



Peninsula Dental Social Enterprise (PDSE)

Paediatric Pathway - Restorative

Version 3.0

Date approved: January 2019

Approved by: The Board

Review due: January 2021

Routine assessment: Clinical Examination and bitewing radiographs

Non carious primary teeth

Caries risk based prevention + review

Carious primary teeth

Non pulpal involvement
Asymptomatic

Pulpally involved
+/- Symptoms of REVERSIBLE pulpitis
A. Sharp pain on stimulation
B. Short duration
C. Responds to analgesia
D. No clinical or radiographic symptoms

Pulpally involved + symptoms IRREVERSIBLE PULPITIS
A. Pain (at night/spontaneous/continuous)
B. Radiolucency at furcation
C. Sinus
D. Swelling – intra/extra oral

Occlusal

Interproximal/multi-surface

OPTION 1

Adhesive restoration
RMGIC/Composite

Hall Crown

Extraction

Extraction

OPTION 2

Hall Crown

Adhesive restoration RMGIC/Composite

Pulpotomy &
Stainless Steel Crown

Age
- Younger patient
- Poor moisture control
- Longer lifespan

Holistic planning
- Caries risk

Extent of Cavity
>1/2 Dentine

Age
- Longevity of the tooth

Cooperation
- Technique sensitive
- LA/RD/moisture control

Parental preference
- Aesthetics

Age
- Close to exfoliation

Cooperation
- GA

Holistic Planning
- Family and Medical
- Multiple pulpotomies required
- Tooth unrestorable

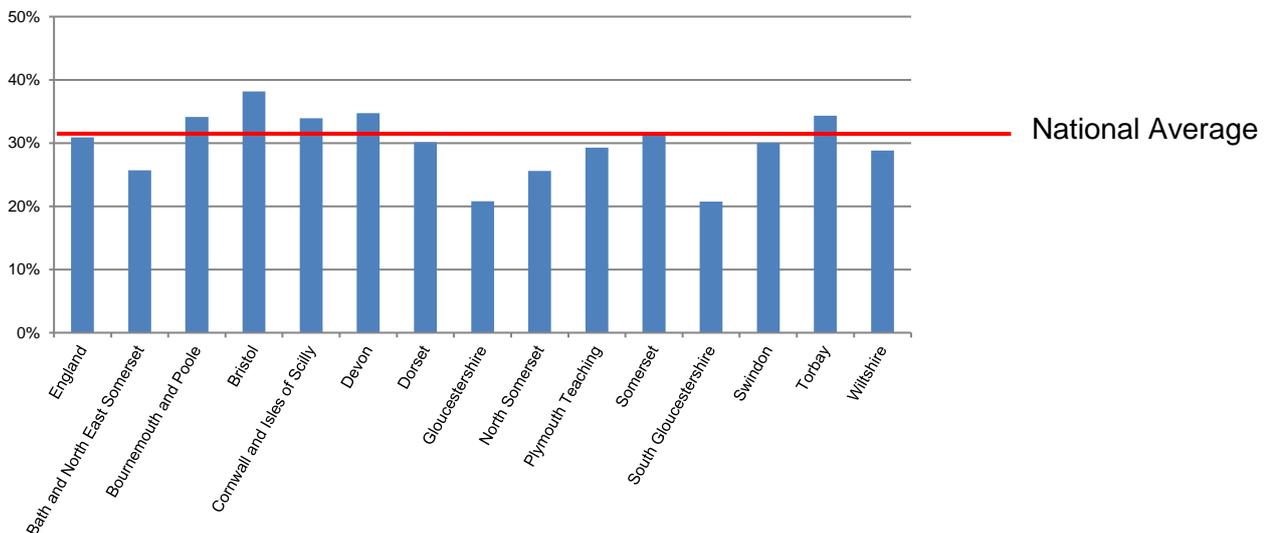
Restorative management of caries in the primary dentition

Background

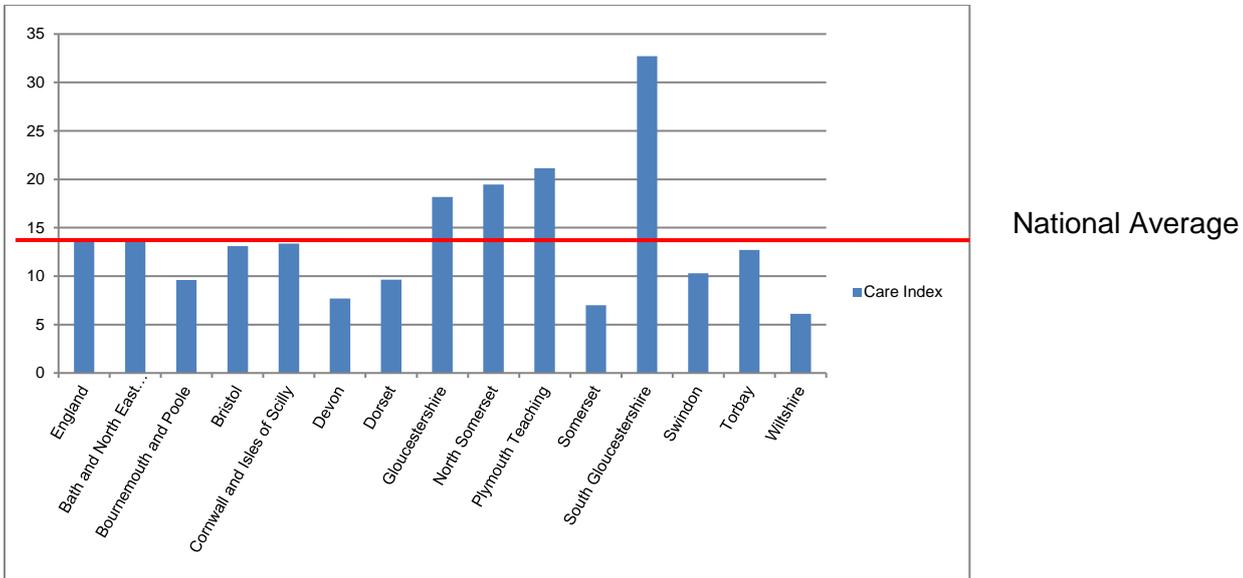
Despite the fact that it is largely preventable, dental caries is the most common chronic disease of childhood. Dental decay in young children frequently leads to pain and infection necessitating hospitalisation for dental extractions under general anaesthesia. Dental problems in early childhood have been shown to be predictive of not only future dental problems but also on growth and cognitive development by interfering with comfort nutrition, concentration and school participation.

Survey data suggests that 5-year old children in the UK have on average just one decayed tooth however closer inspection of this data reveals significant inequalities in the distribution of disease. Whilst 70% of 5 year olds are decay free, the average number of decayed, missing due to caries or filled teeth in those children with decay is 3.5. Furthermore very little of this decay is treated – with a care index (proportion of decayed teeth that have been restored) of only 14% across the country and around between 2 and 3% of all 5 year olds having experienced sepsis or abscesses. Worryingly these disease levels are seen in even younger children with 12% of three year olds having evidence of caries and for those with caries (ie. those with dmft > 0) the mean number of carious teeth is just over three (3.04).

In the South West of England 28% of 5-year olds have some caries experience.



Furthermore the 'care index' for 5 year old children in the South West of England remains unacceptably low with, at best, only a third of decayed primary teeth restored (33% in South Gloucestershire). However elsewhere in the South West the care index is much lower, with only 7% of carious primary teeth being restored in Devon.



Untreated caries in primary teeth is a strong predictor for pain and sepsis (1) and leads to the need for children to have multiple teeth extracted, often under general anaesthesia. This is reflected in the 27% increase in the volume of children having teeth extracted (across the UK) under general anaesthesia from just over 20,000 children in 1997 to over 33,000 in 2005 (2).

Why is there so much untreated caries in children?

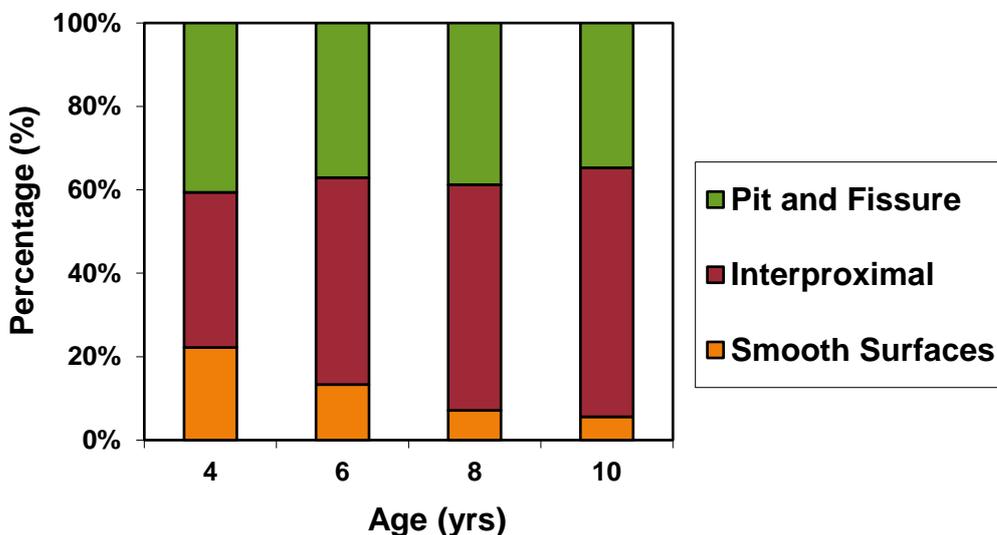
There are many reasons why caries in primary teeth remains untreated including; clinical/technical challenges, child behavioral issues, to lack of confidence in the dental profession, service access issues and funding models.

In terms of technical challenges to restoring the primary dentition there are key differences, between the primary and permanent dentitions.

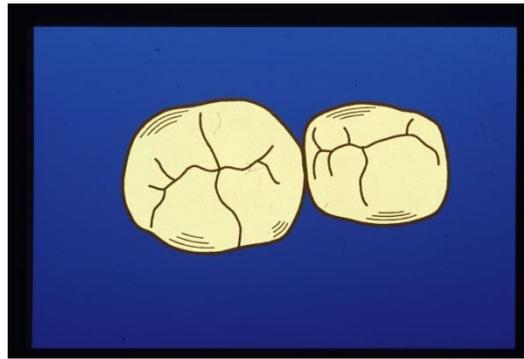
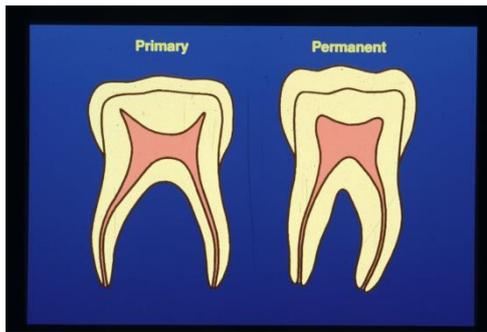
These include:

1. Distribution of disease

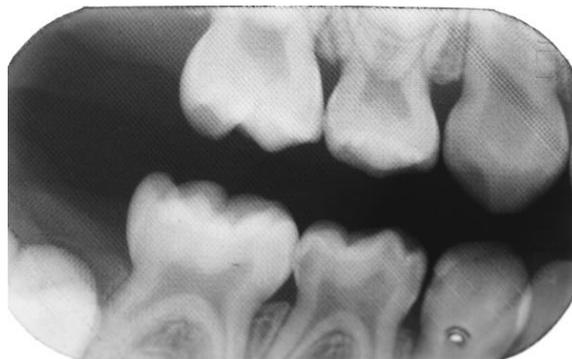
The distribution of caries in the primary dentition differs to that in the permanent dentition such that by the age of 10 years, 60% of all caries is interproximal (3)



2. Anatomy of the primary molar.



Primary molars have relatively large pulps, thin enamel and dentine and broad flat contact areas. Clinically these means that the pulp is affected by the carious process earlier than it might in a permanent tooth and it can be difficult to place sufficient bulk of material in to a cavity to maintain the integrity of the restoration. Furthermore, broad flat contact areas creates an environment for early caries development, the diagnosis of which depends on bitewing radiographs. Between 30 and 60% of caries in primary teeth is missed if bitewing radiographs are not taken (4).



3. Longevity of restorations in primary teeth.

Amalgam:	Failure Rates of between 6.6 – 12% (5, 6) Median Survival Times: 7.8 years (7)
Conventional GICs:	Failure rate of 23 – 26% (8, 9) MST: 4.0 years (8)
Resin Modified GICs:	Failure rate of 5.3 – 19% (10, 11) MST: 4.7 years (11)
Composite resins:	Failure rate of 20.4% (9)
Compomer	Failure rates of 6 – 16% (5, 9)
Stainless steel crowns:	Failure rate < 3% (7) MST: > 9 years (12)

Amalgam is not appropriate for restoring primary molars not only because of public concerns regarding safety but also because it requires mechanical retention to be built in to the cavity design necessitating excessive tooth tissue removal.

As of July 1st 2018, amalgam can no longer be used in children < 15 years of age unless deemed strictly necessary by the dentist (EU Regulations, see <https://bda.org/dentists/policy-campaigns/public-health-science/dental-amalgam-faqs>)

Conventional GIC's are not appropriate for interproximal restorations in primary molars in younger children as they have inferior physical and mechanical properties associated with insufficient longevity.

Pre- formed crowns remain the restorative of choice in the primary dentition though other direct adhesive materials have a role to play. However all materials are technique sensitive and should be placed in such a manner as to optimize longevity (13)

4. Changes in understanding of primary tooth pulp pathology and management.

The inflammation is less extensive than previously considered (Duggal and Nooh 2002, Kassa et al 2009). Furthermore the primary pulp has greater repair potential than previously described (14, 15).

This new evidence, coupled with clinical studies on the use of the minimally invasive technique, the Hall Technique, all suggest that conservative management of the carious primary molar can be very successful in preventing disease progression and avoiding the costly sequelae associated with failure or inappropriate treatment of caries in the primary dentition.

Success rate of around 95% over 5 years for indirect pulp capping (using Ca(OH)₂ restored with a preformed stainless steel crown (16, 17) compared with 75% for the more conventional formocresol pulpotomies. The Hall Technique (minimal/no caries removal) and placement of a preformed crown has a reported failure rate in general dental practice of < 3% (18).

If used as part of a comprehensive caries risk related care pathway with appropriate diagnostic, preventive and recall protocols, the adoption of the primary dentition restorative care protocol will optimize the outcomes not only for the teeth, but the child, their family and the community (<http://www.sdcep.org.uk>) .

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