Abstract
Preformed metal crowns (stainless steel / nickel chrome crowns) will outperform Intra coronal restorations in terms of longevity since they are reliable and durable. But an aesthetic alternative has not been available in the past. Statistics show that when full coverage is required, it is commonly the first primary molars. Since the mandibular first primary molars are the most visible, this is the area with the highest concern for aesthetics, besides the anterior teeth. When full coverage is required, stainless steel crowns are the gold standard of treatment in many aspects, however, there is a need for an aesthetic full coverage option.

Learning Objectives:
The key objectives of this course:
1. Understand the child's and parents need for an aesthetic alternative.
2. Learn the tooth preparation guidelines.
3. Understand the treatment options for performed metal crowns.
4. Learn the advantages and disadvantages of aesthetic pre veneered metal crowns.

Author Profile
Dr. Carla Cohn — In 1991, Dr. Cohn graduated from the Faculty of Dentistry at the University of Manitoba and then went on to complete a post graduate internship in Children's Dentistry at Health Science Centre Children's Hospital. Today Dr. Cohn’s private practice, at Kid’s Dental, the focus is on prevention system that would finally allow dentists to eradicate cavities and treat caries by risk assessment is extremely exciting. Dr. Cohn has lectured nationally and internationally on pediatric dentistry for the general practitioner, prevention and restorative treatment options and maintains a private practice in Winnipeg, Canada. She has contributed clinical articles to several dental journals and publications and holds an appointments at the University of Manitoba, Faculty of Dentistry, and the Dean’s Advisory Board at the University of Manitoba. Dr. Cohn is a member of the following organizations: Canadian Dental Association, Manitoba Dental Association, Manitoba Dental Alumni Association, Winnipeg Dental Society, Women's Dental Group, American Academy of Pediatric Dentistry and the Canadian Dental Institute.

Author Disclosure
The author of this course has no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

Supplement to PennWell Publications
This course was written for dentists, dental hygienists and assistants, from novice to skilled.

Educational Methods: This course is a self-instructional journal and web activity.

Provider Disclosure: PennWell does not have a leadership position or a commercial interest in any products or services discussed or shared in this educational activity nor with the commercial supporter. No manufacturer or third party has had any input into the development of course content.

Requirements for Successful Completion: To obtain 1 CE credit for this educational activity you must pay the required fee, review the material, complete the course evaluation and obtain a score of at least 70%.

Go Green, Go Online to take your course
This course has been made possible through an unrestricted educational grant.

CE Planner Disclosure: Michelle Fox, CE Coordinator does not have a leadership or commercial interest with products or services discussed in this educational activity.

Educational Disclaimer: Completing a single continuing education course does not provide enough information to result in the participant being an expert in the field related to the course topic. It is a combination of many educational courses and clinical experience that allows the participant to develop skills and expertise.

Registration: The cost of this CE course is $39.00 for 1 CE credit.
Cancellations/Refund Policy: Any participant who is not 100% satisfied with this course can request a full refund by contacting PennWell in writing.
Educational Objectives
The key objectives of this course:
1. Understand the child’s and parents need for an aesthetic alternative.
2. Learn the tooth preparation guidelines.
3. Understand the treatment options for performed metal crowns.
4. Learn the advantages and disadvantages of aesthetic pre veneered metal crowns.

Abstract
Preformed metal crowns (stainless steel / nickel chrome crowns) will outperform Intra coronal restorations in terms of longevity since they are reliable and durable. But an aesthetic alternative has not been available in the past. Statistics show that when full coverage is required, it is commonly the first primary molars. Since the mandibular first primary molars are the most visible, this is the area with the highest concern for aesthetics, besides the anterior teeth. When full coverage is required, stainless steel crowns are the gold standard of treatment in many aspects, however, there is a need for an aesthetic full coverage option.

Years ago, a father came into my office with his young son. The boy had rampant decay involving multiple surfaces on all of his primary molars. To make matters more complex, the child had behavioural issues - as we seem to see more and more frequently these days. ADHD and sensory perception disorder made it impossible for this young man to sit for any length of time for treatment, never mind the four appointments necessary to complete treatment on all of his molars. I recommended that he be seen in the operating room, under general anaesthetic. We discussed the treatment required at the preliminary consultation, including the stainless steel crowns that would be necessary to repair his devastated mouth. Treatment was agreed upon, an informed consent was completed and signed and a date was set for treatment in the operating room. The day came for treatment to be completed and I placed eight stainless steel crowns on all of his primary molars. Beautiful, durable, technically perfect stainless steel crowns. Or so I thought! As the child was rousing from his anaesthesia, his dad was distraught. He hated the look of the stainless steel crowns. They were, his words exactly, “the ugliest things he had ever seen” and that “all his child had going for him was his smile, and now that was ruined”. In his father’s opinion, it was preferable to have a mouth full of brown decayed teeth than stainless steel. I was horrified at his reaction. After all, full coverage was the recommended treatment. I thought that I had no other options available. But, I was wrong. What I perceived to be ideal treatment at that time was far from ideal.

The “triangle” of agreement when treating children relies in part on the parents and their wants and needs. If we aren’t listening to the parents in our practice, we are failing. In no way am I suggesting that parents dictate treatment, however their wishes must be taken into the equation. The professional must always remain the professional. Surprisingly, or not, in a recent study on parental attitude on restorative materials, it was found that “many paediatric dentists acquiesce to parents’ wishes when challenged about the material with which they have chosen to restore a posterior primary tooth”. An astonishing 43% of paediatric dentists when confronted by the parents accepted their preference even when it was contrary to their clinical judgement. When considering the restoration of posterior primary teeth, the parents’ chief concern is aesthetics. But it isn’t solely the adults who have opinions on treatment, it is the children as well. Both children and their parents prefer tooth coloured restorations.

How many times have you had the parents in your practice urge you to place a tooth coloured filling instead of an amalgam or a stainless steel crown? How many times have you known that a filling won’t stand the test of time and that this child will be back with a broken tooth? The failure rate of a class II composite restoration is high, 62% in one study when assessed at six years post-op and stainless steel / nickel chrome crowns provide the most durable restoration, often surviving until the tooth exfoliates.

Clinical guidelines
According to the clinical guidelines for the American Academy of Pediatric Dentistry, full coverage is indicated in any of the following circumstances:
1) children at high risk with anterior and / or posterior decay,
2) children with extensive decay,
3) large lesions or multiple surface lesions,
4) pulpally treated teeth and
5) children requiring general anaesthesia.

Preformed metal crowns, ie. stainless steel / nickel chrome crowns, outperform intracoronal restorations in terms of longevity. They are reliable and durable. But aesthetics are clearly lacking. Statistics show that when full coverage is required, it is most commonly the first primary molars. As the mandibular first primary molars are the most visible, this is the area with the highest concern for aesthetics, besides the anterior teeth. When full coverage is required, stainless steel crowns are most certainly the gold standard of treatment in many aspects. But, it is evident that there is a need and desire for an aesthetic full coverage option.
What are the options for full coverage besides stainless steel crowns? The ideal requirements are: durability, ease of placement and aesthetics. (PVSSC) provide full coverage, are durable, easy to place and are aesthetic. Pre-veneered stainless steel crowns are stainless steel / nickel chrome crown that has an aesthetic facing, mechanically and / or chemically bonded. PVSSC were introduced in the early 1990’s. They were initially developed for anterior teeth, but later developed for primary molars. Some of the PVSSC for posterior primary molars on the market are Nusmile Primary Crowns (Houston TX), Kinder Krowns (St. Louis Park, MN), and Cheng Crowns (Exton PA).

PVSSC come with inherent advantages and disadvantages as described in the following table. The most common concern is the retention of the aesthetic facing. The facings can be prone to fracture and in some cases complete loss. Over the years since their introduction the facings have become more resistant and fracture and loss are less of a problem. Repair of the facing is possible but it is suggested that the crown be replaced should the facings fracture. Fracture resistance investigations showed that the crowns should be able to resist occlusal forces over short clinical periods, however long term loading and fatigue failures must be taken into account.

The clinical outcomes for PVSSC are promising. Another recently published study gave excellent reports on longevity and durability. Failure rates are low and parental satisfaction studies have been positive. Another concern of the PVSSC is the limited crimpability of the crowns. Crimping of the metal portion will weaken the aesthetic facing and may lead to premature failure. Instead care must be taken to have as close a fit as possible in order to eliminate the need for crimping and to minimize the reliance on the strength of the cement.

Preparation guidelines
Preparation for placement of a PVSSC requires more aggressive tooth reduction to allow for the thickness of the crown due to the aesthetic facing. It has been suggested by some that pulpal therapy will be required more frequently because of this, however in my clinical experiences, I have found this not to be the case. Finally the shape of the PVSSC is not alterable and in cases in which there is a loss of space, usually due to caries, the crown cannot be “squeezed” mesio-distally. Careful case selection is necessary to avoid difficulties.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetic</td>
<td>Possible Loss of Aesthetic Facing</td>
</tr>
<tr>
<td>Full Coverage</td>
<td>Wide Mesio-Distally</td>
</tr>
<tr>
<td>Easy To Place</td>
<td>Limited Crimpability</td>
</tr>
<tr>
<td>Parental Satisfaction</td>
<td>Aggressive Tooth Reduction</td>
</tr>
</tbody>
</table>

Placement of a posterior pre-veneered stainless steel crown has proven to be simple. The first step is to size the tooth and estimate the crown size needed. This is best done prior to tooth preparation. It was determined that a steam technique of sterilization is suitable and can be used to successfully sterilize the crowns. However, although the crowns can be sterilized, it is best to minimize exposure to the stress of sterilization on the facing. As with a traditional stainless steel crown preparation, occlusal reduction is the first step in preparation. The bulk of the material must be taken into account and so a minimum of 2 mm of occlusal reduction must be accomplished. This can be done with a high speed tapered diamond, football diamond or with a simple straight fissure carbide bur as seen in figure 2. Next circumferential reduction is completed. Again a tapered diamond or a tapered carbide bur may be used. Care must be taken to remove enough tooth structure to allow for the bulk of the crown. Preparation should be a feather edge and extend slightly subgingivally as in figure 3. Caries removal and pulpal therapy, if necessary, are completed after preparation for the crown. Upon try-in, the crown should fit passively with no resistance to the fully seated position. Occlusion must be checked as a “high” restoration would lead to premature fracture of the facing. Cementation with a glass ionomer is the cement of choice.

The following clinical photos demonstrate the preparation and placement of a posterior pre-veneered stainless steel crown.

Figure 1: Case MD pre-operative, maxillary right first primary molar.

Figure 2: Case MD occlusal reduction, high speed diamond tapered bur.

Knowing all of the advantages and disadvantages, it is imperative to have these discussions with the parents prior to treatment. Informed consent is crucial, as it is in any treatment we deliver.
Conclusion:
The demand for aesthetics is increasing at a rate that is in line with our “on line” society. We must be prepared to offer alternatives to our patients. Without compromising strength and requirement for full coverage, pre veneered stainless steel crowns are a most viable aesthetic option. The simple truth is, if you do not offer an aesthetic alternative for full coverage you are missing an integral part of your armamentarium. We must be able to hear and react to the wants and needs of our parents and our patients.

References
4. AAPD, Reference Manual, Clinical Guidelines V 33 / No 6 11/12
15. Sean Beattie, DDS, MSD; Burak Taskonak, DDS, PhD; James Jones, DMD, MSD, EdD, PhD; Judith Chin, DDS, MS; Brian Sanders, DDS, MS; Angela Tomlin, PhD; James Weddell, DDS, MSD, Fracture Resistance of 3 Types of Primary Esthetic Stainless Steel Crowns eJCDA 2011
16. MacLean, Jeanette K.; Champagne, Cariann E.; Wagggoner, William F.; Ditmyer, Marcia M.; Gasamassimo, Paul, Clinical Outcomes for Primary Anterior Teeth Treated with Preveeneered Stainless Steel Crowns, Pediatric Dentistry, Volume 29, Number 5, September / October 2007 , pp. 377-381(5)
Questions

1. According to the American Academy of Pediatric Dentistry full coverage is indicated in the following circumstances?
   a. Children with extensive decay
   b. Pulpally treated primary teeth
   c. Large lesions or multiple surface lesions
   d. All of the above

2. When restoring a posterior or anterior primary tooth with extensive decay, the best treatment is:
   a. Amalgam filling
   b. Composite filling
   c. Full coverage crowns
   d. None of the above

3. Many parents and children agree that:
   a. Stainless steel crowns are the gold standard treatment when full coverage is required.
   b. Stainless steel crowns ruin a child’s smile
   c. Amalgam fillings are better in anterior teeth
   d. Extensively decayed teeth should be pulled after all, they are only “baby” teeth.

4. Pre-Veneered stainless steel crowns (PVSSC) are:
   a. Durable
   b. Easy to place
   c. Aesthetic
   d. All of the above

5. The most common concern for PVSSC is:
   a. Shading is not ideal
   b. Difficulty in cementing
   c. Retention of the aesthetic facing
   d. None of the above

6. Preparation of the tooth for PVSSC requires:
   a. No preparation simply remove the decay and cement
   b. Reduce the occlusal
   c. Heavily reduce the tooth to allow for thickness of the crown due to the aesthetic facing
   d. None of the above

7. PVSSC’s should always be:
   a. Crimped to fit the tooth
   b. Squeezed to fit mesial distally
   c. Polished
   d. None of the above

8. Placement of all PVSSC
   a. Simple no prep procedure
   b. Remove decay and cement crowns
   c. Crowns are all one size
   d. None of the above

9. Placement of posterior PVSSC requires
   a. Sizing the tooth
   b. Reducing occlusal at least 2 mm
   c. Circumferential reduction
   d. All of the above

10. Upon try in the PVSSC must
    a. Have a tight fit on the tooth
    b. Fit passively with no resistance to the fully seated position
    c. Not touch the tooth
    d. Not be in occlusion

11. The cement of choice for PVSSC is
    a. Resin Cement
    b. Polycarbonate cement
    c. Zinc oxy phosphate cement
    d. Glass ionomer cement

12. The PVSSC is
    a. An alternative to all metal crowns
    b. Aesthetically pleasing
    c. Wanted by parents and children
    d. All of the above

Notes

Author Profile
Dr. Carla Cohn – In 1991, Dr. Cohn graduated from the Faculty of Dentistry at the University of Manitoba and then went on to complete a post graduate internship in Children’s Dentistry at Health Science Centre Children’s Hospital. Today Dr. Cohn’s private practice, at Kid’s Dental, the focus is on prevention system that would finally allow dentists to eradicate cavities and treat caries by risk assessment is extremely exciting.

Dr. Cohn has lectured nationally and internationally on pediatric dentistry for the general practitioner, prevention and restorative treatment options and maintains a private practice in Winnipeg, Canada. She has contributed clinical articles to several dental journals and publications and holds an appointments at the University of Manitoba, Faculty of Dentistry, and the Dean’s Advisory Board at the University of Manitoba.

Dr. Cohn is a member of the following organizations: Canadian Dental Association, Manitoba Dental Association, Manitoba Dental Alumni Association, Winnipeg Dental Society, Women’s Dental Group, American Academy of Pediatric Dentistry and the Canadian Dental Institute.

Disclaimer
The author(s) of this course has/have no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

Reader Feedback
We encourage your comments on this or any Penn Well course. For your convenience, an online feedback form is available at www.ineedce.com.

Online Completion
Use this page to review the questions and answers. Return to www.ineedce.com and sign in. If you have not previously purchased the program select it from the “Online Courses” listing and complete the online purchase. Once purchased the exam will be added to your Archives page where a Take Exam link will be provided. Click on the “Take Exam” link, complete all the program questions and submit your answers. An immediate grade report will be provided and upon receiving a passing grade your “Verification Form” will be provided immediately for viewing and/or printing. Verification Forms can be viewed and/or printed anytime in the future by returning to the site, sign in and return to your Archives Page.
ANSWER SHEET

Pre-Veneered Stainless Steel Crowns - An Aesthetic Alternative

Name: ____________________________ Title: ____________________________ Specialty: ____________________________

Address: ____________________________ E-mail: ____________________________

City: ____________________________ State: ____________________________ ZIP: ____________________________ Country: ____________________________

Telephone: Home ( ) Office ( ) Lic. Renewal Date: ____________________________

Requirements for successful completion of the course and to obtain dental continuing education credits: 1) Read the entire course. 2) Complete all information above. 3) Complete answer sheets in either pen or pencil. 4) Mark only one answer for each question. 5) A score of 70% on this test will earn you 1 CE credit. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp. For Questions Call 216.398.7822

Please photocopy answer sheet for additional participants.

Educational Objectives

1. Understand the child's and parents need for an aesthetic alternative.
2. Learn the tooth preparation guidelines.
3. Understand the treatment options for performed metal crowns.
4. Learn the advantages and disadvantages of aesthetic pre-veneered metal crowns.

Course Evaluation

1. Were the individual course objectives met? Objective #1: Yes No Objective #3: Yes No

2. To what extent were the course objectives accomplished overall? 5 4 3 2 1 0

3. Please rate your personal mastery of the course objectives. 5 4 3 2 1 0

4. How would you rate the objectives and educational methods? 5 4 3 2 1 0

5. How do you rate the author's grasp of the topic? 5 4 3 2 1 0

6. Please rate the instructor's effectiveness. 5 4 3 2 1 0

7. Was the overall administration of the course effective? 5 4 3 2 1 0

8. Please rate the usefulness and clinical applicability of this course. 5 4 3 2 1 0

9. Please rate the usefulness of the supplemental webliography. 5 4 3 2 1 0

10. Do you feel that the references were adequate? Yes No

11. Would you participate in a similar program on a different topic? Yes No

12. If any of the continuing education questions were unclear or ambiguous, please list them.

13. Was there any subject matter you found confusing? Please describe.

14. How long did it take you to complete this course?

15. What additional continuing dental education topics would you like to see?

If not taking online, mail completed answer sheet to

Academy of Dental Therapeutics and Stomatology,
A Division of PennWell Corp.
P.O. Box 116, Chesterland, OH 44026
or fax to: (440) 845-3447

For IMMEDIATE results, go to www.ineedce.com to take tests online.

Answer sheets can be faxed with credit card payment to (440) 845-3447, (216) 396-7922, or (216) 255-6619.

☐ Payment of $20.00 is enclosed.

(Checks and credit cards are accepted.)

If paying by credit card, please complete the following: ☐ MC ☐ Visa ☐ AmEx ☐ Discover

Acct. Number: ____________________________

Exp. Date: ____________________________

Charges on your statement will show up as PennWell

For PACE, mail completed answer sheet to

PennWell Corporation, 1201 Lake Eola Drive, Orlando, FL 32803

Please photocopy answer sheet for additional participants.

PennWell maintains records of your successful completion of any exam for a minimum of six years. Please retain our offer for a copy of your continuing education credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

Completing a single continuing education course does not provide enough information to give the participant the feeling that they are an expert in the field related to the course topic. It is a combination of many educational courses and clinical experiences that allows the participant to develop skills and expertise.

CANCELLATION/REFUND POLICY

Any participant who is not 100% satisfied with this course can request a refund by contacting PennWell or writing:

PennWell Corporation
PO Box 5500
Orlando, Florida 32803

If you have any questions or wishes to speak with an account representative, please call:

For Questions: 216.398.7822

PreV812DE