

Point of Care

The Point of Care section of JCDA answers everyday clinical questions by providing practical information that aims to be useful at the point of patient care. The responses reflect the opinions of the contributors and do not purport to set forth standards of care or clinical practice guidelines. Readers are encouraged to do more reading on the topics covered. This month's responses were provided by speakers at the 2004 Journées dentaires internationales du Québec to be held from May 29 to June 2 in Montreal, Quebec. For more information on the JDIQ, visit www.odq.qc.ca. If you would like to submit or answer a question, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.



Question 1 Can skin problems associated with repeated handwashing be reduced?

In a typical day, dentists may wash their hands up to 50 times or more. As a result of frequent handwashing, the epidermis loses its protective oils, which do not have a chance to be replenished. It takes approximately 3 hours for the epidermis to replace lost oils. The skin dries out — even cracks — and itching occurs. Afflicting more than 35% of dental professionals, these skin problems can also bring on a long-term allergy to latex and make the skin more permeable to the chemicals used in dentistry.

Until very recently, hand antisepsis meant washing with antiseptic soap. Now, new guidelines from the Centers for Disease Control and Prevention, promoted in media releases from Health Canada, will considerably affect your infection control program. Keep in mind that good handwashing takes between 1 and 2 minutes of your time, every time, which means the time you take to go to the sink, let the water run, wet your hands, wash them, rinse them and dry them. That's 50 to 100 minutes spent strictly on washing your hands.

Alcohol-based gels (hand rubs) can now be used as part of your hand antisepsis program for hands that are not visibly soiled. There are many benefits to using these gels: increased compliance to hand antisepsis guidelines; enhanced antimicrobial activity; accelerated procedure; reduced risk of recontamination, decreased adverse effects on the skin; and possible improvement in existing skin conditions.

How to Use Hand Rubs

Although these products are easy to use, they must be chosen with care. Many types of gels are now on the market. Make sure you choose a gel (or foam) especially for physicians or dentists. They should contain more than 60% ethanol or isopropanol (or both). Choose a product that contains softening agents or emollients for maximum comfort. Here is the protocol for using this product:

Wash your hands at the start of the day with your regular antiseptic soap. Later, *if your hands are not visibly soiled*

(traces of blood, saliva, powder or other material), use the hand rub, which can serve as a substitute for your handwashing routine during the day. At the end of the day, wash your hands as you normally would with the antiseptic soap.

Alcohol-based agents contain emollients, which can build up on the skin over the day. Therefore, you should wash your hands after using gels or foams 10 or 15 consecutive times.

As well, since alcohol-based products do not actually clean the skin, you should use powder-free gloves to avoid powder accumulation on the hands that can only be removed by handwashing.

As recommended, do not wash your hands immediately before or after applying the gel or foam, to avoid irritating the skin. Lastly, remember that these products are alcohol-based and are therefore flammable. ♦



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Dr. Barbeau's session "Les facettes multiples de la qualité de l'eau et de son implication pour la profession dentaire" will be presented on Wednesday, June 2.

Further Reading

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Question 2

At what point do we decide to rebuild an endodontically treated tooth with a cast post or a preformed post? Adhesive dentistry is so good now, do we still need posts and crowns on posterior teeth? Don't posts weaken teeth?

Clinical and laboratory evidence supports cuspal coverage or extracoronal restoration of endodontically treated posterior teeth to increase their fracture resistance and longevity.^{1,2} In general, the clinical life of endodontically treated molars and bicuspid significantly improves with coronal coverage. The need for a crown is less evident for anterior teeth, and coronal coverage does not necessarily improve clinical longevity.¹ If adequate tooth structure remains, a direct adhesive restoration is often the optimal treatment for anterior teeth. A post is not recommended in these cases. When complete coverage is required for either anterior or posterior teeth, depending on the amount of peripheral crown reduction needed, a core or a post and core should be considered to provide the necessary retention and fracture resistance of the crown/tooth unit.

Molars can be reinforced with a simple direct coronal-radicular amalgam or a bonded composite restoration, without the need for a post. Using the molar pulp chamber volume provides core retention and strength, and has shown clinical success.³ The problem areas are single-rooted teeth or bicuspid with a slender cervical dimension, particularly if the crown is long and shear forces are present. Resistance form against cervical fracture invariably requires a post placement in these single or narrow canals to reinforce the coronal ferrule. Abutments are particularly vulnerable, especially those for removable partial prostheses.⁴ Post placement designed to minimize canal enlargement and maximize preservation of sound tooth structure is currently advocated. This ensures maximum integrity of the tooth and reduces the technical dangers associated with post space preparation.

In all cases where an endodontically treated tooth receives a crown restoration, the prognosis is largely determined by the presence of adequate sound peripheral tooth structure (ferrule) at the crown–root interface. Teeth with little or no cervical ferrule have a very poor prognosis and will require surgical crown lengthening or forced eruption to allow crown placement on adequate peripheral sound tooth structure. For this reason, the intentional provision of endodontic treatment for vital teeth with inadequate ferrule cannot be recommended.

Management of Maxillary Bicuspid

In conjunction with the need for adequate ferrule, post requirements include high strength to prevent cervical fracture, high elastic limit to prevent distortion, and adequate radiopacity to allow future radiographic assessment. Recommendations on the types of posts to use have

changed in recent years. The superiority of a custom-cast post can no longer be claimed over a well-placed prefabricated post, which allows conservative removal of tooth structure. **Figures 1, 2 and 3** show a successfully endodontically treated second maxillary bicuspid before restorative treatment. The tooth has a slender mesiodistal dimension and shows significant loss of tooth structure. In this case, a minimal post space preparation for a prefabricated parallel Para Post (Coltene Whaledent, Konstanz, Germany) was used (**Fig. 4**), concurrent with crown preparation. The passive, parallel, prefabricated post style has shown considerable success in clinical and laboratory studies and is the post by which all others are usually measured.

When there are high clinical strength requirements combined with minimal coronal tooth structure, a metallic post is preferred. A passive *tapered* prefabricated post allows a more conservative removal of tooth structure where there is optimal ferrule and high retention is not required. Safe post space preparation is best achieved with non-end-cutting rotary instruments. The instruments of choice for least-invasive canal preparation are the small head Gates Glidden bur with the Peeso reamer (**Fig. 5**). It is suggested that the smallest size post space be prepared and the post adapted to the canal whenever possible. In the typical figure eight bicuspid canal, the dimensions of the most conveniently accessed “single” canal provide adequate retention and resistance. Sound tooth structure should not be removed to convert the oval shape to a circular outline form, as it will significantly weaken the tooth and may cause root perforation. In the present clinical case, the pulp chamber has also been cleared of all temporary materials. A 1–2 mm preparation into the second canal, involving removal of gutta-percha only, can be added if higher retention and resistance is required.

Clinical studies support superiority of prefabricated posts.^{1–3,5,6} More tooth structure is removed for cast posts,

Post Considerations

- Minimal canal enlargement following endodontic therapy
- Modification of post to fit canal wherever possible
- Length equal to, or exceeding, clinical crown length
- Passive post preferred, to prevent stress concentration
- Minimum 4–5mm gutta-percha remaining



Figure 1: Facial view of a successfully endodontically treated maxillary bicuspid.



Figure 2: Radiographic view after completion of endodontic treatment.



Figure 3: Occlusal view showing extent of occlusal and distal tooth loss.



Figure 4: Initial crown preparation with removal of all restorative materials within the crown. Trial placement of prefabricated metal post in palatal canal.



Figure 5: Non-end-cutting rotary instruments for gutta-percha removal and canal preparation. Gates Glidden bur (below) and Peeso reamer (above).



Figure 6: Bonded composite post-core build-up before crown preparation refinement.

2 appointments are necessary, and the cost is high. Even in clinical situations with an important loss of internal dentin — traditionally restored with a custom-cast post and core — there has been more success when the tooth is restored with bonded resin composite reinforced by a smaller central metal post.⁶ Many commercially available prefabricated posts, including esthetic posts, are now available. Different clinical conditions require careful patient-specific treatment planning. **Figure 6** shows the bonded composite core build-up before refinement of the crown preparation. ♦



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Dr. McComb's sessions "Current Operative Dentistry: Part 1. Minimally Invasive Dentistry" and "Part 2. Managing the Heavily Restored Dentition" will be presented Tuesday, June 1 and Wednesday, June 2, respectively.

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Question 3 Is it recommended to leave a tooth open when performing endodontic emergency treatment for an acute apical abscess?

The acute apical abscess is a common cause of endodontic emergencies. Pain is caused by a build-up of purulent exude at the root apex, resulting from an exacerbation of acute periapical periodontitis, subsequent to pulpal necrosis. The breakdown products of necrotic pulp, bacteria and their toxins migrate to the connective tissue of the pulpoperiapical junction, causing a steadily increasing amount of inflammatory exudate, leukocyte infiltration, suppuration and pain. The goal of emergency treatment is to relieve the pressure formed at the periapical periodontal ligament and to remove the cause of the problem, namely the necrotic pulp.

Signs and symptoms of an acute apical abscess:

- frequently intense and continuous throbbing
- severe pain with biting, percussion and palpation
- negative response to electric or cold pulp test
- possible radiographic results ranging from no periapical changes to a widening of the apical periodontal ligament
- swelling may not be present in the early stages of the condition.

Emergency Management

It is best to close the tooth at the initial, emergency visit to prevent contamination by the oral environment. Teeth left open until endodontic treatment can be completed at a second visit may flare up between visits. When a tooth with an acute apical abscess is opened and pus allowed to drain, the exudate should stop within 20 minutes. It is recommended to isolate the tooth with a rubber dam while the exudate drains. It is also recommended to clean, shape (using a crown-down instrumentation technique) and fill the canals with calcium hydroxide. A hermetic temporary coronal obturation should then be placed on the tooth.

On rare occasions, exudate will continue to drain out of the tooth, preventing the clinician from closing the tooth. In such circumstances, a cotton pellet should be placed in the access cavity to prevent food impaction. The patient should then be seen the following day for canal cleaning, shaping and filling with calcium hydroxide.

There is evidence that teeth left open to the oral environment may increase periapical cyst formation. Studies have shown higher levels of secretory IgA in canals of teeth left open, compared to canals of teeth that are closed. This is significant, because epithelial growth factor — a polypeptide found in saliva — may stimulate the cell rests of Malassez.

For these reasons, teeth should be closed at the end of emergency treatment and an aseptic technique with rubber dam used during treatment. ✦



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Dr. Alvaro's session "Maturogenesis: The Immature Tooth" will be presented on Tuesday, June 1.

Further Reading

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Question 4 Which analgesics should I consider using to manage pain following an extraction?

Appropriate pain management is a challenge in dentistry. Many routine procedures, such as extractions, can lead to significant postoperative pain. Part of pain management includes selecting suitable postoperative analgesics for patient use. The choice of the best drug is influenced by a number of factors, including:

• Severity of Pain

Clinical judgment is required to determine the patient's anticipated level of postoperative pain. To achieve this, the dentist needs to evaluate the traumatic nature of the extraction as well as the patient's perceived pain threshold. A very arbitrary and subjective classification of postoperative pain is mild-moderate, moderate-severe, or severe.

• **Medical History of the Patient**

Factors that would contraindicate nonsteroidal anti-inflammatory drugs (NSAIDs) include gastric ulceration, bleeding concerns, severe asthma, late-term pregnancy and significant renal disease. The patient may be taking drugs that interact with NSAIDs, such as lithium, anticoagulants or antineoplastic doses of methotrexate. NSAIDs should only be used for 4 days or less if the patient is taking an anti-hypertensive that belongs to the angiotensin-converting enzyme inhibitor class, diuretic class or beta-blocker class.

Significant liver disease would require a dose reduction of any analgesic selected.

• **Known Allergies**

Allergy to acetylsalicylic acid (ASA) or an NSAID rules out use of any other NSAID. In particular, ASA-induced asthma rules out use of any NSAID.

A true allergy to codeine contraindicates its use as well as that of oxycodone (found in Percocet).

After evaluating the above factors, the dentist can proceed to follow an algorithm — based on the answers to the following questions — to determine an appropriate analgesic.

Pain Management

1) Is pain estimated to be mild-to-moderate?

If yes, recommend acetaminophen 500 to 1,000 mg (1 to 2 tablets of analgesics such as extra-strength formulations of acetaminophen, or 2 to 3 tablets of regular strength acetaminophen). For children, acetaminophen in a dose of 10–15 mg/kg every 4 hours is the first choice.

2) Is pain estimated to be moderate-to-severe?

a. Is the patient in good health with no contraindications to NSAIDs?

If yes, recommend an NSAID, such as ibuprofen 400 mg, every 4 hours. Alternatively, it is reasonable to prescribe any one of the following: flurbiprofen, diflunisal, naproxen, ketorolac, ketoprofen, floctafenine, etodolac, rofecoxib or celecoxib.

b. Does the patient have an allergy to ASA or other NSAID, or a contraindication to NSAIDs, such as gastric ulceration or severe asthma?

If yes, recommend acetaminophen with codeine.

c. Is acetaminophen 1,000 mg every 4 hours insufficient? Does the patient have gastric ulceration or is the patient susceptible to gastric bleeding, as can be the case in older patients?

If yes, prescribe rofecoxib (50 mg a day, up to 5 days), celecoxib (200 mg twice a day), or acetaminophen with codeine.

d. Is the patient a child?

If yes, consider either ibuprofen 10 mg/kg every 6 to 8 hours if the child is under the age of 12, or 200–400 mg every 4 hours if over the age of 12. Alternatively, codeine at 0.5–1 mg/kg every 4 to 6 hours can be added to either acetaminophen or ibuprofen.

3) Is pain estimated to be severe?

If yes, there are several options to consider:

- a. Use bupivacaine to gain long duration of local anesthesia.
- b. Consider higher doses of an NSAID, such as ibuprofen 600 mg, if there are no contraindications.
- c. Add codeine, 30 to 60 mg, to the NSAID or acetaminophen.
- d. Use oxycodone with acetaminophen (such as Percocet).



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Dr. Haas' sessions "Pharmacology in Dentistry: Part 1. Analgesics" and "Part 2. Anesthetics and Antibiotics" will be presented Monday, May 31.

Further Reading

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