Hall Technique & ART GIC Strip Crowns

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YouTube

Affiliated Children's Dental Specialists

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Diplomate, American Board of Pediatric Dentistry
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AMERICAN BOARD OF PEDIATRIC DENTISTRY

Affiliated Children's Dental Specialists
DENTISTRY FOR TODDLERS, CHILDREN, TEENS AND SPECIAL NEEDS

BS Chemistry, Northern Arizona University 1999
DDS University of Southern California 2003
Pediatric Dentist, University of Nevada School of Medicine/Sunrise Children's Hospital 2005

Disclosures: Neither myself nor my family members have any owner interest or stock in any of the products mentioned in this presentation, nor do I receive sales commission
I have received speaking honoraria in the past from: Elevate Oral Care, Oral Science, GC America, DMG America, NuSmile, DryShield, vVardis, Young Innovations, Garrison, DeNovo, Nowak, and P&G/Crest Oral B

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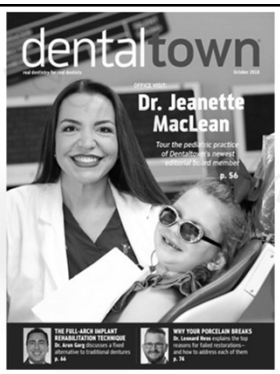

The New York Times

Dr. MacLean said, "People assume that parents will reject it because of poor aesthetics." But "if it means preventing a child from having to be sedated or having their tooth drilled and filled, there are many parents who choose S.D.F.," she added.

After Dr. MacLean treated Knox, she gave him a sticker.
CAITLIN O'HARA FOR THE NEW YORK TIMES

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Contemporary Concepts in Carious Tissue Removal: A Review

"Modern concepts for managing caries and its symptoms (ie, carious lesions) aim to avoid invasive treatments whenever possible and instead attempt to control the activity of the biofilm and the lesions."

Ecologic Plaque Hypothesis = caries is an ecologic imbalance within the dental biofilm, with acidogenic and aciduric bacteria being more competitive under frequent intake of carbohydrates, eventually dominating the biofilm. The result is a further imbalance between mineral gain (from saliva) and mineral loss (by demineralization), leading to the symptom of the disease, the carious lesion

REVIEW ARTICLE

WILEY

Contemporary concepts in carious tissue removal: A review

Falk Schwendicke, Dr. med. dent., DDS, PhD, MDPH

1 | MANAGING CARIES AND CARIOUS LESIONS

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Many US trained dentists are still "Bondodontists"

- Complete caries removal
- Extension for prevention
- Drilling based on color vs. hardness

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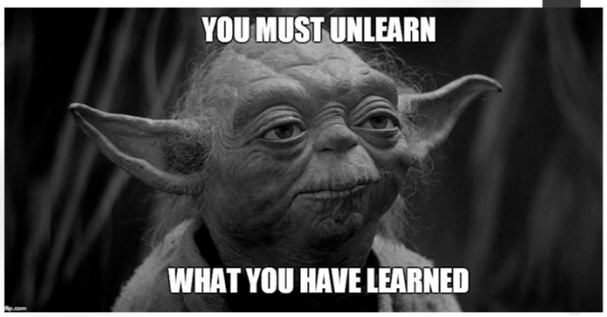

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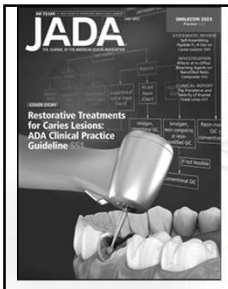

Evidence-based clinical practice guideline on restorative treatments for caries lesions

Vineet Dhar, BDS, MDS, PhD, Lauren Pilcher, MSPH, Margherita Fontana, DDS, PhD, Carlos González-Cabezas, DDS, MED, PhD, Martha Ann Keels, DDS, PhD, Ana Karina Mascarenhas, BDS, MPH, DrPH, Marcelle Nascimento, DDS, MS, PhD, Jeffrey A. Platt, DDS, MS, Gregory J. Sabino, DDS, PhD, Rebecca Slayton, DDS, PhD, Norman Tinanoff, DDS, MS, Douglas A. Young, DDS, BSD, MBA, MS, Domenick T. Zero, DDS, MS, Saran Ponike, MS, Olivia Urquhart, MPH, Kelly K. O'Brien, MLIS, Alonso Carrasco-Labra, DDS, MSc, PhD

The Journal of the American Dental Association
Volume 154 Issue 7 Pages 551-566.e51 (July 2023)
DOI: 10.1016/j.adaj.2023.04.011

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KEY FINDING FOR ADVANCED LESIONS:

- More conservative caries tissue removal approaches were associated with fewer clinical failures

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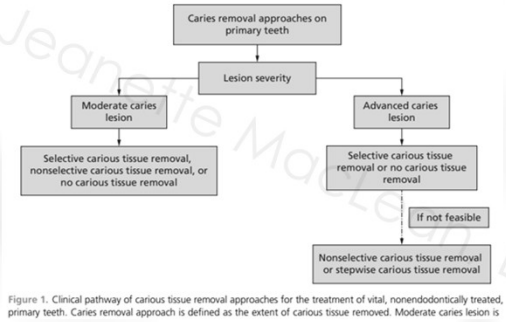

Figure 1. Clinical pathway of carious tissue removal approaches for the treatment of vital, nonendodontically treated, primary teeth. Caries removal approach is defined as the extent of carious tissue removed. Moderate caries lesion is

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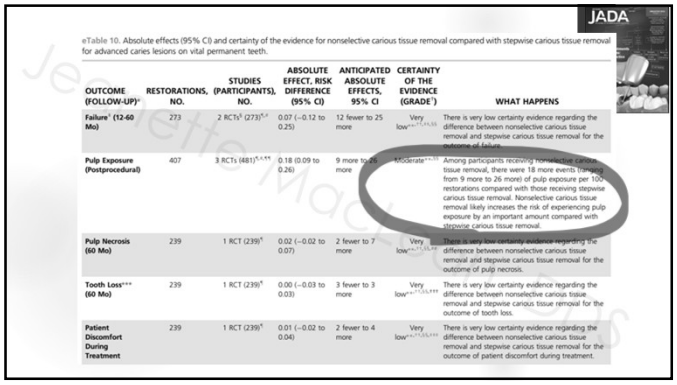
JADA

eTable 10. Absolute effects (95% CI) and certainty of the evidence for nonselective carious tissue removal compared with stepwise carious tissue removal for advanced caries lesions on vital permanent teeth.

OUTCOME (FOLLOW-UP)[a]	RESTORATIONS, NO.	STUDIES (PARTICIPANTS), NO.	ABSOLUTE EFFECT, RISK DIFFERENCE (95% CI)	ANTICIPATED ABSOLUTE EFFECTS, 95% CI	CERTAINTY OF THE EVIDENCE (GRADE[b])	WHAT HAPPENS
Failure[c] (12-60 Mo)	273	2 RCTs[d] (273)[e,f]	0.07 (−0.12 to 0.25)	12 fewer to 25 more	Very low[e,f,g,h,i]	There is very low certainty evidence regarding the difference between nonselective carious tissue removal and stepwise carious tissue removal for the outcome of failure.
Pulp Exposure (Postprocedural)	407	3 RCTs (481)[e,f,g,h]	0.18 (0.09 to 0.26)	9 more to 26 more	Moderate[e,f,g,h]	Among participants receiving nonselective carious tissue removal, there were 18 more events (range from 9 more to 26 more) of pulp exposure per 100 restorations compared with those receiving stepwise carious tissue removal. Nonselective carious tissue removal likely increases the risk of experiencing pulp exposure by an important amount compared with stepwise carious tissue removal.
Pulp Necrosis (60 Mo)	239	1 RCT (239)[g]	0.02 (−0.02 to 0.07)	2 fewer to 7 more	Very low[e,f,g,h,i]	There is very low certainty evidence regarding the difference between nonselective carious tissue removal and stepwise carious tissue removal for the outcome of pulp necrosis.
Tooth Loss[e,f,g,h,i] (60 Mo)	239	1 RCT (239)[g]	0.00 (−0.03 to 0.03)	3 fewer to 3 more	Very low[e,f,g,h,i]	There is very low certainty evidence regarding the difference between nonselective carious tissue removal and stepwise carious tissue removal for the outcome of tooth loss.
Patient Discomfort During Treatment	239	1 RCT (239)[g]	0.01 (−0.02 to 0.04)	2 fewer to 4 more	Very low[e,f,g,h,i]	There is very low certainty evidence regarding the difference between nonselective carious tissue removal and stepwise carious tissue removal for the outcome of patient discomfort during treatment.

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Hall Technique

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The Hall Technique
University of Dundee
Evans and Innes

- The Hall Technique is a method for managing carious primary molars where decay is sealed under preformed metal crowns (PMCs) without local anesthesia, tooth preparation or any caries removal.
- Clinical trials have shown the Hall Technique to be effective, and acceptable to the majority of children, their parents and clinicians.
- It is NOT, however, an easy, quick fix solution to the problem of the carious primary molar. Like all clinical interventions, for success the Hall Technique requires careful and appropriate case selection, a high level of clinical skill, excellent patient management and long term monitoring. In addition, it must always be provided with a full and effective caries preventive programme

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The Evidence for Hall Technique

- The body of evidence for HT continues to grow
- There are now 10 published randomized control trials (an 11th is on the way)
- Dr. Nicola Innes has begun work on a systematic review

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Study	Country & Study details	Age group (years)	Sample	Intervention	Follow up time	Results Success (%)
Innes et al. BMC Oral Health 2007;7:18. Innes et al J Dent Res 2011;90:1405–1410.	UK General Dentists in NHS Practice. Lesions: occlusal & proximal	3–10 yrs Mean = 6.8 yrs; SD 1.58	66 children/ 132 teeth (split mouth design) HT= 132; CR= 132	Hall Technique	2 years 5 years	93% 92%
				Complete & selective removal & restoration (GDP preference)	2 years 5 years	39% 42%
Santamaria et al. J Dent Res. 2014;93:1062-1069. Santamaria et al. Caries Res. 2017;51(6):605-614.	Germany Specialists in hospital. Lesions: cavitated proximal	3-8 yrs Mean = 5.6 yrs; SD 1.5	169 children/ teeth. HT=52; NIRCT=52 CR=65	Hall Technique	1 year 2.5 years	98% 93%
				Complete caries removal & Compomer restoration	1 year 2.5 years	71% 67%
				Non-restorative cavity control	1 year 2.5 years	75% 70%
Narbutaitė et al. Caries Res 2017;51:323.	Lithuania Specialists in hospital. Lesions: cavitated proximal	3–8 yrs Mean = 5.69 yrs; SD 1.23	122 children/ teeth. HT=35; NIRCT=35; CR=52)	Hall Technique	1 year	94%
				Caries removal & restoration according to GDP preference	1 year	73%
				Non-restorative cavity control	1 year	47%
Araujo et al. Analysis of a RCT. Caries Res 2017;51:330	Brazil Specialists & UG students; field school setting. Lesions: cavitated proximal	5–10 yrs Mean = 8.18 yrs; SD 1.11	131 children/ teeth HT=66; ART=65	Hall Technique	1 year 3 years	99% 93%
				Atraumatic Restorative Treatment	1 year 3 years	59% 33%
Kaptan & Korkmaz 2021 Nigerian J Clin Practice 24(3):425-434.	Turkey Lesions:	4-8 yrs	55 children	Hall Technique	1 year	
				Conventional restoration	1 year	
Kezowie et al. 2021 Int J Dent Oral Science 8(1):1039-1046.	Syria Lesions: proximal symptomatic	6-7 yrs	120 children/ 120 molars HT=60; Conventional=60 (Comp =30/ amalg=30)	Hall Technique	1.5 years	100%
				Conventional restoration	1.5 years	87%

Graph courtesy of Dr. Nicola Innes

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Success rates for 11 randomized control trials of the Hall Technique and their comparator interventions – 1-5

Study	Country & Study details	Age group (years)	Sample	Intervention	Follow up time	Results Overall success (%)
Elamin et al. (2019) PLoS ONE 14(6).	Sudan General Practice	5-8 yrs	109 children/103 teeth	Hall Technique	2 years	94%
				Conventional crown	2 years	94%
Ayedun Ayedun et al. (2021) Nigerian Journal of Clinical Practice 24(4): 584-594.	Nigeria Hospital Lesions: enamel or dentine	3-8 yrs	25 children (split mouth) 50 teeth HT=25 CC=25	Hall Technique	1 year	100%
				Conventional crown	1 year	96%
Ebrahimi et al. (2020) Pediatric Dentistry 42(3): 187-192.	Iran	4-9 yrs	123 primary molars	Hall Technique	6 months 1 year	98% 97%
				Conventional crown	6 months 1 year	100% 100%
				Modified ART	6 months 1 year	79% 66%
Boyd et al. (2021) JDR Clinical and Translational Research 6(2): 205-212.	New Zealand Dental Therapists (practice)	5-8 yrs	HT=149 CC=146	Hall Technique	1 year 2 years	89% 85%
				Conventional crown	1 year 2 years	92% 86%

Graph courtesy of Dr. Nicola Innes

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Chompu-Inwai, et al. (2015). Pediatric Dentistry 37(4): e41-e48.	96 primary molars with asymptomatic deep caries or reversible pulpitis were randomly assigned to three groups: (1) indirect pulp treatment (IPT); (2) minimal caries removal with both resin-modified glass ionomer base material and luting cement (MCRB/L); and (3) minimal caries removal with only resin-modified glass ionomer luting cement (MCRL).	Mod Hall Technique (prep & base) minimal caries removal with both resin-modified glass ionomer base material and luting cement (MCRB/L).	2 years	93%
		Mod Hall Technique (prep) (3) minimal caries removal with only resin-modified glass ionomer luting cement (MCRL).	2 years	77%
		IPT (indirect pulp treatment)	2 years	90%

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Graph courtesy of Dr. Nicola Innes

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The Hall Technique 10 years on: Questions and answers

Innes et al BDJ 2017

"A Hall Crown is a predictably successful restoration. When a carious lesion is sealed into a tooth, the biofilm (the community of microbes, their products and extracellular polymeric matrix) is physically prevented from accessing nutrition from its main substrate, dietary carbohydrate. This means that the actively carious/cariogenic lesion becomes a non-cariogenic lesion. Like other treatments aimed at managing carious lesions by sealing them in, a Hall crown works by depriving the lesion of fuel and making the environment unfavourable for its progression. The dental pulp lays down reparative dentine, effectively retreating in response to the advancing carious lesion."


GENERAL

The Hall Technique 10 years on: Questions and answers

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The Hall Technique

Extensive crown destruction, particularly proximal lesions in the primary dentition, fares better long term with an SSC

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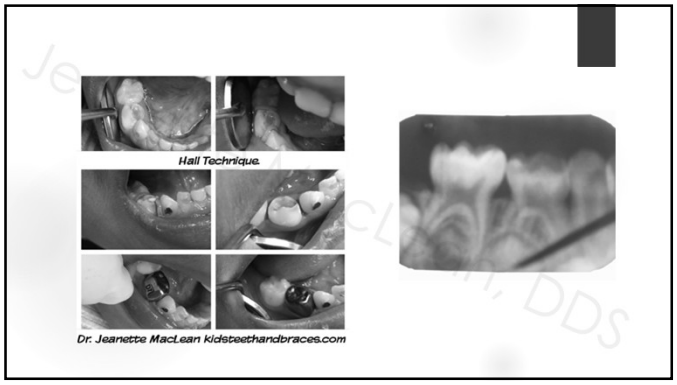
Hall Technique
Dr. Jeanette MacLean kidsteethandbraces.com

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5-year-old immediately after treatment with Hall Technique

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I love Hall crowns!!! 5 month followup on a 2 year old with SSCs placed on all four first primary molars with no sedation, no local anesthesia, in less than 15 minutes. Older brother had IV sedation, so mom was thrilled with this option. Ironically it was easier to put crowns on her than take pictures! But notice how the bite adjusts and the tissue is healthy. Yes, she has a pre-existing raging overbite and chipped #E, which has SDF arrested caries and a GIC band-aid, but no open bite and she'll still super cute IMO!! Improve outcomes, reduce cost, increase access to care; Triple Aim of Healthcare goals achieved! (permission to post) UPDATE: 9.5 month follow up images and X-rays added. — at Affiliated
Write a comment...
Jeanette's Post
goals achieved! (permission to post) UPDATE: 9.5 month follow up images and X-rays added. — at Affiliated Children's Dental.
+13
Like
Comment
I began sharing HT cases online in 2018

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Harsh Critics

22

Defending the Hall Technique

- Harsh criticism
  - Don't understand the process
  - Unaware of the literature
  - Fear over job security
  - Editorial articles lashing out at the technique

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Dentaltown, March 2020

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The COVID Tipping Point

- Initial concerns for aerosols in the early months pf the pandemic made an interesting impact on acceptance of the Hall Technique
- NuSmile HT webinars April & May 2020
- I had several pediatric dentist DM me that they finally had the courage to try HT, and once they had, couldn't believe it took them so long
- AAPD 2020 includes scientific session on minimal interventions, like HT

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Teaching and utilization of silver diamine fluoride and Hall-style crowns in US pediatric dentistry residency programs

Crystal et al JADA 2020

- "US pediatric residency programs have universally adopted SDF for caries arrest in the primary dentition, and this trend seems to extend to other nonsurgical caries management agents."

Table 2. Reports of utilization and teaching caries control in US pediatric residency programs in 2015* (n = 74) and in 2020 (n = 82).

VARIABLE	UTILIZATION, NO. (%)		TEACHING, NO. (%)			
	Utilized 2015	Utilize Currently 2020	Didactic 2015	Didactic 2020	Clinical 2015	Clinical 2020
Silver Diamine Fluoride	19 (25.7)	82 (100)	59 (79.7)	80 (97.6)	19 (25.7)	80 (97.6)
Povidone Iodine	1 (1.3)	2 (2.5)	43 (58.1)	24 (29.6)	2 (2.7)	0 (0)
Silver Nitrate	7 (9.5)	2 (2.5)	46 (62.2)	35 (43.2)	6 (8.1)	2 (2.5)
Fluoride Varnish	74 (100)	82 (100)	69 (93.2)	79 (96.3)	70 (94.6)	80 (97.6)
Acidulated Phosphate Fluoride Foam	36 (48.6)	23 (28.4)	63 (85.1)	64 (79.0)	38 (51.4)	27 (33.3)
Hall-Style Crown	NR†	56 (69.1)	NR	74 (90.2)	NR	57 (69.5)

* NR: Not reported. † Source: Nelson and colleagues.[14]


Original Contributions

Teaching and utilization of silver diamine fluoride and Hall-style crowns in US pediatric dentistry residency programs

Yasmi O. Crystal, DMD, MSc; Malvin N. Janal, PhD; Sooha Yim, DDS; Travis Nelson, DDS, MSD, MPH

ABSTRACT

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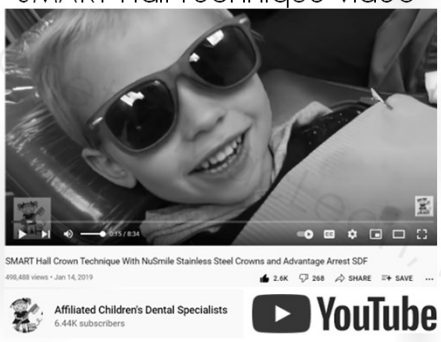
SMART Hall Technique video



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Conventional vs. Hall Technique: Results are Equivalent

- The success of stainless steel crowns placed with the Hall technique: A retrospective study
  (Ludwig et al JADA 2014)

The success of stainless steel crowns placed with the Hall technique

A retrospective study

ABSTRACT

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I STILL DON'T GET IT…

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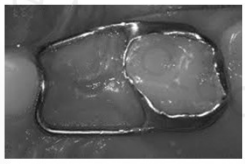
Huh?

30

If you can fit and place a band for a space maintainer,
you can do Hall Technique!



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A Hall crown is just a space maintainer, with a roof

32

If you understand indirect pulp therapy/ indirect pulp cap,
you can do Hall Technique!

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A Hall crown is just an indirect pulp cap… on steroids

- The SSC protects the tooth from the forces of occlusion
- A good marginal seal and the cement wall off the biofilm
- The GIC or RMGI cement releases fluoride and reduces sensitivity
- Odontoblasts lay down a protective barrier of reparative dentin, insulating the pulp

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Presenting Hall Technique to parents

- Your child's tooth warrants a crown
- The good news is we now have a non-invasive way to place crowns that will not require sedation, shots, or drilling
- We have learned it's no longer necessary to drill away all the decay
- Instead, we can seal it under a crown, which will starve the cavity of the sugars and acids needed for it to get worse
- We will use orthodontic separators to create the space between the teeth to fit the crown, instead of using a drill to cut the tooth to make space for the crown
- Studies show the success rate is equivalent to the conventional approach

35

Typical response

- "That's awesome! I wish I had a dentist like you when I was a kid!"

36

Say what?

37

What would happen if I put you in a tank of cement ?
Would you live ? Or would you die ?

38

What about anaerobic bacteria ?

- Caries is driven by dietary carbohydrates NOT oxygen

39

Remember H. Pylori ?

- Marshall and Warren
- 2005 Nobel Laureate in Medicine and Physiology
- 1983 discovery of Helicobacter pylori dramatically changed the treatment approach for gastroduodenal diseases in the last two decades
- Now stomach ulcers and cancers can be treated conservatively without surgical procedures.

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The Hall Technique Clinical Protocol

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Indications for Hall Technique

- Caries in primary molars
- Per "The Hall Technique 10 years on: Questions and answers" (Innes BDJ 2017)
  - Proximal lesions, cavitated on non-cavitated
  - Occlusal lesions, non-cavitated if the child is unable to accept a fissure sealant
  - Occlusal lesions, cavitated if the child is unable to accept selective caries removal
- My indications
  - Primary molars with asymptomatic caries or reversible pulpitis
  - Large , multi-surface lesions
  - Lesions involving cusps or extending beyond proximal line angles
  - Patient cannot tolerate conventional surgical interventions
  - Parent or patient prefers less invasive treatment

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Contra-indications

- No clear band of dentin can be seen on a radiograph
- Signs or symptoms of irreversible pulpitis or dental infection
- Clinical or radiographic signs of pulpal exposure or periradicular pathology
- Crowns/teeth so broken down that they would be unrestorable with conventional techniques
- Children where the airway cannot be managed safely

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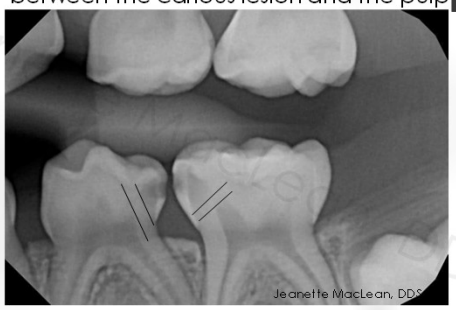
A "clear band of dentin" = dentin between the carious lesion and the pulp



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OBTAIN INFORMED CONSENT

- RISKS
- BENEFITS
- AND ALTERNATIVES
  - INCLUDING NO TREATMENT

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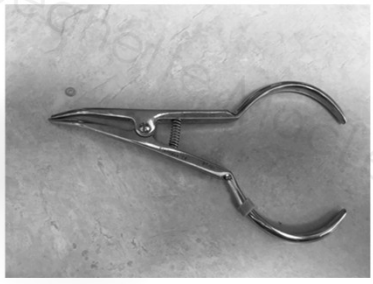
Place separators



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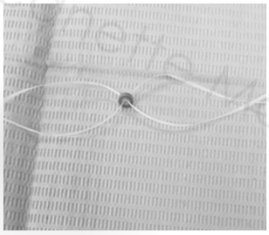
Place separators



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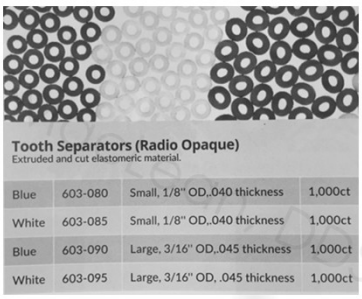
Separators come in 2 sizes

- Small, 1/8"
- Large, 3/16"



Tooth Separators (Radio Opaque)
Extruded and cut elastomeric material.

Blue	603-080	Small, 1/8" OD,.040 thickness	1,000ct
White	603-085	Small, 1/8" OD,.040 thickness	1,000ct
Blue	603-090	Large, 3/16" OD,.045 thickness	1,000ct
White	603-095	Large, 3/16" OD, .045 thickness	1,000ct

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Separator Placement Video

Affiliated Children's Dental Specialists
6.01K subscribers

Separator Placement for SMART Hall Crown Technique after SDF Treatment
6,268 views • Mar 12, 2019
51 4 SHARE SAVE ...

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MORE ON SEPARATORS

- IF THEY HAVE OPEN CONTACTS, YOU WON'T NEED THEM
- IF THEY ONLY HAVE 1 CONTACT, YOU'LL ONLY NEED 1 SEPARATOR
  - BE AWARE THE TEETH WILL SHIFT, SO AN OPEN MESIAL CONTACT MAY BECOME A CLOSED MESIAL CONTACT
- USE LARGER SEP FOR A BROAD MOLAR TO MOLAR CONTACT
- USE SMALLER SEP FOR A NARROWER MOLAR TO CANINE CONTACT
- CONSIDER GIVING PARENTS EXTRA SEPS TO TAKE HOME
- SOMETIMES THE CONTACT WILL FAIL TO OPEN DUE TO THE SEP FALLING OUT, SHIFTING, OR IMPROPER PLACEMENT
  - OPTIONS:
    - REAPPOINTMENT
    - REPLACE AND WAIT 15 MIN.
    - STRIP CONTACT

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Remove separators,
Ideally after 2 days – 1 week

52

Separators are easily removed
with an explorer

53

Notice the space created

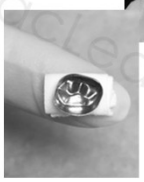
54

Clean with plain pumice

55

Protecting the airway

- Seat patient slightly upright, if possible
- 4x4 gauze
- Athletic tape



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Seated slightly upright

Dr. Nicola Innes

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Video of Hall Technique on Lap

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Select crown

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Too big

Too small

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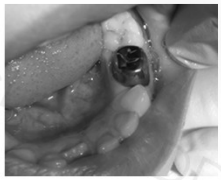
Just right!



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Adjust the SSC for a good fit and marginal seal, just as you would after surgical prep

Crimping plier

Howe Plier

U. Of Dundee

63

Check margins with an explorer to ensure carious lesion is fully covered!

- Open margins can lead to failures!

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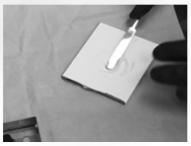
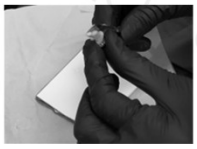
Prepare a high quality glass ionomer or RMGI cement such as Fuji CEM 2, and load into the crown

Fill to the top!





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Automix Options

66

Seat crown with firm finger pressure, ensure airway is protected

67

Instruct the patient to bite down

68

Clean and remove excess cement

69

Rinse

70

All done!

Notice some gingival blanching & a nice, sealed margin

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If you use a needle and a drill, it's not a Hall crown

- Topical is not necessary
  - Some kids get upset that it is too "spicy" or don't like the taste
  - Are you using topical and local to place space maintainers?
- Numbness does not negate pressure sensation
- Redirect their attention
  - Some kids do not complain at all
  - Resilient kids are quickly and easily redirected
  - Drama queens will be drama queens… what else is new?☺
- No soft tissue damage from a bur nicking it
- No accidental tongue or lip bite
- Well tolerated by patients

72

2 weeks later

Notice how healthy the soft tissue looks

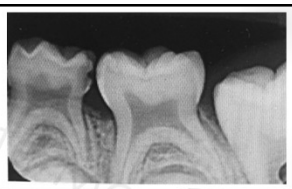
73

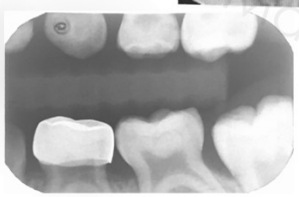
Notice how the bite has self-corrected

Immediate post-op

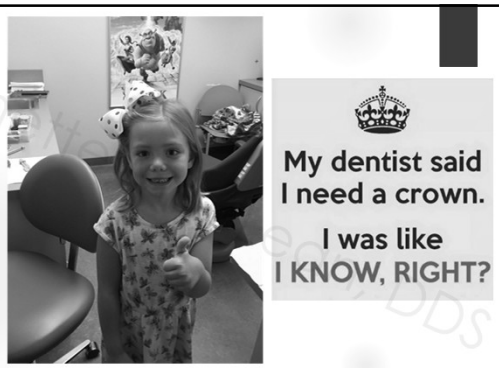
2 weeks post-op

74





75



76

Occlusion

- Influence of preformed metal crowns (Hall technique) on the occlusal vertical dimension in the primary dentition (van der Zee 2010)
  - "The reduction of the overbite seems to be caused by intrusion of the crowned molar and its antagonist."
- Measurement of Occlusal Equilibration Following Hall Crown Placement (So D et al 2015)
  - (Occluso-vertical dimension) "OVD returns to before crown-fit levels within two weeks."
  - "Mainly but not completely from intrusion of the crowned tooth."

77

Digital occlusal analysis of vertical dimension and maximum intercuspal position after placement of stainless steel crown using hall technique in children

Nair, K. International Journal of Paediatric Dentistry April 2020

- "The stainless steel crowns (SSCs) placed using the Hall technique disrupt the occlusion, but stabilization appears to occur within a short period post-placement."
- "There was an occlusal re-equilibration attained after 1 month."

78

Ebrahimi M. et al Success and Behavior During Atraumatic Restorative Treatment, the Hall Technique, and the Stainless Steel Crown Technique for Primary Molar Teeth
Pediatr Dent. 2020 May

- "The Hall technique has acceptable clinical and radiographic results comparable to that of the stainless steel crown technique for treatment for carious primary molar teeth with multisurface lesions"
- "A decrease of canine overbite occurs at the time of treatment in the HT group. However, alterations to overbite subside by six months after treatment."
- "Considering acceptable clinical and radiographic results and other advantages of HT, including less treatment time, technique simplicity, and showing high parental satisfaction, HT offers a treatment option for treatment of multisurface caries of primary molars."


Success and Behavior During Atraumatic Restorative Treatment, the Hall Technique, an the Stainless Steel Crown Technique for Primary Molar Teeth

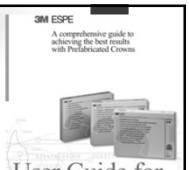
79

Occlusion changes with conventional SSC as well…

- Unless you take a scan or impression and create a custom crown, the occlusion will be different with any prefabricated crown, conventional/surgical prep or no prep/Hall

Finally the crown is checked for occlusion. The primary dentition has great ability to adjust to a slightly opened bite of 1mm or so over a few days with no adverse effect. [12] The patient should be advised that there may be some temporary gingival discomfort when the local anesthetic wears off.

12. Duggal MS and Curzon MEJ. Restoration of the broken down primary molar:2. Stainless steel crowns. Dent Update 1989;16:71-75.



80

ORTHODONICS

BITE TURBOS

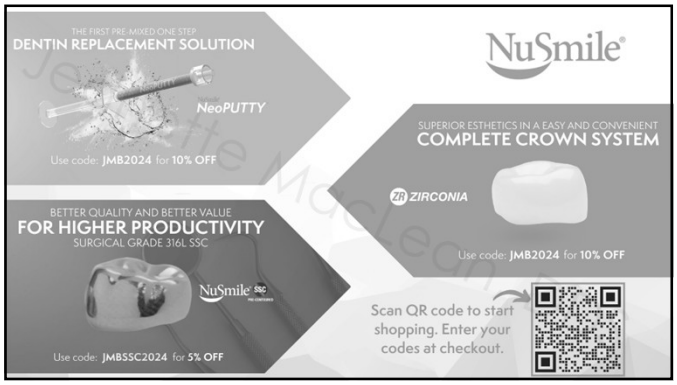
81

NuSmile SSCs

- Flat $3 per crown
  - Compared to 3M which averages $5 - $8, depending on your dealer
- 316 Surgical Grade SS
  - More malleable around the margins for easier placement
  - Holds up to bruxers better than 3M
- 3M uses 304 Food Grade SS
- Average prepped molar size is 4, so average unprepped, "Hall size" is 5

Sizes etched on lingual surface

82

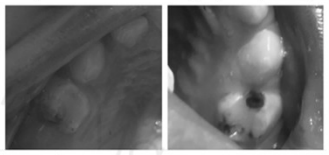


83

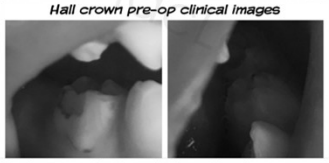
CASE STUDIES

84

SMART Hall 2 year old with carious, hypoplastic primary first molars



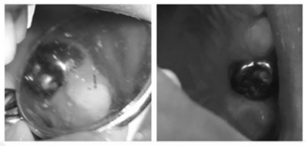
Hall crown pre-op clinical images



Dr. Jeanette MacLean kidsteethandbraces.com

85

5 month follow-up



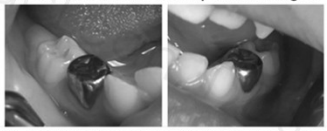
Hall crown 5 month follow-up clinical images

Dr. Jeanette MacLean kidsteethandbraces.com

86

9.5 month follow-up

Hall Crown 9 month follow up clinical images



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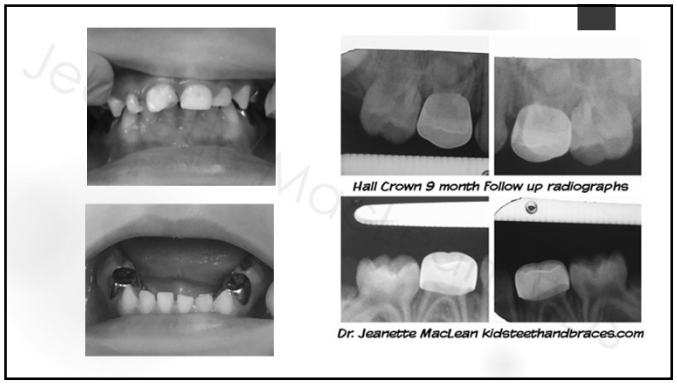
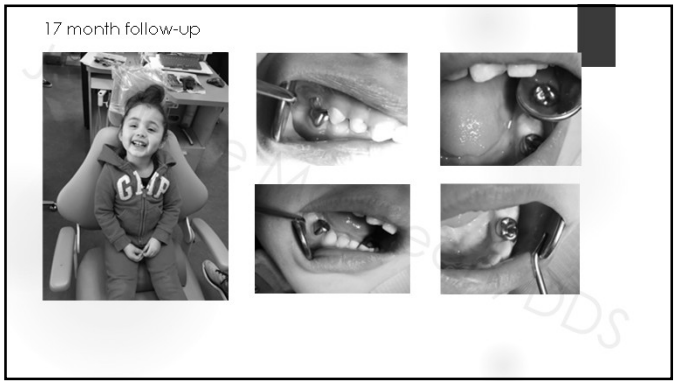
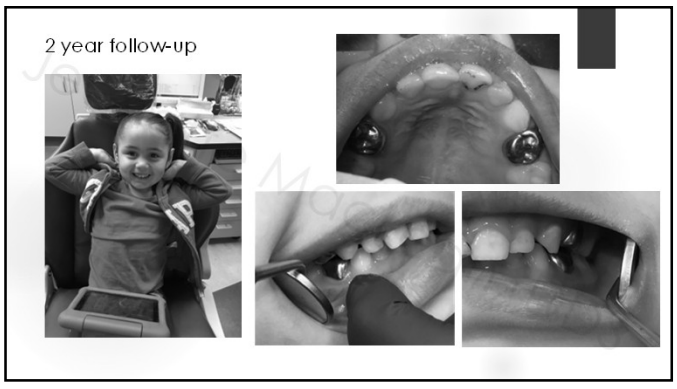

Hall Crown 9 month Follow up radiographs
Dr. Jeanette MacLean kidsteethandbraces.com

88


17 month follow-up

89


2 year follow-up

90

3 year follow-up

91

Almost 4 years!

92

Remember the Haters ?

That comment was directed at the 6 month follow up post of this case

If this is sh*t dentistry, bring on the sh*t!!!

93

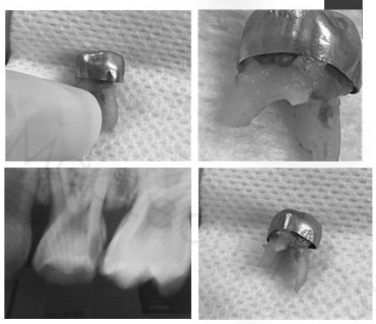
'8 Pack Done Differently'

- People will travel to see you!
- Give the parent extra separators 'just in case'
- 'Knee to knee' kid 5 year follow-up

94

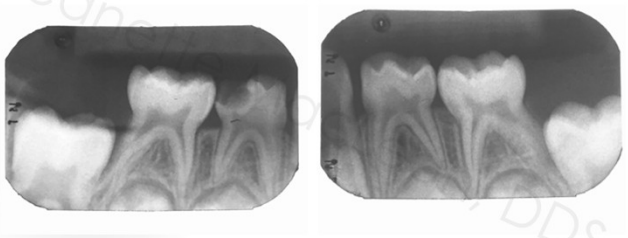
Failed Hall crown placed by another pediatric practice that was able to "get them in sooner"

- I did extract this abscessed tooth
- SSC did not fully cover the carious lesion



95

8/2/18



Treatment plan = #S – SMART Hall SS #L – Occlusal SMART w/ EQUIA Forte

96


6 month follow-up
2/28/19

97

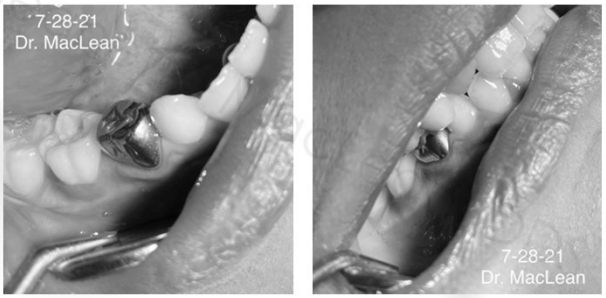

13 month follow-up
9/11/19

98


19 month follow-up

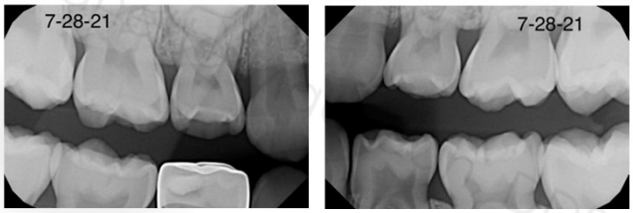
99

3 year follow-up



100

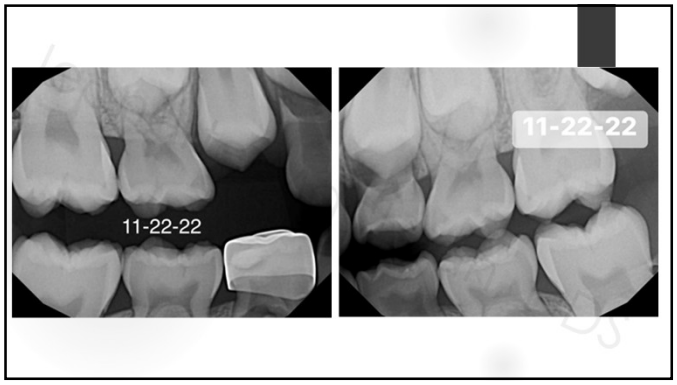
3 year follow-up



101

4+ year follow-up

102

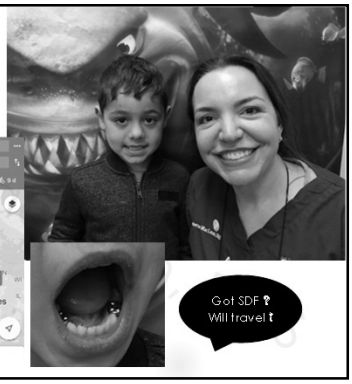


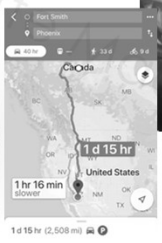
103

Why choose to over-complicate something when the evidence has shown us it's not necessary ?

104

SMART Hall patient from Fort Smith, N. Territory





105

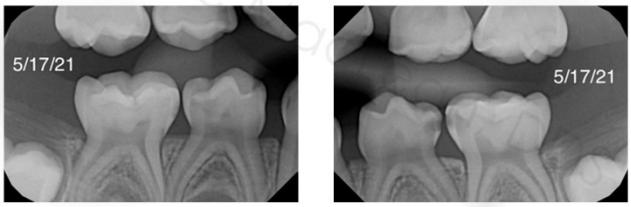
FAQs

"SHOULD YOU APPLY SDF FIRST ?"	"IS THIS ONLY FOR THE BAD KIDS ?"	"DO YOU ONLY DO HALL CROWNS NOW ?"
• SDF IS NOT NECESSARY FOR THE PROVEN EFFICIACY OF HALL TECHNIQUE • IT CAN BE A "TIME BUYER" • IT CAN HELP ASSESS PULP VITALITY • "BELT AND SUSPENDERS"	• NO, "GOOD" KIDS DESERVE NON-INVASIVE OPTIONS TOO • YOU MAY NOT BE ABLE TO DO THIS IF BEHAVIOR IS REALLY BAD AND YOU CAN'T PROTECT THE AIRWAY – THEY MAY WARRANT SEDATION OR ITR	• NO • I DON'T HAVE AN EXACT PERCENTAGE BREAKDOWN, BUT I STILL DO BOTH CONVENTIONAL SURGICAL SSC AS WELL AS HT

106

Back-to-Back Hall Crowns

- Seat the SSC on the worst tooth first (typically the 1st molar)
- Place separators again
- Bring the patient back to seat the adjacent crown



107

108

Atraumatic Glass Ionomer Strip Crowns

109

110

111

112

Benefits

- Minimally invasive
- An extension of ART & IPT
- Great option for kids that;
  - Lack spacing or anatomy for a prefabricated crown
  - Are too young to sedate
  - Parents do not want to sedate
  - High fluoride release arrests caries with little or no tooth preparation

113

Disadvantages

- Learning curve
  - Do NOT attempt this if you've never used a glass hybrid restorative before
  - start with simple occlusals
- Not appropriate for deep sedation or GA
  - In that situation use a prefabricated crown for superior strength and esthetics
- Can be "high maintenance" in certain kids
  - Important to review the pros and cons and set realistic goals

114

115

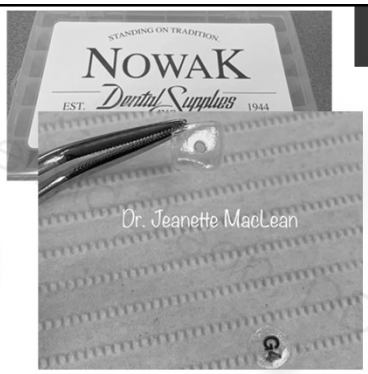
Original Forms

- Longer
- No vent

116

New Option

- Shorter
- Pre-vented



117

SELECT YOUR RESTORATIVE

- EQUIA FORTE
- EQUIA FORTE HT

118

LINGERING MISCONCEPTIONS

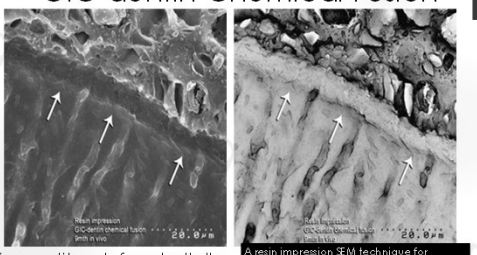
119

Glass Hybrid Restorative

- Bulk fill
- Biocompatible
- Increased flexural strength
- Max fluoride release
- Antimicrobial
- Hydrophilic
- Wear resistant
- Esthetic

120

GIC-dentin Chemical Fusion



Ionic constituents from both the GIC and the underlying dentin

A resin impression SEM technique for examining the glass–ionomer cement chemical fusion zone. Millichich G. Journal of Microscopy. Vol. 217, Pt 1 January 2005, pp. 44-48

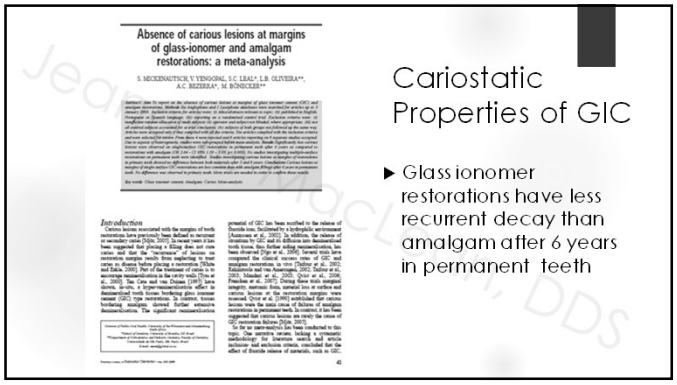
121

Sharing is Caring!

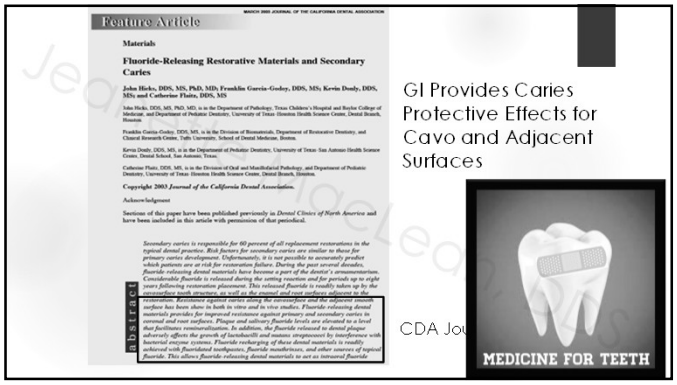
122

"Electron probe microanalysis demonstrated that both fluorine and strontium ions had penetrated deep into underlying demineralized dentin. The pattern was consistent with remineralization. The only source of these ions was the glass ionomer restoration."

123


Absence of carious lesions at margins of glass-ionomer and amalgam restorations: a meta-analysis
S. MICKENAUTSCH, V. YENGOPAL, S.C. LEAL*, L.B. OLIVEIRA**, A.C. BEZERRA*, M. BÖNECKER**
Introduction
Cariostatic Properties of GIC
Glass ionomer restorations have less recurrent decay than amalgam after 6 years in permanent teeth

124


Feature Article
Materials
Fluoride-Releasing Restorative Materials and Secondary Caries
John Hicks, DDS, MS, PhD, MD; Franklin Garcia-Godoy, DDS, MS; Kevin Donly, DDS, MS; and Catherine Flaitz, DDS, MS
Copyright 2003 Journal of the California Dental Association.
Acknowledgment
abstract
GI Provides Caries Protective Effects for Cavo and Adjacent Surfaces
MEDICINE FOR TEETH

125


Crown forms were left in place for removal at a future visit
All Finished!

126


6/24/19

127

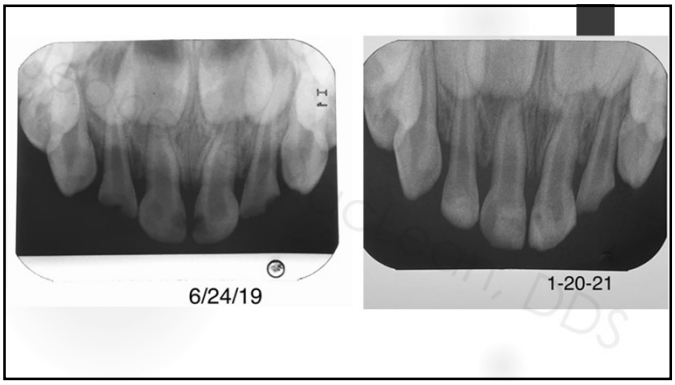

Gary 1.5 Year Follow Up
1-20-21

128

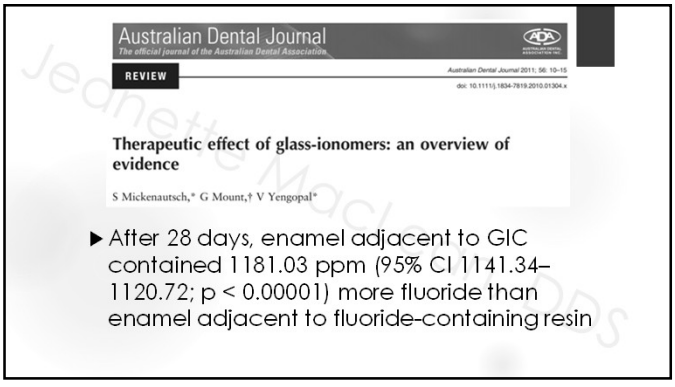

Chipped natural tooth too!
Remineralized & hard as a rock!

129

130


6/24/19
1-20-21

131


Australian Dental Journal
The official journal of the Australian Dental Association
REVIEW
Australian Dental Journal 2011; 56: 10–15
doi: 10.1111/j.1834-7819.2010.01304.x
Therapeutic effect of glass-ionomers: an overview of evidence
S Mickenautsch,* G Mount,† V Yengopal*
After 28 days, enamel adjacent to GIC contained 1181.03 ppm (95% CI 1141.34–1120.72; p < 0.00001) more fluoride than enamel adjacent to fluoride-containing resin

132

TRAC Research by Rella Christensen, RDH, PhD

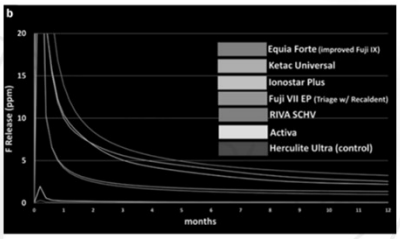


Figure 9. In vitro fluoride release in parts per million from 7 restorative materials we assayed weekly for one year. In **Figure 9a**, the scale of this graph allows the reader to see the typical spike in fluoride release that occurs within the first 24 hours after placement. The scale in **Figure 9b** allows the reader to see the differences in fluoride release among the 7 products tested. EQUIA Forte showed the consistently highest fluoride release throughout the one-year test.

133

CLINICAL PROTOCOL

134

STEP-BY-STEP

- EXAM AND X-RAY
- VITAL PULP OR REVERSIBLE PULPITIS
- TREATMENT PLAN AND INFORMED CONSENT
- CONSIDER BEHAVIOR MANAGEMENT FEE IF UNCOOPERATIVE
- CONSIDER NUMBER OF APPOINTMENTS BASED ON AGE AND BEHAVIOR

135

CLEAN THE TOOTH

- NO LOCAL ANESTHETIC OR TOPICAL NECESSARY
- PLAIN PUMICE
- DEPENDING ON BEHAVIOR & ACTIVITY OF THE LESION, CONSIDER CARIES REMOVAL
  - SPOON EXCAVATION
  - SLOW SPEED ROUND BUR
  - CHEMOMECHANICAL CARIES REMOVAL
  - CONSIDER REMOVAL OF SDF STAINED TOOTH STRUCTURE TO PROVIDE DEPTH FOR BULK OF THE MATERIAL
  - NO CARIES REMOVAL IS ALSO AN OPTION FOR ART

136

137

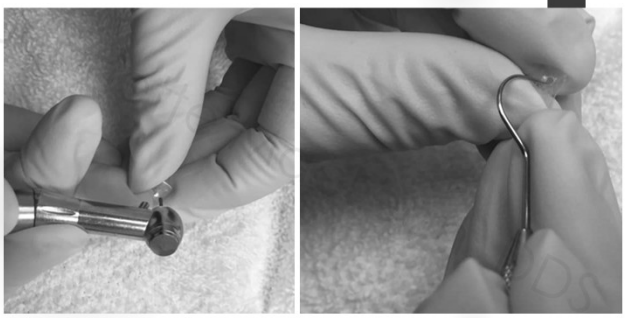
Select and trim crown form

138

139

140

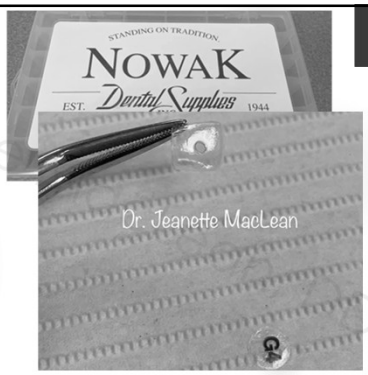
141



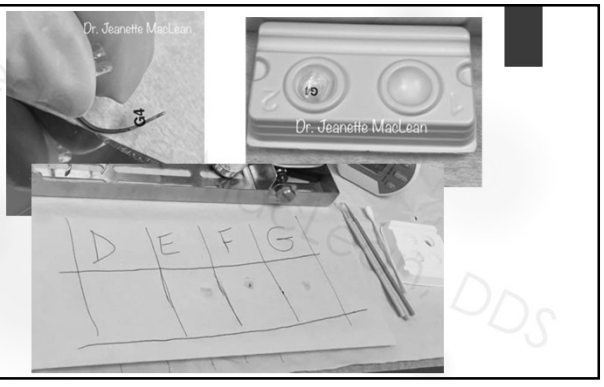
142

New Option

- Shorter
- Pre-vented



143



144

Cavity Conditioner "PAA" = Polyacrylic Acid

- PAA and phosphoric acid etch for resin composite are NOT the same thing!
- Improves chelation and chemical bond
- A bonding agent is NOT necessary
- GC Cavity Conditioner =
  - 20% Polyacrylic Acid: removes the smear layer to enhance the bond of GIC to enamel and dentin
  - 3% Aluminum Chloride Hexahydrate seals dentinal tubules to reduce sensitivity

145

Apply conditioner

- 20% PAA for 10 seconds
- Rinse
  - Consider using wet gauze for extremely phobic patients
- 'Dry,' but do not desiccate
  - Blot
  - No pooling water

146

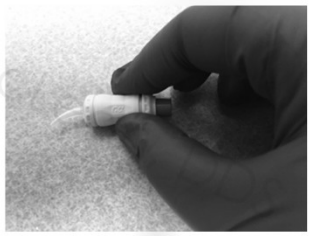
147

PREPARE GI RESTORATIVE

148

Basic Capsule Mixing Steps

1. Remove from wrapper immediately before use
2. Tap capsule on its side to loosen the glass particles



149

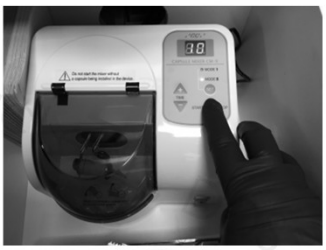
3. To activate the capsule, push the plunger until it is flush with the main body and hold it down for 2 seconds

150

4. Ensure the plunger is fully pressed to avoid the incorrect mixing ratio of powder and liquid
5. The capsule should be activated just before mixing and used immediately

151

5. Place in capsule mixer and mix for 10 seconds



152

WORKING TIME IS SHORT!

153

Place capsule into the applicator gun and click twice to extrude material through the tip

154

Immediately load into the crown form

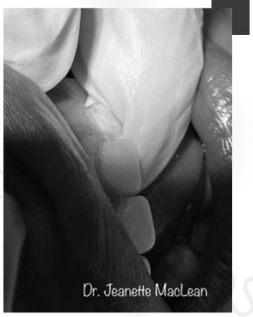
155

Fill to the top

156

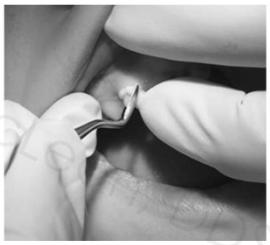
SEAT WITH FIRM FINGER PRESSURE

USE CAUTION NOT TO BEND OR DISTORT THE FORM



157

WORKING QUICKLY, REMOVE EXCESS MATERIAL WITH A HOLLANBACK OR MICROBRUSH



158

NOW WAIT!

159

TIPS

- DO NOT DISTURB THE MATERIAL PAST THE WORKING TIME OR IT WILL HAVE VISIBLE CRACKS IN IT
  - 1 MINUTE 15 SECONDS FOR EQUIA FORTE
  - 1 MINUTE 30 SECONDS FOR EQUIA FORTE HT
- I HIGHLY RECOMMEND TO ONLY LOAD AND SEAT 1 CROWN AT A TIME PER CAPSULE
- PREVENT PATIENT FROM BITING DOWN FOR 3.5 MINUTES
- GIVE THE PATIENT A 15 MINUTE BREAK BEFORE ATTEMPTING TO REMOVE THE FORM SAME-DAY. OR CONSIDER LEAVING THE FORM ON A VERY DIFFICULT PATIENT AND REMOVE AT A FOLLOWUP APPOINTMENT

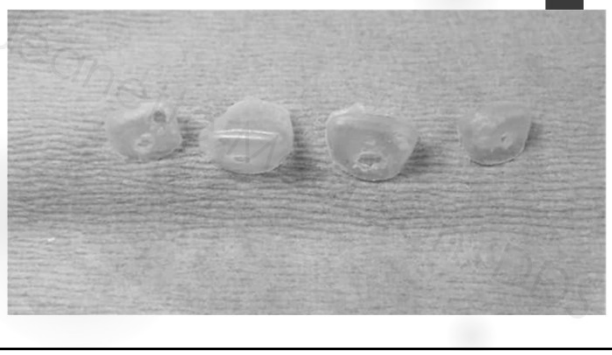
160

161

CAREFULLY REMOVE THE CROWN FORM

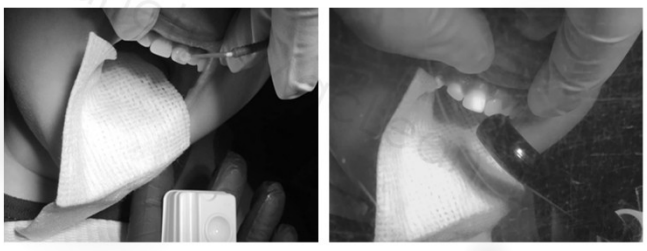
162

163



164

APPLY COAT & LIGHT CURE 20 SECONDS



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SKIP THE COAT IF GUMS ARE BLEEDING OR THE PATIENT IS VERY UNCOOPERATIVE

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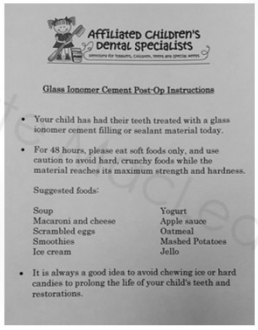
Soft foods only for 48 hours!



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Glass Ionomer Cement Post-Op Instructions

- Your child has had their teeth treated with a glass ionomer cement filling or sealant material today.
- For 48 hours, please eat soft foods only, and use caution to avoid hard, crunchy foods while the material reaches its maximum strength and hardness.

Suggested foods:

Soup	Yogurt
Macaroni and cheese	Apple sauce
Scrambled eggs	Oatmeal
Smoothies	Mashed Potatoes
Ice cream	Jello

- It is always a good idea to avoid chewing ice or hard candies to prolong the life of your child's teeth and restorations.

Download at kidsteethandbraces.com

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CASE STUDIES

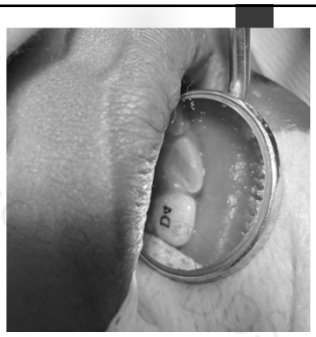
168

2 yo

2nd opinion

Previous dentist recommended "silver crowns" per mom

169



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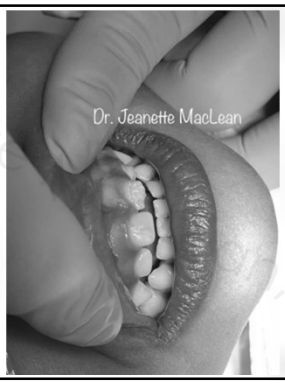
1 crown was placed per visit

171


Dr. Jeanette MacLean

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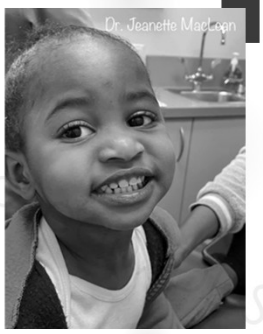
Dr. Jeanette MacLean


Dr. Jeanette MacLean

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8 month follow up

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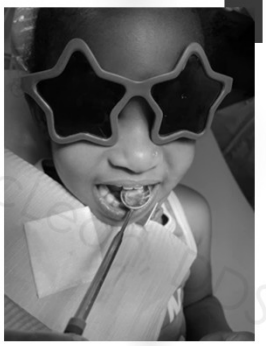

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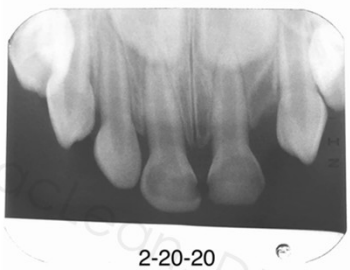
2 yo
2nd opinion

Class III, missing #G

Previous dentist said
SDF or extractions



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15 month follow up

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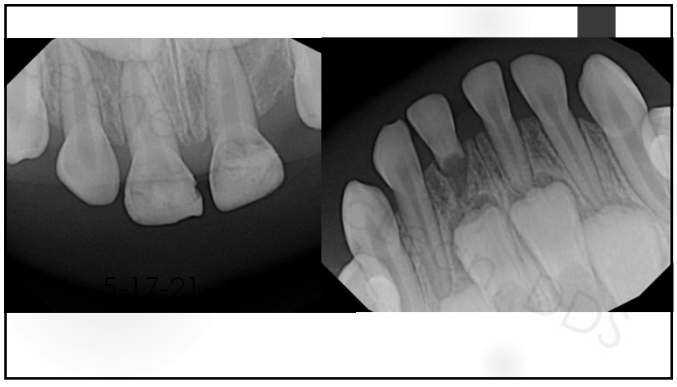
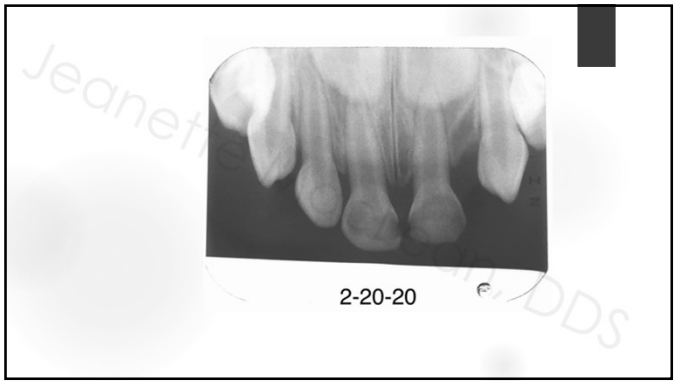


183



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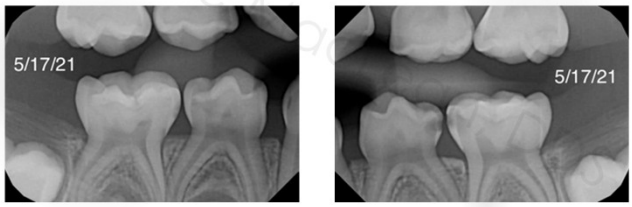
Remember me ?

▶Back-to-Back Hall Crowns



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Treatment Planning Discussion:
Pros
Cons
Other options
"More high maintenance"
Fee to repair or replace

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GIC Strip Crown Tutorial

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Thank You!

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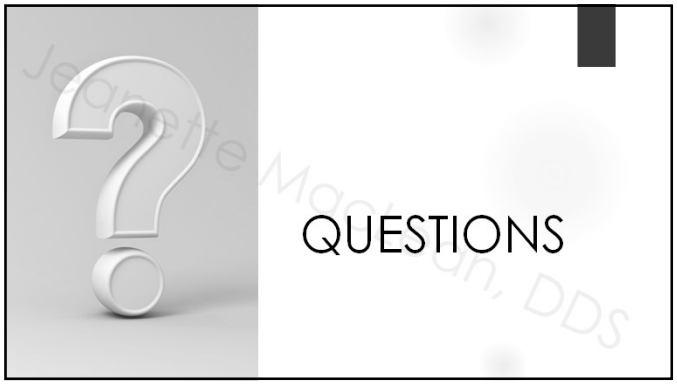
QUESTIONS

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For more information;
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