Hospital-Based Early Childhood Caries Intervention

Organization:
Children's Hospital Boston, Boston, MA

Summary:
Children's Hospital Boston in Massachusetts and St. Joseph Hospital (SJH) in Rhode Island were experiencing long waiting times for dental treatment in the operating room (OR). At the same time, relapse rates after treatment in the OR were high. A clinical protocol was implemented to manage early childhood caries (ECC) in children younger than 60 months of age using a chronic disease management approach in order to reduce new cavitation (indicating inadequately managed disease status), pain related to untreated caries, and referral to the OR.

The clinical protocol called for caries risk assessment and preventive care to be performed regularly based on the patient’s caries risk. Providers explained the causative factors for ECC to parents and encouraged them to participate in the management of their child’s caries (using Self-Management Goals). The Institute for Healthcare Model for Improvement was used to guide efforts to implement changes in the care delivery systems toward applying a disease management approach for ECC.

In-office caries management consisted of applying fluoride varnish and re-assessing caries risk based on the assumption that children who initially presented as high caries risk may decrease their risk over time. An EDR template for the caries management visit was developed and facilitated data collection (see attached form). The periodicity for caries management visits was determined by the most recent caries risk assessed, in conjunction with restorative care as needed and desired by the parent and provider. Patients deemed to be high-caries risk returned in 1-2 months, moderate risk patients in 3-4 months, and low risk patients in 6-12 months.

Parents with young children were given the full options of restorative treatment, which might require pharmacologic management (nitrous oxide, sedation or general anesthesia) as adjunct. If the destruction of tooth structure by the caries process was minimal, arrest of the decay might be possible with remineralization of tooth structure. The restorative treatment was deferred in patients if the disease was stabilized. When decay has progressed into dentin and caries arrest was not achieved, interim therapeutic restoration (ITR) was offered as an alternative treatment in young children with early cavitated lesions. ITR allows for removal of obvious decayed dentin using rotary or hand instruments and sealing with a biocompatible restorative material (e.g. glass ionomer cements which release fluoride). Parents were informed that this approach is caries control rather than permanent restoration.

ECC Management Project Results and Conclusions

After 30 months at Children’s Hospital Boston (CHB), significantly fewer ECC patients developed new cavitation. Fewer patients developed pain or were referred to the OR at both CHB and St. Joseph’s Hospital (SJH).
The proportion of patients classified as high caries risk declined with increasing number of disease management visits. The treating clinicians were able to re-classify previously high-risk ECC patients as medium risk or low risk typically after the third visit. Many ECC patients returned with complete caries arrest after one to three months such that restorative treatment for cavitated carious lesions was no longer needed. In other patients, since the caries process was stabilized, the restorative treatment was deferred until they were able to cooperate for treatment in the office setting (usually by 3-3.5 years of age).

Clinicians and support staff were able to adapt to using a disease management approach to ECC. In interviews with caregivers of children about the ECC clinical protocol, parents expressed appreciation of having been given explanations on the causes of ECC and treatment options, including non-surgical management approaches. It is clear that disease management of ECC has promising potential to improving clinical outcomes, but needs further testing in other clinical environments in which children with ECC receive dental care.

**Lessons Learned:**
Effective ECC management calls for a paradigm shift to a risk-based chronic disease model, which includes surgical care delivery.
- Quality improvement allows flexibility in making systems changes
- Clinicians and staff can support systems change that make sense conceptually
- Most parents are receptive to prevention and self-management goals
  - Need reinforcement and support

**Attachment:**
EDR template for caries management visits.

**Contact Person for Inquiries:**
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# Caries Risk Assessment/ECC Encounter

Today's Date

Clinician's ID#:

Child’s DOB:

<table>
<thead>
<tr>
<th>Is Patient ECC?</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, check:</td>
<td>Initial (Study Enrollment)</td>
<td>Medical Management (F/U)</td>
</tr>
</tbody>
</table>

**Today's Visit:**

- New Patient Visit
- Medical Management
- Recall Visit
- Urgent/Emergency
- OR Scheduled Tx Visit (restorative/ART)

**Step mutans culture this visit?**

- Yes
- No
- F-Varnish Applied 1st
- Not Enough Time
- On Antibiotics

**SM Levels:**

- Zero
- Low
- Medium
- High
- V High
- N/A

## History

<table>
<thead>
<tr>
<th>SHCN</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-natal hx/pre-term</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>On Meds</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Breast/Bottle</td>
<td>Breast</td>
<td>Bottle</td>
</tr>
<tr>
<td>Other</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Caries Risk Status:**

- High
- Medium
- Low

## Diet

<table>
<thead>
<tr>
<th>Frequent sugary foods/drinks</th>
<th>No</th>
<th>Yes</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sippy cup w/ juice/milk</td>
<td>No</td>
<td>Yes</td>
<td>SW</td>
</tr>
<tr>
<td>Bottle use w/ milk/juice</td>
<td>No</td>
<td>Yes</td>
<td>SW</td>
</tr>
<tr>
<td>On-demand breastfeeding</td>
<td>No</td>
<td>Yes</td>
<td>SW</td>
</tr>
</tbody>
</table>

**Caries Risk Status:**

- High
- Medium
- Low

## Fluoride / Home care

<table>
<thead>
<tr>
<th>F-toothpaste</th>
<th>No</th>
<th>Yes</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoride in drinking H2O</td>
<td>No</td>
<td>Yes</td>
<td>SW</td>
</tr>
<tr>
<td>Suppl F (Gelkam, Prevident, ACT)</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Daily Use:**

- 1x
- 2x
- 3x

**Assistance w/ brushing**

- No
- Yes
- N/A

**Floss**

- No
- Yes
- N/A

**Caries Risk Status:**

- High
- Medium
- Low

## Clinical Evaluation

**Visible plaque**

- No
- Yes
- Improved

**Gingivitis**

- No
- Yes
- Improved

**Existing Cavitated lesion**

- No
- Yes
- N/A

**NEW cavitated lesions**

- No
- Yes
- N/A

**Existing Demin enamel**

- No
- Yes
- N/A

**NEW Demineralized enamel**

- No
- Yes
- N/A

**Enamel defects**

- No
- Yes
- N/A

**Deep pits / fissures**

- No
- Yes
- N/A

**Other**

- No
- Yes
- N/A

**Existing Remin. surfaces**

- No
- Yes, complete

**NEW Remin. surfaces**

- No
- Yes, complete

**Caries Risk Status:**

- High
- Medium
- Low

## Supplemenal Assessment

**Pain**

- No
- Yes

**Sensitivity**

- No
- Yes

**Radiographic caries**

- No
- Yes
- N/A

**New radiographic caries**

- No
- Yes
- N/A

## Overall Risk (before SM test)

- Very Low
- Low
- Medium
- High

## Overall Risk (after SM test)

- Very Low
- Low
- Medium
- High

## Care Provided Today:

- SM Test
- Self-mgmt edu given
- OH Literacy
- F-Varnish
- Recomended Gelkam: 1x 2x ART Conventional Restorative OR

**Tx Plan:**

**Fluoride:**

- One month
- Three months
- Six months

**Restorative:**

- None -> monitor
- Conventional restoration
- ART OR

**Next Visit:**

- One month
- Three months
- Six months