



Interim Stabilization Therapy: A Focused Practice Question

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Key Messages

1. Interim Stabilization Therapy / Atraumatic Restorative Treatment are effective as a single surface temporary restoration for dental caries, on both primary and permanent teeth.
2. High viscosity glass ionomer cements should be used as the material of choice for Interim Stabilization Therapy / Atraumatic Restorative Treatment.
3. While the quality of evidence is weak in this area, the use of Interim Stabilization Therapy / Atraumatic Restorative Treatment may be beneficial in aiding with client-provider rapport and building client self-esteem.

Executive Summary

Research Question

What is the effectiveness and recommended use of Interim Stabilization Therapy (IST)/ Atraumatic Restorative Treatment (ART) for temporary tooth restoration?

Issue and Context

Dental decay that is left untreated can cause pain and lead to negative oral health and overall health outcomes. IST and ART are two similar temporary restorative procedures which stop dental decay through a release of fluoride, leading to remineralization of the tooth, and stabilizing its structure until a permanent restoration can be placed.^{2, 8}

Peel Public Health (PPH) is mandated by the Ontario Public Health Standards (OPHS) to provide oral health programming to applicable populations. The OPHS were recently updated, including the Healthy Smiles Ontario Program (HSO) protocol, which now includes offering temporary tooth restoration (e.g., IST/ART) to clinically eligible, preventive service stream enrolled children and youth. Due to these changes, PPH was interested in exploring how temporary tooth restoration may be incorporated into current practice. This literature review has been conducted to examine the effectiveness, correct use, recommended materials, and appropriate application of temporary tooth restorations for PPH practice.

Methods

A grey literature search identified fourteen documents. An additional PubMed search for systematic reviews published after the grey literature identified one review. Seven

documents were reviewed in full. After assessing quality, two guidelines and one systematic review were included in this literature review.

Synthesis of Findings

Two of the three documents included in the review were based on children and youth populations. From this literature it was found that ART using high viscosity glass ionomer cements is an effective single surface temporary restoration for both primary and permanent teeth. However, the evidence for multi-surface primary teeth temporary restorations was inconclusive. The quality of evidence relating to the client-practitioner relationship was found to be weak, but it discussed that applying temporary restorations may build client-provider rapport and enhance client self-esteem. In addition, ART was not found to be effective at reducing dental anxiety among children.

Relevance to Practice

Temporary tooth restoration would be a beneficial addition to PPH's Oral Health programs. It is recommended for use when single surface temporary restorations are required. Evidence for multi-surface primary teeth temporary restorations is inconclusive; however, these restorations may still be warranted for clinical use as they can temporarily provide fluoride to carious teeth.

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Issue & Context

Issue

Dental decay that is left untreated can cause pain and lead to negative oral health and overall health outcomes. In certain instances temporary care for decayed teeth or teeth affected by trauma is required to relieve pain and reduce the risk of further damage to the tooth structure until a client can seek care. Interim Stabilization Therapy (IST) and Atraumatic Restorative Treatment (ART) are temporary restorative procedures which stop dental decay through a release of fluoride, leading to remineralization of the tooth, stabilizing its structure until a permanent restoration can be placed.^{2,8} Where the two therapies vary is in their application; when applying ART, practitioners are allowed to remove tooth structure in order to recontour margins of the tooth, while tooth structure is not removed during IST application.⁸ In Ontario, as per controlled acts under the Regulated Health Professionals Act³, Registered Dental Hygienists are not permitted to remove tooth structure and therefore unable to administer ART; however, they are able to administer IST. There are several other temporary therapies, such as Interim Therapeutic Restoration, used in different jurisdictions by various practitioners (see Appendix D for further details).

Peel Public Health (PPH) is mandated by the Ontario Public Health Standards (OPHS) to provide oral health programming (e.g., screening, follow-up, health promotion, and policy/advocacy) to applicable populations. The OPHS were recently updated, including the Healthy Smiles Ontario Program (HSO) protocol, which now includes offering IST/ART to clinically eligible, preventive service stream enrolled children and youth. Due

to these changes, PPH was interested in exploring IST/ART and how it may be potentially incorporated into current practice (e.g. when and where to use therapy).

This research review has been conducted to examine the effectiveness of IST/ART, correct use, recommended materials, and appropriate application. This will aid PPH Oral Health teams in establishing potential use of this therapy in their clinical practice.

Context

On January 1, 2016, six provincially funded oral health programs were integrated to create the new HSO.* The goal of the new integrated program is to provide a seamless enrolment process and make it easier for eligible children and youth, aged 0 to 17, to access free dental care. Eligible children and youth have access to both preventive and restorative (including urgent care) dental services for up to one year and may be eligible for future years based on financial or clinical criteria.¹

In May 2016, two of the OPHS protocols were revised and released. The protocols were revised to reflect the changes to structure and funding for oral health. The new HSO protocol provides the following parameters for when IST/ART can be placed¹:

- When access to a permanent restoration is not immediate or practical;
- When there are no medical contraindications;
- When the client consents to the treatment; and
- When any of the following apply:

* The six programs included: a previous version of HSO, Ontario Works, Ontario Disability Support Program, Assistance for Children with Severe Disabilities, Children in Need of Treatment and Preventive Services.

- There is a reasonable risk of further damage to the tooth structure;
- The pulp is not exposed;
- The client is in discomfort or is experiencing difficulty in eating;
- The discomfort is due to recent trauma, fracture or lost dental restoration;
- The client has not received any medical/dental advice that would contraindicate placing a temporary restoration; or
- It is in the client's best interest to proceed.

This literature review will investigate temporary tooth restoration and it is expected most of the literature will focus on ART as IST is regionally specific term.⁹

Literature Review Question

The question addressed in this review is: What is the effectiveness and recommended use of IST/ART for temporary tooth restoration? The question is described in PICO format below.

Population	People with temporary tooth restoration needs
Intervention	Use of IST [†] /ART
Comparison	Usual care
Outcome	Health outcomes, but may also include patient based outcomes

[†] IST is a newer Canadian practice, specifically for Ontario, which has been adapted from ART, thus interventions relating to IST, ART, or related terms (i.e., interim therapeutic restoration and alternative restorative therapy) have been included in this search

Literature Search

A search of the National Guideline Clearinghouse, World Health Organization, National Institute for Health and Clinical Excellence (NICE), Centers for Disease Control and Prevention (CDC) - The Community Guide, Canadian Agency for Drugs and Technologies in Health (CADTH) and Turning Research into Practice (TRIP) database was conducted for grey literature between 2006 -2016.

A secondary PubMed search was conducted for systematic reviews. The search date was restricted from January 2014 to March 2016, to capture reviews published post-release of the guidelines found in the above grey literature search. (Refer to Appendix A for the search strategy).

Relevance Assessment

Once the results from the literature search were identified and duplicates were removed, the remaining results were assessed for relevance. Two reviewers assessed the titles and abstracts from the search results and mutually agreed upon the most relevant documents. Fourteen documents were assessed based on the following criteria:

- Inclusion criteria: Documents from the last 10 years; written in English; focused on the effectiveness of IST/ART therapy; included health, social or economic outcomes
- Exclusion criteria: Documents which focused solely on primary prevention therapies

Results of the Search

The grey literature search retrieved nine guideline results, including a CADTH reference list, which provided an additional five guidelines. One applicable systematic review/meta-analysis was also identified. Once duplicates were removed, 13 guidelines and one systematic review/meta-analysis remained. After relevance assessment, three documents remained for quality assessment. (Refer to Appendix B for the search results flowchart).

Critical Appraisal

Three independent reviewers[‡] critically appraised two guidelines using the AGREE II Tool, and two reviewers appraised one systematic review/meta-analysis using the Health Evidence tool. The reviewers discussed appraisals and any discrepancies in scoring were resolved through discussion. One guideline by the American Academy of Pediatric Dentistry (AAPD)⁴ rated as moderate quality, as some details surrounding the methodology were not provided; however, it was included in the report as best available evidence. One guideline by the HealthPartners⁵ group rated weak due to several factors including limited methodology, but it was also included in the report as it contained specific information not addressed by the AAPD. The systematic review/meta-analysis by Simon et al.⁶ rated strong and was also included in the review.

[‡] Usually two reviewers appraise the results, but in this instance one additional staff member was added to the guideline appraisals for professional development purposes.

Description of Included Studies

The following two guidelines and review were included:

- The American Academy of Pediatric Dentistry. (2014). *Guideline on Restorative Dentistry*.⁴
- HealthPartners Dental Group. (2013). *HealthPartners Dental Group and Clinics Caries guideline*.⁵
- Simon AK, Bhumika TV, Sreekumaran Nair N. (2015). *Does atraumatic restorative treatment reduce dental anxiety in children? A systematic review and meta-analysis*.⁶

The American Academy of Pediatric Dentistry (2014)⁴

The AAPD *Guideline on Restorative Dentistry* was an update to a 2012 version. The objective of the guideline was to aid practitioners in making decisions regarding restorative dentistry (e.g., when to treat and what materials/techniques to use) for child and adolescent populations. Nine restoration approaches were examined by the guideline. One section of the guideline, entitled *Glass ionomer cements*, was relevant to this review.

Evidence used to inform this guideline included meta-analyses/systematic reviews and controlled clinical trials published between 1995 and 2013. A total of 35 meta-analyses/systematic reviews and 62 randomized controlled clinical trials were included to derive recommendations for practice; three articles were specifically related to ART. The guideline assessed the evidence within each of its topic areas based on a

modification of the American Dental Association's grading of recommendations. A "strong evidence" grading is based on evidence from well-executed randomized control trials, meta-analyses, or systematic re-views.

HealthPartners Dental Group (2013)⁵

This clinical guideline by the HealthPartners Dental Group was an update to a 2008 version. The objectives of the guideline were:

- To significantly reduce the incidence of caries in the HealthPartners Dental Group's general patient population
- To provide a systematic approach to assess the individual's risk of developing caries, and to provide evidence-based interventions that reduce that risk with the ultimate goal of preservation of tooth structure

The guideline was separated into two sections (i.e., Diagnosis/Evaluation/Risk Assessment and Prevention/Management/Treatment), with several subsections. One subsection of the guideline was relevant to this review, entitled *Rampant Caries Management*.

The evidence used to inform the guideline and the methods used to assess the quality or strength of the evidence were not described, except to note that the applicable research was published between 2008 and 2013. A total of 96 articles were included. An expert committee was formed to formulate recommendations through a consensus procedure.

Simon AK, Bhumika TV, Sreekumaran Nair N. (2015)⁶

The study by Simon et al. includes both a systematic review and meta-analysis. The objective of the study is to synthesize evidence of the effectiveness of ART in reducing dental anxiety in children, compared to conventional restorative treatments.

The search for applicable RCTs and CCTs was conducted in PubMed, Google Scholar and Cochrane Oral Health Group's Trial Register, between 1980 to August 2014. Five randomized controlled trials and one clinical controlled trial were included in the systematic review; three of the six studies were included in a meta-analysis. Risk of bias was estimated for all the included studies. The primary outcome measured was the dental anxiety of the patient. Patients discomfort during the procedure and adverse events were also considered, as secondary outcomes.

Results

The following results are specific for ART; no relevant literature on IST was found during the search.

The American Academy of Pediatric Dentistry (2014)⁴

The guideline found that:

- **There is strong evidence that interim therapeutic restoration (ITR) / ART using high viscosity glass ionomer cements have value as single surface temporary restoration for both primary and permanent teeth.**
- **The evidence is conflicting for multi-surface ART restorations.**

HealthPartners Dental Group (2013)⁵

The guideline recommended that:

- **Temporary restorations, such as glass ionomers can be used to control active caries.**
- **In some cases, to control active caries, it may be necessary to do gross decay removal from a number of teeth, followed by the placement of a temporary restorations during a single appointment.**
- **Glass ionomers offer a number of advantages as a temporary material including the ability to bond to tooth structure and the release of fluoride.**
- **Placing glass ionomer restorations using a non-traumatic technique can build the dentist-client rapport and enhance client self-esteem through improved esthetics.**

Simon AK, Bhumika TV, Sreekumaran Nair N. (2015)⁶

The study found that:

- **ART was not effective at reducing dental anxiety among children.**

The pooled meta-analysis data failed to show any difference between ART group and the conventional treatment group in reducing dental anxiety in children, as measured by psychometric scales.

Synthesis of Findings

The following are the key findings about the effectiveness and recommended use of ART from the literature. Refer to Appendix C for further information.

Outcomes	Findings
Tooth Restoration	<p>ART using high viscosity glass ionomer cements[§] is effective as a single surface temporary restoration for both primary and permanent teeth. (2 guidelines).</p> <ul style="list-style-type: none"> • Single surface ART restorations showed high survival rates in both primary and permanent teeth. • Temporary restorations are beneficial to control caries. Single surface restorations are supported, irrespective of cary size. • In order to control active caries, it may be necessary to schedule the patient in a manner that allows gross decay removal from a number of teeth at a single appointment and the placement of temporary restorations. • Glass ionomers offer a number of advantages as a temporary material including the ability to bond to tooth structure and release fluoride. They can also improve gingival health prior to placement of permanent restorations. • The evidence is inconclusive for multi-surface ART restorations on primary teeth.

[§] Glass ionomers are the material of choice for ART. They offer a number of advantages as a temporary material including the ability to bond to tooth structure and the release of fluoride.

<p>Client - Practitioner Relationship</p>	<p>Temporary restoration using glass ionomers may aid in building client rapport and enhancing self-esteem. (1 guideline)</p> <ul style="list-style-type: none"> • Clients with deep decay may become alienated if they experience significant pre and postoperative pain associated with restorations. Placing glass ionomer restorations using a non-traumatic technique can: <ul style="list-style-type: none"> ○ build dentist-patient rapport ○ enhance clients' self-esteem through improved esthetics <p>ART does not reduce dental anxiety in children, in comparison to conventional treatments. (1 systematic review/meta-analysis)</p> <ul style="list-style-type: none"> • No difference in dental anxiety between the ART group and the conventional treatment group.
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Relevance to Practice

The Manager of PPH Oral Health teams and the Public Health Nutritionist conducting the review met to discuss the findings and how these may apply to Oral Health practice within PPH. Below are the recommendations from this meeting.

Practice Implication

IST** should be integrated into PPH Oral Health programming. PPH has decided to use IST over ART because Registered Dental Hygienists are able to apply IST as a part of their current practice.

** With exception to removing tooth structure during application, ART and IST are comparable.

Application / Use

1. IST using high viscosity glass ionomer cements should be used as the preferred single surface temporary restoration for both primary and permanent teeth.
2. Though the research was inconclusive for multi-surface primary teeth temporary restorations, they may still be considered for clinical use as they can temporarily provide fluoride to carious teeth.

Considerations

1. While evidence is weak in this area, IST may potentially aid with client-provider rapport, which is important to building trust and confidence in Peel's vulnerable populations. It may also enhance client self-esteem.
2. When applying IST, dental professionals should not expect dental anxiety to be reduced in children.

References

1. The Government of Ontario. (2016). *Teeth cleaning, check-ups and dental treatment for kids*. Retrieved from <https://www.ontario.ca/page/get-dental-care>
2. Health Canada - First Nations and Inuit Health Branch, Children's Oral Health Initiative. (2015). *Interim Stabilization Therapy (IST) Orientation Manual*. Retrieved from http://www.sdha.ca/wp-content/uploads/2012/10/IST-Orientation-Manual-Revised-final-Dec_2015.pdf
3. The Government of Ontario. (1991). *The Regulated Health Professions Act*. Retrieved from (<https://www.ontario.ca/laws/statute/91r18>)
4. The American Academy of Pediatric Dentistry. (2014). *Guideline on Restorative Dentistry*. Retrieved From http://www.aapd.org/media/policies_guidelines/g_restorative.pdf
5. HealthPartners Dental Group. (2013). HealthPartners Dental Group and Clinics Caries guideline. Retrieved from <https://www.guideline.gov/summaries/summary/47755>
6. Simon AK, Bhumika TV, Sreekumaran Nair N. (2015). *Does atraumatic restorative treatment reduce dental anxiety in children? A systematic review and meta-analysis*. *European Journal of Dentistry*, 9(2), 304–309. Retrieved from: <http://www.ncbi.nlm.nih.gov/pubmed/26038668>
7. Public Health Agency of Canada. (2016). *Interim Stabilization Therapy in Ontario and its Relationship to Atraumatic Restorative Therapy*.
8. College of Dental Hygienists of British Columbia. (2015). *Interim Stabilization Therapy (IST) CDHBC Position Statement*. Retrieved from: <http://www.cdhbc.com/Documents/IST-Position-Statement-July-2015.aspx>
9. College of Dental Hygienists of Ontario. (2010). *Placement of Temporary Restorations*. Retrieved from: <http://www.cdho.org/docs/default-source/pdfs/reference/guidelines/placementtemprestorations.pdf?sfvrsn=4>

Appendices

Appendix A: Search Strategy

Appendix B: Literature Search Flowchart

Appendix C: Data Extraction Tables

Appendix D: Minimal Intervention Dentistry Comparison Table

Appendix A: Search Strategy

Grey Literature Web Searching Checklist

Requestor	Nadine Khan
Date	May 2016
PICOT/Search Strategy	<p>P - People with temporary restoration needs I – Use of ISTs C – Usual care O – Health outcomes, but may also include patient based outcomes</p> <p>Terms searched <i>Interim stabilization therapy</i> <i>Interim therapeutic restoration</i> <i>Atraumatic techniques / restorative therapy</i> <i>Alternative techniques / restorative therapy</i></p>

Resource	
TRIP	
Page Title	Location
Interim Stabilization Therapy for Patients with Dental Caries: Clinical Effectiveness and Guidelines Canadian Agency for Drugs and Technologies in Health - Rapid Review2015	https://www.tripdata base.com/search?criteria=Interim+stabilization+therapy&lang=en
Guideline Summary: Guideline on management of dental patients with special health care needs. [American Academy of Pediatric Dentistry] info@guideline.gov (NGC)2013	
Guideline Summary: Guideline on pediatric restorative dentistry. [American Academy of Pediatric Dentistry] info@guideline.gov (NGC)2013	
Guideline Summary: Guideline on caries-risk assessment and management for infants, children and adolescents. [American Academy of Pediatric Dentistry] info@guideline.gov (NGC)2013	
Guideline on caries-risk assessment and management for infants, children and adolescents. [American Academy of Pediatric Dentistry] info@guidelines.gov (NGC)2011	
Guideline on management of dental patients with special health care needs. [American Academy of Pediatric Dentistry]	
Guideline on pediatric restorative dentistry. [American Academy of Pediatric Dentistry] info@guidelines.gov (NGC)2011	

Resource	
WHO	
Page Title	Location

Promoting Oral Health in Africa: Prevention and control of oral diseases and noma as part of essential noncommunicable disease interventions	http://apps.who.int/iris/bitstream/10665/205886/1/9789290232971.pdf?ua=1&ua=1
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Resource	
NICE	
Page Title	Location
Guideline on perinatal oral health care. 2009 (revised 2011). NGC:008733 American Academy of Pediatric Dentistry - Professional Association	http://www.guideline.gov/content.aspx?id=34769&search=interim+therapeutic+restoration

Resource	
Canadian Agency for Drugs and Technologies in Health (CADTH)	
Page Title	Location
Rapid Response Report Reference List - Interim Stabilization Therapy and Interim Therapeutic Restorations for Patients with Dental Caries: Clinical Effectiveness and Guidelines	https://www.cadth.ca/sites/default/files/pdf/htis/july-2015/RA0786%20Interim%20Stabilization%20Therapy%20Final.pdf

Websites searched

National Guideline Clearinghouse http://www.guideline.gov/index.aspx Nothing	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
World Health Organization (WHO) http://www.who.int/en/	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
National Institute for Health and Clinical Excellence (NICE) http://www.nice.org.uk/ Nothing	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
CDC – The community Guide http://www.thecommunityguide.org/index.html Nothing specific (does have PFS article)	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
The TRIP database http://www.tripdatabase.com/	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
CADTH https://www.cadth.ca/	N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

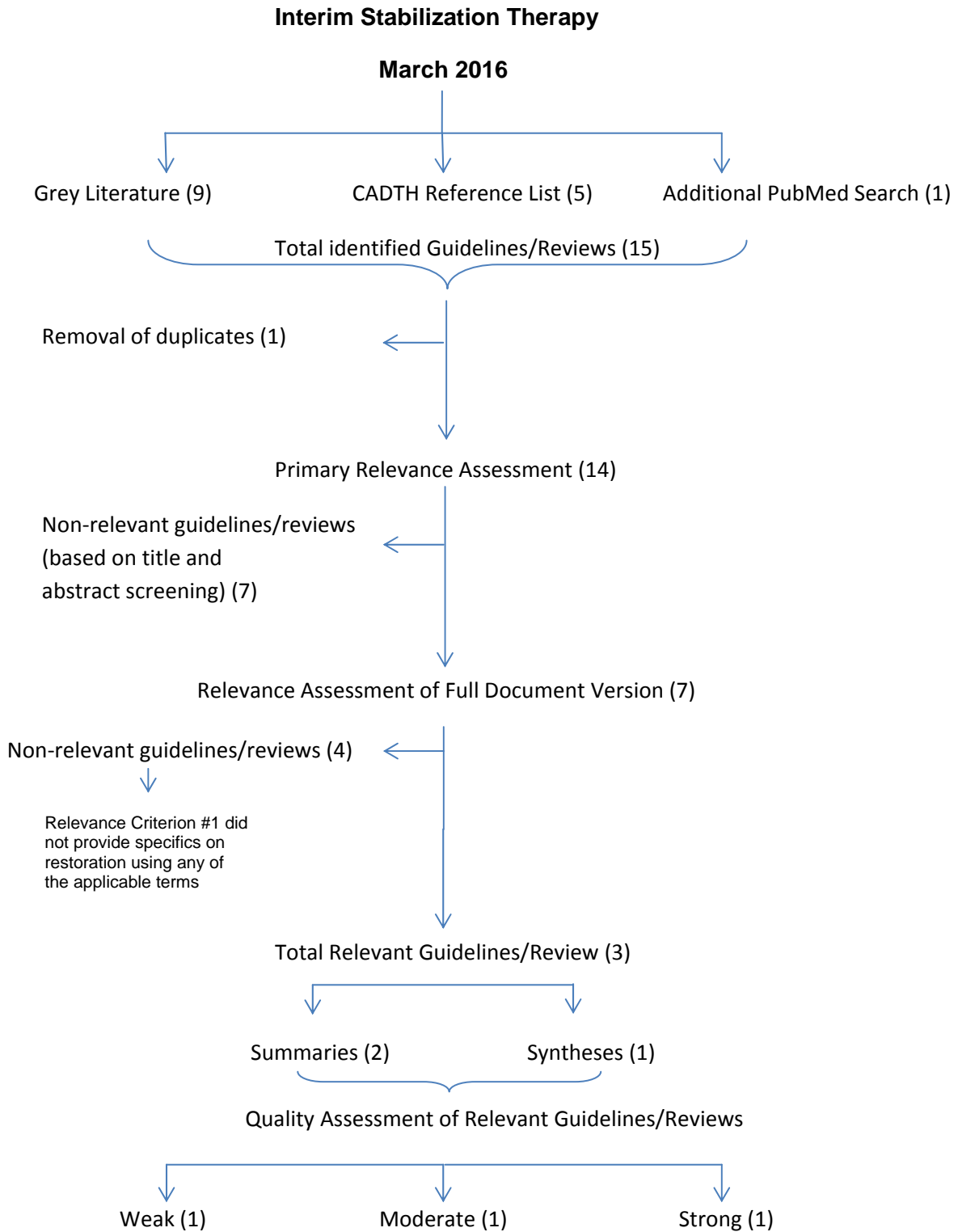
PubMed Search Strategy

Additional PubMed Database Search for reviews (January 2014 to March 2016).

Search Terms:

- 1 "interim stabilization therapy" (0)
- 2 "atraumatic restorative therapy" (1)
- 3 "interim therapeutic restoration" (0)
- 4 "alternative restorative therapy" (0)

Appendix B: Literature Search Flowchart



Appendix C: Data Extraction Tables

Items Reviewed	AAPD – Guideline on Restorative Dentistry
General Information & Quality Rating for Guideline	
1. Date	<ul style="list-style-type: none"> 2014
2. Organization & Country	<ul style="list-style-type: none"> American Academy of Pediatric Dentistry (AAPD) United States
3. Quality Rating	<ul style="list-style-type: none"> Moderate - specifics of methodology lacking
4. Focus & Objective(s)	<p>Objective:</p> <ul style="list-style-type: none"> To aid practitioners with making decisions regarding restorative dentistry (including when to treat and what materials/techniques to use) within children and adolescents population.
5. Target Audience	<ul style="list-style-type: none"> Practitioners
6. Types of Evidence used to Inform the Guideline	<ul style="list-style-type: none"> 35 Systematic reviews/meta-analysis and 62 clinical trials
7. Search Period	<ul style="list-style-type: none"> 1995-2013
8. Databases searched	<ul style="list-style-type: none"> Electronic database searched but database was not identified
9. Inclusion and Exclusion Criteria	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> English language
10. Types of Studies Included	<p>Controlled clinical trial, meta-analysis, systematic review</p>
11. Relevant Recommendations and Evidence	<p>Recommendation</p> <ul style="list-style-type: none"> There is strong evidence that interim therapeutic restoration/atraumatic restorative technique (ITR/ART) using high viscosity glass ionomer cements has value as single surface temporary restoration for both primary and permanent teeth. Additionally, ITR may be used for caries control in children with multiple open carious lesions, prior to definitive restoration of the teeth. <ul style="list-style-type: none"> According to a meta-analysis, single surface ART restorations showed high survival rates in both primary and permanent teeth. One randomized clinical trial supported single surface restorations irrespective of the cavity size and also reported higher success in non-occlusal posterior ART compared to occlusal posterior ART.

	<ul style="list-style-type: none"> ○ With regard to multi-surface ART restorations, there is conflicting evidence. Based on a meta-analysis, ART restorations presented similar survival rates to conventional approaches using composite or amalgam for Class II restorations in primary teeth. However, another meta-analysis showed that multi-surface ART restorations in primary teeth exhibited high failure rates. <p>Related evidence on material choice:</p> <ul style="list-style-type: none"> ● There is evidence in favor of glass ionomer cements for Class I restorations in primary teeth. <ul style="list-style-type: none"> ○ Regarding use of conventional glass ionomers in primary teeth, one randomized clinical trial showed the overall median time from treatment to failure of glass ionomer restored teeth was 1.2 years. ● From a systematic review, there is strong evidence that resin-modified glass ionomer cements for Class I restorations are efficacious, and expert opinion supports Class II restorations in primary teeth. <ul style="list-style-type: none"> ○ Based on findings of a systematic review and meta-analysis, conventional glass ionomers are not recommended for Class II restorations in primary molars. ○ Composite restorations were more successful than glass ionomer cements where moisture control was not a problem. ○ Based on a meta-analysis, Resin modified glass ionomer cements (RMGIC) is more successful than conventional glass ionomer as a restorative material. ○ Conventional glass ionomer restorations have other drawbacks such as poor anatomical form and marginal integrity. ○ Because of fluoride release, RMGIC may be considered for Class I and Class II restorations of primary molars in a high caries risk population. ● There is insufficient evidence to support the use of conventional or resin-modified glass ionomer cements as long-term restorative material in permanent teeth. <ul style="list-style-type: none"> ○ With regard to permanent teeth, a meta-analysis review reported significantly fewer carious lesions on single surface glass ionomer restorations in permanent teeth after six years as compared to restorations with amalgam.
13. Comments/Limitations	<ul style="list-style-type: none"> ● n/a

Items Reviewed	HealthPartners Dental Group and Clinics Caries Guideline
General Information & Quality Rating for Guideline	
1. Date	2013
2. Organization & Country	HealthPartners Dental Group United States
3. Quality Rating	<ul style="list-style-type: none"> Weak <ul style="list-style-type: none"> - Methodology is weak - Evidence based on expert consensus
4. Focus & Objective(s)	Objective: <ul style="list-style-type: none"> To provide a systematic approach to assess the individual's risk of developing caries, and to provide evidence-based interventions that reduce that risk with the ultimate goal of preservation of tooth structure To significantly reduce the incidence of caries in the HealthPartners Dental Group's patient population
5. Target Audience	Dentists
6. Types of Evidence used to Inform the Guideline	Systematic reviews/meta-analysis and clinical trials
7. Search Period	
7. Search Period	2008-2013
8. Databases searched	
8. Databases searched	PubMed
9. Inclusion and Exclusion Criteria	
9. Inclusion and Exclusion Criteria	Inclusion/exclusion criteria: <ul style="list-style-type: none"> Not specified
10. Types of Studies Included	
10. Types of Studies Included	96 relevant articles found (unknown study type)
11. Relevant Recommendations and Evidence	
11. Relevant Recommendations and Evidence	Evidence <ul style="list-style-type: none"> In order to control active caries, it may be necessary to schedule the patient in a manner that allows gross decay removal from a number of teeth at a single appointment and the placement of a temporary restoration such as glass ionomer. Glass ionomers offer a number of advantages as a temporary material including the ability to bond to tooth structure and the release of fluoride. The appointments should allow the maximum number of teeth to be treated (temporized) each visit. There is a natural and understandable tendency on the part of the restoring dentist to want to place permanent

	<p>restorations in the highly active caries patient at the restorative visit. It is important to recognize that this clinical condition developed over a long period of neglect. Placing glass ionomer restorations using a non-traumatic technique can build the dentist-patient rapport while also addressing the patient's active caries state and enhancing their self-esteem through improved esthetics.</p> <ul style="list-style-type: none"> • Patients with deep decay may become alienated if they experience significant pre and postoperative pain associated with deep restorations or pulpal involvement. • Also, glass ionomer temporaries can improve gingival health prior to placement of permanent restorations.
13. Comments/Limitations	<ul style="list-style-type: none"> • n/a

Items Reviewed	“Does atraumatic restorative treatment reduce dental anxiety in children? A systematic review and meta-analysis”
General Information & Quality Rating for Review	
1. Author(s) and Date	Simon A.K., Bhumika T.V., Nair N.S (2015)
2. Organization & Country	Manipal University, India <ul style="list-style-type: none"> • Primary studies were conducted in Brazil, Turkey, Indonesia, South Africa and India
3. Quality Rating	Strong Quality <ul style="list-style-type: none"> • 9/10 for quality criteria using the Health Evidence tool
4. Objective(s) of Review	<ul style="list-style-type: none"> • to conduct a systematic review and meta-analysis of randomized controlled trials done in children, to synthesize evidence of the effectiveness of atraumatic restorative treatment (ART) in reducing dental anxiety in children compared to conventional restorative treatments
Details of Review	
5. Number of primary studies	6 (3 included in the meta-analysis)
6. Types of Studies	<ul style="list-style-type: none"> • RCTs/CCTs
7. Search Period	1980 to August 2014
8. Databases searched	PubMed, Google Scholar, Cochrane Oral Health Group’s Trial Register (reference lists were also searched)
9. Inclusion and Exclusion Criteria	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • English <p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Case reports, case series, observational studies, review articles/letters • Studies in which dental anxiety was not measured

Details of Intervention	
10. Target Group	Children and youth (≤ 15 years of age) with at least one carious primary tooth, who have undergone restoration with ART or conventional treatment approaches
11. Description of Interventions	<ul style="list-style-type: none"> Interventions where primary teeth were restored using ART approach with hand instruments and adhesive material
12. Intervention setting	<ul style="list-style-type: none"> Hospital or school setting
13. Theoretical frameworks	<ul style="list-style-type: none"> Not specified
14. Primary Outcome	<ul style="list-style-type: none"> Reduction in dental anxiety Secondary outcome: Patients discomfort during the procedure and adverse events
Results of Review	
15. Meta-analysis	<ul style="list-style-type: none"> Yes
16. Main Results of Review	<ul style="list-style-type: none"> Both ART and the conventional restorative treatment were comparable in reducing dental anxiety among children. <ul style="list-style-type: none"> The pooled meta-analysis data (standardized mean difference – 2.12 [95% confidence interval: –4.52, 0.27]) failed to show any difference between ART group and the conventional treatment group in reducing dental anxiety in children, as measured by psychometric scales.
17. Comments/Limitations	<ul style="list-style-type: none"> Limited number of studies in meta-analysis

Appendix D: Comparison Table of Minimal Intervention Dentistry⁷

	MID	ART	ITR	Temp	IST
Local Anaesthesia	May need local anaesthetics	No local anaesthetics	May need local anaesthetics	No local anaesthetics	No local anaesthetics
Instrumentation	Can use rotary to gain access to carious tissue followed by hand excavation	hand instruments only	Can use rotary or hand only to gain access to carious tissue	Hand instruments only	Hand instruments only
Removal of Tooth structure	remove decomposed dentine	remove decomposed dentine	remove decomposed dentine	remove plaque and debris	remove plaque and debris
Type of procedure	Restorations and sealants	seal pits and fissures or to restore tooth cavities	Temporary restorations	Temporary restorations	Temporary restorations
Materials	Resins, glass ionomers	high-viscosity glass-ionomer	glass ionomer or resin-modified glass ionomer cement	zinc-oxide eugenol, glass ionomer or other medicated/non-medicated temporary cements	high-viscosity glass-ionomer finger pressure
Permanence of restoration	Final restoration	Final restoration	Temporary restoration referral to dentist for final restoration	Temporary restoration referral to dentist for final restoration	Temporary restoration referral to dentist for final restoration
Scope of Practice	Conjunction with dentist	RDH	Conjunction with dentist	RDH	RDH

MID = Minimum Intervention Dentistry, ART = Atraumatic Restorative Therapy, ITR = Interim Therapeutic Restoration, IST = Interim Stabilization Therapy