



ioRinse RTU: An Effective Pre-treatment Rinse

Gordon's Clinical Observations: Recent research has reported significant quantities of SARS-CoV-2 virus in the oral cavity and saliva. Over the past months you have seen many mouthrinse promotions claiming various levels of deactivation of this virus. Unfortunately, the claims are based solely on clean laboratory tests that ignore the challenges presented by oral cavity secretions which can neutralize many antiseptics. *The information below reports on the performance of a patented iodine antiseptic in controlled testing in the presence of fresh human whole saliva that validates virus inactivation under more realistic conditions.*



Mouth rinsing is a widely accepted practice for antiseptic, therapeutic, and cosmetic purposes. Now in the midst of COVID-19, mouth rinsing to inactivate the causative virus within the oral cavity is paramount in the minds of both dental clinicians and the general public. Many mouthrinse products have been suggested based on intuition, empirical evidence, or lab tests that make no attempt to replicate the complex oral environment challenges. In the oral cavity, many components in saliva interfere with a formulation's kill potential (*very high numbers of a wide variety of microbes, complex proteins, debris from soft tissues and food, etc.*). **Clinical information on ioRinse RTU used as a pre-treatment rinse is contained on pages 2 and 3.**



Figure 1. ioRinse RTU (Ready-To-Use) is a 100 ppm molecular iodine rinse available in two flavors: Mint-Apple (left) and Cinnamon Burst (right).

Continued on Page 2

Broken-Down Teeth: Restore or Remove?

Gordon's Clinical Observations: Every general dentist must place tooth build-ups and posts and cores routinely. However, clinical challenges continue with some restorations breaking or coming off in service. What are the best materials and techniques? *CR clinicians and scientists provide information for you concerning the best materials and specific clinical procedures for production of optimum long-lasting results.*

What are possible treatment choices when a patient has a badly broken-down tooth? Are we quick to suggest extraction? Can retention of the natural tooth minimize trauma, maintain natural proprioception and provide long-term function? This report discusses the viability of saving a broken-down yet "restorable" natural tooth. What are tooth restorative criteria? What is the treatment procedure? What products are the best? How strong are these restored teeth? What is the long-term prognosis?



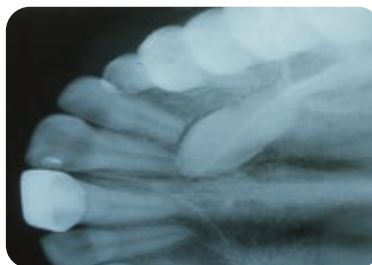
Broken down molar needs post-core build-up for fixed prosthesis

Continued on Page 3

What Causes Tooth Resorption and What To Do About It

Gordon's Clinical Observations: Why do you frequently see resorption? Which reasons are unavoidable? Which reasons are preventable? What techniques are dentists using for resorbed areas? Are there new materials for treatment that are promising? Will third-party payers support and pay for the procedures? *CR clinicians, scientists, and a CR practitioner survey answer these questions and make clinical suggestions for you.*

- Many potential causes have been reported for resorption.
- CR survey on tooth resorption shows agreement on potential causes of resorption.
- Resorption occurs both internally within the tooth and externally.
- External resorption is more commonly observed than internal resorption.



- CR oral surgery consultants have reported malignancies associated with tooth resorption.
- Osteoclasts are the key cells in causing tooth resorption.
- Treatment of resorption is controversial and unpredictable.
- Numerous reports on increase of tooth resorption.
- Most dentists attempt to treat resorption.

Continued on Page 5

Products Rated Highly by Evaluators in CR Clinical Trials

The following four products were rated excellent or good by CR Evaluator use and science evaluations.

1 SimpliShade,
Kerr

2 UltraDose WaveCheck,
L & R Mfg. Company

3 Zipbond,
SDI North America

4 Umbrella Tongue, Lip and
Cheek Retractor, Ultradent

Continued on Page 8

ioRinse RTU: An Effective Pre-treatment Rinse *(Continued from page 1)*

More realistic testing and transparency in marketing of antimicrobials of all types are critical because the product claims are often the only information clinicians have easy access to, and ultimately their choices are based on these claims. In healthcare environments, these choices directly affect the health, safety, and quality of life of many people (*clinicians and patients*) who are all trusting the dentist for protection from cross-contamination. The report below provides unbiased pertinent information on controlled testing at an independent laboratory (*BioScience Laboratories in Bozeman, MT; advised by TRAC Research*) that included the clinical challenge of fresh human whole saliva collected and pooled from 10 non-Covid-19 infected adult humans.

1. How does the performance of ioRinse RTU compare to other products suggested for Covid-19 pre-treatment rinsing?

Major Active Ingredient	60-Second Log ₁₀ Reduction ■ NO SALIVA PRESENT	60-Second Log ₁₀ Reduction ■ SALIVA PRESENT
0.01% (100 ppm) molecular iodine	5.75*	5.25*
3.8% “foaming” hydrogen peroxide	≥3.35♦	Not Tested♦
0.2% povidone iodine	3.0*	Not Tested*
0.12% chlorhexidine gluconate	1.0*	Not Tested*
1.5% hydrogen peroxide	<1.0*	Not Tested*

■ “Log₁₀ reduction” is a mathematical term showing the relative number of live microbes eliminated. In this case, the larger the number, the better the antiseptic kill.

* BioScience Laboratories, Bozeman, MT

♦ Biochem Laboratory, Round Rock, TX

* Utah State University, Institute for Antiviral Research, Logan, UT

Clinical Interpretation of Information in the above Chart:

- Initially, povidone iodine and hydrogen peroxide were both suggested as pre-treatment oral rinses for SARS-CoV-2 management, and both are now in popular use by clinicians. However, neither have confirmed virus inactivation in the presence of fresh human oral fluids. As listed above, continuing research is showing other formulations to be preferable for SARS-CoV-2 oral reduction.
- In the iodine category, molecular iodine 0.01% (100 ppm ioRinse RTU) showed almost twice the virus reduction as 0.2% povidone iodine, with or without the fresh human whole saliva challenge.
- In the hydrogen peroxide category, 3.8% “foaming” hydrogen peroxide showed higher virus reduction than 1.5% hydrogen peroxide.
- Chlorhexidine gluconate formulations currently on the U.S. market have shown low antiviral activity, but have been useful against oral and skin bacteria.

2. What is the formulation of ioRinse RTU, and how is it different from other iodine-based oral antiseptics?

IoRinse is a patented formulation that contains 100 ppm molecular iodine, water, potassium iodate, citric acid, zinc gluconate, flavoring, and sodium saccharin. The unique feature of this patented, pale amber colored, non-staining formulation is the **100 ppm molecular iodine (free iodine)**, which increases its biocidal activity and decreases its toxicity. (For example, 10% Betadine, a well-known healthcare antiseptic, contains about 30,000 ppm total iodine, but only about 3 ppm of that is **molecular iodine, which is the only biocidal iodine component**. Most of the Betadine formulation contains iodine derivatives bound to a large molecule called polyvinylpyrrolidone (popular designation “PVP-I”), all of which causes the formulation to have lower biocidal activity, and the iodine staining and irritation familiar to clinicians. The same is true of all iodine formulations known as iodophors and povidone iodine.)

3. Is testing in the presence of fresh human whole saliva important?

YES. Secretions in the upper respiratory tract can: 1) neutralize antiseptics and 2) cover, coat, and protect the virus from exposure (*see Figure 2*). In the oral cavity, saliva can act these same ways. Product claims for antiseptic kill based solely on clean laboratory tests fail to provide clinicians with essential **realistic** information. IoRinse RTU 100 ppm molecular iodine formulation was not substantially affected by presence of fresh human whole saliva (*see chart above*).

4. Should I buy the ioRinse RTU (Ready-To-Use) or ioRinse Concentrate for my office and patients to use for rinsing?

For rinsing, ioRinse RTU should be used. The ioRinse Concentrate is not flavored and is formulated for use in irrigators at the 50 ppm concentration. As packaged, ioRinse RTU is already at the correct dilution and dispensed in compatible packaging. Although diluting the 500 ppm ioRinse Concentrate to 100 ppm for rinsing reduces the per ounce cost, mistakes are often made with on-the-spot dilutions and, most important, the composition of bottles and caps chosen for storage after dilution are critical to avoid iodine vapor leakage with associated staining and loss of activity.

5. How should ioRinse RTU be used clinically?

Two 30-second consecutive rinses.

- Once the patient is seated in the operatory, hand the patient **two** 4 oz disposable cups (*one in each hand*)—one empty and one containing 2 oz of ioRinse RTU (*a 1 oz dispensing cup comes with each bottle of ioRinse RTU*).
- Ask the patient to swish half the liquid in cup #1 for 30 seconds (*clinician should time the swishing*).
- Expectorate into the empty cup #2.
- Swish the remaining liquid 30 seconds and expectorate into either cup.
- Clinician pour the expectorate down the operatory sink drain, **and water flush**.

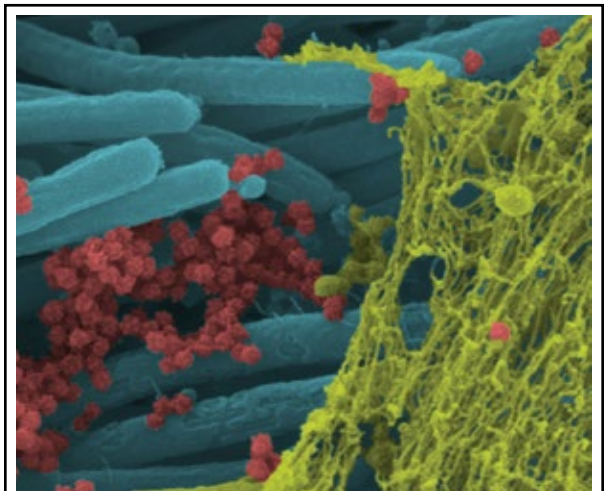


Figure 2: Color-rendered scanning electron microscope image of the SARS-CoV-2 virus (red) among the cilia in the upper respiratory tract (blue) in an infection showing the mucous coverage (yellow) that can interfere with the kill potential of antiseptic rinses.

(Camille Ehre, PhD, cehre@med.unc.edu)

ioRinse RTU: An Effective Pre-treatment Rinse (Continued from page 2)

6. How long does ioRinse RTU reduce the oral SARS-CoV-2 virus count?

An after-rinse “safe period” cannot be clinically determined or guaranteed. Many unpredictable variables, such as virus load, replication rate, thoroughness of rinsing, etc., contribute to clearance time. Rinsing does not **sterilize** the oral cavity (*kill all microbes present*), it simply lowers organism numbers. One virologist compared oral rinsing to use of windshield wipers during a rainstorm—it helps, but not for long! Clinically, this means for restorative procedures, immediately after rinsing, apply a dam to **isolate the treatment site from saliva**, and paint the treatment site with the rinse to disinfect it before beginning excavation. For soft tissue procedures, use re-rinsing, plus careful close proximity of the high velocity suction tip (*HVE tip 1–2 mm from operating instrument*) throughout the procedure. *For added safety, have all patients re-rinse before leaving the operatory.* **Rinsing is not a stand-alone procedure, but is one step in the “multi-layered” infection control process that includes use of full-coverage PPE, surface disinfectant, air purification, screening of all who enter the office, etc.**

7. Are there contra-indications to use of ioRinse RTU?

YES. The manufacturer states not for use by persons with known sensitivity to iodine or any of the other ingredients listed on the label, children younger than six years of age, and anyone whose physician declines use due to underlying medical conditions.

8. Where can ioRinse RTU be purchased, and what is its retail list price?

ioTech International website (www.iotechinternational.com) or **phone** (561-509-0205 Ext. 5)

Cost to professionals: \$135.60/Case (twelve 1-liter bottles)

(Also available through many dental suppliers.)

TRAC RESEARCH CONCLUSIONS: Although rinsing with an antiseptic does not **assure** safety, it is one of several logical steps to lower microbe concentrations in preparation for dental treatments. Currently, ioRinse RTU is one of the only commercially available antiseptic rinses that has performed well in controlled testing using the SARS-CoV-2 Wuhan strain virus in the presence of fresh human whole saliva pooled from 10 healthy adults. **All types of products used to control clinical cross-contamination need this same type of independent testing under rigorous clinical conditions to validate efficacy before use with patients.**

CR DENTISTRY UPDATE—All New Course Material for 2021!

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Broken-Down Teeth: Restore or Remove? (Continued from page 1)

CR Survey on Core Build-Ups (n=845)

- **93% of surveyed dentists place core build-ups.**
- **Core materials:** 16.4% Build-it FR (*Pentron*), 10% CorePaste XP (*DenMat*), 6.6% Fuji II LC (*GC America*), 5% Absolute Dentin (*Parkell*), 4% Luxacore Z (*DMG America*), 19% various composite resins, 3% amalgam
- **Core bonding agents:** 24% Scotchbond Universal (*3M*), 23% Clearfil SE Bond (*Kuraray Noritake*), 11% OptiBond eXTRA Universal (*Kerr*), many others found in individual core build-up kits
- **Canal Post Adhesive:** 50% RelyX Unicem 2, 11% Panavia SA Universal (*Kuraray Noritake*), 5% Maxcem Elite (*Kerr*)
- **Pins:** 41% use Filpin (*Filhol*) pure titanium, 30% titanium alloy, 17% stainless steel gold plated, 11% stainless steel.
- **Posts placed by dentists:** 45% frequently, 52% less frequent.
 - 40% in one third, 18% in one half, and 9% in three quarters of endodontically treated teeth

- **Post types:** (n=845): 59% fiber-reinforced composite, 15% titanium alloy, 14.6% stainless steel (*check: allergy to nickel*)
 - Fiber-reinforced brands (n=445): 29% Parapost Fiber (*Coltene*), 23% FibreKleer and FibreKor (*Pentron*), 16% RelyX Fiber (*3M*), 6% Endosequence (*Brasseler*)
 - Post radiolucency: 89% radiopaque, 9.5% translucent
 - Metal post brands (n=285): 61% Parapost (*Coltene*), 24% Flexi-Post (*EDS*)
- **Are post-core teeth strong?** 60% yes, 40% no
- **Post-core root breakage:** Seen in about 15% of teeth.
- **Biologic width needed:** 34% 3 mm, 30% 2 mm
- **Osseous crown-lengthening:** 81% would consider it, 59% refer

Survey was extensive and very enlightening. There were multiple supplemental responses to products and techniques.

Pre-Treatment Observations

- **Based on subject clinical experience,** is there 50% or more of the original full crown remaining? If supragingival tooth structure is sound, restorative treatment can be successful.
- **Treatment alternatives:** A) Core build-up, and B) Endodontics with or without post-core build-up; either of these procedures, A or B, may be enhanced with the use of pins. C) Occasionally, orthodontic extrusion of anterior teeth and some single-rooted pre-molars is an excellent treatment.



Pins and Posts—Osseous crown lengthening needed

Broken-Down Teeth: Restore or Remove? (Continued from page 3)

Treatment Restorative Criteria

- **Ferrule (circumferential):** **Key to success.** **CR Survey:** 62% require 2 mm or more. 17% would like 3 mm or more.
- **Periodontal health:** Sufficient healthy bone, gingival tissue, gingival sulcus, and acceptable facial–gingival contour.
- **Multiple teeth:** Occlusal forces are equalized better with more teeth, especially immediately adjacent teeth.
- **Balanced occlusion:** Multiple teeth involved in group excursive movements minimize stress on built-up teeth.
 - **Special care with endodontically treated maxillary canines.** Ensure adequate ferrule and post core build-up.
- **Bruxism:** Without the above factors for support, build-ups may be contraindicated in patients with severe bruxism.
- **Clenching:** Depending on severity and possible use of protective splints, build-ups may be contraindicated.
- **Cracks:** If cracks penetrate subgingival root structure, a build-up should not be attempted.
- **Evaluate pulpal health:** Core build-up? *Endodontics*—post—core build-up? *Orthodontic extrusion*—Extract?
- **Coronal treatment:** **Full coronal coverage** recommended in all cases, deters recurrent decay and strengthens tooth.
- **Broken off at gingival line:** *Posterior teeth*—extract. *Anterior teeth*—possible orthodontic extrusion or extract.
- **Fixed Prosthesis Support:** Post recommended for endodontically treated teeth.
- **Questionable Prognosis?** **Know when extraction is preferred rather than heroics.**
- **After recommendations and alternatives are given,** listen to patient, document treatment to be performed, and record informed consent.

Core Build-Up Technique

- 1. Pre-operative considerations:** If all criteria are positive and no osseous surgery or extrusion needed, proceed.
- 2. Photograph:** Shade check, gingival margin alignment, occlusal and interdental position.
- 3. Anesthetize tooth.**
- 4. Temporize:** Temporary crown form or restoration may be needed to develop shape.
- 5. Prevent contamination:** Rubber dam, Isolite (Zyris), cotton rolls, NeoDrys (Microcopy), OptraGate (Ivoclar Vivadent), etc.
- 6. Pre-crown preparation:** Verify crestal bone, biologic width, and adequate ferrule. Prepare to the gingival margin.
- 7. Crown length:** *Excess gingiva?* Evaluate for possible gingivectomy at final preparation.
- 8. Retraction cord:** Place first retraction cord filling the deepest half of the gingival sulcus.
- 9 Intra-coronal preparation:** Debride intra-coronal space and place mechanical retention.



Step 10: Filpin Drill and Pure Titanium Pin by FilHol



Step 11: Tempered Copper Tube Matrix with Build-Up



Step 16: Core Build-up and Post-Core Build-up

- 10. Pin placement option:** **CR Survey:** 41% Filpin (Filhol) pure titanium, 2 mm from walls; avoid pulp horns; bend toward center.
- 11. Matrix placement:** Gripper Soft Copper Band (Parkell), Greater Curve Band (Tofflemire), or Preformed Bands (Denovo)
- 12. Disinfect and desensitize:** Gluma (Kulzer), Microprime G (Zest Dental Solutions), G5 (Clinicians Choice), etc.
- 13. Pulpal protection:** Vitrebond Plus (3M), GC Fuji LINING LC (GC America), TheraCal LC (Bisco Dental), NeoMTA 2 (Avalon Biomed), Endo-Eze MTA Flow (Ultradent)
- 14. Core material shade:** Match final restoration. **CR Survey:** 56% no contrast, 44% contrast core
- 15. Etch, prime, and bond:** Line chamber with thinned self-etch cement or use a separate bonding agent. Cure.
- 16. Core placement:** Carefully place core material, cover pins, retentive areas, all internal surfaces. Cure.
- 17. Crown preparation:** ≥ 2 mm ferrule, gingivectomy, if needed; margin to be 1/2 mm subgingival.
- 18. Second cord:** Place then remove, and final impression.
- 19. Temporize:** LuxaCrown (DMG America), Integrity Multi-Cure (Dentsply Sirona), Protemp Plus (3M), etc.

Post-Core Build-Up Technique—Endodontic Teeth

- 1. Numbers 1–9 listed above**
- 2. Canal selection:** Canal diameter to be as small as possible so as not to weaken root.
 - **Anterior teeth:** One canal; one post; pin placed to lingual increases strength.
 - **Premolars:** One or two canals; one or two posts and/or pins
 - **Posterior teeth:** Multiple *non-parallel* posts, if possible, provide best core retention and strength.
- 3. Prepare canal(s):** *Slowly, carefully,* use kit “sized drill(s);” prepare canal(s) to 1/2 of bony supported root length, less length if root curve present.
- 4. Roughen canal walls** with *hand diamond reamer*, debride, clean, then dry with paper points.
- 5. Fiber-reinforced post(s):** “Passive” parallel or tapered posts. **CR Survey:** 89% prefer radiopaque. X-ray to verify fit.
- 6. Trim posts to length:** Fit post(s) within planned build-up height. Mark, remove, then cut with diamond bur.
- 7. Numbers 10, 11, and 12 listed above:** Pins (*if needed*), matrix, disinfect.



Two fiber posts in place 1/2 the bony supported root length



Canal drill and canal diamond reamer (step 3)

Clinicians Reports

- April 2020
- August 2018
- July 2015
- July 2013
- January 2011

Continued on Next Page

Broken-Down Teeth: Restore or Remove? (Continued from page 4)

Post-Core Build-Up Technique—Endodontic Teeth (Continued)

8. **Bond and cement:** *CR Survey:* 50% use RelyX Unicem 2 (3M). Insert post(s), hold and cure.
9. **Numbers 14–19 listed above:** Choose shade, etch, bond, place core, crown prep, impression, temporary crown.

Billing Codes (ADA 2020 National Fee Survey)

- **D2949:** Fillers. Non-payable code.
- **D2950:** Build-up including pins. \$282. This code is abused, probably in order to get decent price for crown. Send corroborating photo showing pin(s) and build-up.
- **D2952:** Post and core in addition to indirectly fabricated crown. \$416
- **D2954:** Prefab post and core in addition to crown (two appointments). \$348

CR CONCLUSIONS: Broken-down teeth meeting proven criteria with *mandatory* ≥ 2 mm circumferential ferrule can be restored.

- 845 dentists surveyed and previous Clinicians Report evaluations provide suggested materials and techniques.
- CR strongly suggests fiber-reinforced composite posts, pure titanium pins, and self-etch adhesives.
- Saving broken-down teeth, having the restorative characteristics described, is better than placing an implant.
- The proven restorative techniques written here, with alternatives, are presented to the patient for their consideration.
- Patients will make their informed decision based on their present situation: age, finances, appearance, tolerance, and trust.
- Previous reports on this subject can be found online at www.CliniciansReport.org—see *Clinicians Reports* listed on page 4.

What Causes Tooth Resorption and What To Do About It (Continued from page 1)

Current State of Diagnosis and Treatment for Tooth Resorption (CR Survey n=567)

• Reported causes as observed by respondents (multiple choices requested):

- 70% Orthodontic tooth movement, conventional and aligners
- 64% Traumatic accident
- 33% Traumatic occlusion
- 18% Bruxism
- 13% Deep restoration
- Others: perio treatment, tooth whitening, cyst, tumor, close proximity to implants

• Treatment used MOST:

- 33% Extraction
- 30% Remove resorptive material, root canal, place bioactive material, restore
- 17% Remove resorptive material, place bioactive material, restore
- 20% Other

• Liner: bioactive material used MOST in resorption site:

- 30% MTA (mineral trioxide aggregate)
- 27% RMGI (resin-modified glass ionomer)
- 14% Calcium hydroxide
- 14% GI (glass ionomer)
- 6% Calcium silicate
- 10% Other

• Treatment success:

- 6% Excellent
- 29% Good
- 47% Fair
- 19% Poor

CR Survey Showed:

- Many causes; orthodontics and trauma were most reported.
- Mineral Trioxide Aggregate (MTA) and RMGI were most common bioactive materials used.
- One-third of respondents stated that they just extract resorbed teeth without other treatment.
- Reported treatment success varied from poor to excellent, but 81% reported some success.

What is Tooth Resorption?

Tooth resorption is a non-painful, gradual destruction of tooth structure caused primarily by osteoclasts producing resorption lacunae supported by macrophages, fibroblasts, and numerous blood vessels. Resorption may be internal within the tooth or external. Both occur infrequently and are most commonly associated with orthodontic tooth movement or trauma to the tooth. Unperforated lesions are more successfully treated than perforated lesions. Successful treatment is possible in selected cases. Early diagnosis and treatment is most successful.

► Preventing Tooth Resorption

- **Avoiding excessive force and fast movement in orthodontics.** The use of aligners by patients who are relatively unsupervised is commonplace. Dentists should caution patients about having professional observation and counsel on use of aligners.
- **Stabilizing traumatized teeth with temporary splinting.** Such splinting with composite resin and reinforced fiberglass products is suggested (example: *Ribbon*).
- **Impacted teeth. This may be news to some of you.** The CR surgical dentists involved with composing this article reported numerous resorption situations associated with impacted teeth, including third molars, canines, and other teeth not aligned appropriately for eruption (see Figure 1). The old adage “let a sleeping dog lie” may not be a good decision. If impacted teeth are allowed to remain in the mouth for whatever reason, very close observation at normal re-care appointments is strongly suggested.
- **Observation and follow-up of traumatized teeth.** Accidental trauma to teeth is often unavoidable. Traumatized teeth should be followed-up subsequent to the trauma to allow early treatment of resorption should it begin to occur.

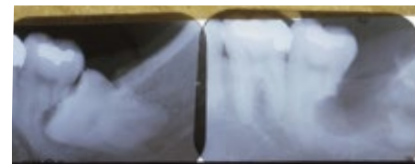


FIGURE 1: Severe adjacent tooth resorption next to an impacted tooth

► When to Treat Tooth Resorption

- **If the patient accepts** the following potential challenges related to this procedure and the lesions looks treatable, treat it.
- **If previous patient, check older radiographs** to determine if a small part of the lesion might have been present in the older radiographs. If it appears to be growing rapidly, be cautious about treating.
- **Estimate how much tooth structure will be remaining** if the lesion is treated. If you judge the tooth strength will be adequate after removing the resorbed area and questionable surrounding tooth structure, treat it.
- **Large non-perforated resorption area** in root canals are extremely difficult to treat without significantly opening the canal for treatment and weakening the tooth, be cautious about treating.
- **The chances for clinical success are good** if the technique is accomplished adequately.

What Causes Tooth Resorption and What To Do About It (Continued from page 5)

What is Tooth Resorption? (Continued)

► Informed Consent is Necessary for Treatment

When treating patients who have tooth resorption, candid informed consent is suggested. Since successful treatment is not assured, patients should be advised of the risks relative to treatment of resorption and provided with the alternative which is primarily extraction without treatment.

► Early Diagnosis and Treatment Advised

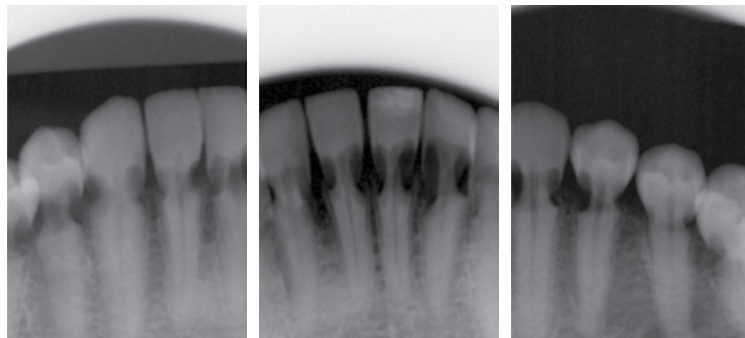
Dentists should be looking for resorptive lesions when doing routine recall appointments. Early treatment is far easier and more successful than waiting. *Figure 2* shows the result of orthodontic resorption in an 18-year-old female. The teeth could have possibly been saved with early diagnosis, but they were extracted.

► Suggested Treatment Materials for Tooth Resorption

Dentistry needs more materials that stimulate tooth structure repair and replacement. Recognized and proven ones are:

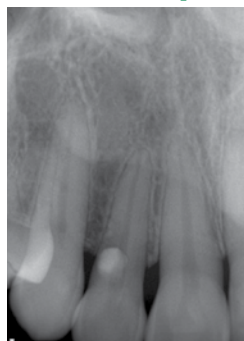
- MTA (Mineral Trioxide Aggregate)
- Resin-modified glass ionomer
- Calcium hydroxide
- Glass ionomer
- Calcium silicate

FIGURE 2: Resorption in an 18-year-old female patient

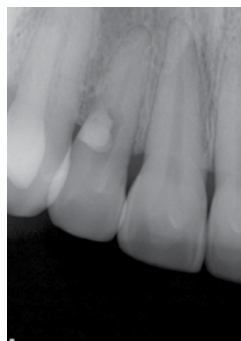


Suggested Technique for Treating Tooth Resorption

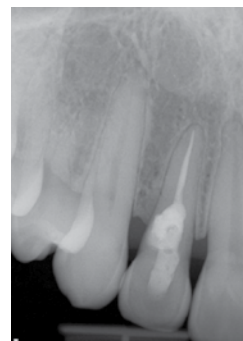
- 1. Radiograph:** Periapical, but prefer cone beam also.
- 2. Diagnosis and treatment plan.**
- 3. Informed consent** for patient including all alternatives.
- 4. Dry operating field,** clamp and dam, or soft tissue flap, clamp and dam, cord, etc. If resorption is perforated to the tooth external and is below bone or deeply subgingival, making a flap of soft tissue extending the incision at least to the apical extent of the resorption and reflecting it at least one or two teeth away from the lesion is often necessary. Careful suturing and patient caution usually allows esthetically acceptable healing.
- 5. Remove obvious resorbed tooth structure.**
- 6. Remove at least 1 mm of apparently healthy additional tooth structure** all around the resorptive lesion.
- 7. Place two 1-minute applications of glutaraldehyde containing product** (examples: Gluma, Microprime). Don't wash off—suction only.
- 8. Place MTA material** of your choice in the preparation (*Figure 3*).
- 9. Place bonding agent** of your choice and cure.
- 10. Place composite, glass ionomer, resin-modified glass ionomer, or amalgam.**
- 11. Instruct patient** about what to expect.



Initial observation



Before endo, flap, removal of all resorption and 1+ mm into solid tooth.



Completion of endo



Three years later

FIGURE 3



Endo-EZE MTA Flow, Ultradent



NeoMTA 2, Avalon Biomed

Third-Party Payment for Resorption Treatment

See pages 23–25 of the 2021 ADA booklet *Current Dental Terminology* for numerous codes relating to tooth resorption, and select those related to the specific condition you are treating.

Mineral Trioxide Aggregate (MTA) for the following indications:

- Direct and indirect pulp capping
- Partial pulpotomy
- Cavity liner and base
- Pulpotomy and apexogenesis
- Perforation repair
- Root resorption
- Sealing
- Obturation
- Root apexification
- Root-end filling

CR CONCLUSIONS:

- Include observation and diagnosis of resorption in normal exams.
- The condition is unpredictable.
- Educate and advise patient about expected success.
- Early treatment is more successful.
- Attempt treatment only if the situation looks appropriate.
- Follow-up on a routine basis.
- Keep complete records of your procedure for future decisions.
- **Successful treatment is possible and should be attempted.**

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Earn 1 credit hour for successfully completing each test. Tests are also available at www.CliniciansReport.org. This is a self-instruction program.

At the completion of this test, participants should be able to:

- Evaluate ioRinse RTU as a pre-treatment rinse
- Treat tooth resorption
- Determine treatment alternative for patients with broken-down teeth
- Evaluate new products and their potential clinical usefulness

Self-Instruction Test, April 2021, 1 CE Check the box next to the most correct answer.

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- Human oral secretions can cause antiseptic mouthrinses to:
 - ☐ A. Dry oral tissues.
 - ☐ B. Decline in kill potential.
 - ☐ C. Increase in kill potential.
 - ☐ D. None of the above
- Pre-treatment rinsing can assure prevention of cross-contamination between patient and clinician.
 - ☐ A. True
 - ☐ B. False
- Endodontically broken-down teeth can be considered restorable if:
 - ☐ A. 2–3 mm circumferential ferrule is present.
 - ☐ B. Adequate posts and/or pins are possible.
 - ☐ C. Complete patient informed consent has been provided.
 - ☐ D. All of the above
- A factor that may be detrimental to long-term core build-up success is:
 - ☐ A. Balanced occlusion.
 - ☐ B. Adjacent healthy teeth present.
 - ☐ C. Clenching.
 - ☐ D. Full coronal restorative.
- The most commonly used liner for treating resorption was reported to be:
 - ☐ A. Calcium hydroxide.
 - ☐ B. Glass ionomer.
 - ☐ C. Resin-modified glass ionomer.
 - ☐ D. Mineral trioxide aggregate.
- The article on tooth resorption suggested:
 - ☐ A. Extracting all resorbed teeth.
 - ☐ B. Treatment of selected resorptive areas should be attempted.
 - ☐ C. Extracting all impacted third molars.
 - ☐ D. Treating all resorptive areas to see if they will respond positively.
- SimpliShade is a resin-based composite system:
 - ☐ A. Based on previous durable brands.
 - ☐ B. With light, medium, dark, opaque, and bleach shades.
 - ☐ C. That easily accomplished the best match of surrounding dentition.
 - ☐ D. All of the above
- UltraDose WaveCheck is an enzymatic solution that changes color when it needs to be changed.
 - ☐ A. True
 - ☐ B. False
- Zipbond is a universal adhesive with:
 - ☐ A. Ease of dispensing and application.
 - ☐ B. Bond to multiple surfaces.
 - ☐ C. MDP monomer.
 - ☐ D. All of the above
- Umbrella Tongue, Lip, and Cheek Retractor conveniently retracts lips, cheeks, and tongue.
 - ☐ A. True
 - ☐ B. False

To receive credit, all 2021 tests are due by
DECEMBER 15, 2021

Submit your test answers online at www.CliniciansReport.org and receive immediate results;
 mail to Clinicians Report, Attn CE Tests, 3707 N Canyon Rd, Bldg 7, Provo UT 84604;
 fax 888-353-2121; or scan and email to CR@CliniciansReport.org

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Products Rated Highly by Evaluators in CR Clinical Trials *(Continued from page 1)*

“Smart-Matching” Composite with Best Match Overall Can Simplify Resin-Based Composite Inventory

SimpliShade Kerr



\$100/20 Unidose (light or medium); **\$68/10 Unidose** (dark, bleach white, or universal opaque)

SimpliShade is based on previous durable composites, including Harmonize and Herculite Ultra, which had excellent overall results in CR clinical trials. It has five shades (*light* for A1, B1, B2, C1, D2; *medium* for A2, A3, C2, D3, D4; *dark* for A3.5, A4, B3, B4, C3, C4; *universal opaque*; and *bleach white*). Shade-match was better than with many 16–30 shade brands according to tests at the University of Utah and CR Dental Test Clinic. Shade tabs are used to determine the best shade. Reducing inventory of shades has cost advantages and simplifies resin-based composite procedure.

Advantages:

- Non-stick, easy handling
- Shade match was accomplished easily
- Initial polish accomplished easily
- Lower price than many multiple-shade composite systems

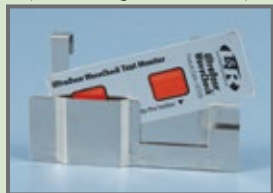
Limitation:

- Practitioners experienced hard visible lines when opaquer was not used for Class IV restorations greater than 2 mm or when adding length.

CR CONCLUSIONS: 75% of 24 CR Evaluators stated they would incorporate SimpliShade into their practice. 88% rated it excellent or good and worthy of trial by colleagues.

Ultrasonic Cleaner Indicator Provides Visual Assurance of Adequate Instrument Debris Removal

UltraDose WaveCheck L & R Mfg. Company (sold through distributors)



\$114/Box of 50
(~\$2/Indicator)

Ultrasonic cleaners are helpful cleaning devices that should be tested for effectiveness, but frequently are not. This ultrasonic cleaner indicator was designed for testing/monitoring the effectiveness of ultrasonic cleaner performance. It is a ready-to-use monitor with red color on the surface of a tab to mimic blood and visually confirm debris removal and accuracy of device. They are helpful in assuring the effectiveness of ultrasonic cleaners.

Advantages:

- Easy to use in multiple locations of ultrasonic tank
- Results are quick, convenient, and easy to interpret
- Provides assurance that ultrasonic cleaner is working

Limitation:

- Some Evaluators desired an attachment/clip for the tab that is more adjustable.

CR CONCLUSIONS: 90% of 20 CR Evaluators stated they would incorporate UltraDose WaveCheck into their practice. 95% rated it excellent or good and worthy of trial by colleagues.

Universal Adhesive with Two Monomers for Effective Wetting and Compatibility with Multiple Surfaces

Zipbond SDI North America



\$153/5 ml Dropper Bottle
(~\$30/ml)

Zipbond is a one bottle, light-cured universal adhesive developed with MDP and another monomer for consistent and reliable bond strengths. The monomers also have hydrophobic and hydrophilic characteristics. This chemistry is compatible with total-, selective-, or self-etch techniques. CR in-vitro bond testing confirmed bond to unetched dentin (24 MPa), etched dentin (22 MPa), base metal (32 MPa), lithium disilicate (45 MPa), and zirconia (55 MPa). Approximate cost per use at \$1.34 is one of the lowest among competitive adhesives tested by CR.

Advantages:

- Easy to dispense and apply
- Thin consistency flows well and is easy to air thin
- MDP monomer for bonding to multiple surfaces (*universal*)

Limitation:

- Long-term clinical success is being established

CR CONCLUSIONS: 71% of 24 CR Evaluators stated they would incorporate Zipbond into their practice. 91% rated it excellent or good and worthy of trial by colleagues.

Unique Lip, Cheek, and Tongue Retractor that Also Allows Closure for Initial Occlusion Observations

Umbrella Tongue, Lip, and Cheek Retractor Ultradent



\$2.50/Retractor

This clever retractor conveniently hold lips, cheeks, and tongue to improve clinician's access to all areas of the oral cavity. Comfortably holds patient's mouth open and prevents gag reflex experienced by other retraction devices. Additionally, allows for patient to bite for gross occlusion observations.

Advantages:

- Holds tongue back in mouth and out of the way
- Easy to place
- Holds lips and cheeks away from teeth
- Improvements observed when placed on known gaggers

Limitation:

- Access to posterior lingual tooth surface can be impeded by retractor

CR CONCLUSIONS: 79% of 24 CR Evaluators stated they would incorporate Umbrella Tongue, Lip, and Cheek Retractor into their practice. 83% rated them excellent or good and worthy of trial by colleagues.

