

INTRACAPSULAR DISORDERS OF THE TMJ
Pathophysiology, Diagnosis & Management

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Oral Medicine Specialist

Devaraj SD, Pradeep D. 2014. Internal Derangement of Temporomandibular Joint - A Review. IOSR Journal of Dental and Medical Sciences, 13, 66-73. Available from: <https://www.iosrjournals.org/iosr-jdmr/Vol13-6-66-73.pdf>

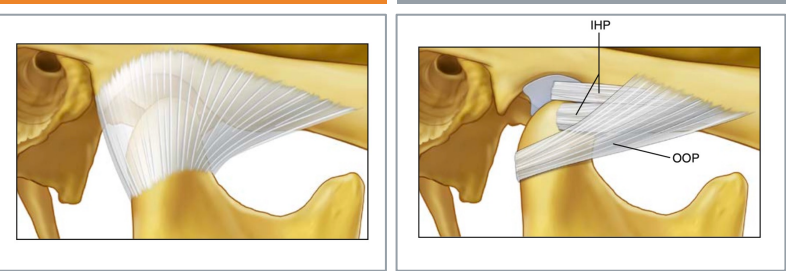
1

LEARNING OBJECTIVES

- Understand intracapsular TMJ disorders
- Recognise clinical features
- Apply diagnostic frameworks
- Develop management plans

Reading resources:

1. Farah CS, Balasubramaniam R, McCullough MJ. 2019. Contemporary Oral Medicine. Springer Nature Switzerland. Available from: <https://doi.org/10.1007/978-3-319-72303-7>
2. Okeson J. 2020. Management of Temporomandibular Disorders and Occlusion. 8th ed. Elsevier; Missouri.
3. Schiffman et al. 2014. The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD). J Oral & Facial Pain & Headache. Available from: <https://inform-iaodr.com/index.php/tmd-assessment/diagnosis/dc-tmd/>



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KEY TMJ ANATOMY

Mandibular condyle

Mandibular/Glenoid fossa (temporal bone)

Articular/TMJ disc

Bilaminar zone
• Superior retrodiscal lamina
• Inferior retrodiscal lamina
• Retrodiscal tissue

Capsular ligaments

Synovial membrane and joint fluid

Modified from: Devraj SD, Pradeep D. 2014. Internal Derangement of Temporomandibular Joint - A Review. IOSR Journal of Dental and Medical Sciences, 13, 66-73. Available from: <http://www.iosrjournals.org/ijcm/vol13i06/0611156673.pdf>

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* Fig. 1.11. The Condyle. A, Anterior and B, posterior views. A dotted line marks the border of the articular surface. Note that the articular surface on the posterior aspect of the condyle is greater than on the anterior aspect.

• Fig. 1.12. A. Bony structures of the temporomandibular joint (lateral view). B. Articular fossa (in view). AE, Articular eminence; MF, mandibular fossa; STF, squamotympanic fissure.

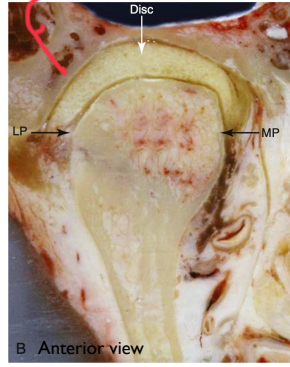
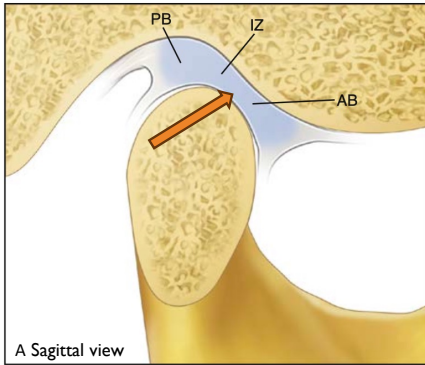
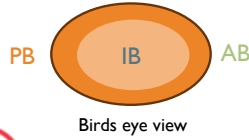
KEY TMJ ANATOMY

CONDYLE
MANDIBULAR/GLENOID FOSSA

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The disc is "squishy", functional & adaptable!

- Biconcave structure
- Dense fibrous CT, avascular, aneural
- Flexible and adaptive
- Morphology affected by destructive forces
- 3 zones: Anterior (AB), Intermediate (IB), Posterior (PB)



• **Fig. 1.13.** Articular Disc, Fossa, and Condyle (Lateral View). The condyle is normally situated on the thinner intermediate zone (IZ) of the disc. The anterior border of the disc (AB) is considerably thicker than the intermediate zone, and the posterior border (PB) is even thicker.

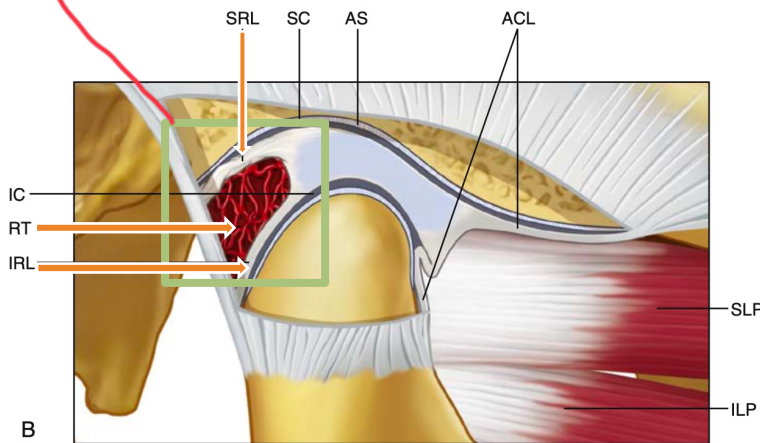
Okeson J. 2020. Management of Temporomandibular Disorders and Occlusion 8th ed. Elsevier: Missouri.

KEY TMJ ANATOMY

ARTICULAR DISC

5

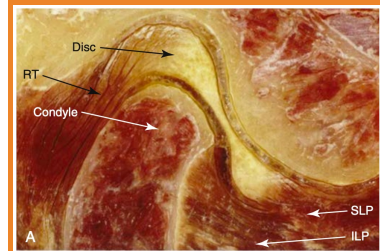
Pain from retrodiscal tissues derives from this region



• **Fig. 1.15.** Temporomandibular Joint. **A.** Lateral view and, **B.** diagram showing the anatomic components. ACL, Anterior capsular ligament (collagenous); AS, articular surface; IRL, inferior retrodiscal lamina (collagenous); RT, retrodiscal tissues; SC and IC, superior and inferior joint cavity; SLP and ILP, superior and inferior lateral pterygoid muscles; SRL, superior retrodiscal lamina (elastic); the discal (collateral) ligament has not been drawn. (A. Courtesy Dr. Per-Lennart Westesson, Rochester, NY.)

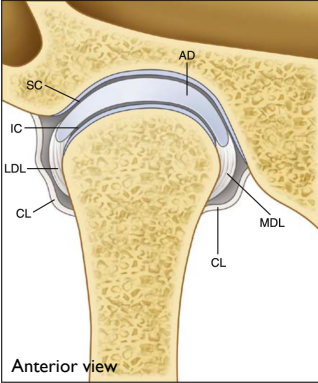
Okeson J. 2020. Management of Temporomandibular Disorders and Occlusion 8th ed. Elsevier: Missouri.

KEY TMJ ANATOMY



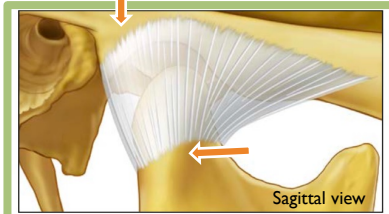
BILAMINAR ZONE RETRODISCAL TISSUES

6



Anterior view

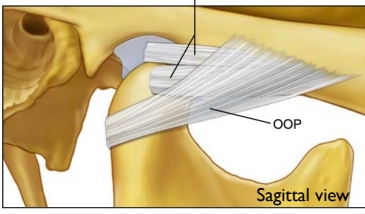
• **Fig. 1.18.** Temporomandibular Joint (Anterior View). The following are identified: AD, Articular disc; CL, capsular ligament; IC, inferior joint cavity; LDL, lateral discal ligament; MDL, medial discal ligament; SC, superior joint cavity.



Sagittal view

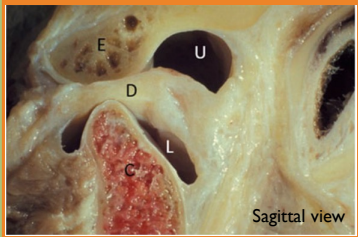
• **Fig. 1.19.** Capsular Ligament (Lateral View). Note that it extends anterior to include the articular eminence and encompass the entire articular surface of the joint.

KEY TMJ ANATOMY



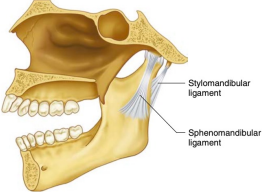
Sagittal view

• **Fig. 1.20.** Temporomandibular Ligament (Lateral View). Note that there are two distinct parts: the outer oblique portion (OOP) and the inner horizontal portion (IHP). The OOP limits normal rotational opening movement; the IHP limits posterior movement of the condyle and disc. (Modified from Dubrul EL: *Sicher's oral anatomy*, ed 7, St Louis, MO, 1980, The CV Mosby CO, pp 185.)



Sagittal view

CAPSULAR LIGAMENTS COMPARTMENTS



• **Fig. 1.22.** The mandible, temporomandibular joint, and accessory ligaments.

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Sagittal view

D = disc
E = eminence
C = condyle
U = upper compartment
L = lower compartment

KEY TMJ ANATOMY

SYNOVIAL MEMBRANE

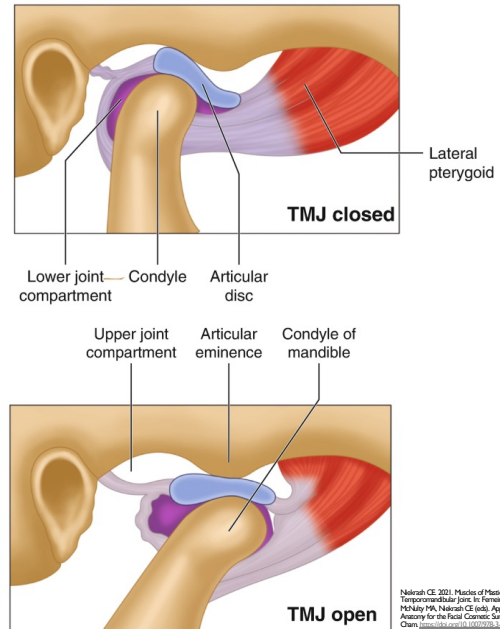
8

TMJ BIOMECHANICS

- Rotation → early opening (20-35 mm)
- Translation → late opening
- Disc-condyle coordination and load distribution



Source: <https://youtu.be/Nkz3k0l1T7Y?si=6G7Ch2NR0V4w7s>



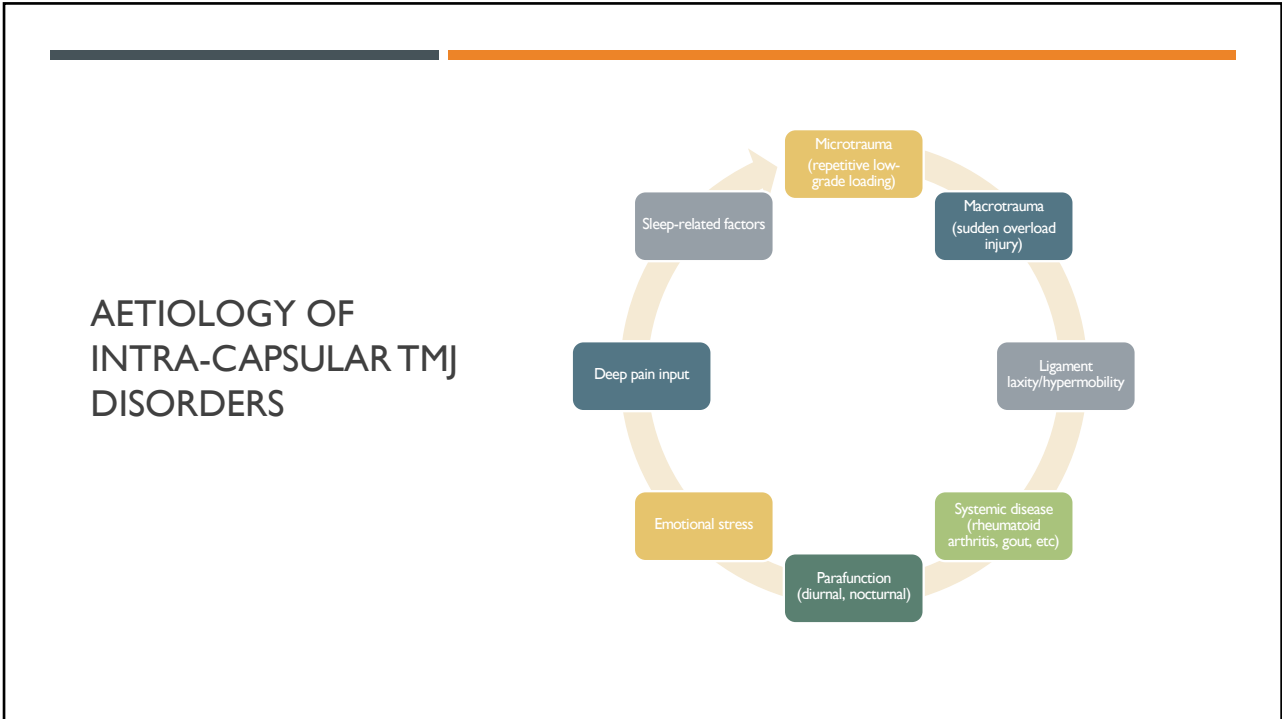
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TMJ BIOMECHANICS

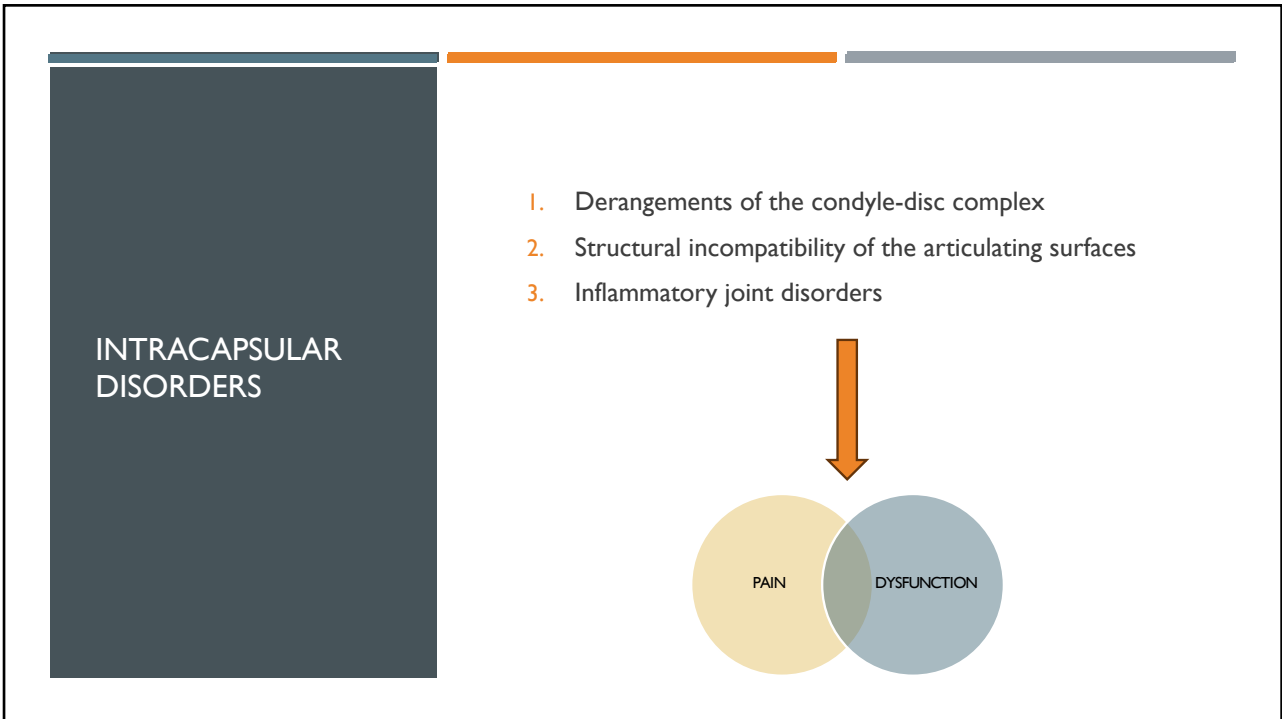
- Disc morphology is critical for maintaining correct positioning during joint function
- Normal shape, combined with intra-articular pressure, enables self-positioning of the disc → smooth and stable joint movement
- Ligamentous attachments have minimal functional impact when disc morphology is intact
- Significant alteration of disc morphology compromises this system
 - Ligaments do not stretch but become elongated with excessive force
 - Articular surfaces of TMJ are no longer maintained in constant contact
 - Resulting changes disrupt normal joint biomechanics
 - **Leads to development of TMJ dysfunction signs and symptoms**

Video: https://youtu.be/utKvFD6a_6o?si=WZHIECHQDbDeL-mWV

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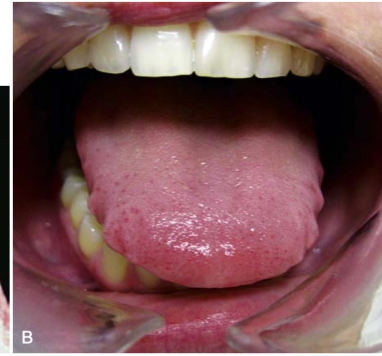
12

CLINICAL FEATURES OF INTRACAPSULAR DISORDERS

- Joint pain (preauricular)
- Clicking, popping, or crepitus
- Restricted or deviated mouth opening
- Locking (intermittent or persistent)
- Pain on function (chewing, yawning)

PARAFUNCTION FEATURES

+/- occlusal wear



• **Fig. 7.2** Some Clinical Signs Associated With Parafunctional Activity. **A.** Evidence of cheek biting during sleep. **B.** Note the lateral borders of the tongue are scalloped, conforming to the lingual surfaces of mandibular teeth. During sleep a combination of negative intracanal pressure and forcing the tongue against the teeth produces this altered tongue shape. This is a form of parafunctional activity.

Chesson J. 2000. Management of Temporomandibular Disorders and Occlusion. 8th ed. Elsevier: Missouri.

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CLASSIFICATION OF INTRACAPSULAR DISORDERS (DC-TMD)

1. Disc displacement with reduction
2. Disc displacement with reduction with intermittent locking
3. Disc displacement without reduction with limited opening
4. Disc displacement without reduction without limited opening

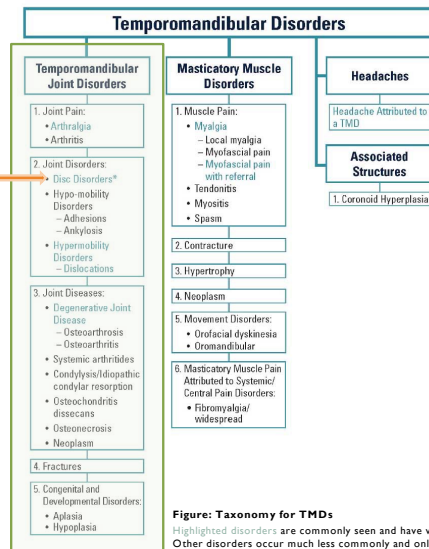


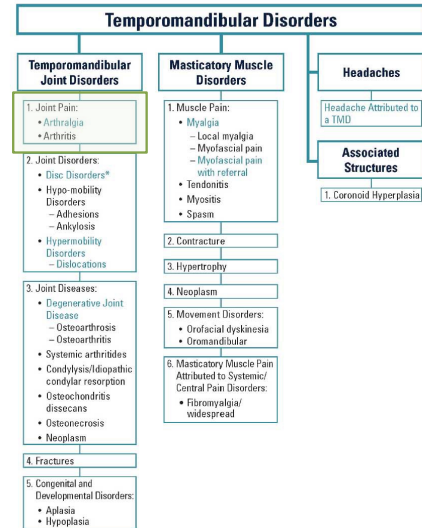
Figure: Taxonomy for TMDs
 Highlighted disorders are commonly seen and have validated diagnostic criteria
 Other disorders occur much less commonly and only have clinical criteria

Source: Peck et al., 2014; Schiffman and Okuda, 2014. National Academy of Sciences
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4064674/> [Retrieved on 04/17/2026]

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JOINT PAIN

- **Arthralgia** = pain in TMJ structure
 - Non-inflammatory
 - Arises from nociceptors in surrounding soft tissues: discal ligaments, capsular ligaments (capsulitis), retrodiscal tissues (retrodiscitis), synovial lining (synovitis)
 - Provoked by movement, function, parafunction or palpation
- **Arthritis** = inflammation in TMJ structure
 - Inflammatory
 - Clinical signs: pain, swelling, warmth, erythema, altered function
 - Often associated with systemic inflammatory disease e.g. rheumatoid arthritis
 - Pain often more persistent and can occur at rest
- Effect:
 - Limited mandibular movement
 - Protective co-contraction

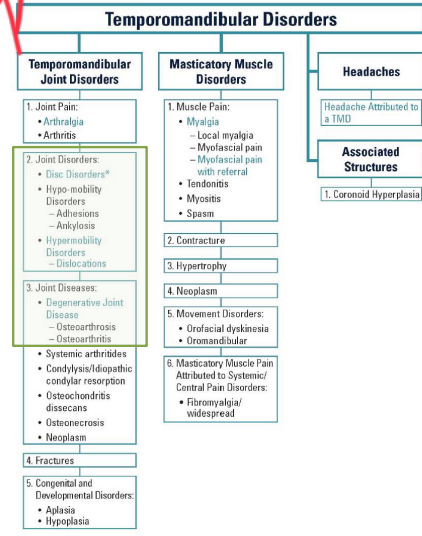
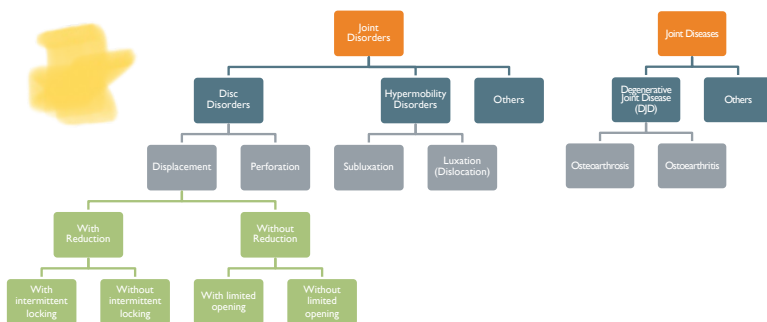


Source: Peck et al., 2014; Schiffman and Ohrbach, 2016; National Academy of Sciences
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4701118/figure/fig1/#d3118-fig1-00001>

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JOINT DISORDERS AND DJD

- Conditions affecting TMJ structures: articular disc, articulating bony surfaces, supporting ligaments
- Osteoarthritis: non-inflammatory DJD
- Osteoarthritis: inflammatory DJD



Source: Peck et al., 2014; Schiffman and Ohrbach, 2016; National Academy of Sciences
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4701118/figure/fig1/#d3118-fig1-00001>

16

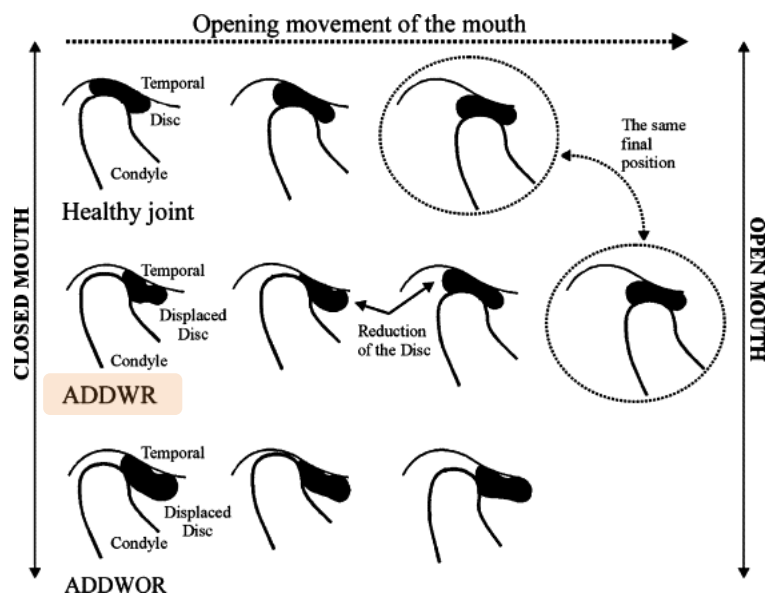
JOINT DISORDERS AND DJD

Condition	History (Patient Report)	Clinical Examination Findings
Disc Displacement with Reduction (DDwR)	Clicking or popping during opening and/or closing	Reproducible click on opening and/or closing (≥ 1 of 3 cycles)
DDwR with Intermittent Locking	Episodes of jaw "locking" with temporary inability to fully open	Click present + occasional limited opening that resolves
Disc Displacement without Reduction (with limited opening)	History of locking with sudden reduction in mouth opening	Limited opening (< 40 mm), deviation to affected side, no click
Disc Displacement without Reduction (without limited opening)	Previous history of locking, now improved opening	Normal opening but persistent deflection, no click
Subluxation (hypermobility)	Jaw "goes out" on wide opening but self-reduces	Excessive opening with terminal "clunk" on closing
Luxation/Dislocation (open lock)	Inability to close mouth after wide opening	Patient presents with mouth open, requires assisted reduction
Degenerative Joint Disease (osteoarthritis / osteoarthrosis)	Joint noise (grating, grinding), may or may not have pain	Crepitus on movement (coarse, gravel-like sound)

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DISC DISPLACEMENT WITH REDUCTION (DDWR)

- Normal range of mouth opening
- Reproducible click on opening/closing, or opening/lateral/protrusive movements
- Ipsilateral jaw deviation on opening with correction
- +/- TMJ pain on movement, function, palpation



Polaris AP, Dobson M. 2007. An accurate simulation model of anteriorly displaced TMJ discs with and without reduction. Medical Engineering & Physics, 29 (2): 216-226. Available from <https://doi.org/10.1016/j.medengphy.2006.07.007>

18 * if its not painful, don't treat
 * if it is/ progressing then treat

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© Moore J. 2000. Management of Temporomandibular Disorders and Occlusion. 8th ed. Elsevier: Missouri.

* Fig. 8.11. Variations in Disc Displacements. A. A medial disc displacement. B. An MRI of a medial displaced disc. C. An MRI of a lateral disc displacement. D. Sometimes the disc is only partially displaced, either the medial portion is displaced E, or the lateral F. (A to C. Courtesy Dr. Per-Lennart Westesson, University of Rochester, NY.)

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DISC DISPLACEMENT WITH REDUCTION (DDWR)

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Rob. Corrado L, B-Olea A 2022. Disc Displacement with Inconsistent Lock: A Case Series of a Rarely Addressed Disorder. World Journal of Dentistry. 13 (3). Available from <https://doi.org/10.5005/wjod.v13i03.1712>

↓ disk displacement with reduction

Repeated displacement & reduction

Morphological disc changes

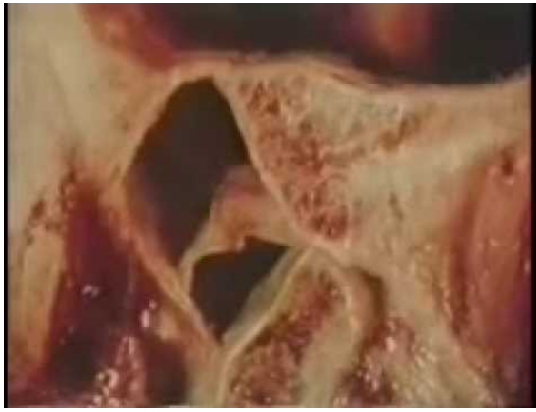
↓ ability to self-position

↑ elongation of discal ligaments

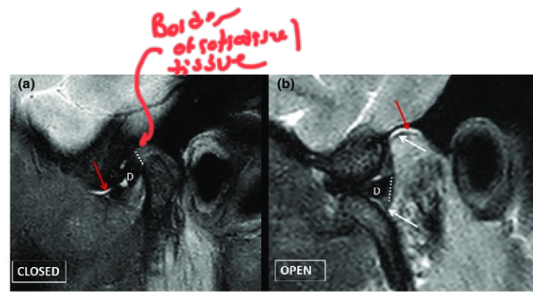
Compromised joint stability

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DISC DISPLACEMENT WITH REDUCTION (DDWR)



Source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC333009/>



Whyte A et al. Imaging of temporomandibular disorder and its mimics. 2020 | Medical Imaging and Radiation Oncology. Available from <https://doi.org/10.1111/1754-9889.13119>

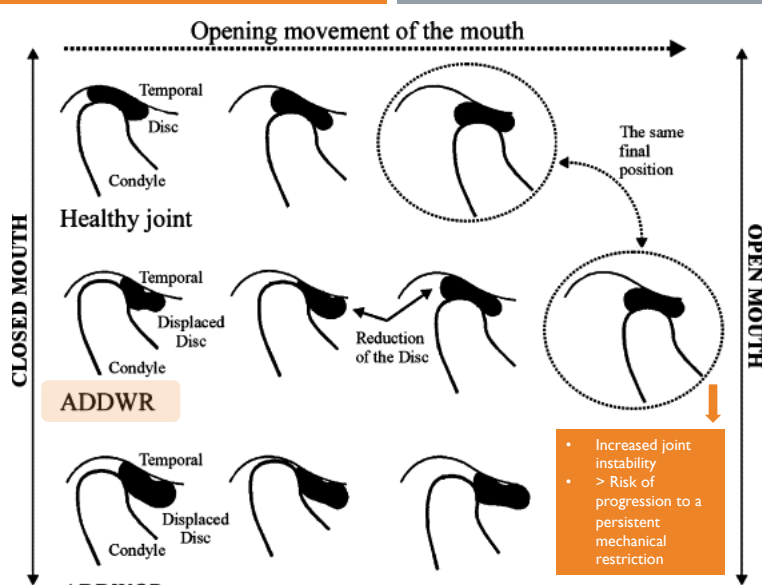
- MRI fat-saturation T2 sagittal sequence
- Anterior DD of a crumpled disc (D) in closed-mouth position
- Reduction of disc in open-mouth position
- Effusion (red arrow)
- Bilaminar zone of retrodiscal tissues (white arrow)

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DISC DISPLACEMENT WITH REDUCTION WITH INTERMITTENT LOCKING (DDWRIL)

- Episodes of "catching" or intermittent locking
- Normal mouth opening (may be intermittently limited during locking episodes)
- +/- clicking on opening and closing (may become inconsistent)
- +/- ipsilateral jaw deviation on opening with correction (when reduction occurs)
- +/- TMJ pain on movement, function, palpation

Opening movement of the mouth



Pisano AP, Dobiani M. 2007. An accurate simulation model of anteriorly displaced TMJ discs with and without reduction. Medical Engineering & Physics. 29 (2): 216-226. Available from <https://doi.org/10.1016/j.medengphys.2006.07.007>

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DISC DISPLACEMENT WITHOUT REDUCTION (DDWOR) WITH LIMITED OPENING (CLOSED LOCK)

- Limited range of mouth opening (typically <35-40 mm; often 25-30 mm initially)
- No clicking on opening and closing (loss of prior joint sounds)
- Ipsilateral jaw deflection on opening (no correction)
- Restricted contralateral excursion
- +/- TMJ pain on movement, function, palpation

MECHANICAL PROBLEM

Opening movement of the mouth

CLOSED MOUTH
OPEN MOUTH

Palmer AP, Dobson M 2007. An accurate simulation model of anteriorly displaced TMJ discs with and without reduction. Medical Engineering & Physics, 29 (2): 216-226. Available from <https://doi.org/10.1016/j.medengphy.2006.07.007>

23

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MECHANICAL PROBLEM

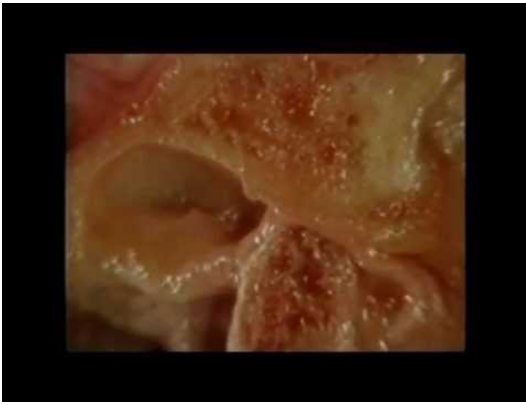
Rocha - Cordeiro L, B Oates A. 2022. Disc Displacement with Intermittent Lock: A Case Series of a Paralytic Adolescent. World Journal of Otology, 13 (1). Available from <https://doi.org/10.53073/wjo.2022.13.1.1>

Olsson J. 2020. Management of Temporomandibular Disorders and Occlusion. 6th ed. Elsevier: Missouri.

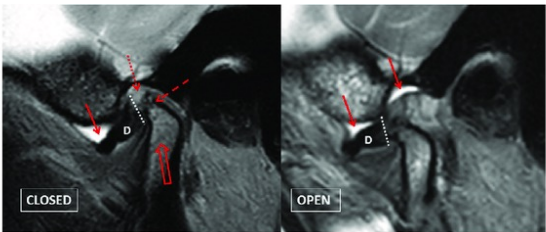
* Fig. 8.15. A. Note that in this specimen the disc is completely anterior to the condyle and the condyle is articulating on the retrodiscal tissues (RT). B. The specimen also reveals the disc to be completely anterior to the condyle (closed lock). Note how the condyle has moved closer to the fossa as the joint space (JS) has narrowed. This disc displacement is likely chronic. (Courtesy Dr. Per-Lennart Westesson, University of Rochester, NY.)

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DISC DISPLACEMENT WITHOUT REDUCTION (DDWOR) WITH LIMITED OPENING (CLOSED LOCK)



Source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4454920/>



Wheya A et al. Imaging of temporomandibular disorder and its mimics. 2020. J Medical Imaging and Radiation Oncology. Available from <https://doi.org/10.1111/jir.12585>

- MRI fat-saturation T2 sagittal sequence
- Anterior DDWOR of a crumpled disc (D) in open and closed-mouth position
- Red arrows show effusion in the superior joint space
- Dotted red arrow show focal hyperintensity of the anterior retrodiscal soft tissues
- Dashed red arrow shows subtle erosion of the superior condylar cortex
- Open red arrow shows mild oedema of the marrow in the condyle

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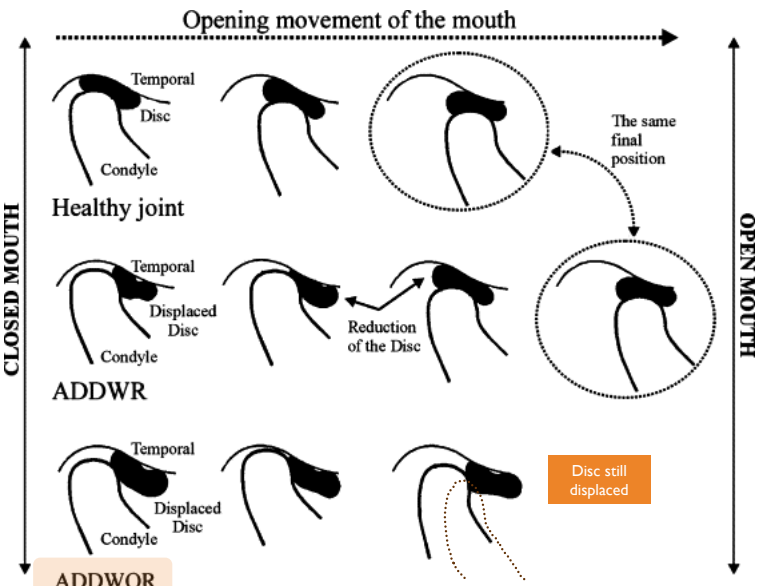
This history is key for diagnosis

DISC DISPLACEMENT WITHOUT REDUCTION (DDWOR) WITHOUT LIMITED OPENING

- History of prior limited opening ("closed lock")
- Normal or near-normal range of mouth opening (≥ 40 mm), ie opening is no longer limited
- No clicking on opening and closing
- +/- ipsilateral jaw deflection (may reduce or become minimal)
- +/- TMJ pain on movement, function, palpation

ADAPTED, NON-REDUCING DISC

Opening movement of the mouth



HEALTHY JOINT: Shows normal disc movement from closed to open mouth. The disc returns to the same final position.

ADDWR: Shows a displaced disc that undergoes reduction during opening but remains displaced upon closing.

ADDWR: Shows a displaced disc that remains displaced throughout the opening and closing cycle.

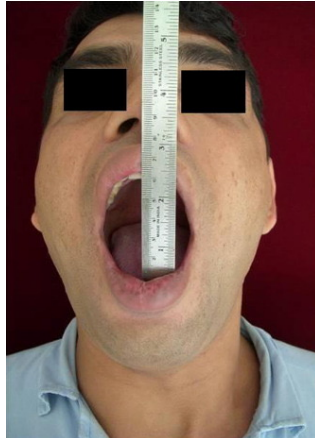
Labels: CLOSED MOUTH, OPEN MOUTH, Temporal Disc, Condyle, Reduction of the Disc, Disc still displaced.

Pisano AP, Dobiani M. 2007. An accurate simulation model of anteriorly displaced TMJ discs with and without reduction. Medical Engineering & Physics. 29 (2): 216-226. Available from <https://doi.org/10.1016/j.medengphys.2006.07.007>

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SUBLUXATION (HYPERMOBILITY)

- Excessive anterior translation of the condyle beyond the articular eminence
- Mouth opening > 40 mm
- Sudden "jump" or "thud" at maximal opening
- No clicking (not a disc displacement)
- Often visible preauricular depression at full opening
- Usually painless and not pathological
- May be associated with ligamentous laxity
- Repetitive episodes may predispose to joint instability or disc disorders



Sharma HS. 2012. Modifications to Nemer's procedure for hypermobility of the TMJ. Medical J Armed Forces India. 68 (3): 237-239. Available from: <https://doi.org/10.1007/s12010-011-1107-0>

Video 1:

https://www.tiktok.com/@mor10web/video/7367052507878591750?is_from_webapp=1&sender_device=pc

Video 2:

https://www.instagram.com/reel/DPR1S5ajOty/?utm_source=ig_web_button_share_sheet

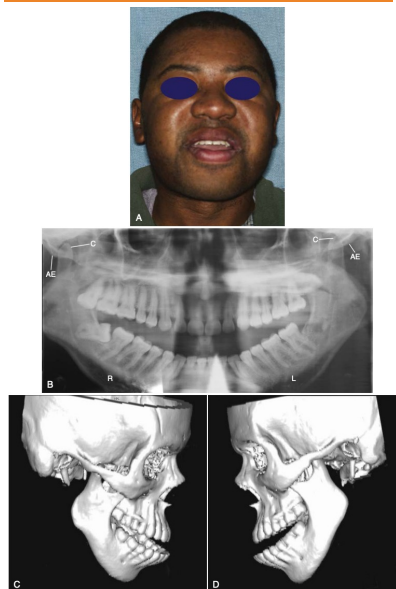
Excessive movement rather than restricted movement

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LUXATION (OPEN LOCK)

- Condyle displaced anterior to the articular eminence
- Unilateral or bilateral
- Inability to close the mouth
- Typically occurs after wide opening (yawning, dental procedures)
- Often preceded by hypermobility / subluxation tendency
- Patient may appear anxious and unable to self-reduce
- Not a disc disorder (do not confuse with closed lock)
- Usually non-pathological but requires manual reduction

CLINICAL EMERGENCY



* Fig. 8.22. A. Clinical presentation of a patient with a bilateral luxation (open lock). This patient cannot close his mouth. B. A panoramic radiograph of this patient. Note both condyles (C) are anterior to the articular eminences (AE). C. Three-dimensional reconstruction of the left temporomandibular joint and right luxation. Note the condyles anterior to the eminences. Courtesy: Dr. Larry Cunningham, University of Kentucky, Lexington, Kentucky.

Cheney J. 2020. Management of Temporomandibular Disorders and Occlusion 8th ed. Elsevier, Missouri.



Source: <https://www.tiktok.com/@scoer/what-does-lockjaw-onyou-mean>

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INFLAMMATORY INTRACAPSULAR TMJ DISORDERS

Synovitis:

- Inflammation of synovial lining of joint recesses
- Constant deep intracapsular pain
- Pain increases with joint movement
- Often due to irritation, microtrauma, or joint dysfunction
- Clinically difficult to distinguish from capsulitis
-

Capsulitis:

- Inflammation of the capsular ligament
- Localised tenderness at lateral pole of condyle
- Pain present at rest and increases with function
- Commonly associated with macrotrauma (e.g. wide opening injury)
-

Retrodiscitis:

- Inflammation of retrodiscal tissues
- Constant dull aching pain, often worsened by clenching
- May cause acute malocclusion if swelling displaces condyle
- Typically associated with disc displacement or trauma

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DEGENERATIVE JOINT DISEASE (DJD)

- **Crepitus** on opening and closing
- **Limited** mouth opening (<35 mm)
- **Osteoarthrosis**: DJD without pain (non-inflammatory); wear-and-repair imbalance → structural change
- **Osteoarthritis**: DJD with pain (inflammatory)
- Ipsilateral jaw **deflection**
- TMJ pain on movement, function, palpation
- May lead to functional limitation

Key Features:

- Destructive bony changes of articular surfaces (condyle & fossa)
- Response to **chronic increased joint loading**
- Cartilage softening (**chondromalacia**) → subchondral bone resorption
- Progressive **bone erosion and remodelling**
- Late radiographic changes: flattening, erosion, sclerosis

Associations:

- **Disc displacement without reduction**
- **Disc perforation or loss of cushioning**
- Increased loading of condyle on fossa accelerates degeneration

Early disease may be **clinically present but radiographically silent**
Reduced loading can allow **adaptive remodelling (osteoarthrosis)**



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DEGENERATIVE JOINT DISEASE (DJD)

5 radiographic findings:

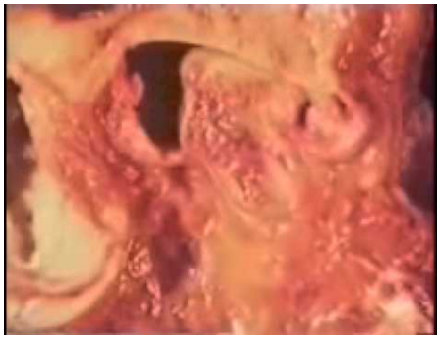
Sclerosis

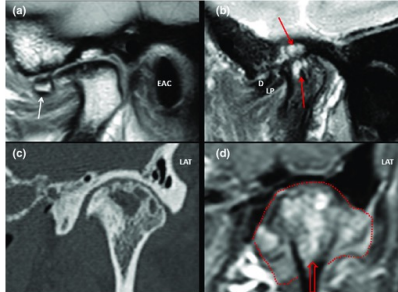
Erosion

Flattening

Pseudocyst

Osteophyte





Source: https://doi.org/10.1007/978-94-007-5092-3_10

- MRI proton density sagittal sequences
- Loss of joint space, articular surface flattening, cortical thickening, osteophytosis, ossified body (white arrow) (a)
- Anterior DD, bone on bone contact, synovial cysts (b)
- Advanced DJD (c)
- Red arrow shows large effusion distending the anterior recess of the superior joint space
- White arrows indicate remnant of retrodiscal laminae
- Dashed red arrow shows extensive erosion
- Open red arrow shows extensive sub-articular marrow oedema
- Glenoid fossa appears normal (often the case)

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DIAGNOSTIC APPROACH

History

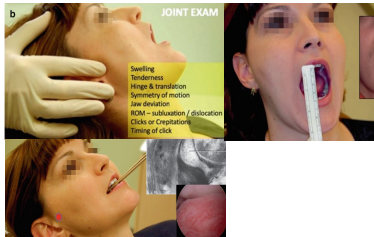
1. Clicking?
2. Grating?
3. Locking - transient, persistent?
4. Pain pattern
5. Habits

Exam

- Muscles of mastication (another lecture)
- Range of motion (active, passive)
- TMJ palpation, swelling, tenderness
- TMJ range (rotation, translation)
- TMJ sounds (click, crepitus)
- Jaw deviation, deflection, asymmetry
- Subluxation or dislocation
- Direct pressure loading (bite on tongue-blade contralateral side)
- Intra-oral (occlusion, parafunction signs)

Key features of internal derangement:

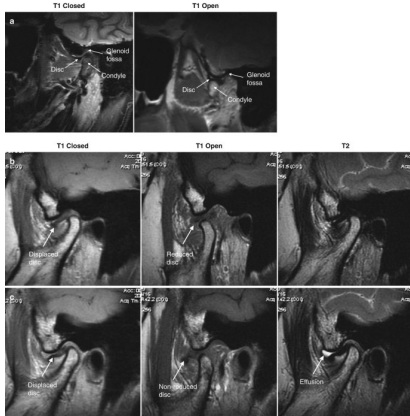
- **DDWR** → clicking
 - Early click: mild displacement
 - Late click: greater displacement
- **Intermittent locking** → occasional catch
- **DDWoR (closed lock)** → limited opening
- **DDWoR (no limit)** → normal opening
- **Subluxation** → increased opening
- **Luxation (open lock)** → movement stuck
- **DJD** → crepitus
- **Perforation** → crepitus
- **Pain in loaded TMD** → retrodiscitis



Wickham G. 2021. Internal Derangements of the Temporomandibular Joint. In: Borsthege K, Pevsnerstein E, Meisel S, Kurnar VV, Ra A. (eds) Oral and Maxillofacial Surgery for the Clinician. Springer, Singapore. https://doi.org/10.1007/978-981-15-1366-6_53

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RADIOGRAPHIC EXAM



Varburton G. 2001. Internal Derangements of the Temporomandibular Joint. In: Bonarshaya K, Pennerhalam E, Mehal S, Kumar V, Rao A, (eds) Oral and Maxillofacial Surgery for the Clinician. Springer, Singapore. https://doi.org/10.1007/978-981-15-1346-6_63

(a-c) MRI scan—T1 and T2 images in closed and open mouth positions.
 (a) Normal disc position. (b) Anterior disc displacement with reduction.
 (c) Anterior disc displacement without reduction and superior joint space effusion

Imaging modalities:

- Plain radiographs / CT → assess bony changes
- MRI = gold standard for disc position & soft tissues (~90% accuracy)
- MRI protocol: T1 + T2 sequences, closed & open mouth views, additional: fat-suppressed / STIR → detect oedema

What MRI evaluates:

- Bone: sclerosis, erosions, flattening, osteophytes, cortical breaks
- Disc: position, shape, size, continuity (perforation)
- Joint space: collapse
- Effusion: best seen on T2
- Disc displacement patterns

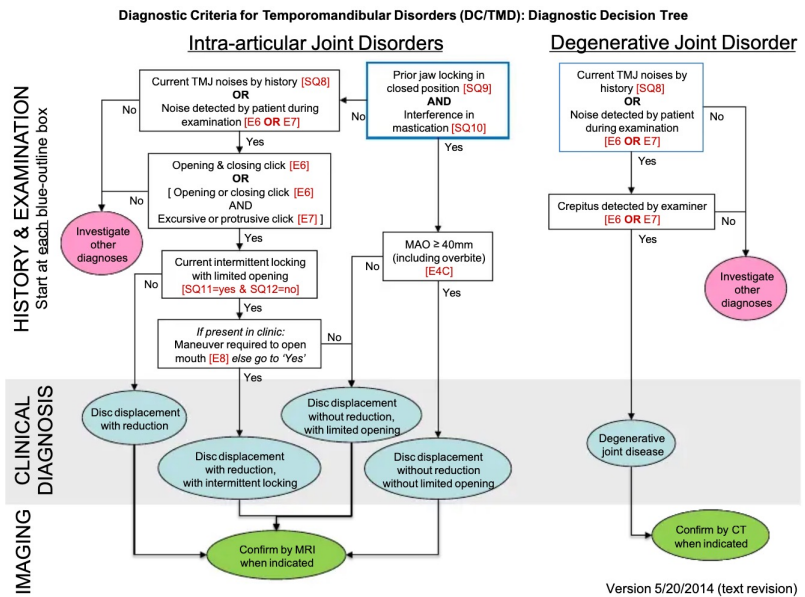
Key interpretation point:

- Compare closed vs open mouth
- Determines disc displacement and reducibility


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*EXAMM
 ↳ start in blue box

DECISION TREE




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MANAGEMENT

- Education, reassurance
- Pain free jaw function
- Nutrient-dense softer diet
- Habit control
- Thermotherapy
- Physical therapy (jaw exercises, massage, other)
- Stress management
- Oral appliance
- Pharmacotherapy (NSAIDs, muscle relaxants, TCAs, SSRIs, botox)
- Specialist referral for further assessment and management

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SPECIALIST MANAGEMENT

Indications for referral:

- Persistent symptoms despite conservative management
- Recurrent locking or restricted mouth opening
- Suspected internal derangement or degenerative joint disease
- Significant functional limitation or progressive symptoms
- Diagnostic uncertainty

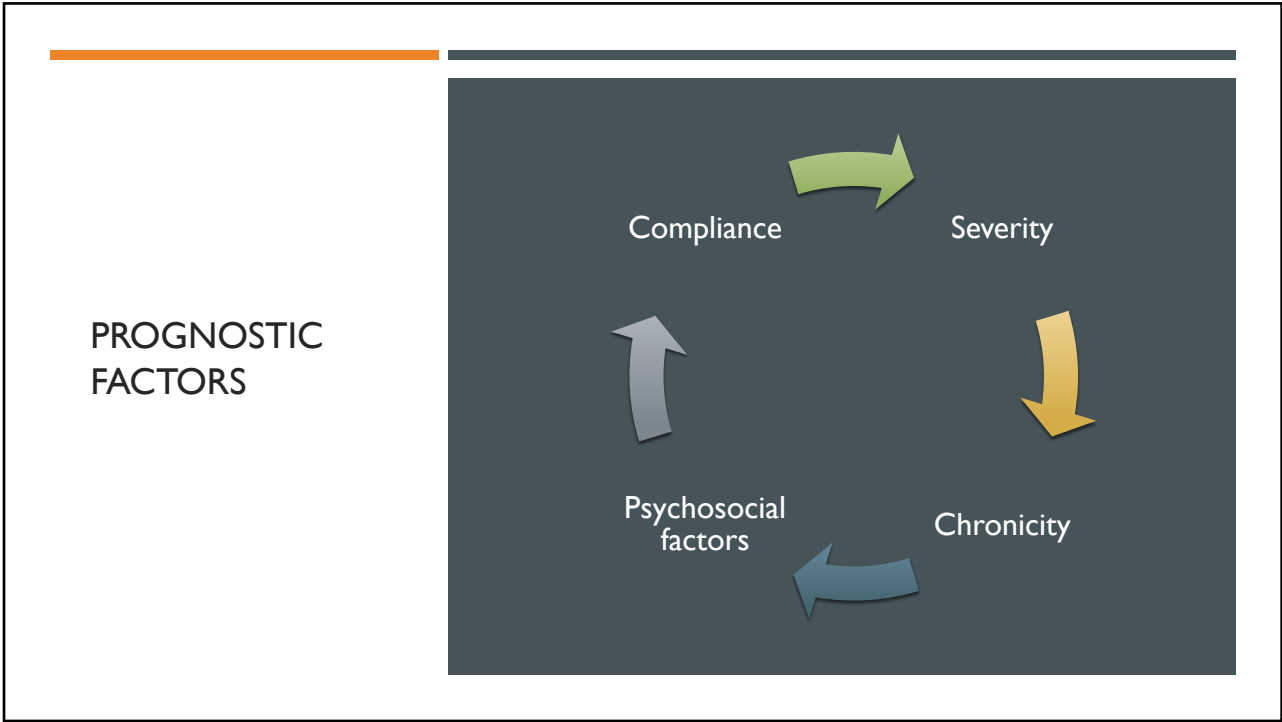
Specialist management options:

- Conservative measures
- Custom stabilisation splints
- Targeted physiotherapy programs
- Pharmacological optimisation
- Management of DJD
- Intra-articular injections (e.g. corticosteroids)
- Arthrocentesis (joint lavage)
- Arthroscopy (adhesiolysis, synovial assessment)

Advanced / surgical (rare):

- Open joint surgery for refractory cases
- Disc repositioning or repair procedures

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THANK YOU

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The slide features a dark grey background with the text 'THANK YOU' in yellow. Below it is the contact information for Supeetha Suntharamoorthy. On the right side, there are two logos: the Perth Oral Medicine & Dental Sleep Centre logo (a green and purple swirl) and the University of Western Australia logo (a blue shield with a yellow swan and the motto 'ALERE WISDOM').

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