

Session 1 Overview

Review & Clinical Assessment

- TMD Self-Management Treatment Program: Program Overview
- TMD Clinical Assessment
- Patient Summary of Findings Form
- Instructions for Relief of Jaw Muscle Pain

Guidelines for Self-care Activities

- Guidelines for TMD Self-Care Activities
- Guidelines for Physical Relaxation – Abdominal (Tension-Release) Breathing
- Completing the Personal TMD Health Care Plan Form

Readings

- “Understanding Temporomandibular Disorders”
- “Pain and Basic Stress Management”
- Reading Feedback Forms

Personal TMD Health care Plan

- Daily Recordings of Self-Care Activities
- Readings
- Reading Feedback Forms
- Obstacles and Solutions

Next Session

- Phone Contact #1: Date: _____ Time: _____
- Clinic Session #2: Date: _____ Time: _____
- Bring Patient’s Manual (with completed forms)
- Preview
 - Pain - Stress - Muscle Tension Cycle
 - Breaking the Cycle

Guidelines for TMD Self-Care Activities

These guidelines are designed to help you learn to: (1) monitor your TMD symptoms, (2) identify habits, postures and activities that may contribute to your TMD symptoms, and (3) practice daily self-care techniques for reducing TMD pain and associated symptoms. As you become more familiar with your symptoms and their patterns for occurrence, you will be able to detect changes in your condition, both positive and negative, know which changes to tell your dentist about, monitor the progress of your treatment and make informed decisions about which treatments seem to be most helpful for you. Ultimately, you will be aiding your dentist to make the best diagnostic and treatment decisions for your condition. When you are able to identify habits, postures and other activities that contribute to your symptoms, you will then be able to take immediate action to reduce their influence on your condition.

Your dentist has recommended several exercises and other activities. These recommendations form the basis for the TMD self-care activities you will learn and do on a regular basis.

Learning to Monitor Your TMD Symptoms

1. Locating Your Temporomandibular Joints (TMJ):
Gently place the first 2 fingertips of each hand directly in front of each ear. The TMJs are directly beneath your fingers. You should be able to feel their movement as you open and close your mouth. If you do not feel the joints move, change your finger position and try again. Note if the light pressure of your fingertips causes pain on one or both sides.
2. Locating the Powerful Jaw Closing Muscles:
 - A. *The Masseter Muscles:* Holding your hands near the sides of your face, tip them backward so the fingertips are pointing slightly back toward your ears. Place all four fingertips against your lower jaw on each side, with your small fifth finger ("pinky") even with your lips. Gently squeeze your back teeth together to feel the movements of the thick masseter muscles used to chew. Note if squeezing your back teeth together or the light pressure of your fingertips causes pain on one or both sides.
 - B. *The Temporalis Muscles:* Place your fingers against your temples and in front of your ears. Gently clench your jaws together to feel the movement of the fan-shaped temporalis muscles. Note if the light pressure of your fingertips causes pain on one or both sides.
3. Measuring Your Jaw Opening:
Using the Therabite® ruler included in your manual, place the notched end of the ruler on the indentation in the center of your *lower* front teeth. Now, open your mouth as wide as you can until just before you first feel pain. Note the number on the ruler next to the edge of your *upper* front teeth and enter on your Personal Plan.

4. Monitoring Your Symptom Patterns:

A. Refer to sample forms (attached) for “Monitoring Symptom Patterns.”

- Select 1-3 symptoms that currently bother you. Write these at the top of the “Monitoring Symptom Patterns” form.
- Choose 4 times of the day for monitoring your symptoms. The times selected should include:

waking
bedtime

2 additional times during your waking hours. Many people find that lunch and dinner time are points that are easy to remember. If possible, choose the same times each day that are practical.

- Rate your symptoms by selecting a number between 0 and 10, where 0 represents ‘no symptom’ and 10 represents ‘symptom as bad as can be.’ Each day provide a rating at awakening and each additional time point, for each symptom listed.

B. Note whether there are any activities, events or moods that may increase your symptoms and write these in the right-hand column of the “Monitoring Symptom Patterns” form. Some examples that TMD patients commonly report include:

- jaw use: eating hard foods; eating all foods; talking; smiling
- oral habits: tensing the lower jaw; clenching/grinding the teeth; chewing gum
- postures: tensing the shoulders; holding a phone between ear and shoulder
- activities: exercise; singing; playing a musical instrument
- stress: work, family or other stressors
- moods: feeling anxious or tense; feeling depressed or ‘blue’
- other: poor nutrition; caffeine; poor sleep; lack of exercise

C. As you notice particular patterns in your TMD symptoms, or make observations about things that increase or decrease your symptoms, sometimes it takes a little thought—write these down at the bottom of the page.

Learning TMD Self-Care Techniques

Monitor and Correct Jaw Posture:

1. Monitor your jaw posture by checking to see that your teeth are separated and your jaw muscles relaxed. Never let your teeth touch, except when eating or swallowing.
2. Place your hand lightly on the sides of your face. Allow your face and jaw muscles to relax. Pay attention to letting your masseter and temporalis muscles relax, as well as the muscles in your forehead and around your eyes.
3. To relax your jaw muscles, place the tip of your tongue behind your lower front teeth, then let your tongue become completely relaxed.
4. Check and correct your jaw posture each hour. Some people find it helpful to set their watch alarm or a timer to beep every hour as a reminder.

Adaptation to the correct jaw posture, and inhibition of harmful postures and habits will be obtained more quickly with more frequent monitoring of your jaw posture.

SUMMARY: The correct Jaw posture is:

- teeth apart
- tongue resting behind lower front teeth
- facial muscles smooth, still and relaxed
- lips slightly apart and relaxed

Remember: Check your jaw posture frequently during the day

5. Note: Some people find that tensing the facial muscles briefly before shifting into a relaxed jaw posture helps them to relax the muscles more.

Monitor and Correct Harmful Postures and Oral Habits:

1. Avoid wide open jaw movement: As your jaws are used during the day, open your jaws only as far as you feel no pain. Do not stretch muscles by opening excessively wide or by moving the jaw side to side. Do not position or hold your lower jaw forward or off to the side.
2. Do not intentionally try to reproduce joint sounds or make awkward jaw movements by opening very wide or very quickly, or by stretching or moving your jaw to one side or the other. However, if you sometimes have sounds with normal use of the jaw, that is not of concern and you should not avoid doing the usual things with your jaw just to avoid those occasional sounds.
3. Avoid clenching or grinding your teeth. You can fight the habit by continually monitoring and correcting your jaw posture.
4. Don't bite or suck on your nails or cheeks and don't hold pencils, pens, pins or other items in your mouth.
5. Do not prop your chin or face on one or both hands for extended periods. Many people do this unconsciously when watching television, reading or during meetings.
6. Keep your shoulders down and relaxed. Avoid awkward positions such as cradling the phone between your ear and shoulder.

Jaw Stretching Exercise

(When possible, try to do this exercise in front of a mirror)

1. Place your hands on your face with your middle fingers on the TM joints
2. Keeping your muscles relaxed, open your mouth as wide as possible without feeling pain or strain.
3. Hold this open position for 5 seconds.
4. Then close your mouth halfway (before your teeth touch) and rest for 5 seconds. Remember to keep your muscles relaxed and to continue breathing.
5. If your dentist has not made specific recommendations about jaw stretching exercises, then the first day that you try this exercise, do only 5 repetitions. That is, repeat steps #1-4 five times. Add one more repetition each day until you are opening 10-15 times each time you do the exercise.
6. Repeat the entire exercise 3-4 times a day.
7. One rule to remember about this exercise is "DO NO HARM." Open only to the point just before you begin to experience pain, and not beyond that. If you notice that doing the exercise is causing you pain, take it easy and do not increase the repetitions, staying at the same number each day. Or if you are concerned, discontinue the exercise and give us a call.

8. If your dentist has recommended use of heat and/or cold packs, do these exercises after application of heat or cold. Take small bites and avoid opening your mouth wider than is comfortable. Cutting foods into small pieces that are more comfortable to chew may make it possible to eat some of your favorite foods that are otherwise difficult to manage:

- Avoid or minimize eating hard or crunchy foods such as raw apples, raw vegetables, nuts, etc. You can substitute cooked vegetables, nuts, etc. You can substitute cooked vegetables and fruits for raw.
- Avoid or minimize eating chewy foods such as steak, or hard, chewy breads (e.g. bagels). Hard, chewy or sticky candies, and chewing gum should also be avoided.
- Caffeine from all sources including coffee, caffeinated teas, colas, chocolate, etc., is okay in moderation, unless specifically limited by your dentist. Decaffeinated drinks and foods are okay.

Apply Heat or Cold for Relief of Pain and Muscle Tension

1. Some patients experience more relief from one than the other and some are helped most by the use of heat and cold applied in succession. It is best to try each of three methods (i.e., cold alone, heat alone, alternating cold and heat) to see which one works best for you.
2. Methods of heat application include a moist compress, a heating pad, or a towel soaked in hot water. A hot water bottle applied over a compress will keep it warm longer. Apply heat to the area of pain on your face or neck for 15 to 30 minutes at least twice a day.
3. There are a variety of cold packs that can be used for cold application. Ready-made cold packs are convenient and comfortable. Large bags of frozen peas can be wrapped in a dry cloth or thin towel and re-used over many applications. Cold packs can also be made economically by placing ice in a plastic bag which is then wrapped in a dry cloth or thin towel. Apply the cold pack to the area of pain on your face or neck at least twice each day for 10-15 minutes each application. Do not exceed twenty minutes of cold application in any hour to avoid damage to your skin.

Using Pain Medications

1. Over-The-Counter Medications: Unless recommended otherwise by your dentist, aspirin, acetaminophen (Tylenol), ibuprofen, or other over-the-counter medications can provide additional pain relief. It is important to use these medications as directed on the package. A note of caution—even though these medications can be purchased without a prescription, they can cause potentially serious side effects if used inappropriately. Be sure to read the precautions listed on the package insert and ask your health care provider or pharmacist if you have any questions or concerns.
2. Prescription Medication: Your provider may prescribe a variety of medications for relief of jaw pain and related symptoms. For maximal benefit from these medications, it is important to follow their directions for use as closely as possible. It is also important to ask your provider about the potential risks, benefits, and side effects of these medications.
3. If your dentist has prescribed medications for your pain, do not add over-the-counter pain medications without consulting and obtaining permission from your dentist.

Additional Stress Relieving Techniques

In addition to the two structured relaxation exercises that we have recommended, abdominal breathing and progressive muscle relaxation, there are a number of additional relaxation techniques that people find helpful for easing stress and tension. In fact, you may do some of these already. Some of these are:

Take care of yourself: It is important to get enough sleep, and eat a balanced and nutritious diet. If you are irritable and tense from lack of sleep or if you are not eating well, you will have less ability to deal with your pain.

Become (or stay) physically active: When you feel tense, worried or upset, exercise and physical activity can help release some of the pressure. Running, walking, playing tennis, and working in your garden are just a few of the activities you might try. Many people find that they sleep better when they get regular exercise. Overall, regular exercise, even if it is mild, promotes health. If you have not been active, be sure to check with your doctor before beginning any exercise program.

Make time for fun: Scheduling time for recreation is as important as scheduling time for work. You need a break from your daily routine just to relax and have fun. In addition to physical activity, schedule time to do some of your favorite hobbies. Reading, painting and other hobbies are not only relaxing but they also help to distract your focus away from your pain.

Try a hot bath or sauna: Some people find that a hot bath or shower, sauna or Jacuzzi can be extremely relaxing overall as well as for specific areas of muscle soreness.

Try a massage: Massage can also be extremely relaxing overall and can help reduce pain in specific areas of muscle soreness.

Cut down on or eliminate nicotine: Nicotine (primarily from tobacco products) stimulates the central nervous system. This can result in increased muscle tension and may increase sensitivity to pain.

Caffeine used to excess may also stimulate muscle tension, but limited or moderate caffeine use is okay, unless specifically prohibited by your dentist.

Try other relaxation tapes: In your manual there is a list of additional relaxation tapes that you might want to try (look at list). Listed here are a variety of tapes that patients with pain have found helpful.

Listening to music: Some patients find that listening to music can be extremely relaxing.

Dealing with Flare-ups

It is not unusual for episodes of TMD pain and related symptoms to flare up from time to time, leading to the belief that you are right back where you started. Although many

people who experience TMD eventually become symptom-free, a larger number of people with TMD will, over the years, have symptoms return at times. In this way, TMD can be quite similar to ordinary tension-type headaches. Sometimes a flare-up of symptoms will occur just before, during or following an illness or some type of personal crisis. Yet, at other times, flare-ups may seem to occur for no reason at all.

However, a return of TMD symptoms, in most cases, does not mean that the condition is getting worse. Nor do flare-ups indicate that treatment has failed. In fact, most times a flare-up of TMD can be approached much like people typically approach ordinary headaches. For example, when we have a headache, we don't usually think of our previous headache treatment as having failed. Rather, many of us have learned over time that we can rely on a variety of self-management strategies to alleviate the headache—strategies such as the use of aspirin, lying down to rest, or eating a solid meal. By and large, we learn to do whatever worked the last time!

In rare instances, these self-management approaches don't work well. In the case of headache, for example, the location or pattern of pain or other symptoms may seem different from the type of headache symptoms that are usually experienced. In that case, it is a good idea to monitor the symptoms, evaluate how they are different from the more common headaches, and if they persist, see the appropriate health care provider for an evaluation. We strongly recommend the same approach to manage flare-ups of TMD. That is, monitor the symptoms, evaluate how they are different from previous symptoms, and if they are different or persist, then seek an evaluation from your dentist or doctor.

Admittedly, having your TMD symptoms return can be worrisome and very discouraging. Therefore, it is important to discuss recurrences in advance in order to formulate a plan of action for dealing with such TMD flare-ups if and when they occur. The good news is that all the skills you have developed through participation in this treatment program can and should be applied if TMD flare-ups occur, just as we discussed for the headache example above. Most importantly, continued self-evaluation and self-monitoring will help you learn which factors can contribute to or aggravate your TMD symptoms. In fact, continued self-monitoring of TMD symptom patterns can even help you learn to *predict* those times during which you may be most vulnerable to having TMD symptoms return. It is important to learn which factors make a flare-up more likely so that you can learn to take action in advance or at least before the symptoms increase in intensity. For example, when anticipating a series of impending deadlines at work, or an increase in workload, overall stress and tension, a good strategy would be to closely follow your TMD Personal Plan by taking time out to practice the CHECK/STRETCH/BREATHE routine and other self-care activities listed on your plan.

But remember, there are important symptom changes you should not ignore, such as severe headaches lasting more than a day, chest pain, bleeding, etc.

During your next session with the dental hygienist, the two of you will work together to modify your TMD Personal Health Care Plan for use after this program ends. At that time, you will also discuss strategies for dealing with flare-ups of TMD symptoms.

- 1) Dworkin, S. F., Truelove, E. L., Bonica, J. J., Sola, A. Facial and head pain caused by myofacial and temporomandibular disorders. In: J. J. Bonica (ed.), *The Management of Pain*, ed. 2. Philadelphia, Lea and Febiger, 1900, pp. 727-745.
- 2) Gervitz, R. Temporomandibular Disorders. In: E. M. Catalano, *the Chronic Pain Control Workbook: A Step-By-Step Guide for Coping With and Overcoming Your Pain*, New Harbinger Publications, Inc., Oakland, CA, pp. 139-152.
- 3) *TMD, Temporomandibular Disorders*. National Institute of Dental Research; P.O. Box 54793, Washington, DC 20032.
- 4) Turk, C.C., Nash, J. M. Chronic Pain: New Ways to Cope. In: D. Goleman & J.Gurin (eds.), *Mind/Body Medicine: How to Use Your Mind for Better Health*, Consumer Reports Books, New York, 1993, pp. 111-130.

ABDOMINAL (TENSION-RELEASE) BREATHING:

Get in a comfortable position.

Briefly scan for tension and relax tense muscles.

Inhale slowly and deeply, through your nose into your abdomen.

Continue breathing slowly and deeply for a minute or two.

Use a mental suggestion (such as "relax") each time you breathe out.



(SAMPLE)

Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: pain
Symptom #2: headache
Symptom #3: jaw stiffness

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
MONDAY	Time: 6 a.m.	12:15 p.m.	6:15 p.m.	10:45 p.m.	
	Symptom				
	1: <u>3</u>	<u>5</u>	<u>7</u>	<u>5</u>	
	2: <u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
	3: <u>4</u>	<u>2</u>	<u>2</u>	<u>2</u>	
TUESDAY	Time: 6:30 a.m.	11:45 a.m.	6:00 p.m.	11:00 p.m.	more stress at work; jaws feel tight in morning; may be clenching at night.
	Symptom				
	1: <u>6</u>	<u>5</u>	<u>6</u>	<u>5</u>	
	2: <u>4</u>	<u>2</u>	<u>0</u>	<u>0</u>	
	3: <u>6</u>	<u>4</u>	<u>2</u>	<u>2</u>	
WEDNESDAY	Time: 6:00 a.m.	12:00 p.m.	6:00 p.m.	11:00 p.m.	may be clenching while asleep.
	Symptom				
	1: <u>4</u>	<u>5</u>	<u>5</u>	<u>4</u>	
	2: <u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
	3: <u>5</u>	<u>3</u>	<u>2</u>	<u>2</u>	
THURSDAY	Time: _____	_____	_____	_____	
	Symptom				
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
FRIDAY	Time: _____	_____	_____	_____	
	Symptom				
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SATURDAY	Time: _____	_____	_____	_____	
	Symptom				
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SUNDAY	Time: _____	_____	_____	_____	
	Symptom				
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	

What I have learned about these symptoms (e.g., patterns, aggravating factors, factors that decrease symptoms): _____



Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
Symptom #3: _____

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
MONDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
TUESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
WEDNESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
THURSDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
FRIDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SATURDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SUNDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	

What I have learned about these symptoms (e.g., patterns, aggravating factors, factors that decrease symptoms): _____



Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
Symptom #3: _____

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
MONDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
TUESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
WEDNESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
THURSDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
FRIDAY	Time: _____ Symptom	_____	_____	_____	
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	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SATURDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SUNDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	

What I have learned about these symptoms (e.g., patterns, aggravating factors, factors that decrease symptoms): _____



Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
Symptom #3: _____

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
MONDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
TUESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
WEDNESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
THURSDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
FRIDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SATURDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SUNDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	

What I have learned about these symptoms (e.g., patterns, aggravating factors, factors that decrease symptoms): _____



Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
Symptom #3: _____

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
MONDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
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TUESDAY	Time: _____ Symptom	_____	_____	_____	
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WEDNESDAY	Time: _____ Symptom	_____	_____	_____	
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	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
THURSDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
FRIDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SATURDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
SUNDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	

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Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
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Time to Monitor

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MONDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
TUESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
WEDNESDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
	2: _____	_____	_____	_____	
	3: _____	_____	_____	_____	
THURSDAY	Time: _____ Symptom	_____	_____	_____	
	1: _____	_____	_____	_____	
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What I have learned about these symptoms (e.g., patterns, aggravating factors, factors that decrease symptoms): _____



Monitoring Symptom Patterns

Use a scale from 0–10 (0 = "no symptom";
10 = "symptom as bad as can be").

Symptom #1: _____
Symptom #2: _____
Symptom #3: _____

Time to Monitor

	Waking (#1)	Time #2	Time #3	Bedtime (#4)	Activities, events or moods that may increase symptoms
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Understanding Temporomandibular Disorders (TMD)

University of Washington
Orofacial Pain Research Group

1996

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University of Washington
TMD Self-Management Treatment Program

Understanding Temporomandibular Disorders (TMD)

TEMPOROMANDIBULAR DISORDER - AN OVERVIEW

Temporomandibular disorders (TMD) are a *group* of conditions that affect the jaw joint (temporomandibular joint or TMJ), the muscles responsible for jaw movement, or both. Pain in the area of the jaw joint and jaw muscles is the most common symptom of TMD. Other symptoms that may be associated with TMD include limited ability to open one's mouth wide; occasional locking of the jaw or other limitations in jaw movement; clicking, popping or grating sounds in the jaw joint when opening or closing the mouth; pain in the face, neck or shoulders and sudden, noticeable change in the way the upper and lower teeth fit together. Occasionally, other symptoms such as headaches, earaches, dizziness and hearing problems may sometimes be related to TMD.

You may have heard a number of names for the temporomandibular disorders, such as myofascial pain dysfunction (MPD), craniomandibular pain syndrome, and temporomandibular joint dysfunction (TMJ). The various names for these conditions reflect different views as to the causes of TMD and how these disorders are best treated. We use the term "temporomandibular disorder," or TMD, which is the term recommended by the American Dental Association.

If you have TMD, you are not alone. Recent research conducted at the University of Washington and Group Health Cooperative showed that about 12% of Group Health enrollees reported TMD pain in the six months prior to being questioned. These figures excluded people reporting minor or fleeting aches or pain in the jaw joint or chewing muscles, which are quite common and are generally not a cause for concern. This same

research showed that TMD affected about twice as many women as men, and that most women with TMD are between 25 and 44 years of age. The good news is that TMD disorders are less common in individuals over age 45, suggesting that for most people, TMD goes away as they get older. In fact, for many people, TMD pain and uncomfortable limitations in jaw movement often diminish or go away with little or no treatment.

It is also true that TMD, like many other chronic pain conditions such as headache and back pain, goes through cycles in which pain and discomfort are present and then diminish or go away completely. For the overwhelming majority of people, a recurrence of TMD is not associated with increased physical pathology or disease and only a small percentage of people with TMD pain develop significant, long-term problems.

ANATOMY OF THE TMD-RELATED MUSCLES AND THE JAW JOINT

The diagnosis of TMD is often complex, in part because of the complexity of this region of the body. Many different structures are located in a relatively compact area, including the following, which are most relevant to understanding TMD:

- 1) the jaw muscles, known as the muscles of mastication, that are used for chewing and communicating;
- 2) the temporomandibular joints, or TMJ, that allow the lower jaw to move in several directions;
- 3) the upper and lower teeth (and the way they come together to form the occlusion or bite) that perform vital functions in nutrition, appearance and communication;
- 4) numerous nerves and blood vessels which regulate how the muscles, joints and teeth work as a coordinated and effective system.

The Jaw Muscles

The muscles of mastication are the compact and powerful jaw muscles that allow us to directly control when and how our mouths open and close. The jaw muscles are usually anchored at one end to the skull bones (which do not move) and at the other end to the lower jaw, or mandible, which is movable. The most important of these muscles, the temporalis and the masseter muscles, are the main jaw closing and chewing muscles and are the strongest of the muscles of mastication. The most common forms of TMD pain are associated mainly with pain in these muscles. The temporalis muscle is fixed to the skull in the region of the temples, and is attached to the lower jaw. The masseter muscle is also fixed to the skull and has a very broad attachment over much of the lower jaw. Other muscles located inside the mouth and beneath the mandible also contribute to the complex opening, closing, side-to-side and forward movements that the lower jaw needs to make to execute its many functions including chewing, swallowing, talking, and laughing and smiling.

As is true of other muscles, the jaw muscles can change for better or worse, in response to how they are used or abused. Exercise or lack of exercise and changes in patterns of use will affect the structure of these muscles as well as influence whether they perform their functions smoothly and whether these functions are accompanied by pain and discomfort. Jaw muscles that are over-used (for example, through excessive clenching and grinding the teeth) may feel tender, achy or “tight”. On the other hand, stretching and strengthening the muscles through controlled exercise can lead to increased flexibility and decreased discomfort.

The Temporomandibular Joint (TMJ)

The joints of the body serve the purpose of connecting bones to each other. Some of these joints, such as those which knit the bones of the skull together, become fixed and immovable before we reach adulthood. However, most of the bones of the body are connected to each other by joints that allow movement. The temporomandibular joint, or TMJ, as it is commonly called, is one of the body’s most important and most complex joints.

The TMJ is like sliding “ball and socket” joint that allows smooth movement of the mandible during talking, chewing, yawning and other jaw functions. The condyle, which is the round end of the mandible, is the “ball” that glides along the joint “socket.” During jaw opening, the condyle glides along the socket, and then slides back to its original position when the mouth is closed. If you place your fingers just in front of your mouth, you can feel each of the temporomandibular joints in action as your jaw moves.

To keep the jaw opening and closing motions smooth, a soft disc made of cartilage lies between the condyle and the socket. This particular disc acts as a pad or cushion for the TMJ during chewing and other movements. The joint contains a specialized fluid, called synovial fluid, which keeps the TMJ well lubricated. There is also evidence that the bony surfaces of the TMJ are covered by a unique type of tissue called fibrocartilage. Fibrocartilage can be repaired or regenerated even after it has been damaged by disease or jaw injury.

The Teeth

When the jaw closing muscles are working, they bring the lower teeth in contact with the upper teeth, which then prevents further closure of the lower jaw. That is, the teeth limit the amount of movement of the lower jaw. However, even when the teeth are compressed together, the jaw muscles can continue to exert strong vertical forces, such as those observed when people clench their teeth, as well as horizontal forces which make it possible to grind one’s teeth in a side-to-side fashion. Thus, coordinated operation of the muscles, TMJ and teeth is necessary to accomplish successful chewing and other all important functions assigned to these structures. Although the teeth are an essential part of coordinated jaw function, the bite, or occlusion of the teeth, is not presently thought to be an important factor in either causing or maintaining TMD-related pain and discomfort.

The Related Blood and Nerve Supply

It should come as no surprise that this complex arrangement of muscles, bones and joints has a very rich nerve and blood supply—one of the richest of any similar-sized region of the body. The nerve that supplies all these structure is the trigeminal nerve, which belongs to the network of cranial nerves that connect within the brain. The trigeminal nerve transmits sensations from the jaw muscles, TMJ and teeth to the brain and also delivers instructions back to the muscles allowing for movement of the muscles and the TMJ. The blood supply to the muscles, bones and TMJ is primarily derived from branches of the carotid artery.

TEMPOROMANDIBULAR DISORDERS-WHAT ARE THEY?

Today, both clinicians and researchers agree that temporomandibular disorders fall into three main categories. The most common form of TMD is **myofacial pain**, which is discomfort or pain in the muscles that directly control jaw function, often accompanied by pain in the neck and shoulder muscles. The second form of TMD is called **internal derangement of the TMJ**, and refers to the disturbances among the components of the joint, which may include a dislocated jaw, slippage or damage to the disc within the joint or direct injury to the condyle (“ball” of the joint). The third main form of TMD is **degenerative joint disease**. This includes conditions such as irritation or inflammation of the TMJ and/or the joint capsule and arthritis of the TMJ. There are two forms of arthritis that affect the TMJ. Osteoarthritis is a common condition involving localized inflammation and degeneration in one or a few joints throughout the body. Rheumatoid arthritis is a generalized disease that affects many joints of the body and can affect other organ systems as well. Fortunately rheumatoid arthritis affecting the TMJ is a relatively rare condition.

Persons suffering TMD can have one or more of these conditions at the same time, with symptoms overlapping among two or three categories. When this occurs, it can be difficult to determine which condition came first and how the conditions relate to each other.

TEMPOROMANDIBULAR DISORDERS-WHAT ARE THE CAUSES?

The specific causes of TMD are often unknown but there is agreement that a combination of factors, rather than any single cause, is responsible for the majority of TMD cases. Trauma resulting from a blow to the jaw (as can occur in a car accident or fall) or, in rare circumstances from dental procedures, can result in fracture of the jaw bones, damage to the disc, or muscle and tendon strain, thus interfering with the smooth motion of the jaw and causing pain or locking. Arthritis in the jaw joint which may result from injury or other conditions can also disrupt smooth jaw functioning.

Other causes of TMD are less clear. For many years, it was believed that a bad bite, referred to as malocclusion, could cause TMD. Current research disputes that view. It was also thought that orthodontic treatment to correct a bad bite could cause some forms of TMD. Research studies now show that this, too, is unlikely.

It was also believed that clicking sounds in the jaw joint could eventually lead to serious TMJ problems. In fact, jaw clicking is fairly common. Many people who have joint sounds have no other problems such as jaw pain or limited ability to use the jaw comfortably. Most clicking or popping in the jaw joint is caused by the disc being displaced, or slipping, from its normal position as it attempts to keep up with the moving condyle during jaw movement. As long as there are no other signs or symptoms such as pain or difficulty in moving the jaw, then clicking or popping of the disc does not require treatment.

In the greatest number of cases, numerous research studies indicate that the pain that people with TMD experience seems to come primarily from the jaw muscles and occasionally from the nearby neck and shoulder muscles. Postural habits of the jaw which may lead to strain or abuse of these muscles are thought to be an important causal factor for many who suffer from TMD. People with TMD often clench or grind their teeth, which can tire the jaw muscles and lead to pain. Other habits which strain the jaw, neck or shoulder muscles, such as holding a telephone between the shoulder and ear (without hands) for an extended time, can also lead to muscle pain. Disturbances in the jaw muscles can also be caused by inflammation or injury within the TMJ itself.

Some experts suggest that stress may cause or aggravate TMD. Stress can be defined as the negative physical and emotional responses to situations that challenge or overwhelm one's ability to cope effectively. Our bodies have a common set of physical responses to certain stressors. In response to an acute (immediate) stressor such as a near collision in a car, one's heart rate and blood pressure increase and breathing becomes rapid and shallow. In addition, many muscles in the body may become tight, and one might feel agitated or "tense." Many people associate this feeling with an "adrenaline rush." If a stressful situation persists, or if a person has had a number of stressors over time, the body can stay in a constant state of increased tension, which can eventually lead to fatigue, irritability, nervousness and anger.

Some individuals may clench or grind their teeth when they experience physical or emotional distress. This can result in sore jaw muscles and even headaches. Many people get headaches when they're under stress because of tension in the upper back, shoulders and neck. Others may get TMD pain because of tension in the muscles of the face and jaw. For other individuals, feeling physically or emotionally fatigued or "stressed" can deplete one's typical resources for coping or make one feel bad and think negatively, thus sabotaging the inclination to do anything which might lessen or prevent the pain. Of course, living with pain is also stressful, further reducing one's ability to cope with the pain itself, or the life changes often associated with chronic pain. This in turn leads to even more pain which helps to establish a viscous cycle of pain, stress, tension, and fatigue. Finally, stress is thought to be cumulative, such that chronic (continued) stress can wear a person down. Chronic, or long-standing, stress can lead to 1) physical symptoms and illness, 2) feeling bad, down or upset, and 3) difficulty in thinking clearly and taking constructive action to make the situation better. Thus, while it is difficult to know when and if stress has caused TMD, stress can certainly make TMD worse.

Hopefully, it is now more clear that TMD is typically the result of a combination of factors rather than a single cause. Because it is so difficult to pinpoint the causes of TMD, it is very important that the diagnosis and treatment of TMD draw on the coordinated expertise of clinicians from a variety of disciplines. This interdisciplinary perspective is advocated by nearly all research- and university-based pain centers throughout the world.

TEMPOROMANDIBULAR DISORDERS-HOW ARE THEY DIAGNOSED?

As discussed, the exact causes of TMD are not always clear. Similarly, symptoms of TMD may also be vague. Thus, diagnosing these disorders can be difficult. However, in most cases, the diagnosis of TMD can be made after completing a careful clinical examination of the face and jaw, obtaining a thorough history of the condition, and on occasion, reviewing x-rays of the joint. Once in a while, however, diagnosing TMD can be a problem. Although there are a number of techniques commonly used to assist in the diagnosis of TMD, the scientific and research community still has not identified or endorsed any one specific diagnostic tool or device for TMD. The biggest problem with the available diagnostic devices for TMD is that they are not scientifically proven to be reliable and valid. For a device to be reliable, it must be established that the device will give consistent results when it is used repeatedly. For a device to be valid, it must be shown what the device actually measures is in fact related to the disorder. For example, a thermometer, which is a reliable device for measuring body temperature, can be a valid indicator of infection in the body but would not be a valid indicator of body strength.

The symptom that brings most patients into treatment is pain. During the evaluation for TMD, your clinician will ask you a series of questions about pain and other symptoms. Specifically, you will be asked to show the location of your symptoms and to describe their severity (e.g., how intense?), frequency (e.g., how often?), and patterns of occurrence (e.g., morning versus evening versus all day, week days versus weekends, etc.). You may be asked about particular habits such as tooth clenching or grinding and about lifestyle patterns such as exercise, sleep, and diet. It is likely that you will also be asked about current and past health status, and about your mood and levels of stress. The more you have observed and noticed about your symptoms, and the more accurately you can report these to your clinician, the more accurately the clinician can diagnose your problem and select appropriate treatments.

The physical examination for TMD typically includes an evaluation for jaw opening and closing patterns as well as sideways jaw movement for signs of discomfort, limited jaw movement, locking of the jaw, and clicking, popping or grating sounds. The examination also includes pressing on the jaw joints and specific face, jaw and neck muscles to determine if there is any pain or tenderness. A dental examination (inside the mouth) will also be performed and if needed, dental x-rays may be taken.

If necessary, some additional diagnostic methods also may be used. Tomography is a specialized x-ray technique which produces one or more cross-sectional images of the TMJ and may be used if degenerative changes in the TMJ are suspected. Arthrography is an x-ray technique during which dye is injected into the joint to determine the relative

positions of the various structures, and to assess movement and function within the TMJ. Arthrography is not used very often because it is an invasive procedure, and may be painful. Magnetic resonance imaging (MRI), a technique which looks specifically at the soft (that is, non-bony) tissues, may be used for imaging the disc within the joint, or when significant pain persists over time and symptoms do not improve with treatment. Other diagnostic methods may include laboratory tests (e.g., blood or urine). Before undergoing any expensive or invasive diagnostic procedure, it is always wise to get a second independent opinion.

TEMPOROMANDIBULAR DISORDERS & PAIN

The two most prominent features of TMD that cause people to get treatment are pain and/or inability to use the jaw comfortably. One particularly intriguing, and often times quite frustrating, characteristic of TMD pain, is that often very little physical pathology or disease can be identified as clearly causing the pain. Some conditions, such as arthritis, do result in pain and have obvious physical change, but arthritis of the TMJ affects a relatively small minority of TMD sufferers. In this respect, TMD resembles the most common forms of headache and many forms of low back pain. These highly common health problems are also associated with persistent pain and other musculo-skeletal symptoms that seem to linger despite the absence of clear physical changes.

Recent advances in our knowledge of both pain and physical changes such as inflammation may shed important light on these perplexing conditions. We now know, for instance, that pain can be felt or experienced in one part of the body even though the actual site of the physiological disturbance causing the pain is in another part of the body. In these instances, the pain is said to be "referred" pain. A well-known example of such referred pain arises in some forms of cardiac problems. Pain of a heart attack, for example, is commonly experienced in the left shoulder, left arm, back and jaw. For TMD, it is now believed possible that pain which the patient pinpoints as arising from jaw muscles may, in fact, be referred from physical changes in the jaw joint or vice versa.

Another advancement in our understanding of pain is the important distinction between two general categories of pain known as acute and chronic pain. Acute pain is defined as relatively short-term pain (lasting less than 3 months) which is associated with recent tissue injury. Acute pain can be a symptom of tissue injury as well as a warning signal to the body to prevent tissue damage. For example, when one touches a hot stove, pain is the signal to remove the hand immediately. Acute pain also has a curative or healing function. For example, following an injury, pain can be the body's signal to rest in order to allow for healing. By contrast, chronic (long standing) pain is that which has persisted for longer than 3 months or so, and does not appear to be a bodily warning or part of an initial healing process. When pain becomes chronic or recurrent, it no longer serves to signal danger. Pain then ceases to be useful even though the body continues to hurt.

It is important to differentiate between acute and chronic pain conditions because their treatments differ. In an acute condition, pain is typically a symptom of a recent injury. After the injury has been identified, treatment is directed towards the injury itself and

pain medications are used only for symptom relief. Appropriate treatments may include immobilization of the injured part (for example, a broken leg placed in a cast). Even in acute pain situations, however, the latest research points to the advantage of limited rest for the injured person (that is, after surgery or acute back injury), and early, gradual remobilization.

In the chronic pain condition, the injury may be unidentifiable or tissue healing may be complete, even if things don't feel exactly as they did before the injury or disorder. In chronic pain conditions, long-standing immobilization or bed rest can result in more pain because of atrophy and shortening of the muscles and ligaments. Thus, appropriate treatments for chronic pain conditions often include physical therapy to help stretch and strengthen the previously-injured tissues and exercise to help build overall endurance and strength. Chronic pain is not a warning signal that activity will result in harm to the body. In fact, clinicians who treat people with chronic pain encourage them to "work through the pain," that is, to exercise and participate in normal activities despite their pain.

Why is it that acute and chronic pain should be so different? Nearly all people consider pain to be a highly unpleasant and uncomfortable condition. To that end, it is often said that all pain is stressful. In acute pain conditions, tissue healing and pain reduction are expected, leading to hope and optimism. The longer the pain goes on, the greater the potential for other factors such as frustration, discouragement, depression, and lack of participation in normal activities to become important secondary problems.

All types of pain, whether acute or chronic, are influenced by a multitude of factors. Have you ever wondered why professional athletes who are injured during a game often don't "feel" pain until the game is over? Or why some people seem to have a high "tolerance" for pain while other people have low pain "tolerance?" Some of the answers to these questions are explained by the gate control theory of pain, first proposed 30 years ago by psychologist Ronald Melzack and anatomist Patrick Wall. To begin to understand pain, and the gate control theory, it is important to first understand some basic facts about the nervous system.

The human nervous system is fascinating and, as we are continuing to discover, amazingly complex. In the simplest of terms, the nervous system can be organized into the central nervous system (CNS), which consists of the brain, brain stem, and spinal cord, and the peripheral nervous system, which includes all other nervous system fibers. Together, the brain and the brain stem handle the bodily functions necessary for survival and day-to-day functioning (e.g., breathing, heart rate, activity and motion). The brain also processes sensations, thoughts, emotions and memories. The spinal cord is a column of nerve protected by the bony structure of the spine. The spinal cord serves as a link between the brain and the peripheral nervous system. For example, after stepping on a nail, nerves in the punctured foot (periphery) send messages through the spinal cord to the brain. The brain processes the information received as pain, and then sends a message back to the foot with all kinds of directions about what to do.

Drs. Melzack and Wall have proposed that as pain messages travel toward the brain, they pass through a number of "gates" that, when open, allow the pain messages through to the brain. When these pain gates are closed, pain messages may be blocked. Thus, the perception of pain can be modified at a number of different places, and in very different ways, as the pain message is relayed from the site of the problem to the brain. Pain killers (including Novocain or other pain-relieving medications), distraction, hypnosis and relaxation are examples of things that can close the pain gates and block pain. Pain transmission from tissue injury can be shut off (gates closed) not only by pain killers, but by stimulation of certain non-pain nerve fibers, such as touch fibers. For example, rubbing a sore area can sometimes alleviate pain. Certain parts of the brain can also alter pain transmission through production of specific morphine-like chemicals called endorphins that act to reduce pain. Endorphin production has been used to explain the "runner's high," or feelings of euphoria that runners report experiencing. The context or environment in which pain occurs can also greatly affect the amount of pain experienced. Thus the pain gates can be opened by things such as worry or anxiety, feeling blue or depressed, overwhelming life situations, chronic pain, feeling tired or run down, and beliefs that the pain indicates something serious or threatening.

Recent scientific information indicates that there may be strong input from the central nervous system that sustains pain in many chronic pain situations, even when no physical pathology can be found in the parts of the body that hurt. These so-called "central pain states" may be responsible for a variety of well-known pain problems, such as phantom limb pain that persists even after amputation or spinal cord injury.

Inflammation is an important cause of muscle pain. However when the jaw muscles from which pain is felt to be arising are examined scientifically, none of the expected chemical or microscopic signs of inflammation can be detected. Unlike a sore muscle (known as a "charley-horse") that results from muscle overuse, which is associated with specific biologic signs of inflammation, the jaw muscles implicated in TMD do not yield such a clear indicator of pathologic inflammatory changes. There is, for example, no localized swelling resulting from inflammatory "fluids" indicating that the body is responding to an inflammatory process. Instead, there is an abundance of chemicals (with names such as Substance P, badykinin and capsaicin) that are produced in the muscles in response to messages coming from the brain. The term "neurogenic inflammation" has been applied to this process. These chemicals are responsible for transmitting highly specific information about pain along the pathways of the nervous system. Capsaicin is one of the pain-transmitting chemicals produced by the body that plays prominently in this scenario. (Capsaicin, incidentally, is a naturally occurring substance in hot peppers and other plants and is responsible for the painful sensation associated with ingesting hot peppers!)

But how did these pain-transmitting chemicals get into the jaw muscles? If patterns of jaw muscle overuse do not give rise to clear signs of muscle inflammation, how did this neurogenic inflammation come about? One way is believed to be in response to messages from the muscle to the brain that all is not well with the muscle. However, the conditions in the muscle that could give rise to such messages can be far less dramatic or obvious than a "charley-horse" or trauma. Instead, the conditions required for production of these

pain-inducing substances may be associated with longer lasting, but lower, levels of physical change in the affected muscles. The result is pain-aching, diffuse pain in muscles, even though the muscles are not “sick” or “diseased” in any important or non-reversible way.

In summary, there are a variety of mechanisms to explain the apparent discrepancy between what the TMD patient feels and what the clinician finds with diagnostic procedures. Pain is a complex phenomenon and our experience of pain depends on a host of factors acting together. For example, pain could be experienced in the muscle directly affected, or pain could be referred to nearby muscles and the TMJ. Similarly, identifying whether trouble with opening the mouth, comfortably or smoothly, was due to problems with one muscle, several muscles, the TMJ itself, or even the teeth, often results in a perplexing diagnostic dilemma. Also influencing the experience of pain are one’s past experience with similar conditions; the extent to which one is distracted from attending to the painful region; one’s mood (that is, calm, agitated, angry or depressed) at the time; one’s beliefs and expectations about the pain (that is, whether it will be serious or minor, long or short in duration); and the extent to which the pain interferes with one’s life. Because the physical, behavioral, environmental and psychological components of the pain experience really cannot occur independent of each other, a well-rounded treatment approach should address each of these major areas of influence.

TEMPOROMANDIBULAR DISORDER - HOW ARE THEY TREATED?

Just as there are numerous theories about the causes of temporomandibular disorders, there are also numerous theories about treatment of these conditions. Some of the more common TMD treatments used over the years fall into these main categories: occlusal splints, muscular or physical therapy interventions, behavioral therapies, and surgical and injection therapies.

Conservative (Reversible) Therapies

Occlusal splints, perhaps the most common treatment for TMD, are devices that fit over the teeth and keep the upper and lower jaws apart. Splints are generally categorized as either flat occlusal splints or occlusal repositioning splints. The latter are discussed below under structural change therapies. The flat occlusal splint is a plastic guard fabricated from a hard or soft acrylic material that is designed to fit over either the upper or lower teeth. These splints have a flat surface that covers the chewing surfaces of the teeth, thus preventing the upper and lower teeth from engaging or interlocking when the mouth is closed. The flat occlusal splint may reduce muscle tension by decreasing one’s ability to clench the teeth together, or by absorbing abnormal forces on the teeth during tooth grinding. When the flat occlusal splint is made properly, no permanent changes in the bite usually result.

Physical Medicine techniques also are used commonly in the treatment of TMD to help relax, stretch and strengthen the jaw, neck and shoulder muscles. The techniques commonly used for TMD include gentle stretching of the jaw muscles following

application of a cold spray, massage, and ultrasound. In addition, there are a number of techniques prescribed which the patient can use at home on a daily basis. These include jaw stretching exercises (sometimes preceded by application of heat or cold), minimization or elimination of oral habits such as jaw clenching or tooth grinding, correction of jaw and upper body posture, and dietary modification to avoid hard and chewy foods. In addition, aerobic exercise is often recommended for its influence in improving one's mood and general sense of well-being, in addition to the physical benefits. These physical therapies have the added benefit that they are conservative (that is, noninvasive) and reversible (although not all types of physical therapy are reversible).

Other conservative, reversible treatments for TMD include behavioral strategies for coping with pain. These strategies work by helping control the body's physical responses that contribute to pain production. Behavioral treatments for TMD include modification of habits which may contribute to pain, special techniques for relaxing and reducing stress, and strategies to help manage negative thoughts associated with pain. The behavioral treatments are a unique part of the overall treatment for TMD because, for the most part, these are strategies that each individual can easily learn to do and practice daily. Often when people are experiencing pain, they lose sight of what they can do to relieve their pain. The behavioral strategies allow the individual to take charge of his or her own pain management.

The key habits which can influence TMD are clenching and grinding the teeth, tensing the lower jaw, and gum chewing. Postural habits such as keeping the shoulders tensed or holding a phone between the ear and shoulder for long periods can also influence TMD. Poor sleep habits can also aggravate TMD pain. Decreasing or eliminating these habits is important in the treatment of TMD. The first stage to modifying these damaging habits is learning to become aware of them. For example, people who clench or grind their teeth, or tense their lower jaw, often are not aware that they do. Once specific habits are brought into awareness, there are a number of strategies used to help break them.

Relaxation strategies are among the most commonly used self-management techniques for the control of all kinds of pain conditions, most notably headache and back pain. There are a variety of relaxation techniques, but all have the goal of inducing a state of profound body relaxation. This state of relaxation is thought to interrupt the body's physical responses to stress, thus decreasing stress-induced tension and fatigue. Another benefit of these techniques is that with practice, people typically become more aware of when their body is reacting to stress and fatigue, so that they know when to implement these relaxation techniques. None of these techniques stands out as being more effective than the others. However, all of these strategies require practice to master the techniques. It is important to select a technique that you like and feel comfortable with.

Since TMD pain can be influenced by our thought processes and our emotional responses to pain, self-management methods that help people to diminish or eliminate negative thoughts and feelings have been found to be very helpful. These methods are included in most stress-management programs. One of the most effective of these methods is called "cognitive restructuring" (which just means changing one's thought processes). Through

cognitive restructuring, people can teach themselves to identify negative pain-related thoughts (for example, “I can’t take this anymore;” “This pain will never get better”) and examine whether there might be ways of viewing the situation that are more realistic or optimistic. This is particularly important for people who become depressed or anxious because of pain, since these mood states are typically associated with, and made worse by, negative thoughts and beliefs.

Some medications can be helpful in treating TMD, particularly when combined with other TMD treatments. The most common medications prescribed for TMD are the anti-inflammatory agents, which include aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen. Some antidepressant medications may be used for short periods of time. Narcotic analgesics and sedative-hypnotic medications (certain types of tranquilizers) may be used in select cases under the dentist’s strict supervision, and only for short periods of time due to the potential for dependence and tolerance (the need for more drugs in order to get the desired drug effect). In general, medications do not cure TMD but can be helpful in relieving associated symptoms.

Individuals react differently to medications—what works well for one person may not work at all for another. Similarly, some people experience a wide range of side effects from certain medications while others experience few problems. It is always best to consult with your health care practitioner about the particular medications that you are taking. Ask questions about the benefits, risks, and potential side effects of each medication you are taking. Other important questions concern the length of time required for the drug to have desired effects, specific instructions on how to properly use the medication, and how you will need to take the medication.

Structural (Irreversible) Therapies

The structural change therapies include occlusal (bite) repositioning splints (plastic appliance that fits over the upper or lower teeth), orthodontics (braces), occlusal equilibration (bite adjustment) and occlusal reconstruction (rebuilding the teeth to even out or balance the bite). Typically, these therapies are used by practitioners who believe that TMD is caused by imbalances in how the teeth fit together. They presume that imbalances in the dental bite (occlusion) place excessive stress or strain on the jaw joint and jaw muscles, producing injury and subsequent pain. Thus, these therapies aim to change the occlusion as a way of improving functioning of the jaw joint. Unfortunately, the resulting changes in the structure or position of the jaw or teeth are not reversible. That is, once the treatment is started, one cannot easily return to the pretreatment bite if the new bite is uncomfortable. Thus, the structural change therapies have potentially serious risks. However reasonable these therapies may sound, they have not been substantiated scientifically and a great deal of controversy still remains about their effectiveness and cost.

Surgical therapies are most often irreversible and are typically considered as treatment of “last resort.” Arthroscopic surgeries of the temporomandibular joint, which are less invasive than other types of TMJ surgeries, are typically used to break up adhesions and

clean out the joint space. Arthroscopy utilizes a very small incision in front of the ear through which an optical scope and surgical tools are then inserted into the TMJ. TMJ surgeries that involve repositioning the disc or replacement of the temporomandibular joints with artificial implants are more invasive, requiring that the TMJ be exposed during surgery. TMJ implants can be particularly problematic; some devices may fail to function properly or may break apart over time, causing severe pain and permanent jaw damage. Other surgical techniques are used to change the dental bite by changing the position of the upper and lower jaw in relation to one another.

While surgical therapy may in fact be the best therapy in a few specialized cases, the vast majority of persons suffering from TMD should be able to obtain relief without surgical intervention. In addition, surgeries may result in scar tissue formation or other post-operative problems which can actually negate the beneficial effects of the surgery. If surgery is recommended, it is critical that you get a second independent opinion. If possible, it is best to find an oral surgeon who affiliates with a university, works with a team of health care providers from a variety of disciplines (that is, multidisciplinary), and advocates conservative non-invasive treatment approaches whenever possible.

On occasion, various injection techniques are used for treating TMD. Injections into the joint can sometimes bring immediate and dramatic pain relief. However, repeated use of these procedures can actually damage the disc or cause scarring within the joint. Another technique for pain control involves injecting pain relieving medications into painful muscle sites, called "trigger points." This technique, known as trigger point therapy, is thought to produce a mechanical disruption in the muscle that can result in pain relief and increased range of jaw opening.

CHOOSING THE "BEST" TREATMENT STRATEGY

Over the years, a number of treatments for TMD have gone in and out of fashion. Today, the key words to keep in mind about TMD treatment are "conservative" and "reversible." Be sure to have the dentist or doctor explain to you, in words you can understand, the reason for any recommended treatment, the risks involved, and other types of treatment that may be available. It may be useful to ask what you can expect to happen if you have the treatment, and what is likely to happen if you do not have the treatment. You might want to ask if the clinician can recommend articles for you to read about the available treatment options. If the treatment is irreversible or potentially risky, see another clinician for a second opinion.

It is important to remember that TMD can be a problem that comes and goes throughout the years and its return does not typically indicate progressive deterioration of one's physical condition or the need for more invasive or involved TMD treatments. Ask the clinician you see about what you can do on your own to manage your TMD problems and make a plan for using these "self-management" strategies. Remember to use them regularly and to give them time (that is, several weeks) to work. Once you learn a variety of strategies for managing TMD pain, you will be better able to deal with this problem on your own, without expensive and time-consuming medical visits and treatments.

References:

- 1) Dworkin, S. F., Truelove, E. L., Bonica, J. J., Sola, A. Facial and head pain caused by myofascial and temporomandibular disorders. In: J. J. Bonica (ed.), *The Management of Pain*, ed. 2. Philadelphia, Lea and Febiger, 1990, pp. 727-745.
- 2) Gervitz, R. Temporomandibular Disorders. In: E. M. Catalano, *the Chronic Pain Control Workbook: A Step-By-Step Guide for Coping With and Overcoming Your Pain*, New Harbinger Publications, Inc., Oakland, CA, pp. 139-152.
- 3) *TMD, Temporomandibular Disorders*. National Institute of Dental Research; P.O. Box 54793, Washington, DC 20032.
- 4) Turk, C.C., Nash, J. M. Chronic Pain: New Ways to Cope. In: D. Goleman & J. Gurin (eds.), *Mind/Body Medicine: How to Use Your Mind for Better Health*, Consumer Reports Books, New York, 1993, pp. 111-130.