

ENDO:

Risks and Benefits

The **toughest**
teeth, the **safest**
solutions and
more

by Manor Haas, DDS



Manor Haas, DDS, is a certified specialist in endodontics. He is extensively and passionately involved in continuing dental education. He is a fellow of the Royal College of Dentists of Canada and is on staff at the University of Toronto Faculty of Dentistry, and the Hospital for Sick Children.

He maintains a full-time private practice limited to endodontics and microsurgery in Toronto. Haas has lectured and hosted many international workshops on modern endodontics and has contributed to numerous dental journals. To contact the author, email him at ' or visit haasendoeducation.com.

Abstract

If a general dentist decides to perform root canals, then he or she needs to consider the clinical and practice management pros and cons of doing so. Furthermore, clinical proficiency in endodontics and having the right armamentaria is very important.

One needs to keep in mind which teeth and clinical scenarios may present challenges. These may include calcified and curved roots and the difficulty in locating MB2 canals. While there are challenges, there are also means available to help manage various complex scenarios.

Educational objectives

1. Learn the pros and cons of performing root canals in-house.
2. Identify common clinical mishaps.
3. Understand which teeth may pose clinical challenges and why.
4. Learn how to manage complex clinical scenarios.
5. Learn when it's better and safer to refer to an endodontist.

Introduction

As private practitioners, we all want to have successful and busy practices. Of



Approved PACE Program Provider
FAGD/MAGD Credit
Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement.
1/1/2016 to 12/31/2018
Provider ID#304396

AGD
Code:
070

This print or PDF course is a written self-instructional article with adjunct images and is designated for 1.5 hours of CE credit by Farran Media. Participants will receive verification shortly after Farran Media receives the completed post-test. See instructions on page 127.

ADA CERP® | Continuing Education Recognition Program

Farran Media is an ADA CERP Recognized Provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse individual courses or instructors nor does it imply acceptance of credit hours by boards of dentistry.

course, we also want to help our patients by looking after them with our own two hands. If you choose to perform your own root canal treatments, however, there are risks and benefits to be aware of. Nowadays, we often stress only the bright side of endodontics and make it seem simple, but overlooking the realities we face and the potential pitfalls could mean trouble. In hopes of keeping you out of trouble, I'll identify common clinical mishaps you may face, and discuss how you could avoid those potential headaches.¹

So, pardon the occasional careful and somber tone of this article—but stressing the potential clinical, financial, practice management and legal pitfalls is aimed to help you, your patients and your practices.

Part 1: Practice management

There are many benefits and complications to your practice when doing your own root canals. Table 1 highlights the pros and cons of performing root canal treatments in-house. First, the positives about endodontic treatments. Keeping root canal treatments in-house often benefits your patients, who usually prefer the convenience and comfort of being treated by a familiar, trusted face instead of being sent to an unknown specialist.

Your practice benefits from in-house treatment because your schedule is busier. Your production also benefits as you perform more root canal treatments; if you're proficient and efficient, then providing this service could be quite lucrative.

This has become increasingly possible in recent years with the introduction of newer endodontic armamentaria. For instance, some new nickel titanium files work more efficiently and enable canal instrumentation with fewer files and steps. Examples are the

TABLE 1: *Pros and cons of keeping root canal treatments in-house*

PROS

- Patients' convenience and comfort when treated by their doctor.
- Increased production.
- Lower overhead (if root canals are performed efficiently).
- Busier schedule.
- Personal satisfaction.

CONS

- Increased overhead (if root canals are performed inefficiently).
- Potential for mishaps.
- Loss of patient/patient trust.
- Medicolegal risks.
- Increased capital costs.

WaveOne Gold (Dentsply Sirona) and One Shape (Micro-Mega) which enable one file to perform all or most of the mechanized instrumentation. Such files have simplified root canal treatments and, for routine cases, may also reduce treatment times.²

If the root canal quality is not compromised, faster root canals are of great benefit to your patients, your overhead and production. Let's face it: No patient—or, should I say, *few* patients—love going to the dentist and spending time in the chair. Faster root canals mean patients are happier. Furthermore, spending less time on a procedure makes your practice more productive and reduces your office overhead.

Finally, so long as you enjoy performing root canal treatments, you'll be happy to know you can provide this important service to your patients. And in the process you'll diversify your clinical practice. It's a satisfying feeling we get when we can directly look after the patients we've come to sincerely care for.

Potential troubles

Now we get to the potentially somber side of endodontics. Performing root canals efficiently and easily is fun to talk about, but

we can't ignore the elephant in the room, which is one of the reasons I love *Dentaltown* magazine's motto of "real dentistry for real dentists."

A case in point is the following: A busier schedule benefits the practice production and overhead, but only if you can perform root canals efficiently and effectively. If you run into trouble with a case and end up spending too much time completing the root canal, it may be a loss financially. Pardon the obvious, but if the total cost of your practice overhead, including endo materials and hourly overhead, ends up being more than the income from the root canal, your practice will be losing money.

It's not uncommon to see dentists spend multiple appointments and many hours on a root canal. And, unlike a hygiene procedure, spending extra time on a procedure doesn't mean you can bill more. In the end, you may spend more time but still bill the same fee.

In this case, you may end up paying the patient, so to speak, to sit in your chair instead of making a net profit from the procedure. In such a scenario, you'd be better referring the case to an endodontist. Furthermore, patients can tell when you run into trouble as you spend too much time

Disclosure:

The author declares that neither he nor any member of his family has a financial arrangement or affiliation with any corporate organization offering financial support or grant monies for this continuing dental education program.

TABLE 2: RISKS AND MANAGEMENT of endodontic scenarios



Fig. 1. Curved mesial root in #30

SCENARIO: Curved roots

REASON FOR RISKS:

- Inability to negotiate canals.
- May result in ledging, blocking or file fracture.



Fig. 2. Precurved small SS hand files.
(Top: C-file by Dentsply Sirona;
bottom: Kerr Dental stainless steel file.)

MANAGEMENT OF RISKS:

- Identify curvature in advance.
- Precurve stainless steel (SS) hand files and use in watch-winding motion.
- Use narrow and flexible nickel titanium (NiTi) files.



Fig. 3. Calcified mesial root in #30

SCENARIO: Calcified canals

REASON FOR RISKS:

- Inability to locate calcified canals.
- Inability to instrument calcified canals.



Fig. 4. Files to access and negotiate calcified and curved canals. (Left to right: Stiff C-files by Dentsply Sirona, SS file by Kerr Dental, NiTi Pathfile and ProGlider by Dentsply Sirona, ESX by Brasseler USA.)

MANAGEMENT OF RISKS:

- Use enhanced magnification with illumination.
- Use stiff and small hand-files such as the C-files by Dentsply Tulsa Dental Specialties in Fig. 2 (above) and Fig. 23 (p. 125).
- Use NiTi files designed for negotiating small canals, such as X-Plorer by Clinician's Choice, Pathfiles and ProGlider by Dentsply Sirona, and Expeditor by Brasseler USA.



Fig. 5



Fig. 6

SCENARIO: Pulp stones

REASON FOR RISKS:

- Pulp stones in #14 seen radiographically and clinically in pulp chamber.

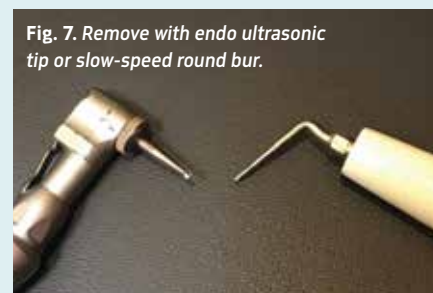


Fig. 7. Remove with endo ultrasonic tip or slow-speed round bur.

MANAGEMENT OF RISKS:

- Remove with endo ultrasonic tip or slow-speed round bur.

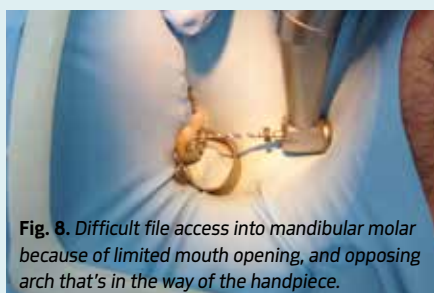


Fig. 8. Difficult file access into mandibular molar because of limited mouth opening, and opposing arch that's in the way of the handpiece.



Fig. 9. Pre-curved Typhoon NiTi files

SCENARIO: Difficult access to teeth

REASON FOR RISKS:

- Limited mouth opening.
- Posterior location of teeth.
- Long posterior teeth requiring long files, which make accessibility difficult.

MANAGEMENT OF RISKS:

- Use short files (i.e. 21 millimeters)
- Pre-curve stainless steel hand files to facilitate entry into endo access and canals.
- Use NiTi files with short shafts.
- Use NiTi files that can be pre-curved before accessing canals, such as WaveOne Gold by Dentsply Sirona or Typhoon by Clinician's Choice.

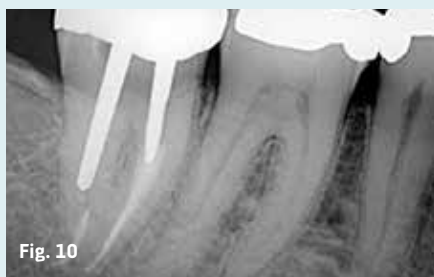


Fig. 10



Fig. 11. 25mm #30 in a patient with limited opening.



Fig. 12. Precurvable WaveOne Gold NiTi files with short shaft.



Fig. 13. Long (left) vs. short (right) NiTi file shafts.

and require many appointments. To them, this could translate into loss of confidence in you and your skills.

From a patient retention perspective, you must ask the following: What's the cost to your patients and your practice when you spend too long on a root canal or when it fails? The patient doesn't benefit and neither does your practice, because you may lose that patient, along with any referrals. As many of us (including myself) have found the hard way, good news is often taken for granted by patients, while bad news can

spread like wildfire. The cost to your practice of a failed root canal could be significant. This certainly is not a good thing when you want to keep your patients in your practice.

We can't discuss endodontic risks without touching upon the reality of legal hazards. Unfortunately, we live in a society that can easily be litigious. In fact, thanks in large part to the internet, it's become easy for patients to file complaints or take legal actions against dentists. Furthermore, if you didn't perform the root canal properly, your legal and monetary risks could be even greater.

Part 2: Clinical

There are clinical scenarios and teeth which present higher risks for clinical complications. Some of the more common scenarios with potential pitfalls are outlined in Table 2 (p. 122) and Table 3 (p. 125).

Clinical scenarios that may complicate endodontic procedures include: management of calcified and curved canals; presence of pulp stones; teeth and canals that are difficult to access because of their posterior location; a patient's limited opening; or the difficulty in visualizing canals in an endo access.¹ For

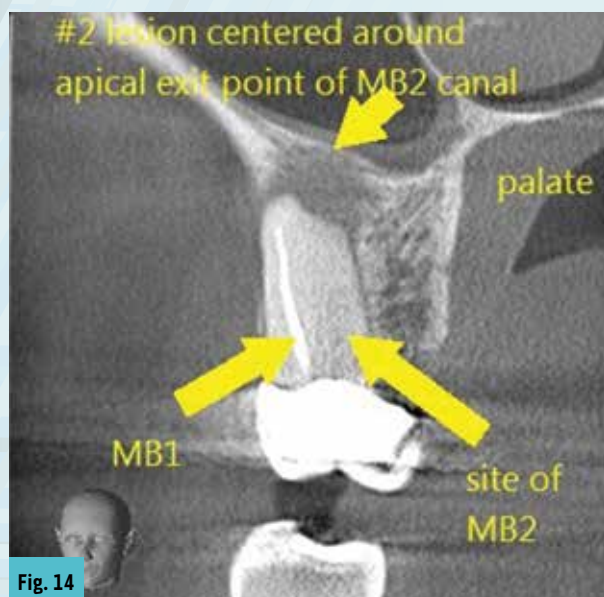


Fig. 14. Apical lesion centered around apical exit point of untreated MB2 canal (frontal plane).

Fig. 15. Bone loss around #3 MB root with untreated MB2 canal. Lesion around untreated MB2 canal in #3.

examples of scenarios and means to manage potential difficulties, refer to Table 2.

If a tooth seems too calcified or the roots too curved, or the tooth too difficult to access, then you and your patients may be better off with a referral to an endodontist. An endodontic headache mid- or post-treatment is not going to benefit anyone.

With respect to teeth, some present greater challenges clinically (Table 3).⁴ A couple of teeth to keep in mind are maxillary molars and maxillary lateral incisors.⁵ Maxillary molars may be more difficult for a couple of reasons

We are aware of the presence of the infamous MB2/fourth canal that should always be treated.⁶ However, it's well-known that locating and negotiating MB2 canals may be a challenge. An untreated MB2 canal could result in periapical pathology (Figs. 14 and 15). A less obvious issue with maxillary molars that often gets us in trouble is the curvature

of the palatal roots. Although these roots may seem straight in a 2-D radiograph, they often have an apical curvature to the buccal (Fig. 22). If this curvature isn't appreciated in advance and negotiated properly, it may ledge, block or transport the canal. Such a problem may translate to the inability to treat the most important part of the root's canal, the apical third.

The maxillary lateral incisor may seem easy and simple to treat but turn out to be the opposite. Maxillary lateral incisors are some of the most likely teeth to present with root canal failures.⁴ This is because no matter how they look in 2-D radiographs, they often have an apical disto-palatal curvature that must be carefully negotiated. Poor management of this curvature could compromise the procedure (Fig. 25).

In summary, these clinical scenarios and potentially difficult teeth may seem obvious to many of us, but there are still many dentists getting into trouble with them. Hence, they can't be stressed enough and need to be kept in mind when deciding whether to perform root canals in-house.

Final comments

I have been humbled many times in my career, so it's with sincerity that I ask you to consider and know your limits. In my endodontic practice, I mention to patients that an honest, humble and experienced

dentist knows how to judge the complexity of a case and when to refer to a specialist, instead of getting into trouble. This may sound patronizing toward my referring dentists but when done sincerely, those patients understand and walk away appreciating and respecting their dentists even more.

So, ask yourself if performing RCT is worthwhile for your patients and your practice. If you're proficient in performing root canal treatments and have the necessary armamentaria, go ahead and help your patients and your practice. If not, then perhaps it's best to let a specialist perform the endo, allowing you to not risk anything and your patients to return to you for the post-endodontic restorative work.

We face enough stresses in our practices. Why create more? ■

References:

- Hargreaves KM, Berman LH. *Cohen's Pathways of the Pulp*. 11th ed. St. Louis, MO: Elsevier; 2016.
- Bartols A, Laux G, Walther W. Multiple-file vs. single-file endodontics in dental practice: a study in routine care. *PeerJ*. 2016; 4:e2765
- Zanin AA, Herrera LM, Melani RF. Civil liability: characterization of the demand for lawsuits against dentists. *Braz Oral Res*. 18:30 (1) 2016.
- Iqbal, A. The factors responsible for endodontic treatment failure in the permanent dentitions of the patient reported to the college of dentistry, the university of Aljouf, Kingdom of Saudi Arabia *J Clin Diagn Res*. 2016 May; 10(5)
- Ng YL, Mann V, Rahbaran S, et al: Outcome of primary root canal treatment: systematic review of the literature. Part 2. Influence of clinical factors. *Int Endod J* 41:6, 2008.
- Schwarze T, Baethge C, Stecher T, Geurtsen W. Identification of second canals in the mesiobuccal root of maxillary first and second molars using magnifying loupes and operating microscope. *Aust Endod J*. 2002 Aug; 28(2): 57-60.



Discover more about endo from Dr. Manor Haas

The author covers even more endo topics in a new companion video to this CE piece. To find it, head to **dentaltown.com** and click "Magazine" to find the online version of this article.



Fig. 16. Potentially difficult maxillary first molar: curved MB root with two canals.



Fig. 17. Difficult visibility inside maxillary molar access.

SCENARIO: Maxillary molars (MB2 canals)

REASON FOR RISKS:

- Untreated MB2 canals.
- Difficulty instrumenting palatal root curvature (often to the buccal), resulting in ledging/blocking of canals.

HOW TO REDUCE RISKS:

- Know where and how to look for MB2 canals.
- Use enhanced magnification and illumination.
- Pre-curve SS hand files and use flexible NiTi files.

TABLE 3: RISKS AND MANAGEMENT of two potentially difficult teeth



Fig. 18. MB1 and MB2 and DB canals made possible under high magnification and illumination



Fig. 19. Zeiss microscope

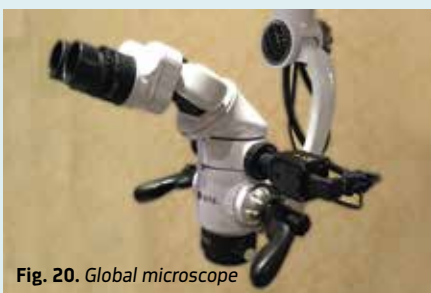


Fig. 20. Global microscope



Fig. 21. Designs for Vision Loupes with light

Maxillary molars Curved palatal roots



Fig. 22. Palatal root curving buccally



Fig. 23. Precurved SS hand files



Fig. 24. Disto-palatal apical curvature

SCENARIO: Maxillary lateral incisors

REASON FOR RISKS:

- Disto-palatal apical curvature not negotiated may result in apical ledging or block.

HOW TO REDUCE RISKS:

- Precurve SS hand files and use watch-winding motion.
- Use flexible NiTi files.

Fig. 25. Apical curvature not negotiated, resulting in an apical ledge.



Claim Your CE Credits

POST-TEST

Answer the test on the Continuing Education Answer Sheet and submit by mail or fax with a processing fee of \$36. Or answer the post-test questions online at dentaltown.com/onlinece. To view all online CE courses, go to dentaltown.com/onlinece and click the "View All Courses" button. (If you're not already registered on Dentaltown.com, you'll be prompted to do so. Registration is fast, easy and, of course, free.)

1. **Which of the following is false about performing root canals in-house?**
 - A. They help fill the schedule.
 - B. Patients often prefer treatment by their dentists.
 - C. May help increase production.
 - D. They pose no risks to the practice.
2. **Inefficiently performed root canals may increase office overhead.**
 - A. True.
 - B. False.
3. **Which maxillary molar canal is most commonly not treated?**
 - A. MB1.
 - B. MB2.
 - C. DB.
 - D. Palatal.
4. **Which of the following is not a complex clinical endodontic scenario?**
 - A. Calcified root canal.
 - B. Curved root canal.
 - C. Straight and large root canal.
 - D. Presence of pulp stones.
5. **Which of the following teeth is most likely to present with an endodontic failure?**
 - A. Maxillary central incisor.
 - B. Maxillary lateral incisor.
 - C. Maxillary canine.
 - D. Mandibular canine.
6. **The palatal roots of maxillary molars often curve buccally.**
 - A. T
 - B. F
7. **Which of the following does not help in treating calcified canals?**
 - A. Dental loupes
 - B. Dental microscope
 - C. Narrow tapered and flexible nickel titanium (NiTi) files
 - D. Gates Glidden drills
8. **In which direction do the apices of maxillary lateral incisors often curve?**
 - A. Labial
 - B. Palatal
 - C. Mesial
 - D. Disto-palatal
9. **Which of the following is not helpful when treating a molar in a patient with limited opening?**
 - A. NiTi files that can be precurved.
 - B. NiTi files with a short shaft.
 - C. NiTi files with a long shaft.
 - D. Endo handpiece with a small head.
10. **What statement is false about the use of enhanced magnification and illumination?**
 - A. They are helpful in locating calcified canals.
 - B. Such armamentaria help prevent endodontic mishaps.
 - C. They are not recommended for use in complex endodontic cases.
 - D. They are helpful in locating MB2 canals.

Legal Disclaimer: The CE provider uses reasonable care in selecting and providing content that is accurate. The CE provider does not represent that the instructional materials are error-free or that the content or materials are comprehensive. Any opinions expressed in the materials are those of the author of the materials and not the CE provider. Completing one or more continuing education courses does not provide sufficient information to qualify participant as an expert in the field related to the course topic or in any specific technique or procedure. The instructional materials are intended to supplement, but are not a substitute for, the knowledge, expertise, skill and judgment of a trained health-care professional.

Licensure: Continuing education credits issued for completion of online CE courses may not apply toward license renewal in all licensing jurisdictions. It is the responsibility of each registrant to verify the CE requirements of his/her licensing or regulatory agency.

CONTINUING EDUCATION ANSWER SHEET

Instructions: To receive credit, complete the answer sheet and mail it, along with a check or credit card payment of \$36, to: Dentaltown.com, 9633 S. 48th St., Suite 200, Phoenix, AZ 85044. You may also fax this form to 480-598-3450 or answer the post-test questions online at dentaltown.com/onlinece. This written self-instructional program is designated for 1.5 hours of CE credit by Farran Media. You will need a minimum score of 70 percent to receive your credits. Participants pay only if they wish to receive CE credits; thus no refunds are available. **Please print clearly. This course is available to be taken for credit May 1, 2017, through its expiration on May 1, 2020. Your certificate will be emailed to you within 3–4 weeks.**

Endo Risks and Benefits

by Dr. Manor Haas

License Number _____

AGD# _____

Name _____

Address _____

City _____ State _____ ZIP _____

Daytime phone _____

Email (required for certificate) _____

☐ **Check** (payable to Dentaltown.com)

☐ **Credit Card** (please complete the information below and sign; we accept Visa, MasterCard and American Express.)

Card Number _____

Expiration Date – Month / Year _____ / _____

Signature _____ Date _____

CE Post-Test

1. A B C D
2. A B
3. A B C D
4. A B C D
5. A B C D
6. A B
7. A B C D
8. A B C D
9. A B C D
10. A B C D

Please circle your answers.

Program Evaluation (required)

Please evaluate this program by circling the corresponding numbers: (5 = Strongly Agree to 1 = Strongly Disagree)

- | | | | | | |
|--|---|---|---|---|---|
| 1. Course administration was efficient and friendly | 5 | 4 | 3 | 2 | 1 |
| 2. Course objectives were consistent with the course as advertised | 5 | 4 | 3 | 2 | 1 |
| 3. COURSE OBJECTIVE #1 was adequately addressed and achieved | 5 | 4 | 3 | 2 | 1 |
| 4. COURSE OBJECTIVE #2 was adequately addressed and achieved | 5 | 4 | 3 | 2 | 1 |
| 5. COURSE OBJECTIVE #3 was adequately addressed and achieved | 5 | 4 | 3 | 2 | 1 |
| 6. COURSE OBJECTIVE #4 was adequately addressed and achieved | 5 | 4 | 3 | 2 | 1 |
| 7. COURSE OBJECTIVE #5 was adequately addressed and achieved | 5 | 4 | 3 | 2 | 1 |
| 8. Course material was up to date, well-organized, and presented in sufficient depth | 5 | 4 | 3 | 2 | 1 |
| 9. Instructor demonstrated a comprehensive knowledge of the subject | 5 | 4 | 3 | 2 | 1 |
| 10. Instructor appeared to be interested and enthusiastic about the subject | 5 | 4 | 3 | 2 | 1 |
| 11. Audio-visual materials used were relevant and of high quality | 5 | 4 | 3 | 2 | 1 |
| 12. Handout materials enhanced course content | 5 | 4 | 3 | 2 | 1 |
| 13. Overall, I would rate this course (5 = Excellent to 1 = Poor): | 5 | 4 | 3 | 2 | 1 |
| 14. Overall, I would rate this instructor (5 = Excellent to 1 = Poor): | 5 | 4 | 3 | 2 | 1 |
| 15. Overall, this course met my expectations | 5 | 4 | 3 | 2 | 1 |

Comments (positive or negative): _____

For questions, contact Director of Continuing Education Howard Goldstein at hogo@dentaltown.com.