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Which is Best: Full or Double-Arch Impressions for Crowns?

Gordon's Clinical Observations: Currently, about 90% of indirect units are single crowns as reported by laboratories. Before the recession, about 80% were single units, indicating that fewer multiple-unit cases are now being done. What is the most adequate impression procedure for one or two units? You may have been taught that the double-arch impression concept is inferior to a full-arch concept. This is a major misconception. *This article shows the most optimum methods to make your double-arch impressions nearly foolproof!*

Some laboratory technicians complain about double-arch quadrant impressions and claim they are not adequate. It has been well proven that they ***are*** adequate if made correctly. This seemingly elementary topic relates to 30% or more of a general practitioner's practice revenue, which shows its importance. Numerous factors relate to whether a double-arch impression for one or two crowns is acceptable. Among them are:

- ***Pre-operative occlusion evaluated*** and corrected if necessary
- ***Correct tray used***
- ***Try-in tray*** and ensure it allows comfortable mandibular closure
- ***Correct combination of impression material viscosity is used***
- ***Enough teeth included*** in the impression
- ***No separation of impression material*** from tray
- ***Margins all shown clearly***
- ***No separation of different viscosities of impression material***
- ***No bubbles or voids*** in critical areas of the impression
- ***Pouring or scanning of impression done properly***

This article discusses and illustrates the *necessary* characteristics of a double-arch impression for one or two crowns.

Continued on Page 2

Best Oral Hygiene Products for Patient Home Care

Gordon's Clinical Observations: Unless you and your staff educate patients about oral hygiene aids, they can be completely confused when they encounter an entire aisle of these products in their grocery store or pharmacy. There are many excellent methods that have been proven to assist patients with their oral hygiene. If these products and methods are understood well by patients and carried out on a routine basis, caries and periodontal disease can be significantly reduced or eliminated. *CR scientists and clinical staff have identified for you the popular and most adequate oral hygiene aids and how to encourage patients to use them.*

Improving oral hygiene requires effective products, education, and encouragement

A recent CR survey asked clinicians which factors had the greatest impact on patient oral health. Their responses highlight the need for effective products, education, and encouragement. Factors with greatest impact on oral health:

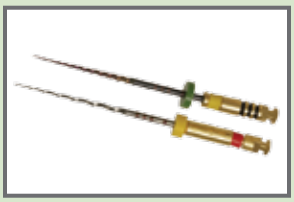
1. ***Consistent thorough brushing and flossing***
2. ***Proper oral hygiene technique***
3. ***Regular dental cleanings***
4. ***Diet***

This report lists effective products to improve oral hygiene, as well as clinical tips to educate and encourage patients to actually use them.

Continued on Page 3

Low Cost Endodontic Files

Gordon's Clinical Observations: Endodontic treatment is a nearly daily procedure for most general dentists, and the relatively low overhead makes this treatment very profitable if accomplished correctly. The introduction of lower-cost endo files has many clinicians wondering if these files are clinically acceptable and as efficient as conventional higher-cost files. *CR scientists and clinicians, assisted by a survey of practitioners, help you decide if these inexpensive files are right for you.*



Two examples of low cost NiTi files: EdgeFile by EdgeEndo *(upper)* about $4, and EndoFlex by Henry Schein *(lower)* about $6

Low cost nickel-titanium *(NiTi)* endodontic files are making a significant impact on the endo market.

- ***EdgeFile (EdgeEndo)*** is the leader in low-cost files and is now the fourth most popular file brand in use.
- ***Single use*** of files is a more viable option with lower cost, which reduces the risks of cross-contamination and file separation of fatigued instruments.

CR surveyed clinical users and performed controlled tests to compare low-cost files to conventional files to determine notable similarities and differences. **The following report includes survey data on current use, a comparison of low-cost files to other popular brands, clinical tips, and CR conclusions.**

Continued on Page 4

Preventing Full-Zirconia Crowns From Coming Off During Service

Tips from Gordon: Answers on how to avoid zirconia crowns coming off during service.

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.

Page 8: **Spring Radiometer *(model 662)*, NADA Pumice Paste, Ionostar Plus, Aquasil Ultra+**

Continued on Page 8

Which is Best: Full or Double-Arch Impressions for Crowns? *(Continued from page 1)*

CR Survey

Results of a recent CR survey of subscribers:

- 972 respondents, 96% general practitioners; majority 26–45 years of practice; 99% place crowns
- Impression type used MOST for 1 or 2 crowns: 57% double arch; 17% digital; 15% quadrant and separate opposing arch; + misc.
- Impression material or concept used: 71% vinyl polysiloxane; 15% digital; 12% polyether; + misc.
- Those using double-arch for 1 or 2 crowns, ~ 80% state that they do not have frequent problems
- Those using double-arch for 1 or 2 crowns, 92% state that it is an acceptable technique

Survey observations: Many dentists were taught that the double-arch impression procedure was not acceptable, and most have not received education on it in dental school. This survey refutes that belief. However, some laboratory technicians still state that they see numerous problems with the technique potentially caused by their doctors. The following information will help to overcome those problems and foster better interaction between dentists and technicians.

Necessary Characteristics for an Optimum Double-Arch Impression

1. **Observe and adjust pre-operative occlusion if necessary.** Many patients have occlusal interferences causing a lateral shift from centric relation to maximum intercuspation. If this is not removed by minor occlusal adjustment before making a double-arch impression, the shift will be accentuated by the anatomy of the new restorations made in the maximum intercuspation position.

2. **Grinding bruxers are a contraindication in most situations.** Teeth must have interdigitating occlusal contacts for this technique. Grinding bruxers do not have these contacts. They have a long-centric and a wide-centric occlusion. Full-arch trays are often indicated.

3. **Prep only one or two teeth when using a double-arch impression.** Assuming non-bruxing occlusion and no interferences causing lateral shift, only one or two teeth prepared are optimum for a double-arch quadrant impression. Including more preps in the impression often does not allow enough occlusal contact for proper interdigitation of the opposing arches.

4. **Tray Characteristics** ***(figure 1)***

– ***Tray should have no sides or flexible sides.*** If rigid sides are present on the tray, contact with the palate or a rigid tongue can cause the tray to flex during the impression, distorting it, and causing the tray to spring back when it is removed.

– ***Rigidity of the tray:*** The tray can be rigid or flexible. If using a rigid tray, such as the Quad-Tray Xtreme from Clinicians Choice, any viscosity of impression material may be used. If using a flexible tray, such as the Premier Sideless Triple Tray, a heavy body impression material plus a lighter viscosity around the preps should be used.

Figure 1: Examples of proven double-arch trays

Rigid aluminum sideless tray, Quad Tray Xtreme, Clinicians Choice

Flexible plastic sideless tray Sideless Triple Tray, Premier

– ***The posterior connector between the two sides of the tray should be thin enough to not interfere with jaw closure and occlusion.*** Some brands of double-arch trays have a thick connector between the two sides posterior to the most distal tooth. Such trays can cause discomfort when closing into maximum interdigitation, thereby distorting the occlusal contacts.

– ***The mesh between the arches should be thin and flexible.*** Some trays have thick plastic mesh or paper between the arches. Optimum occlusal contour and contact cannot be recorded using these trays

– ***The mesh between the arches should not absorb moisture.*** If the wafer between the arches absorbs liquid while the impression is made, the moisture will evaporate during the normal one- to three-day interim period before the lab pours or scans it, distorting the occlusion.

– ***Multiple brands of double-arch trays currently available meet all suggested criteria listed above.*** Related product information, including cost and other pertinent attributes, has been summarized into a quick-reference comparative table online at www.CliniciansReport.org. *Please visit our website to access this additional content.*

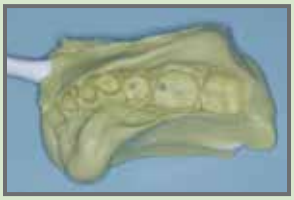
5. **The Impression** ***(figures 2–4)***

– ***Impressions should include the teeth at least from canine to the most posterior tooth on each arch,*** including the canine on both arches, allowing the technician to have knowledge about the presence or absence of a canine rise. Most posterior teeth can be prepared if this is present. If third molars are present, use a longer tray such as the QuadTray XL from Clinicians Choice.

Figure 2

Operative side of correct impression

Figure 3

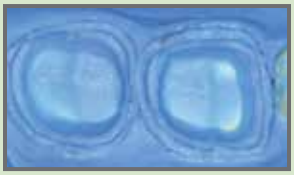


Opposing arch of correct impression

– ***Teeth should not touch the tray.*** If teeth touch the tray through the impression material in any location, the possibility of these contacts moving the tray and causing distortion is present.

– ***The impression material should be connected tightly to the tray.*** Usually there is no need for any adhesive to be placed on the tray because of retentive holes or ridges in the tray. But, the impression material should **not** be loose from the tray in any location.

Figure 4



All margins must be clearly visible

– ***All the tooth preparation margins should be visible in the impression.*** Although many techniques for soft tissue management are used, including one cord, two cords, laser, electrosurgery, various astringent retraction paste products, etc., the proven double-cord technique is still considered to be the most predictable and adequate.

Which is Best: Full or Double-Arch Impressions for Crowns? (Continued from page 1)

Necessary Characteristics for an Optimum Double-Arch Impression (Continued)

6. Die stone must be relieved for proper occlusion *(figure 5).* Densite and stone should be used for the dies and the mounting respectively. Plaster should not be used because of significant expansion. When the impression is poured, there is usually a small amount of stone that extends beyond the ends of the impression. This excess must be removed to allow full occlusion or the restoration will be too high.

7. Adjusting centric relation occlusion on seating may be necessary *(figures 6–8).* The impression is made in maximum interdigitation. Centric relation is not recorded in a typical double-arch impression. Often the restoration is high in centric relation and must be adjusted on seating.

Figure 5

Example proven articulator: ARTIMAX, B&D. When casts are poured, eliminate excess stone on both ends of arch allowing casts to interdigitate.

Figure 6

Carefully trimmed densite die

Figure 7

Finished lithium disilicate restoration

Figure 8

IPS e.max crown made with double-arch technique on first pre-molar

CR CONCLUSIONS: Digital impressions continue to grow in use; however, double-arch impressions are the most commonly accomplished procedure for one or two indirect restorations. Double-arch impressions must be made correctly to be accurate and provide optimum occlusal characteristics. If the characteristics described in this article for the double-arch procedure are followed, double-arch impressions provide a simple, inexpensive, accurate, and predictable technique for this nearly daily procedure.

Best Oral Hygiene Products for Patient Home Care (Continued from page 1)

Psychology and Effective Oral Hygiene

Patient education should empower patients, reinforce positive habits, and instill a desire to improve or change behavior. Recommending simple, convenient products and encouraging a logical progression is critical to improving patient oral hygiene.

- **High compliance – use existing behaviors/habits and recommend better products.** Examples: Switch from over the counter *(OTC)* dentifrice to a 5000ppm fluoride dentifrice *(Colgate PreviDent 5000 Plus);* Use an electric toothbrush with a timer rather than brushing briefly with manual toothbrush.
- **Moderate compliance – add to or piggyback on existing behaviors/habits.** Examples: Floss or use interdental cleaner in addition to brushing; use interdental pick or disposable flosser while commuting to work, etc.
- **Lower compliance – it is difficult to form new habits and behavior changes.** Examples: Smoking cessation; low-sugar diet; new hygiene routine upon orthodontic placement.

Effective Oral Hygiene Products

Over 730 clinicians were asked what products they recommend to their patients. Recommendations were based on specific oral hygiene challenges, and popular brands are listed. *(Rankings and percentages obtained from survey.)*

Patient/Challenge	Effective Products	Effective Brands
High Caries	97% High Fluoride Dentifrice	67% Colgate PreviDent 5000 Plus *(Colgate);* and others
	92% Fluoride Treatment	59% In-office fluoride varnishes; 58% Fluoride gels/pastes/dentifrices; example Colgate PreviDent Gel *(Colgate)*
	77% Oral Rinses	67% ACT Anticavity Fluoride Rinse *(OTC, Chattem)*; 24% PreviDent Dental Rinse *(Rx, Colgate)*; 22% Any
Fixed Prostheses/ Orthodontics	94% Floss Threaders	95% Any, example GUM Eez-Thru Floss Threader *(Sunstar);* DenTek Floss Threaders *(DenTek)*
	83% Oral Irrigators	73% Waterpik *(corded models);* 37% Waterpik *(cordless models);* 16% Airflosser *(Sonicare)*
	80% Interdental Brushes	60% GUM Proxabrush Go-Betweens Cleaners *(Sunstar);* 13% Oral-B Interdental Brush *(Oral-B)*
Poor Hygiene/ Poor Compliance	88% Electric Toothbrushes	51% Sonic *(Philips Sonicare);* 32% Rotation/oscillation *(Oral-B);* 16% Any
	86% Tongue Cleaners	58% Any; 25% Oolitt Tongue Cleaner *(OOLITT Advantage);* 9% Oolitt Elite *(OOLITT Advantage)*
	67% Oral Rinses	55% Chlorhexidine gluconate, example Peridex *(3M);* 40% Listerine *(Johnson & Johnson)*
Limited Motor Skills	90% Electric Toothbrushes	51% Sonic *(Philips Sonicare)*; 32% Rotation/oscillation *(Oral-B);* 16% Any
	78% Floss Holders	95% Any, examples: GUM Eez-Thru Flosser *(Sunstar)* and Listerine UltraClean Access Flosser *(Johnson & Johnson)*
Children	88% Brushing Timers	54% Any; 34% Manual timer *(hourglass, etc.)*; 34% Electric toothbrush with timer
	54% Fluoride Varnish *(in office)*	22% Vanish *(3M);* 21%; Colgate PreviDent Varnish *(Colgate);* 20% Any

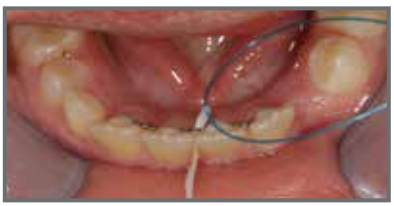
Best Oral Hygiene Products for Patient Home Care *(Continued from page 3)*

Example Effective Oral Hygiene Products *(previously evaluated by CR)*

• **Electric Toothbrushes**

• Sonic*:* Philips Sonicare *(top)*
• Rotation: Oral-B *(bottom)*

• **Floss/Floss Threaders**



• Various, floss threaders simplify flossing under fixed prostheses, permanent retainers, etc.

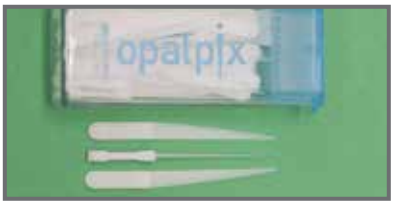
• **Interdental Brushes**

• GUM Proxabrush Go-Betweens Cleaners by Sunstar

• **High Fluoride Dentifrice**

• Colgate PreviDent 5000 Plus by Colgate

• **Interdental Picks**



• Opalpix by Ultradent

• **Tongue Cleaners**

• Oolitt Tongue Cleaner *(top)* by OOLITT Advantage
• Oolitt Elite *(bottom)* by OOLITT Advantage

• **Oral Rinses**

• Tooth & Gums Tonic by Dental Herb Company

Clinical Tips

• **Minimize behavior change:** Rather than introducing a new oral hygiene regimen, take advantage of existing habits/behaviors or consider piggybacking. *Example: If patient brushes regularly with OTC dentifrice, encourage using floss/interdental brushes in addition to brushing with a high fluoride dentifrice.*

• **Orthodontics:** Placement of brackets necessitates a difficult behavioral change; patients often require encouragement and help maintaining proper hygiene. Floss threaders, oral irrigators, interdental brushes, and specialty flosses should be recommended.

• **Frequent patient recall:** Patients with poor compliance should be recalled often to receive dental cleanings, fluoride treatments, and encouragement and guidance.

• **Patient education and guidance** is critical. Consider one of the following excellent patient education resources for effective instruction:
  – ADA Patient Education, various resources *(American Dental Association)*
  – CAESY Patient Education Systems *(Patterson Dental Supply)*
  – Patient Education videos and Dental Documents booklet *(Gordon J. Christensen Practical Clinical Courses)*

CR CONCLUSIONS: Dental healthcare professionals have the major responsibility to educate patients on proper oral hygiene, and recommending products to improve their oral health. Together with education on proper oral hygiene, the following products were viewed as most effective overall by clinicians surveyed: electric toothbrushes, floss/floss threaders, fluoride treatments *(especially high-fluoride dentifrice)*, inter-dental brushes and picks, oral rinses, and tongue cleaners. Patients with oral hygiene challenges benefit from product recommendations and require frequent dental cleanings, education, and encouragement.

Low Cost Endodontic Files *(Continued from page 1)*

Current Use of Endo Files

Key findings from 673 clinicians who regularly perform endo treatments (97% general dentists):

• **Approximate number of endo treatments per week:** 78% 0–3; 18% 4–6; 3% 7–9; 1% 10+

• **File brands used most:** 18% WaveOne Gold *(Dentsply);* 18% ProTaper *(Dentsply);* 12% Endosequence *(Brasseler);* 7% EdgeFile *(EdgeEndo);* 7% hand files *(various companies);* 7% GT *(Dentsply);* 4% TF *(Kerr);* 3% Kflex *(Dentsply);* plus 27 additional brands reported

• **File motion used:** 58% rotary; 26% reciprocal; 14% hand only

Most popular files identified in survey *(left to right):* WaveOne Gold, ProTaper Gold, EndoSequence, and EdgeFile

Performance of EdgeFile Compared to Other Popular Brands

CR Controlled Tests:

• **Low cost files were clinically useful,** with models available for both rotary and reciprocal handpieces.

• **Low cost files differed in both design and metallurgy** from other brands, even those they are purported to replace. These differences required a clinical learning period. *Clinicians should evaluate feel and performance, in addition to cost, as they choose instruments.*

• **Torsion strength testing** of 11 file brands, averaged across different sizes, showed that low cost files were similar to other brands. Data correlated with user feedback and showed that clinically adequate strength can be expected with all brands.

• **EdgeFiles exhibited high *plasticity*** and held their shape when bent to match canal anatomy. Additional examples with plasticity are HyFlex CM *(Coltene Whaledent)*, Pac-File NiTi Conform *(PacDent)*, and others. Most brands of files exhibited ***elasticity***, and rebounded to shape after being bent. Both attributes can be advantageous in certain clinical situations.

Low Cost Endodontic Files (Continued from page 4)

Performance of EdgeFile Compared to Other Popular Brands (Continued)

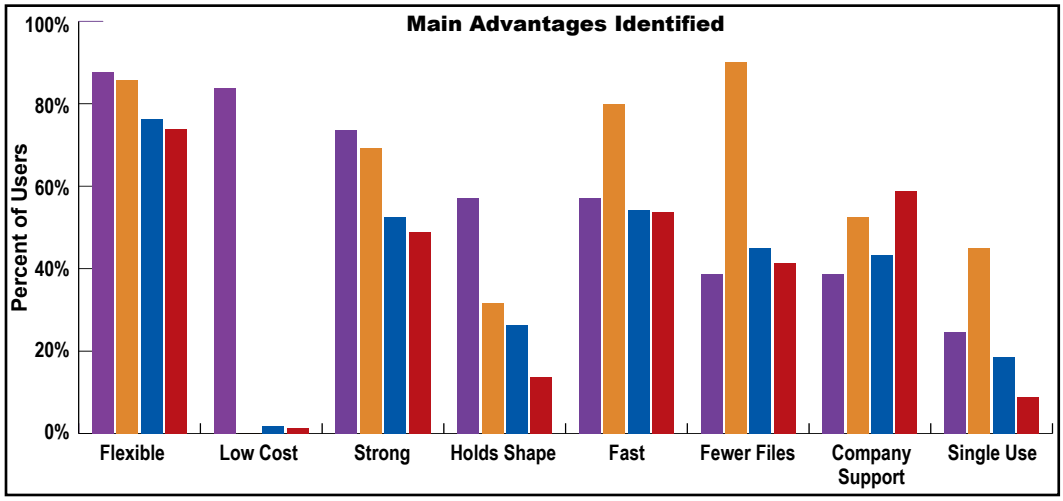
Feedback from clinical users: User ratings for the four file brands used most.

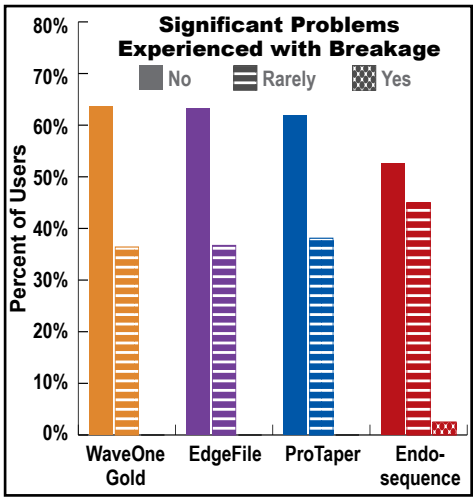
EdgeFile, $4 each *(49 users)*

WaveOne Gold, $22 each *(120 users)*

ProTaper, $11 each *(118 users)*

Endosequence, $14 each *(80 users)*





- EdgeFile's most distinct advantages were "low cost" and "holds shape." It was marginally rated higher in "strong" and "flexible."
- WaveOne Gold was rated highest for "fast," "fewer files" needed, and "single use."
- File separation problems were fairly similar for the four brands.

Clinical Tips

- **Avoiding file separation *(breakage):*** Use torque-limiting handpieces that stop and reverse rotation when file binds; use reciprocal motion instead of rotary motion; don't allow file to draw *(pull)* down canal and bind; use single-use files to avoid fatiguing and unwinding.
- **Effective irrigation:** Sodium hypochlorite is essential and should be used frequently and alternated with mechanical filing. It dissolves organic components of dentin smear layer, acting as a "lubricant" and helping flush debris, making the file more efficient. EDTA is used to dissolve inorganic components of the smear layer, and solutions with chlorhexidine improve the disinfection. Gel lubricants and chelating agents *(example: RC-Prep by Premier)* can help in treating calcified canals.
- **Thorough debridement:** Radiographs seldom show full canal anatomy. Use a sweeping or brushing motion to flex sides of file against canal walls for more thorough debridement. Use caution to not "ledge" with the tip of file or remove excessive dentin and weaken tooth.

CR CONCLUSIONS: Clinical and laboratory evaluations found the EdgeFile to have clinically acceptable performance with a cost significantly lower than other leading brands. Users noted its flexibility, strength, and ability to hold its shape. They rated file separation as similar to other brands, which was confirmed with controlled tests. Low cost makes single use of endo files a more viable option. Design features and metallurgy differ among brands, and clinicians should consider all factors when choosing files, including feel, efficiency, aggressiveness, flexibility, shape, familiarity, cost, compatibility with obturation, etc.

TIPS FROM GORDON: Preventing Full-Zirconia Crowns From Coming Off During Service

Questions keep coming to CR on why zirconia crowns are coming off. The following points verified by both clinical and basic science research and clinical observation will assist you to avoid this problem:

- **Roughen the axial walls of the tooth preparation** with a coarse diamond on the cementation appointment.
- **Gently roughen *FULL-ZIRCONIA* crown axial wall internal surfaces** with a coarse diamond using water coolant.
- **Do *NOT* use prophy paste to clean the prep.** Many brands contain fluoride and lubricants.
- **Use flour of pumice to clean the prep** such as Pumice Preppies from Whipmix or NADA Pumice Paste from Preventech.
- **Clean the restoration internal** with gentle sand blasting or Ivoclean from Ivoclar Vivadent. Be sure to wash out the Ivoclean thoroughly.
- **Desensitize and disinfect** the tooth preparation with glutaraldehyde solution. *(Two 1-minute applications of Gluma, Microprime G, G5, or other brands; suction off, do not wash off.)*
- **Do not seat zirconia crowns with resin cement** if ZOE provisional cement was used for provisionalization, ***unless*** two weeks have passed since the original temporary cementation, during which research shows the eugenol has been inactivated.
- **If using resin cement**, do ***not*** clean the crown with phosphoric acid, which deactivates the bond of MDP bonding agents to zirconia.
- **If using resin cement,** use MDP primer *(such as Clearfil Ceramic Primer from Kuraray, Monobond Plus from Ivoclar Vivadent, or Z-Prime Plus from Bisco)* in addition to bonding agents.
- **VERY IMPORTANT:** ***Over twelve years of research in the TRAC division of CR on in-vivo zirconia cementation of hundreds of units has shown that resin-modified glass ionomer cements are working well to retain zirconia restorations placed over acceptable tooth preparations.***

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

- Refine your double-arch impression method
- Identify the best oral hygiene products for patient home care
- Decide if less expensive endo files are right for you
- Evaluate new products and their potential clinical usefulness

Self-Instruction Test, June 2017, 1 CE *Check the box next to the most correct answer.*

1. Double-arch quadrant impressions are:
   - ❑ A. Adequate for all single crown applications.
   - ❑ B. Often not adequate for grinding bruxers.
   - ❑ C. Usually adequate for three-unit FPDs.
   - ❑ D. None of the above

2. Double-arch quadrant impressions:
   - ❑ A. Have been proven to be adequate for 1 or 2 single crowns.
   - ❑ B. Provide near optimum occlusion if used correctly.
   - ❑ C. Can be used with flexible or rigid impression trays.
   - ❑ D. All of the above

3. Which of the following products was ***not*** recommended in the survey as being highly effective for patients with fixed prostheses/orthodontics?
   - ❑ A. Floss threaders
   - ❑ B. Oral irrigators *(Waterpik)*
   - ❑ C. Interdental brushes
   - ❑ D. Brushing timers

4. Which of the following oral hygiene recommendations requires little behavior change and should have higher patient compliance?
   - ❑ A. Start flossing twice daily
   - ❑ B. Switch from OTC dentifrice to a high-fluoride dentifrice
   - ❑ C. Start using an oral irrigator *(Waterpik)*
   - ❑ D. Begin a low-sugar diet

5. Which statement regarding current endo file use is ***false***?
   - ❑ A. The file brands used most are WaveOne Gold and ProTaper by Dentsply, EndoSequence by Brasseler, and EdgeFile by EdgeEndo.
   - ❑ B. The majority of clinicians are using rotary file motion.
   - ❑ C. 14% of clinicians reported using hand files only.
   - ❑ D. Most general dentists are doing 7–9 endo treatments per week.

6. In which characteristic was EdgeFile significantly advantageous over other popular brands tested?
   - ❑ A. Company support
   - ❑ B. Low cost
   - ❑ C. File separation *(breakage)*
   - ❑ D. Fast

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7. Spring Radiometer *(model 662)* is ideal for testing resin curing light output because:
   - ❑ A. Debris on light tip reduces intensity dramatically.
   - ❑ B. LED(s) can stop functioning.
   - ❑ C. It is small and handheld for easy portability.
   - ❑ D. All of the above

8. NADA Pumice Paste has the following desirable characteristics for adhesive dentistry ***except:***
   - ❑ A. Pre-mixed flour of pumice
   - ❑ B. Consistency helps reduce splatter
   - ❑ C. Vanilla mint flavoring
   - ❑ D. Cleans effectively with no residues from flavoring agents, dyes, oils, or fluoride

9. Ionostar Plus is a:
   - ❑ A. Conventional glass ionomer restorative with natural fluorescence
   - ❑ B. Resin modified glass ionomer with natural fluorescence
   - ❑ C. Glass ionomer restorative with seven shades
   - ❑ D. Reinforced glass ionomer restorative

10. Aquasil Ultra + has which of the following improvements?
    - ❑ A. Better hydrophilicity
    - ❑ B. Maintains high tear strength
    - ❑ C. Rigid viscosity ideal for double-arch trays
    - ❑ D. All of the above

REQUIRED: Participant Information: ***please print.*** *For additional participants, copy this page and list requested information.*

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

Small, Handheld Radiometer for Checking Output of Curing Lights

Spring Radiometer
(model 662)
Spring Health Products

$112/Radiometer

CR scientists and others have found that the majority of curing lights tested in clinical practice have lower output than expected due to degradation of light elements, debris on tips, and normal wear and tear. Radiometers allow simple periodic verification of output and can help prevent inadequate polymerization of dental materials. This handheld analog radiometer measures up to 3000 mW/cm^2 and is compatible with most resin curing lights: LED, halogen, and plasma arc. No battery required.

Advantages:
- Low cost
- Easy to use
- Compact size

Limitation:
- Instructions could be improved

CR Note:
- Record output of each curing light on back of radiometer. If output decreases significantly, consider repair or replacement of light.

CR CONCLUSIONS: 64% of 25 CR Evaluators stated they would incorporate Spring Radiometer *(model 662)* into their practice. 84% rated it excellent or good and worthy of trial by colleagues.

No Residue Pumice Paste *(NO Flavoring Agents, Dyes, Oils, or Fluoride)* Improves Adhesive Dentistry

NADA Pumice Paste
Preventech

23¢/Cup

Pre-dose flour of pumice paste has no oils, dyes, flavorings agents, or fluoride which can leave residues and reduce effectiveness of adhesives and cements. No residue pastes are ideally used to clean teeth before acid etch or cementation. Well accepted by flavor-intolerant patients.

Advantages:
- Easy to use; pre-mixed
- Good constancy, low splatter, and easily rinsed
- Cleans tooth surfaces effectively

Limitation:
- No major limitation noted

CR CONCLUSIONS: 70% of 24 CR Evaluators stated they would incorporate NADA Pumice Paste into their practice. 87% rated it excellent or good and worthy of trial by colleagues.

Conventional Glass Ionomer Restorative with Natural Fluorescence and Two-Minute Set Time

Ionostar Plus
VOCO

$3.90/Capsule

Ionostar Plus is a conventional glass ionomer with two-minute set. It is the first glass ionomer material with tooth-like fluorescence. The new capsule design accesses smaller preparations and difficult-to-reach areas of the oral cavity. Four shades *(A1, A2, A3, A3.5)*. Indicated for following restorations: non occlusion-bearing Class I, short-term Class I and II, cervical lesions, Class V, root caries, Class III, and restoration of deciduous teeth. Also used as: base/liner, core build-up, temporary restorations, and extended fissure sealants.

Advantages:
- Easy to place and shape
- Adequate working time
- Acceptable shades/colors

Limitations:
- Two-minute set was too long for a few Evaluators
- Clinical trials are needed to monitor longevity of various indicated restoration types

CR CONCLUSIONS: 73% of 24 CR Evaluators stated they would incorporate Ionostar Plus into their practice. 77% rated it excellent or good and worthy of trial by colleagues.

Popular VPS Impression Material has Several Helpful Improvements

Aquasil Ultra+
Dentsply Sirona

$110/50ml cartridge *(55¢/ml)*
$3.28/Small digit *(1.6ml)*
$3.71/Large digit *(2.4ml)*

Well known VPS *(vinyl polysiloxane)* impression material with the following improvements:
- Better hydrophilicity intraorally and maintains high tear strength. Working and setting times are clearly marked on cartridges.
- Several delivery options available including single-use cartridges with digit Targeted Delivery System for precision syringing onto preparations.
- Available in fast and regular set and in several viscosities.
- Rigid viscosity specifically designed to help prevent distortion when used with double-arch trays.

CR evaluated medium/heavy body with extra light body for this evaluation.

Advantages:
- Accurate and clean impression
- Multiple set times are helpful
- Precision syringing with digit Targeted Delivery System

Limitation:
- Premium price

CR CONCLUSIONS: 83% of 24 CR Evaluators stated they would incorporate Aquasil Ultra+ into their practice. 92% rated it excellent or good and worthy of trial by colleagues.

Gordon J. Christensen
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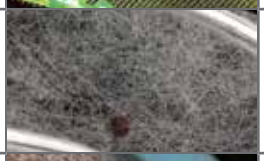
Which is Best: Full or Double-Arch Impressions for Crowns?

Double-Arch Trays

The following **sideless posterior double-arch trays** were evaluated by CR scientists and are expected to perform well clinically, based on their compliance with suggested criteria for double-arch trays *(see Clinicians Report June 2017).* Brands are listed alphabetically.

Brand *Company*	**Tray** *(sideless posterior version)*	**Cost per tray**	**Tray Rigidity**	**Posterior Connector Thickness** *(lower is better)*	**Wafer** *(mesh)*	**Water sorption of wafer**	**Flexibility of wafer**
BluPrint *Benco Dental*		$0.51	Semi-Flexible	2.57 mm		Excellent	Excellent
COE Sideless *GC America*		$1.47	Flexible	2.73 mm		Excellent	Excellent
FishBone *Meta Biomed*		$0.99	Semi-Flexible	1.60 mm		Excellent	Excellent
Maxima *Henry Schein*		$0.94	Flexible	2.05 mm		Excellent	Excellent
Multi-Tray *Henry Schein*		$0.61	Flexible	1.76 mm		Excellent	Excellent
NeoTray *Premier Dental*		$1.11	Flexible	2.32 mm		Excellent	Excellent
Quad-Tray Xtreme *Clinicians Choice*		$2.00	Rigid	3.20 mm		Excellent	Excellent
Shark Tray *Practicon*		$1.44	Flexible	1.84 mm		Excellent	Excellent
The Gripper *DenMat*		$1.23	Rigid	1.50 mm		Excellent	Excellent
Triple Tray Sideless *Premier Dental*		$1.08	Flexible	2.14 mm		Excellent	Excellent