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# Prevention and Optimal Management of Peri-Surgical Pain in Dentistry

**Abstract:** It is every patient's right to expect optimal pain management in relation to routine elective surgery. Dentistry is a profession predicated upon causing and/or managing pain in patients. Poorly managed pain, or severe pain, peri-operatively, is the predominant cause of complaints in NHS dentistry, often leading to legal or GDC scrutiny. Whether the unexpected or persistent pain initiates the patient's suspicions about possible sub-optimal treatment, which then precipitates a complaint, is a possible hypothesis. For now, however, focusing on managing the patient holistically using up-to-date pain management should be a priority for all dental teams. Recent evidence highlights the risks of opiate and opioid dependence and mortality. In addition, the minimal benefit these medications provide for peri-operative pain management compared with other over-the-counter (OTC) analgesics is recognized. Competent patient management, optimal local anaesthetic techniques and intelligent prescription of non-steroidal anti-inflammatories and paracetamol are the mainstay for odontogenic and surgical pain management.

**CPD/Clinical Relevance:** It is imperative that dental teams are familiar with current optimal peri-surgical pain management to optimize the patient's experience and minimize complaint.

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The definition of pain is that it is '*an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage*' (International Association for the Study of Pain, IASP).<sup>1</sup> Please dwell on this definition, it proposes that pain can potentially occur with no physical damage (for example, have any of you been dumped by text?) or at the prospect of impending pain (for example a forthcoming visit to the dentist). Your brain is the 'boss' of pain, as

without a brain you won't feel pain! Your little finger or tooth doesn't feel the pain, it's the brain's somatosensory cortex that overlays the pain experience on the digit or tooth that is in danger, to effect appropriate protective behaviours (including removing your digit from harm or escaping the dental chair!). The brain tells whatever part of your body that's getting hurt to move away from the cause. When this system is disconnected, that is when healthy healed tissue continues to 'feel' pain, which is due to the brain continuing to overlay the pain to the healthy tissues. This is the cause of chronic or pathological (also suspected to be due to central sensitization) pain.

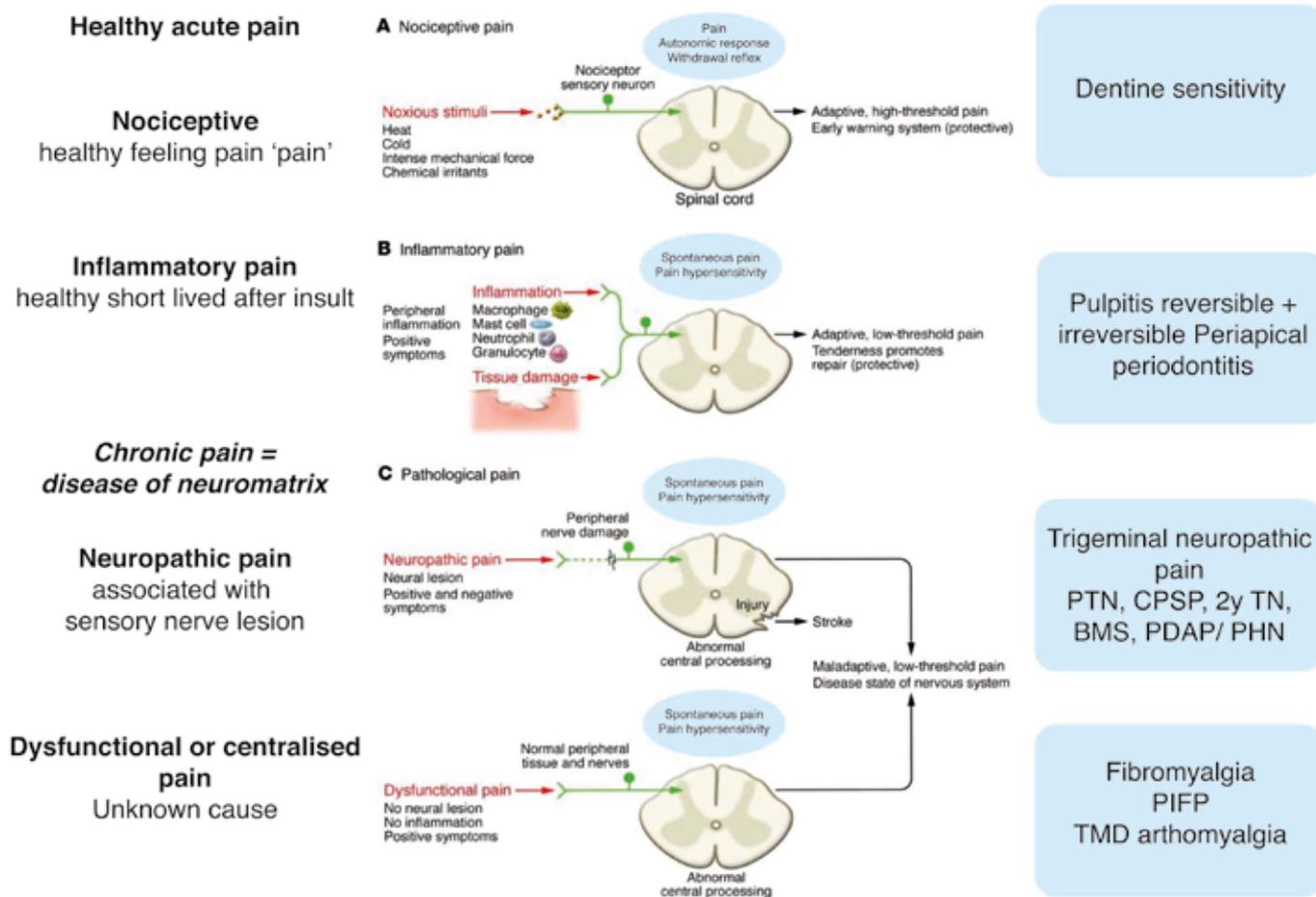
The mechanisms underlying acute and chronic pain are different. Thus pain management needs to reflect these differences. Acute nociceptive and

inflammatory pains are protective and healthy pains. Persistent neuropathic or centralized/dysfunctional pains are a result of disease of the pain neuromatrix due to multiple changes in the functioning of the peripheral and central nervous system, with resultant psychological and behavioural changes. The understanding of pain has progressed significantly over the last 10 years with the identification of these four types of pains (Figure 1).<sup>2</sup>

Acute pain is 'the normal, predicted physiologic response to trauma which can be chemical, thermal, or mechanical stimulus ... associated with surgery, trauma, or acute illness'.<sup>3</sup>

Healthy acute protective pain includes the following. Nociceptive pain is the conversion of tissue injury and release of algogenic factors (intracellular cellular

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**Figure 1.** Different types of pain. (Adapted from Woolf CJ. What is this thing called pain? *J Clin Invest* 2010; **120**: 3742–3744.)

components released due to cell damage) which act as 'foreign bodies', exciting pain receptors on nociceptive nerve fibres (C, A delta and A beta fibres), causing transduction from chemical inflammation into an action potential and transmission, to the progression of an action potential, advancing up to the tertiary order neurones to the somatosensory cortex; once reached the 'ouch' is acknowledged, resulting in reflex withdrawal of the digit from danger. Inflammatory pain follows nociceptive pain if tissue damage persists. The inflammatory response aims to resolve the tissue damage, whilst resulting in tissue tenderness and muscle spasm. This reaction aims to protect the body and prevent further damage by restricting activity (for example walking on a broken leg). This process should usually resolve in days or weeks, depending on the degree of tissue damage and the

persistence of infection.

Although pain in response to tissue damage is a normal phenomenon, it may be associated with significant, unnecessary, physical, psychological and emotional distress.<sup>4,5</sup> If a patient is phenotypically or genetically predisposed, pathological pain may result in continued overlay of pain in the digit or tooth by the brain. This may be neuropathic pain caused by nerve lesions (physical damage or lesional damage by systemic disease) or centralised 'dysfunctional' pain related to multiple pain presentations likely due to central sensitization conditions, such as TMD arthomyalgia, fibromyalgia, migraines, irritable bowel syndrome, interstitial cystitis, vulvodynia and other persistent pain conditions.

The General Dental Council have identified that poor management of pain

or poor pain diagnosis are leading causes of complaints, often escalating to litigation. Kalendarian *et al*<sup>6,7</sup> have demonstrated that poorly managed perioperative pain is the leading adverse event in routine dental care. In Finland, a national overview assessing patient complaints about their dental care also reported that poorly managed pain was the leading adverse event.<sup>8,9</sup> This makes sense; if patients have an unpleasant experience at the dentist, with either unexpected pain or severe pain during a dental procedure, this may set the basis for patients to question the quality of other aspects of their care. Thus, patient expectations must be managed, not just in the short term for post-surgical inflammatory pain, but in the context of chronic neuropathic pain if there is risk of nerve injury.<sup>7,9</sup>

Poor pain management in

surgical settings is known to be associated with slower recovery, greater morbidity, longer lengths of stay, lower patient satisfaction, and higher costs of care, suggesting that optimal pain care in these settings is of utmost importance in promoting acute illness management, recovery and adaptation.<sup>10</sup> The American Veteran Clinical Practice Guidelines have been developed for the management of acute post-operative pain, although the basis for many of the recommendations was by expert consensus rather than empirical evidence. Peri-operative pain is not managed well in dentistry. A population study of 1086 individuals demonstrated that 42.5% reported pain during dental treatment and severe pain was reported by 25% of patients.<sup>2</sup> In another study, of 1422 subjects who completed questionnaires at baseline and five-year follow-up, 96.4% had visited a dentist over the observation period, with 42.5% reporting having pain during treatment and with 19.1% having pain that was moderate to severe in intensity.<sup>11</sup> More alarmingly, 10–15% of patients felt poorly cared for undergoing routine dental care.<sup>12</sup>

Barriers to optimal pain management may come from the healthcare provider in terms of inadequate knowledge regarding pain management.<sup>13</sup> None of the current guidance to 'surgical pain analgesia' applies to dentistry, including the WHO acute pain ladder,<sup>14</sup> NICE neuropathic pain guidelines,<sup>15</sup> or IASP pain recommendations.<sup>16</sup> The current guidance that may apply to dental procedures ONLY mentions medical management for pain.<sup>17,18</sup>

The ageing population also presents challenges in diagnosing and managing trigeminal pain, with more complex medical comorbidity, complex dentition needs due to retained heavily restored dentition and an increased propensity to develop chronic pain conditions and cancer.<sup>19</sup> Chronic orofacial pain is comparable with other chronic pain conditions in the body, and accounts for between 20 and 25% of chronic pain conditions.<sup>20</sup> In the study by Locker and Grushka,<sup>21</sup> some pain or discomfort in the jaws, oral mucosa, or face had been experienced by less than 10% of patients in the previous 4 weeks.

The dental team has five main responsibilities with regards to

pain management in their patients. The correct diagnosis, underpinning successful management, and the treatment of trigeminal pain by dental teams involves several aspects including:

1. Excluding sinister causes of pain (cancer);
2. Managing patients presenting with acute dental pain related to underlying pathology (eg pulpitis, ulcer);
3. Preventing or minimizing peri-operative pain in patients undergoing surgery;
4. Managing patients presenting with chronic orofacial pain conditions;
5. Preventing chronic pain.

## Managing the dental patient undergoing surgery

### Pre-operative

There are two significant challenges often overlooked in dentistry. First, dentists are the *only* surgeons who primarily operate on conscious patients.

The second overlooked challenge is that dentists operate in the most highly innervated region of the body with representation of the sensory cortex of over 50%. The trigeminal nerve is the 'great protector' of the fundamental systems that underpin our very existence (airway, eyesight, brain, smell, taste and hearing). Thus, is it any wonder that the primordial reaction to threatened, perceived or actual pain *in the trigeminal system* causes significant limbic affective and emotional responses, the main one being wanting to 'run for the hills' and NOT sit in the dental chair!

The dental team have therefore to overcome operating on awake patients in the most sensitive region of the body by using complex skills. Most of the success of treatment will be predicated upon the team's ability to communicate, establish patient trust and good clinical skills and very little to do with actual analgesia alone (even though pain-free treatment is the objective but is rarely accomplished).

Local anaesthesia only blocks nociceptive pain and analgesics reduce inflammatory post-surgical pain successfully but, due to pain's multiple components, these alone are not enough to manage peri-operative pain in our patients. Some patients may be stoic types ('rugby player'), more able to cope with the anticipated and actual surgical discomfort, whereas

others may be more susceptible to lack of coping and catastrophizing ('football player patients'), who need a lot more attention and support.

Pain and its management is complex as the individual's pain experience is unique and based upon his/her gender, beliefs, religion, ethnicity, prior pain experience, psychological factors, nocebo and placebo effects, etc.<sup>22</sup> Holistic patient management is fundamental in pain management, with increasing evidence supporting and educating patients in the expected pain levels (managing their expectations), being caring, empathetic, providing appropriate anxiolysis, distraction and, on occasions, providing alternative techniques (hypnosis and acupuncture). The development of communication skills, psychological interventions and alternative therapies for anxiolysis and pain management, and patient screening for conditions predisposing them to increased risk of heightened pain experience or persistent pain, are the future of effective pain management.<sup>23–25</sup>

### Psychological factors driving pain

We all recognize that certain patients in our practice are more 'brittle' and cope less well with dental procedures. Catastrophizing, fear of pain, fear of surgery, introspection, increased pre-operative anxiety, introverted personality, poor coping skills and hypervigilance states are all related to higher operative pain reports and persistent pain after routine surgery.<sup>25</sup>

### Genetic factors

Genetic factors can lead to increased anxiety, catastrophizing and other psychological traits that predispose the patient to chronic pain and increased sensitivity to surgical pain.<sup>26</sup> Prior abuse and neglect can also lead to the development of psychological factors that predispose the patient to increased susceptibility to pain.<sup>27</sup> Variations in the catecholamine metabolizing enzyme genes (*MAOA* and *COMT*) show significant associations with the maximum post-operative pain rating, while the serotonin transporter gene (*SLC6A4*) shows association with the onset time of post-

operative pain.<sup>28,29</sup> A recent genetic study in mice and humans revealed the modulatory effect of MC1R (melanocortin-1 receptor) gene variants on k-opioid receptor-mediated analgesia whereby red heads display additional opioid need and are less sensitive to local anaesthetics.<sup>30</sup>

**Anxiety**

There could be many reasons for increased anxiety when patients need dental treatment. Increased anxiety will result in lowering of the patients' pain threshold. Studies have illustrated that 71% of patients undergoing dental treatment are not anxious, 16% moderately anxious, 9% highly anxious and 4% phobic.<sup>31</sup> Anxiety is determinant for pain during dental care and pain is related to local anaesthetic procedures.

In a study comparing UK and Dutch dental patients' MDAS scores, the percentage of respondents with high dental anxiety (HDA) (total MDAS score  $\geq 19$ ) was 11.2%. Significant prevalence of HDA across several distressing experiences was shown in both UK and Dutch samples notably: extreme helplessness during dental treatment, lack of understanding of the dentist and extreme embarrassment during dental treatment. There were little or no effects of non-dental trauma, with the exception of sexual abuse in the UK sample.<sup>32</sup>

**Empathy**

There is also evidence that the dentists' attitudes are determinants for pain.<sup>33</sup> Empathy likely facilitates patients' downward inhibitory processes by managing their expectations and reduces peri-surgical pain experience.<sup>22</sup>

**Education**

Education and managing patients' expectations can significantly reduce operative pain and the need for post-surgical analgesia. Providing pre-operative education about post-operative pain (POP) can improve patients' knowledge, as well as encouraging a positive attitude towards it. It provides realistic expectations about POP and its management, reduces anxiety and increases patient satisfaction.<sup>34</sup> There is a positive relationship between pre-operative

expectations, satisfaction, and functional outcomes in patients undergoing lumbar and cervical spine surgery and other general surgical procedures.<sup>35</sup> But beware, showing videos to patients with previous negative dental experience can result in significantly increased anxiety!<sup>36</sup>

**Information**

Optimal patient clinician communication reduces post-surgical pain.<sup>37</sup> Information received after surgery is essential for each patient in facilitating the transition from hospital to home.<sup>38</sup>

**Laser**

Laser acupuncture is demonstrated to reduce post-surgical pain.<sup>39</sup>

**Alternative and holistic management of pain**

Alternative methods for pain management should not be dismissed.

■ **Distraction:** With most patients having mobile phones, tablets and headphones at their disposal, few dentists take the opportunity to exploit these devices for distraction during surgical procedures, which can significantly reduce operative pain.<sup>40</sup> Music alone has also been shown to reduce post-surgical pain in non-dental procedures.<sup>41</sup> Other alternative techniques may include using a placebo, or a difficult memory task. But when they put the two together, 'the level of pain reduction that people experienced added up, there was no interference between them'.<sup>42</sup>

■ **Hypnotism:** The evidence for peri-operative hypnotism is conflicting but some prospective studies do show an analgesic effect.<sup>43</sup>

■ **Acupuncture:** Acupuncture can also reduce operative pain and the need for LA and analgesics for dental surgical pain.<sup>44</sup>

**The patient**

Patients may be able to maximize downward inhibition of pain with good sleep habits, good diet and mindfulness or meditation techniques, but evidence remains weak for this holistic approach.

The clinician and team must

take some simple clear pre-operative steps to ensure success of the planned treatment:

- Correct diagnosis and correct treatment plan;
- Full medical history and recent prescription chart;
- Recognition of mental health factors including anxiety;
- Patient relationship – empathy works;
- Manage patients' expectations;
  - Education pre- and post-op
  - Frank consent (includes surgical consent, financial consent and future required maintenance recognition).

**Pre-surgical**

Pre-surgical prevention of surgical and post-surgical pain.

**Pre-operative analgesia**

Failure of inferior alveolar nerve blocks to anaesthetize teeth with symptomatic irreversible pulpitis ('hot pulps') is partly due to inflammatory sensitization of sodium channels resistant to LA inducing peripheral nociceptor sensitization and central sensitization.<sup>45</sup> There are limited studies in relation to dental surgery that demonstrate a pre-emptive analgesic benefit.<sup>46</sup> However, ibuprofen has been reported to provide more intensive pain relief in adjunct to dental blocks, and ibuprofen<sup>47</sup> is superior to paracetamol in facilitating analgesia related to LA for mandibular pulpitis.<sup>48</sup>

A prospective randomized study was conducted, on pre-emptive analgesia, in which patients undergoing third molar surgery were randomly allocated to a protective analgesia (1.6 g modified release ibuprofen) or conventional analgesia (400 mg conventional ibuprofen) orally for 2 h pre-operatively. Post-operative outcomes of interest were pain intensity at 30 min, 1, 6, 24 and 48 h. The time to rescue analgesia, overall assessment of pain control, safety and tolerability profiles were also recorded. It was concluded that there was no difference in the protective analgesia group compared with conventional analgesia group in improving the post-operative pain experience. A different protective analgesia regimen may be necessary, which employs a more aggressive and multimodal strategy for post-operative pain management.<sup>49,50</sup>

The minimal effect of pre-prandial analgesia may be due to the average lidocaine inferior dental block, which lasts for 3 hours 25 minutes, providing plenty of opportunity to take post-surgical analgesia during this period. This provides more effective analgesia and reduces the effect of pre-emptive analgesia.

#### **During surgery**

The surgeon should use the following practices:

- Allow some patient control;
- Assess and manage anxiety;
- Smart local anaesthesia;<sup>45</sup>
- Minimal access surgical technique (less tissue damage = less pain);
- Post-op advice.

All forms of sedation and anaesthesia should be administered in an environment of trust, empathy, and competence. Such an integrated approach will result in reduced drug dosages, decreased need for multiple drug techniques, improved patient safety, and better control of anxiety.<sup>23</sup>

#### **Anxiolysis**

Dental anxiety is prevalent across a broad spectrum of the population.<sup>51</sup> The tools for measuring a patient's anxiety levels can provide a simple indication for his/her sedation need and include the indication for sedation need<sup>52,53</sup> and modified dental anxiety scale<sup>54</sup> (MDAS score of 13 or more indicates anxiety).

A study has illustrated that 71% of patients undergoing dental treatment are not anxious, 16% moderately anxious, 9% highly anxious and 4% phobic.<sup>55</sup> Anxiety is a determinant for pain during dental care and pain is related to local anaesthetic procedures. Dental anxiety is not associated with gender and frequency of dental visits, however, feeling of lack of control and pain anticipation were strong predictors of anxiety. These results highlight the important role that dental healthcare providers could play in counselling anxious patients to reduce the impact of these factors on seeking dental care. Successful management of anxiety positively impacts on the patient's surgical experience, however, the evidence is weak for direct anxiety management and reduced peri-operative pain experience.

There is evidence that dentists' attitudes are also determinants for pain.<sup>56</sup> Advancement of psychological and sedation techniques for anxiolysis have nearly eradicated the need for patients requiring general anaesthesia for routine dental care.<sup>57,58</sup>

Dental phobia is extreme dental fear, which interferes with normal functioning. For any dental treatment, it is an ethical, legal and professional duty of dentists to obtain valid informed consent from their patients. Prevalence of dental fear was 24.3% which is less common than fear of snakes (34.8%), heights (30.8%) and physical injuries (27.2%). Dental phobia appeared most common (3.7%), followed by height phobia (3.1%) and spider phobia (2.7%). Fear of dental treatment was associated with female gender, rated as more severe than any other fear, and was most strongly associated with intrusive re-experiencing (49.4%). The findings suggest that dental fear is a remarkably severe and stable condition with a long duration, only declining after the age of 70 years.<sup>59</sup> The question arises as to how dental phobia impacts on patients' ability to give valid informed consent. The impact of dental phobia on patient consent must not be underestimated and measures must be incorporated to ensure that the patient is appropriately informed.<sup>60</sup> Extreme fear may impair patient ability to understand information about the procedure, their capacity to make balanced decisions, and to make these decisions voluntarily. The dental chair and syringe represent the most feared associative objects and, perhaps, consent and conversation with the patient should take place in a medical consultation setting, allowing the patient to be more relaxed, ideally restricting the use of the dental chair for examination and treatment only. A trusting rapport between dentist and patient, supporting patient understanding by providing useful information material, and keeping regular appointments, may help overcome these obstacles.

#### **Tailored local anaesthesia**

■ Local anaesthetics work by preventing nociceptive pain by blocking the transmission of the action potential. The standard lidocaine infiltration techniques work effectively in the maxilla and recently

it has been demonstrated that palatal and incisal blocks are not required.<sup>29</sup>

- Standard local anaesthetic technique for mandibular dentistry is currently the inferior dental block which is remarkably inefficient as pulpal anaesthesia rates are low and onset is slow (15–30 minutes). Malamed<sup>61</sup> stated that the rate of inadequate anaesthesia ranged from 31% to 81%. When expressed as success rates, this indicates a range of 19% to 69%. These numbers are so wide ranging as to make selection of a standard for rate of success for IANB seemingly impossible.<sup>61</sup>
- There is increasing evidence that infiltration articaine 4% buccal infiltration plus lidocaine intra-ligamental or infiltration is appropriate for all dental procedures in the mandible with the exception of posterior molar endo and restoration of pulpitic second molars.<sup>45</sup>
- The future is likely to be 2% articaine for all dental LA procedures, with 1:400K epinephrine or no vasoconstrictor for simple procedures or procedures in children. With the development of combined topical anaesthetics, jet applicators and computerized delivery systems, improved LA experience for patients is ensured.

#### **Minimal access surgery**

There is a paucity of evidence to support that minimally invasive surgery reduces post-surgical pain, however, there is increasing evidence that minimally invasive surgery does reduce chronic post-surgical pain.

#### **Post surgery**

- Post-op advice;
- Accessibility for patient contact;
- Post-op proactive analgesic regimen:
  - ibuprofen (600 mg) and paracetamol (1 g) orally on day of surgery;
  - if pain next day continue analgesia 6 hourly as is routine. You MUST ensure your patients are not already consuming other paracetamol-containing analgesia and advise against taking more than 20 paracetamol tablets in 24 hours to prevent permanent liver damage.

#### **Home check**

A key factor in patient satisfaction is a sense that the care-giver

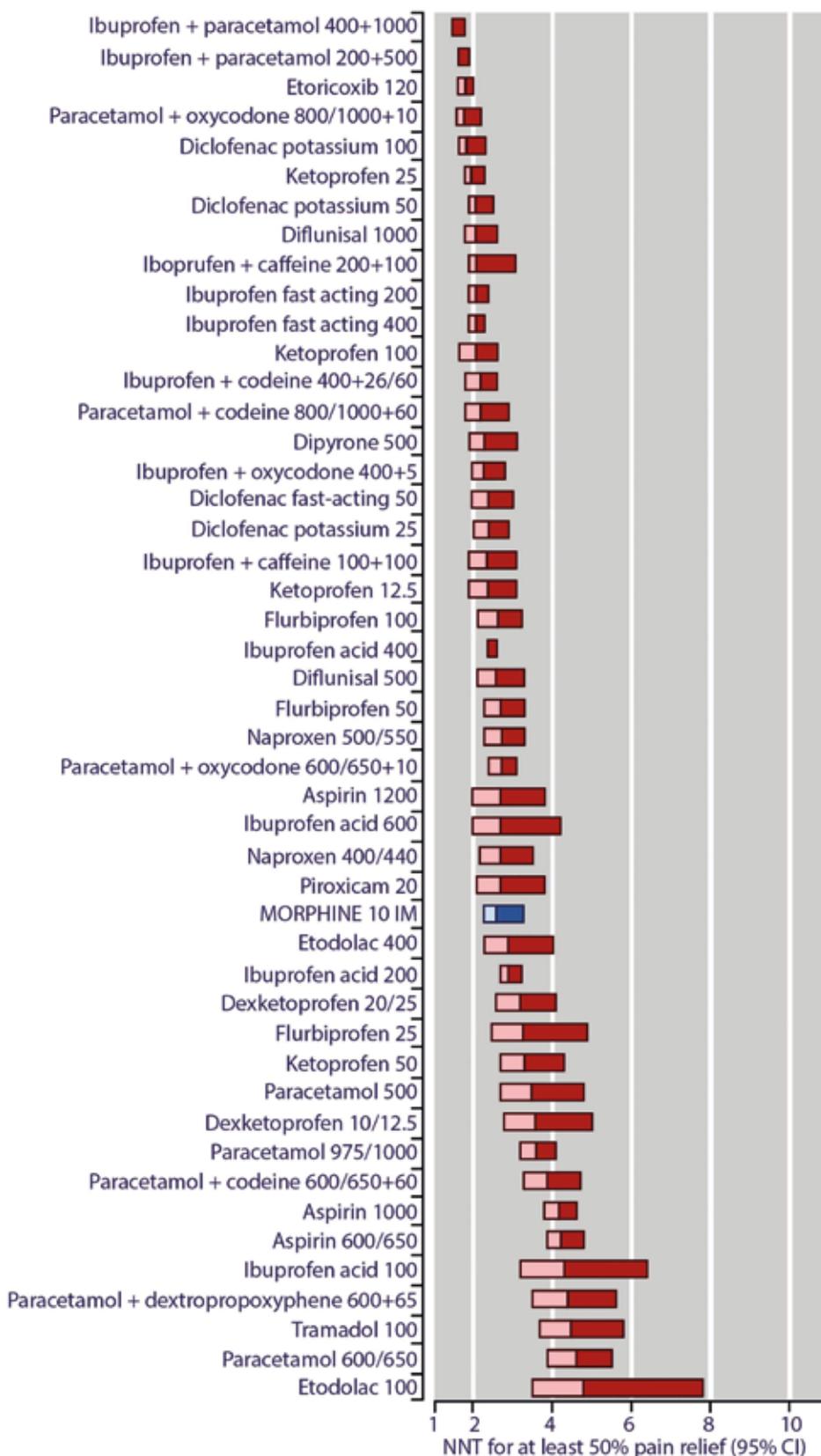


Figure 2. The Oxford League Table of Analgesic Efficacy.

is doing his/her best and is genuinely concerned that therapy is adequate. For this reason, follow-up is crucial. Unfortunately, despite a widespread focus on educating healthcare providers to perform this follow-up, such a re-assessment often does not occur.<sup>62</sup>

### Post-operative analgesia

Effective odontogenic pain management and post-operative pain management is fundamental to quality dental care. Conventional analgesics act by interrupting ascending nociceptive information or depressing downward inhibition. For dental or routine day case surgery post-surgical pain control, oral analgesia is usually prescribed as over-the-counter (OTC) analgesic medications including, NSAIDs, paracetamol, opiates or combinations of these medications. A meta-analysis of Cochrane reviews of randomized controlled trials (RCTs) testing the analgesic efficacy of individual oral analgesics in acute post-operative pain has helped facilitate indirect comparisons between oral analgesics.<sup>63</sup> The results from this review and previous systematic reviews of randomized post-surgical analgesic trials helped to formulate the Oxford League Table of Analgesic Efficacy which is used by healthcare professions worldwide (Figure 2).<sup>64</sup> Analgesic efficacy is expressed as the number-needed-to-treat (NNT). This estimates the number of patients who need to receive the analgesic for one to achieve at least 50% relief of pain compared with a placebo over a six-hour treatment period. The more effective the analgesic, the lower the NNT. Oral NSAIDs perform well and paracetamol in combination with an opioid is also effective.<sup>65-68</sup>

A single dose paracetamol (1 g) provided 50% post-operative pain relief for 4 hours in over 50% of patients.<sup>69</sup>

Codeine is not as effective as NSAIDs or paracetamol for TMS pain.<sup>70</sup> Aspirin may be better than paracetamol for post TMS pain.<sup>71</sup> Optimal analgesia is reported to be combined paracetamol with Ibuprofen as they work synergistically, working extremely effectively for third molar surgery and other moderate pain-inducing dental procedures.<sup>72</sup> Combined Ibuprofen 400–600 mg + paracetamol 500 mg–1 g has the lowest number needed

<ul style="list-style-type: none"> <li>NSAIDs</li> </ul>
<ul style="list-style-type: none"> <li>Allergy to aspirin</li> <li>History of asthma</li> <li>Under 12 years – Reyes syndrome</li> <li>History peptic ulceration or GI bleeding</li> </ul>
<ul style="list-style-type: none"> <li>Duodenal ulcer (DU) 3–4% Peptic ulcer (PU) 4–7% (risk factors &gt;75yr/history PU or heart disease/ + H pylori 27%)</li> </ul>
<ul style="list-style-type: none"> <li>Bleeding disorders – reduced platelet adhesion</li> <li>Pregnancy/breast feeding</li> <li>Renal impairment</li> <li>Decreases effectiveness of anti-hypertensives</li> </ul>
<ul style="list-style-type: none"> <li>Paracetamol</li> </ul>
<ul style="list-style-type: none"> <li>No inflammatory action</li> </ul>
<ul style="list-style-type: none"> <li>Side-effects are rare</li> </ul>
<ul style="list-style-type: none"> <li>Decreases liver function (CI AZT therapy)</li> </ul>
<ul style="list-style-type: none"> <li>Irreversible hepatic impairment 10–15g within 24 hours (<b>ONLY 20–30 tablets</b>)</li> </ul>
<ul style="list-style-type: none"> <li>Renal impairment</li> </ul>

**Table 1.** Contra-indications to prescribing analgesics.

Systemic Signs	Local Signs
Over 50 years	Recent onset
Previous history of carcinoma	Rapid growth
Smoking/alcohol/betel nut/pan	Neuropathy – sensory or motor
Night fevers	Resorption of adjacent structures
Weight loss	Localized mobility of teeth
Blood loss/anaemia	Progressive trismus
	Persistent painless ulcer
	Lymphadenopathy painless persistent
	Lack of response to conventional treatments: <ul style="list-style-type: none"> <li>Antibiotics</li> <li>Endodontic surgery</li> </ul>

**Table 2.** Red flags for cancer. (Regulatory NICE recommend immediate referral to relevant specialist and maximum 2 week wait for consultation).

to treat (NNT) compared with other commonly used analgesics, providing evidence of the effectivity of this combination.<sup>73</sup>

However, although these drugs are seemingly ‘benign’ over the counter analgesics, there are reported to be as many deaths from paracetamol

over dose per year in the UK as there are related to cocaine use. Some of this may be intentional but, on this basis, many countries prohibit the availability of paracetamol from pharmacies without prescription.

The clinician must be aware of contra-indications to prescribing

NSAIDs and paracetamol (Table 1).<sup>74</sup>

**Optimal pain management for dental or operative surgical pain**

NSAIDs should be combined with paracetamol, when possible, reducing the effective dose and, hence, possible side-effects.<sup>63-73</sup> This synergistic effect is attributed to different sites of action of the two analgesics.<sup>77</sup> Oral non-steroidal drugs often supplement the initial prescription of paracetamol. Taking paracetamol with NSAIDs only when necessary can limit potential side-effects of the NSAID.<sup>75</sup>

**Codeine is ineffective for dental pain and addictive**

What is significant is that adding codeine to paracetamol and NSAIDs provides minimal pain relief benefit (<1% additional analgesia) but significant side-effects such as nausea, constipation and potential addiction.

**Antibiotics are ineffective in reducing post-surgical pain**

It is recognized that dentists over prescribe antibiotics rather than extract or extirpate the dental cause. Over the last decade, GMP prescription of antibiotics has significantly reduced, whereas GDPs prescribe antibiotics even more <https://www.fgdp.org.uk/antimicrobial-prescribing>

Antibiotics are ONLY indicated with spreading infection which cannot be drained. There are guidelines for prescribing antibiotics in dentistry: **■** Scottish Dental Clinical Effectiveness Programme (2011) *Drug Prescribing For Dentistry: Dental Clinical Guidance*. 2nd edn <http://www.sdcep.org.uk/wp-content/uploads/2016/03/SDCEP-Drug-Prescribing-for-Dentistry-3rd-edition.pdf>

**■** National Formulary prescribing for dentists <file:///C:/Users/tarar/Desktop/dental%20update%20pain%20VJ/pg860-872%20Prevention%20and%20Optimal%20Management%20of%20Peri-surgical%20Pain%20in%20Dentistry.pdf><sup>76</sup>

If the pain is not responding to routine dentistry OR inflammatory analgesics .....think again! Red Flags for

cancer are listed in Table 2.

### Summary

Management of peri-operative pain in dentistry needs to be improved.<sup>77</sup> Pre-operative pain can be best managed by holistic strategies with explicit consent, managing the patients' expectations and recognizing and managing the patients' fear and anxiety. During the procedure, alternative techniques should not be discarded. Providing a mouth prop for all long duration procedures will minimize temporomandibular joint pain. A tailored LA technique and minimal access surgery ensure minimal operative pain and post-operative pain is optimally managed by minimal surgical soft tissue and hard tissue damage, optimal analgesic regimens and providing contact access or follow-up for the patient.

Untreated post-operative pain is an important ethical and financial issue that can lead to unnecessary suffering and prolonged stays in hospital. Despite the availability of effective analgesics and a growing body of published material that supports their use, post-operative pain remains a problem worldwide. To reduce acute postoperative pain, we introduced an intervention combining evidence-based analgesic protocols with the education of staff and patients on a surgical ward. Inadequately controlled pain was significantly reduced after the intervention, which suggests that the introduction of analgesic protocols supported by the education of staff and patients can be beneficial. Despite this, severe pain remained relatively common, indicating room for improvement. Research is required to fill the considerable gaps in peri-surgical pain management.<sup>78</sup>

Education in pain is recognized as being insufficient, compromising less than 1% of most health curriculae.<sup>79</sup> Attempts have been made to recommend an integrated approach to teaching in pain.<sup>80</sup> Dental undergraduate training sets the precedent of future practice and a

radical overview is needed in regard to teaching consent, local anaesthesia and holistic patients' management that requires psychological, psychiatric, neurosciences and communication skills.

Policy and guidelines also need to improve and be more transparent to both clinicians and patients with regard to optimal pain management in dentistry.<sup>81</sup>

With recognition of pain as the fifth vital sign, as it is in many countries, policy, education and research may improve but, alas, this is not yet the case in the UK.

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