

Arch enemies: Painful TMD & orthodontics?

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What are we going to do today?

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Examine:

- Prevalence of facial pain
- What are TMD?
- Biopsychosocial aetiology of TMD
 - Exploring pain pathophysiology & risk of TMD
- Current recommended care for TMD
- An empirical 'Ortho guide to approaching TMD'

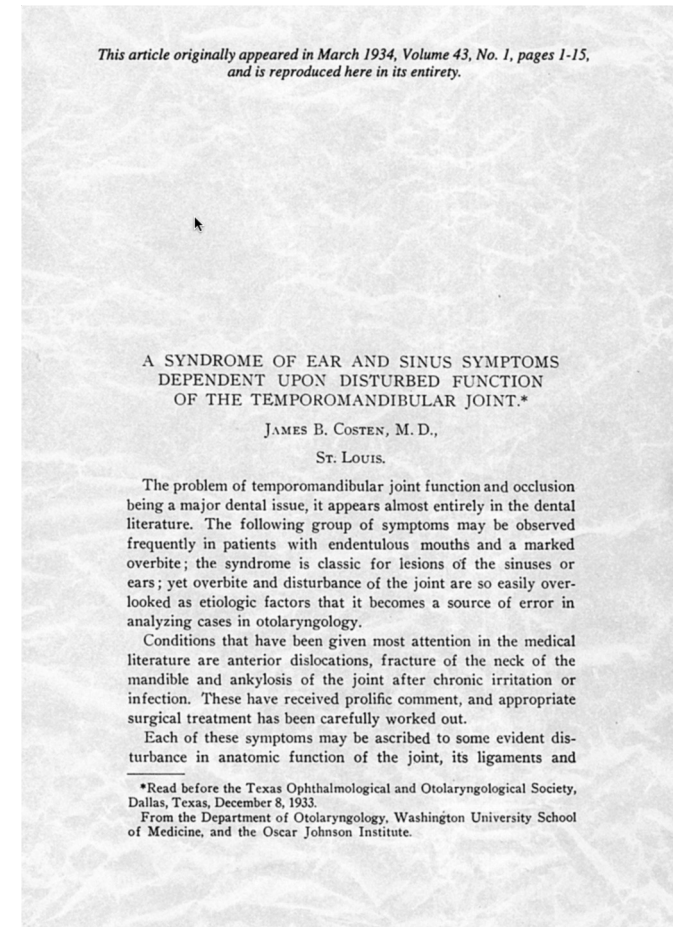
What's common in orofacial pain?

“Toothache” 8-12% (Steele et al 2011; Brown et al 2015)

- c. Temporomandibular disorders
7% (Macfarlane et al 2004)
- b. Burning mouth syndrome
3.7% (Bergdahl & Bergdahl et al 1999) or 0.1% (Kohorst et al 2015)
- e. Phantom tooth pain a.k.a. atypical odontalgia post endo
1.6% (Nixdorf & Moana-Filho 2011)
- d. Trigeminal neuralgia
0.3-0.7% (Mueller et al 2011; MacDonald et al 2000)
- a. Atypical facial pain a.k.a Persistent idiopathic facial pain
0.03% (Mueller et al 2011)

What are TMD?

Why occlusion & TMD?



What are Temporomandibular Disorders (TMD)?

*“**Collective** term embracing a number clinical problems involving masticatory musculature, the TMJ & associated structures, or both”*

Pseudonyms include:

Facial arthromyalgia, Pain dysfunction syndrome, TMJ, TMJD,
Costen’s syndrome

12 common types painful TMD (Schiffman et al 2014)

Type of TMD	Origin
1. Myalgia	
2. Local myalgia	
3. Myofascial pain	
4. Myofascial pain with referral	
5. Headache attributed to TMD	
Intra-articular disorders	
6. Disc displacement with reduction	
7. Disc displacement with reduction with intermittent locking	
8. Disc displacement without reduction with limited opening	
9. Disc displacement without reduction without limited opening	
10. Degenerative joint disease	
11. Subluxation	
12. Arthralgia	

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Most commonly...

Females > males - marginally

Type of pain?

- Persistent pain in 19%, recurrent 65%, singular in 12%
- Myalgia with arthralgia most commonly

Most commonly...

A: $\frac{1}{2}$ Headache + facial pain

B: $\frac{1}{4}$ headache

C: $\sim\frac{1}{5}$ pain in face, temple, jaw, in/in front ear

Most common signs and symptoms

Pain

Joint sounds (clicking and crepitus)

Limitation and incoordination of mandibular movement

Headaches

Otological symptoms (De Toledo et al 2016; Stechman-Neto et al 2016)

Most common signs and symptoms

Pain

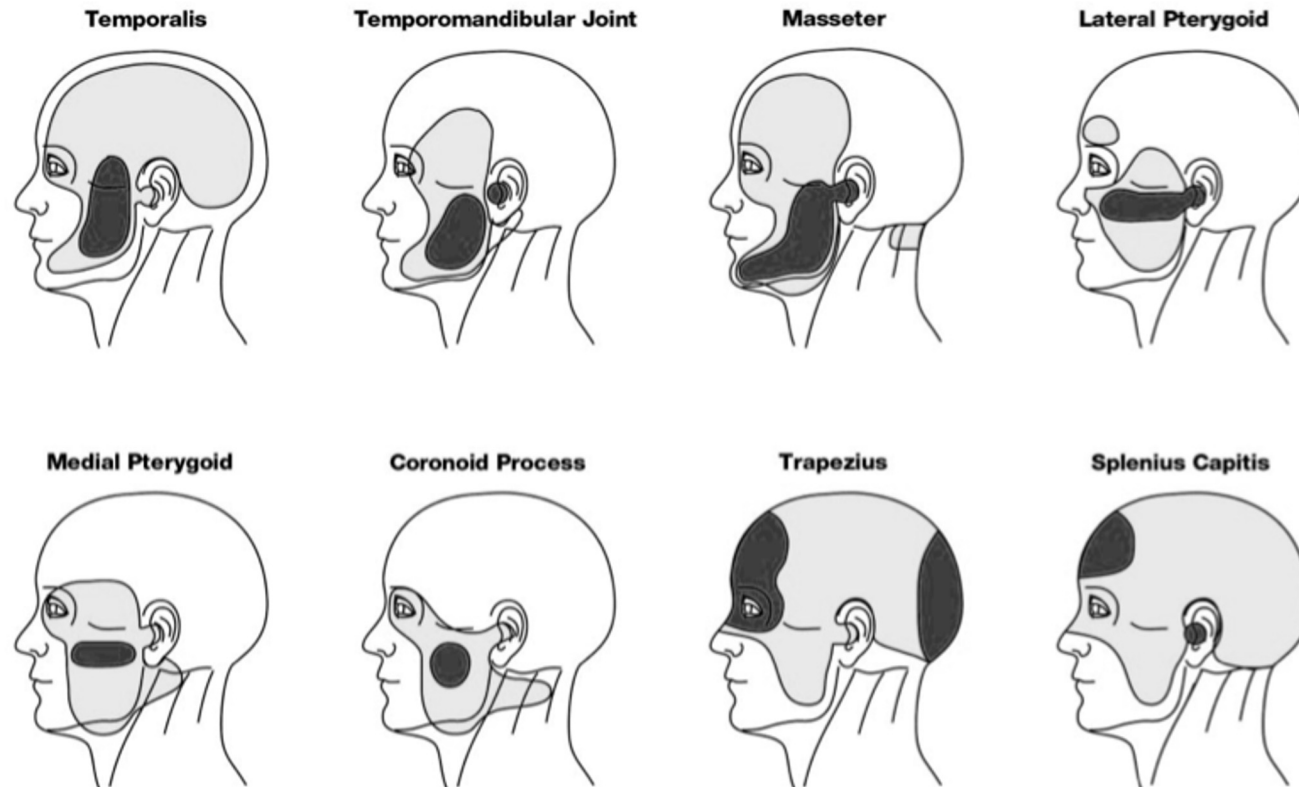
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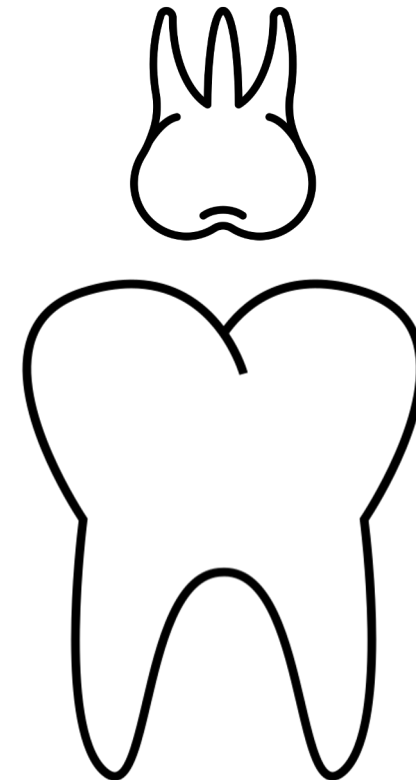
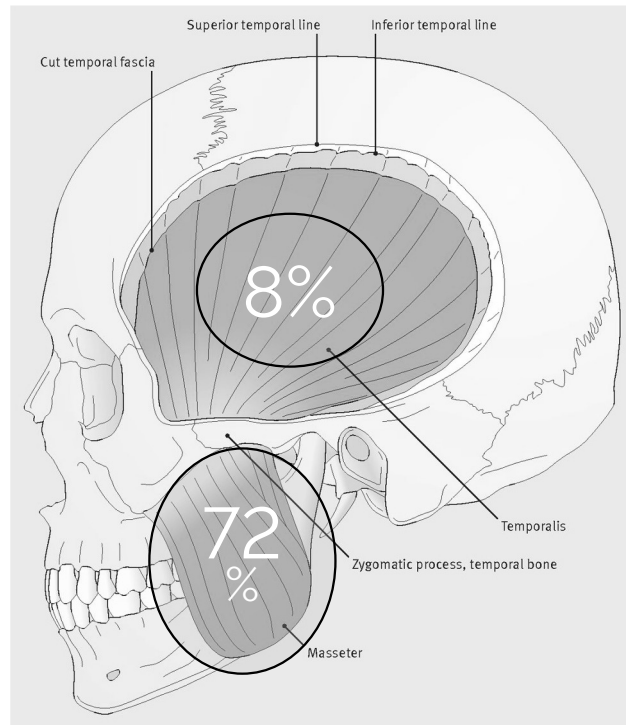
Otological symptoms (De Toledo et al 2016; Stechman-Neto et al 2016)

Most commonly referral patterns



Referred pain – beware!

(Wright 2000; Fernandez-de-las-Penas et al 2010)



Most common signs and symptoms

Pain

Joint sounds (clicking and crepitus)

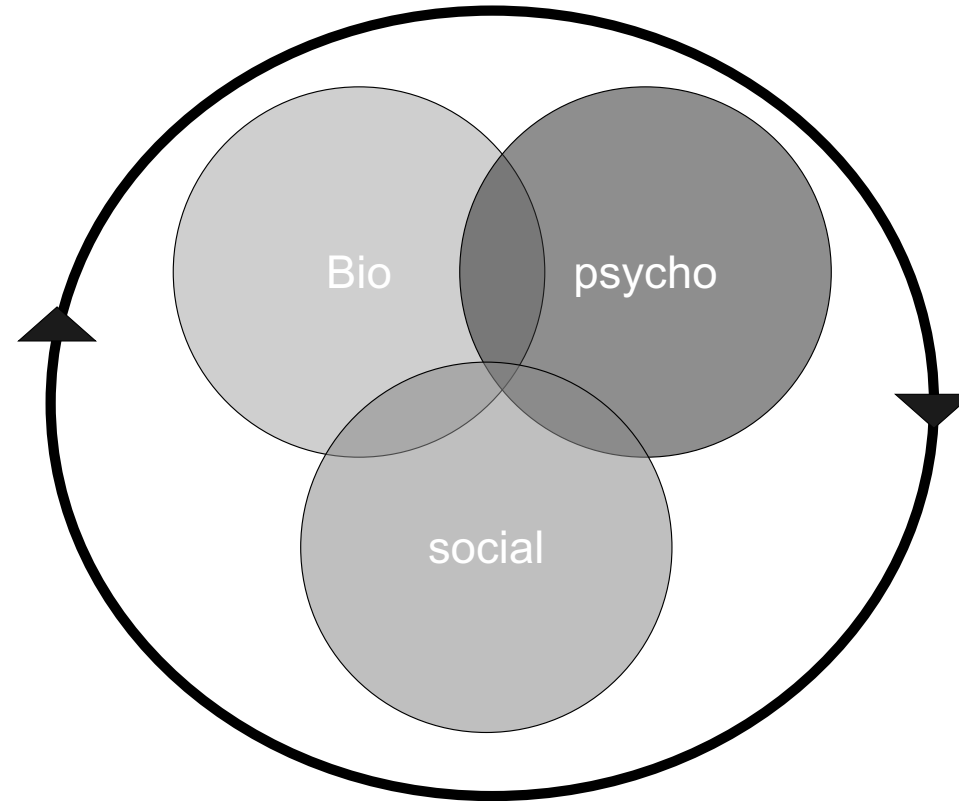
Limitation and incoordination of mandibular movement

Headaches

Otological symptoms (De Toledo et al 2016; Stechman-Neto et al 2016)

- Speak or write to GP

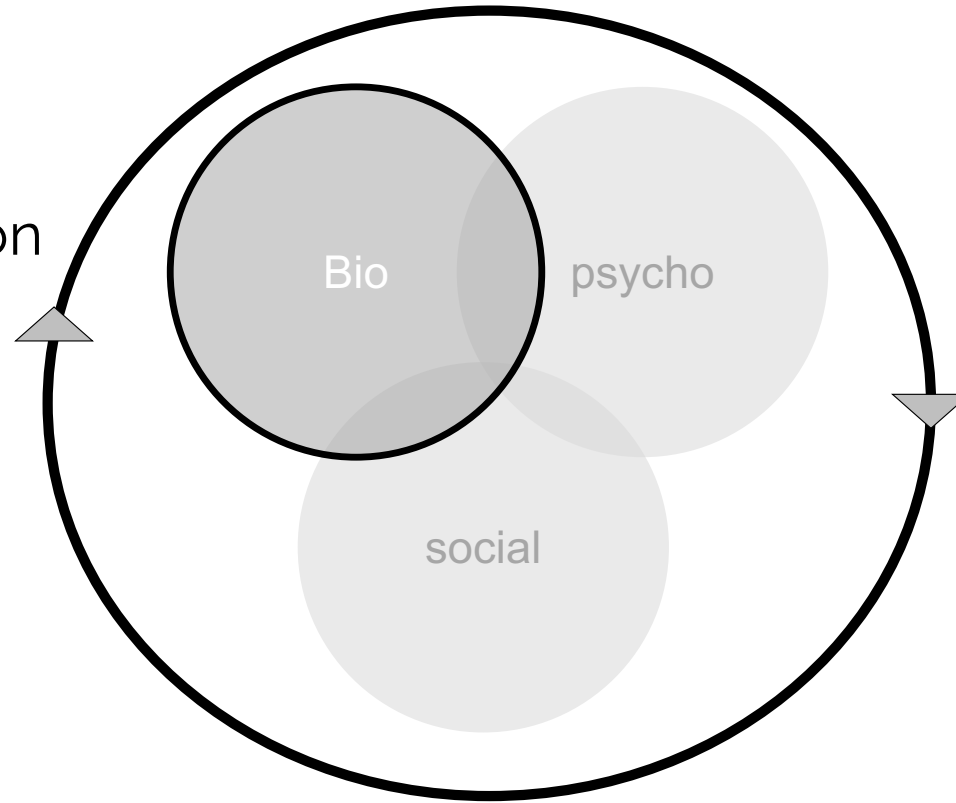
Biopsychosocial aetiology of TMD



Predisposing, Initiating, Perpetuating

Summarizing aetiology

Genomics
Central sensitisation
Jaw opening
Occlusion



Predisposing, Initiating, Perpetuating

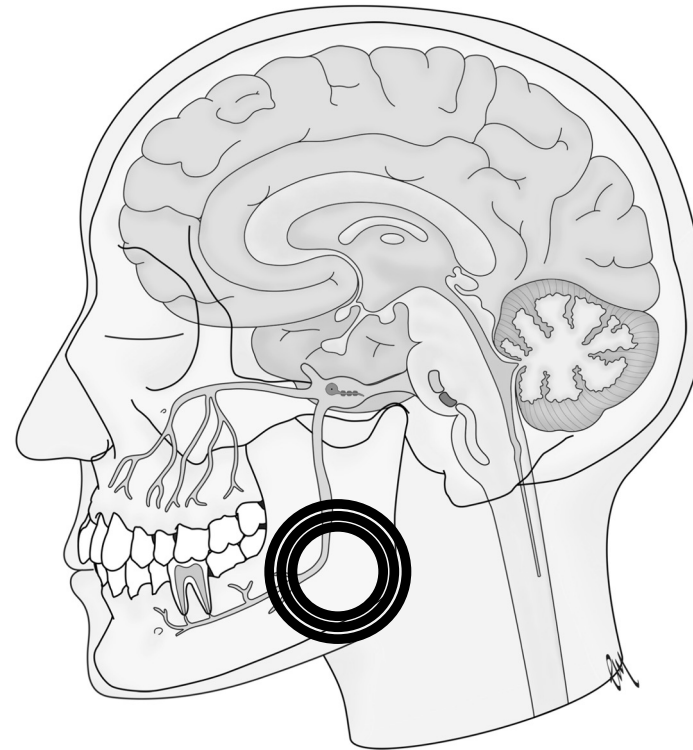
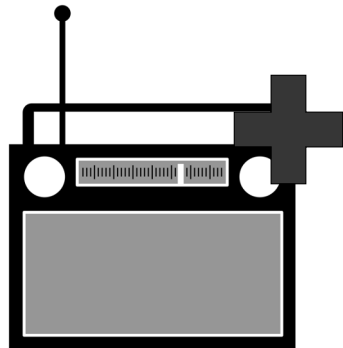
Biological: genomics

TMD may be partially heritable

Genetic variations encoding amongst others:

- Catecholamine metabolism (COMT)
 - ⇒ lowered pain threshold
 - ⇒ relative risk increases in orthodontics

Biological: central sensitisation



(Woolf et al 1982) Radio image Openclipart.org

From Newcastle. For the world.

Biological: jaw opening & central sensitisation

Prolonged jaw opening:

- Differential central cytokine expression reinforced by epidemiological data
- COMT polymorphism => postop acute pain and chronic TMD at 6/12

Peripheral => central sensitisation

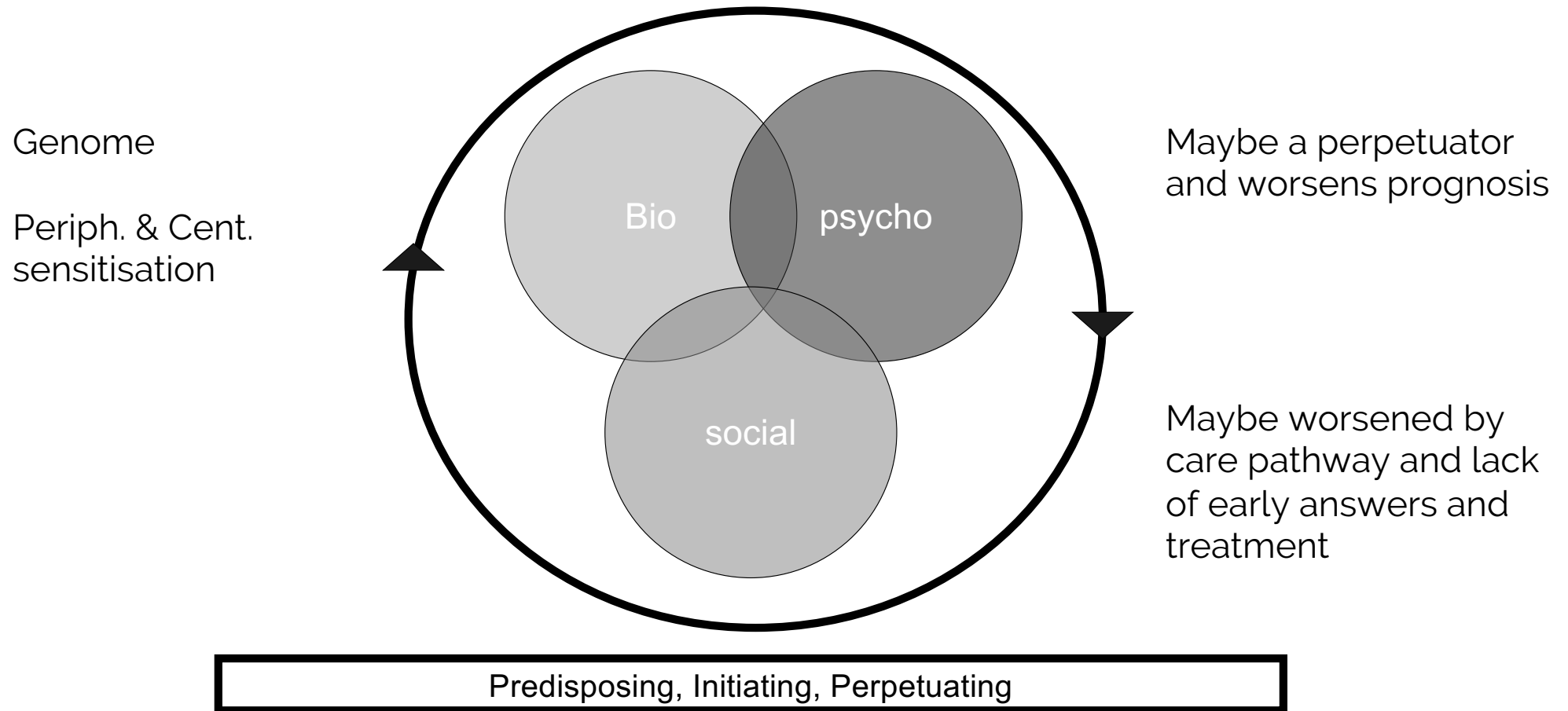
Occlusion & neuroplasticity

Biological: occlusion & central sensitisation

Occlusion?

- Neuroplasticity demonstrated (Avivi-Arber et al 2015)
- TRPV-1 may be implicated (Xu et al 2015)
- Controls & pts stabilisation splint => changes in central processing of pain perception (Lotze et al 2011; Lichteig 2013)

Summarizing aetiology



In a **genotypically** and or **phenotypically** vulnerable person:
Trauma, M.O., Overwork/Parafunction, occlusion, other comorbid pain (Migraine).
Smoking, diet, sleep, interventions

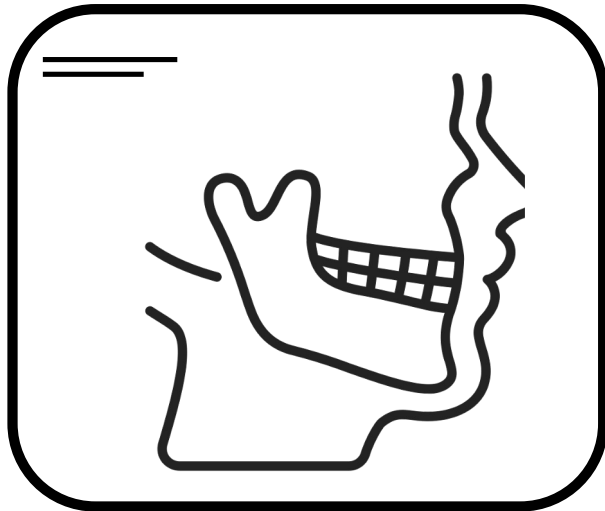
Diagnosing TMD

When should I get worried?

Previous malignancy
Pain precipitated by exertion, coughing,
or sneezing
Weight loss
Neurological signs or symptoms
Pyrexia
Facial asymmetry or masses
Nasal symptoms
Neck mass
Occlusal changes
Ipsilateral hearing changes



What you don't routinely need



What you do routinely need (and we've known for 30 years)

Biopsychosocial approach because:

- Need accurate physical diagnosis for prevention of iatrogenic harm
- Psychosocial factors can predict chronicity
- Addressing psychosocial improves outcomes

Screen for it first

≥1 questions as Yes = positive

Sensitivity 0.81 (0.73-0.87)

Specificity 0.79 (0.73-0.83)

3Q/TMD - Screening instrument for Temporomandibular Disorder (TMD)¹

Do you have pain in your temple, face, jaw, or jaw joint once a week or more?

- Yes
 No

Do you have pain once a week or more when you open your mouth or chew?

- Yes
 No

Does your jaw lock or become stuck once a week or more?

- Yes
 No

Submit

1. Lövgren A, Visscher CM, Häggman-Henrikson B, Lobbezoo F, Marklund S, Wänman A. Validity of three screening questions (3Q/TMD) in relation to the DC/TMD. J Oral Rehabil. 2016 Oct;43(10):729-36. doi: 10.1111/joor.12428. Epub 2016 Aug 30. PMID: 27573533.

Access online



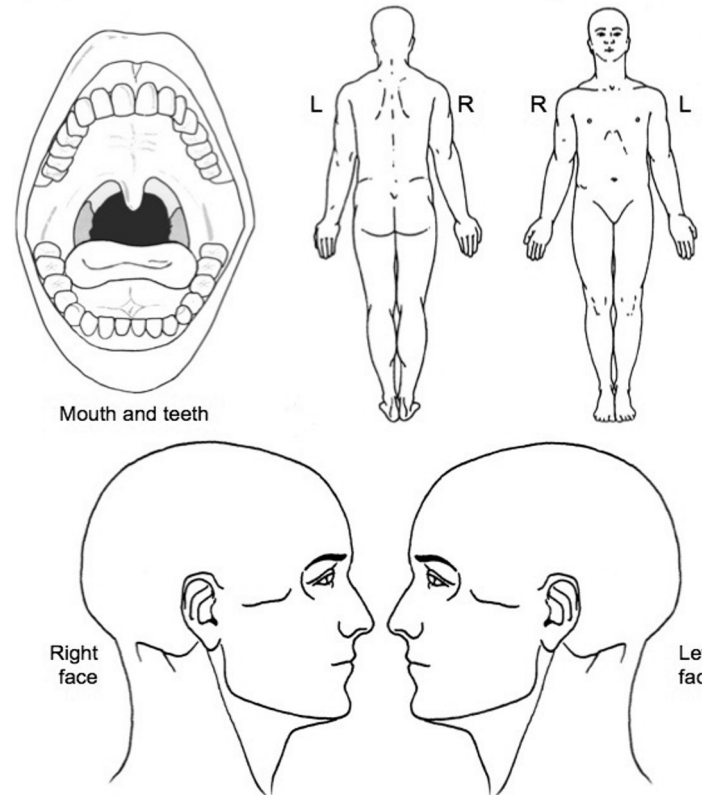
Download github



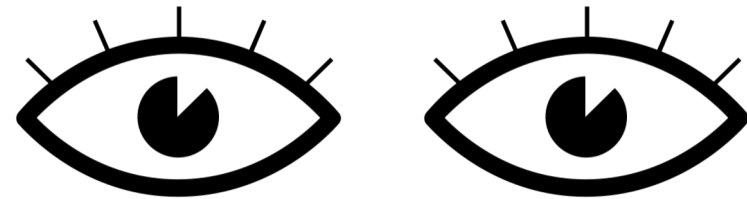
Positive screen: make your life easier before seeing the patient

PAIN DRAWING

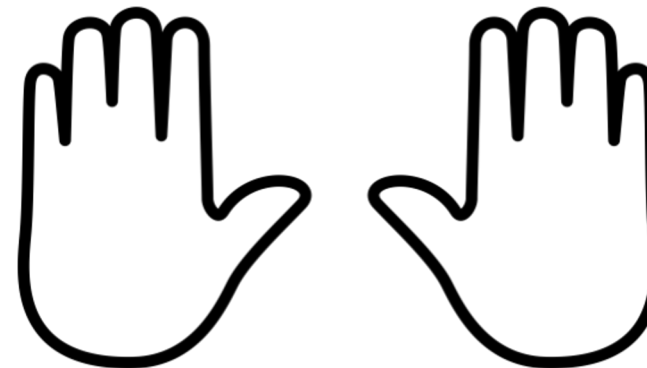
Indicate the location of ALL of your different pains by shading in the area, using the diagrams that are most relevant. If there is an exact spot where the pain is located, indicate with a solid dot (•). If your pain moves from one location to another, use arrows to show the path.



Making the physical diagnosis is highly technical....



Familiar



Psychosocial assessment

Ohrbach & Michelotti (2015)– suggest PHQ-4,
GCPS and pain drawing

Access online



Download
github



PHQ-4 - Patient Health Questionnaire 4 screening for levels of psychosocial distress^{1, 2}

**Over the past 2 weeks have you been bothered
by these problems?**

Feeling nervous, anxious or on edge

- 0 - Not at all
- 1 - Several days
- 2 - More than half of the days
- 3 - Nearly every day

Not being able to stop or control worrying

- 0 - Not at all
- 1 - Several days
- 2 - More than half of the days
- 3 - Nearly every day

Or could simply obtain “FLATS” in
your history (Beecroft et al 2019):

- Fear
- Low
- Avoid
- Think worst
- Social impact

In summary – diagnose by:

1. Excluding red flags & odontogenic
2. Listen carefully in history & consider FLATS or PHQ-4
3. Elicit **familiar** pain = diagnosis

Management

Management principles

Initial reversible, non-invasive, therapy

- Goals:
 - Encouraging self-management
 - Reducing the (impact of) pain
 - Decreasing functional limitation
 - Reducing exacerbations and educating in how to manage any exacerbation

Success rate 75-90%

Diagnosis and education

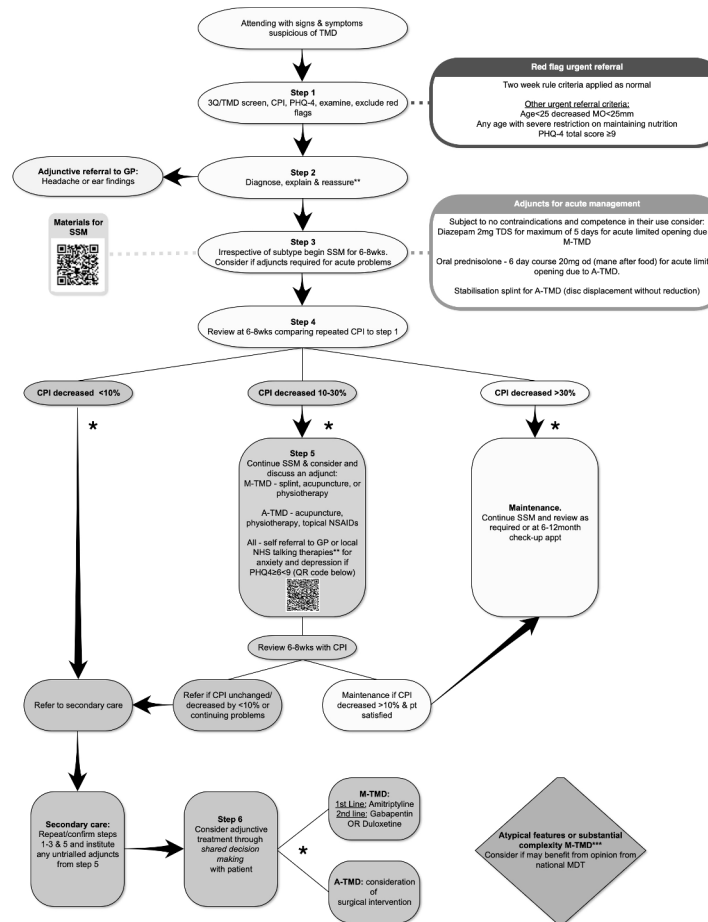
Education and reassurance

- Most get better with simple measures
- Disc displacements and crepitus (DJD) unlikely to progress

1/3 people have disc displacements
 $\leq 1/3$ go on to any problems

~1/3 have bony alterations
2/3 have no change, ~1/6 reverse!

Standard management now available



Guideline
&
flowchart



Self-management resources available



What about orthodontics....

*As treatment **for** TMD?*

Not indicated (Luther et al 2010; Michelotti & Iodice 2010)

In positive screen?

Informed consent and delay till stable/resolved.

What about orthodontics...

Precipitating TMD?

Can occur, but remember annual incidence rate ~2%

No good evidence to base treatment on

Stop mechanics, treat as per RCS, & review on restart

What about orthodontics...

On completion?

Can occur again remember incidence

If ortho Tx based on standard and accepted principles, then manage as per RCS & retention can continue

Be aware of lack of contemporary & robust evidence related to e.g. finishing positions, extraction vs non-extraction

Summary

Summary

TMD is common and is >1 “thing”

It is a biopsychosocial condition

It produces significant impacts

It becomes more daunting to manage if the following aren't done:

- Early diagnosis leading to...
- Early explanation and simple intervention

Ortho summary

- Not sole cause and not sole treatment
- PreTx screen for TMD
 - +ve: exclude red flag, examine for familiar pain & axis 2. Begin SM and stabilize
 - Informed consent
 - The future may be POC COMT
- During Tx
 - Pause & begin SM
- After Tx

So...in conclusion

Examine fully and appropriately

- Look for familiar pain to make diagnosis
- It is simple to make the diagnosis, but don't allow referral to fool you

Remember red flags and exclude them or note and act on them

TMD identified early will respond well to simple treatment delivered by non-specialists

Bibliography

Good open access paper & spec issue

Available on request:

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Very good BOS leaflet



Images from Noun Project: H Alberto Gongora; Viktor Vorobyev; Valery. <https://thenounproject.com/>
Red flag designed by FreePik