reported that their lower income patients declined TMD referral or treatment at higher rates than did those of middle to high incomes.

Based upon the findings of this descriptive survey, the following recommendations are made: 1) funding for the study of the etiology and epidemiology of TMD, including development of case definitions, should be increased; 2) the establishment of accepted TMD treatment protocols; 3) further study of the effects of cost on TMD care is warranted.
REFERENCES


Glass, M., Glass, R. “From the Patients Perspective”. *JADA* 1996; 127:1600-1603


Appendix
Appendix A

Survey Questionnaire

“TMJ Treatment Coverage: A CSDA survey of dentists”
Participating Dentist ID number __ __ __ __

**TMJ Treatment Coverage: a CSDA Survey of Dentists**

1. Your type of dental practice
   ___ general dental practice
   ___ specialty practice
   if so, please indicate specialty: __________________________

2. Based upon your experience over the past 5 years, how many patients with TMJ complaints do you typically see in a year?
   ___ average # of TMJ patients / year

3. Of all your TMJ patients, indicate the percent that you either treat, refer, or treat-and-refer.
   ___ % treated totally, and solely, by you
      (no referral for consultation or treatment)
   ___ % treated by you using consultation referral
   ___ % directly referred for treatment to other practitioners
   100% (i.e. no treatment by you at all)

4. Indicate the criteria you use when deciding whether you will treat or refer a TMJ patient
   ___ a. Not applicable, I always initially treat TMJ patients.
   ___ b. Not applicable, I always initially refer TMJ patients.
   ___ c. The criteria I use in deciding whether to personally treat TMJ patients, or to refer these patients for treatment are:

   ________________________________________________________________

   ________________________________________________________________

5. When you refer TMJ patients to another provider for treatment, it is primarily based on:
   (select the ONE best answer)
   ___ a. your lack of training to treat TMJ disease
   ___ b. you unwillingness to treat patients who require long-term, complex care
   ___ c. your feeling that specialty referral relieves you of the responsibility of TMJ case management
   ___ d. your experience that payment to you for TMJ care is either unavailable or limited
   ___ e. not applicable as I do not refer my TMJ patients
6. When deciding whether to treat or refer a TMJ patient how would you indicate for the following statement the relative importance level? __________

(print number appropriately)

(1) very important (2) important (3) less important (4) not an issue

_____ lack of reimbursement available by third party payors
_____ patient difficulties in handling the costs associated with appropriate care
_____ patient management difficulties associated with TMJ patients
_____ the time required to educate patients concerning their diagnosis and treatment alternatives
_____ the lack of successful therapeutic alternatives currently available
_____ lack of qualified experts available for referral

7. What has been your referral pattern for TMJ patients over the past five years?

_____ a. I never refer TMJ patients (skip to next question)

(Circle most appropriate choice for each type of practitioner)

<table>
<thead>
<tr>
<th>practitioner</th>
<th>always</th>
<th>usually</th>
<th>sometimes</th>
<th>rarely</th>
<th>never</th>
</tr>
</thead>
<tbody>
<tr>
<td>general dentist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>general dentist, practice limited to TMJ</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>periodontist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>orthodontist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>oral&amp;max-fac’l surgeon</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>endodontist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>prosthodontist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>oral radiologist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>physical therapist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>psychologist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>primary care M.D.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>neurologist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>orthopedic surgeon</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>psychiatrist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>medical radiologist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>other M.D.: ________________________</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>other provider: ____________________</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
8. What types of diagnostic imaging do you obtain when you manage TMJ patients?
   (Circle most appropriate choice for each type of practitioner)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>always</th>
<th>usually</th>
<th>sometimes</th>
<th>rarely</th>
<th>never</th>
</tr>
</thead>
<tbody>
<tr>
<td>transcranial radiographs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>panoramic radiographs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>routine panoramic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>open &amp; closed panoramic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>special TMJ studies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>MRI</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>CT scan</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>arthrograms</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>other: _________________</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. What types of TMJ treatment have you provided over the past 5 years?
   (Circle most appropriate choice for each type of practitioner)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>always</th>
<th>usually</th>
<th>sometimes</th>
<th>rarely</th>
<th>never</th>
</tr>
</thead>
<tbody>
<tr>
<td>splint therapy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>hot or cold therapy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>medication:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSAIDS</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>analgesics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>steroids</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>muscle relaxants</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>antidepressants</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>dietary restrictions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>trigger point injections</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>inter-articular injections</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>steroids</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>other: _________________</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>relaxation techniques</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>surgery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>occlusal adjustment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>crown &amp; bridge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>orthodontics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>other: _________________</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
10. Due to a lack of insurance reimbursement for TMJ care, have you ever experienced:

(circle)

a. difficulty in collecting payment for your services?  Yes  No
b. patients declining treatment?  Yes  No
c. patients declining referral?  Yes  No

11. Do lower income patients decline TMJ referral or treatment more often than middle and upper income patients?

___ no, all income groups decline at the same rate
___ yes, there is a major difference
___ yes, but it’s only a minor difference

Would you be willing to allow approximately 2 to 6 of your patients complete a questionnaire concerning the subject of TMJ coverage?

IF YES, in a few days we will send you a copy of the questionnaire for your review and at that time request the names and addresses of those persons to contact.

(circle)

YES, I would like to receive a sample of the questionnaire before deciding whether my patients participate. Be assured any patient you identify will receive only one request to participate in the survey. This ensures that we fully respect your patients right to not to participate.

NO, for any number of reasons I choose not to participate in the next stage. We guarantee that we will not contact you again related to any patient involvement, i.e., NO means NO and we accept that.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE
it will provide guidance to the CSDA on this important issue

Please mail the completed questionnaire in the pre-addressed, pre-stamped envelope enclosed
Appendix B

Tables
Table 1

Five issues explored by the questionnaire

1. Provider TMD treatment and referral patterns
2. Provider perceptions of TMD treatment resources
   - professional education
   - referral options
3. Provider perceptions of patients' ability to pay for TMD treatment
4. Provider perceptions of potential for economic burden faced by patients in pursuit of TMD treatment
5. Provider experience in obtaining reimbursement for provided TMD services
Table 2

Diagnostic Imaging

- **Dental Imaging** (dental office based)
  - Routine panoramic radiograph
  - Closed panoramic radiograph
  - Open panoramic radiograph

- **Medical Imaging** (hospital based)
  - Transcranial radiograph
  - Special TMJ studies
  - MRI
  - CT scan
  - Arthrogram
Appendix C

Figures
Fig. 1

Connecticut oral health provider response rates for TMD treatment issues survey

- **general dentists**
  - n = 371

- "high TMD interest" dentists
  - n = 65

- oral surgeons
  - n = 103
Fig. 2

Mean number of TMD patients seen per year by Connecticut dentists over past 5 years

- general dentist
- "high TMD interest" dentist
- oral surgeon
Fig. 3

Percentage of TMD patients that the dentist treated, treated with referral, or directly referred

- treated without referral
- treated with referral
- no treatment, directly referred
Fig. 4

Primary reasons for dentist to refer TMD patients to another provider for treatment

- payment limited
- referral relieves responsibility
- unwilling to provide long-term, complex care
- lack of training
Fig. 5

Percentage of dentists who use diagnostic imaging for TMD treatment*

* Limited to dentists that provide TMD care
Diagnostic imaging: Patterns of use by dental provider groups

Reports of “rare” use are not reflected when reported in combination with imaging use of equal to or greater than “sometimes”.
Fig. 7  Percent of providers that identified the patients’ ability to handle the cost of TMD care as being an issue in their (providers’) treatment and referral decisions.
Fig. 8

Percentage of dentists who reported patients declining treatment or referral due to a lack of insurance reimbursement for TMD care:

- general dentist
- "high TMD interest" dentist
- oral surgeon

- patient declining treatment
- patient declining referral
Fig 9  Providers’ perception of whether lower income patients declined TMD treatment or referral more often than middle and upper income patients?

![Bar chart showing the perception of providers regarding the decline in treatment or referral of lower income patients compared to middle and upper income patients.](chart)
Fig. 10

Percentage of dentists who reported difficulties in collecting payment due to a lack of insurance reimbursement for TMD care:

- General dentist
- "High TMD interest" dentist
- Oral surgeon