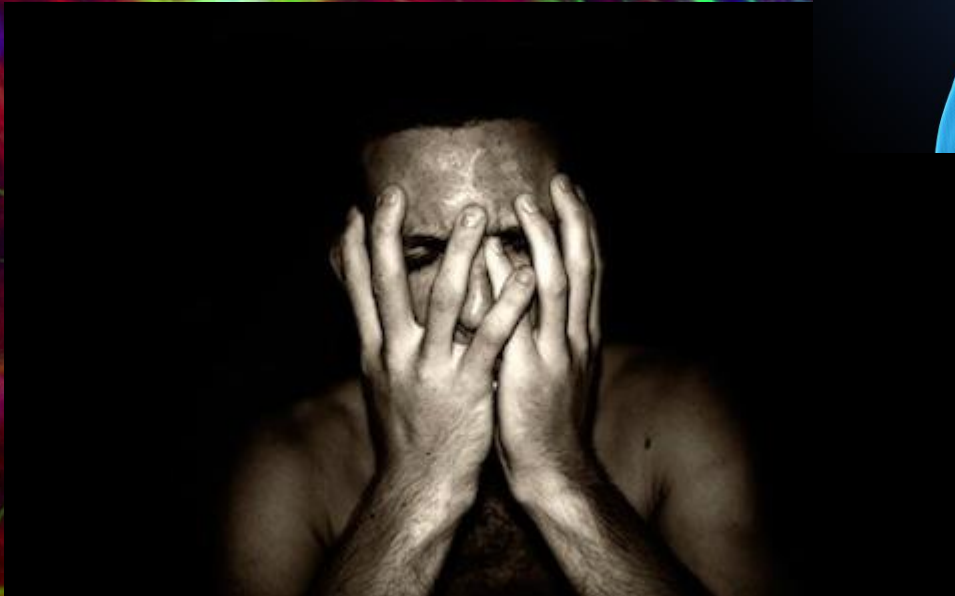


# TRIGEMINAL NERVE FOUNDATION

## Orofacial pain website

**'to provide excellence in education, management and prevention of trigeminal chronic orofacial pain'**





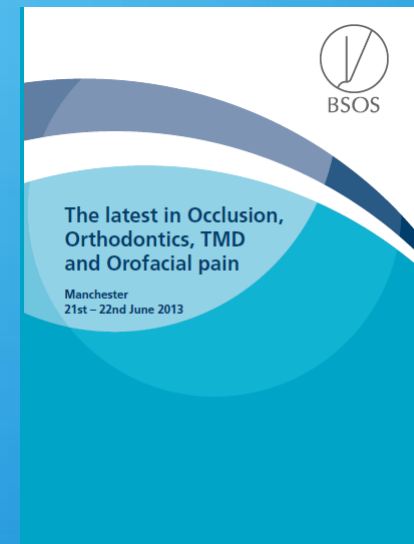
# OFP: update on Classification Diagnosis Management

KING'S  
*College*  
LONDON

BSOS 2 June 2013

Manchester

Tara.renton@kcl.ac.uk



# An update

## OFP classification

- Types of pain
- Politics

## Differential diagnosis

- Assessment
- Management



# Trigeminal nerve pain

Education

Complex region

Consequences

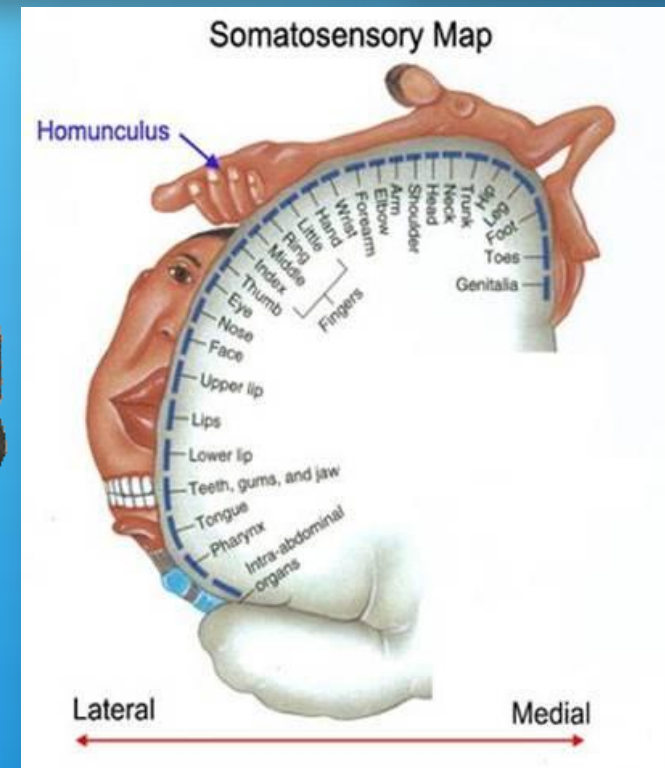
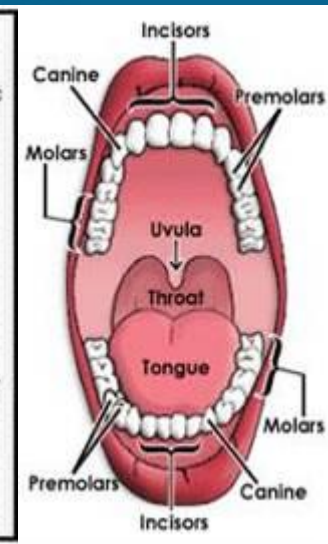
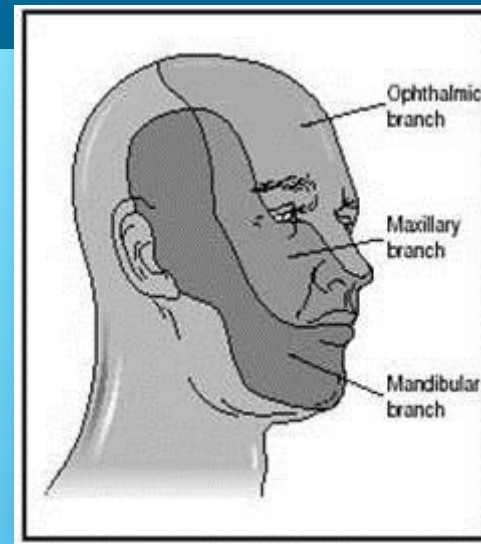
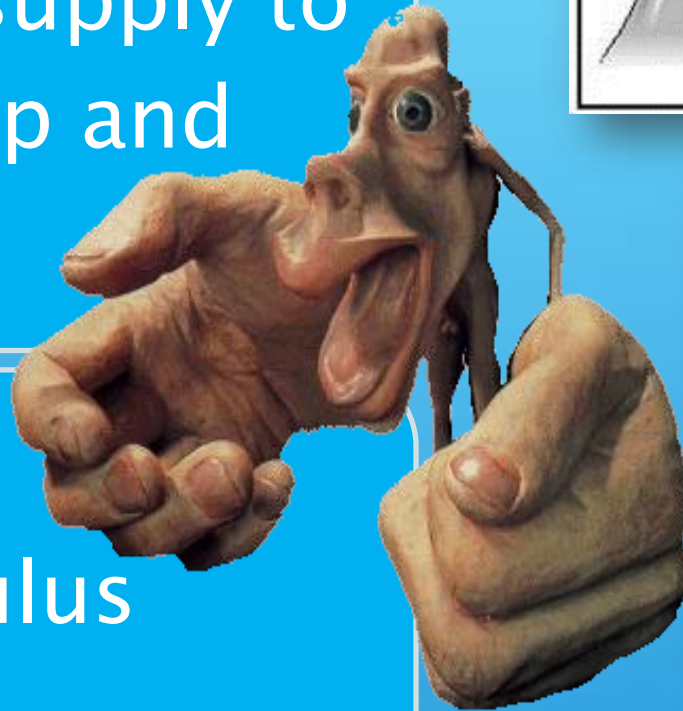
- Social function
- Eating
- Drinking
- Speaking
- Kissing
- Make up / shaving
- Sleeping



# Trigeminal nerve

Sensory supply to  
face, scalp and  
mouth

Homunculus



# Impact of orofacial pain

70% psychological impact

Locker & Grushka 1987

48% psychosocial impact

Richards & Slade 1996

**In TMJ pain:**

29% high disability resulting in unemployment

Von Korff et al 1992

64% decreased efficiency at work

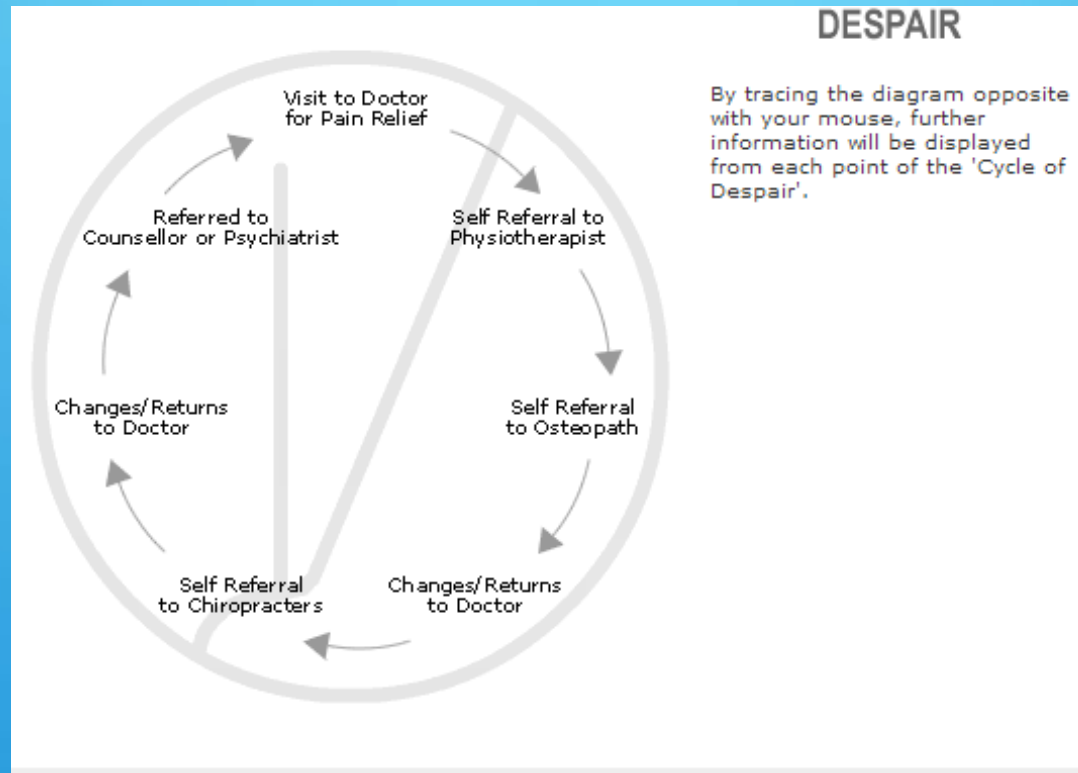
Dao et al 1994



# Impact of chronic V pain



# Type of patient....BSOS





## Pain

*“An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (IASP, 1979).*

## Pain

*“An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (IASP, 1979).*

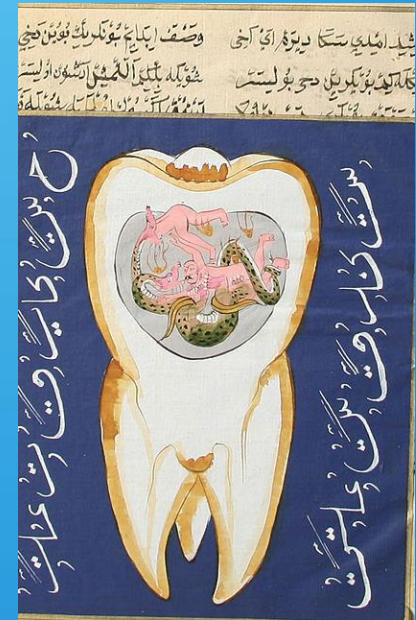
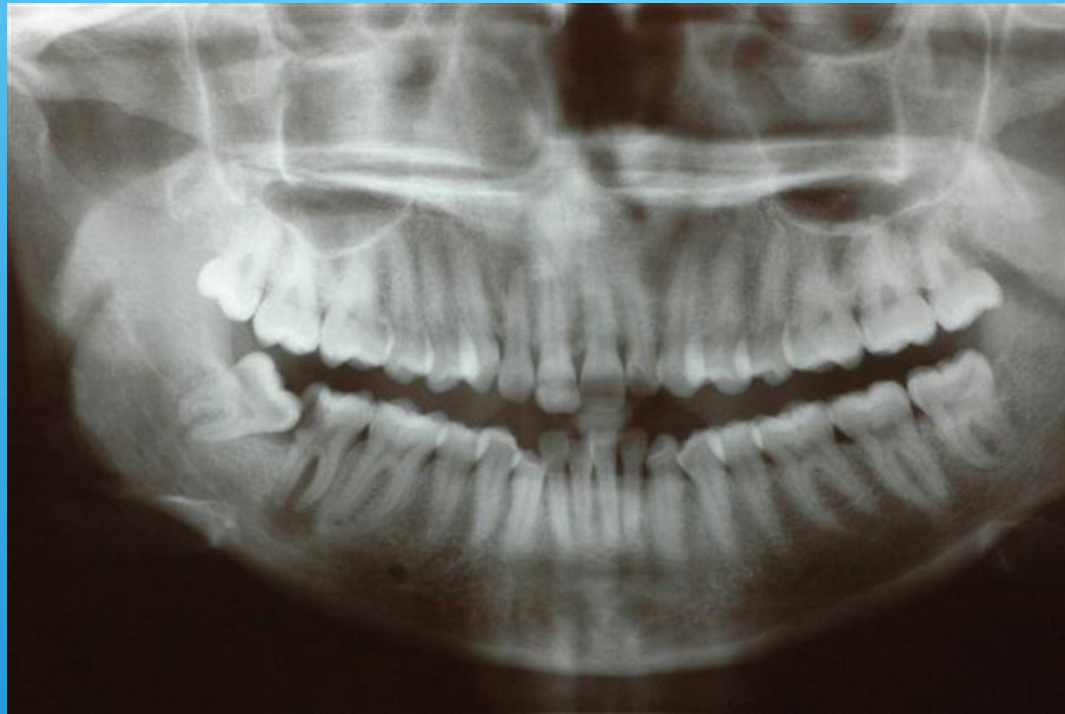
Acute pain  
Nociceptive

Acute pain  
inflammatory pain

Dysfunctional  
pain

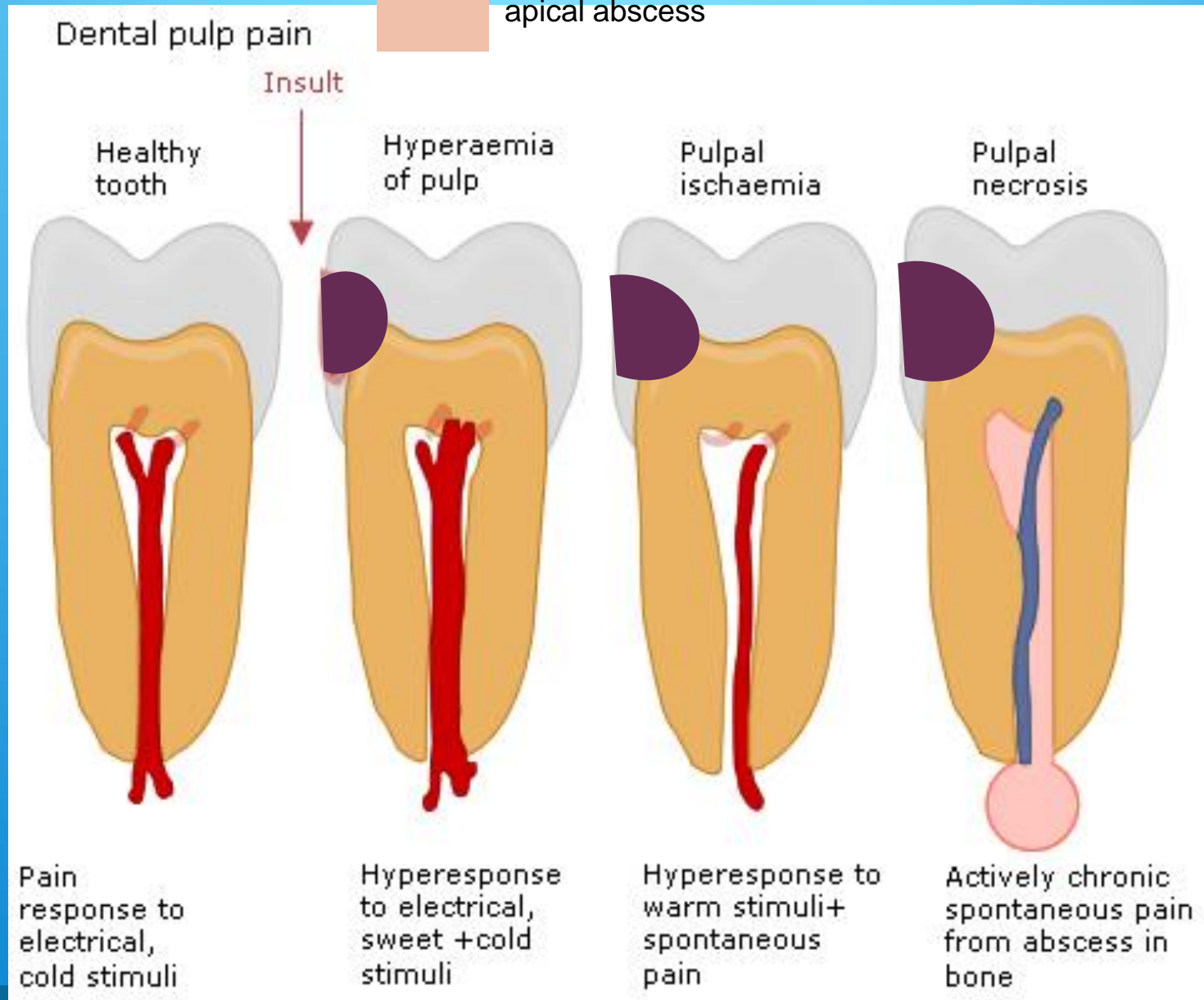
Chronic pain  
Neuropathic pain

# Common things happen commonly!



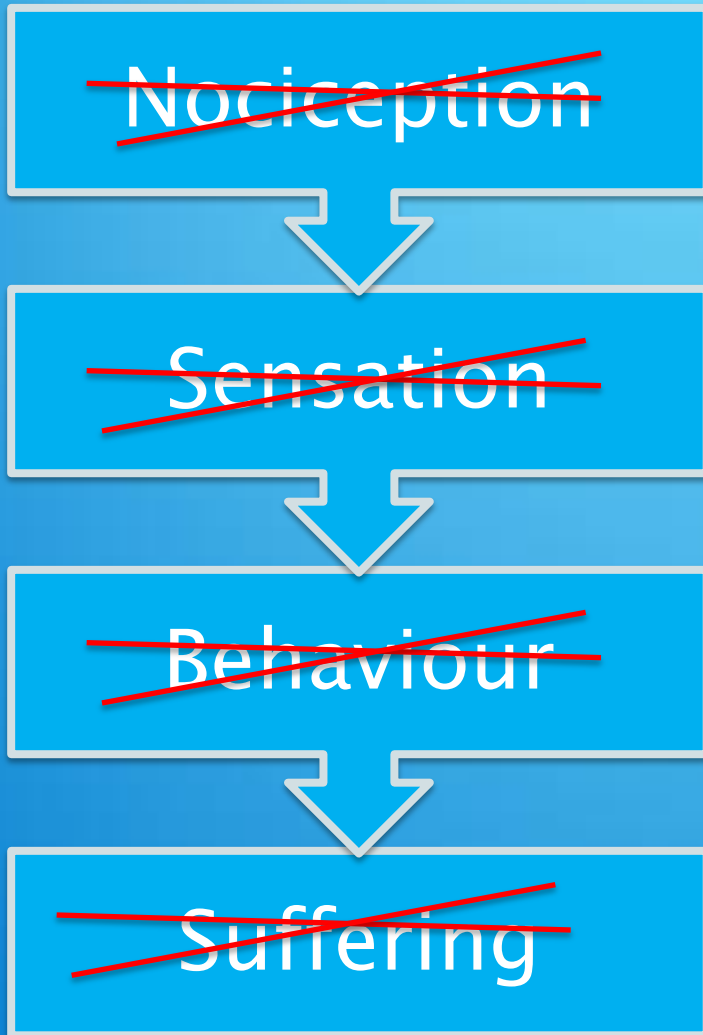
# Caries

**Pus** made of dead white cells predominantly macrophages, due to necrotic pulp, leakage through apex ultimately causing an apical abscess



# Manage the Acute Pain Process

Bio psycho social Model



LA, Spinal Block

Social / cultural

Age, gender, race,  
peer support, familial  
expectation

Antiinflammatory  
analgesics

Membrane stabilising drug

Sedation, CBT

CBT

Cognitive /  
conceptual

Memories past  
experience,  
secondary gain,  
threat  
perception

Emotional /  
psychological

Depression,  
anxiety, stress,  
fear, anger

## Successful Management of Acute Dental Pain

Ken M. Hargreaves, DDS, PhD

University of Texas Health Science Center at San Antonio

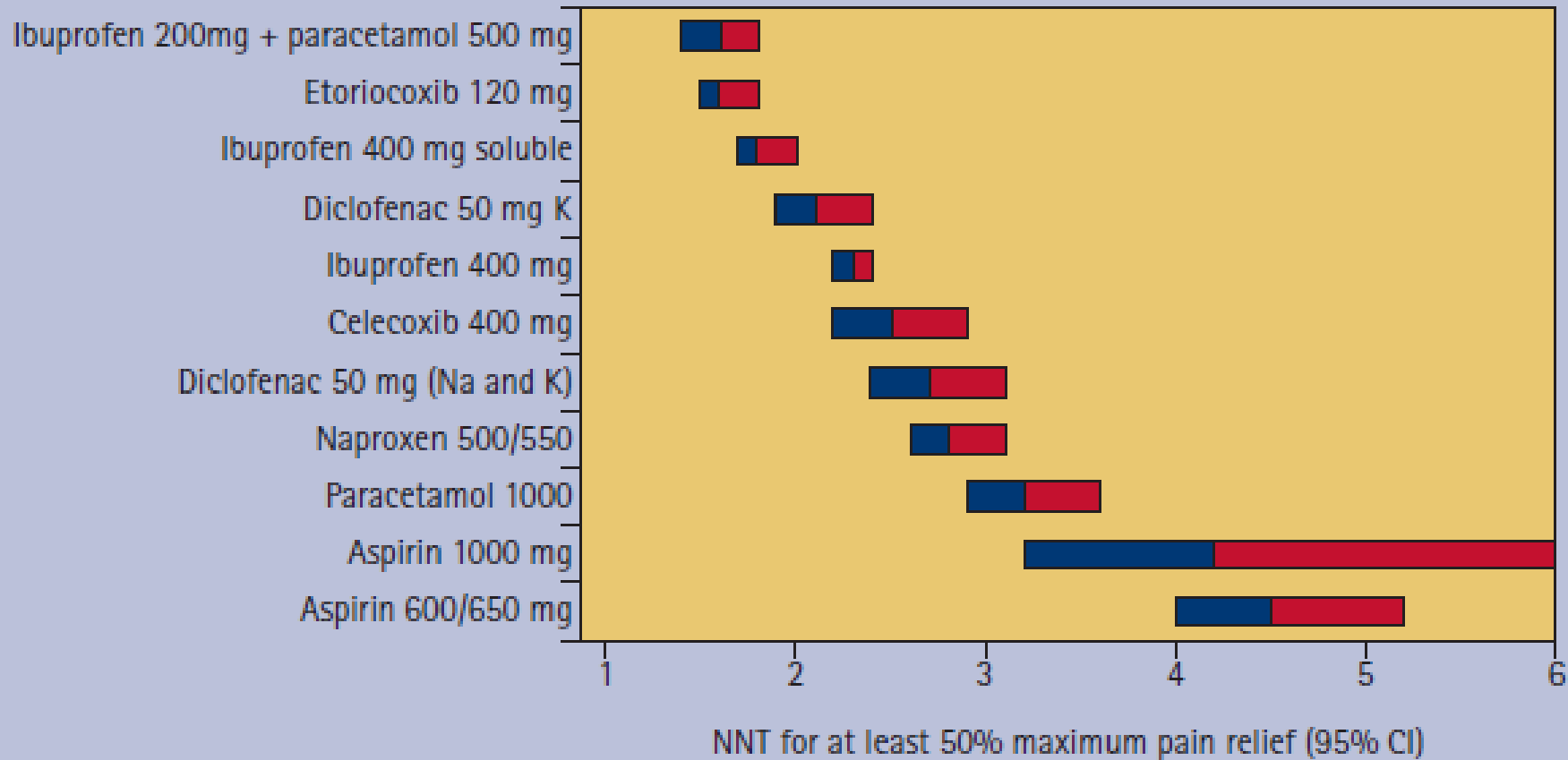
Hargreaves@UTHSCSA.edu

**Ibuprofen (400-800mg) + Paracetamol (500-1000mg) QDS PO**

# Synergism paracetamol + NSAIDs

Miranda HF, Puig MM, Prieto JC, Pinardi G. Synergism between **paracetamol** and nonsteroidal **anti-inflammatory** drugs in experimental acute pain. *Pain*. 2006 Mar;121(1-2):22-8. Epub 2006

- ❖ Merry AF et al. Combined acetaminophen and ibuprofen for pain relief after oral surgery in adults: a randomized controlled trial. *Br J Anaesth*. 2010 Jan;104(1):80-8.
- ❖ Merry AF *Eur J Clin Pharmacoz*. 2009 Apr;65(4):343-53. Epub 2009 Feb 28.
- ❖ Onset of analgesia with sodium ibuprofen, ibuprofen acid incorporating poloxamer and acetaminophen--a single-dose, double-blind, placebo-controlled study in patients with post-operative dental pain.



**Fig. 1 NNTs in dental pain studies for a range of commonly used analgesics**

Derry S, Wiffen PJ, Moore RA. **Relative efficacy of oral analgesics after third molar extraction--a 2011 update.** Br Dent J. 2011 Nov 11;211(9):419-20. doi:



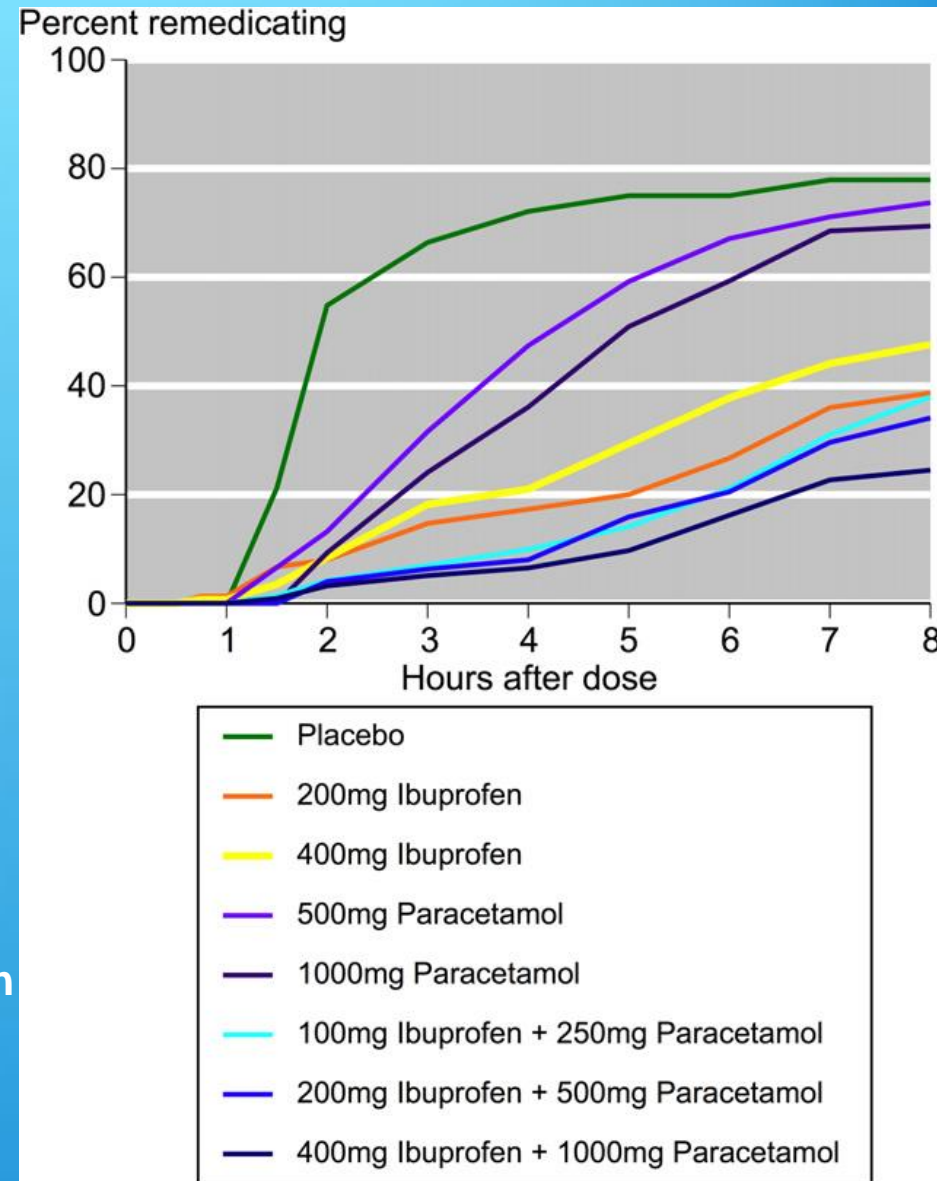
❖ 400mg ibuprofen

❖ With 1000mg

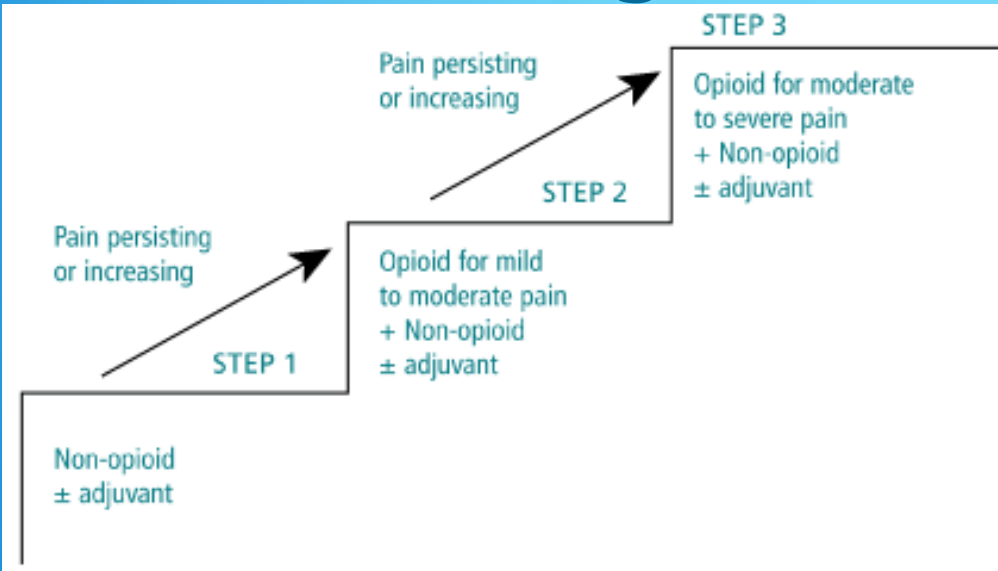
❖ Paracetamol

❖ Lowest re-medication rate

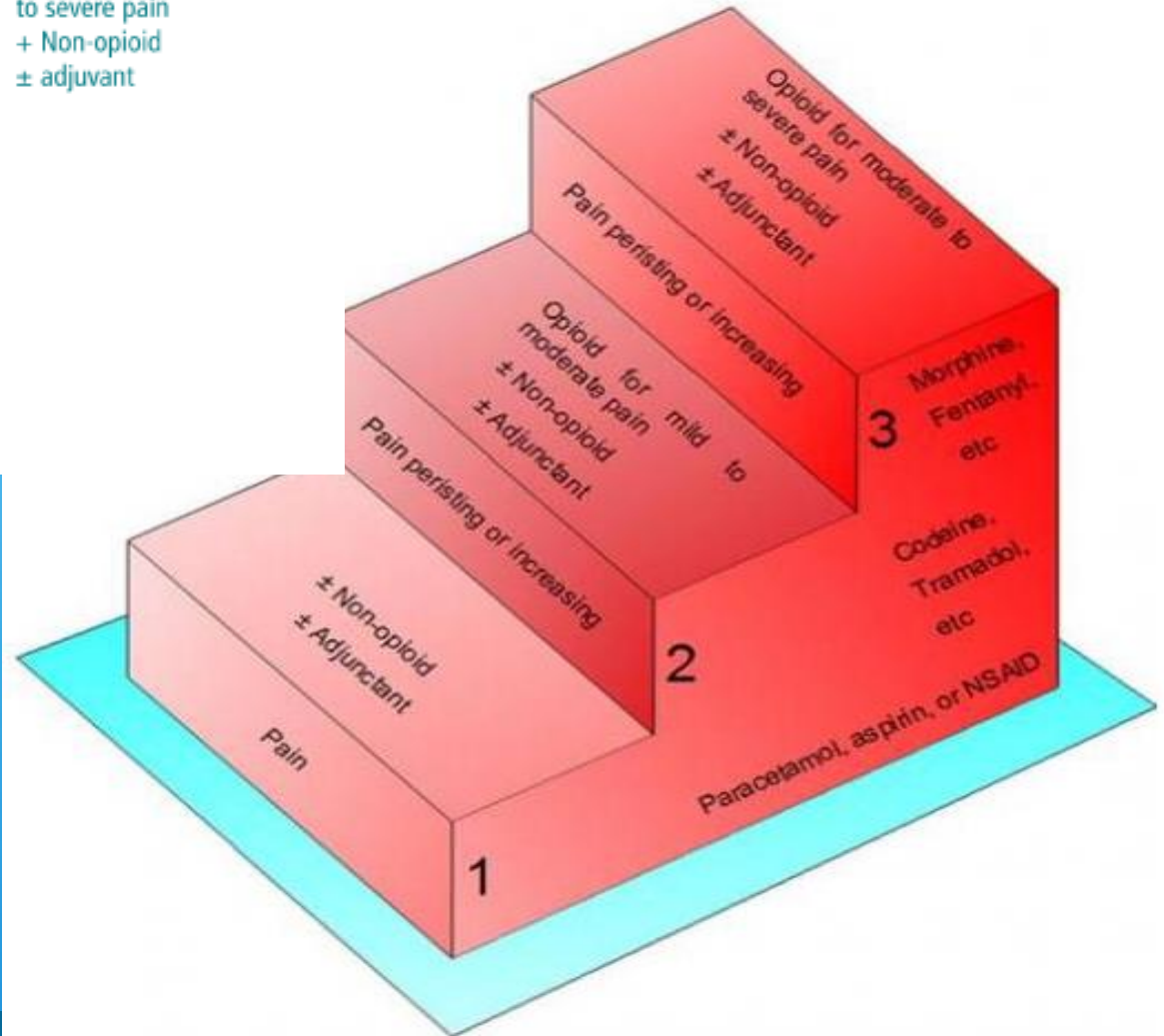
Andrew Moore a,↑, Sebastian Straube b,  
Jocelyn Paine c, Sheena Derry a, Henry J.  
McQuay M. PAIN 152 (2011) 982–989  
**Minimum efficacy criteria for comparisons between treatments using individual patient meta-analysis of acute pain trials: Examples of etoricoxib, paracetamol, ibuprofen, and ibuprofen/paracetamol combinations after third molar extraction**



# Medical- analgesics WHO analgesic ladder



asis of the WHO Analgesic Ladder and has subsequently inform



- Rescue medication
- NSAIDs
  - Tramadol
  - Pethidine
  - Morphine
  - IV lidocaine/LA blocks

# Classification of chronic OFP



# Expert Reviews



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[Downloads/Links](#)

[Online Submission](#)

[2013 Catalogue](#)

[Library](#)

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[Informa Healthcare](#)

## Summary

### [Expert Review of Neurotherapeutics](#)

May 2012, Vol. 12, No. 5, Pages 569-576 , DOI 10.1586/ern.12.40  
(doi:10.1586/ern.12.40)

## Theme: Pain - Review

### The classification and differential diagnosis of orofacial pain

[Tara Renton](#)<sup>\*1</sup>, [Justin Durham](#)<sup>2</sup> and [Vishal R Aggarwal](#)<sup>3</sup>

\* *Author for correspondence*

There are currently four main pain classification systems relevant to orofacial pain (OFP): the International Association for the Study of Pain, International Classification of Headache Disorders, the American Academy of Orofacial Pain and the Research Diagnostic Criteria for Temporomandibular Disorders. Of the four, the Research Diagnostic Criteria for Temporomandibular Disorders is the most biopsychosocial system, with the remaining three focusing more on the biomedical aspects. Unsurprisingly, clinical scientists and clinicians have both reported perceived deficiencies in the published systems and have proposed further modified classifications and nomenclature for OFP. Establishing a standardized biopsychosocial classification of OFP is essential for ensuring continuity for patient care since it creates a standardized language with which to communicate healthcare information, thus enabling improved and more specific (epidemiological) research and patient care. Despite ongoing attempts, an accepted overarching classification of OFP is still a work in progress. There is an urgent need for a robust classification system for OFP. This review aims to highlight the recent debate and continued struggle to

## IASP Regional Classification of Localized Syndromes of the Head and Neck<sup>16</sup>

- ❖ Neuralgias of the head and face
- ❖ Craniofacial pain of musculoskeletal origin
- ❖ Lesions of the ear, nose, and oral cavity
- ❖ Primary headache syndromes, vascular disorders, and cerebrospinal fluid syndromes
- ❖ Pain of psychological origin in the head, face, and neck
- ❖ Suboccipital and cervical musculoskeletal disorders
- ❖ Visceral pain in the neck

# **A Hierarchical International headache classification IHCD II <sup>17</sup>**

## **Part I: The Primary Headaches**

1. Migraine
2. Tension-type headache
3. Cluster headache and other trigeminal autonomic cephalalgias
4. Other primary headaches

## **Part II: The Secondary Headaches**

5. Headache attributed to head and/or neck trauma
6. Headache attributed to cranial or cervical vascular disorder
7. Headache attributed to non-vascular intracranial disorder
8. Headache attributed to a substance or its withdrawal
9. Headache attributed to infection
10. Headache attributed to disorder of homoeostasis
11. Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cranial structures
12. Headache attributed to psychiatric disorder

## **Part III: Cranial Neuralgias Central and Primary Facial Pain and Other Headaches**

13. Cranial neuralgias and central causes of facial pain
14. Other headache, cranial neuralgia, central or primary facial pain

## Chapter 13 IHS Classification of cranial neuralgias and central causes of facial pain <sup>17</sup> (ICD-10 G44.847, G.44.848 or G44.8)

- 13.1. Trigeminal neuralgia
- 13.2. Glossopharyngeal neuralgia
- 13.3. Nervus intermedius neuralgia [G51.80]
- 13.4. Superior laryngeal neuralgia [G52.20]
- 13.5. Nasociliary neuralgia [G52.80]
- 13.6. Supraorbital neuralgia [G52.80]
- 13.7. Other terminal branch neuralgias [G52.80]
- 13.8. Occipital neuralgia [G52.80]
- 13.9. Neck-tongue syndrome
- 13.10. External compression headache
- 13.11. Cold-stimulus headache
- 13.12. Constant pain caused by compression, irritation or distortion of cranial nerves or upper cervical roots by structural lesions [G53.8] + [code to specify aetiology]
- 13.13. Optic neuritis [H46]
- 13.14. Ocular diabetic neuropathy [E10-E14]
- 13.15. Head or facial pain attributed to herpes zoster
- 13.16. Tolosa-Hunt syndrome
- 13.17. Ophthalmoplegic “migraine”
- 13.18. Central causes of facial pain

# American Academy of Orofacial Pain classification.<sup>18</sup> Taxonomy is based on a mixture of regional, temporal and Axes.

Vascular and Nonvascular Intracranial Disorders

Primary Headache Disorders

Neurogenic pain disorders Episodic and Continuous

Neuropathic Pain

PHN

Intraoral Pain Disorders

Temporomandibular Disorders

Cervicogenic Mechanisms of Orofacial Pain and Headaches

Extracranial and Systemic Causes of Head and Facial Pain

Axis II: Bio behavioural Considerations



## Table 5 Temporomandibular Disorders RCD TMD <sup>19</sup>

Temporomandibular disorders (TMDs) refers to three groups of conditions:

### 1. Myofascial pain (pain from the masticatory musculature):

- with limited opening
- without limited opening

### 2. Disc displacement (abnormal movement of the articular disc):

- with reduction of the disc [clicking],
- without reduction of the disc displacement:
  - with limited opening
  - without limited opening

### 3. Other joint disorders:

- arthralgia (pain from the Temporomandibular joint),

**Woda et al 2005** classification for chronic orofacial pain adapted from <sup>20</sup>

Neurovascular and tension	Neuralgia	Persistent idiopathic
<p>Tension headache Migraine Cluster headache</p>	<p>Primary Trigeminal neuralgia (Classical and Non classical)</p> <p>Secondary neuropathy Post herpetic neuralgia Diabetes mellitus Multiple sclerosis HIV Post traumatic neuropathy Lingual Inferior alveolar nerve injuries</p>	<p>Stomatodynia/Burning mouth syndrome BMS</p> <p>Persistent idiopathic PIFP (e.g. atypical facial pain)</p> <p>Arthromyalgia non clustered</p>

# Preferred Classification of Chronic orofacial pain

Trigeminal chronic pain		
Neurovascular	Neuropathic	Idiopathic
Tension HA Migraine Cluster HA MoH Giant cell arteritis Trigeminal autonomic cephalgias	<b>Primary neuropathy</b> Trigeminal N Classic/symptomatic Glossopharyngeal N <b>Secondary neuropathies</b> PHN Post surgical N Lingual inferior alveolar nerve injuries	Burning Mouth S Persistent idiopathic (ATFP / ATO)

Temporomandibular disorders did not cluster

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Temporomandibular disorders did not cluster

# Neurovascular



- ❖ Exclude sinister headaches 1%
  - >50 yrs Tumour 1%
  - Subarachnoid haemorrhage – recent trauma LoC
- ❖ Migraine 10-17%
  - ❖ Five or more lifetime headache attacks lasting 4-72 hours each and symptom-free between attacks
  - ❖ moderate to severe pain, unilateral +/- aura visual signs
- ❖ Cluster headaches 5% - SUNCT
  - ❖ Male:female ratio 4:1 to 20:1 / 30yrs +
  - ❖ Severe episodic pain lasting 15-180 minutes
  - ❖ Unilateral Orbital, supraorbital or temporal
  - ❖ 8x a day to every other day for a period of 2 -12 weeks
- ❖ Tensions type headaches
  - ❖ 30-78% population -Highest socioeconomic impact
  - ❖ At least 10 episodes occurring <1 day a month on average
  - ❖ Infrequent episodes lasting from 30 minutes to 7 days
  - ❖ Typically bilateral
- ❖ Medication over use headaches 30-78%

# Headaches

**Sinus:**  
pain is usually behind the forehead and/or cheekbones



**Cluster:**  
pain is in and around one eye



**Tension:**  
pain is like a band squeezing the head



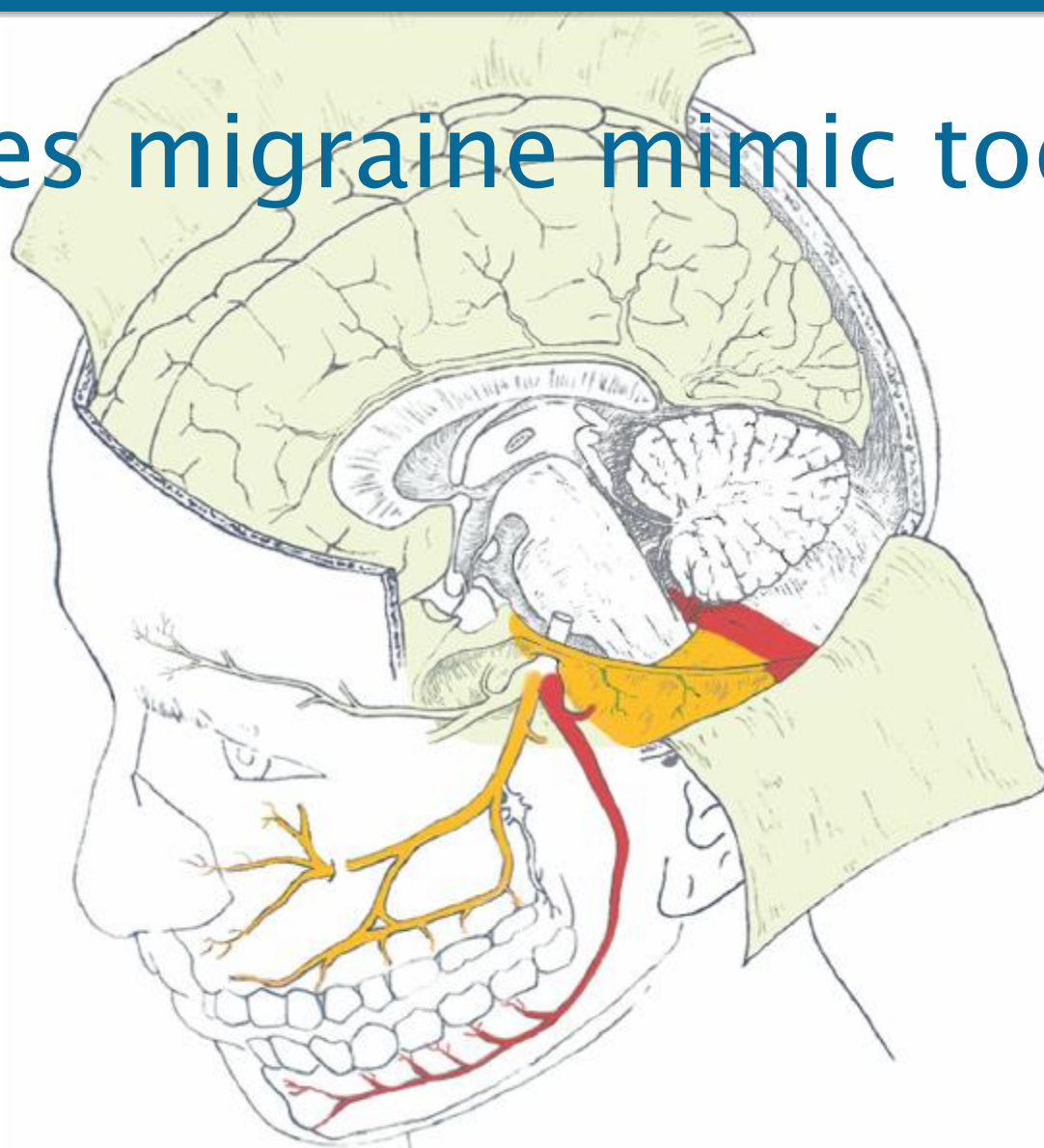
**Migraine:**  
pain, nausea and visual changes are typical of classic form



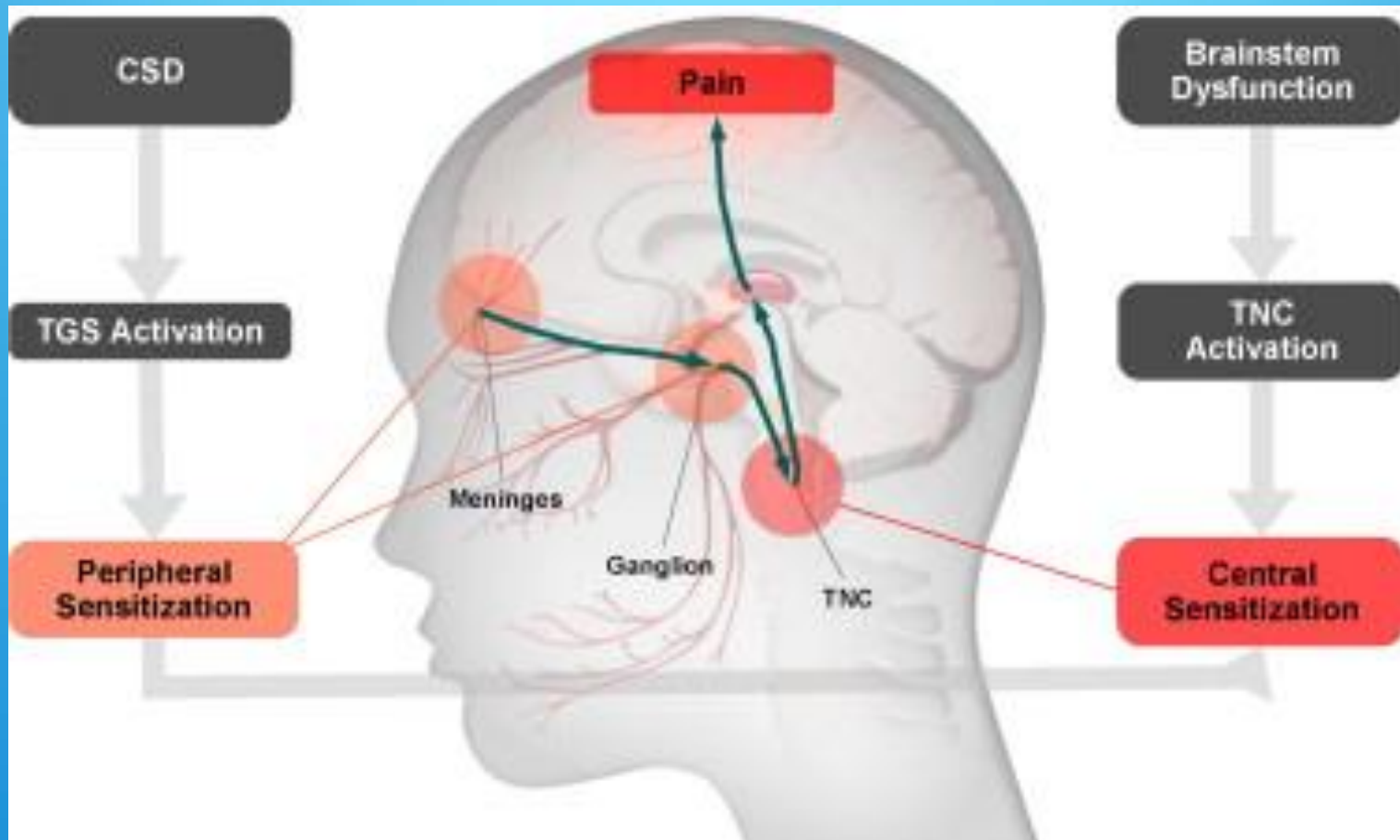
 ADAM.

Medication  
overuse  
headache

# How does migraine mimic toothache?



Case Series of Four Different Headache Types Presenting as Tooth Pain  
*Aurelio A. Alonso, DDS\* and Donald R. Nixdorf, DDS, MS\**



## Chronic migraine, Migraine chronique

D. Valade Review Neurologique May 2013





*National Institute for  
Health and Clinical Excellence*

[http://www.nice.org.uk/nicemedia/  
live/13901/60853/60853.pdf](http://www.nice.org.uk/nicemedia/live/13901/60853/60853.pdf)

## Headaches

Diagnosis and management of headaches in  
young people and adults

Issued: September 2012

	ICHD-II	ICD-10	Diagnosis
<b>Primary headaches</b>	1.	G43	Migraine
	2.	G44.2	Tension-type headache (TTH)
	3.	G44.0	Cluster headache and other trigeminal autonomic cephalalgias (TAC)
	4.	G44.80	Other primary headaches
<b>Secondary Headaches</b>	5.	G44.88	Headache attributed to head and/or neck trauma
	6.	G44.81	Headache attributed to cranial or cervical vascular disorder
	7.	G44.82	Headache attributed to non-vascular intracranial disorder
	8.	G44.4 or G44.83	Headache attributed to a substance or its withdrawal
	9.		Headache attributed to infection
	10.	G44.882	Headache attributed to disorder of homeostasis
	11.	G44.84	Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cranial structures
	12.	R51	Headache attributed to psychiatric disorder
<b>Cranial neuralgias, central and primary facial pain and other headaches</b>	13.	G44.847, G44.848 or G44.85	Cranial neuralgias and central causes of facial pain
	14.	R51	Other headache, cranial neuralgia, central or primary facial pain

Internationale Klassifikation von Kopfschmerzerkrankungen der International Headache Society (IHS), 2. Auflage, 1. Revision 2004 (Abb. 1).

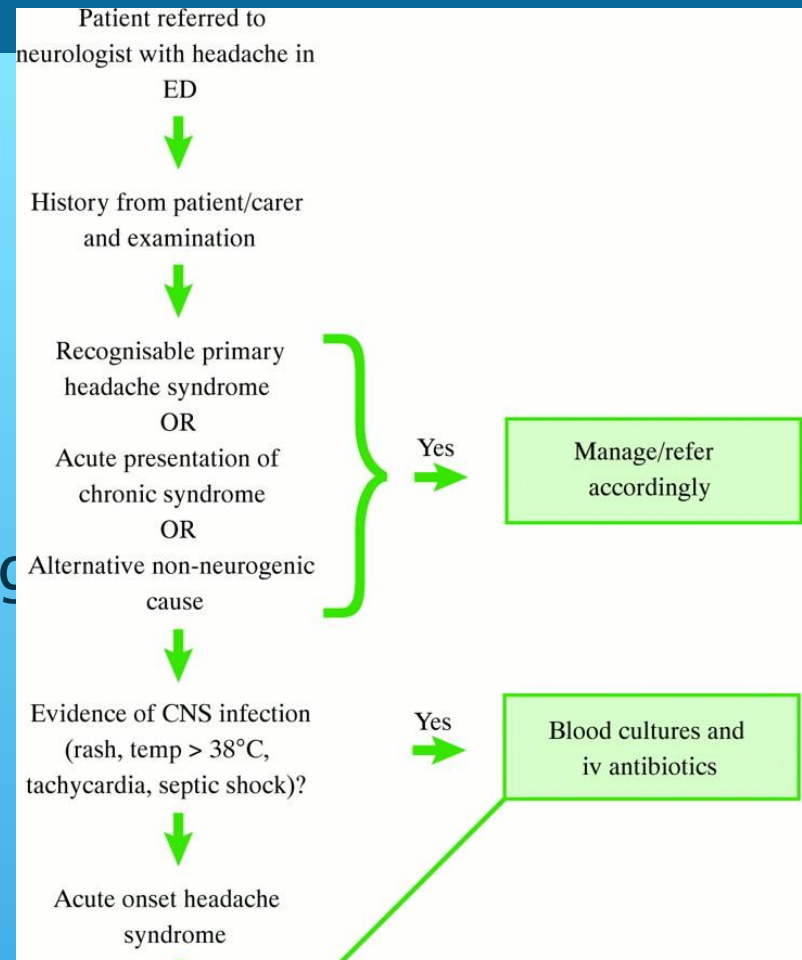
# Acute headache

- ❖ Kids exclude meningitis
- ❖ Adults 1% sinister causes
- ❖ Stroke
- ❖ Sub arachnoid haemorrhage

## ❖ Headache -Migraine

Rehydration/ Anxiolysis,

- ❖ IV Sumatriptan



### Primary headache syndromes

- Migraine
- Cluster headache and related syndromes (including paroxysmal hemicranias, SUNCT)
- Thunderclap headache
- Hypnic headaches
- Benign exertional/sex headache
- Cough headache

Yes → Manage appropriately

# Management of headaches

The vast majority of episodic, impactful headaches reported by patients are caused by migraine

Intermittent  
mild-to-moderate migraine  
(+/- aura)

Intermittent  
moderate-to severe migraine  
(+/- aura)

Aspirin/NSAID (large dose)  
Aspirin/paracetamol plus anti-emetic

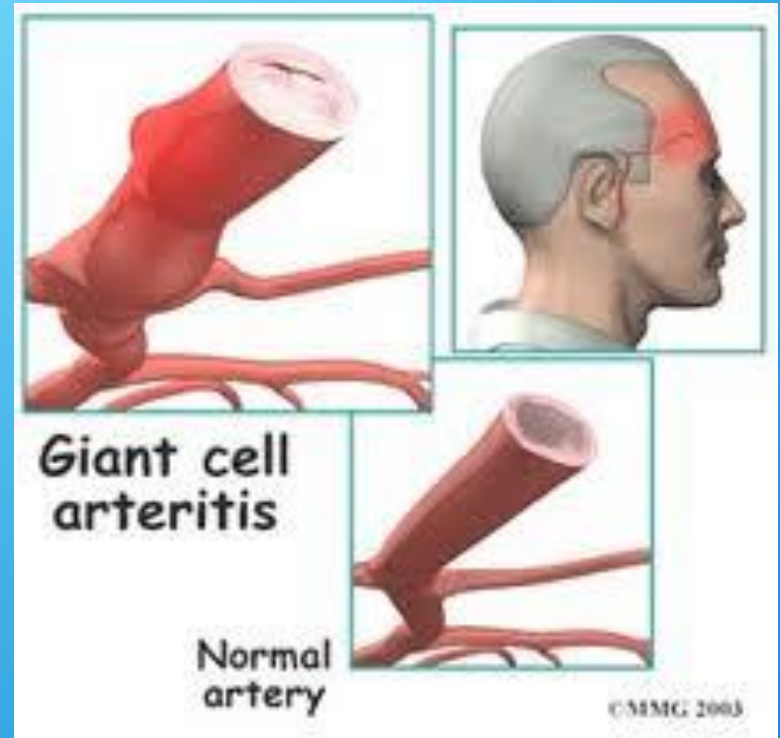
Oral triptan  
Nasal spray/subcutaneous  
triptan

# Exclude sinister headaches

- ❖ Subarachnoid haemorrhage - recent trauma LoC
- ❖ Cranial arteritis
- ❖ Tumour 1%
- ❖ >50 yrs
- ❖ New-onset, acute headaches associated with other symptoms
  - ❖ e.g. rash, neurological deficit, vomiting, pain/tenderness, accident/head injury, hypertension
  - ❖ Neurological change/deficit does not disappear when the patient is pain-free between attacks
  - ❖ Develop algorithm for sinister headaches
- ❖ Dowson AJ, Cady RC. Rapid Reference to Migraine 2002.

# Giant cell arteritis

- ❖ Acute temporal onset pain
- ❖ Palpable temporal artery
- ❖ May be bilateral
- ❖ +/- Occular signs
- ❖ Risk of blindness
  - ❖ Prednisolone 50mg oral (GMP)
  - ❖ Ophthalmic assessment



# Trigeminal autonomic cephalgias (TACs)

- ❖ Cluster headache
- ❖ SUNCT
- ❖ SUNA
- ❖ Paroxysmal hemicrania
- ❖ Hemicrania continua



# SUNCT

sudden onset neuralgiform conjunctival irritation and tearing



- ❖ Redness
- ❖ Ptosis
- ❖ Tearing
- ❖ Nasal congestion
  
- ❖ V2



# CH/ SUNCT/SUNA/PH

	<b>Cluster headache</b>	<b>Paroxysmal hemicrania</b>	<b>SUNCT</b>
Sex F: M	1:2.5	1:1	1:2
Pain:			
Type	Stabbing, boring	Throbbing, boring, stabbing	Burning, stabbing, sharp
Severity	Excruciating	Excruciating	Excruciating
Site	Orbit, temple	Orbit, temple	Periorbital
Attack frequency	1/alternate day - 8/day	1-40/day (>5/day for more than half the time)	3-200/day
Duration of attack	15- 180 min	2-30 min	5-240 s
Autonomic features	Yes	Yes	Yes
Migrainous features	Yes	Yes	Very rarely
Alcohol trigger	Yes	Occasional	No
Cutaneous triggers	No	No	Yes
Indometacin effect	-	++	-
Abortive treatment	Sumatriptan injection or nasal spray Oxygen	Nil	Nil
Prophylactic treatment	Verapamil Lithium Topiramate	Indometacin	Lamotrigine Topiramate Gabapentin

# Mx TAC

- ❖ Cluster headache

Greater occipital  
nerve block (GON)

- ❖ Initially using LA

- ❖ Then using botox

Medication

SUNCT SUNA

- ❖ Lamotrigine

Hemicrania

- ❖ indomethacin

Lambru G, Matharu MS. Trigeminal autonomic cephalalgias: A review of recent diagnostic, therapeutic and pathophysiological developments. *Ann Indian Acad Neurol* 2012;15:51-61

# Preferred Classification of Chronic orofacial pain

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Temporomandibular disorders did not cluster

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Temporomandibular disorders did not cluster

# Neuropathic OFP with 'neuralgia'

- ❖ **Primary neuralgia**

- ❖ Trigeminal neuralgia (TN)

- ❖ Typical Classic
- ❖ Atypical symptomatic

- ❖ Glossopharyngeal neuralgia

- ❖ Acute pain pharynx, tongue base, mastoid regions

- ❖ **Secondary neuralgia**

- ❖ Post herpetic neuralgia (PHN)

- ❖ > 50 yrs 60% likely to develop pain post shingles
- ❖ Ramsay Hunt syndrome

- ❖ Diabetes
- ❖ HIV
- ❖ PHN
- ❖ Chemotherapy
- ❖ MS

**BMS?**

- ❖ Post traumatic V neuralgia

- ❖ Lingual nerve injuries
- ❖ Inferior alveolar nerve

# Trigeminal Neuralgia

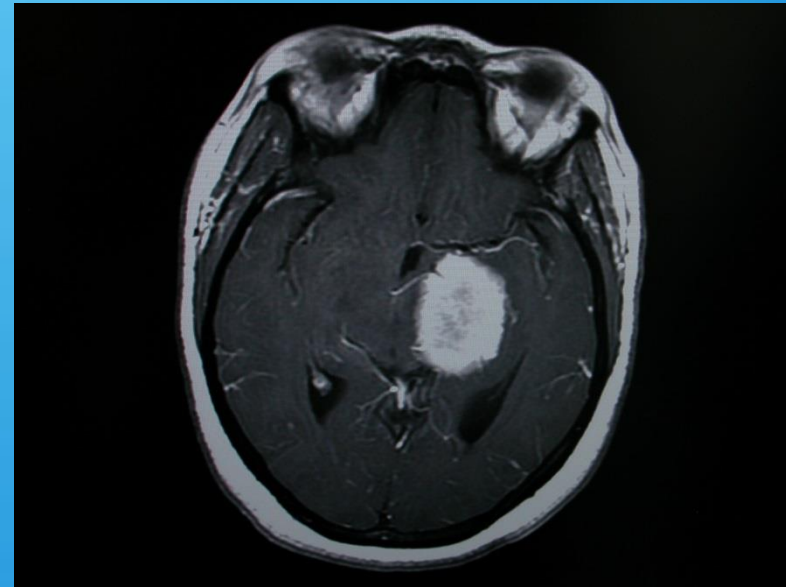
IASP defines trigeminal neuralgia as

**“ a sudden, usually unilateral, severe, brief, stabbing, recurrent pain in the distribution of one or more branches of the fifth cranial nerve”.**

Classical TN has diagnostic criteria  
International Headache Society.

❖ Classical TN

❖ Symptomatic TN  
bilateral  
neuropathy  
younger age



# Classic TN

- ❖ Character
  - ❖ Flashing, shooting, sharp, unbearable
- ❖ Severity
  - ❖ Moderate to severe
- ❖ Site, radiation
  - ❖ Distribution of trigeminal nerve
- ❖ Duration, periodicity
  - ❖ Bouts last for seconds, pain free periods
- ❖ Provoking factors
  - ❖ Elicited –Light touch, eating, talking
- ❖ Relieving factors
  - ❖ Avoid touch, anticonvulsants
- ❖ Associated factors
  - ❖ Trigger areas, weight loss
  - ❖ No causative event

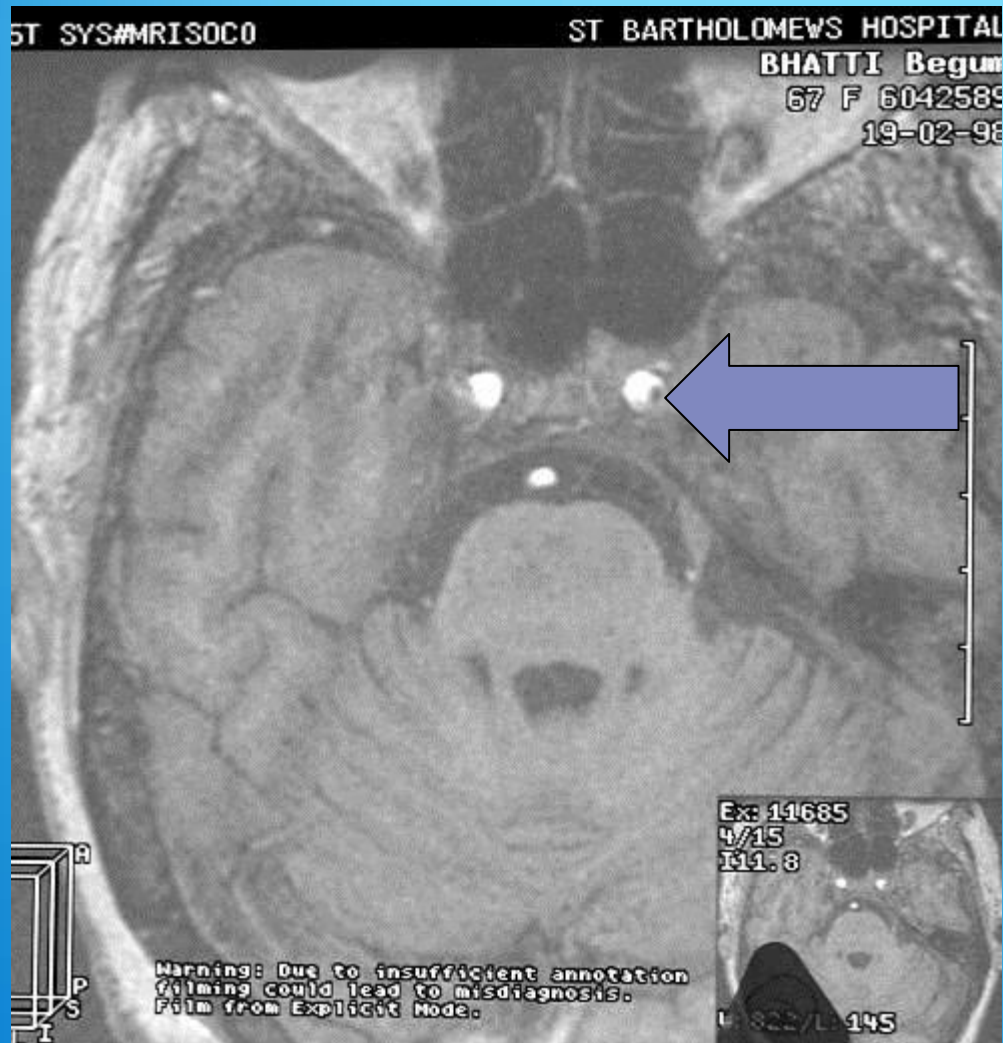


# Classic TN interesting features

- ❖ Never at sleep
- ❖ Elicited
- ❖ Unilateral
- ❖ V2/3
- ❖ Responds to tegretol
- ❖ No neuropathic area
- ❖ Exclude;
  - ❖ TACs
  - ❖ MS
  - ❖ SOL

# TN Investigations

- ❖ MRI – patients under 40 years to exclude
  - ❖ multiple sclerosis
  - ❖ assess if micro vascular compression
  - ❖ Space occupying lesions (Devor 2010)
- ❖ CT - tumours of posterior fossa
- ❖ Haematological tests
- ❖ Biochemical tests
- ❖ Neurological – sensory testing and hearing



# MRI scan

## Diagnosis and differential diagnosis of trigeminal neuralgia

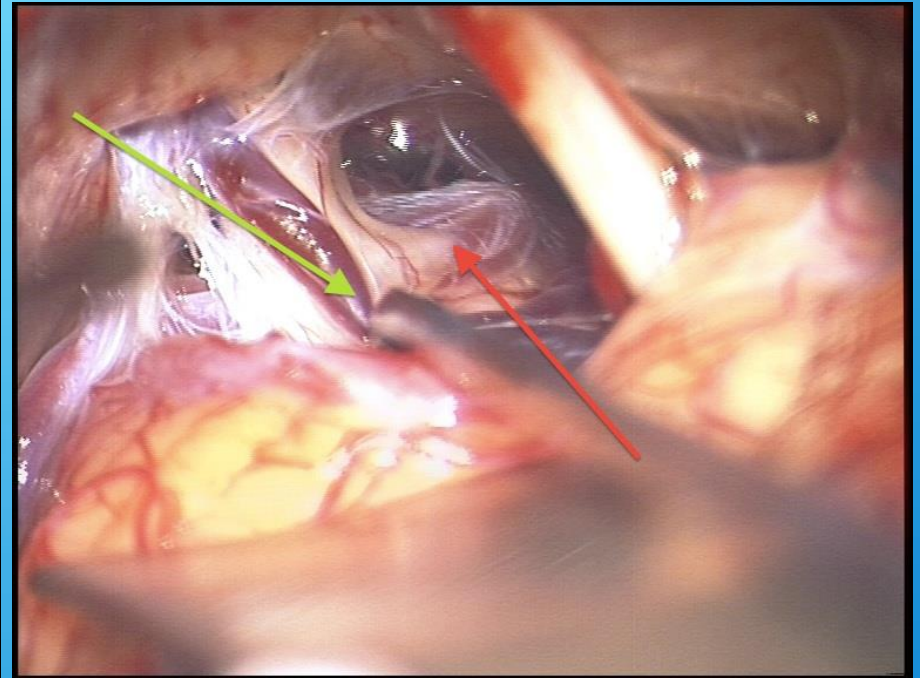
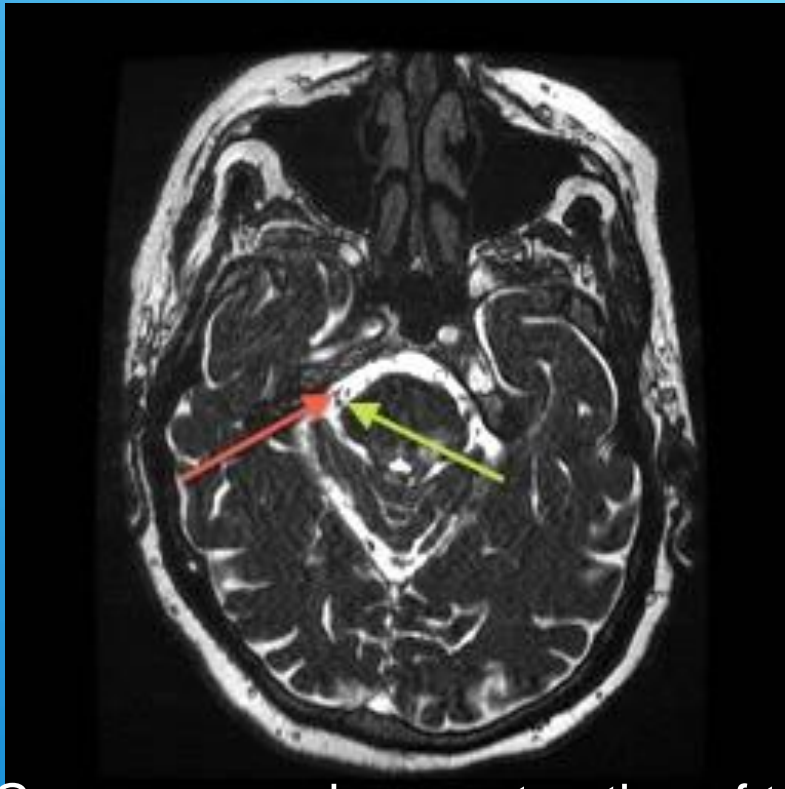
Zakrzewska JM.

Clin.J.Pain 2002;18:14-21

15-88% MRI+ superior cerebellar artery vascular compromise+ve results

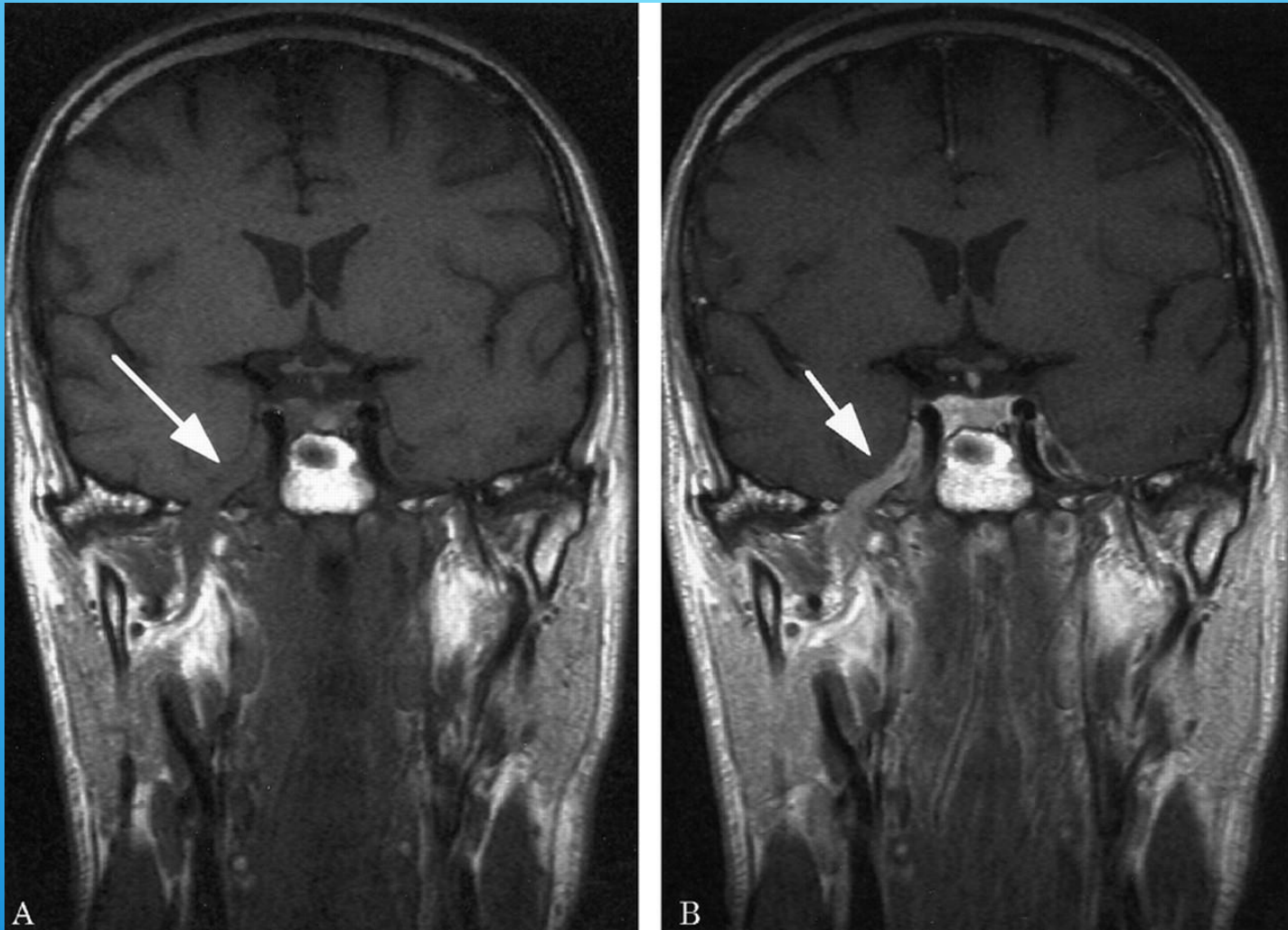
25-49% people with NO TN have MRI +ve signs!!!! (Kakizawa et al 2008, Adamczyk et al 2007)

# Sup cerebellar artery vascular compromise



Green arrow shows retraction of trigeminal vein in contact with but not compressing V; red arrow shows a branch of the superior cerebellar artery passing medial to and severely compressing V at the root entry zone  
Courtesy Mr Sinan Barazi Neurosurgeon KCH

**Figure. Coronal T1-weighted spin echo image of Patient 1 before (A) and after (B) gadolinium enhancement.**



Boerman R et al. *Neurology* 1999;53:213-213

# Mx TN

- ❖ Tegretol Carbamazepine (8% rash)
  - ❖ Oxcarbazepine
  - ❖ Gabapentin
  - ❖ Pregabalin
- 
- ❖ MVD if MRI confirms vascular compromise

# Issues with TN

- ❖ Wrong diagnosis
  - ❖ GMP toothache
  - ❖ SUNCT/SUNA
- ❖ Mainly managed by GMPs 'toothache'
- ❖ Early MRI beneficial?
- ❖ Stevens-Johnson syndrome (SJS) has Genetic link skin reaction in HLA-B\*1502 gene in Han Chinese and Thai population.

Hung SI et al. Genetic susceptibility to carbamazepine-induced cutaneous adverse drug reactions. *Pharmacogenet Genomics*. 2006 Apr;16(4):297-306.

# Useful links TN

- ❖ Information also available on TNA UK website <http://www.tna.org.uk>
- ❖ Brain and spine foundation booklet on face pain Available on <http://www.brainandspine.org.uk>
- ❖ ISBN 978-1-901893-60-1



# Trigeminal neuropathy

## ❖ Secondary

❖ Injury

❖ HIV

❖ PHN

❖ Stroke

❖ Diabetes

❖ MS

❖ Parkinsons

❖ Chemotherapy

❖ Radiation

❖ Malignancy

❖ Growth hormone injections

# Post herpetic neuralgia

## ❖ PHN

Shingles and **PHN** - Shingles Support Society

[www.shinglesupport.org/faq](http://www.shinglesupport.org/faq)



Post ophthalmic herpes zoster –  
hyperaemia and corneal scarring

# Prevent post Herpetic Neuralgia

- ❖ 20% of patients (60% > 50yrs) progress to neuropathic pain after Shingles caused by a reactivation of the varicella-zoster virus (VZV).
- ❖ In the trigeminal system most commonly V1 and V2
- ❖ If patient is <40 years **check immuno status** (15 times higher in HIV-infected patients )
  - ❖ If caught early treat with high dose ant-herpeticals
    - ❖ Acyclovir (Zovirax) †800 mg orally five times daily for 7 to 10 day 10 mg per kg IV every 8 hours for 7 to 10 days
    - ❖ Prednisone 30 mg orally twice daily on days 1 through 7; then 15 mg twice daily on days 8 through 14; then 7.5 mg twice daily on days 15 through 21
  - ❖ Ramsay hunt syndrome HZ of geniculate ganglion (facial nerve, CT)

# Management of Herpes Zoster

- ❖ High dose steroids and antivirals (Acyclovir) during acute infection phase
  - ❖ If caught early treat with high dose antivirals
    - ❖ Acyclovir (Zovirax) †800 mg orally five times daily for 7 to 10 days or 10 mg per kg IV every 8 hours for 7 to 10 days
    - ❖ Prednisone 30 mg orally twice daily on days 1 through 7; then 15 mg twice daily on days 8 through 14; then 7.5 mg twice daily on days 15 through 21
  - ❖ + Amitriptyline

# Features of neuropathic pain

- ❖ Non responsive to anti inflammatory drugs
  - ❖ Worse with stress /anxiety
  - ❖ Worsens during day
  - ❖ Alleviated by distraction/ activity
- 
- ❖ Usually responds to TCAs or Membrane stabilising drugs

# Management painful neuropathy

- ❖ Counselling
  - ❖ CBT
- ❖ Medical
  - ❖ Antidepressants
    - ❖ Tricyclic antidepressants
      - ❖ Amitriptyline
      - ❖ Nortriptyline
    - ❖ Anticonvulsants
      - ❖ Carbamazepine
      - ❖ Gabapentin
      - ❖ Pregabalin
  - ❖ Surgery early repair / late exploration repair
    - ❖ 90% patients feel as though surgery is worthwhile (Robinson PP et al., 2003)

**Table 1** Comparison of neuropathic pain treatment guidelines, excluding trigeminal neuralgia\* [11]

Medication Class	Neuropathic Pain Special Interest Group Guidelines	Canadian Pain Society Guidelines	European Federation of Neurological Societies Guidelines
Tricyclic antidepressants	First line	First line	First line for PPN, PHN, and CP
Calcium channel $\alpha_2$ - $\delta$ ligands (gabapentin and pregabalin)	First line	First line	First line for PPN, PHN, and CP
SSNRIs (duloxetine and venlafaxine)	First line	Second line	Second line for PPN
Topical lidocaine	First line for localized peripheral NP	Second line for localized peripheral NP	First line for PHN if small area of pain/allodynia
Opioid analgesics	Second line except in selected circumstances <sup>†</sup>	Third line	Second-third-line for PPN, PHN, and CP
Tramadol	Second line except in selected circumstances <sup>†</sup>	Third line	Second-third-line for PPN and PHN

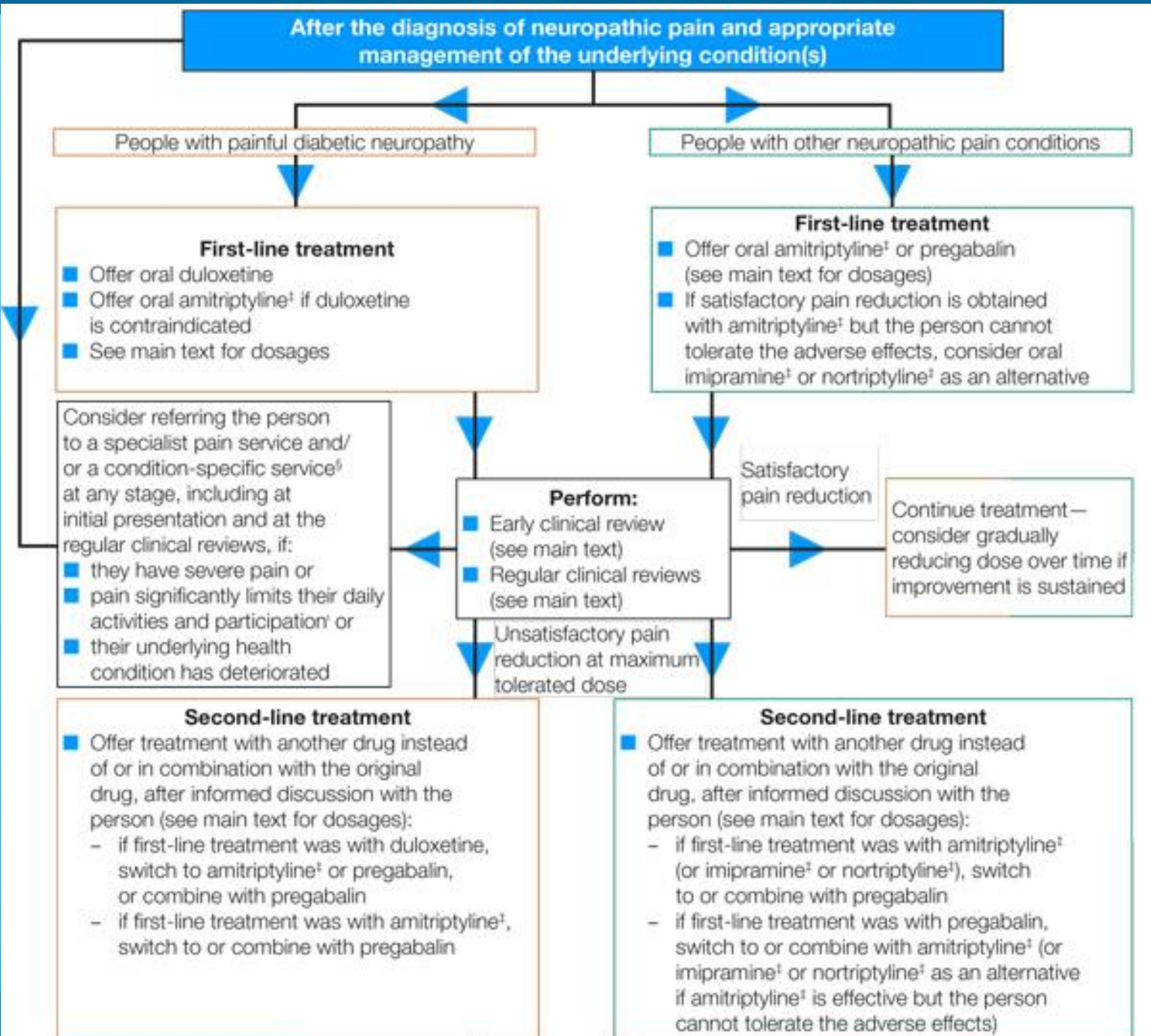
\* Only medications considered first or second line in 1 of the guidelines are presented.

<sup>†</sup> Opioid analgesics and tramadol were considered first-line options in the following circumstances: for the treatment of acute NP, episodic exacerbations of severe NP, neuropathic cancer pain, and during titration of a first-line medication in patients with substantial pain.

CP = central pain; NP = neuropathic pain; PHN = postherpetic neuralgia; PPN = painful polyneuropathy; SSNRIs = selective serotonin and norepinephrine reuptake inhibitors.

Reprinted from O'Connor AB, Dworkin RH. Treatment of neuropathic pain: An overview of recent guidelines. *American Journal of Medicine* 2009;122(suppl 10):S22–32, with permission from Elsevier.





# Preferred Classification of Chronic orofacial pain

Trigeminal chronic pain		
Neurovascular	Neuropathic	Idiopathic
Tension HA Migraine Cluster HA MoH Giant cell arteritis Trigeminal autonomic cephalgias	<b>Primary neuropathy</b> Trigeminal N Classic/symptomatic Glossopharyngeal N <b>Secondary neuropathies</b> PHN Post surgical N Lingual inferior alveolar nerve injuries	Burning Mouth S Persistent idiopathic (ATFP / ATO)

Temporomandibular disorders did not cluster

# Preferred Classification of Chronic orofacial pain

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Temporomandibular disorders did not cluster

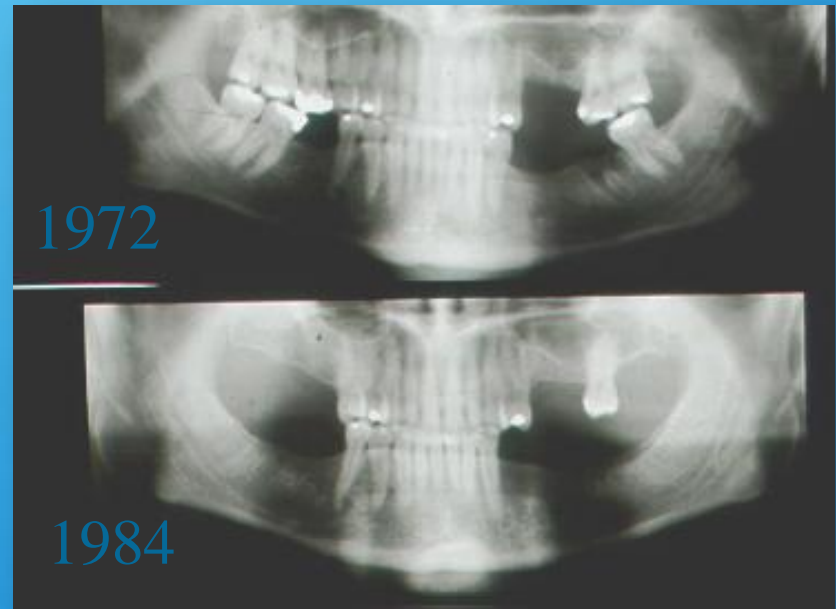
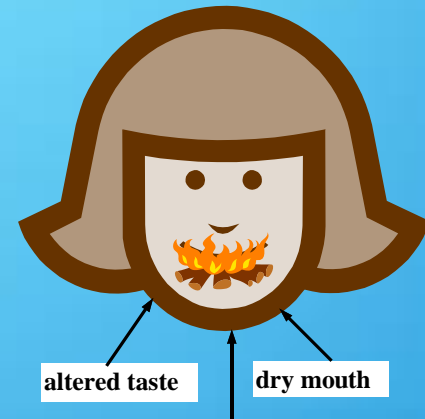
# Idiopathic chronic OFP

## BMS

- ? Neuropathy?

## Persistent idiopathic

- Extraoral / facial
- Intraoral / odontalgia



# BMS

- ❖ The International Association for the Study of Pain (IASP) defines BMS as:
  - ❖ *‘a distinctive nosological entity’ characterised by ‘unremitting oral burning or similar pain in the absence of detectable oral mucosal changes’ that can last at least 4-6 months.*

# Burning Mouth Syndrome

Incidence  
Women 15:1  
1-5%  
Age >40-60yrs  
Post  
menopausal



Features

Spontaneous  
onset

➤ 4month duration

Normal  
appearance

Supertasters/taste  
sensitivity



# BMS causes

- ❖ Menopausal
- ❖ Supertasters
- ❖ Deficiency in Haematinics
- ❖ Psychometric - increased HADS scores
- ❖ Diabetes
- ❖ Neuropathy ??

# Aetiology of BMS

- ❖ An **alteration in autonomic innervation** and oral blood flow (Heckmann et al., 2001)
- ❖ Changes in endocrine status during **menopause**, causing a disruption in sensory pathways (Basker et al., 1978)
- ❖ A **disruption of central sensory** and modulatory pathways that include the spinal trigeminal nucleus and striatum (Hagelberg et al., 2003; Gao et al., 2000).
- ❖ A sensory dysfunction illustrated by changes in QST associated with a **small and/or large fibre neuropathy** (Forssell et al., 2002)
- ❖ A trigeminal, peripheral **small-fibre sensory neuropathy** (Lauria et al., 2005; Lauritano et al., 2005).



Research

# BMS

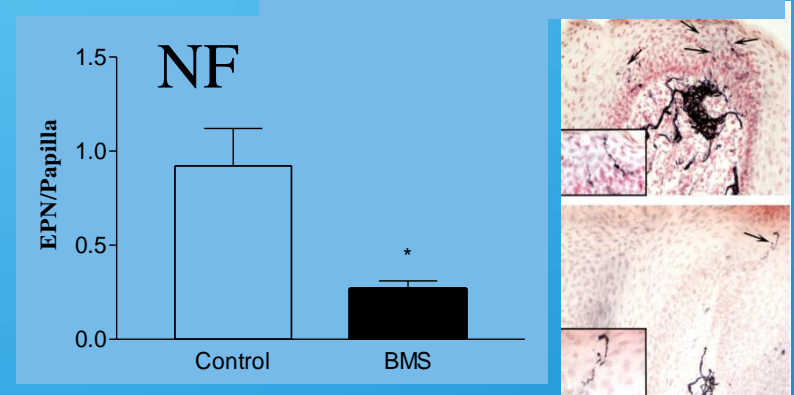
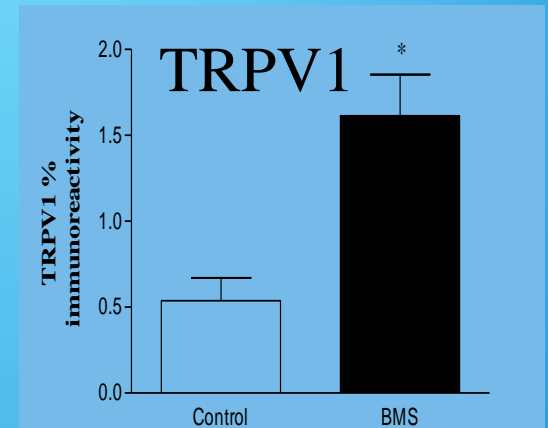
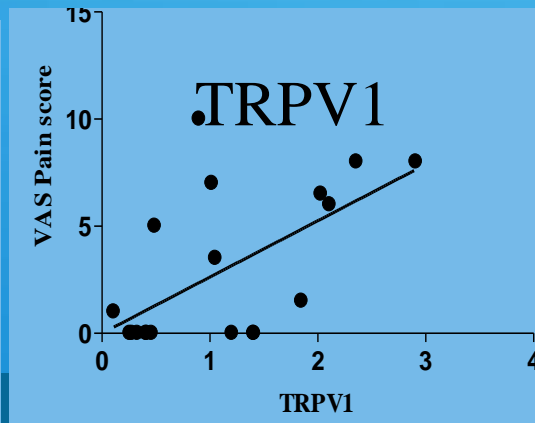
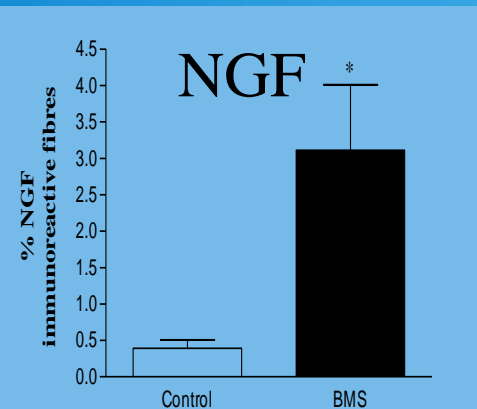
Dr Kiran Beneng PhD St

Prof Praveen Anand

Dr Zehra Yilmaz

- ❖ Ongoing work TRPM8
- ❖ CB1, P2X3 and GABA receptors
- ❖ Imaging central pathways (CNS)

Dr Matt Howard



NF Bar charts of the mean  $\pm$  SEM of epithelial nerve fibres per papilla in control and BMS tongue. \* P < 0.0001.

**P = 0.0006, Spearman r = 0.55**

# BMS update

BMS may encompass three distinct, subclinical neuropathic pain states that may overlap in individual patients. <sup>11-16</sup>

- Subgroup 1 (50-65%) is characterized by peripheral small diameter fibre neuropathy of intraoral mucosa.
- Subgroup 2 (20-25%) consists of patients with subclinical lingual, mandibular, or trigeminal system pathology that can be dissected with careful neurophysiologic examination but is clinically indistinguishable from the other two subgroups.
- Subgroup 3 (20-40%) fits the concept of central pain that may be related to hypofunction of dopaminergic neurons in the basal ganglia.

The neurogenic factors acting in these subgroups differ, and will require different treatment strategies. In the future, with proper use of diagnostic tests, BMS patients may benefit from interventions specifically targeted at the underlying pathophysiological mechanisms.

# Management of BMS

- ❖ **Systematic Review** and data in Clinical Evidence
- ❖ Cognitive behaviour therapy may be beneficial
- ❖ Reassurance
- ❖ Nortriptyline first line but limited evidence for use of antidepressants
- ❖ ? Future neuropathic pain blocking agents
- ❖ Capsaicin lollies
- ❖ Tabasco sauce

Chronic idiopathic facial pain

# Persistent Idiopathic facial pain PIFP

## ❖ Character

❖ Intense -Nagging, dull, throbbing, sharp, aching 'pain all the time resistant to all interventions usually >3years'

## ❖ Severity

❖ Varies, mild to severe though patient can often sleep and function normally

## ❖ Site, radiation

❖ no anatomical area

❖ Duration, periodicity    Constant >6 months

# Atypical Odontalgia (Dental Allodynia)

? Post traumatic Neuropathy?

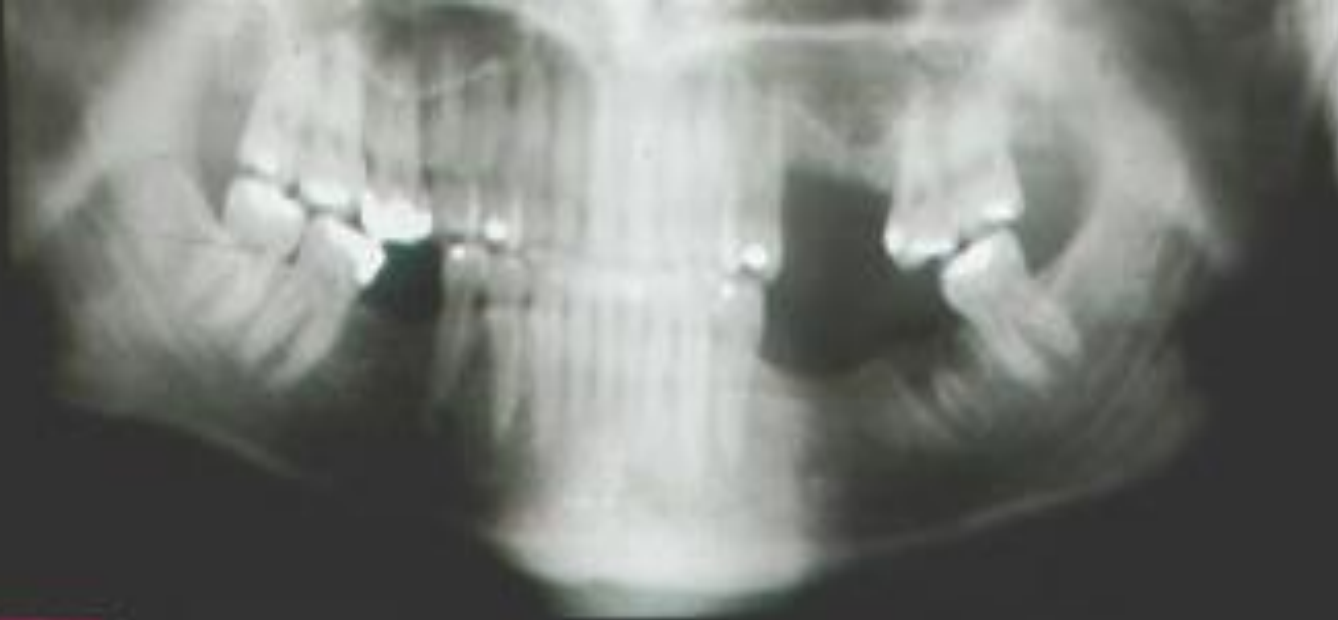
- persistent MIMIC of dental pain
- hypersensitivity to all stimuli
- may migrate from tooth to tooth
- no detectable pathology

i.e not a cracked tooth?

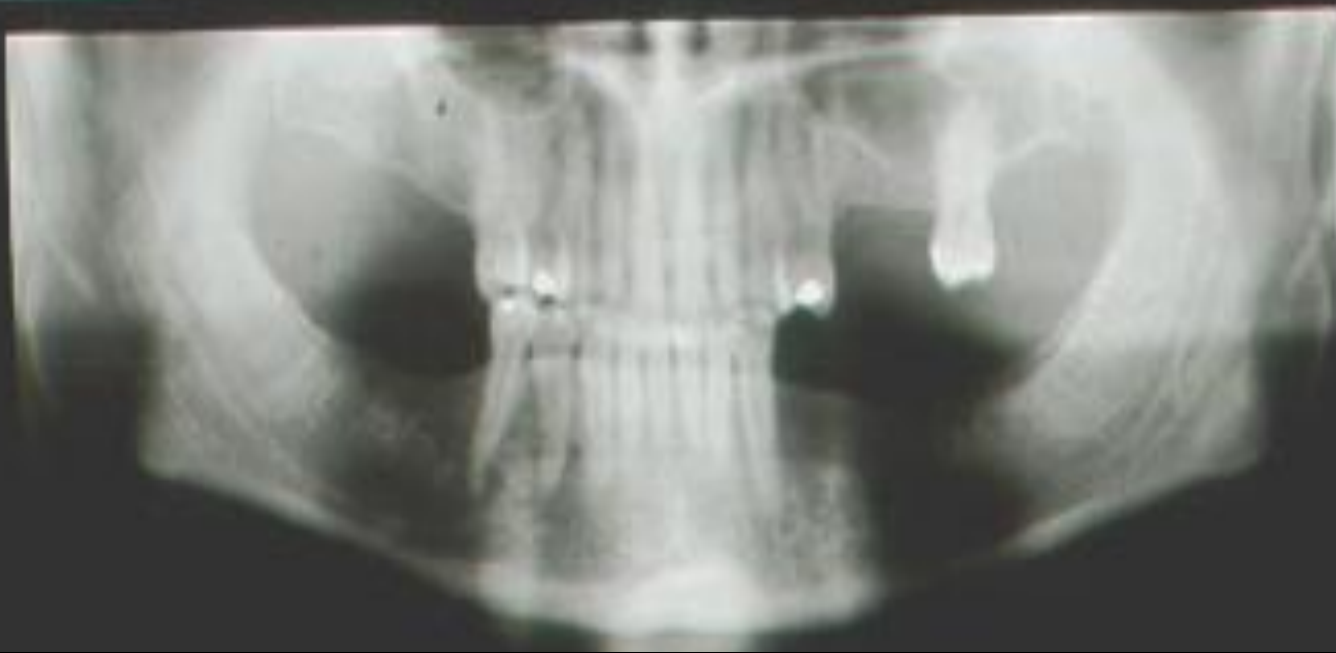
# Exclude the obvious Cracked tooth.....



1972



1984



**Natural history of atypical odontalgia**

# Prognosis

- ❖ Chronic idiopathic facial pain – after one year 38% of patients pain free but 39% taking drugs to prevent relapse
- ❖ Feinmann and Harris 1984



Pain 95 (2002) 259–266

**PAIN**

[www.elsevier.com/locate/pain](http://www.elsevier.com/locate/pain)

Long-term cohort study comparing medical (oxcarbazepine) and surgical management of intractable trigeminal neuralgia

Joanna M. Zakrzewska<sup>a,\*</sup>, Philip N. Patsalos<sup>b</sup>

12/15 required surgery to control their pain



# Management of PIFP /AO

- ❖ Counselling and reassurance
  - ❖ CBT
- ❖ Medical
  - ❖ Antidepressants
    - ❖ Tricyclic antidepressants
      - ❖ Amitriptyline
      - ❖ Nortriptyline 10mg,20mg,30mg,40mg each week. Maintain on 40mg nocte for 6 weeks before review
  - ❖ Anticonvulsants
    - ❖ Oxcarbazipine
    - ❖ Carbamazepine
    - ❖ Gabapentin
    - ❖ Pregabalin
- ❖ Topical local analgesia
- ❖ Capsaicin

# Non clusterable disorder

## Temporomandibular disorders (TMD)

**Summary of Royal College of Surgeons (England) clinical guidelines on management of Temporomandibular Disorders (TMDs) in primary care**

Authorship: J.Durham<sup>1\*</sup>, VR Aggarwal<sup>2</sup>, SJ Davies<sup>3</sup>, SD Harrison<sup>4</sup>, RG Jagger<sup>5</sup>, R Leeson<sup>6</sup>, R Lloyd<sup>7</sup>, T Thayer<sup>8</sup>, H Underhill<sup>9</sup>, RW Wassell<sup>10</sup>, J Zakrzewska<sup>11</sup>, A Begley<sup>12</sup>, AR Loescher<sup>13</sup>, E Murphy<sup>14</sup>, R McMillan<sup>15</sup>, T Renton<sup>16</sup>

\* Contact author

Authors' affiliations:

Dr Justin Durham Newcastle University

# TMJ Dysfunction/Myofascial Pain

- ❖ TMDs are musculoskeletal disorders and represent the most common cause of chronic pain in the orofacial region
- ❖ 33% population affected (Rugh et al 1985)
- ❖ 5% population require treatment (McNeill 1993)
- ❖ 5% of those requiring treatment will need surgery (McNeill 1993)
- ❖ 70-90% patients are female (Franks 64, Carraro 69)
- ❖ Age range 20-50

Chronic TMD often does not occur in isolation. Individuals suffering from chronic pain associated with a TMD frequently report other chronic pain conditions including: chronic headache, fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, sleep disturbance and depression

{Dworkin, 2011, #69458; Hoffmann et al., 2011, #64698; Maixner et al., 2011, #63267}.

Some of the bio psychosocial factors implicated in TMDs are: genetics, psychological characteristics, and small roles for occlusion, parafunctional habits, and trauma

{Diatchenko et al., 2006, #58543; Diatchenko et al., 2005, #33565; Nackley et al., 2007, #55525; Slade et al., 2007, #33881; Slade et al., 2008, #17670; Tchivileva et al., 2010, #63251; Gatchel et al., 1996, #75; Wright et al., 2004, #77; List and Axelsson, 2010, #65649; Luther et al., 2010, #93866; Koh and Robinson, 2004, #76868; Pullinger and Seligman, 1991, #67676; Pullinger and Seligman, 2000, #5872; Pullinger et al., 1993, #98128; Benoliel et al., 2011, #43262}.

# TMD symptoms

These signs and symptoms commonly include,

- ❖ Pain in and around the TMJs and muscles of mastication often worsened by function
- ❖ Muscle and joint tenderness on palpation
- ❖ Joint sounds (clicking and crepitus)
- ❖ Limitation and incoordination of mandibular movement
- ❖ Headaches
- ❖ Otalgia

De Boever JA, Nilner M, Orthlieb JD, Steenks MH. Recommendations by the EACD for examination, diagnosis, and management of patients with temporomandibular disorders and orofacial pain by the general dental practitioner. *J Orofac Pain.* 2008;22:268-278.

# Clinical exam

- ❖ It is possible to make a reliable and quick physical diagnosis for a TMD patient using the Clinical Examination Protocol (CEP-TMD).
- ❖ This approach provides a useful descriptive diagnosis of whether the patient's problem involves the masticatory muscles, TMJ disc displacement or other TMJ condition and correlates well with the gold standard research diagnostic system for TMDs (RDC/TMD) {Hasanain et al., 2009, #39328} and is freely available on the web

Adapting the diagnostic definitions of the RDC/TMD to routine clinical practice: a feasibility

**Signs and symptoms of TMDs (can present with one of or a combination of)**

**Pain in joint and associated musculature**

**Signs and symptoms of TMDs and key questions in taking a history from a patient with a suspected TMD.**

**Joint noises**

**Restricted range of movement**

**Headache related to temporalis pain**

**Sometimes patients can also present with a non-specific toothache or sensitivity**

**Pain history questions**

**Potential findings**

**SOCRATES ([www.medicalmnemonics.com](http://www.medicalmnemonics.com))**

**Site**

Primary sites: TMJ, muscles of mastication, within the ear.  
Not necessarily well localised (see radiation and referral)

**Onset**

Can be sudden or gradual

**Character**

Aching, deep, continuous with potential acute exacerbations

**Radiation and referral**

To ear, angle of jaw, temple, teeth

**Associated and alleviating factors**

Rest, analgesia may help, dynamic movements worsen

**Timing - duration and frequency**

Can worsen through day or through the night, but often present continuously

**Exacerbating factors**

Chewing, yawning, prolonged mouth opening

**Severity (Score out ten with ten being "worst pain imaginable")**

Variable

**Other questions relevant to TMD history {Dworkin and LeResche, 1992, #67; NICE, 2009, #76799}**

Relevance

**Have you had pain in the face, jaw, temple, in front of the ear, or in the ear in the past month?**

Indicative of TMDs

**Have you ever had any clicking or grinding noises from your jaw joint in front of your ear?**

Indicative of disc disorder or arthritides

**Have you ever had your jaw lock or catch so it won't open all the way?**

Indicative of a disc displacement without reduction

**During the last month, have you often been bothered by: feeling down, depressed or hopeless?**

Answer yes to either of these questions and the patient should be assessed by a practitioner



# Manchester 3 minute examination

Date of exam	
Patient's name and DOB	

## Articulatory System: The 3-minute Exam [SJD 09]

MANCHESTER  
1824

The University  
of Manchester

### Temporomandibular Joint

		Right		Left
<b>Tender to palpation?</b>	<i>Lateral pole</i>			
	<i>Intra-auricularly</i>			
<b>Noises?</b>	<i>Clicks</i>	Right Soft Consistent Opening Cycle: Early Painful	Left Loud Intermittent Closing Mid Painless	Bilateral   Both Late

# TMJ research Diagnostic Criteria

❖ TMJ RCD

❖ Arthritides

❖ +/-pain

❖ Myalgia

❖ Muscle pain

❖ Dysfunction

Internal derangements

❖ +/-pain

Dworkin SF, LeResche L. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications, critique. J Craniomandib Disord. 1992;6:301-355.

COMMENTARY | GUEST EDITORIAL

## GUEST EDITORIAL

### Temporomandibular disorders A term past its time?

**Continued use of the term "temporomandibular disorders" no longer can be defended in light of the many scientific advances that have been made in this field.**

**A**s G.K. Chesterton once wrote, "A man does not know what he is saying until he knows what he is not saying."<sup>1</sup> Use of the term "temporomandibular disorders" (TMD) clearly fits this description. Having been introduced into the literature as a means of solving a complex taxonomic dilemma, the term has been misused to the degree that it now has led to more confusion than clarification. Perhaps it is time to reconsider the value of maintaining this diagnostic classification. In making this decision, it is important to understand how we arrived at the current situation.

#### "TEMPOROMANDIBULAR DISORDERS": HISTORY OF THE TERM

The earliest descriptions of conditions involving the temporomandibular joint (TMJ) date back to the fifth century and were concerned with the diagnosis and treatment of dislocation. Subsequently, there were references to so-called fixations that were related to TMJ ankylosis and arthritis. Thus, initially, although all of the conditions affecting the TMJ were not fully understood, there was a disease concept of TMJ involvement.

Before the establishment of formal dental education in the late 1800s, physicians generally treated these conditions. However, in 1918, a key article by Prentiss<sup>2</sup> sparked some interest in this subject in the dental community. Prentiss wrote, "When the teeth are extracted the condyle is pulled upward by the powerful musculature and pressure on the meniscus results in atrophy." Subsequently, articles by Summa,<sup>3</sup> Monson,<sup>4</sup> Wright<sup>5</sup> and Goodfriend<sup>6</sup> emphasized the role of missing teeth, lost vertical dimension and the resulting displacement of the mandible as the cause of the symptoms these patients experienced.

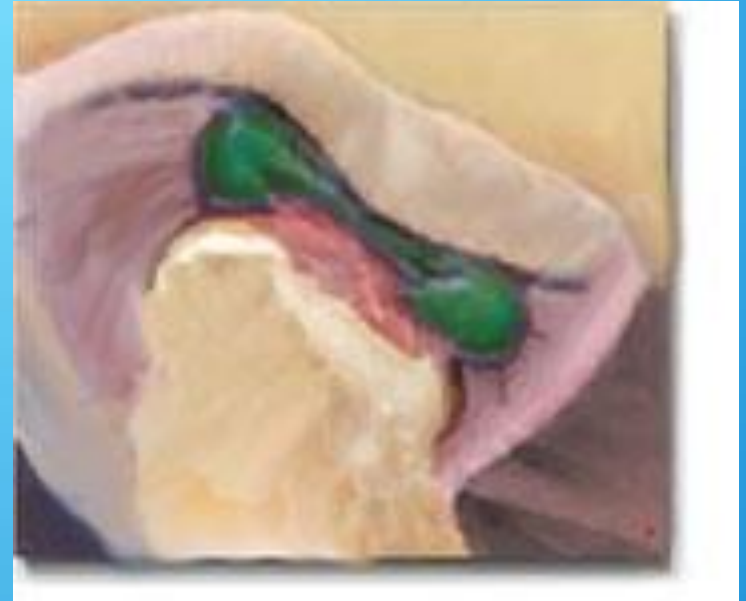
However, it was in 1934 that the first of a series of articles by otolaryngologist James Costen<sup>7</sup> not only resulted in greater involvement of dentistry in the management of TMJ disorders and diseases, but also changed the entire diagnostic concept. In this article, Costen described a series of TMJ, ear and "sinus" symptoms that ultimately came to bear his name (Costen syndrome), which he attributed to nerve impingement from overclosure of the bite. Although it subsequently was shown that his anatomical explanations for the causes of the symptoms were incorrect,<sup>8,9</sup> his work still had a profound and long-lasting effect on the diagnosis and treatment of TMJ pain and dysfunction. As a result of his influence, there was a shift

Daniel M. Laskin, DDS, MS

124 JADA, Vol. 139 <http://jada.ada.org> February 2008  
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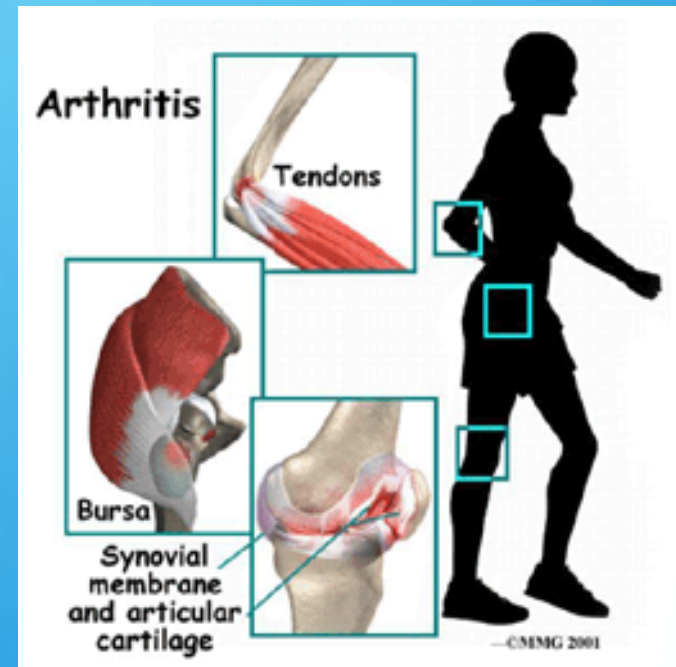
# I Arthritides

- ❖ RA
  - ❖ Still's disease juvenile RA
  - ❖ Diagnosis Rh factor
- ❖ Osteo Arthritis
- ❖ Gout
- ❖ Reactive Arthritis
- ❖ Spontaneous
- ❖ Degeneration of condylar head (condylosis)

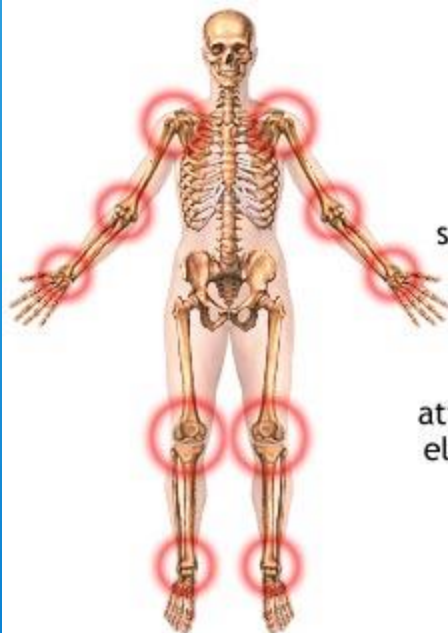
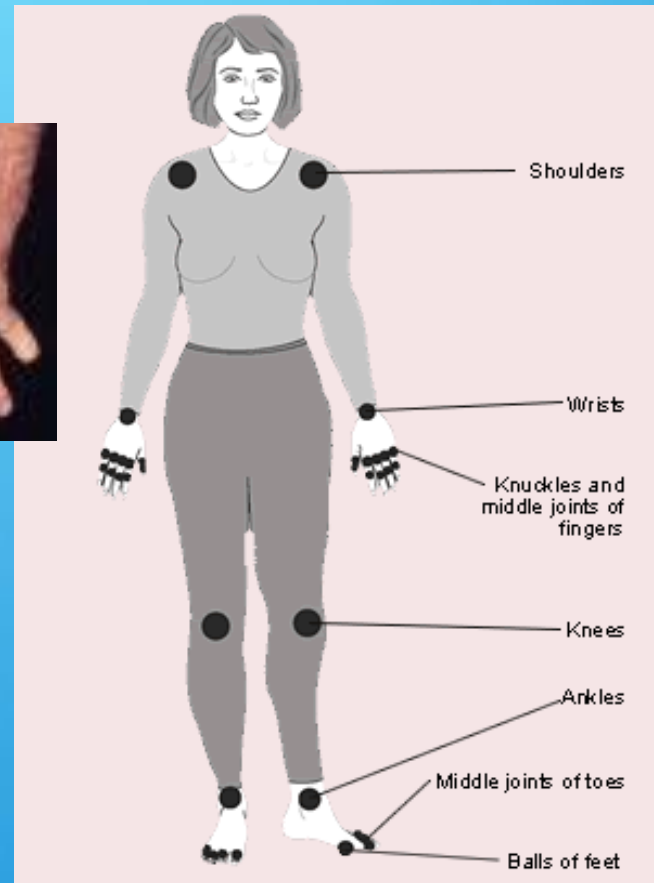


# Osteoarthritis

- ❖ Major joints
- ❖ Older age



# Rheumatoid Arthritis



Rheumatoid arthritis usually affects joints symmetrically (on both sides equally), may initially begin in a couple of joints only, and most frequently attacks the wrists, hands, elbows, shoulders, knees and ankles

Figure 3. Joint frequently affected by rheumatoid arthritis. Less commonly affected are elbows, hips and the neck.

# Investigations helpful in diagnosis of RA

- ❖ **Erythrocyte sedimentation rate (ESR) / C-reactive protein (CRP) / plasma viscosity**
  - ❖ Usually elevated in RA but may be normal
- ❖ **Full blood count (FBC)**
  - ❖ Normochromic, normocytic anaemia and reactive thrombocytosis common in active disease
- ❖ **Urea & electrolytes (U&E), Liver function tests (LFT)**
  - ❖ Mild elevation of alkaline phosphatase and gamma-GT common in active disease
- ❖ **Uric acid/ synovial fluid analysis**
  - ❖ Will assist in excluding polyarticular gout
- ❖ **Urinalysis**
  - ❖ Microscopic haematuria/proteinuria may suggest connective tissue disease
- ❖ **Rheumatoid factor (RF)**
  - ❖ RF positive in only 60–70% RA patients.
- ❖ **Antinuclear antibody (ANA)**
  - ❖ Positive in SLE and related conditions. ANA positive in up to 30% of RF-positive RA patients. May be weakly positive in up to 10% of normal individuals
- ❖ **Radiology**
  - ❖ May be normal or may show periarticular osteopenia and/or erosions

# Differential diagnosis of arthritis

- ❖ Viral arthritis (e.g. parvovirus, rubella)
- ❖ Reactive arthritis (e.g. post-infective: throat, gut, sexually acquired)
- ❖ Seronegative spondyloarthropathy (e.g. psoriatic, ankylosing spondylitis, inflammatory bowel disease)
- ❖ Connective tissue disease (e.g. systemic lupus erythematosus (SLE), scleroderma)
- ❖ Polymyalgia rheumatica
- ❖ Polyarticular gout
- ❖ Fibromyalgia
- ❖ Medical conditions presenting with arthropathy (e.g. sarcoidosis, thyroid disease, infective endocarditis, haemochromatosis, diabetic cheiroarthropathy, paraneoplastic syndromes, multiple myeloma).

# II Muscle pain = myalgia

## ❖ Trismus

- ❖ Limited opening due to muscle spasm

- ❖ Exclude parafunction

  - ❖ Pain am (night bruxist or sleep position)

  - ❖ Pain late day chewing gum

- ❖ Myositis

- ❖ Myofascial pain

- ❖ Myospasm

- ❖ Hyperkinesia

- ❖ Hypokinesia

- ❖ Contracture

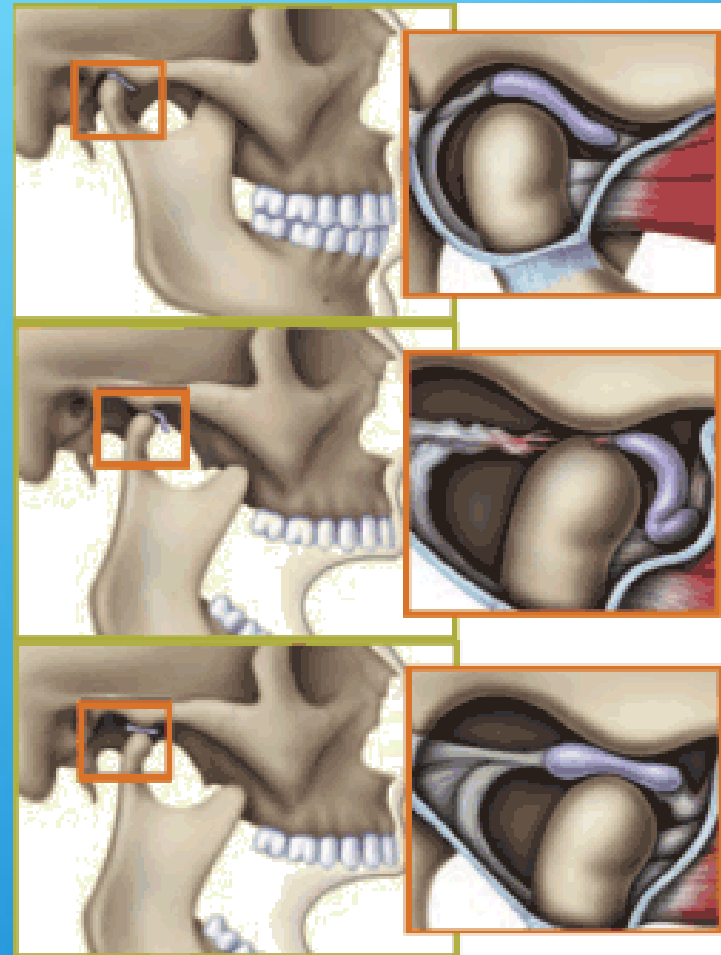
- ❖ Fibromyalgia



# III TMJ dysfunction

## Internal derangement

- ❖ Painful internal derangement
- ❖ Signs
  - ❖ Clicking
  - ❖ locking
- ❖ Mx includes
- ❖ Non interventional
- ❖ Interventional
  - ❖ Arthroscopy
  - ❖ Surgical disc plication



# Other joint problems

- ❖ Congenital and developmental disorders
- ❖ Subluxation
- ❖ Dislocation
- ❖ Locking
- ❖ Traumatic injuries
- ❖ Ankylosis
- ❖ Neoplasia

# Trismus

- ❖ Progressive worsening
  - ❖ Consider neoplasia
    - ❖ Infratemporal fossa Ca (1:60,000 Ferguson 1986)
  - ❖ Arthritides
  - ❖ Condylolysis
- ❖ Intermittent with normal resolution
  - ❖ TMJ PDS
- ❖ Permanent
  - ❖ Ankylosis ( true =bony /false=soft tissue)
  - ❖ Most common in third world due to middle ear infection /mastoiditis

❖ Beware progressive trismus often  
painless

# Neoplasia

- ❖ Serious pathology of the Temporomandibular complex and associated musculature is rare.
- ❖ Primary tumours in the Temporomandibular complex are thought to account for less than 1% of all head and neck tumours and incidental findings on MRI for TMDs occur in less than 1% of TMDs.
- ❖ Metastases to the Temporomandibular joint can occur from multiple sites but the most likely are breast, lung, thyroid, kidney and prostate.

# Red Flags

- ❖ These 'red flag' signs and symptoms should mandate an urgent referral and they include:
  - ❖ New signs and symptoms of TMDs presenting for the first time in the advanced age group (> 60 years old)
  - ❖ Ipsilateral lymphadenopathy
  - ❖ Previous history of malignancy elsewhere in the body and new onset TMDs
  - ❖ Cranial nerve dysfunction in relation to the complaint especially in the fifth and seventh cranial nerves
  - ❖ Progressive trismus precluding careful oral examination
  - ❖ Recurrent ipsilateral epistaxis
  - ❖ Anosmia
  - ❖ Persistent nasal obstruction or purulent discharge
  - ❖ Objective ipsilateral hearing loss.

Lets not patients  
presenting with TMD

end up like this!





The primary goals of any reversible and ion-invasive therapy should be:

Encouraging self-management of the condition through education

Reducing the (impact of) pain associated with the condition

Decreasing functional limitation caused by the condition  
Reducing exacerbations and educating individuals in how to manage any exacerbation of the condition

# TMD Mx

- ❖ Reassurance NO CANCER!
- ❖ Patient information
- ❖ BRA
- ❖ Cognitive behaviour therapy
- ❖ Antidepressants
  - ❖ Tricyclics – nortriptyline
  - ❖ SSRI – fluoxetine



# TMD Cochrane reviews

- ❖ Koh H, Robinson PG **Occlusal adjustment for treating and preventing temporomandibular joint disorders.** J Evid Based Dent Pract. 2006.
- ❖ Al-Ani MZ **Stabilisation splint therapy for temporomandibular pain dysfunction syndrome.** Evid Based Dent. 2004;5(3):65-6.
- ❖ Koh H, Robinson PG **Occlusal adjustment for treating and preventing temporomandibular joint disorders.** J Oral Rehabil. 2004 Apr;31(4):287-92
- ❖ Bessa-Nogueira RV, Vasconcelos BC, Niederman R **The methodological quality of systematic reviews comparing temporomandibular joint disorder surgical and non-surgical treatment.** BMC Oral Health. 2008 Sep 26;8:27



NO EVIDENCE !

# More lack of evidence

▶ Karppinen K et al., **Adjustment of dental occlusion in treatment of chronic cervicobrachial pain and headache.** J Oral Rehabil.1999 Sep;26(9):715-21.

▶ **Risk management in clinical practice.** Part 8. Temporomandibular disorders.Gray R, Al-Ani Z.BDJ

▶ **NICE on headaches** Dental occlusion problems are a major cause of headache. *BMJ* 2012; 345 doi:

▶ Badel T, Marotti M, Pavicin IS, Basić-Kes V. **Temporomandibular disorders and occlusion.** Acta Clin Croat. 2012 Sep;51(3):419-24.

▶ Lobbezoo F, Ahlberg J, Manfredini D, Winocur E. **Are bruxism and the bite causally related?** J Oral Rehabil. 2012 Jul;39(7):489-501. doi: 10.1111/j.1365-2842.2012.02298.x. Epub 2012 Apr 10.

# And more.....

Cooper BC; International College of Cranio-Mandibular Orthopedics (ICCMO). **Temporomandibular disorders: A position paper of the International College of Cranio-Mandibular Orthopedics (ICCMO)**. Cranio. 2011 Jul;29(3):237-44.

Michelotti A **Evaluation of the short-term effectiveness of education versus an occlusal splint for the treatment of myofascial pain of the jaw muscles**. J Am Dent Assoc. 2012 Jan;143(1):47-53

Bales JM, Epstein JB. **The role of malocclusion and orthodontics in temporomandibular disorders**. J Can Dent Assoc. 1994 Oct;60(10):899-905.

Gebeile-Chauty S et al., **Can orthodontic treatment generate temporomandibular disorders and pain? A review**]. Orthod Fr. 2010 Mar;81(1):85-93. doi: 10.1051/orthodfr/2010009. Epub 2010 Apr 1.

Manfredini D et al., **Dental occlusion, body posture and temporomandibular disorders: where we are now and where we are heading for**. J Oral Rehabil. 2012 Jun;39(6):463-71

# Reasons to refer TMD

Dentists may wish to refer such patients with:

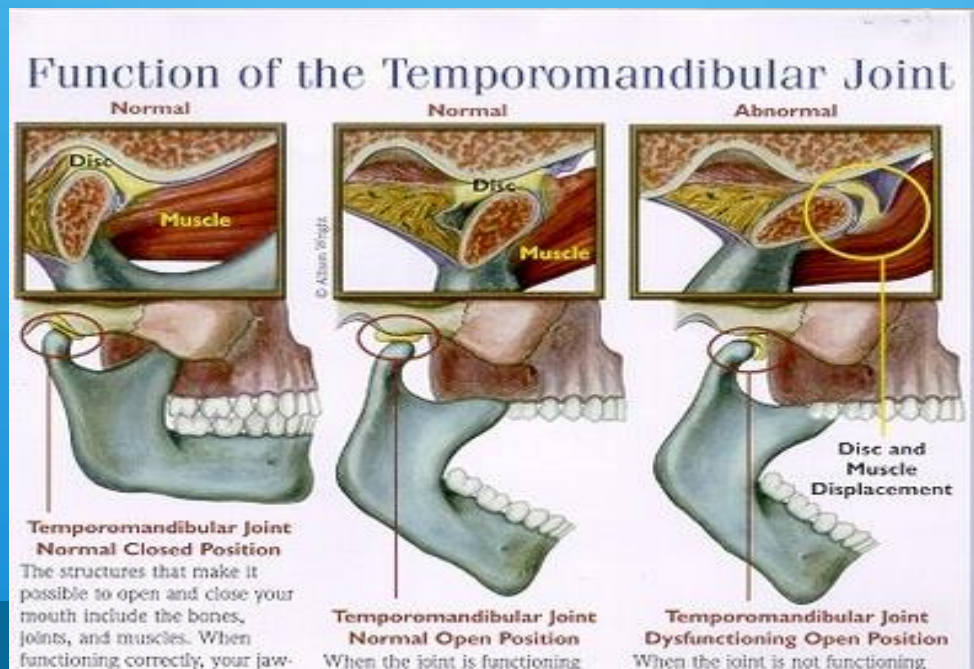
Multiple unsuccessful treatments

Psychological distress

**Occlusal preoccupation ? form of dismorphobia!**

Chronic widespread pain

Disc displacement without reduction (open or closed lock).



Nature of material	Source	Website addresses
<b>Patient information</b>	National Institute for Health	<a href="http://www.nidcr.nih.gov/oralhealth/topics/tmj/tmjdisorders.htm">http://www.nidcr.nih.gov/oralhealth/topics/tmj/tmjdisorders.htm</a>
	American Academy of Orofacial Pain	<a href="http://www.aaop.org/content.aspx?page_id=22&amp;club_id=508439&amp;module_id=108085">http://www.aaop.org/content.aspx?page_id=22&amp;club_id=508439&amp;module_id=108085</a>
	European Academy of Craniomandibular Disorders	<a href="http://www.eacmd.org/patient.php">http://www.eacmd.org/patient.php</a>
	NHS Knowledge summary on TMDs	<a href="http://www.cks.nhs.uk/tmj_disorders/management/scenario_tmj_disorders">http://www.cks.nhs.uk/tmj_disorders/management/scenario_tmj_disorders</a>
	Newcastle University/Newcastle Dental Hospital Patient information sheet and exercises	<a href="http://www.ncl.ac.uk/dental/AppliedOcclusion/assets/TMD%20info%20and%20exercise%20sheet.pdf">http://www.ncl.ac.uk/dental/AppliedOcclusion/assets/TMD%20info%20and%20exercise%20sheet.pdf</a>
<b>Examination of TMJ and muscles of mastication</b>	Research Diagnostic Criteria for TMD consortium network	<a href="http://www.rdc-tmdinternational.org/OtherResources/TrainingReliability/RDCExaminerTraining.aspx">http://www.rdc-tmdinternational.org/OtherResources/TrainingReliability/RDCExaminerTraining.aspx</a>
	E-learning for healthcare	<a href="http://portal.e-lfh.org.uk/">http://portal.e-lfh.org.uk/</a>  Requires registration and working within the NHS. "The three minute examination By S.Davies and Z. Al-Ani
	Newcastle University	<a href="http://www.ncl.ac.uk/dental/AppliedOcclusion/">http://www.ncl.ac.uk/dental/AppliedOcclusion/</a>



# ASSESSMENT OF PAIN



# Pain assessment

Diagnosis of pain

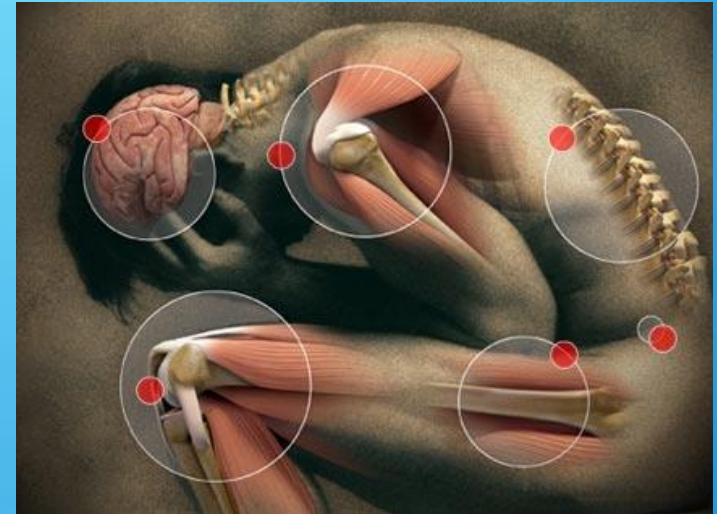
Pain History

Pain thresholds

Subjective measurement of pain

Indirect measurement of pain

Objective assessment of pain



# Good history taking

- ❖ Social history
- ❖ Medical history
- ❖ Pain history

**LISTEN!**

# Ask the patient!

- ❖ Pain profiling
- ❖ Functional profiling (impact on their life)
- ❖ Neurological profiling
- ❖ Psychometric profiling
- ❖ Clinical examination
- ❖ Investigations

# Pain's multiple components

- ❖ nociception / sensation / suffering / behavior

## Disability

- ❖ lack of mobility, inability to work, difficulty in interpersonal relationships

## Multiple components of pain assessment

- ❖ physical location of pain, description tools
- ❖ functional tools: sickness/impact profile, pain disability index
- ❖ behavioral/cognitive drug use, physician visits
- ❖ economic
- ❖ Socio-cultural, litigation, patient independence, quality of life, family dynamics, patient goals.

# Pain history

- ❖ Site
- ❖ Duration
- ❖ Frequency
  - ❖ Constant (burning throbbing)
  - ❖ Spontaneous / evoked (cause / relief)
- ❖ Character
  - ❖ Type
    - ❖ burning, stabbing
  - ❖ Intensity
- ❖ Persistent / intermittent
- ❖ Localisation
- ❖ Radiation
- ❖ Associated signs -redness swelling

## Pain Descriptors

### Steady Pain (97%)

- Burning
- Aching
- Stinging
- Throbbing
- Itching
- Numbing
- Pins & Needles
- Pulling

### Brief Pain (87%)

- Sharp
- Jabbing
- Shooting
- Electric

### Evoked Pain (87%)

- Mechanical
- Thermal

Watson and Babul. Neurology 1998;50:1837-41

Blau<sup>44</sup> suggested fifteen questions to facilitate the history taking process in OFP which cover the following aspects of the presenting

pain: Onset

Frequency

Duration

Provoking factors

Site of initiation of pain

Radiation and referral of pain

Is the pain deep or superficial

Aggravating or exacerbating factors

Relieving factors

Characteristics of the pain

Severity

Other associated features, for example lacrimation or other autonomic signs and symptoms

Previous management strategies attempted

Patient's perceived cause(s) of pain

# Visual Analogue Scales

Anchors:

no pain

max pain

[eideneurolearningblog.blogspot.com/2005\\_02\\_25...](http://eideneurolearningblog.blogspot.com/2005_02_25...)  
[:www.mindhacks.com/blog/linkage/index.html](http://www.mindhacks.com/blog/linkage/index.html)

---

10 cm line

# Assessment- Measurement Tools

- ❖ Pain history

- ❖ Examination

- ❖ Psychometric

- ❖ Subjective pain scores

- ❖ VAS, pain descriptors

- ❖ Affective

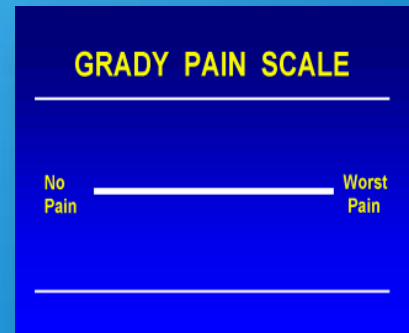
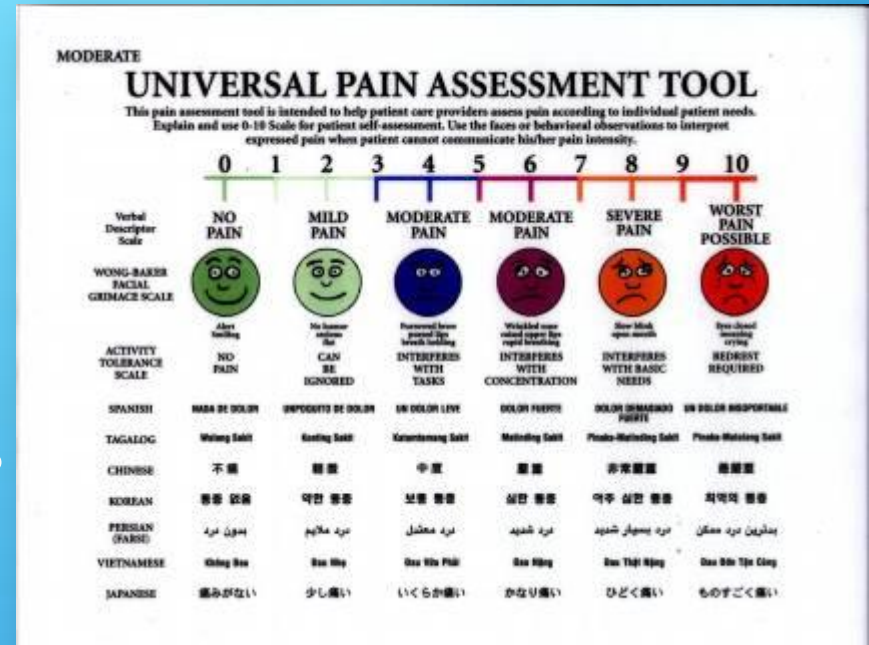
- ❖ Anxiety depression FUNCTIONALITY- disability

- ❖ Psychophysical

- ❖ Neurophysical tests - neuropathic area

- ❖ Cold warm / Mechanosensory / Vibration

- ❖ Special sensory =Taste



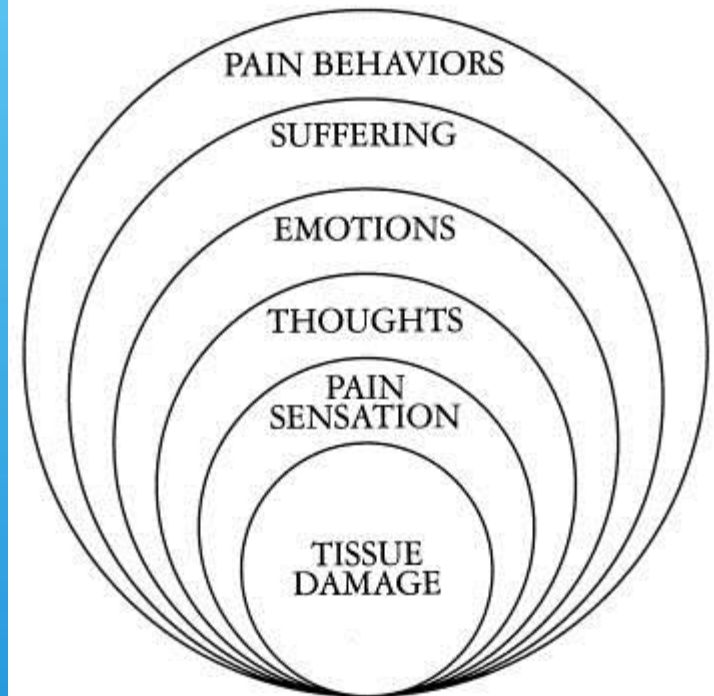


# Psychometrics

- Measure
  - ❖ Affective
    - ❖ Anxiety
    - ❖ Depression
    - ❖ Beliefs
    - ❖ Fear
    - ❖ Anger
    - ❖ Coping



OUTSIDE ENVIRONMENT



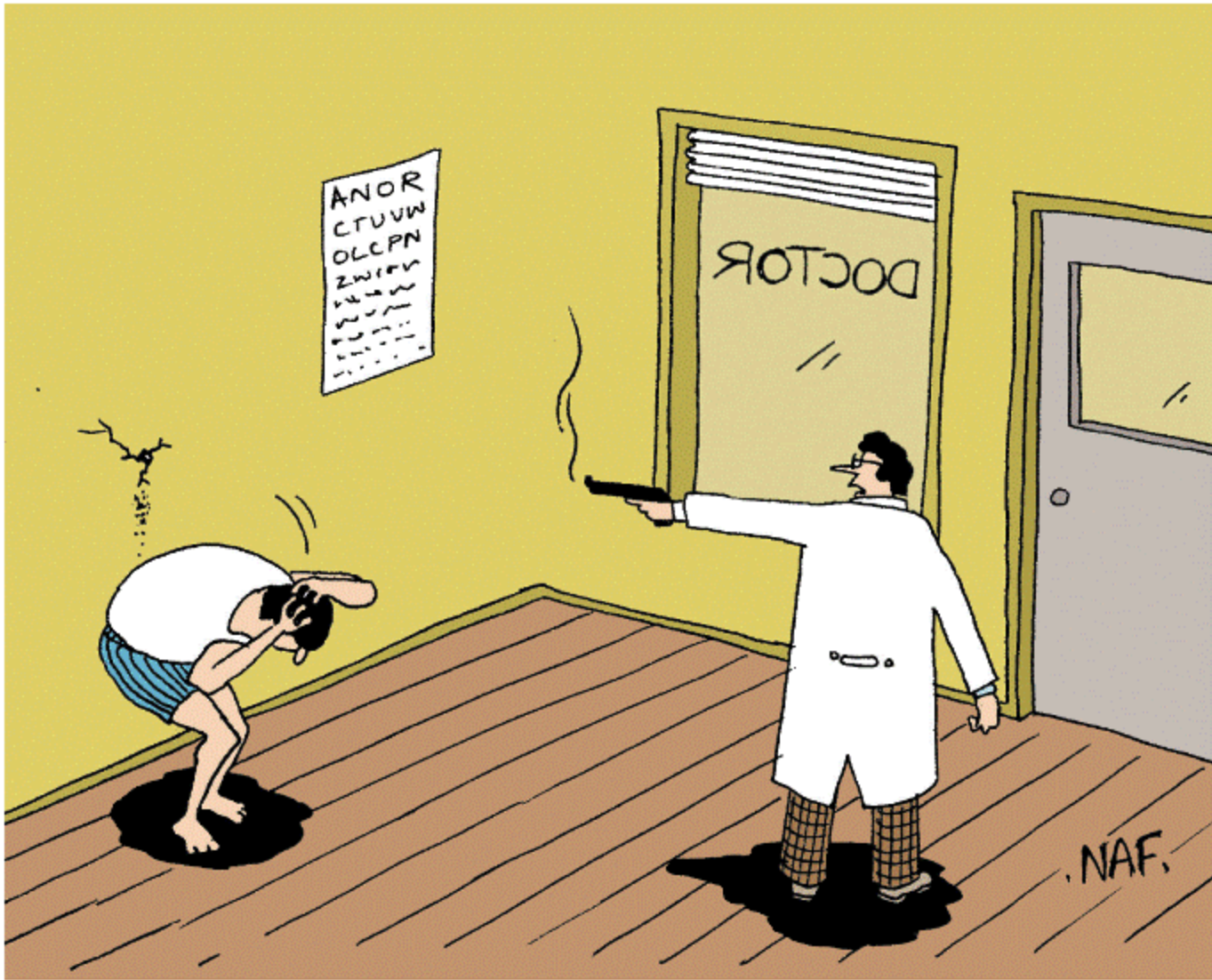
# We use.....

- ❖ PSEQ Patient self efficacy Q
- ❖ PCS Patient catastrophising scale
- ❖ HADs Hospital anxiety depression
- ❖ CPAQ Chronic pain acceptance Q
- ❖ Euroquol Quality of health
- ❖ OHIP Oral health impact Q
- ❖ PCL The Posttraumatic Stress Disorder Checklist

# Clinical examination

Diagnostic process refines:

1. Inspection of the head and neck, skin, topographic anatomy, and swelling or other orofacial asymmetry
2. Palpation of the temporomandibular joint and masticatory muscles, tests for strength and provocation. With assessment and measurement of the range of mandibular movement
4. Palpation of soft tissue (including lymph nodes)
6. Palpation of cervical muscles and assessment of cervical range of motion
7. **Cranial nerve examination**
8. General inspection of the ears, nose, and oropharyngeal areas
9. Examination and palpation of intraoral soft tissue
10. Examination of the teeth and periodontium (including occlusion)



“Your reflexes seem fine Mr Hart”

## Systemic Diseases Associated with Headache and Orofacial Pain

- **Paget's disease**
- **Metastatic disease**
- **Hyperthyroidism**
- **Multiple myeloma**
- **Hyperparathyroidism**
- **Vitamin B deficiencies**
- **Systemic lupus erythematosus**
- **Vincristine and other chemotherapy for cancer**
- **Folic acid and iron deficiency anaemias**

# Exclude systemic and local pathology

## Bloods

FBC, haematinic (folate, B12, ferritin)

Thyroid function tests

HBA1c

Zinc levels

ENAs and ANAs

Us+Es required for contrast

Gadolinium MRI scan

# Exclude central pathology

## Classical TN

- vascular compression

## Multiple sclerosis

- MRI plaques

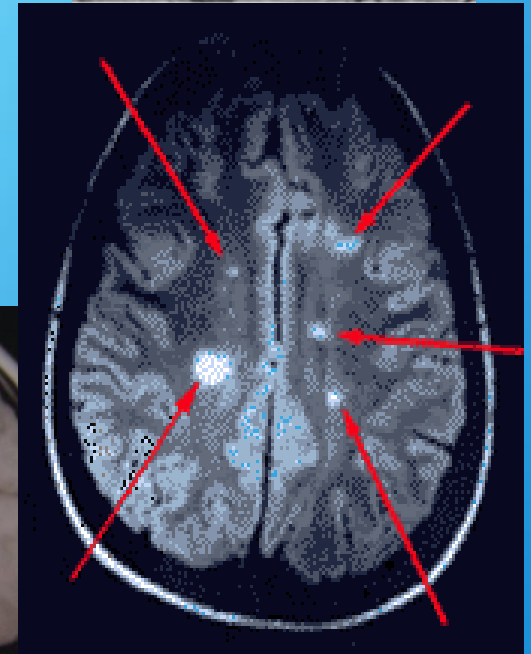
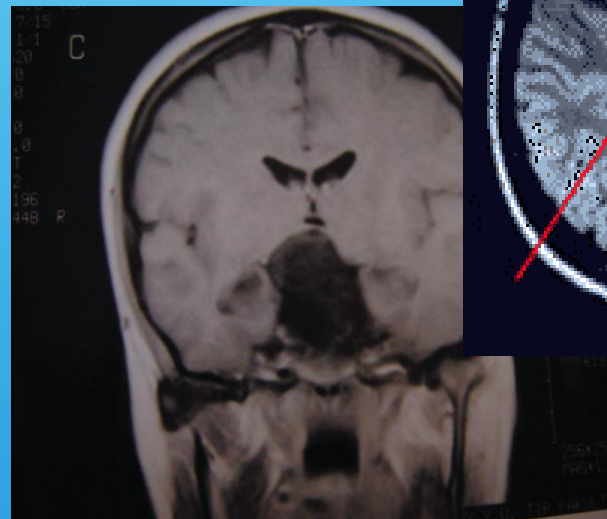
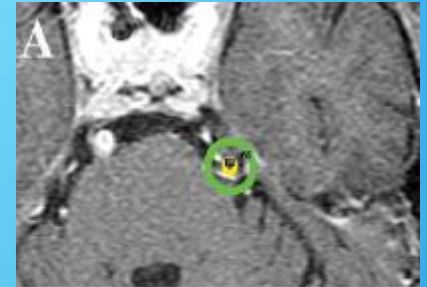
## Stroke

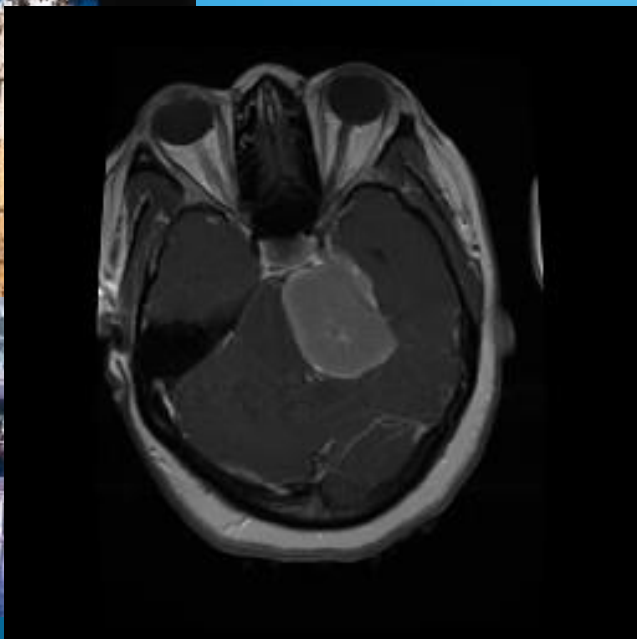
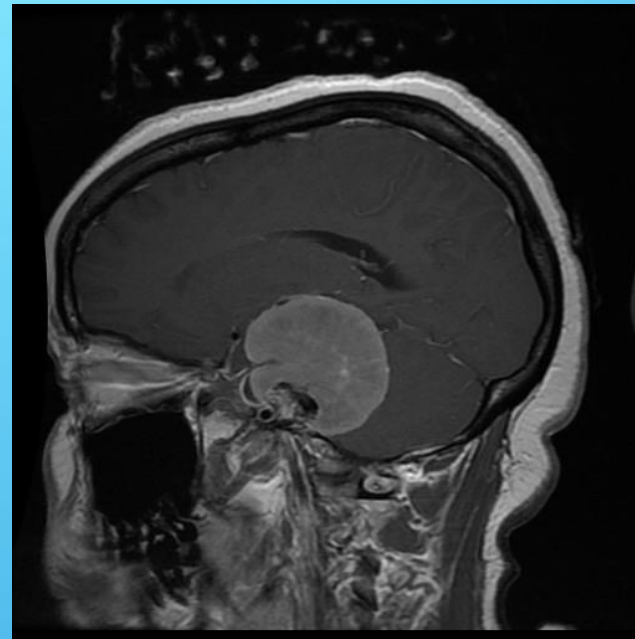
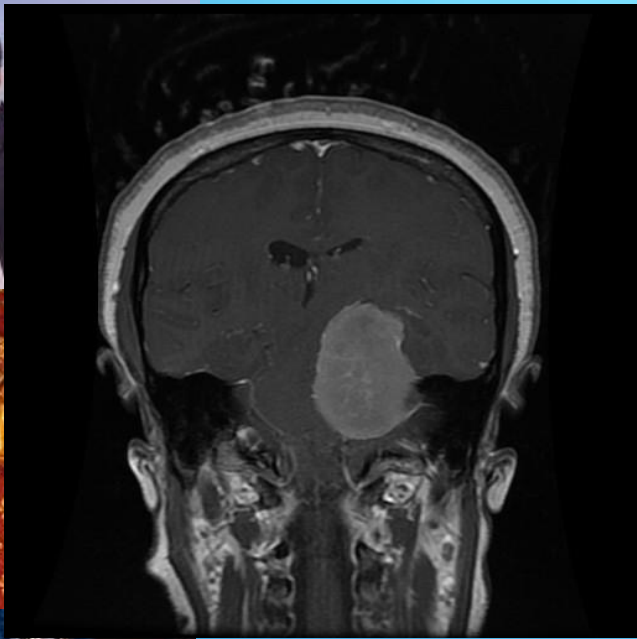
## Vasculitis

## Post herpetic neuralgia

## Tumours

- Meningioma



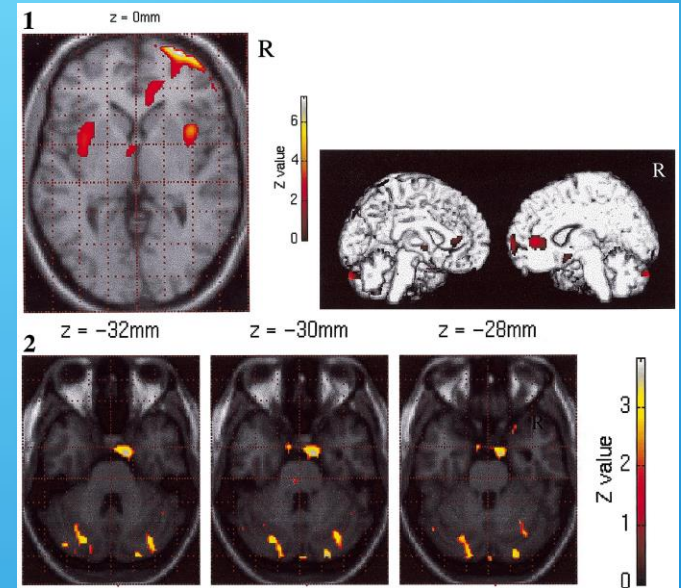


- ❖ 46 year old lady presented with left facial pain and entirely normal neurological examination. WHO grade I meningioma.



# PET limitations

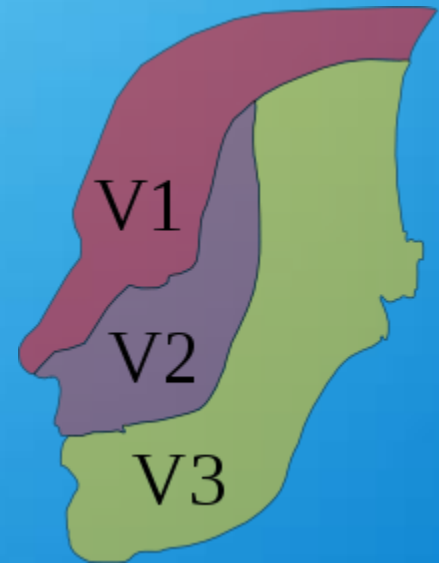
- ❖ Non-invasive, but involves exposure to ionizing radiation-ethical for research?
- ❖ Lack of specificity
  - ❖ poor functional anatomy clarity for pain modelling
  - ❖ Inflammatory conditions
- ❖ Radioactivity decays rapidly so limited to monitoring short tasks



(Borsook et al 2000)

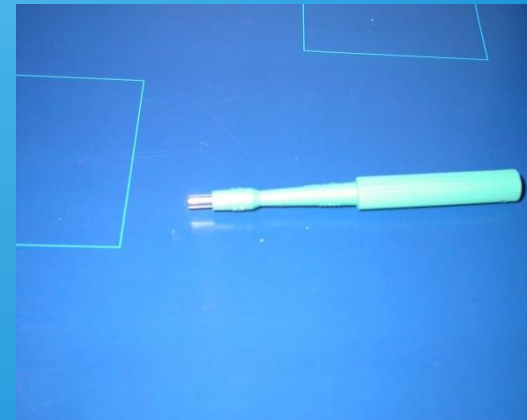
# Aims of neurological assessment

- ❖ Confirm neuropathy V and other cranial n
- ❖ Define pain affected dermatome(s)
- ❖ Hyperaesthesia
- ❖ Hypoaesthesia
- ❖ Allodynia
- ❖ Hyperalgesia
- ❖ Specific fibre function (QST)



# Assessment - neuropathy

- VAS
  - At rest
  - Dynamic allodynia
  - Cold allodynia
  - capsaicin
- Mechanosensory
  - Von Frey
  - Neuropathic area
- Local analgesia
- Thermo sensory
- Biopsy

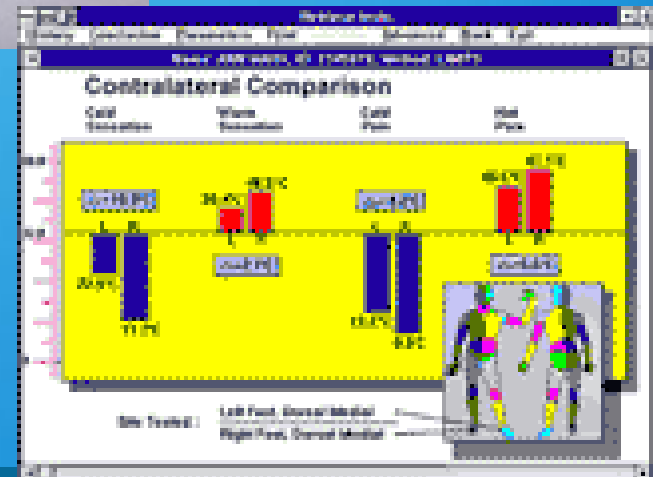


# Quantitative sensory testing QST

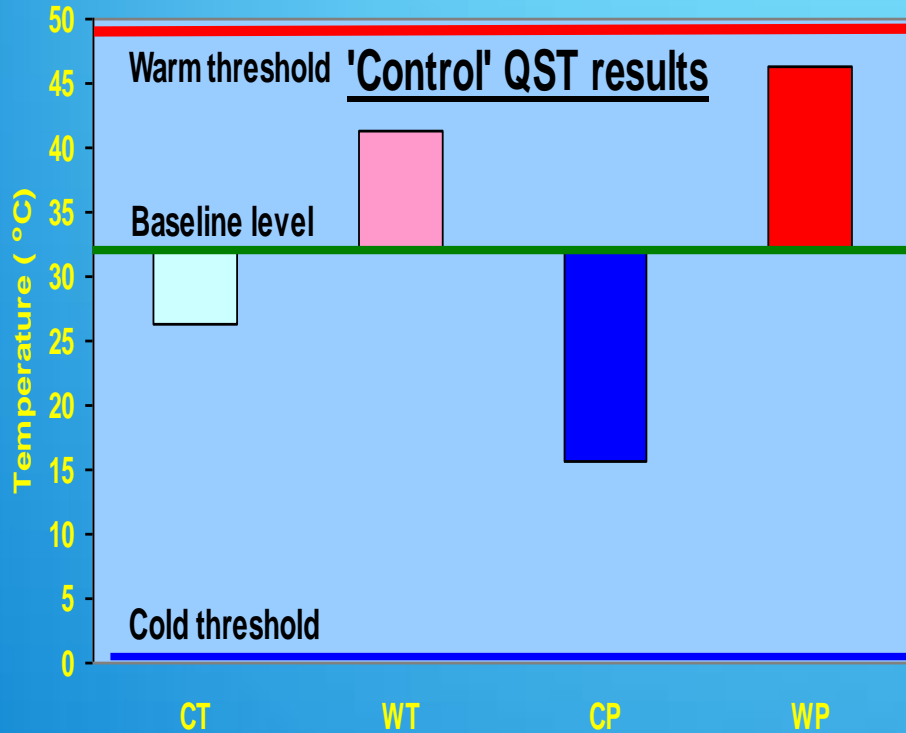
Clinical sign	Fiber class	Clinical test	Technique QST
Mech Hypo	A beta	Cotton wool	Graded von frey
Cold /warm hypo	A delta C	Thermo roller	Disc device QST
Mech hypoalgesia	A delta	Tooth pick finger	Weighted pinprick blunt pressure/algometer
Cold heat hypoalgesia	A delta C		Thermal device laser
Mechanical hyperalgesia	A delta C	Tooth pick finger	Weighted pinprick blunt pressure/algometer
Dynamic mech allodynia Cold heat hyperalgesia	A beta  A delta C	Cotton wool tip Soft brush  Isoprenalol	Cotton wool Soft brush Thermal test device

# Psycho physical testing

## Quantitative thermo sensory testing

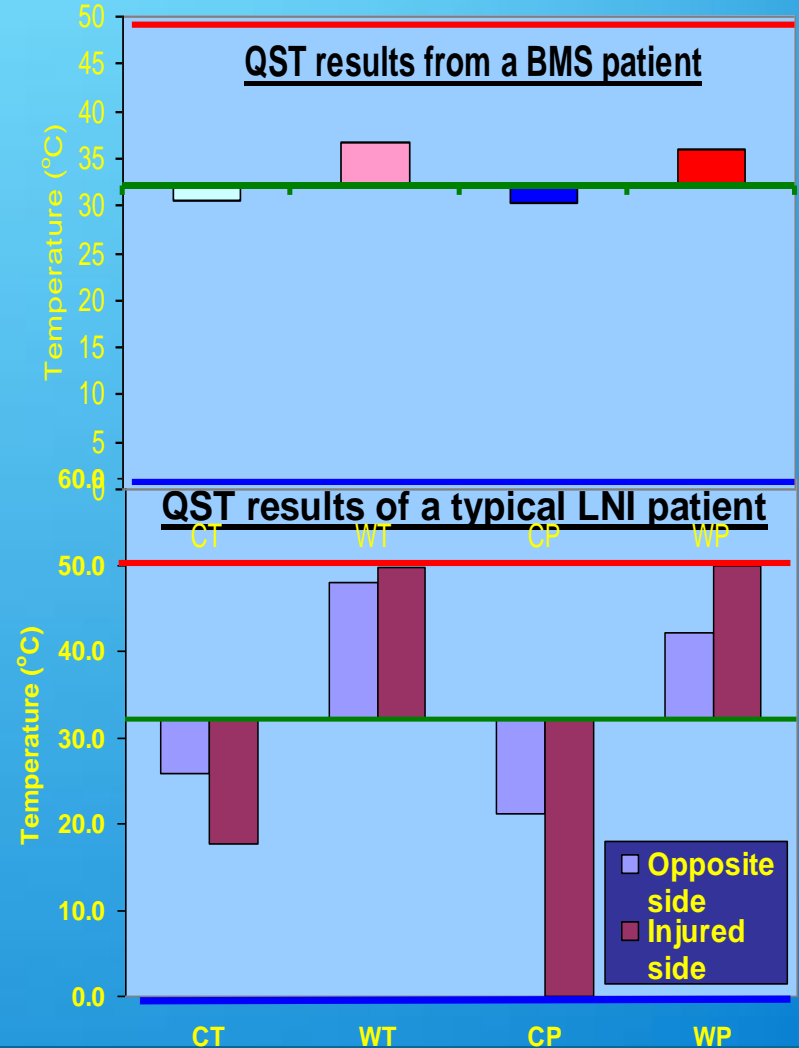


# Sample thermal sensory results



## Codes:

CT = Cool Threshold      CP = Cold pain  
 WT = Warm Threshold    WP = Warm pain



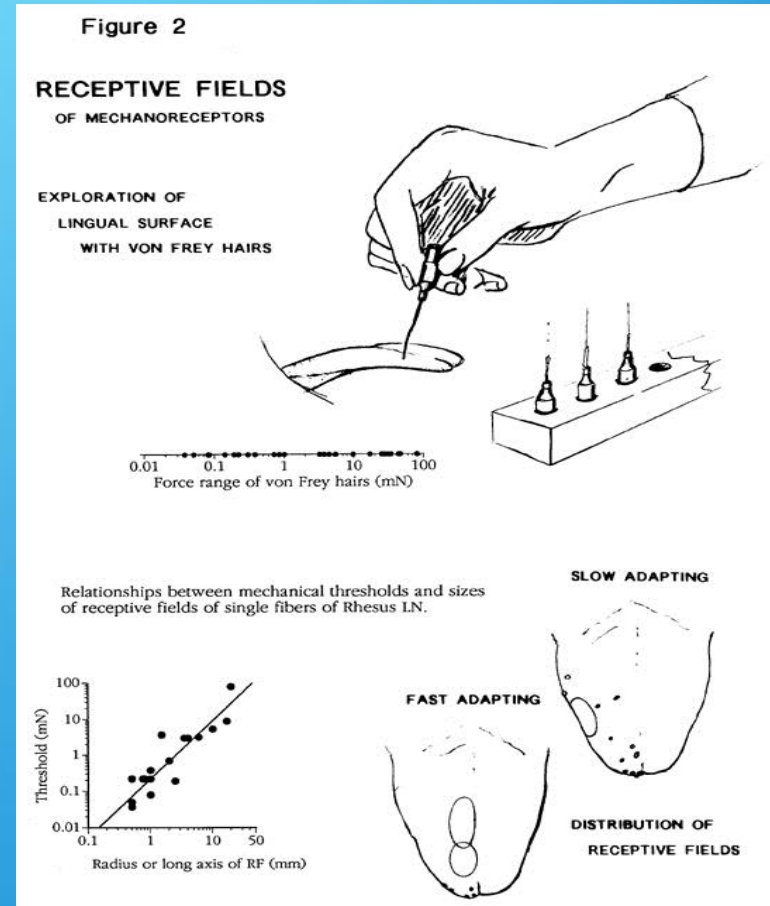
# What are the problems?

With current assessment of trigeminal function

Solely mechanosensory  
(large fibres only)

Taste tests unreliable

Pain and altered  
sensation often over  
looked



# ❖ QST may directly link suitable management

❖ Mechanical allodynia, hyperalgesia

❖ Thermal

❖ Blink reflex

❖ JOR

Value of **quantitative sensory testing** in neurological and **pain** disorders: NEUPSIG consensus.

Backonja M, Attal N, Baron R, Bouhassira D, Drangholt M, Dyck PJ, Edwards RR, Freeman R, Gracely D, Haanpaa MH, Hansson P, Hatem SM, Krumova EK, Jensen TS, Maier C, Mick G, Rice AS, Rolke R, Serra J, Toelle TR, Treede RD, Tugnoli V, Walk D, Wallace M, Ware M, Yarnitsky D, Ziegler D.

**Pain.** 2013 Jun 3. doi:pii: S0304-3959(13)00289-3. 10.1016/j.



# Summary

- ❖ Management chronic OFP
  - ❖ Psychological
  - ❖ Medical
  - ❖ Interventional

## **KCH OFP**

Lead TR

Liaison Psychiatrist Annabel Price

Clinical Psychologist Dr Sarah Barker

Health Psychologist Jared Smith

## **MDT St Thomas InPUT**

TR lead OFP clinician

Pain management Tom Smith

Neurologist SamChong, Georgio

Lambru

Neurosurgery Sinan Barazi

# Neurosurgical interventions

- ❖ Microvascular decompression (MVD) for TN remains EB more effective than thermo-controlled radiofrequency trigeminal rhizotomy

However.....

- ❖ Percutaneous interventions for:
  - ❖ trigeminal neuralgia (pterygoplatine blockade, gasserian ganglion glycerol injection)
  - ❖ cryotherapy
    - ❖ facet joint syndromes,

- ❖ Most ablative pain surgery procedures

- ❖ Neurotomy
- ❖ Rhizotomy
- ❖ sympathectomy, etc.)

These procedures have been replaced by **neuromodulatory approaches** such as electrical stimulation of the central nervous system (CNS)

# Interventional

- ❖ Neural blockade (diagnostic or therapeutic)
  - ❖ Epidural injections PHN
  - ❖ Steroid injections Radiculopathy
    - ❖ Sympathetic blocks
    - ❖ GONB cluster headache
    - ❖ Botox Migraines
- ❖ Superficial simulation – Neurostim/ TENS
- ❖ Spinal cord stimulation SCS
  - ❖ failed back surgery
  - ❖ CRPS
- ❖ Intrathecal medication

Value of quantitative sensory testing in neurological and pain disorders: NEUPSIG consensus. Backonja M, Attal N, **Baron** R, Bouhassira D, Drangholt M, Dyck PJ, Edwards RR, Freeman R, Gracely D, Haanpaa MH, Hansson P, Hatem SM, Krumova EK, Jensen TS, **Maier** C, Mick G, Rice AS, Rolke R, Serra J, Toelle TR, Treede RD, Tugnoli V, Walk D, Wallace M, Ware M, Yarimitsky D, [www.kcl.ac.uk](http://www.kcl.ac.uk)

Good evidence supports the use of **neurostimulation** for reducing pain associated with failed back surgery syndrome (FBSS) and CRPS I, CRPS II, peripheral nerve injury, DPN, PHN, brachial plexus lesion, amputation (stump and phantom pains), and partial spinal cord injury

**Motor cortex stimulation** may be useful for central post-stroke pain and neuropathic facial pain. Additionally, practice parameters issued in the United States support the use of spinal cord stimulation techniques for treating neuropathic pain in patients who have failed other forms of therapy [25].

A study published in January 2010 considered the use of spinal cord stimulation for FBSS, using the outcome of workers' compensation. A prospective

A task force assembled by the EFNS reviewed the literature published between 1968 and 2006 on neurostimulation therapy for treating neuropathic pain.

- ❖ All treatments far from satisfactory
- ❖ CBT and ACT most effective in our unit

# TRIGEMINAL NERVE FOUNDATION

## Orofacial pain website

'to provide excellence in education, management and prevention of trigeminal chronic orofacial pain'



**THANK YOU**

