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**Background*

1. Diagnosis of any of the TMDs is derived from assessment of signs and symptoms.
   Most frequently cited diagnostic classification systems
   (a)RDC/TMD: Research Diagnostic Criteria for Temporomandibular Disorders
      (1)Provides a standardised assessment for a limited set of TMDs which generates reliable data for researchers
      (2) Proven to be one of the most successful approaches to pain-related TMDs diagnose
         (a) Clearly operationalised data collection procedures
         (b) Specific diagnostic criteria
         (c) Diagnostic reliability and dual assessment of physical, and behavioural and psychosocial
      (3)Translated into over 20 languages and has an overwhelming number of literature citations
      (4) Wide range of experimental, clinical and population-based studies
   (b)AAOP: American academy of Orofacial Pain
      (a)Does not have the same standardised approach as RDC/TMD
      (b)Consists of a wider group of disorders and has more widerspread clinical acceptance
2.1992 , successful in promoting critical discussion about TMDs diagnoses
   (a) Criterion validity of the axis I diagnostic algorithms
   (b) Feasibility of some of the selected palpation sites and its application in clinical settings
3.2001, National Institute for Dental and Craniofacial Research (NIDCR) funded a multisite Validation Project: Examine the reliability and validity of the RDC/TMD axis I and axis II, and to recommend revisions
   (a)The modification of the classification system commenced
4. 2008 International Association for Dental Research (IADR) General Session in Toronto
   (a) Investigators presented the findings of the Validation Project at a one-day symposium
   (b) Reported that all RDC/TMD axis I diagnostic algorithms had inadequate criterion validity
   (c) Proposed revised RDC/TMD axis I diagnostic algorithms for the most common TMDs
5. 2009 IADR General Session in Miami,a closed workshop was held
   (a) Synthesise the findings of the major studies over the years into a consensus set of criteria for use in the clinical an research settings, final product is the Diagnostic Criteria for Temporomandibular Disorder (DC/TMD)
   (b) 34 professionals from 12 countries and representing 11 organisations participated.

To derive diagnoses for the most common TMDs

(c) Outcome:

(1) Evidence-based DC/TMD axis I and axis II diagnostic protocol, which provides a comprehensive assessment of the TMD patient based on the biopsychosocial health model

(2) DC/TMD axis I: Reliable and valid diagnostic criteria had sensitivity and specificity above the target values of at least 0.7 and 0.95, for the common pain-related TMDs and one intra-articular disorder affecting the masticatory system.

(3) axis II: Psychosocial assessment, simplified from the RDC/TMD and has two options: a set of shorter initial screening instruments and a set of instruments for expanded assessment

(4) AAOP has included the 12 DC/TMD diagnoses in a new revision

(a)DC/TMD and AAOP taxonomic system for TMDs are now consistent

(5) This research has improved the diagnostic criteria for the common TMDs. There is a need to expand the classification to include less common

6. 2011 IADR General Session in San Diego. Addition workshop designed to further the results of the 2009 workshop were organised by the Consortium Network and the Orofacial Pain Special Interest Group (SIG)

(a) Finalise an extended group of disorders outlined from the DC/TMD and identify a set of less common TMDs

(b) Expand assessment methods and measures for axis I and axis II to facilitate the diagnosis and prognosis of TMDs

(c)Create a third axis for additional measures (new technologies in genetics and neuroscience)

7.This article focuses only on the findings related to one purpose of the workshops,that

is ,to develop axis I diagnostic algorithms for the less common TMDs diagnoses

* *METHODS*

(1) Participants:

(a)2011 workshop, participants represented various areas of research and clinical expertise including TMDs, headache ,orofacial pain, neurology, neuroscience and psychology and represented multiple and geographically diverse universities as well as organisations.

Table 1. RDC/TMD Consortium Network Workshop participants. *Workgroup 1 participants of consensus workshop, San Diego 2011; ^ Workgroup 1 participants of meeting, Iguacu Falls 2012; +Workgroup 1 participants of meeting, Seattle 2013. Other workshop participants listed below were not participants of the Workgroup but were participants of the Network Workshop.

Per Alstergren*+	Sweden
Gary Anderson*	USA
Raphael Benoliel	Israel
Brian Cairns (Chair, Workgroup 3)	Canada
Reny de Leeuw*	USA
Mark Drangsholt	USA
Justin Durham	UK
Malin Ernberg	Sweden
Dominic Ettlin	Switzerland
Jean-Paul Goulet*^+	Canada
Rigmor Jensen*	Denmark
John Kusiak	USA
Thomas List*^+	Sweden
Frank Lobbezoo*^+	The Netherlands
Bill Maixner	USA
Ambra Michelotti (Chair, Workgroup 2)	Italy
Don Nixdorf	USA
Richard Ohrbach*^	USA
Sandro Palla	Switzerland
Chris Peck*^+ (Chair, Workgroup 1)	Australia
Arne Petersson*	Sweden
Doreen Pfau	Germany
Karen Raphael	USA
Eric Schiffman*^	USA
Peter Svensson	Denmark
Yoshihiro Tsukiyama	Japan

(2) Consensus meeting procedure

(a) Workgroup members worked together: communication including email, videoconferencing, consensus workshop and subsequent meetings, with the annual general session of the IADR at San Diego, USA (2011) Iguac_u Falls, Brazil (2012) and Seattle, USA (2013).

(b) Face-to-face discussion where consensus could be reached, closed to provide consistency and continuity to the discussion.

(c Participation was by invitation,a Planning Committee from the Consortium Network and Orofacial Pain SIG invited participants based on proven clinical and research expertise in the diagnosis of TMDs and related conditions. The workgroup complemented other workshop activities including the consideration of new biobehaviouralassessments (axis II) and biomedical markers for TMDs (axis III).

(3) Pre-workshop activities

(a) Workgroup members reviewed TMDs and their diagnostic criteria that were initially dervied from multiple sources

(b) Review of the scientific literature

(c) Recommendations from the AAOP

(d) Expert advice from other health professions including rheumatology and neruology

(e) Each member initially reviewed conditions for inclusion

(1) prevalence of the condition, likelihood of developing operationalised criteria, reliability and validity of associated diagnostic tests

(2) likelihood of future productive research

(4) Workshop description

(a) A general overview

(1)Formal presentations (15mins summaries summarise the current status of their work), identify the major workgroup challenges associated with the goals and provide an initial description of the planned activities

(b) Discussion and consensus

(1) Collated list of conditions, which was prioritised according to availability of diagnostic criteria and clinical significance of the conditions.

(2) Conditions without diagnostic criteria and/or questionable clinical significance, consultation with experts and reached consensus on whether to include the conditions or not.

(c) Finalising recommendations based on workgroup goals format include:

(1) Disorder name

(2) Brief description (with or without aetiological mechanisms)

(3) Diagnostic criteria: History

(4) Diagnostic criteria: Examination

(5) Diagnostic criteria: Other tests

**Results*

(1) 56 conditions were considered in the TMDs taxonomy

(2) Workgrouip review,this list was reduced to 37 conditions

(3) 19 omitted:

(a) Extremely uncommon

(b) Inability to develop operationalised diagnostic criteria

(c) Not clearly related to TMDs or not sufficiently distinct from orther disorders already included within the expanded taxonomy

(c) Included bifid condyle, condylosis, fibrous dysplasia, infectious arthritis, metabolic arthritis, traumatic systemic arthritis, mechanical impingement arthralgia, infectious myositis, non-infectious myositis, centrally mediated myalgia, infrequent

episodic TMD-related headache, frequent episodic TMD-related headache, chronic TMD-related headache, myofascial pain with/without familiar referral, mitochondrial muscle disorders, polydermatomyositis, tardive dyskinesia, drug-induced dyskinesia and TMD secondary to or associated with other conditions (e.g. hemifacial paralysis, whiplash).

(4) Document is considered an extension of the publication entitled 'Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: Recommendations of the International RDC/TMD Consortium Network and Orofacial Pain Special Interest Group'

(5) As a reminder diagnostic criteria with acceptable criterion-related validity are only available for the conditions in the DC/TMD publication referenced above. Whereas proposed diagnostic criteria, which have not been formally operationalised, are provided for the additional disorders, lack estimates of sensitivity and specificity at this time. It is our intent to provide a framework for future investigation of the diagnostic criteria for these conditions.

Table 2. Expanded Taxonomy for Temporomandibular Disorders

I. TEMPOROMANDIBULAR JOINT DISORDERS

1 Joint pain
- A Arthralgia
- B Arthritis

2 Joint disorders
- A Disc disorders
  - 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
- B Hypomobility disorders other than disc disorders
  - 1 Adhesions/Adherence
  - 2 Ankylosis
    - a Fibrous
    - b Osseous
- C Hypermobility disorders
  - 1 Dislocations
    - a Subluxation
    - b Luxation

3 Joint diseases
- A Degenerative joint disease
  - 1 Osteoarthrosis
  - 2 Osteoarthritis
- B Systemic arthritides
- C Condylysis/Idiopathic condylar resorption
- D Osteochondritis dissecans
- E Osteonecrosis
- F Neoplasm
- G Synovial Chondromatosis

4 Fractures

5 Congenital/developmental disorders
- A Aplasia
- B Hypoplasia
- C Hyperplasia

II. MASTICATORY MUSCLE DISORDERS

1 Muscle pain
- A Myalgia
  - 1 Local myalgia
  - 2 Myofascial pain
  - 3 Myofascial pain with referral
- B Tendonitis
- C Myositis
- D Spasm

2 Contracture

3 Hypertrophy

4 Neoplasm

5 Movement Disorders
- A Orofacial dyskinesia
- B Oromandibular dystonia

6 Masticatory muscle pain attributed to systemic/central pain disorders
- A Fibromyalgia/widespread pain

III. HEADACHE

1 Headache attributed to TMD

IV. ASSOCIATED STRUCTURES

1 Coronoid hyperplasia

This table was developed in collaboration with Schiffman and colleagues (30).

Classification of temporomandibular disorders

(1) Default time for assessing pain: 'the last 30 days' examiner must identify with the patient all anatomical locations that they have experienced pain in the last 30 days.may choose a different time frame as dictated by clinical circumstances

(2) The location of pain induced by the specified provocation test(s) must be in an anatomical structure consistent with that diagnosis

(3) 'familiar pain' or ' familiar headache' is based on patient report that the pain induced by the specified provocation test(s) has replicated the patient's pain

(4) 'pain modified' is used in the diagnostic criteria for pain-related TMDs to emphasise that the pain may be made better or worse by jaw function, movement or parafunction./pain made worse' or 'pain made better' is used to differentiate a musculoskeletal pain from other pain conditions of the trigeminal system

(5) Jaw muscle pain diagnosed:examination of the masseter and temporalis muscles, other masticatory muscles may be examined as required,

(6) Diagnostic imaging: a history and physical examination,indicates that information from imaging will influence patient care.

(7) Magnetic resonance imaging (MRI) and computerised tom ography(CT) often the preferred imaging modalities

(8) Intra-muscular electromyography monitoring:performed with fine wire or needle eletrodes

(9) For all pain-related diagnoses.pain/headache is not better accounted for by another pain/headache diagnosis

1. TEMPOROMANDIBULAR JOINT DISORDERS

1. JOINT PAIN

A. ARTHRALGIA

Pain of joint origin affected by jaw movement, function, or parafunction, and replication of this pain occurs with provocation testing of the TMJ.

History: Positive for both of the following:

1. Pain in the jaw, temple, in front of the ear, or in the ear

AND

2. Pain modified with jaw movement, function or parafunction.

Examination: Positive for both of the following:

1. Confirmation of pain location in the area of the TMJ(s)

AND

2. Report of familiar pain in the TMJ with at least 1 of the following provocation tests:

a. Palpation of the lateral pole or around the lateral pole

OR

b. Maximum unassisted or assisted opening, right or left lateral movements, or

protrusive movements
Note: The pain is not better accounted for by another pain diagnosis.
B. ARTHRITIS
Pain of joint origin:clinical characteristics of inflammation or infection over the affected joint: edema,erythema, and/or increased temperature.
Associated symptoms: dental occlusal changes.
Disorder also referred to as synovitis or capsulitis, although these terms limit the sites of nociception. This is a localized condition; there should be no history of systemic inflammatory disease.
History: Positive for both of the following:
1. Arthralgia as defined in I.1.A
AND
2a. Swelling, redness and/or increased temperature in front of the ear
OR
2b. Dental occlusal changes resulting from articular inflammatory exudate
Examination: Positive for both of the following:
1. Arthralgia as defined in I.1.A
AND
2a. Presence of edema, erythema, and/or increased temperature over the joint
OR
2b. Reduction in dental occlusal contacts noted between two consecutive measurements (unilateral/bilateral posterior open bite)
1. Negative for rheumatologic disease, including those in 3B- Systemic arthritides
Note: The pain is not better accounted for by another pain diagnosis.

2. JOINT DISORDERS
A. DISC DISORDERS
1. DISC DISPLACEMENT WITH REDUCTION
An intracapsular biomechanical disorder involving the condyle-disc complex.
closed mouth position : disc is in an anterior position relative to the condylar head disc opening of the mouth :reduces upon.
Medial and lateral displacement of the disc may also
be present. Clicking, popping or snapping noises may occur with disc reduction. A history of prior locking in theclosed position coupled with interference in mastication precludes this diagnosis.
History: Positive for at least one of the following:
1. In the last 30 days any TMJ noise(s) present with jaw movement or function
OR
2. Patient report of any noise present during the exam
Examination: Positive for at least one of the following:
1. Clicking, popping and/or snapping noise detected during both opening and closing, with palpation during at least 1 of 3 repetitions of jaw opening and closing
OR
2a. Clicking, popping and/or snapping noise detected with palpation during at least 1 of 3 repetitions of opening or closing
AND
2b. Clicking, popping and/or snapping noise detected with palpation during at least 1 of 3 repetitions of right or left lateral movements,or protrusive movements
Imaging: When this diagnosis needs to be confirmed, then TMJ MRI criteria are positive for both of the following:

1. In the maximum intercuspal position, the posterior band of the disc is located anterior to the 11:30 position and the intermediate zone of the disc is anterior to the condylar head
AND
2. On full opening, the intermediate zone of the disc is located between the condylar head and the articular eminence
2. DISC DISPLACEMENT WITH REDUCTION WITH INTERMITTENT LOCKING
An intracapsular biomechanical disorder involving the condyle-disc complex. In the closed mouth position the disc is in an anterior position relative to the condylar head, and the disc intermittently reduces with opening of the mouth. When the disc does not reduce with opening of the mouth, intermittent limited mandibular opening occurs. When limited opening occurs, a maneuver may be needed to unlock the TMJ. Medial and lateral displacement of the disc may also be present. Clicking, popping or snapping noises may occur with disc reduction.
History: Positive for both of the following:
1a. In the last 30 days, any TMJ noise(s) present with jaw movement or function
OR
1b. Patient report of any noise present during the exam
AND
2. In the last 30 days, jaw locks with limited mouth opening, even for a moment, and then unlocks.
Examination: Positive for the following:
1. Disc displacement with reduction as defined in I.2.A.1. Although not required, when this
disorder is present clinically, examination is positive for inability to open to a normal amount, even momentarily, without the clinician or patient performing a specific manipulative maneuver.
Imaging: When this diagnosis needs to be confirmed:
1. The imaging criteria are the same as for disc displacement with reduction if intermittent
locking is not present at the time of imaging. If locking occurs during imaging, then an imagingbased diagnosis of disc displacement without reduction will be rendered and clinical confirmation of reversion to intermittent locking is needed.
3. DISC DISPLACEMENT WITHOUT REDUCTION WITH LIMITED OPENING
An intracapsular biomechanical disorder involving the condyle-disc complex. In the closed mouth position the disc is in an anterior position relative to the condylar head, and the disc does not reduce with opening of the mouth. Medial and lateral displacement of the disc may also be present. This disorder is associated with persistent limited mandibular opening that does not resolve with the clinician or patient performing a specific manipulative maneuver. This is also referred to as ‘closed lock’. Presence of TMJ noise (e.g. click with full opening) does not exclude this diagnosis.
History: Positive for both of the following:
1. Jaw locked or caught so that the mouth would not open all the way
AND
2. Limitation in jaw opening severe enough to limit jaw opening and interfere with ability to eat.
Examination: Positive for the following:
1. Maximum assisted opening (passive stretch) including vertical incisal overlap < 40

mm.
(Maximum assisted opening of < 40 mm is determined clinically.)
Imaging: When this diagnosis needs to be confirmed, TMJ MRI critieria are positive for both of the following:
1. In the maximum intercuspal position, the posterior band of the disc is located anterior to the 11:30 position and the intermediate zone of the disc is anterior to the condylar head,
AND
2. On full opening, the intermediate zone of the disc is located anterior to the condylar head.

4. DISC DISPLACEMENT WITHOUT REDUCTION WITHOUT LIMITED OPENING
An intracapsular biomechanical disorder involving the condyle-disc complex. In the closed mouth position, the disc is in an anterior position relative the condylar head and the disc does not reduce with opening of the mouth. Medial and lateral displacement of the disc may also be present. This disorder is NOT associated with limited mandibular opening.
History: Positive for both of the following:
1. Jaw locked or caught so that the mouth would not open all the way
AND
2. Limitation in jaw opening severe enough to limit jaw opening and interfere with ability to eat.
Examination: Positive for the following:
1. Maximum assisted opening (passive stretch) including vertical incisal overlap ≥ 40 mm. (Maximum assisted opening of ≥ 40 mm is determined clinically.)
Imaging: When this diagnosis needs to be confirmed, then imaging analysis criteria are the same as for disc displacement without reduction with limited opening, as defined in I.2.A.3
B. HYPOMOBILITY DISORDERS OTHER THAN DISC DISORDERS
Intra-articular fibrous adhesions/adherence and ankylosis are characterized by a restricted mandibular movement with deflection to the affected side on opening that may result as a long-term sequela of trauma including mandibular fracture. Note: in the case of bilateral involvement, asymmetries in mandibular movements during clinical examination will be less pronounced or absent. The diagnostic criteria of mandibular movement asymmetries are for unilateral causes of hypomobility. Hypomobility is firm and unyielding due to either intra-articular fibrous adhesions, more widespread fibrotic
changes in the capsular ligaments (fibrous ankylosis) and/or, less frequently, the formation of a bony mass which results in fusion of the joint components (bony ankylosis). The condition is not usually associated with pain. The most frequent cause of TMJ ankylosis is macrotrauma; less frequent causes are infection of the mastoid or middle ear, systemic disease and inadequate surgical treatment of the condylar area.
1. ADHESIONS/ADHERENCE
Fibrous adhesions within the TMJ are thought to occur mainly in the superior compartment of the TMJ.
They produce a decreased movement of the disc-condyle complex. Adhesions may occur secondary to joint inflammation that results from direct trauma, excessive
loading or systemic conditions such as a polyarthritic disease, and are typically associated with disc disorders.

History: Positive for both of the following:
1. No history of TMJ clicking AND
2. History of loss of jaw mobility.
Examination: Positive for all of the following:
1. Limited range of motion,
AND
2. Uncorrected jaw deviation to the affected side on opening when present unilaterally
AND
3. Marked limited laterotrusion to the contralateral side when present unilaterally.
Imaging: When this diagnosis needs to be confirmed,
1. Arthrography or MRI or arthroscopy may demonstrate the presence of adhesions 2.
ANKYLOSIS
Bony ankylosis results from the union of the bones of the TMJ by proliferation of bone cells; this may cause complete immobility of that joint. In fibrous ankylosis, there are no gross bony changes, and the predominant radiographic finding is absence of ipsilateral condylar translation on opening. Note that fibrous ankylosis may be considered a more severe form of TMJ adhesions/adherence. Bony ankylosis is characterized by radiographic evidence of bone proliferation with marked deflection to the affected side and marked limited laterotrusion to the contralateral side.
a. FIBROUS ANKYLOSIS
History: Positive for the following:
1. History of progressive loss of jaw mobility.
Examination: Positive for all of the following:
1. Severely limited range of motion on opening
AND
2. Uncorrected jaw deviation to the affected side on opening
AND
3. Marked limited laterotrusion to the contralateral side.
Imaging: CT/CBCT is positive for both of the following:
1. Imaging findings of decreased ipsilateral condylar translation on opening
AND
2. Imaging findings of a disc space between ipsilateral condyle and eminence.
b. OSSEOUS ANKYLOSIS
History: Positive for the following:
1. History of progressive loss of jaw mobility.
Examination: Positive for the following:
1. Absence of or severely limited jaw mobility with all movements.
Imaging: CT/CBCT is positive for the following:
1. Imaging-based evidence of bone proliferation with obliteration of part or all of the joint space.
C. HYPERMOBILITY DISORDERS
Hypermobility disorders include two types of TMJ dislocations, in which the condyle is positioned anterior to the articular eminence and is unable to return to a closed position, without a specific maneuver by the patient (i.e., subluxation or partial dislocation) or by the clinician (i.e., luxation or complete dislocation). The latter disorder is also referred to as open lock. Note that the condyle is frequently anterior to the eminence at full mouth opening and thus by itself is not a predictor of hypermobility disorders. The duration of dislocation may be momentary or prolonged. Pain may occur at the time of dislocation with residual pain following the episode.
1. DISLOCATIONS

a. SUBLUXATION
A hypermobility disorder involving the disc-condyle complex and the articular eminence: In the open mouth position, the disc-condyle complex is positioned anterior to the articular eminence and is unable to return to a normal closed mouth position without a specific manipulative maneuver. The duration of dislocation may be momentary or prolonged. When the patient needs the assistance of the clinician to reduce the dislocation and normalize jaw movement; this is referred to as luxation. This disorder is also referred to as 'open lock'.
History: Positive for both of the following:
1. In last 30 days, jaw locking or catching in a wide open mouth position, even for a moment, so could not close from the wide-open position
AND
2. Inability to close the mouth without a specific manipulative maneuver
Examination: Although no exam findings are required, when this disorder is present clinically, examination is positive for:
1. Inability to return to a normal closed mouth position without the patient performing a specific manipulative maneuver
b. LUXATION
A condition in which the disc-condyle complex is positioned anterior to the articular eminence and is unable to return to the fossa without a specific manipulative maneuver by a clinician. This is also referred as 'open lock'.
History: positive for both of the following:
1. Report of episode(s) of inability to close from wide opening
AND
2. Report that mouth closing can be achieved only with a specific mandibular maneuver by the clinician.
Examination: Positive for one of the following persistent presentations:
1. Wide open mouth position
OR
2. Protruded jaw position
OR
3. Lateral position to the non-affected side (in the case of a unilateral luxation)
Imaging: When this diagnosis needs to be confirmed, CT/CBCT or MRI are positive for the following:
1. The condyle is anterior to the articular eminence with the patient attempting to close the mouth.
3. JOINT DISEASES
A. DEGENERATIVE JOINT DISEASE
A degenerative disorder involving the joint characterized
by deterioration of articular tissue with concomitant osseous changes in the condyle and/or articular eminence. DJD can be sub-classified: DJD without arthralgia is osteoarthrosis and DJD with arthralgia is osteoarthritis. Flattening and/or cortical sclerosis are considered indeterminant findings for DJD and may represent normal variation, aging, remodeling or a precursor to frank DJD. DJD can result in malocclusions including an anterior open bite especially when present bilaterally or contra-lateral posterior open bite when present unilaterally.
1. OSTEOARTHROSIS
History: Positive for at least one of the following:
1. In the last 30 days any TMJ noise(s) present with jaw movement or function
OR

2. Patient report of any noise present during the exam
Examination: Positive for the following:
1. Crepitus detected with palpation during maximum unassisted opening, maximum assisted opening, lateral, or protrusive movements
Imaging: When this diagnosis needs to be confirmed,
TMJ CT/CBCT criteria (29) are positive for at least one of the following:
1. Subchondral cyst(s) OR 2. Erosion(s) OR 3. Generalized sclerosis OR
4. Osteophyte(s)
Rheumatologic consultation when needed:
1. Negative for rheumatologic disease, including those in 3B- Systemic arthritides
2. OSTEOARTHRITIS
History: Positive for both of the following:
1. In the last 30 days any TMJ noise(s) present with jaw movement or function
OR
1.b. Patient report of any noise present during the exam
AND
2. Arthralgia as defined in I.1.A
Examination: Positive for both of the following:
1. Crepitus detected with palpation during maximum unassisted opening, maximum assisted opening, right or left lateral movements, or protrusive movements
AND
2. Arthralgia as defined in I.1.A
Imaging: TMJ CT/CBCT criteria (29) are positive for at least one of the following:
1. Subchondral cyst(s) OR 2. Erosion(s) OR 3. Generalized sclerosis OR
4. Osteophyte(s)
Rheumatologic consultation when needed:
1. Negative for rheumatologic disease, including those in 3B- Systemic arthritides
B. SYSTEMIC ARTHRITIDES
Joint inflammation resulting in pain or structural changes
caused by a generalized systemic inflammatory disease,including rheumatoid arthritis, juvenile idiopathic arthritis, spondyloarthropathies (ankylosing spondylitis, psoriatic arthritis, infectious arthritis, Reiter's syndrome), and crystal-induced disease (gout, chondrocalcinosis). Other rheumatologically related diseases that may affect the TMJ include autoimmune disorders and other mixed connective tissue diseases (scleroderma, Sjogren's syndrome, lupus erythematosus). This group of arthritides therefore includes multiple diagnostic categories that are best diagnosed and managed by rheumatologists regarding the general/systemic therapy. Clinical signs and symptoms of ongoing chronic (TMJ) inflammation are variable among patients and often over time for a single patient. They can vary from no sign/symptom to only pain to only swelling/exudate to only tissue degradation to only growth disturbance. Resorption of condylar structures may be associated with malocclusion such as a progressive anterior open bite. A diagnostic instrument should aim to identify patients with chronic inflammation early and accurately, should not exclude patients with chronic arthritis of long duration and should not only diagnose rheumatoid arthritis but the whole range of chronic inflammatory states. Note that imaging in early stages of the disease may not demonstrate any osseous findings.
History: Positive for both of the following:
1. Rheumatologic diagnosis of a systemic inflammatory joint disease
AND
2.a. In the past month, any temporomandibular joint pain present

OR
2.b. Temporomandibular joint pain which worsens with episodes/exacerbations of the systemic inflammatory joint disease
Examination: Positive for both of the following:
1. Rheumatologic diagnosis of a systemic joint disease
AND
2.a. Arthritis signs and symptoms as defined in I.1.B
OR
2.b. Crepitus detected with palpation during maximum unassisted opening, maximum assisted opening, right or left lateral movements, or protrusive movements
Imaging: If osseous changes are present, TMJ CT/CBCT or MR imaging is positive for at least one of the following:
1. Subchondral cyst(s) OR 2. Erosion(s) OR 3. Generalized sclerosis OR
4. Osteophyte(s)

題號	題目
1	下列有關 Temporomandibular joint ankylosis 何者錯誤 (A) 可能為 fibrous 或 bony 'fusion' (B) 可能為 intra-articular 或 extra-articular ankylosis (C) 不會導致張口困難 (D) 治療方法為 surgical osteoplasty 或 joint replacement
答 案 (C)	Oral and maxillofacial pathology 3rd edition , Neville, et al p.882
題號	題目

C. CONDYLYSIS/IDIOPATHIC CONDYLAR RESORPTION
(Sensitivity and specificity have not been established) 1. Resorption of the condyles, leading to the idiopathic loss of condylar height, and a progressive anterior open bite.
2. The condition is almost always bilateral and predominantly occurs in adolescent and young adult females.
3. The presence of pain or articular sounds is variable. In early stages, dental occlusal changes may not be evident but imaging findings would be positive. This disorder is also referred to as idiopathic condylar resorption. The cause is unknown, although it has been suggested that it may be a severe form of degenerative joint disease and thatestrogen may be implicated.
History: Positive for the following:
1. Progressive dental occlusal changes
Examination: Positive for both of the following:
1. Anterior open bite
AND
2. Evidence of progressive dental occlusal change with at least one of the following:
a. Occlusal facets which cannot be approximated;
OR
b. Change in sequential dental occlusal measurement over time (horizontal overjet; vertical overbite; or intercuspal contacts).
Imaging: Positive for at least one of the following:
1. CT/CBCT evidence of resorption of part or all of the condyle(s) OR
Lateral cephalometric change with sequential imaging over time (clockwise mandibular rotation, i.e., increase in mandibular plane angle; increase in ANB)

Rheumatologic consultation when needed:
1. Negative for rheumatologic disease, including those in 3B- Systemic arthritidesLAR DI S O R D E R S TAXONOMY 11 OSTEONECROSIS
Sensitivity and specificity have not been established) Osteonecrosis is a painful condition most commonly affecting the ends of long bones such as the femur. Other common sites include the humerus and the knees. The condition is found in the mandibular condyle on MRI as (sclerosis pattern) and (edema). This condition has also been referred to in the literature as avascular necrosis (AVN).
History: Positive for the following:
1. Arthralgia as defined in I.1.A
Examination: Positive for the following:
1. Arthralgia as defined in I.1.A
Imaging: TMJ MRI is positive for the following:
1. Decreased signal in T1-weighted or proton density
MRI and on T2-weighted MRI and can be combined with increased signal on T2 MRI
Rheumatologic consultation when needed:
1. Negative for rheumatologic disease, including those in 3B- Systemic arthritides
F. NEOPLASM
(Sensitivity and specificity have not been established) Neoplasms of the joint result from tissue proliferation with histologic characteristics, and may be benign (e.g., chondroma or osteochondroma) or malignant (e.g., primary or metastatic). They are uncommon but well documented.
They may present with swelling, pain during function, limited mouth opening, crepitus, occlusal changes, and/or sensory-motor changes.
Facial asymmetry with a midline shift may occur as the lesion expands.
Diagnostic imaging, typically using CT/CBCT and/or MRI, and biopsy are essential when a neoplasm is suspected
SYNOVIAL CHONDROMATOSIS
(Sensitivity and specificity have not been established)
Cartilagenous metaplasia of the mesenchymal remnants of the synovial tissue of the joint.
Its main characteristic is the formation of cartilagenous nodules
Calcification of the cartilage can occur (i.e., osteochondromatosis).
The disease may be associated with malocclusion, such as a progressive ipsilateral posterior open bite. Imaging is needed to establish the diagnosis.
History: Positive for at least one of the following:
1. Report of preauricular swelling OR
2. Arthralgia as defined in I.1.A OR
3. Progressive limitation in mouth opening OR
4. In the past month, any joint noise(s) present
Examination: Positive for at least one of the following:
1. Preauricular swelling OR
2. Arthralgia as defined in I.1.A or
3. Maximum assisted opening (passive stretch)
< 40 mm including vertical incisal overlap OR
4. Crepitus as per I.3.A (DJD)
Imaging: TMJ MRI or CT/CBCT is positive for at least one
of the following:
1. MRI: multiple chondroid nodules, joint effusion and amorphous iso-intensity signal tissues within the joint space and capsule

OR
2. CT/CBCT: loose calcified bodies in the soft tissues of the TMJ
Laboratory testing:
1. Histological examination confirms cartilagenous
Metaplasia
B. HYPOPLASIA
(Sensitivity and specificity have not been established) Incomplete development or underdevelopment of the cranial bones or the mandible. Growth is proportionately reduced and less severe than in aplasia. Condylar hypoplasia spans the continuum from aplasia to normal condylar size. It can be secondary to facial trauma, as well as the same congenital anomalies associated with aplasia.
Facial asymmetry or micrognathia occur and the condition may be associated with malocclusion (e.g. non-horizontal occlusal plane and contralateral posterior open bite in unilateral cases or anterior open bite in bilateral cases).
History: Positive for both of the following:
1. Progressive development of mandibular asymmetry or micrognathia from birth or early childhood
AND
2. Development of malocclusion, which may include posterior open bite
Examination: Positive for the following:
1. Confirmation of mandibular asymmetry, with
deviation of the chin to the affected side, or micrognathia
Imaging: CT/CBCT is positive for at least one of the
following:
1. Hypoplasia of the condyle OR
2. Hypoplasia of the fossa OR
3. Shortened mandibular ramus height
B. HYPOPLASIA
(Sensitivity and specificity have not been established) Incomplete development or underdevelopment of the cranial bones or the mandible. Growth is proportionately reduced and less severe than in aplasia. Condylar hypoplasia spans the continuum from aplasia to normal condylar size. It can be secondary to facial trauma, as well as the same congenital anomalies associated with aplasia. Facial asymmetry or micrognathia occur and the condition may be associated with malocclusion (e.g. non-horizontal occlusal plane and contralateral posterior open bite in unilateral cases or anterior open bite in bilateral cases).
History: Positive for both of the following:
1. Progressive development of mandibular asymmetry or micrognathia from birth or early childhood
AND
2. Development of malocclusion, which may include posterior open bite
Examination: Positive for the following:
1. Confirmation of mandibular asymmetry, with deviation of the chin to the affected side, or micrognathia
Imaging: CT/CBCT is positive for at least one of the following:
1. Hypoplasia of the condyle
OR
2. Hypoplasia of the fossa
OR
3. Shortened mandibular ramus height

C. HYPERPLASIA
(ICD-10 M27_8; ICD-9 526_89) (Sensitivity and specificity have not been established)
Overdevelopment of the cranial bones or mandible. There is a non-neoplastic increase in the number of normal cells.
Hyperplasia is typically unilateral as a localized enlargement such as condylar hyperplasia or as an overdevelopment of the entire mandible or side of the face.
History: Positive for the following:
1. Progressive development of mandibular or facial asymmetry.
Examination: Positive for the following:
1. Confirmation of a positive history.
Imaging: Panoramic radiography and/or CT/CBCT and single photon emission computed tomography are positive for both of the following:
1. Asymmetry in mandibular ramus height
AND
2. History of increased uptake of Technetium-99 mhydroxy diphosphonate on bone scintigraphy
2. MYOFASCIAL PAIN
From DC/TMD (30) (Sensitivity and specificity have not been established)
Pain of muscle origin plus a report of pain spreading beyond the immediate site of tissue stimulation (e.g., the palpating finger) but within the boundary of the masticatory muscle being examined. Limitation of mandibular movement(s) secondary to pain may be present.
History: Positive for the following:
1. Local myalgia as defined in II.1.A.1
Examination Positive for all of the following, when examining the temporalis or masseter muscles:
1. Confirmation of pain location(s) in the temporalis or masseter muscle(s)
AND
2. Familiar muscle pain with palpation
AND
3. Pain with muscle palpation with spreading of the pain beyond the location of the palpating finger(s) but within the boundary of the muscle
3. MYOFASCIAL PAIN WITH REFERRAL
From DC/TMD (30) (Sensitivity 0. 86; Specificity 0. 98)
Pain of muscle origin as defined for myalgia (II.1.A) plus a referral of pain beyond the boundary of the masticatory muscle(s) being palpated such as to the ear, teeth or eye. Limitation of mandibular movement(s) secondary to pain may be present. Although not required for this diagnosis, taut bands (i.e., contracture of muscle fibers) in the muscles may be present.
History: Positive for the following:
1. Local myalgia as defined in II.1.A.1
Examination: Positive for all of the following, when examining the temporalis or masseter muscles:
1. Confirmation of pain location(s) in the temporalis or masseter muscle(s)
AND
2. Familiar muscle pain with palpation
AND
3. Pain with muscle palpation beyond the boundary of the muscle
Note: The pain is not better accounted for by another pain diagnosis.

B. TENDONITIS
(ICD-10 M67 90; ICD-9 727 9) (Sensitivity and specificity have not been established)
Pain of tendon origin affected by jaw movement, function, or parafunction, and replication of this pain with provocation testing of the masticatory tendon. Limitation of mandibular movement(s) secondary to pain may be present. The temporalis tendon may be a common site of tendonitis and refer pain to the teeth and other nearby structures. Tendonitis could also apply to other masticatory muscle tendons.
History: Positive for the following:
1. Myalgia as defined in II.1.A
Examination: Positive for the following:
1. Myalgia as defined in II.1.A, in any tendon in the masticatory muscles including the temporalis tendon.
C. MYOSITIS
(ICD-10 M60_9, ICD-9 729_1 non-infective; ICD-10 M60_009, ICD-9 728_0 infective) (Sensitivity and specificity have not been established)
Pain of muscle origin with clinical characteristics of inflammation or infection: edema, erythema, and/or increased temperature. It generally arises acutely following direct trauma of the muscle or from infection, or chronically with autoimmune disease. Limitation of unassisted mandibular movements secondary to pain is often present. Calcification of the muscle can occur (i.e., myositis ossificans).
History: Positive for the following:
1. Local myalgia as defined in II.1.A.1; Examination: Positive for both of the following, when examining the temporalis or masseter muscles:
1. Local myalgia as defined in II.1.A.1
AND
2. Presence of edema, erythema, and/or increased temperature over the muscle
Laboratory testing:
1. Serologic tests may reveal elevated enzyme levels (e.g., creatine kinase), markers of inflammation, and the presence of autoimmune diseases.
Note: The pain is not better accounted for by another pain diagnosis.
D. SPASM
A sudden, involuntary, reversible tonic contraction of a muscle. Spasm may affect any of the masticatory muscles. Acute malocclusion may be present.
History: Positive for both of the following:
1. Immediate onset of myalgia as defined in II.1.A
AND
2. Immediate report of limited range of jaw motion.
Examination: Positive for both of the following:
1. Myalgia as defined in II.1.A and may include any of the masticatory muscles
AND
2. Limited range of jaw motion in direction that elongates affected muscle; (i.e for jaw closing muscles, opening will be limited to <40 mm; for lateral pterygoid muscle, ipsilateral movement will be limited to <7 mm)
Laboratory testing: When this diagnosis needs to be confirmed, laboratory testing is positive for the following:
1. Elevated intramuscular electromyography (EMG) activity when compared to contralateral unaffected muscle
Note: The pain is not better accounted for by another pain diagnosis.
(i.e., for jaw closing muscles, opening will be limited to an assisted opening of <40

mm and assisted opening will demonstrate a hard end-feel [firm, unyielding resistance to assisted movements])

3. HYPERTROPHY

(ICD-10 M62_9; ICD-9 728_9) (Sensitivity and specificity have not been established)

Enlargement of one or more masticatory muscles. Usually not associated with pain. Can be secondary to overuse and/or chronic tensing of the muscle(s). Some cases are familial or genetic in origin. Diagnosis is based on clinician assessment of muscle size, and needs consideration of craniofacial morphology and ethnicity.

History: Positive for the following:

1. Enlargement of one or more masticatory muscles as evidenced from photographs or previous records

Examination: Positive for the following:

1. Enlargement of one or more masticatory muscles

4. NEOPLASM

(ICD-10 C49_0, ICD-9 171_0 soft tissues of head face and neck malignant; ICD-10 D21_0; ICD-9 215_0 soft tissues of head face and neck benign) (Sensitivity and specificity have not been established)

Neoplasms of the masticatory muscles result from tissue proliferation with histologic characteristics, and may be benign (e.g., myoma) or malignant (e.g., rhabdomyosarcoma, or metastatic). They are uncommon. They may present with swelling, spasm, pain during function, limited mouth opening, and/or sensory/motor changes (e.g., paresthesia, weakness). Diagnostic imaging, typically using CT/CBCT and/or MRI, and biopsy are essential when a neoplasm is suspected.

5. MOVEMENT DISORDERS

A. OROFACIAL DYSKINESIA

(ICD-10 R25_1 tremor unspecified; R25_2 cramp and spasm; R25_3 fasciculations; ICD-9 781_0 abnormal involuntary movements; ICD-10 R27_0, ICD-9 781_3 ataxia, unspecified; ICD-10 R27_9, ICD-9 781_3 muscular incoordination; ICD-10 G24_01, ICD-9 333_85 subacute, due to drugs; oral tardive dyskinesia) (Sensitivity and specificity have not been established)

Involuntary, mainly choreatic (dance-like) movements that may involve the face, lips, tongue, and/or jaw.

History: Positive for both of the following:

1. Neurological diagnosis of dyskinesia in the orofacial region

AND

2.a. Arthralgia as defined in I.1.A, which worsens with episodes of dyskinesia

OR

2.b. Myalgia as defined in II.1.A, which worsens with episodes of dyskinesia

Examination: Positive for all of the following:

1. Sensory and/or motor nerve conduction deficit

AND

2. Central and/or peripheral myopathic disease

AND

3. Muscular hyperactivity confirmed by intramuscular

EMG

AND

4.a. Arthralgia as defined in I.1.A

OR

4.b. Myalgia as defined in II.1.A

Note: The pain is not better accounted for by another pain diagnosis.

B. OROMANDIBULAR DYSTONIA
(ICD-10 G24_02, ICD-9 333_72 acute, due to drugs; ICD-10 G24_1, ICD-9 333_6 deformans, familial, idiopathic and torsion dystonia) (Sensitivity and specificity have not been established.)
Excessive, involuntary and sustained muscle contractions that may involve the face, lips, tongue, and/or jaw.
History: Positive for both of the following:
1. Neurological diagnosis of oromandibular dystonia
AND
2.a. Arthralgia as defined in I.1.A which worsens with episodes of dystonia
OR
2.b. Myalgia as defined in II.1.A which worsens with episodes of dystonia
Examination: Positive for all of the following:
1. Sensory and/or motor nerve conduction deficit
AND
2. Central and/or peripheral myopathic disease
AND
3. Dystonia confirmed by intramuscular EMG
AND
4.a. Arthralgia as defined in I.1.A
OR
4.b. Myalgia as defined in II.1.A
Note: The pain is not better accounted for by another pain diagnosis.
6. MASTICATORY MUSCLE PAIN ATTRIBUTED TO SYSTEMIC/ CENTRAL PAIN DISORDERS
A. FIBROMYALGIA
(ICD-10 M79_7; ICD-9 729_1); Widespread Pain
(Sensitivity and specificity have not been established)
Widespread pain with concurrent masticatory muscle pain.
History: Positive for both of the following:
1. A rheumatologic-based diagnosis of fibromyalgia
AND
2. Myalgia as defined in II.1.A.
Examination: Positive for both of the following:
1. A rheumatologic-based diagnosis of fibromyalgia
AND
2. Myalgia as defined in II.1.A

四、discussion

1.The time frame for assessing the disorders described in this document is in ‘the last 30 days’, because the stated sensitivity and specificity of the criteria for the most common TMDs were established in the DC/TMD using this time frame
2. The cardinal sign was used in attempt to separate arthritis from arthralgia and degenerative joint disease. Future research exploring the other aspects of inflammation may indeed suggest that TMJ arthritis fits better within Joint Diseases.
3. As different mechanisms could be responsible for these different types of muscle pain on palpation, myalgia was subdivided into three subclasses
4. Although centrally mediated myalgia has been a distinct clinical entity in the AAOP classification system, it was not included in the expanded taxonomy because it overlaps with the muscle pain disorders as listed and more specifically with

myofascial pain with referral and fibromyalgia
5. Movement disorders have been included in the expanded DC/TMD taxonomy, because in some cases, they may present primarily as masticatory muscle disorders.
五、conclusion
1. it offers an integrated approach to clinical diagnosis and research opportunities to operationalise and test the proposed taxonomic system and diagnostic criteria

題號	題目
1	以下何種疾病不屬於 inflammatory joint disorder (A) Synovitis (B) arthriritides (C) retrodiscitis (D) fibromyalgia
答 案 (D)	出處：Temporamandibular disorders and occlusion 7ed p.241,248,249
題號	題目
2	以下何種疾病不屬於 Chronic mandibular hypomobility (A) ankylosis (B) Muscle contracture (C) subluxation (D) Coronoid impedance
答 案 (C)	出處：Temporamandibular disorders and occlusion 7ed p.246.252.253