

Incremental Fill, Bulk Fill, Self-Cure, or 3-D Printed Resins. Which One Do I Use and Where?

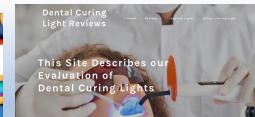
Dr. Richard Price, Dalhousie University



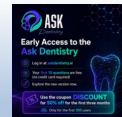
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Conflict of Interest Statement

I created askdentistry.ai, the split-tooth, and MARC, but I am not associated with BlueLight Analytics who sell MARC. I interact with AI to create my images



This Site Describes our Evaluation of Dental Curing Lights



askdentistry.ai

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Dr. Richard Price??

A Clinician, Scientist and a Teacher at
Dalhousie Since Oct 1984



Dal
Grad
1988

Fourth Year Dentistry, 1987-88



3

Teacher

Researcher

Prosthodontist

Check me out :
Google Scholar
YouTube: PriceCuringLab
QR Codes
rbprice@dal.ca

lcreviews.com

Learning Objectives

- Match the restorative approach to cavity size, depth, geometry, access, isolation, and occlusion
- Explain where incremental placement, bulk-fill, self or dual-cure materials, and 3-D printed resins fit
- Recognize the curing, adaptation, void, and finishing risks unique to each option
- Use an evidence-based decision pathway instead of choosing by hype

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WHO TESTS THE MATERIAL?

A PRODUCT CAN BE USED ON PATIENTS WITHOUT BEING TESTED CLINICALLY.

MANUFACTURER: generates evidence

REGULATOR: reviews submission

LONG-TERM CLINICAL OUTCOMES: may still be unknown

MARKET AUTHORIZATION ≠ CLINICALLY PROVEN LONGEVITY.

US 510(k) → **FDA CLEARED**

US PMA → **FDA APPROVED**

CANADA Class II-IV → **HEALTH CANADA LICENSED**

1 FDA: Clinical data are unnecessary for most 510(k) clearances.

2 HEALTH CANADA: Clinical evidence requirements depend on the device and its risk class.

3 NEITHER TERM, BY ITSELF, ESTABLISHES LONG-TERM CLINICAL LONGEVITY.

FDA 510(k): cleared • Health Canada Class II-IV: licensed

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19th-century scientist

I seek the mechanism behind this phenomenon to understand nature.

21st-century academic

I need a result that fits the story so the paper gets into Nature.

THE METRICS TRAP

When what can be counted matters more than what counts.

RESEARCH

TEACHING

PATIENT CARE

PAPERS

CITATIONS

GRANTS

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You miss 100% of the shots you don't take

WAYNE GRETZKY
1979 1989

60 Minutes to Impart
34 Years of Research

Three men in kilts

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CARDP **THE EVIDENCE, WITHOUT THE HYPE**

askdentistry.ai
Science based answers
Product info
Codes

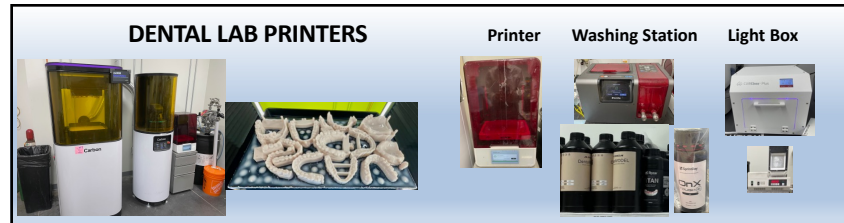
INCREMENTAL **BULK FILL** **SELF-CURE** **35-MINUTE**

BENEFITS **LIMITATIONS**

A scientific, unbiased view for CARDP

NO BULLSHIT

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DON'T SHOOT THE MESSENGER
I JUST READ THE LITERATURE.

2023, the American Dental Association removed the requirement of being a “pressed, fired, polished, or milled” material. This definition change allowed 3D-printed crowns containing over 50% filler to be reimbursed as permanent crowns using the CDT code D2740 (porcelain/ceramic crown)

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3D-PRINTED RESINS: THE PROFIT PITCH

WHY PRINT CROWNS?

3D PRINTING
Multiple crowns per batch
Low-cost resin; no milling bars
~7x lower printer purchase price (vs. traditional equipment)
Potentially <\$3 USD in resin per crown

MILLING
One crown at a time per mill
Ceramic blocks = replaceable bars

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Manufacturers are SELLING and YOU are USING UNFINISHED PRODUCTS

Polymerization: Conversion monomers to polymers.
• Light-activated process with specific wavelength requirements
• Degree of Conversion (DC = critical quality indicator)

Regardless of the restorative material, successful results over more than 5 years are due much more to the correct application of the technique, the operator's skill/knowledge, the type of tooth, number of surfaces involved in the restoration, and oral hygiene.

EUROPEAN JOURNAL OF PROSTHODONTICS AND RESTORATIVE DENTISTRY
Longevity of Resin Composite and Analogous Prosthetic Restorations: A Systematic Review
2022

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DENTISTS MAKE THE BIGGEST DIFFERENCE, NOT THE MATERIALS

Longevity of composite restorations is definitely not only about materials

2023

Fábio Fernando Demarco^{1,2}, Maximiliano Sergio Cecchi^{3,4,5},
 Anaclara Fernandes Montagner^{6,7}, Verônica Pereira da Lima^{8,9},
 Marcos Brito Correa^{10,11}, Rafael R. Moraes^{12,13}, Nish J.M. Opdam^{14,15}

33 studies
 AFR Ranged: 0.8 to 6.3%
 Differences between composites play a minor role in durability, assuming they are properly used

Contents list available at www.sciencedirect.com/journal/journal-of-dentistry

Journal of Dentistry

Direct Message: www.sciencedirect.com/journal/journal-of-dentistry

2018

An update on the reasons for placement and replacement of direct restorations

From Elsevier: Christopher D. Lynch¹, Barbara L. Chadwick², Igor B. Blum³, Nish J.M. Opdam⁴

Replacing failed restorations accounts for more than half (57%) of the restorations placed by dentists

D. Eltahlah, C.D. Lynch, B.L. Chadwick, I.B. Blum, N.J.M. Wilson. An update on the reasons for placement and replacement of direct restorations. J. Dent. 72 (2018) 1–7.

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HOW DO YOU CHOOSE ?

- TESTIMONIALS, Instagram
- ADVERTISING CLAIMS
- LECTURES
- READ THE ARTICLES

AS A KID, I USED TO WATCH THE WIZARD OF OZ AND WONDER HOW SOMEONE COULD TALK IF THEY DIDN'T HAVE A BRAIN. THEN I GOT SOCIAL MEDIA.

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You Can Feel the Difference in the Composites you Cure With This Light

A conversation about Vista Apex's PinkWave Curing Light with Mike Miyasaki, DDS

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REAL MEN DON'T READ INSTRUCTION MANUALS

WE BUILD IT TWICE

Real men don't use instructions, son. Besides, this is just the manufacturer's opinion on how to put this together.

— Tom Allen —

REAL MEN DON'T READ INSTRUCTIONS

What could possibly go wrong?

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ANY QUESTIONS?

- rbprice@dal.ca
- YouTube: PriceCuringLab
- GoogleScholar





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YOUR CAR IS USELESS WITHOUT



GAS



A GOOD DRIVER

YOUR RESIN IS USELESS WITHOUT



A GOOD LIGHT



A GOOD DRIVER

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CURING LIGHTS GENERATE MOST OF YOUR INCOME



One small device supports nearly every bonded restoration.

6 QUESTIONS DENTISTS SHOULD ASK THE MANUFACTURER

Because every restoration you place requires **each** cure to be effective.

1. IS THE LIGHT APPROVED FOR USE IN MY COUNTRY?

Is the light certified with a recognized medical device regulatory agency in my country?

2. WHAT LIGHT OUTPUT DOES THE LIGHT DELIVER?

What irradiance or power should I expect to see under real world curing conditions?

3. WHAT IS THE EMERGENCY SPECTRUM OF THE LIGHT?

What wavelengths does the light emit and how much power is emitted at those wavelengths?

4. WHAT IS THE LIGHT PROFILE AT THE TOP OF THE LIGHT?

Is the light uniform across the top and bottom of the treatment area?

5. WHAT IS THE EFFECT ON DISTANCE OF THE IRRADIANCE INTENSITY?

How does the irradiance change as the distance from the light source increases?

6. WHAT ARE THE RECOMMENDED EXPOSURE TIMES FOR DIFFERENT MATERIALS?

For different materials, what are the recommended exposure times and distances from the light source?

MY PATIENTS. MY PRACTICE. MY RESPONSIBILITY.

Check the evidence, not just the marketing.

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How often do you hear?

Save Time, Buy this One Second Curing Light?



DocPortMac
LED Intraoral Camera System

DentalMastermindGroup.com

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If the composite says
it must be cured for
at least 10 s,
DO NOT USE 1s

WHY?

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Radiant Exposure
(J/cm²)
=
Irradiance (W/cm²)
X
Time (s)



Different: emission spectra, power, irradiance, beam
profile, effect of distance & modes



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Do the Math

A light emitting
1,200 mW/cm² for 20 s will
deliver 24 J/cm² of energy



Do the Math

To deliver 24 J/cm² of
energy
in 1 s the light
must emit **24,000 mW/cm²**



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No Light Emits

24,000 mW/cm²



• Initial polymerization (hard to the touch) was achieved in 1 to 2 seconds of exposure for resins tested.
• Optimum polymerization at 2 mm depth with more complete development of material properties required >3 seconds exposure (time and depended on resin brand based on development of hardness and degree of conversion of monomer to polymer).
• As with any curing light, extra cure time is desirable to overcome clinical variables and assure well-polymerized resin at the bottom of the restoration where optimum properties at the bonding interface are most crucial.

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6 QUESTIONS DENTISTS SHOULD ASK THE MANUFACTURER

Because every restoration you place requires each cure to be effective.

1. IS THE LIGHT APPROVED FOR USE IN MY COUNTRY?

Is the light curing unit approved for use in your country? Check the label for the country of origin.

2. WHAT LIGHT OUTPUT DOES THE LIGHT PROVIDE?

What is the light output of the curing unit? Check the label for the light output.

3. WHAT IS THE WAVELENGTH SPECTRUM OF THE LIGHT?

What is the wavelength spectrum of the light? Check the label for the wavelength spectrum.

4. WHAT IS THE LIGHT INTENSITY AT THE TIP OF THE LIGHT?

What is the light intensity at the tip of the light? Check the label for the light intensity.

5. WHAT IS THE EFFECT ON DISTANCE FROM THE TIP OF THE LIGHT?

What is the effect on distance from the tip of the light? Check the label for the effect on distance.

6. WHAT ARE THE RECOMMENDED EXPOSURE TIMES FOR DIFFERENT MATERIALS?

What are the recommended exposure times for different materials? Check the label for the recommended exposure times.

MY PATIENTS. MY PRACTICE. MY RESPONSIBILITY.

Check the evidence, not just the marketing.

BEST LIGHTS ON THE MARKET



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THE BLUE LIGHT HAZARD

YouTube Video
The Blue Light Hazard: How Worried Should We Be?
2015 Lippincott Williams & Wilkins, Baltimore, MD



Dr: You failed to provide adequate eye protection



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OSHA GENERAL DUTY CLAUSE

UNITED STATES DEPARTMENT OF LABOR

OSHA

OSHA Laws & Regulations - OSHA Act of 1970

OSH-Act of 1970

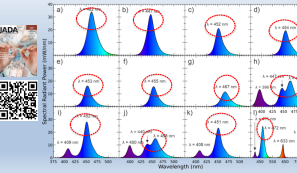
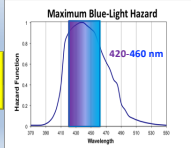
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(a) Each employer --

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

<https://www.osha-slc.gov/osha-slc/osha-slc.pdf>

The Blue Light Hazard



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EASE-IN-SHIELDS Ultradent



Ultradent Ease-In-Shields



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Incremental Fill, Bulk Fill, Self-Cure, or 3-D Printed Resins

EVIDENCE-BASED DENTISTRY

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Five Questions Before Starting

- Does this tooth need a direct restoration, cuspal coverage, or a full indirect restoration?
- Can I isolate and adapt the material to every internal surface?
- Can the deepest region receive the light exposure required by this exact product and shade?
- Will incremental placement improve adaptation or anatomy enough to justify the added interfaces and time?
- If I choose chemical cure or 3-D printing, am I following the complete validated system?

No approach removes the need for isolation, adhesion, contour, finishing, and occlusal control

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Tooth Structure and Fracture Strength of Cavities

Just MONDILL
Editor MONDILL
Pratt, Peter M. MONDILL
Art Director MONDILL

MORE TOOTH REMOVED FOR INDIRECT INLAY PREPARATION

DIRECT COMPOSITE RESTORATION	INDIRECT INLAY PREPARATION
16.19%	21.34%

Mean tooth loss removed - widest cavity group (16.19% vs 21.34%)

The study found preparation designs and an restored tooth. It did not test clinical survival. Reproduction of this presentation is not permitted without written permission.

UNDERCUTS CHANGE THE PREPARATION

DIRECT COMPOSITE	INDIRECT INLAY: CUT BACK	INDIRECT INLAY: BLOCK OUT
Undercut retained No path of insertion needed	Restoring undercut leaving marginal denture Extra tooth removal for seating	Block out with bonded composite Indirect restorations need a path of insertion; undercuts can be cut away OR blocked out.

In vitro premolar study: Indirect inlay preparations removed more tooth structure than matched direct composite preparations.
Mondill et al. Bio Dent J. 2007;18:154-158. DOI: 10.1090/BJD.2007.18.3.154. Copyright © 2007 by W.B. Saunders Company. All rights reserved.

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HOW SHOULD POSTERIOR COMPOSITES BE PLACED?

Simple → Complex

Bulk Fill	Horizontal Increments	Oblique Increments	Multiple Wedge Increments
Most desired Bulk Fill	Most often used	Lowest Stress?	

THESE TECHNIQUES LOOK GOOD IN THE LAB, BUT IN A PATIENT?

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ARE YOU STAYING UP TO DATE?

Journal of Dentistry 2017

The effect of instrument lubrication on the shear bond strength and wear rates of aesthetic composite restorative material

J. Dent. 47, 100-105 (2017)

ARE YOU STAYING UP TO DATE?

Materials 2022

Modeling Lipidity and Resin-Based Dental Composite: Materiality in a Changing World

Journal of Materials 2022, 15(1), 1-10

- Use of instrument lubricants to aid composite placement is widespread
- Should discontinue the use of instrument lubricants.
- The 'bonding agent' from a 3-step adhesive system has the least deleterious effect upon material properties.
- Use of non-solvent adhesives (3-step ERs) or modelling resins enhances the bond strength between RBC layers;
- Solvated adhesives affect color stability (Acidic, HEMA, Acetone)
- Better color stability is obtained with non-solvent adhesives or modelling resins between RBC layers;
- Sculpting RBCs with modelling resins influences the composite surface properties in a way that is material-dependent.

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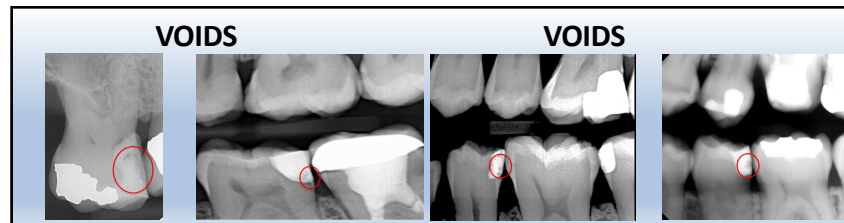
Voids and Porosities in Class I Micropreparations Filled with Various Resin Composites

NIM (Dyract + Z100 Resins) + T & B (Bond + Dyract) + T & B (Dyract)

VOIDS

Narrow occlusal preparations are difficult to restore completely free of voids. Packable composites had poor results even in combination with an uncured flowable composite.

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Polymerization Sets the Boundary Conditions

CHEMICAL AND DUAL-CURED RESINS

- Chemical initiation reduces dependence on light access
- Many dual-cure materials still perform better when light activated
- Working and setting times limit manipulation
- Material-specific bonding and mixing instructions remain critical

18 MONTHS

165/165 restorations remained in service

STELA AUTOMIX	STELA CAPSULE	FILTEK ONE
No replacement	No replacement	No replacement
Minor marginal staining	Minor marginal staining	Minor marginal staining
8/55	11/55	8/55

Functional and biological outcomes comparable at 18 months; longer follow-up needed.

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How Often do you Hear? I Do Not Trust Bulk Fills



Is the clinical performance of incremental and bulk-fill resin composite different? **2022**

Camila Tringoli

A Commentary on:
Bauer P P, B. Wambler L M, Kulkarni M D R, Correr C M, Reis A, Kiatgong C C.
Is the clinical performance of composite resin restorations in posterior teeth similar? Incremental vs. bulk-fill technique: A systematic review and meta-analysis. Clin Oral Investig 2022; 26: 1040-1047.

Practical point:
Based on practical point of view, considering clinical decision-making, bulk-fill resin composites showed significantly better results than incremental technique.

A systematic review and meta-analysis with moderated quality of evidence bulk fill and incremental techniques showed similar clinical performance on posterior resin composite restorations.

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2023

Journal of Dentistry
Clinical evaluation of bulk-fill and universal nanocomposites in class II cavities: Five-year results of a randomized clinical split-mouth trial

60 patients 120 class II restorations
Filtek Bulk Fill Posterior Restorative Filtek Supreme XTE Universal Restorative
Overall survival of restorations was 92% in both groups at 5 years
Both materials showed acceptable clinical performance



EBD
2023
The clinical performance of bulk-fill versus the incremental layered application of direct resin composite restorations: a systematic review

Amica

•Out of the 1445 records two studies had an overall low-risk of bias, fourteen studies raised some concerns, and two studies exhibited high-risk.
•CONCLUSION: Bulk-filled resin composite restorations had clinical outcomes similar to those of incrementally layered resin composite restorations within a review interval of 6 months to 10 years.



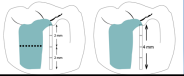
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The influence of different placement techniques on the clinical success of bulk-fill resin composites placed in Class II cavities: a 4-year randomized controlled clinical study **2023**

Nazire Nurdan Çakır Kiling¹, Sezer Demirelbuğa²

A double-blind and split-mouth randomized controlled clinical trial to evaluate the clinical success of the placement technique (bulk-filling and incremental techniques)

The 4-year clinical success of X-trafil and Filtek Bulk-Fill nanocomposites is not dependent on the placement technique



Clinical Performance of Bulk-Fill Versus Incremental Layering Techniques in Class II Restorations: A Systematic Review and Network Meta-Analysis **2026**

Abbas Mousavi Chahidi (MSc) ¹, Leila Farah Vafaei ², I. Shafiq Nazimuddin Vafaei ³, Laleh Larijani Vafaei ⁴, Elzababha Fawzan Vafaei ⁵

BULK-FILL VS INCREMENTAL
Class II posterior restorations

12 months
No statistically significant difference in clinical success at 12 months

Long-term outcomes remain uncertain



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Bulk-Fill: how does it perform clinically? **2026**

MEAN ANNUAL FAILURE RATE
BULK-FILL: 0.8%
INCREMENTAL LAYERS: 1.4%

Comparable clinical outcomes • Moderate certainty of evidence



2019

Clinical time and postoperative sensitivity after use of bulk-fill (syringe and capsule) vs. incremental filling composites: a randomized clinical trial

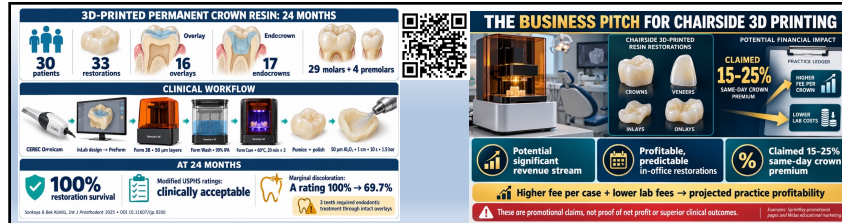
Incremental filling takes more than twice as long as bulk filling using capsules

	Mean Time (SD) seconds/mm ³	Minimum-Maximum Time (s)
Incremental	28.42 (27.92)	2.04-117.50
Bulk Syringe	18.70 (20.43)	1.67-102.50
Bulk Capsule	12.22 (8.13)	2.18-44.75

A systematic literature search was carried out for the period of 2010–2025 in PubMed, Embase, Web of Science and Scopus and was structured according to PRISMA flow diagram.



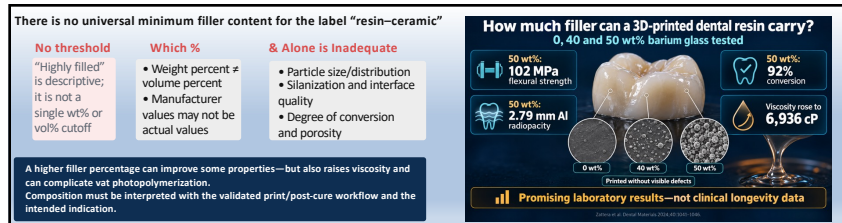
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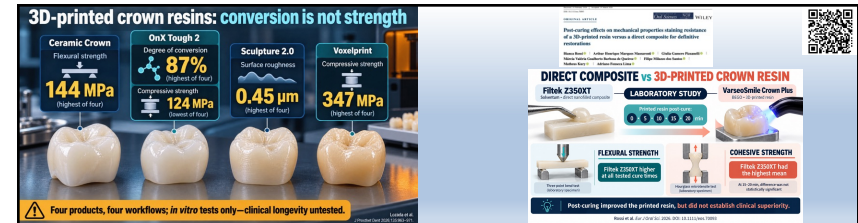
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3D-PRINTED POSTERIOR SINGLE CROWNS
Prospective study • 30 patients / 30 crowns • 29 ± 2.6 months

93% SURVIVAL
Survival: crown present at follow up

87% SUCCESS
Success: no complications

2 irreparable fractures
2 debonded, then recemented
2 minor chips, polished

No comparison control group > longer follow-up needed
No long-term clinical studies for 3D-printed crowns

Performance of posterior 3D printed resin-matrix ceramic crowns fabricated in a fully digital workflow: a two-year prospective clinical study
Marrero del Moral-Pedrazo*, Galán-Tobías*, Pardo-Galán*, Alonso-Pérez*, Méndez-Luaces*

No restorative control group
Probable bruxism excluded
Mixed premolars/molars and arches

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What determines the quality of a 3D-printed resin restoration?

1 RESIN FORMULATION
2 PRINT SETTINGS
3 ORIENTATION & SUPPORTS
4 WASHING & POST-CURE
5 FINISHING & ADHESION

Change one process variable—and you can change the restoration

A resin printed on an unvalidated printer, or not post-cured using the recommended protocol, does not inherit the original evidence.

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Midas Restore should be printed only the Midas Digital Press. SprintRay says it cannot be printed on the Pro 2.

MIDAS RESTORE: WHICH PRINTER?

MIDAS DIGITAL PRESS **VALIDATED**
OTHER PRINTERS **NOT VALIDATED**

Follow the current manufacturer compatibility list

Using another wash or post-curing unit takes the Midas Digital outside the validated workflow. Use only SprintRay compatible equipment

MIDAS RESTORE: WASH → POST-CURE

PHARMALIM 45s
Shake 45 s • Remove and dry immediately
-30% PA IN WATER

NANOCURE
Use Midas Restore preset

Midas Restore workflow only. Follow the P2 for other resins. Remove supports before curing

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SprintRay
NOW AVAILABLE
MIDAS RESTORE
75% CERAMIC

Midas Restore resin introduced on September 1, 2026,
As of September 27, 2026,
Been on the US market for 26 days
No long-term clinical studies for Midas Restore
May be better than other printed resin?

Digitally pressed restorative resin

75%
Ceramics
Channels

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FIELDTEST IN YOUR CLINIC ON YOUR PATIENTS
Midas Restore launched September 1, 2026 (US)



LONG-TERM OUTCOMES UNKNOWN

How will these restorations perform over time?

Early clinical data is not a formal clinical trial



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HOW LONG DO YOU EXPECT A RESTORATION TO LAST?

5 YEARS? 10 YEARS? 15 YEARS?

DIRECT COMPOSITE
Well-placed, well-placed filling

INDIRECT CERAMIC-FILLED 3D-PRINTED RESTORATION
Custom-fabricated restoration

HEAD-TO-HEAD CLINICAL EVIDENCE?

I have not found a clinical study showing that a modern ceramic-filled 3D-printed restoration lasts longer than a well-placed direct composite.

2 YEARS
Promising early clinical follow-up

Revised FDI criteria: at least 5 years of follow-up advised for INDIRECT restorations.

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BRIDGES ARE DIFFERENT
Do not extrapolate to single restorations

The Critical Variable: Connector Cross-Section

Standard Connector Design (3x3mm)
(High Fracture Risk)

Mandated Design Protocol (≥ 5x5mm)

The Cagidiaco (2026) study mandated a minimum connector cross-section of ≥ 5x5mm. Increasing this dimensional parameter exponentially improves fracture load and flexural stress distribution, neutralizing the cohesive failures observed in the Hobbi cohort.

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Safe Desktop Vint Photopolymerization 3-D Printing



1. Before printing, ensure the printer is properly calibrated and the material is loaded correctly.
2. Always wear safety glasses and avoid direct contact with the resin.
3. After printing, clean the printer and the printed part with isopropyl alcohol.
4. Post-curing is required for all printed parts to ensure they are fully cured.
5. Store the printed parts in a safe, dry, and dark place.
6. Dispose of the waste material properly.

Always

- Use the printer in a well-ventilated area.
- Do not use the printer for food or medical purposes.
- Do not use the printer for printing parts that will be in contact with food or medical products.
- Do not use the printer for printing parts that will be in contact with fire or heat.
- Do not use the printer for printing parts that will be in contact with water or moisture.
- Do not use the printer for printing parts that will be in contact with chemicals.
- Do not use the printer for printing parts that will be in contact with electricity.
- Do not use the printer for printing parts that will be in contact with any other hazardous material.



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RESEARCH ARTICLE VOLUME 1

Allergic reaction from dental bonding material through nitrile gloves: Clinical case study and glove permeability testing

Andreina Sananes DDS, MS¹ | April Sanchez MD² | Loretta Davis MD³ | Yovany Vento DDS⁴ | Frederick Rungeberg DDS, MS⁵

Wear disposable nitrile gloves when handling uncured resin.

Use nitrile gloves, keep liquid resin off the gloves where possible. (Assign) Latex and vinyl unsuitable. Replace contaminated gloves promptly. "Nitrile" does not mean indefinitely impermeable. If resin reaches the skin, wash with cold soapy water.

3D printing adds an acrylate exposure route

1. Uncured resin → skin contact
2. Previously sensitized technician → dermatitis returned
3. One case report + incidence estimate

Uncured (as printed) → **After cleaning, finished** → **Final post-cured**

Uncured (as printed): Wet, tacky, Contains uncured acrylates. After cleaning, finished: Cleaner surface, Reduced resin residue. Final post-cured: Polymerized, Dimensional stability, Intended for clinical or laboratory use.

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Safer in-office 3D printing: control each exposure point
Focus on liquid resin, uncured prints, contaminated surfaces and wash solvents.

1. **RESIN**: Keep resin in a sealed, labeled container. Follow the SDS and avoid bare hand contact. Choose gloves using **resistant SDS**.
2. **PRINT**: Use an enclosed printer in a designated ventilated work area.
3. **REMOVE + WASH**: Remove uncured prints with tools, wearing gloves and avoid bare hand contact. Use appropriate wash solvent in a ventilation system. Replace contaminated gloves promptly.
4. **POST-CURE**: Follow manufacturer specified wetting and post-curing procedures using a light chamber.
5. **DELIVER**: Inspect the clean, cured dental appliance before delivering to the patient. Persistent hand or eyelid eczema → occupational assessment and patch testing.

NITRILE GLOVES ARE NOT AN ABSOLUTE BARRIER

UNCURED ADHESIVE ON GLOVE → **18.1 min** (Mean penetration time of the commercial adhesive on nitrile gloves) → **3 STUDENTS** (Localized contact dermatitis).

KEEP UNCURED ADHESIVE OFF YOUR GLOVES

This paper tested a dental bonding adhesive. NOT a 3D printing resin.

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3-D Printed Resin Ceramics

- This is a polymer-based, ceramic filled printed restoration
- It is not the same as eMax or Zirconia
- Clinical evidence is encouraging but ALL short-term
- Established alternatives have longer outcome histories
- Fractures may be more likely in high-load use
- Define YOUR warranty/remake policy

Do not describe a 2-year study as evidence of a 10-year service life.

New bulk-fill composites are a proven technology that saves you time.

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3D-PRINTED RESINS: THE PROFIT PITCH

WHAT ABOUT LONG-TERM PATIENT OUTCOMES?

MORE \$\$\$ FOR THE DENTIST

Clinical time and postoperative sensitivity after use of bulk-fill (syringe and capsule) vs. incremental filling composites: a randomized clinical trial

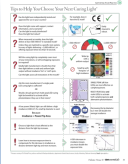
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	Mean Time (SD) seconds/mm ³	Maximum-Maximum Time (s)
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Bulk Syringe	18.70 (20.43)	1.67-102.50
Bulk Capsule	12.32 (8.13)	2.18-44.75

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FOLLOWING THE INSTRUCTIONS GIVES YOU THE BEST RESULTS.





Thank You

CARDP
CANADIAN ACADEMY OF RESEARCH DESIGN AND PROFESSIONAL DESIGN
ADA CERP



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QUOTE OF THE DAY



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