

Guide to Evaluation of Permanent Impairment of the Temporomandibular Joint

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This guide provides a method for evaluating permanent impairment due to injury of the temporomandibular joint (TMJ). Each author represents a major organization whose members treat temporomandibular disorders. The ratings are based on (1) disc displacement and joint degeneration, (2) range of motion, and (3) surgery. The rating values are comparable to those provided in the American Medical Association Guides to the Evaluation of Permanent Impairment for functional and disc-protected joints, so TMJ impairment values obtained by use of this guide can be combined with values for other impairments rated in accord with the AMA Guides. This guide for rating of TMJ impairment is intended for individualized application. A conservative attitude and sound clinical judgment are recommended. J OROFACIAL PAIN 1997;11: 166-171.

The Guides to the Evaluation of Permanent Impairment¹ began to evolve in the 1950s as a way, based on medical standards, of improving estimates of the severity of human impairments. The estimates were intended to help in comparison, evaluation, and adjudication of claims of ill health and impairment arising from injury.^{1(p1)} The developmental process began under the Committee on Medical Rating and Physical Impairment, continued under the Committee on Rating of Mental and Physical Impairment, and finally was mandated by the American Medical Association (AMA) Council on Scientific Affairs. The resulting *Guides to the Evaluation of Permanent Impairment*, originally a system for rating physical impairment of various organs, expanded into 13 separate booklets; in 1971 it was published as a single volume. The text has been revised periodically to keep pace with advances in medicine and corresponding changes in philosophy. It is now in its fourth edition.

Among all the previous drafts and revisions, however, the temporomandibular joint (TMJ)—a very complex, important, and frequently injured joint—did not appear.² To arrive at ratings of permanent TMJ impairment, practitioners made use of other published guides in combination with the third edition of the *AMA Guides*.

The fourth edition of the *AMA Guides* included the TMJ for the first time. But in regard to permanent TMJ impairment, it is vague about methods of evaluation and void of objective criteria

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on which to base ratings. So there has been need for a guide to the evaluation of permanent impairment of the TMJ based on the current philosophy and new values used for other functional and disc-protected joints in the fourth edition of the *AMA Guides*. As a result, the Permanent Impairment Conference for the Temporomandibular Joint ("Permanent Impairment Conference") was held in April 1995.

Representatives of all the major societies and academies whose members treat temporomandibular disorders (TMD) came together for the first time to form a consensus. The groups thus participating were the American Academy of Head, Neck, and Facial Pain; the American Academy of Orofacial Pain; the American Academy of Pain Management; the American College of Prosthodontists; the American Equilibration Society; the American Society of Maxillofacial Surgeons; the American Society of Temporomandibular Joint Surgeons; the International College of Cranio-mandibular Orthopedics; and the Society for Occlusal Studies.

The ultimate result is the Guide to the Evaluation of Permanent Impairment of the Temporomandibular Joint offered here. It is intended to be conservative, fair, and correspondent to the current *AMA Guides*.

Definitions, Concepts, Scope

Regarding *normality*, the consensus of the Permanent Impairment Conference agrees with the philosophy of the *AMA Guides*. "Normal" is regarded not as a fine point, but rather a range or zone, which varies with sex and other factors. Notably as people age, there are changes in the structural responses induced by postural adaptation to habits, avocations, physical insults, and gravity. An interpretation of normal that is too strict or too liberal can result in overestimation or underestimation of impairment.^{1(p2)}

Impairment is a medical issue and is assessed by medical means.^{1(p1)} An "impairment" is "the loss, loss of use, or derangement of any body part, system, or function."^{1(p315)} A "permanent impairment" is one that has become static or stabilized during a sufficient period and is unlikely to improve further.^{1(p1)}

Disability is defined as "an alteration of an individual's capacity to meet personal, social, or occupational demands, or stationary or regulatory requirements, because of an impairment." An impaired individual is not necessarily disabled. For

example, a flute player with an impairment of the TMJ may be disabled for his or her job, whereas a taxicab driver may not be disabled at all.^{1(p2)}

Handicap is a very broad concept, but basically "an impaired individual is handicapped if there are obstacles to accomplishing life's basic activities which can be overcome only by compensating" for the effects of the impairment by the use of assisting devices. These devices may include crutches, wheelchairs, hearing aids, optical magnifiers, craniomandibular orthotics, dental prostheses, and other special tools or equipment.^{1(p2)}

Temporomandibular disorders is a term that embraces several clinical phenomena involving the masticatory musculature, or the TMJ and associated structures, or both. Temporomandibular disorders are a cluster of related disorders in the masticatory system that have many common symptoms.^{3,4}

Current epidemiologic studies agree that clinical signs and symptoms of TMD can be classified as intracapsular and extracapsular with respect to the TMJ.^{5,6} Because of the enormous variety of factors, however, this guide cannot provide a label for every type and degree of such impairment.^{1(p3)}

Our objective is to classify physiologic and structural TMJ impairments not related to common developmental defects. Examples of common developmental defects are arthritic changes and disc alterations found in a large percentage of the population as results of postural adaptation with aging—the kind of changes the *AMA Guides* describe for the spine.^{1(p100)} In each case, the objective data available and the dentist's or physician's clinical experience and judgment must be blended with high integrity.

The Method

Standard Elements

Permanent impairment of the TMJ is to be rated by the following objective criteria:

- Disc displacement and joint degeneration
- Range of motion
- Surgery²

Values for disc displacement, range of motion, and surgery of the TMJ are based on comparison with circumstances affecting the functional joints of the thumb^{1(p24-29)} and disc-protected joints of the spine,^{1(p113)} as well as consensus among representatives of the societies and academies present at the Permanent Impairment Conference.

Table 1 Ratings for Disc Displacement and Joint Degeneration⁷⁻⁹

	Symptoms and clinical findings	Imaging ⁷⁻⁹
Stage 1 (Whole-person impairment 0-1%) Early-stage disc displacement with reduction	Reciprocal TMJ click (soft, painless, nonprogressive) Joint noise, reproducible (usually at varying positions during opening and closing) No coarse crepitus No limitation of motion Pain uncommon overall	Disc: displacement, reduced during jaw opening; form normal Articular surfaces: initial degenerative changes of osteoarthritis in some cases Other degenerative bone changes absent
Stage 2 (Whole-person impairment 1-2%) Early-intermediate disc displacement with reduction	Moderate to late clicking Translation may be limited Transient catching and locking, with variable degrees of discomfort (painless to severe) No coarse crepitus	Disc: displacement (usually anterior and medial, may be lateral also), which may reduce on opening or intermittently persist; early thickening of posterior band in some cases Articular surfaces: initial degenerative changes of osteoarthritis Other degenerative bone changes absent or minimal
Stage 3 (Whole-person impairment 1-3%) Intermediate disc displacement without reduction	Opening of mandible deflected, with mild to severe discomfort Intercuspal space restricted in most cases, severely in some Condylar translation hindered by disc dislocation Joint noise may be absent (because translation is limited) Pain variable (absent to severe)	Disc: displacement, partial or complete; dislocation without reduction, anterior or anteromedial to condyle (but medial cuts may show partial recapture on opening); thickening of posterior band; other disc deformation in some cases Articular surfaces: mild to moderate remodeling and degeneration
Stage 4 (Whole-person impairment 1-4%) Late-intermediate disc displacement without reduction	Permanent locking of jaw Limitation of mouth opening may resolve gradually Hypomobility of joint, possibly with hypermobility of contralateral joint Range of motion restricted Pain variable on movement or palpation of affected joint Noise, but no coarse crepitus	Disc: displacement (no reduction); degeneration and deformation increased; possible fibrosis of bilaminar zone Condyle: bony surfaces flattened, irregular or resorbed, without clear trabecular pattern; mild to moderate sclerosis Articular eminence and glenoid fossa in some cases: bony-tissue findings like those of condyle Articular surfaces: remodeling and degenerative changes
Stage 5 (Whole-person impairment 1-5%) Late-stage disc displacement with advanced disc degeneration and gross osseous changes	Variable limitation of mandibular motion Condylar translation may seem normal (because of disc displacement) Often coarse crepitus Variable pain and discomfort Possible: occlusal changes, such as open occlusal relationship (anterior or contralateral, or both ⁷⁻⁹)	Disc: dislocation; gross degeneration and deformation Disc attachments: perforation Osteocartilage: severe remodeling Condylar head and articular eminence: degenerative changes Condyle: small or shortened, with extensive flattening and resorption; marginal hypertrophy (osteophytes); obvious sclerosis or subcortical cystic translucencies Extensive degenerative disease

Disc Displacement and Joint Degeneration (Table 1). A modification of Wilkes' staging criteria⁷ for internal derangements of the TMJ is to be used in evaluating the degree of joint derangement. Magnetic resonance imaging and arthrography are not necessary in all cases of arthrosis obvious on traditional tomography and the like. However, imaging studies may be required for documenting early to intermediate stages of

derangement in joints with obvious clinical dysfunction. Chronic synovitis and ligament entrapment in the TMJ may cause chronic pain, as they do in other synovial joints. Each TMJ—right and left—is rated for impairment.

The impairment ratings (Table 1) are provided as a range for each stage, to allow scope for the rating physician's judgment, because the correlation between pain and objective pathology is poor.

Table 2 Consensus Ratings of TMJ Hypomobility

	Range of motion, mm	Whole-person impairment, %
<i>Interincisal opening</i>	5-10	8-10
	10-20	5-7
	20-30	3-4
	30-40	1-2
	40-50	0-1
<i>Lateral excursion</i>	0-4	3-4
	4-7	1-3
	8-12	0-1

Range of Motion. For measuring range of motion, it is important to employ appropriate and generally accepted measuring devices. Active, rather than passive, range of motion is measured^{1(p14)}; the opening range, in millimeters, between the incisal edges of the maxillary incisors and the corresponding mandibular incisors, with subsequent appropriate subtraction to compensate for an anterior open occlusal relation and addition to compensate for the amount of anterior tooth vertical overlap, if present. The mean of three consecutive measurements is the factor used in calculating impairment.^{1(p115)} The normal ranges of motion for evaluation of permanent impairment are consensus judgments of the Permanent Impairment Conference, informed by consideration of other publications.^{10,11} For whole-person ratings, the normal opening range is 40 to 50 mm, and the normal left and right lateral movement is 8 to 12 mm. The whole-person ratings for hypomobility are given in Table 2.

For *ankylosis* of the TMJ, the whole-person rating is 6% per joint. This must be combined (the combining procedure is explained later in this paper) with *AMA Guides* values for impairments, such as dietary restriction, which accompany TMJ ankylosis.

Hypermobility of a joint, in general, does not impair function; consequently, TMJ hypermobility without disc involvement is given no impairment designation and no rating value.¹² If a dentist or physician finds it necessary to rate hypermobility of the TMJ, factors offered later in this paper can be used in absence of other criteria.

Surgery (Table 3). Impairment ratings for surgical patients are consistent with *AMA Guides* ratings for other synovial joints. Arthrocentesis, diagnostic arthroscopy, and injections into the TMJ have no impairment value.

Table 3 Ratings for TMJ Surgery

TMJ surgery	Whole-person impairment, %	
	1st joint	2nd joint
Arthroscopic	2	1
Open-joint	4	2
Arthrotomy or arthroplasty, meniscectomy or condylectomy		
Partial joint replacement with metallic alloplast		
Total joint replacement ¹³	10	5

For a second surgery, add 2%; for each additional surgery, 1%.¹⁰⁽¹³⁾

Table 4 Ratable Factors That May Be Employed, if Necessary, in Lieu of Those in Table 1*

Factor	Whole-person impairment, %
Muscle rigidity	4
Joint swelling or synovial hypertrophy	4
Muscle atrophy or hypertrophy	4
Crepitation	4

*Method derived from *AMA Guides*.^{10(9&10)}

Factors That May Be Used in Absence of Other Objective Criteria

When the treating dentist or physician judges a patient to be impaired by TMJ injury but is not able to verify objectively disc displacement, range of motion restriction, or history of surgery, or when the criteria do not support adequately the extent of the TMJ impairment,^{1(p58)} certain ratable factors (Table 4) provided for other joints by the *AMA Guides* may be employed in lieu of the three presented above.

Dietary restriction may not be used in this way and may not be used in combination with any other rating factor except ankylosis, where it *must* be used.

Maximum Allowable TMJ Impairment Rating

To accommodate states that limit percentage impairment to a maximum percentage of the whole person for each body part, and to exclude the possibility that ratings of a much-injured person's impairments in various body areas could exceed 100% of the whole person, the maximum rating for TMJ impairment is restricted to 40% of the whole person.

Performing the Evaluation and Rating

It should be understood that this guide, like those of the AMA, is only a guide, not a set of rules. In determining the degree of a patient's impairment, the criteria provided herein are to be combined with the dentist's or physician's training, experience, skill, and thoroughness in examining that patient.^{1(p3)}

When an injured person has been treated until the clinical features indicate that the medical condition has been well stabilized for a reasonable period, he or she is said to have reached maximum medical improvement (MMI) with the treatment available.^{1(p1)} Only then may the injured person be evaluated for a permanent impairment due to the injury.

The first step in assessing an individual's TMJ impairment is to gather a thorough history of the medical and dental status and supplement it, if possible, by appropriate tests and diagnostic procedures. Next, a complete examination is performed for accurate determination of the clinical status.^{1(p29)} The general advice of the *AMA Guides* is that "if an individual's prosthesis or assisting device can be removed," the system should be evaluated without the device. Patients with TMD should be evaluated without their orthotic or prosthetic devices. The *AMA Guides* say further that the examining physician may choose to assess the system with and without the devices, and report both results.^{1(p9)}

The findings are analyzed to determine the facts that may be compared with the criteria specified for rating impairment of the TMJ.^{1(p1),2} The values determined are then added or combined with each other. They may be combined with values found in the *AMA Guides* for speech^{1(p233)}; facial deformity¹⁰; dysarthria and dysphagia^{1(p147)}; reflex sympathetic dystrophy^{1(p89)}; pain^{1(p303)}; sleep disorders^{1(p143)}; trigeminal, facial, glossopharyngeal, and hypoglossal neuralgia^{1(p145-146)}; and other conditions as they appear in various cases.

Combining Values

The method for combining values—different from simply adding them—was derived from the method used in the *AMA Guides* for rating impairments of the thumb^{1(p29)} and the disc-protected joints of the spine.^{1(p1)}

For the TMJ, there are two rules: (1) values for range of motion are added; (2) their total and all other values are combined. In other words, all

impairment values for range of motion—opening movement and lateral movements—are added together. The total of the range of motion values is then combined with the other values based on disc displacement and surgery, by use of the Combined Values Chart that was published in the *AMA Guides* and is reproduced (in part) as the Appendix of this article. The final value thus obtained is the whole-person rating for TMJ impairment.

Examples

In the following examples, the maximum values are used, but the clinician should select lower values if the impairment so indicates.

Example 1

Circumstances at MMI (maximum medical improvement)

1. TMJ: disc displacement and joint degeneration

Right	Stage 2
Left	No objective abnormality

2. Range of motion

Opening	42 mm
Right lateral	12 mm
Left lateral	10 mm

Ratable criteria

1. Disc derangement and joint degeneration

Right TMJ	2%
Left TMJ	0%
2. Range of motion

	0%
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3. Surgery

	0%
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The resultant rating of permanent TMJ impairment is 2% of the whole person.

Example 2

Circumstances at MMI

1. TMJ: disc displacement and joint degeneration

Right	Stage 3
Left	Stage 2

2. Range of motion

Opening	37 mm
Right lateral	11 mm
Left lateral	7 mm

Ratable criteria

1. Disc derangement

Right TMJ	3%
Left TMJ	2%
2. Range of motion

Opening	1%
Right lateral	10%
Left lateral	2%
3. Surgery

	0%
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The range of motion values are added, totaling 3%. This 3% then is combined—by use of the Combined Value Chart (Appendix)—with the 3% assigned for disc displacement and joint degeneration of the right TMJ, making 6%. This 6% then is combined with the 2% value of the left TMJ. The resultant rating of permanent TMJ impairment is 8% of the whole person.

Example 3

Circumstances at MMI

1. TMJ: disc displacement and joint degeneration

Right	Stage 4
Left	Stage 3
 2. Range of motion

Opening	31 mm
Right lateral	16 mm
Left lateral	15 mm
 3. Surgery

Right TMJ	Arthroscopic; Arthrotomy or arthroplasty (open-joint), at a separate second procedure
Left TMJ	Arthroscopic
- Ratable criteria
1. Disc displacement and joint degeneration

Right TMJ	4%
Left TMJ	3%
 2. Range of motion

Opening	2%
Right lateral	2%
Left lateral	3%
 3. Surgery

Right TMJ	2% arthroscopic 4% arthrotomy or arthroscopy (open-joint) 2% second surgery
Left TMJ	1% arthroscopic

The range of motion values are added, totaling 7%. This 7% is combined with each value for disc displacement and joint degeneration and then with each surgery value in order of size—largest first:

- | | |
|--|----------|
| Range of motion 7% with disc displacement and joint degeneration | 4% → 11% |
| 11% combined with disc displacement and joint degeneration | 3% → 14% |
| 14% combined with surgery | 4% → 17% |
| 17% combined with surgery | 2% → 19% |
| 19% combined with surgery | 2% → 21% |
| 21% combined with surgery | 1% → 22% |

The resultant rating of permanent TMJ impairment is 22% of the whole person.

This rating is to be combined with the impairment ratings from other physicians dealing with the neck, shoulder, knee, etc, to obtain the total permanent impairment rating for the injured person.

Reporting TMJ Impairment Ratings

“A clear, accurate, and complete report is essential to support a rating of permanent impairment.”^{1(p10)} The content of such a report is described in Chapter 2 of the *AMA Guides*.^{1(p7-12)} It includes a narrative history of the case, which may be used in many situations, notably legal proceedings.²

Discussion

This document represents a consensus and endorsement of the leading American organizations concerned with TMD.

Temporomandibular joint dysfunction and TMD are orthopedic and neurologic medical conditions, and treatment generally involves a team. Dentists have pioneered in this field with both clinical and academic studies and have established diagnostic guidelines and treatment protocols. We submit this guide for use with the *AMA Guides* as the most appropriate and authoritative method for evaluation of TMJ impairment.

Combined Values Chart (continued)

Table with 20 rows and 50 columns of numerical data. The first row contains headers 1 through 50. Each subsequent row contains 50 numerical values.

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