

Temporomandibular Joint Internal Derangements

Cover consideration factors

This information has been developed by ACC Clinical Services working together with the representatives of the Australian and New Zealand Association of Oral and Maxillofacial Surgeons (ANZAOMS). The document outlines the agreed factors Oral and Maxillofacial Surgeons and other treating clinicians consider when applying to ACC for treatment funding, and ACC staff consider when making decisions on these cover and entitlement requests related to temporomandibular joint (TMJ) internal derangements (ID). These factors are based on a review of published research evidence and expert opinion.

Enabling rapid decisions for ACC clients

It is important that we make funding decisions for our clients as efficiently as possible, especially when, for some, getting treatment sooner is likely to lead to a better outcome. ACC funding of entitlements is considered on a case-by-case basis. When we make a decision, it is based on information provided in the Assessment Report and Treatment Plan (ARTP), contemporaneous clinical information and imaging reports provided, along with information we already hold. If there is a request for surgery, the ARTP must include appropriate imaging reports such as MRI. Other imaging such as CT scan, or CBCT scan reports should be provided if available.

In all cases where ACC funding for medical/surgical management is sought, the treating clinician should explain the causal link between the condition they are treating and the injury that ACC has covered.



Endorsed by the New Zealand Dental Association



**New Zealand
Dental Assoc.**

For the common
good since 1905.
NZDA.org.nz

ACC assessment of cover and entitlement funding requests

ACC is required to ensure that its funding decisions comply with the Accident Compensation Act 2001. The need to establish a causal link between a condition to be treated and an accepted claim event is critical to the application of the legislation. Applications for entitlement (eg surgery requests) must be related to a covered personal injury for that body site. In the absence of such a covered personal injury, ACC will consider if the diagnosed condition was caused by the accident. It should be noted that a temporal attribution of symptoms to an event is not sufficient evidence of causation of a personal injury. Where the conclusion using these consideration factors is that causation is unlikely to be established, the treating clinician should set these expectations with their patient and advise ACC.

TMJ internal derangements/disc displacement

In TMJ trauma, several structures can be affected, from the bone components of the joint (condyle, glenoid fossa) to the articular surfaces (disc or synovial lining on the joint spaces). Trauma to the TMJ can cause both bone and soft tissue injuries, like intracapsular condylar fracture with mostly displaced TMJ disc without reduction. Extrinsic factors do not necessarily need to directly involve the joint apparatus in the trauma to result in a diagnosable TMJ disorder.

TMJ internal derangements (TMJ ID) are the most common TMJ disorders when studies have been retrospective, cross-sectional, without application of well-defined clinical diagnostic criteria, and risk of significant biases such as referral bias or treatment bias based on the receiving discipline.

Where studies have been conducted with application of Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), usually muscle-based pains (myofascial pains) predominate across comparable study populations for all TMDs.

TMJ ID (or intra-articular disorders) have been defined as an abnormal positional relationship between the disc and the condyle, articular eminence, and/or articular fossa.

The term 'internal derangement' is often used interchangeably with 'disc displacement', depending on the position of the disc relative to the condyle and its anterior displacement. These conditions are categorised as disc displacement with reduction (DDWR) and disc displacement without reduction (DDWoR). The presence of internal derangement or disc displacement does not necessarily indicate intra-articular pathology. For instance, some patients may have physiologically displaced disc on MRI but without any clinical symptoms (such as pain) or signs (normal range of mouth opening).

DDWR is the most common intra-articular disorder of the TMJ. It is often asymptomatic and requires no treatment when there is an absence of arthralgia or functional (intermittent) locking episodes. The correlation between disc position and arthralgia is unclear. Factors contributing to DDWR are abnormal biomechanical forces applied to the mandibular condyle resulting in alteration of the shape and function of the articular tissues: chronic (microtrauma eg, occlusal abnormality, joint hypermobility) or acute (macrotrauma) injuries.

DDWoR is a rare form of TMD. It can cause TMJ and referred pain, decreased range of motion and painful jaw locking. It can be acute or chronic, and it may proceed from DDWR. Unlike in cases of DDWR, treatment is usually required for this condition.

Characteristics of **acute** TMJ disc displacement without reduction:

- facial trauma, particularly to the chin
- no TMJ pain, clicking, trismus, mouth opening limitation and mandibular movement dysfunction before injury
- TMJ swelling, pain and mouth opening limitation after injury
- CT examination showing no condylar fracture on the painful side but a decreased or diminished space between the condyle and fossa on the coronal reconstruction
- MRI examination showing an anteriorly displaced TMJ disc with a normal shape, but the posterior disc band is elongated or maybe disrupted with or without effusion in the joint space.

Background prevalence

DDWR, particularly painless DDWR without functional limitations, is relatively common in the general population across most age groups. The prevalence of individual TMJ ID diagnoses varied among individual studies, depending on studied populations:

DDwR — 33%

DDwoR — 0.74%

Osteoarthritis — 1.9-3.2% (Valesan et al, 2021).

Overall prevalence of clinical signs of intra-articular disorders in children and adolescents was estimated at 16% (de Silva et al, 2016).

Prevalence of DDwR in the young population varies with age, with a peak prevalence in adolescent children (Marpaung et al, 2019; Ikeda et al, 2014). The estimated prevalence rates of anterior disc displacements with reduction (DDwR):

- 7-12 years old — 7.0%
- 13-18 years old — 14.4%
- 19-21 years old — 12.3% (Marpaung et al, 2019).

In a meta-analysis assessing prevalence of degenerative joint disease (DJD) in patients with anterior disc displacement, the prevalence of DJD involving DDWR was 35% (Silva et al, 2020).

TMJ (craniomandibular) ankylosis

Ankylosis is a very rare but the most serious complication of post-traumatic TMJ injury. In adults, its clinical manifestations are inability to adequately open mouth, affecting oral hygiene, mastication, and speech. In children, TMJ fusion can result in profound growth impairment (Giannakopoulos et al, 2009).

Cover and entitlement consideration factors

ACC uses the following consideration factors to determine whether TMJ ID is likely to represent a physical injury caused by an accident.

IMPORTANT: The factors in this table are not to be considered in isolation; rather the overall balance of factors that are more supportive and less supportive of a causal link should be considered.

Factor	More supportive of a possible causal link between an accident and TMJ internal derangement	Less supportive of a possible causal link between an accident and TMJ internal derangement
<p>Cover</p> <p>Initial diagnosis — what is the initial diagnosis from the claim lodging provider? What injury code was accepted by ACC for cover?</p>	<p>There is an ACC-covered ‘relevant’ injury:</p> <ul style="list-style-type: none"> • Condylar fracture • Sub-condylar fracture • Jaw dislocation • Mandibular trauma 	<p>No ACC cover for TMJ trauma.</p> <p>Cover for Treatment Injury (TI) as any injury is due to a minor force.</p> <p>ACC cover for a TMJ sprain only.</p> <p>Internal derangement on the contralateral side.</p>
<p>Mechanism of injury</p>	<p>Direct mandibular trauma:</p> <ul style="list-style-type: none"> • direct blow to the mandible in an assault • fall on the mandible. <p>High energy impact</p>	<p>Mechanism of injury is not likely to cause internal derangements in the joint:</p> <ul style="list-style-type: none"> • absence of direct mandibular trauma • low energy impact
<p>Clinical examination findings at initial presentation</p>	<p>Presence of pain, swelling, bruising, locking, loss of ROM in the TMJ, clicking, crepitus & malocclusion, deviation on opening; open and closed lock.</p>	<p>Absence of pain, bruising, swelling around the TMJ, locking, loss of ROM.</p>

<p>Timeframe</p> <p>How much time is there between the date of accident and the date of initial presentation for assessment?</p>	<p>Clinical presentation with signs and symptoms attributable to TMJ trauma within three months from the date of accident, unless there are specific extenuating circumstances documented.</p> <p>Presentation with post-traumatic arthritis within two years from the date of accident.</p>	<p>Presentation more than three months after the accident date.</p>
<p>Previous history</p>	<p>No previous history of symptoms consistent with TMD.</p>	<p>Documented clinical evidence of pre-existing TMD.</p> <p>Note: a history of prior TMD does not exclude a new accident causing a new injury</p> <p>Alternative explanation for symptoms, eg bruxism, clenching, impact aids, pre-existing neuropathic or nociplastic orofacial pain complaints of more generalised chronic bodily pain.</p> <p>Medical conditions, such as facial neuralgia, pain syndromes.</p> <p>Prolonged dental procedures.</p>
<p>Demographics</p>	<p>Post-traumatic degenerative joint disease can develop at any age.</p> <p>Males are more likely to have TMJ ID from accident than females.</p>	

<p>Initial subjective history</p> <p>The contemporaneous clinical record of the subjective history including the mechanism of accident, degree and type of force involved, initial consequences of the accident, initial signs and symptoms as described by the client and evolution of signs and symptoms since the accident.</p>	<p>The contemporaneous record shows a clear contiguous chain of symptoms and signs from around the time of injury to lodgement.</p> <p>The history and mechanism of injury documented in the subsequent clinical notes, including any specialist reports, are consistent with the contemporaneous medical records.</p>	<p>No recording of the event in the contemporaneous clinical notes.</p> <p>No recording in the initial ACC42 or ACC45 forms</p> <p>Unexplained inconsistencies in the client's recollection and the treating clinician's recording.</p>
<p>Imaging</p>	<p>Joint effusion diagnosed on MRI.</p> <p>The disc displacement is more severe and anterior.</p> <p>The condylar head shows signs of bone marrow oedema or contusion.</p>	<p>Evidence of osteoarthritis or TMJ internal derangement on imaging eg Xray, CT, MRI prior to accident.</p> <p>The joint effusion absent, indicating resolution of inflammation or oedema.</p> <p>The condylar head shows signs of degenerative changes, such as osteophytes, subchondral cysts, or erosions (irregularity or loss of cortical bone).</p> <p>The degree of associated degenerative changes (if any) should be considered against all other factors listed in this table.</p>
<p>Medical, social, and occupational history</p> <p>The relevant medical history, including comorbidities, past medical and family history; the relevant occupational history including work, sporting activities and hobbies</p>	<p>No prior history of family or relevant medical conditions.</p>	<p>Migraine, tension headaches, sinus pain being mistaken for TMJ disorder, immunologically mediated connective tissue disease with pre-existing evidence of joint erosion or other arthropathy.</p>
<p>Analysis and conclusion — considering all the factors of the individual case, does the pathology (eg TMJ internal derangement, OA) appear more likely than not to have been caused by the covered accident?</p>		

References

de Silva, C. G., Pachêco-Pereira, C., Porporatti, A. L., Savi, M. G., Peres, M. A., Flores-Mir, C., & Canto Gde, L. (2016). Prevalence of clinical signs of intra-articular temporomandibular disorders in children and adolescents: A systematic review and meta-analysis. *J Am Dent Assoc*, 147(1), 10-18.e18. doi:10.1016/j.adaj.2015.07.017

Giannakopoulos, H. E., Quinn, P. D., Granquist, E., & Chou, J. C. (2009). Posttraumatic Temporomandibular Joint Disorders. *Craniomaxillofacial Trauma & Reconstruction*, 2(2), 91-101. doi:10.1055/s-0029-1215872

Ikeda, K., Kawamura, A., & Ikeda, R. (2014). Prevalence of disc displacement of various severities among young preorthodontic population: a magnetic resonance imaging study. *J Prosthodont*, 23(5), 397-401. doi:10.1111/jopr.12126

Marpaung, C., van Selms, M. K. A., & Lobbezoo, F. (2019). Temporomandibular joint anterior disc displacement with reduction in a young population: Prevalence and risk indicators. *Int J Paediatr Dent*, 29(1), 66-73. doi:10.1111/ipd.12426

Silva, M. A. G., Pantoja, L. L. Q., Dutra-Horstmann, K. L., Valladares-Neto, J., Wolff, F. L., Porporatti, A. L., . . . De Luca Canto, G. (2020). Prevalence of degenerative disease in temporomandibular disorder patients with disc displacement: A systematic review and meta-analysis. *J Craniomaxillofac Surg*, 48(10), 942-955. doi:10.1016/j.jcms.2020.08.004

Valesan, L. F., Da-Cas, C. D., Réus, J. C., Denardin, A. C. S., Garanhani, R. R., Bonotto, D., . . . de Souza, B. D. M. (2021). Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis. *Clin Oral Investig*, 25(2), 441-453. doi:10.1007/s00784-020-03710-w

Wilkes Classification

(Adapted from **Oral and Maxillofacial Surgery: WILKES CLASSIFICATION** (omf-surgery.blogspot.com))

The most widely used classification of TMJ dysfunction. Its main advantage is that it can be used to guide management. It is based upon clinical presentation, appearance on imaging and what is found at arthroscopy or surgery.

STAGE 1

Clinical: Painless clicking with no restrictions in motion

Imaging: Slightly forward disc that can reduce. Normal bone contour

Surgical appearance: Normal disc.

STAGE 2

Clinical: occasionally painful clicking, intermittent locking, headaches

Imaging: slightly forward disc that can reduce. Early disc deformity. Normal bone contour

Surgical appearance: thickened disc. Anterior disc displacement

STAGE 3

Clinical: frequent pain, joint tenderness, headaches, closed lock, painful chewing. These patients usually progress to a stage 4 given time

Imaging: anterior disc displacement (early stages reduce, late stages do not), disc thickening, normal bone contour

Surgical appearance: disc deformed and anteriorly displaced. Sometimes adhesions, no bone changes

MRI to confirm diagnosis will show anterior disc displacement.

STAGE 4

Clinical: chronic pain, headache, and restricted motion

Imaging: non reducing anterior disc displacement. Disc thickening. Abnormal bone contours

Surgical appearance: gross arthritic degenerative changes

STAGE 5

Clinical: variable pain, joint crepitus, painful function. Pre-ankylosis

Imaging: non reducing anterior disc displacement. Disc thickening. Abnormal bone contours

Surgical appearance: gross arthritic degenerative changes

Acknowledgements

This document has been developed in collaboration between the New Zealand Dental Association and ACC.

The representatives involved in the document development:

Australian and New Zealand Association of Oral and Maxillofacial Surgeons (ANZAOMS) — Liam Moore, Wayne Gillingham, Peter Coghlan.

ACC — Rosemary Kennedy, Michael Austen, Michael Sexton, Karyn Drummond, Tanya Skaler.

Peer reviewers — Derek Goodisson, OMFS; Hadleigh Clark, Oral Medicine Specialist; Sefton Moy, Medical Advisor.

Disclaimer

All information in this publication was correct at the time of printing. This information is intended to serve only as a general guide to arrangements under the Accident Compensation Act 2001 and regulations. For any legal or financial purposes this Act takes precedence over the contents of this guide.