Non-odontogenic pains

Suhail Al-Amad

14 Nov 2019

What is pain?

- Definition:

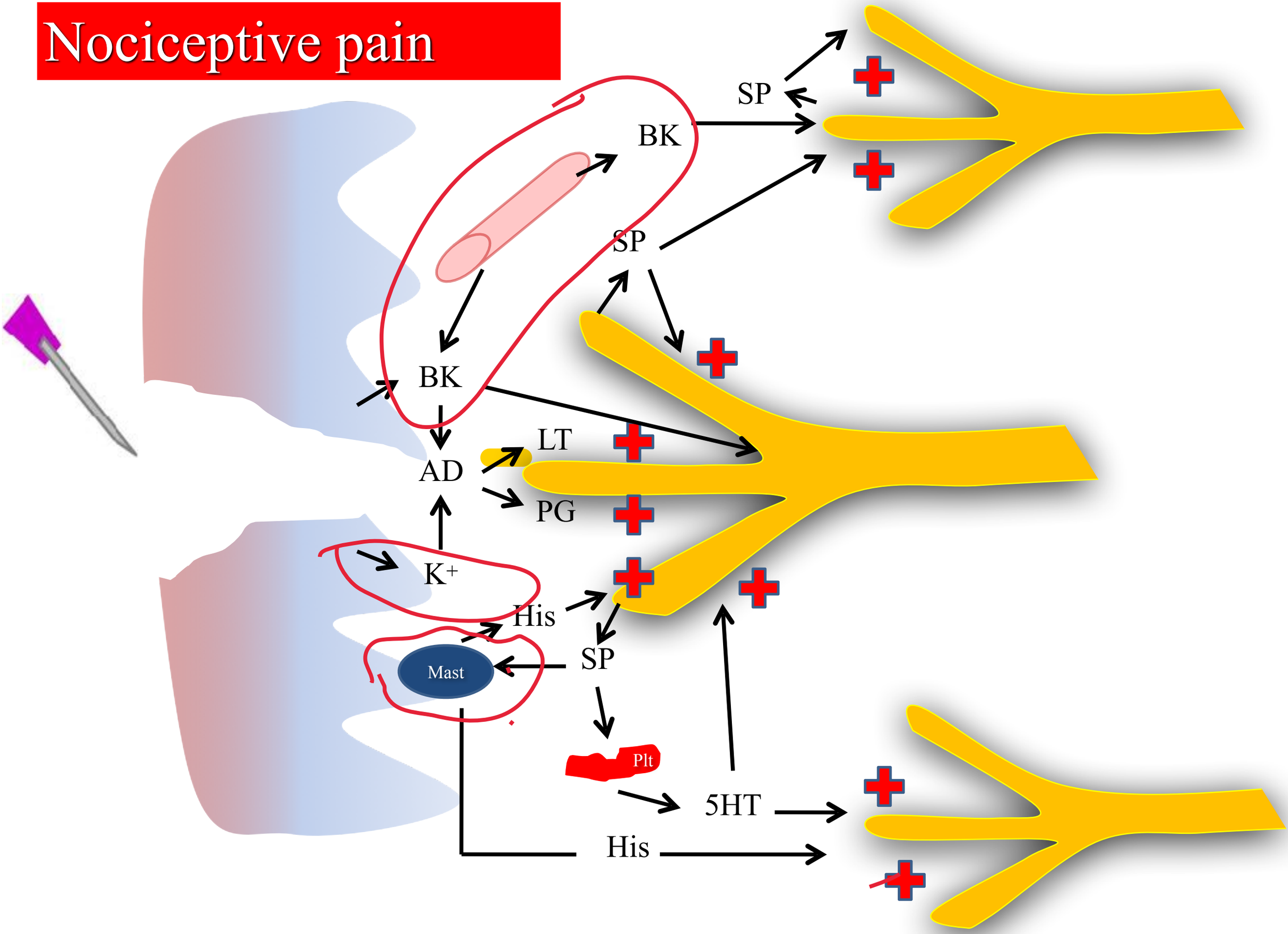
  An unpleasant sensory and emotional experience that is associated with actual or potential tissue damage, or is described in terms of such damage.

- Pain is subjective → its magnitude can't be determined
- Pain can be nociceptive, neuropathic or psychogenic.

Nociceptive pain

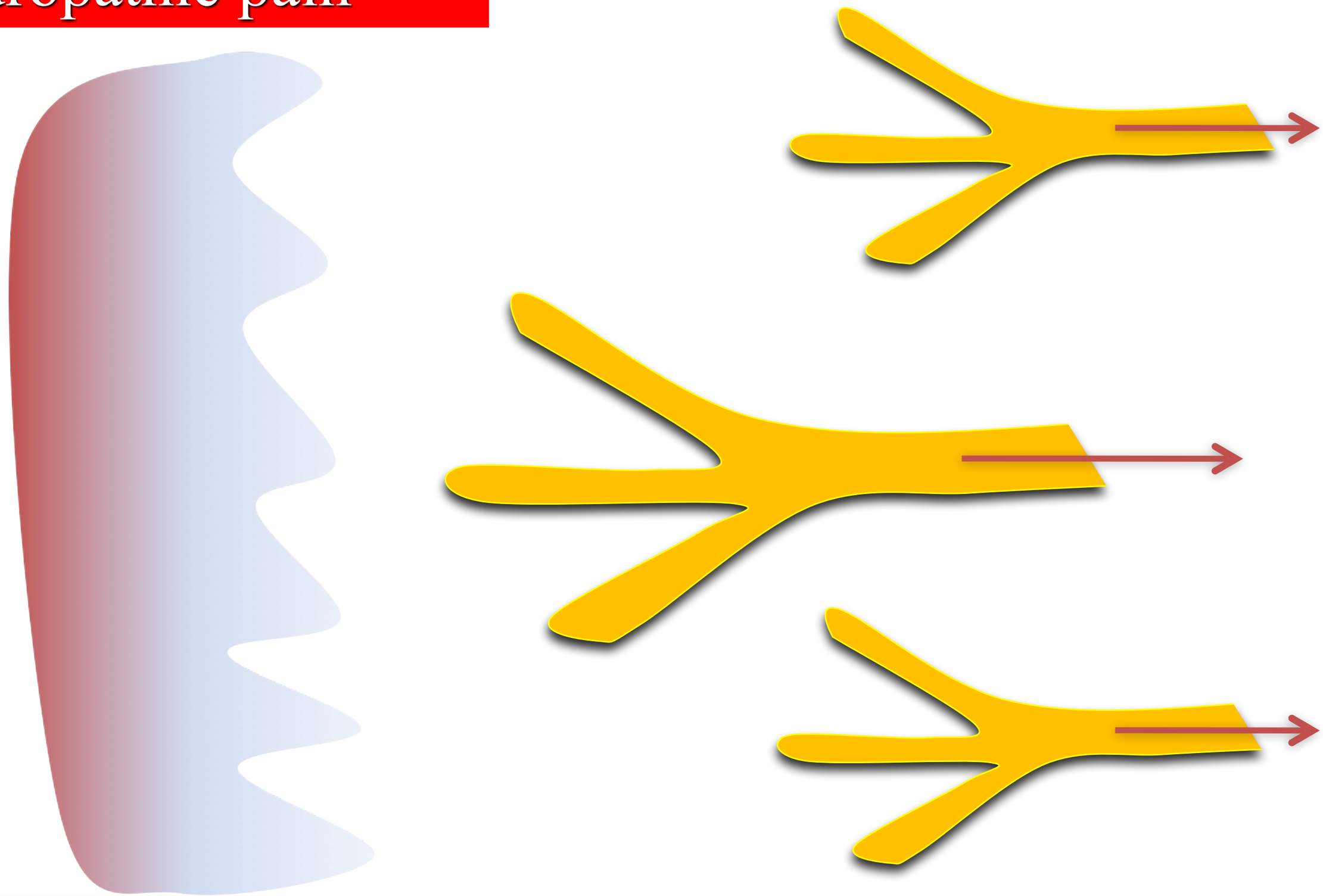
- Physiological activation of nerve endings as a result of tissue injury.
- Injury will cause the release of molecules such as Substance P, Bradykinin, Prostaglandin.
- Following activation → dorsal horn → midbrain → thalamus and hypothalamus → cerebral cortex.
- After transduction and transmission, there is perception → at the cerebral cortex where pain is felt. Then, modulation where person's emotions can modify the perception of pain.

Nociceptive pain



BK: Bradykinin; **AD**: Arachedonic acid; **LT**: leukotrien; **PG**: prostaglandin; **SP**: Substance P; **His**: Histamine; **5-HT**: Serotonine

Neuropathic pain



Actual injury → crushing, stretching, or cutting in the nerve fiber.
Demyelination → metabolic disease (DM), inflammation, idiopathic (MS)

- Pain is conducted mainly by;
  - C-fibers (mainly)
    - unmyelinated nerve fibers, slow conducting.
  - A-delta fibers
    - thinly myelinated nerve fibers, fast conducting.
- Beta fibers conduct touch, and are myelinated and fast... (*hot kettle experience*)

Terminology

- **Nociception**:
  - The mechanism of converting noxious or potentially noxious stimuli into neural impulses and the transmission of such impulses to A-delta and C-fibers then to the CNS.
- **Allodynia**:
  - Pain resulting from a stimulus that does not normally provoke pain, such as touching a sun-burnt skin.
- **Hyperalgesia**:
  - An increased response to stimulus that is normally painful.
- **Dysaesthesia**:
  - An unpleasant and abnormal sensation whether spontaneous or evoked.

Neuropathic pain

- Pain is initiated or caused by a primary lesion or dysfunction in the central or peripheral nervous system.
- This can result from;
  - Actual injury → crushing, stretching, or cutting in the nerve fibre.
  - Demyelination → metabolic disease, inflammation, idiopathic
- Examples:
  - PHN, DM, surgical trauma, amputation, MS, stroke

Pathogenesis

- Mechanisms are not completely understood.
  Some theories include;
  - Generation of ectopic impulses from damaged nerves.
  - Loss of the normal inhibitory processes centrally and peripherally.

Clinical presentation

- Described as a constant burning, episodic shooting or electric pain in a particular region. Patients use terms indicating physical trauma; such as “pins”, “twitching”, “pinching”. Or thermal “heat”, “cold”.
- Pain is spontaneous, and can fit one of those phenomena;
  - hyperalgesia—an increased responsiveness to normally painful stimuli.
  - allodynia—a painful response to normally nonpainful stimuli.

Treatment

- Challenging and hard to completely eradicate pain.
- Patient education and psychological support are important elements in the treatment.
- Usually a 50% reduction in pain is considered successful treatment.
- Pain is usually refractory to NSAIID, but some patients may respond to opioids.
- Most successful treatments relay on antidepressants, mainly tricyclic antidepressants TCAs, alone or in combination with antiepileptic drugs
  - TCAs increase synaptic noradrenaline and serotonin, both are inhibitory NT.
  - Antiepileptic drugs decrease the excitability of neurones at a spinal and brain level. Another possible action is increasing the effectiveness of inhibitory neurotransmitters, such as gamma-aminobutyric acid.

Odontogenic pain

- Pain is dull ache or occasionally sharp.
- Response to stimuli, such as hot, cold or percussion, is predictable and proportionate.
- Pain is usually inconsistent and tends to get better or worse over time.
- Pain often disrupts sleep.
- There is often an identifiable source.
- Local anesthesia of the suspect tooth eliminates the pain.

Non-odontogenic pain

- Pain may be dull, sharp, shooting or burning.
- Response to hot, cold or percussion does not reliably relate to the pain and may be disproportionate.
- Pain is persistent and remains unchanged for weeks or months.
- Pain rarely disrupts sleep.
- There is no obvious source of local pathology.
- Response to local anesthetic is ambiguous.
- Pain may be felt in multiple areas or teeth.
- Repeated dental therapies fail to resolve the pain.

Matwychuk 2004, J Can Dent Assoc

Burning Mouth Syndrome

- Defined as

  "a distinctive disease entity characterized by unremitting oral burning or similar pain in the absence of detectable mucosal changes".

Burning Mouth Syndrome

- Defined as

  "a distinctive disease entity characterized by **unremitting** oral burning **or similar pain** in the **absence** of detectable mucosal changes".

- Prevalence between 0.01% to 1.5%
- Mainly affects the elderly
- Mainly females (ratio ranges from 3:1 to 7:1)

Causes

- Causes were divided into
  - Primary (essential)→ neuropathy.
  - Secondary → there are causes that are manifesting as BMS.
  - Psychogenic → anxiety and depression, poor coping skills with a chronic problem.

Not all "*burning*" is BMS...

- There are local, systemic and psychogenic disorders that can manifest as *burning*.

Causes of secondary BMS

- **Local causes**
  - Xerostomia
  - Candidosis
  - OLP
  - LE
  - Tongue thrusting, denture problems
  - Contact allergy
- **Systemic causes**
  - DM
  - Haematinic def
  - Hypothyroidism
  - Medications (ACE inhibitors)
- **Psychogenic**
  - Anxeity
  - Depression
  - Cancerphobia

Primary (essential) BMS

- Prevalence between 0.01% to 1.5%.
- Mainly affects the middle age and elderly patients.
- Mainly females (ratio ranges from 3:1 to 7:1).
- Most frequently affects the tongue, but can also affect the hard palate and lips.
- Usually bilateral.
- Pain is severe, but sleeping is pain free.
- Pain is usually relieved by eating.

Complex Medical History

Year	Medical condition diagnosed	Management
1973	Large tonsils	Tonsillectomy
1980	Blocked nasal passage due to adenoids	Nasal decongestant
1986	Appendicitis	Surgery
1987	Back disc problem (herniated)	Surgery (unsuccessful)
1988	Back disc problem (herniated)	Repeated surgery (successful)
1989	Cholecystitis	Surgery
1995	Hiatus Hernia	No treatment
2007	Pressure on nerves of the left hand	Surgery
2007	Early arthritis in knee	No treatment
2008	Gastric acidity and regurgitation	Nexium, Antacid
2009	Burning mouth	Diclofenac, Ibuprofen or Paracetamol

Multiple Consultations

Specialist	Procedure	Outcome
Neurosurgeon	Brain MRI + EEG	Normal
Internist	Rx Gabapentin (900mg per day)	no benefit
Orthodontist	Rx mouth guard	no benefit
Dermatologist	Clinical examination	Normal
Dentist	Clinical examination and OPG	Normal
Psychiatrist	Diagnosed OCD, Rx Fluvoxamine maleate and Clonazepam	no benefit
Oral Medicine specialist	Rx mycostatin and α-lipoic acid ALA	no benefit
Neurologist	ANA, CRP, ESR	Normal
Virologist	Ab to CMV, Herpes zoster	Normal

Complex Family and Social History

- **Father** (deceased) → hypertension and diabetes mellitus. The diabetes was poorly controlled and resulted in blindness and gangrene in both legs, then death.
- **Mother** → hypertension and diabetes.
- **Younger son** → Crohn's disease.
- **Older son** → obesity.
- **Husband** → Myocardial infarction (2001) controlled on medications.

Diagnostic approach to a patient with burning mouth

Is the mucosa erythematous?

Yes

Is there any obvious mucosal disease?

Yes

Geographic tongue
Fissured tongue
OLP / LE...etc

No

R/O candida
R/O xerostomia
R/O haematinic deficiency

No

Psych

Consider psychological assessment

No

Is the patient known to have diabetes, or is on medications?

Yes

Check diabetes control
Reconsider medications

No

Check for hypothyroidism
Parafxnal habits
Tongue space

No

Treatment

- Long, difficult and unsatisfactory.
- Patient acceptance was found to be a significant component of successful treatment.
- If secondary → identify the cause and manage it.
- If primary →
  - Simple analgesics
  - Anti-convulsants and anti-depressants.
- Patient's understanding, reattribution and continuous support have shown considerably positive results.