

Temporomandibular Disorder

Temporomandibular Disorder or TMD is an extremely common disorder affecting up to a third of the population at some time in their lives. However as the symptoms of TMD are so diverse, this disorder is only diagnosed in about 10% of cases. This condition is more common in women and may become more prevalent due to greater amounts of stress in our daily lives.

TMD is a disorder involving both the arthrogenous (TMJ) and myogenous (muscle) components in approximately 70% of cases, or the condition may present as only involving the TMJ or masticatory muscle component. The meniscus (interarticular disc) can also be displaced which can lead to the production of joint sounds during mandibular function and can result in limited mouth opening in severe cases.

The term 'disc displacement with reduction' refers to the seating of the displaced meniscus onto the condylar surface during mouth opening and closing functions. This may often be felt by the patient as a clicking or popping sound. In cases where the meniscus remains forward (during all movements of the TMJ) to the condyle is called 'disc displacement without reduction' and in some cases can lead to limited mouth opening or a 'closed lock'. Pain can involve the face and jaw, including the ears. Patient's may also present with neck, shoulders and back pain that may occur independently of their TMD condition

Some of the causes of Temporomandibular Disorders include:

- ◆ **Cartilage wear and tear:** The cartilage around the TMJ becomes worn or displaced, which causes painful grinding of the jaw.
- ◆ **Dislocated TMJ:** Indicated by popping/cracking noises when the jaw is opened or closed, this may affect jaw movement and strain the muscles of the jaw, face, and neck.
- ◆ **Clenching and grinding (bruxism):** Teeth grinding or clenching places extreme pressure on the joints. This is most common while sleeping and usually patients notice painful and fatigued jaw muscles in the morning. The added stress on the jaw joint can cause wear and tear of the cartilage, and may even cause dislocation of the joint.
- ◆ **Occlusal trauma:** Such can occur in a new restoration, causing pain in the TMJ and surrounding muscles.
- ◆ **Arthritis:** Arthritis can cause uncomfortable inflammation of the TMJ as well as swelling in the adjoining tissues.
- ◆ **Trauma:** Trauma to the jaw such as a car accident, a fall, a punch, etc. can cause damage. This is usually acute and can conservatively managed, however sometimes trauma to the joint can cause chronic damage which may eventually contribute to a TMD problem at a later time.
- ◆ **Stress:** Emotional stress can play a major role in the development of temporomandibular dysfunction. Stress increases both the severity and duration of bruxism while asleep. Also, patients are more likely to clench or

grind their teeth while awake during times of stress.

- ◆ **Ergonomic (Posture related):** Patients who work on a computer may be holding their head in a way that places strain on the jaw and TMJ.

The most common symptoms of a Temporomandibular Disorder are:

- ◆ Headaches involving the frontal-temporal regions. The patient may also experience headaches or neck aches, commonly called tension headaches, at the back of the head where the neck attaches to the skull.
- ◆ Clicking or popping of the joint with tenderness or pain
- ◆ Sore muscles in the head, face or neck
- ◆ Difficulty in chewing or fatigue of the jaw muscles after prolonged chewing or talking
- ◆ Limitations in the range of movement of the lower jaw
- ◆ Locking of the jaw
- ◆ Tooth wear and Tooth sensitivity may occur as a result of occlusal parafunctional habits such as tooth clenching or nocturnal bruxism (tooth grinding)
- ◆ Deviation of the jaw when opening or closing the mouth
- ◆ Pain in one or both ears or in the TMJ joint itself
- ◆ Hearing difficulties or the perception the patient's ears are blocked.

Treatment of TMJ dysfunction is extremely variable as it depends on the individual patient and the contributing factors to their condition. In many cases, the symptoms are muscular or dental, with minimal joint damage. In these cases, successful treatment options are non-surgical, and may include:

Patient education and self care: The jaw needs to rest to enable it to heal. Ways of self care include not chewing gum or clenching teeth together while awake, and avoiding other non-functional jaw habits such as pencil chewing. A soft diet avoiding particularly crunchy or chewy foods also helps. Other methods of self care include massage and heat application to the affected muscles, as well as relaxation techniques and stress reduction. Anything that helps relieve stress is useful, such as reading, exercising, listening to music, etc. Counselling is often helpful to learn stress management.

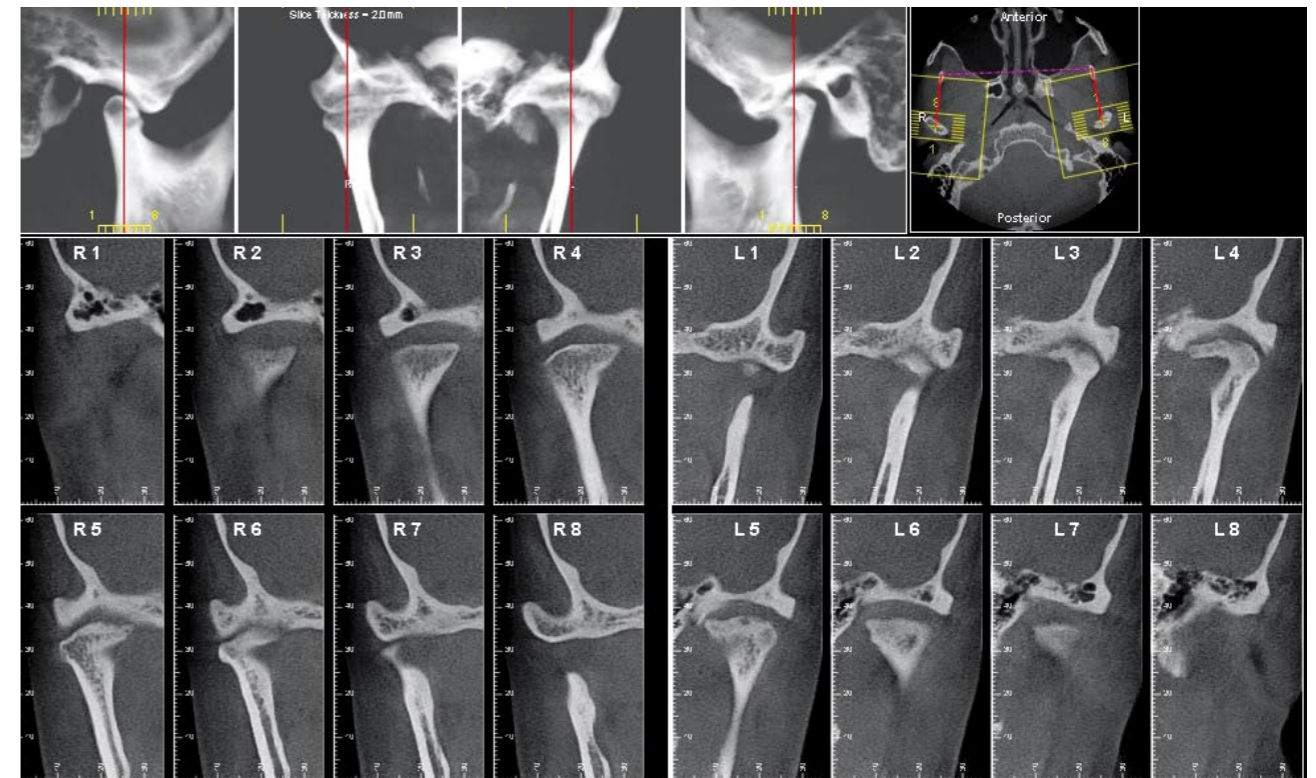
Physiotherapy and postural training: This includes jaw and neck exercises which will help the muscles stretch.

Occlusal splints: These are designed to protect the teeth from further wear. They reduce the severity of grinding at night and allow the muscles to rest.

Analgesics and muscle relaxants: Pain medication such as ibuprofen can be prescribed to reduce pain as well as inflammation. Occasionally a mild muscle relaxant may be prescribed.

Intraarticular steroid injection: This can be used to treat TMJ inflammation.

Surgery: This is for the small minority of patients only and can range from arthroscopic surgery for less severe damage to a total TMJ implant for extensively damaged joints.

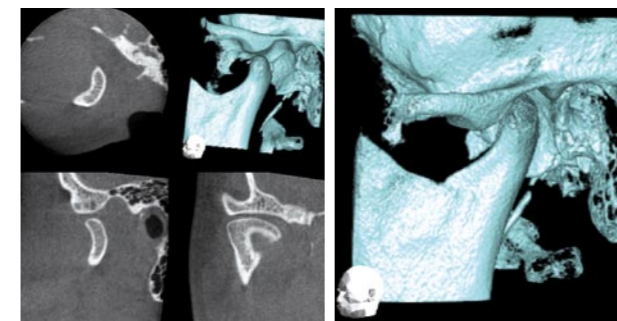


Dolphin Imaging software also allows cross-sectional views of the TMJ.

The use of DMDI and Morita technology in the diagnosis of TMJ dysfunction

The use of Morita Accuitomo 170 cone beam CT in clinical practice provides a number of potential advantages for TMJ imaging.

- ◆ **X-ray beam limitation:** The Morita Accuitomo 170 is capable of reducing the size of the irradiated area by collimating the primary x-ray beam to the area of interest. We can open the field of view to scan the entire facial area.
- ◆ **Image accuracy:** The data set obtained in a CT scan contains a 3D block of cuboid structures, known as voxels. The Morita Accuitomo 170 cone beam CT unit provides voxel resolutions that are equal in all 3 dimensions. This



produces sub-millimetre resolution as low as 0.125 mm, which exceeds that of the highest grade multi-slice CT.

- ◆ **Dose reduction:** Published reports indicate that the effective dose of radiation for a cone beam CT is significantly reduced by up to 98% compared with helical CT systems. This reduces the effective patient dose to approximately the same as a periapical survey of the dentition or 3-15 times that of a single OPG.
- ◆ **Reduced image artifact:** With manufacturers' artefact

suppression algorithms and increasing number of projections, The Morita Accuitomo 170 images result in much less metal artifact, particularly in reconstructed images of the teeth. The one volume viewer enables the user to have complete diagnostic control. This is unique to the Morita Accuitomo 170 CT.

The Morita Accuitomo 170 is the only cone beam CT in Australia to be both medically accredited and listed on the Australian register of therapeutic goods, and therefore is the only CBCT scanner legally able to obtain Medicare rebates on TMJ scans. Our state of the art high resolution technology enables viewing of the TMJ in 3 planes as well as an easily manipulated 3D image. Because CBCT emits up to 90% less radiation than a helical CT scan, open and closed mouth TMJ views are easily obtainable on a CT allowing an easier diagnosis with minimal radiation dose.

DMDI's use of Dolphin Imaging software also allows cross-sectional views of the TMJ, enabling the images to be emailed or printed out as requested.

The use of the Morita Accuitomo 170 enables high quality imaging of the TMJ to better visualise TMJ dysfunction. This helps to further enforce the DMDI reputation as a centre of excellence. ◆

This article has been prepared by
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DMDI is a diagnostic centre that specializes in 3D imaging of the head and neck and offers the referring practitioners complete temporomandibular joint diagnostic imaging with complete accuracy. To refer patients to DMDI you can download a referral form at www.dmdi.com.au or ring or contact us by email as shown above.