Treating Tooth Decay
How to Make the Best Restorative Choices for Children’s Health
Treating Tooth Decay
Top Take-Aways
An ideal restoration for a child provides strong function, protection from future decay, improved appearance and freedom from pain.

A less-than-ideal treatment choice often leads to failure of the restoration and re-treatment of the tooth several times over its lifetime, resulting in additional cost, time, and inconvenience for the family. It can also lead to infection and severe pain for the patient.

Larger cavities – often associated with broken-down teeth and infection into the nerve of a tooth – require the strength and protection of a crown. Because large cavities present greater risk of pain, tooth loss, and serious infection, crowns represent cost savings by covering tooth surfaces prone to future cavities in children at high risk for tooth decay.

Based on numerous studies proving their durability, stainless steel crowns are the restoration of choice where there is extensive decay in primary teeth. They can prolong the life of a tooth when re-treatment would require sedation or general anesthesia, with its attendant risks and expense.

To support better oral health for children, policy makers and insurers should develop coverage criteria, treatment authorizations and related policies based on sound clinical recommendations such as those found in the Reference Manual of Pediatric Dentistry published by the American Academy of Pediatric Dentistry (AAPD).

Dental insurance policies and regulations must serve the best interests of the individual child and ensure that benefit coverage supports the future oral and overall health of children.

Since children in the Medicaid program have a higher rate of oral disease, a higher restoration replacement rate should be expected in this population compared to privately insured patients.

Tooth decay, the most common chronic disease of childhood, can hurt a child's health and quality of life. It is preventable with the help of regular dental visits starting early in life and a sound program of oral health care at home.
“No cavities!” is what every parent wants to hear at a dental visit. Unfortunately, this experience is far too rare. Tooth decay is the most common chronic disease of childhood, affecting three times more children than obesity and four times more than asthma.¹ One in five children has had tooth decay by kindergarten and more than half have had cavities by age eight.² The presence, pain and severity of childhood tooth decay affects the quality of life of children from preschool age through adolescence.

Working together, pediatric dentists, parents, policy leaders and insurers can help all children receive the best treatment using proven restorative choices. The purpose of this brief is to:

- Offer practical information about restorative choices for children's teeth;
- Provide solutions that will limit further infection and damage from dental decay;
- Promote good oral health and quality of life for children from birth through adolescence; and
- Assist dental providers, parents, third-party payers, policy makers and child advocates in making and supporting ideal choices regarding restoration of children's teeth.

### Why It’s Not “Just” a Cavity

Tooth decay can hurt a child's health and quality of life. Cavities can make children more vulnerable to infections in other parts of their body, such as ears, sinuses and brain.³ Pain from tooth decay can make chewing food painful enough to keep a child from eating properly and getting adequate nutrition.⁴ It also hinders many children from speaking, playing, sleeping, going to school or paying attention in class. In fact, more than 34 million school hours are lost each year because of dental problems.⁵ Children with untreated dental caries are more likely to be bullied compared to cavity-free or disease-treated children.⁶ In extreme cases, tooth decay and its treatment can be life threatening and lead to serious disability.⁷,⁸

Tooth decay in children can be hard on the whole family. Parents must call off work, take children from school, arrange transportation and manage post-treatment care instructions. Financial well-being of families, communities, and public insurance programs are affected. For example, treatment of severe tooth decay can cost $10,000 a child and can go up to $25,000 in severe cases, especially if the child needs to be hospitalized and treated under general anesthesia.⁹
How Kids Get Cavities

Bacteria use sugars to produce acid which, over time, break down tooth structure. Children can acquire these bacteria early in life, leading to significant tooth decay before age three. Once the surface of the tooth is broken, it can’t heal itself and the break allows infection, sensitivity, and pain that prevent eating and drinking. Hygiene becomes difficult if not impossible. This creates a vicious circle that quickly spirals into pain, discomfort and potentially dangerous health situations.

Children are at risk for tooth decay when they:

- Have eating habits that include frequent sugary drinks and snacks or refined carbohydrates;
- Don’t brush their teeth;
- Don’t get the right amount of fluoride;
- Have special health care needs, complicating medical conditions or take certain medications; or
- Don’t visit a dentist regularly, or begin dental care later than age one.

What to Consider When Choosing the Best Restoration

Everyone – parents, patients, pediatric dentists, insurers, and policy makers – wants the best restoration for every damaged tooth. The right restoration for each patient:

- Restores the shape and function of the tooth;
- Allows for proper cleaning and supports prevention of future decay;
- Is provided in the safest and easiest way for the child;
- Is affordable while taking appearance into account;
- Lasts for the lifetime of a baby tooth; and
- Leads to better oral health for the child.

Each individual situation presents different challenges, such as the child’s age, ability to cooperate with treatment, size and location of the cavity, medical complications, and potential risk for continued tooth decay. The choice of the best restoration is based on a complete medical and dental history, review of the patient’s risk factors, comprehensive clinical exam, and necessary X-rays by the treating pediatric dentist. Good communication between the pediatric dentist and parents, providing clear understanding of the health/dental conditions and restorative choices, is critical in choosing the right restorative treatment for each child.
Tempted by the easiest and cheapest option? Think again, because it may turn out to be a bad bargain. A less-than-ideal treatment choice often leads to failure of the restoration and re-treatment of the tooth several times over its lifetime, resulting in additional cost, time, and inconvenience for the family. It can also lead to infection and severe pain for the patient, and pain for a child is harder to manage than pain for an adult. Choosing a restoration that best fits the needs of the tooth, the child, and the family within their system of care will reduce duplicative interventions and save money in the long run.

**Restorations for Each Patient’s Unique Needs**

Several types of fillings and full-coverage restorations can be used depending on the size and location of the cavity.  

**Amalgam Fillings.** Also called silver or mercury fillings, amalgam fillings are made of a mixture of metals including silver, copper, tin and mercury. Proven both safe and effective, amalgam material has been the most commonly used to restore teeth for over a century. Amalgam fillings need a strong tooth to hold them in place. Although they are the most affordable alternative, many patients prefer a more natural look rather than the metallic color of amalgam.

Small amalgam fillings are durable and can last up to seven years or more. When decay is larger, amalgam fillings may break and need replacement. They are less able to resist leakage of bacteria into the tooth. The rest of the tooth, not replaced with the filling, is still at risk for future decay.

(Left) Primary teeth with clinically detectable decay and decay evident on X-rays (not shown); (Center) Two primary molars prepared with decay removed; (Right) Finished amalgam restorations.
**Tooth-Colored Fillings.** Composite or plastic fillings match the tooth’s original color, making them nearly impossible to see when the patient smiles or laughs. (Some even contain slow-release fluoride to strengthen the remaining tooth.) Usually bonded to the remaining tooth, they repair the cavity and offer some protection against bacterial leakage. Like amalgam fillings, plastic or composite fillings leave some tooth surfaces exposed to future decay. Plastic fillings may also pick up stains from food and beverages and become discolored over time. They typically cost more than amalgam fillings.

Because plastic is not as strong as the tooth itself, these fillings can break or wear out, allowing bacteria to leak into the tooth and lead to more decay. The larger the tooth-colored filling, the greater the risk of failure and need for replacement. If a tooth is very weak or missing much of its structure, a better treatment usually is a crown that covers the entire tooth and protects it from further breakdown.

**Stainless Steel Crowns.** Also known as silver caps or preformed metal crowns, stainless steel crowns are silver-colored metal shells adapted to individual teeth and cemented in place. They are made of iron, chromium, nickel and other metals, making them very durable and impervious to bacterial attack. Crowns are used to repair teeth that are badly decayed or not strong enough to hold an amalgam or plastic filling. Of all the restorations for primary teeth, stainless steel crowns last the longest.

Stainless steel crowns can withstand biting forces and rarely need replacement. Because they protect all of the remaining tooth, bacteria cannot easily penetrate into the tooth and attack other tooth surfaces. This is especially important for children at high risk of dental decay. When a patient needs treatment of a tooth’s pulp or nerve, the tooth becomes weaker. Only a stainless steel crown can protect the tooth from new infection and fracture, so it is the restoration of choice in these cases.

More affordable than other types of crowns, stainless steel crowns are metallic in color and often recommended for back baby teeth where appearance is less of a concern. For the front of the mouth, stainless steel crowns can be covered with white plastic, or patients can choose from several kinds of tooth-colored crowns.
A 2020 study of hundreds of back baby teeth in very young children revealed that various restorative treatments – except stainless steel crowns – resulted in a need for additional care for a significant number of back baby teeth after treatment. In fact, treatment with stainless steel crowns lasted the duration of the study (seven years) with as few as two in 100 teeth needing further restorative management. These findings confirm that once established, early childhood tooth decay continues to put high-risk children in danger of recurrent dental disease. Thus, stainless steel crowns should be chosen over other restorative options to reduce repeat dental care in children with a serious risk of tooth decay.¹²
Tooth-Colored Crowns. Made of plastic or composite, tooth-colored crowns cover the entire tooth above the gum line and are cemented or bonded to the remaining tooth structure, adding strength and protecting against bacterial leakage. These crowns are not as resistant to biting forces as stainless steel crowns, although new polymer technology offers materials approaching similar strength. More expensive than stainless steel crowns, tooth-colored crown forms are used primarily for the front teeth because of their natural appearance. Like plastic fillings, they may pick up stains from food and beverages and become discolored over time.

Zirconia crowns are another tooth-colored restoration option, offering full coverage of baby and permanent teeth. These crowns offer both strength and esthetics. Pediatric zirconia crowns available on the market feature different materials and construction, and the technique for tooth preparation varies significantly between the brands, but in general, requires a greater amount of tooth reduction than stainless steel crowns. Comparatively, stainless steel crowns last slightly longer according to existing clinical research.
# What are the Choices to Restore Teeth?[^9]

<table>
<thead>
<tr>
<th>Treatment Name</th>
<th>Description</th>
<th>Best Uses</th>
<th>Success Rates</th>
<th>Average Costs*</th>
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</table>
| Amalgam fillings (also called silver or mercury fillings) | *Made of a combination of metals including silver, mercury, tin, and copper*  
  *Metallic in color and more affordable than other cavity-filling materials* | *Restores a tooth with limited decay, usually a small or medium-sized cavity*  
  *Tooth must be strong enough to hold it in place under the stress of chewing*  
  *Commonly used in back teeth due to the metallic color*  
  *Takes less time, so a good choice for patients who may have difficulty staying still during treatment* | *Small and medium-sized amalgam fillings in baby and permanent teeth have an excellent success rate, slightly higher than composite fillings*  
  *Studies show medium-sized amalgam fillings typically last four to seven years; small fillings can last seven or more years*  
  *The main reason fillings break and need replacement is recurring tooth decay or oversizing the restoration* | Amalgam filling to repair one tooth surface, $156  
  two surfaces, $193  
  three surfaces, $238  
  four or more surfaces, $273 |
| Composite fillings (also called tooth-colored fillings) | *Plastic and glass mixture bonded to the tooth*  
  *Matches the tooth's color and more expensive than amalgam* | *Restores a tooth with limited decay, usually a small or medium-sized cavity*  
  *Tooth must be strong enough to hold it in place under the stress of chewing*  
  *Used on both front and back teeth*  
  *Takes more time than placing amalgam fillings and can be affected by saliva during restoration* | *Small and medium-sized composite fillings on both baby and adult teeth show an excellent overall success rate, slightly lower than amalgam fillings*  
  *The main reason fillings break and need replacement is recurring tooth decay and material breakdown* | Composite filling to repair one surface, $177 - $193 (depending on tooth location and type)  
  two surfaces, $211 - $239  
  three surfaces, $256 - $292  
  four or more surfaces, $321 - $343 |
| Stainless steel crowns (also called silver caps or preformed metal crowns) | • Metal alloy tooth-shaped forms cemented or bonded to the tooth and covering the entire tooth  
• Metallic in color and more affordable | • Restores a tooth with extensive decay or not strong enough to hold a filling  
• Protects a tooth with severe loss of tooth surface due to decay, fracture, or developmental defects-  
• Of all restorations for baby and adult teeth, stainless steel crowns last the longest  
• Has a higher success rate than amalgam fillings in back baby and permanent teeth with extensive decay  
• Have a higher success rate than amalgam fillings for teeth that have had a root canal (calcium hydroxide pulpotomy) | Stainless steel crown to repair baby tooth, $304  
permanent tooth, $351 |
|---|---|---|---|
| Composite crowns (also called tooth-colored crowns or caps) | • Plastic or composite forms cemented or bonded to the tooth and cover the entire tooth  
• Matches the tooth's color and more expensive | • Similar uses as stainless steel crowns  
• Used for front and back teeth due to their natural appearance  
• Plastic, tooth-colored crowns not as resistant to biting forces as stainless steel crowns, although new materials are approaching similar strength  
• Success rates of tooth-colored and stainless steel crowns are fairly comparable for baby and adult front teeth | Composite crown to repair front tooth, $384 |
| Zirconia crowns (also called tooth-colored crowns or caps) | • Made from the durable metal zirconium dioxide cemented or bonded to the tooth and cover the entire tooth  
• Matches the tooth's color and more expensive | • Similar uses as stainless steel crowns  
• Used for front and back teeth due to their natural appearance  
• May resist staining better than plastic or composite crowns  
• Stainless steel crowns last slightly longer according to existing clinical research | Zirconia crowns, depending upon type and location, $1082 - $1219 |

*The costs for restorations do not include the costs for other required services of treatment, such as clinical examinations, radiographs, and anesthetics. The average fees are drawn from American Dental Association, Health Policy Institute. Survey of Dental Fees for Pediatric Dentists in the U.S. Chicago, IL: American Dental Association, 2017. https://ebusiness.ada.org/productcatalog/product.aspx?ID=55492. Accessed on 1 March 2020.*
Action Steps

Steps For Policy Makers and Insurers

1. **Develop coverage criteria, treatment authorizations and related policies based on sound clinical recommendations.**

   Children are best served when they have access to dental care in keeping with scientific research and established clinical practices. Denying coverage for evidence-based treatment not only cheats a child of the benefits of good oral health, but has the potential to discourage pediatric dental providers from seeing children enrolled in Medicaid.

   The AAPD’s *Reference Manual of Pediatric Dentistry* contains clinical recommendations for safe, effective care of children. It offers 82 policies, guidelines and best practices, revised every year by experts who research and practice state-of-the-art care based on sound clinical science. It is available free at https://www.aapd.org/research/oral-health-policies--recommendations/ and also as an app on iTunes or Google Play.

2. **Support policies and regulations that serve the best interests of the individual child and family.**

   Each child is unique, living within a particular family and community situation. Each child has a unique oral health diagnosis requiring an individualized treatment plan based on health history, diagnostic testing, caries risk assessment, hygiene and nutrition practices, and ability to access care. Dental benefit policies and regulations must grant strong credence to the treatment decisions made by parents in consultation with a pediatric dentist.

3. **Ensure that benefit coverage supports the future oral and overall health of children.**

   The cheapest initial restoration may not be the best nor the cheapest over the lifetime of the teeth or the child. A “quick fix” treatment choice can lead to restoration failure and re-treatment with its accompanying cost, time, discomfort for the child and inconvenience for the family. Choosing a restoration with a long-term success rate represents a wise financial investment in a child’s future health.

4. **Encourage pediatric dentists to provide access to the best restorative care for children.**

   Pediatric dentists are the provider of choice for children who need care most – the very young, financially disadvantaged, and those with special health care needs. As specialists, they treat a lion’s share of patients with severe treatment needs for restorative dentistry. More than seven in 10 pediatric dentists provide care to publically insured patients, and virtually all treat patients with special needs.13

5. **Support fair and consistent audits of dental providers in their service to patients.**

   Auditing criteria should be consistent with AAPD clinical recommendations, since pediatric dentists are expected to meet these standards for pediatric restorative dentistry. In addition, audits should be completed by those who have credentials on par with the dental provider being audited. For example, a pediatric dentist’s audit findings should be reviewed by a dentist who specializes in pediatric dentistry and who understands the clinical guidelines and standards of care that have been adopted and followed by their specialty.
Steps for Pediatric Dentists

1. **Effectively inform caregivers, children and adolescents of treatment choices.**
   
   The most successful treatment is one selected by the patient’s family with the advice of a pediatric dentist. Dental provider communication skills, caregiver health literacy, informed consent and partnership toward decision-making are paramount to patient-provider engagement. Particularly critical, this interaction can impact the patient’s health. Does satisfaction with communication have anything to do with successful treatment outcomes? It sure does!

2. **Clearly document the course of treatment.**
   
   Sometimes pediatric dentists follow the clinical practice recommendations put forth by their profession, putting to use their specialized training in pediatric restorative dentistry, and still face coverage denials on behalf of their patient families. Why? Because the documentation isn’t clear, comprehensive or supportive of treatment rationale using multiple approaches. What is more, third-party payers, including Medicaid, have their own criteria of medical necessity. Treatment requirements from the payer may be more or less restricted or ambiguous than the criteria from the pediatric dental profession, risking confusion about the justification for treatment choices. In other words, patient records can get lost in translation. Through carefully completed documentation, pediatric dentists can facilitate insurance coverage and improve the quality of care for their patients.

3. **Work effectively with insurers.**
   
   An oral health delivery system works only when parents, pediatric dentists and third-party payers are on the same side and speak the same language. Pediatric dentists hold the responsibility to advocate for compatible policies between third-party payers and established clinical recommendations. In addition, prior to entering a payer contract, pediatric dentists should be familiar with third-party coverage criteria and review the dental Medicaid provider manual of their state.

4. **Encourage prevention.**
   
   When prevention starts early – with a dental visit at age one – it prevents the establishment of the disease that results in high costs and complex treatments. It curbs the pain, difficulty eating, lost school time, and overuse of emergency departments that accompany tooth decay in children and adolescents.
Steps for Parents and Caregivers

1. **Select a dental home by age one.**
   
   Visit a pediatric dentist before there is a chance for decay to develop, ideally after the first baby tooth comes in. The establishment of a relationship with a pediatric dentist early in a child’s life encourages a trusting relationship with the provider, a comfortable space for the parent to receive preventive counseling, and an opportunity to avoid childhood dental disease.

2. **Seek information on treatment choices.**
   
   Ask for clarification, more information or guidance if you need it. Parents are encouraged to assert themselves when they need more information and when they have particular attitudes about treatment choices. Being well informed about treatment options leads to better outcomes and lower long-term costs.

3. **Secure prompt treatment.**
   
   Early diagnosis is key to minimizing the effects of tooth decay. Find out how many appointments are necessary to complete treatment and schedule right away. To find a pediatric dentist in your area, visit [https://www.aapd.org/publications/find-a-pd/](https://www.aapd.org/publications/find-a-pd/).

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Conclusion

The outcomes of choosing the ideal restoration for a child are strong function, protection from bacterial leakage, improved appearance and freedom from pain. Small cavities are most cost-effectively treated with restorations like amalgam or composite fillings, because their choice maximizes the beneficial properties of those materials.

Larger cavities – often associated with broken-down teeth and infection of the nerve or pulp – require the strength and protection of a crown. Crowns represent cost savings by covering tooth surfaces prone to future decay in high caries-risk children. They may serve to prolong the life of a tooth beyond the age of a child when any re-treatment would require sedation or general anesthesia, with its attendant risks and expense.

Proven Tips for Tooth Decay Prevention

1. **Good home care starts with regular early dental visits.** Parents are encouraged to have a dental home for their children by age one to learn about what they can do to prevent tooth decay in their young children and to receive guidance on the frequency and types of visits needed.

2. **Smart snacking.** Oral health is negatively impacted by a child’s nutritional history when their meals and snacks don’t include enough vitamins, minerals, and proteins. Dietary guidance can be expected at early dental visits so that parents and children may learn about proper nutrition and foods and drinks to avoid.

3. **Fluoride.** *Water fluoridation is the No. 1 most cost-effective way to prevent tooth decay.* Unfortunately, three in ten communities in the U.S. do not receive the benefits of fluoride in their public water supply. If a child does not have access to fluoridated water, a pediatric dentist can advise parents about other sources of fluoride, such as toothpaste, rinses, and fluoride supplements.

4. **Sealants.** *Most cavities in children occur in places that sealants could have protected.* Decay in the pits and fissures on back teeth accounts for nearly half of the cavities in baby teeth and four out of five cavities in permanent back teeth. Sealants cost less than half of the cost of a filling, a good value in view of the decay protection offered.
Contributing Authors


AAPD Pediatric Oral Health Research & Policy Center Publications

September 2019
The Importance of the Age One Visit

March 2019
The State of Little Teeth, Second Edition

September 2017
Are Your Kids Covered? Medicaid Coverage for Essential Oral Health Benefits

May 2017
Pediatric Dentist Toolkit for Seeing Patients with Medicaid

May 2016
Competition or Collaboration: Exploring the Relationship between Corporate Dentistry and Dental Training Programs

February 2015
Unique Considerations for Medicaid Audits of Pediatric Dental Practices

https://www.aapd.org/research/policy-center/technical-briefs/