



Published for the
dental professional
community by the
American
Association of
Endodontists.

Spring/Summer
1995

ENDODONTICS

COLLEAGUES FOR EXCELLENCE

Pain It is a common symptom, bringing many patients to the dental office. Despite its prevalence, however, it can present the most challenging diagnostic and treatment planning dilemmas faced by dentists in everyday practice.

Surveys conducted by the American Association of Endodontists reveal that over half of the patients referred to endodontists are in pain. Therefore, by necessity, endodontists have become proficient in diagnosing and treating pain. They share from their experience and learning in the following article.

Perception is not always reality. Pain is often associated with root canal therapy by the media and public. Everyone has heard jokes about root canals and how much they hurt. However, in a survey conducted by the American Association of Endodontists, people who had actually experienced root canal therapy were three times more likely to describe it as "painless" than were those who had never had the procedure.

MANAGEMENT OF ACUTE PAIN



The management of oral health is, to a large extent, the management of inflammation. Daily, the dentist encounters inflammation associated with pulpitis, periodontitis, and other disease states, as well as transient responses to restorative procedures.

Acute inflammation often produces a condition known as hyperalgesia, which is characterized by spontaneous pain, an exaggerated

response to stimulation, and a reduced pain threshold. Sunburn is a classic example of hyperalgesia. The acute inflammation associated with pulpal and periapical disease will sometimes lead to hyperalgesia.

The management of pain due to inflammation is directed at blocking the development of hyperalgesia. Four key actions can help you achieve effective management of acute pain:

- 1) Diagnose and treat the cause of the pain.
- 2) Use a flexible analgesic prescription strategy.
- 3) Pre-treat with nonsteroidal anti-inflammatory drugs (NSAIDs) when indicated.
- 4) Achieve profound anesthesia; and use long-acting local anesthetics when indicated.

Diagnosing and treating the cause of the pain

Acute pain is generally a symptom of an underlying problem. Managing the symptom, the pain alone, generally does not cure the problem. In most cases of acute dental pain, drug therapy is only an adjunct to dental treatment.

Often, dental treatment alone can result in substantial pain relief—such as the immediate reduction of pain that can follow incision and drainage of an abscess or the relief that can be accomplished by pulpectomy of an irreversibly inflamed pulp. Conse-

quently, before drug therapy can be considered, the first steps in pain management are 1) make an accurate diagnosis and 2) provide effective treatment.

Making an accurate diagnosis is sometimes the biggest challenge. For example, a dental patient reporting pain in the area of an upper bicuspid tooth could be suffering from dentin hypersensitivity, a fractured tooth, pain referred from a sinus infection, a periodontal abscess, or pain due to pulpal or periapical disease. The

treatments for these conditions are obviously different. Therefore, effective management of the patient's pain hinges upon making an accurate diagnosis.

If an accurate diagnosis cannot be reached, the patient should either be re-appointed for subsequent re-evaluation or referred to a specialist. Because of their years of training and experience with diagnosing dental pain, endodontists can be a resource for the difficult-to-diagnose pain problem.

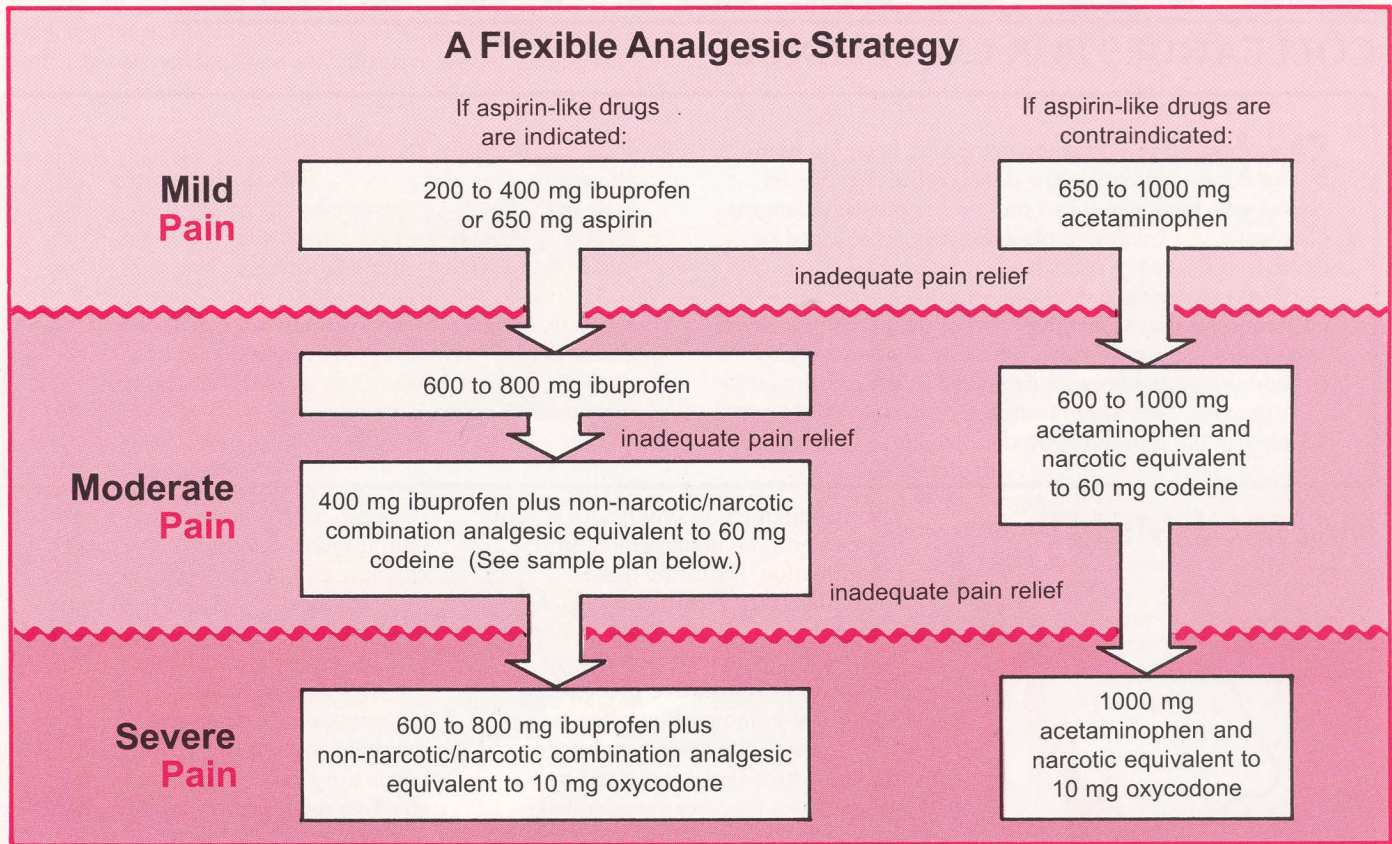
Using a flexible analgesic prescription strategy

Each patient in your practice is unique. Each has different needs. If you always prescribe the same analgesic, some patients will be under-medicated and experience unnecessary pain while some will be over-medicated and experience unnecessary side effects. In order to provide the most appropriate analgesic in each particular case, adopt a flexible prescription plan.

A typical flexible prescription plan is presented below. The strategy for this plan is to begin by prescribing a maximally effective dose of a non-narcotic analgesic and then later prescribe a narcotic analgesic only if the pain continues.

The illustrated prescription plan is divided into two columns. The column on the left is for patients who can take

aspirin-like drugs. The column on the right is for those who cannot. Examples of patients who cannot take aspirin-like drugs include those with peptic ulcer or active asthma or patients taking other drugs—such as insulin, sulfonylurea, dicumarol, heparin, methotrexate, or others—that might interact with aspirin or NSAIDs.



Sample pain management plan

A patient, for example, may present at your office reporting severe pain that kept her awake all night. She denies any contraindications to NSAIDs. After examination, you find the patient is suffering from irreversible pulpitis with acute apical periodontitis, and a root canal procedure is initiated. This patient may well experience some post-appointment pain due to continued inflammation of the periapical tissues.

A possible pain management plan would be to give this patient two prescriptions:



Rx: ibuprofen 400 mg
Disp: 24 tablets
Sig: take one tablet every 4 hrs.

Rx: acetaminophen 300 mg with 30 mg codeine
Disp: 12 tablets
Sig: take two pills every 4 hrs.

The patient will take the two medications as follows:

Beginning at your office: 400 mg ibuprofen
Two hours later: 2 tabs of acetaminophen/codeine (equal to 600 mg & 60 mg, respectively)



The patient will then repeat this two-hour dosing schedule throughout the first day.

The approach illustrated in the sample pain management plan (below left) provides several advantages. First, a two-hour dosing schedule means that one drug is always being absorbed while the second is at or near its peak level of analgesia. This helps provide an effective and continuous level of pain relief.

Second, pain medication is more effective when pills are taken "by the clock" rather than "as needed for pain." When a given medication is taken by the clock—such as every four hours in our example—the medication stays ahead of the pain rather than trying to catch up. Generally, moderate to severe pain can be managed by having the patient take drugs "by the clock" for the first day or so, switching to "as needed" later when the pain begins to subside.

Taking different medications every two hours, however, may be confusing for some patients. Therefore, when considering this regimen, you should take into account the patient's ability to follow the dosing schedule.

Prescribing non-narcotic/narcotic combination drugs

Most of the effectiveness in the non-narcotic/narcotic combination drugs—such as acetaminophen (600 mg) with codeine (60 mg)—is actually derived from the non-narcotic component. Moreover, most of the side effects are due to the opiate narcotic.

It is common to see prescriptions for acetaminophen with codeine that read, "Take one to two tablets every four hours as needed for pain." However, taking only one tablet reduces the amount of acetaminophen to half the effective dosage. Many patients would receive greater pain relief from the full

recommended dosage of acetaminophen, 650 - 1000 mg., *without* codeine. Therefore, opiates should be considered as adjunctive analgesics when managing acute pain in the ambulatory patient.

Furthermore, for most patients, the 60 mg strength of codeine is required for clinically significant analgesia. While the 30 mg dose that would result from taking just one tablet may be effective in smaller patients, it generally does not provide substantial analgesia for most patients.

Prescribing NSAIDs

Studies have shown no major differences among the NSAIDs for analgesic effectiveness or side effect potential. Most NSAIDs appear to produce similar levels of both analgesia and side-effects. Accordingly, when deciding which NSAIDs to use in your practice, you should base your decision on your own experience—what works well in your hands.

Many NSAIDs are available today. A practitioner should become familiar with two or three and select the one best suited for each patient depending on the patient's clinical needs, dosage, previous experience with the drug, affordability, and other factors.

Nonsteroidal anti-inflammatory drugs offer clinicians pain relief comparable to many traditional narcotic analgesics, with one significant advantage. Because NSAIDs do not produce substantial central nervous system depression, most patients do not suffer the drowsiness and lightheadedness commonly associated with narcotics. Patients can usually drive, work, and engage in other activities more safely than while under the influence of narcotic analgesics. Problems with drug diversion and abuse are also avoided.

Pre-treating with NSAIDs

Research has shown that pre-treating patients with NSAIDs, when indicated, delays the onset of post-operative pain and reduces its magnitude when it does occur. NSAIDs inhibit the production and release of the chemical mediators of inflammation. Therefore, their administration prior to treatment is an effective and convenient pain management strategy. You can have your patients take the NSAID in your office prior to treatment.

Unfortunately, pre-treatment with acetaminophen does

not appear to offer the same advantages as pre-treatment with NSAIDs. Therefore, this approach is of value only to patients who can tolerate NSAIDs.

In addition, aspirin is generally not used to pre-treat patients, especially prior to surgical procedures, where aspirin can increase bleeding. Short term use of NSAIDs, however, does not appear to have a clinically significant effect altering bleeding, so pre-treatment prior to surgery is generally not contraindicated.

Using long-acting local anesthetics

It is extremely important to achieve profound anesthesia prior to initiating treatment. It is equally important to ensure that the anesthesia is of adequate duration. Adequate anesthesia not only ensures comfortable treatment but also reduces post-treatment pain. Research has shown that when dental procedures are performed without complete anesthesia, patients are likely to report greater and longer lasting post-treatment pain.

One method for controlling post-operative or post-endodontic pain is to use long-acting local anesthetics, when indicated. In addition to ensuring patient comfort throughout a procedure, long-acting local anesthetics have exhibited an extended duration of analgesia, beyond the period of anesthesia.

Both etidocaine and bupivacaine are available in dental cartridges and are effective in reducing pain after dental

procedures. Etidocaine may have a slight advantage over bupivacaine since it often demonstrates a faster onset for anesthesia. However, cost differences between these local anesthetics may be a consideration.

Combining NSAID pre-treatment with the use of long-acting local anesthetics can result in nearly 70% of patients reporting pain as either none or slight, even at 7 hours after surgical removal of impacted third molars.

Of course, case selection is important when considering the use of long-acting local anesthetics. Patients, especially children, may be prone to biting their lips following inferior alveolar nerve block anesthesia. Some patients dislike the sensation of a "fat lip" or anesthetized tongue and may elect not to have long-acting local anesthetics. In addition, there have been some reports of increased cardiac risk with the use of long-acting local anesthetics in certain patients.

Summary

The management of pain due to inflammation is a common clinical problem. Effective pain management begins with an accurate diagnosis. If patients do not respond to treatment in a predictable fashion, then the clinician should consider an alternative diagnosis and treatment plan or referral to an endodontist.

The recommendations in this article are meant to aid the practitioner in the management of acute pain. Practitioners must always use their best professional judgement, taking into account the needs of each individual patient when choosing an analgesic plan. AAE neither expressly nor implicitly warrants any positive results nor expressly nor implicitly warrants against any negative results associated

with the application of this information.

It is impossible to guarantee success in every case. However, the combined use of a flexible prescription strategy emphasizing effective doses of non-narcotic analgesics, pre-treating patients with NSAIDs when indicated, and using long-acting local anesthetics when appropriate can provide the opportunity for successful management of acute dental pain.

If you would like more information on the management of acute dental pain, call your local endodontist or contact the American Association of Endodontists, 211 E. Chicago Ave., Ste. 1100, Chicago, IL 60611-2691, 312/266-7255, fax 312/266-9867.

On the Horizon...

Future promises improved NSAIDs, local anesthetics

NSAIDs

With the clinical introduction of nonsteroidal anti-inflammatory drugs (NSAIDs) in the 1970s, the dental profession at last had access to medication that provided potent analgesia combined with significant anti-inflammatory qualities. The absence of any addictive liability for these medications was an added advantage over the narcotic combinations popular at the time.

However, NSAIDs are not without problems. The most frequently reported side effects for these agents are gastrointestinal distress; nausea; and, in extreme situations, mucosal perforation and bleeding. With prolonged use of the recently introduced, more potent and longer acting NSAIDs, some evidence of renal dysfunction has also been reported. Attempts to reduce these NSAID-induced side effects are being pursued.

Research has suggested that cyclooxygenase, the enzyme responsible for synthesis of prostaglandins, may exist in two or more forms called isozymes. One isozyme—the functional form—has been isolated from tissues in the stomach and kidneys and shown to serve a physiologic function. Another isozyme—the inducible form—has been associated with the production of inflammation and pain. This second form can be induced by cytokines, endotoxins and the like. Compounds are now being synthesized that can inhibit the inducible form

of cyclooxygenase without affecting the functional form, thus providing a more specific therapeutic effect while minimizing unwanted side effects.

Recent research suggests that NSAIDs may have a central nervous system component that contributes to their analgesic effectiveness, and chemical structural properties responsible for this central effect have been suggested. Researchers are now attempting to synthesize new NSAIDs that will produce a peripheral analgesic effect with enhanced central effects, but without addictive liability. NSAIDs with greater bioavailability—and therefore better clinical effectiveness—are also undergoing clinical trials.

Local anesthetics

New research indicates that the sodium channel associated with the nerve action potential may exhibit variations when the neurons associated with pain, temperature and skeletal muscle tone are compared. In the not-too-distant future it is likely that new local anesthetic compounds with more specific neuron-blocking capacity will be discovered. Imagine the freedom of being able to protect patients from the pain *and* from the slurred speech, tongue-biting, and other undesirable side effects of local anesthesia.

Comments?

Did you enjoy this issue of *ENDODONTICS*? Did the information have a positive impact on your practice? Are there topics you would like *ENDODONTICS* to cover in the future? We want to hear from you! Send your comments, questions and suggestions to:

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American Association of Endodontists
211 E. Chicago Avenue, Suite 1100
Chicago, IL 60611-2691