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.

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.

Diagnosing and Treating the Cause of 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. Consequently, 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. 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.

**A Flexible Analgesic Strategy**

**If aspirin-like drugs are indicated**

<table>
<thead>
<tr>
<th>Mild Pain</th>
<th>Moderate Pain</th>
<th>Severe Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 to 400 mg ibuprofen or 650 mg aspirin</td>
<td>600 to 800 mg ibuprofen</td>
<td>600 to 800 mg ibuprofen plus non-narcotic/narcotic combination analgesic equivalent to 60 mg codeine</td>
</tr>
<tr>
<td>650 to 1000 mg acetaminophen</td>
<td>600 to 1000 mg acetaminophen and narcotic equivalent to 60 mg codeine</td>
<td>1000 mg acetaminophen and narcotic equivalent to 10 mg oxycodone</td>
</tr>
</tbody>
</table>

**If aspirin-like drugs are contra-indicated**

<table>
<thead>
<tr>
<th>Inadequate pain relief</th>
<th>Inadequate pain relief</th>
<th>Inadequate pain relief</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 to 400 mg ibuprofen</td>
<td>400 mg ibuprofen plus non-narcotic/narcotic combination analgesic equivalent to 60 mg codeine</td>
<td>600 to 800 mg ibuprofen plus non-narcotic/narcotic combination analgesic equivalent to 10 mg oxycodone</td>
</tr>
<tr>
<td>650 to 1000 mg acetaminophen</td>
<td>600 to 1000 mg acetaminophen and narcotic equivalent to 60 mg codeine</td>
<td>1000 mg acetaminophen and narcotic equivalent to 10 mg oxycodone</td>
</tr>
</tbody>
</table>

**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 above. 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 hours

**Rx:** acetaminophen 300 mg with 30 mg codeine
Disp: 12 tablets
Sig: take two pills every 4 hours
"My experience has been that augmenting the following protocol with 300 mg of Dalacin C (Clindamycin) every 6 hours for a 24 hour period, in the vast majority of cases will obviate the need to open teeth. The presumption that all teeth will drain to alleviate pain/pressure is not born out empirically. In many cases, the pressure of access can induce exacerbation of the problem and given the scope of the inflammation, anaesthesia, regardless of the degree, is difficult. If a "severe pain regimen" including the antibiotic is utilized for 24 hours only, many cases will calm down and can be treated without emergency intervention. In those cases that cannot, the degree of acuteness is lessened and the facility to achieve anaesthesia of little or no concern. The benefit of NOT opening teeth for any period of time is the reduction of post-operative symptoms after completion of the endodontic procedure. Regardless of how clean the tooth structure may seem after being left open, the root canal is a two way street; that which exits also allows entrance."

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 (24 hours).

The approach illustrated in the sample pain management plan 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 effective in reducing pain after dental procedures. Etidocaine may have a slight advantage over bupivacaine since it often demonstrates a faster onset for anesthesia.

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 and a thorough understanding of the mechanism of inflammation and the means by which augmentation of a superceded immune response capacity can be achieved through pharmacotherapeutics.