



# Teething:

## a problem for children, parents and their doctors

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### Key points

- Parents' experiences are frequently at odds with the saying 'teething produces nothing but teeth'.
- Mothers report the presence of an average of five symptoms in their children at the time of first tooth eruption.
- Teething symptoms can conceal more serious health problems that need to be excluded first.
- Almost 90% of parents use over-the-counter medications to alleviate teething symptoms in their children.
- Advice to parents to only use safe medications in the correct dosage and the correct way is not superfluous.

Teething symptoms can be due to more serious health problems and parental administration of analgesics can mask these problems in young children. Unfortunately, once more serious problems have been excluded, there is no evidence-based information on what is effective in alleviating the discomfort of a teething child.

**T**eething is the appearance of deciduous teeth, also called primary teeth or milk teeth, and is a universal natural stage of human development. Yet, for time immemorial, many cultures have perceived it as the cause of a vast array of health problems in infants and young children.<sup>1,2</sup> Hippocrates thought that teething children experienced 'itching of the gums, fevers, convulsions and diarrhoea, especially when they cut their eye teeth and when they are corpulent and costive.'<sup>1</sup> Centuries later, when statistics on infant mortality started to be collected in England in the 19th century, the Registrar General reported in 1842 that 12% of all deaths of children under 4 years of age were due to

teething.<sup>1</sup> About 50 years later, in 1894, Dr Thrasher wrote, 'So deadly has teething become, that one third of the human family die before the twenty deciduous teeth have fully appeared.'<sup>1</sup>

Nowadays, we can smile when reading such exaggerated accounts. Yet, the appearance of primary teeth, welcome as it may be, does not necessarily bring a smile to a parent's face. For many, uncertain whether the child's discomfort is due to teething or to other health problems, it is a period of stress and worry. Some spend sleepless nights with a limited understanding of what is happening, how long it will last and how to alleviate it.

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Few parents are likely to take their teething child to a paediatrician, let alone a paediatric dentist, particularly in rural and remote areas. As a result the GP is often called on to deal with the child's problem and the parents' anxiety. However, little information on teething has managed to penetrate medical school curricula and there is a good deal of literature to suggest that healthcare professionals are not necessarily more knowledgeable about the issue than parents.<sup>3-6</sup>

### UNDERSTANDING TOOTH ERUPTION

Deciduous teeth are formed early during fetal development, long before they eventually appear. The factors that drive their appearance are still a favourite subject of dental research.<sup>7</sup> In comparison to its surrounding structures, the tooth itself has little to do with it. Usually a tooth starts its movement toward the mouth at around the time that the formation of its crown is completed. Until it emerges, the crown is covered by enamel epithelium. As the tooth moves toward the oral cavity, connective tissue between the enamel epithelium and the oral epithelium gradually disappears, allowing the two epithelial layers to fuse together before the tooth breaks through the gums.

Occasionally, tooth eruption is preceded by the formation of an eruption cyst or a small bluish haematoma, which mostly is a simple accumulation of blood or fluid between the two layers of epithelium before they fuse together. These are generally innocuous and seen most often over deciduous molars, which are bulkier than incisors, but they can also occur above incisors.

Usually the first teeth to appear are the lower incisors at about 6 to 8 months of age. The timing of the first tooth eruption (Figure 1) and the subsequent other 19 deciduous teeth (Figure 2)<sup>8</sup> varies widely, although more often than not they tend to come in pairs. Little is known about what governs the variation in timing apart from a reasonable consensus that there is a genetic component to it<sup>9</sup> and that, in preterm infants, postconceptional age is more important than actual age, especially for the first few teeth.<sup>10,11</sup> There are many contradictory findings on whether the age at

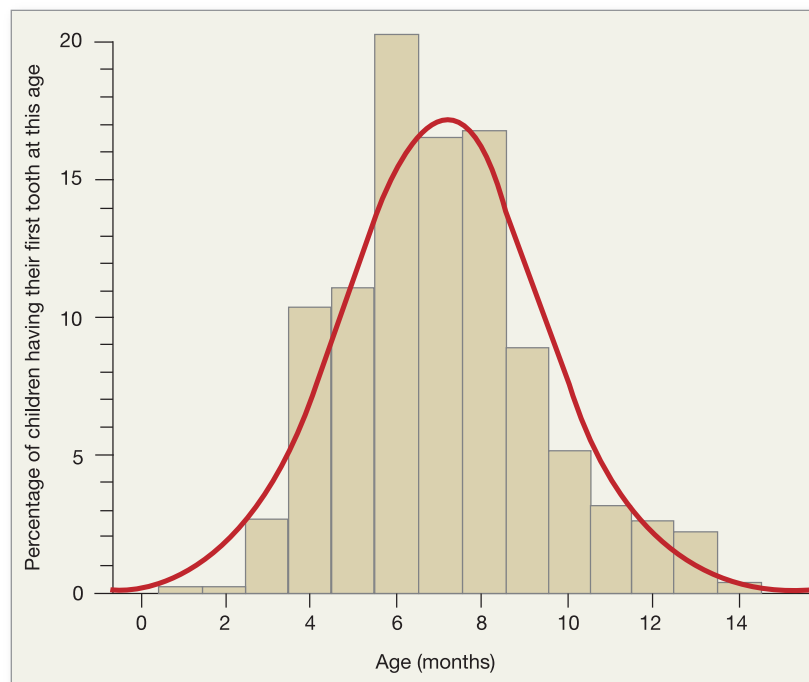


Figure 1. Age of 409 first-born South Australian children at the time of eruption of their first tooth.<sup>15</sup>

tooth eruption differs between boys and girls, but gender differences are generally not clinically significant.

Almost all children will have their 20 primary teeth before 3 years of age. In about 20% of children the first tooth erupts before 6 months of age, but rarely does it occur before 4 months of age. Children without a tooth at 12 months of age are equally uncommon. Provided the child is otherwise developing normally, a delay in tooth eruption of several months is common enough to be of no concern. Rarely (in less than one in 2000 infants) a tooth will be present in the neonatal period or at birth. Although these teeth are often poorly mineralised and without proper root development, when left alone they will gradually firm up over the next few weeks as further root growth occurs.<sup>12</sup> These teeth are usually part of the normal contingent of 20 deciduous teeth; less than one in 10 are supernumerary. Unless these teeth cause trauma, feeding problems or become so loose that they might be inhaled, they should be left alone. If

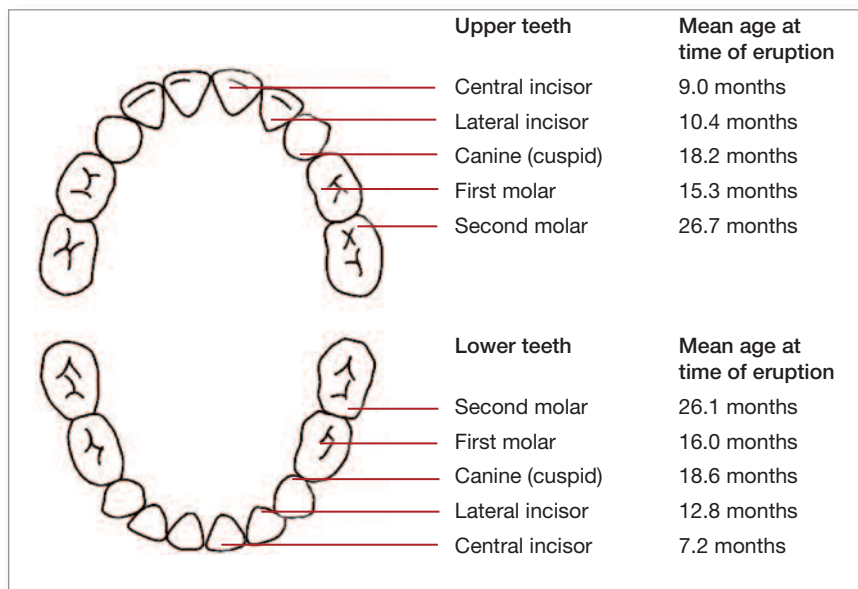


Figure 2. Mean age of children at time of eruption of their primary teeth.<sup>8</sup>

problematic, the child should be referred to a paediatric dentist.<sup>12</sup>

A widely publicised practical rule of thumb is that until all 20 deciduous teeth have emerged, a child will have about six teeth less than its age in months.

It is important to emphasise to parents who seek advice on tooth eruption that good oral hygiene is essential from the very start. Early childhood caries has been on the increase in Australia for several years and has become the main reason for hospitalisation of children between the ages of 1 and 4 years.<sup>13,14</sup> In essence, despite their deciduous nature, primary teeth require as much attention as permanent teeth.

### UNDERSTANDING TEETHING SYMPTOMS

The first teeth erupt around the time that children acquire an active immune system to replace the passive one inherited at birth. It is a time when they are susceptible to an onslaught of viruses and bacteria that inhabit their environment in addition to being subjected to vaccination schedules and other life events, such as

starting to attend day care centres. It is hardly surprising that this creates a great deal of confusion as to what symptoms can be attributed to teething.

As the gums swell and become tender before the tooth breaks through, teething must inevitably cause some discomfort; however, how much of that discomfort is actually due to teething or to other problems is not easy to determine. A systematic review of the literature has not been particularly helpful in resolving this either.<sup>15</sup>

There are a number of reasons for this. Foremost, there is the difference between signs and symptoms. Symptoms are what patients experience, but children getting their first few teeth can communicate symptoms only through signs and signals that their carers can interpret. Interpreting these is not always easy and teething occurs at an age when children have learned that producing a suitable level of noise is guaranteed to get them out of their cot to enjoy time with one of their parents. Differences in symptom interpretation between parents and healthcare professionals have been documented in

several studies.<sup>5,6,16,17</sup> Healthcare professionals only see a minority of infants with so-named teething symptoms and they predominantly see those who are less well. It is easy to believe, therefore, that most symptoms are due to problems other than teething. On the other hand, parents spend a lot more time at the cot-side than most healthcare professionals and their powers of observation should not be dismissed lightly.

A further complicating factor is that most studies, whether longitudinal or cross-sectional in nature, have dealt with children of various ages.<sup>17-23</sup> Therefore, there is little or no information on whether teething symptoms relate predominantly to the eruption of the first few teeth, all deciduous teeth or some teeth in particular. Not to be dismissed either is that teething infants may well be more vulnerable to other ailments at the same time.<sup>24</sup>

Teething problems cannot be ignored. Of 428 first-time mothers in South Australia, only 2% reported no symptoms at the time their child's first tooth erupted.<sup>15</sup> Overall, they noted the presence of an average of five symptoms with drooling, biting and irritability being the most common (Table 1). Mothers had also used several strategies to alleviate their child's discomfort.<sup>15</sup> Almost nine out of 10 (88%) had used over-the-counter medications. Three-quarters (73%) had used topical medications, mostly teething gels, and two-thirds (66%) had used systemic medications, almost always paracetamol. About half of the mothers (51%) had used both oral and topical medications.<sup>15</sup>

A Victorian study found that, compared with other childhood problems, parents rarely sought medical advice before using over-the-counter medications to alleviate teething symptoms.<sup>25</sup> If anything, parents' extensive use of medications, also documented in other countries,<sup>6,20,22</sup> indicates that teething symptoms should not be shrugged off or dismissed as irrelevant.

## DEALING WITH TEETHING SYMPTOMS

It is evident that sick teething children require substantially more attention than an examination of their gums.<sup>26</sup> High temperatures or severe systemic upsets should never be attributed to teething,<sup>19,26</sup> and neither should vomiting or resisting fluid intake, which readily leads to dehydration in young children. Ear rubbing, which seems to be a common enough symptom of teething,<sup>2,15,20</sup> should alert to the possibility of the presence of otitis media. Not to be ignored either is that parental administration of analgesics and sedatives can mask the presence of serious problems in young children.<sup>26</sup> There is obviously no substitute for a thorough examination of the child to exclude more serious conditions and, perhaps equally important, to alleviate parental distress.

Unfortunately, once more serious problems have been excluded, there is almost no evidence-based information on what is effective in alleviating the discomfort experienced by a teething child. Our search of Medline and the Cochrane Library found only two controlled trials on the subject.<sup>27,28</sup> Both were conducted more than 40 years ago, dealt with topical medications and were too small to draw substantive conclusions.

Commonsense dictates that addressing teething problems, like any other health problem, should deal with the cause of the problem rather than its symptoms or its side effects. Obviously, there is little that can or should be done about tooth eruption itself. However, the first approach should be to:

- conduct a thorough examination of the child to exclude serious issues
- ascertain that adequate hydration is maintained
- explain to the parents the physiological mechanisms that underlie the discomfort and their self-limiting nature.

## ALLEVIATING TEETHING SYMPTOMS

A sensible approach to alleviating symptoms was recommended by Steward more

**TABLE. SYMPTOMS ASSOCIATED WITH ERUPTION OF THE FIRST TOOTH AS REPORTED BY FIRST-TIME MOTHERS IN SOUTH AUSTRALIA.<sup>15</sup>**

Symptoms reported by mothers	Percentage of children (n=428)	Percentage of symptoms (n=2207)
<b>Oral and facial symptoms</b>		
Drooling	71.7	13.9
Biting/chewing	58.6	11.4
Ear rubbing	39.3	7.6
Pain	37.6	7.3
Running nose	36.0	7.0
Facial rash	20.8	4.0
Gum rubbing	6.8	1.3
<b>Mood and sleep disturbances</b>		
Irritability	52.3	10.1
Sleep disturbance	47.4	9.2
<b>Gastrointestinal symptoms</b>		
Bowel upset	36.9	7.2
Vomiting	4.0	0.8
Low appetite for solids	34.3	6.7
Low appetite for liquids	7.7	1.5
<b>Flu-like symptoms</b>		
Nappy/body rash	31.1	6.0
Fever	24.3	4.7
Cough	6.8	1.3
<b>None</b>	2.1	0.0

than 20 years ago.<sup>29</sup> Parents were advised to rub the gums with a clean, cool wet cloth to ease discomfort, although pieces of cloth found in the nursery are not necessarily clean enough to rub a child's inflamed gums. Parents were further advised to give the child a clean cold (but not too cold) teething ring to bite on and to avoid giving objects, such as biscuits, crackers, pretzels and hard vegetables, that can easily break into small pieces and cause an infant to choke. Some of these may also contain sugar, promoting the development of early childhood caries. Parents should be advised against using aspirin, teething powders

and dummies dipped in alcohol. How effective simple mechanical measures are has never been subjected to rigorous evaluation. The available data indicate that many parents resort to pharmacological approaches,<sup>6,15,17,20,22</sup> but these have also never been subjected to rigorous evaluation.

## PHARMACOLOGICAL APPROACHES

A lack of evidence has not hindered the marketing of a variety of teething products with various constituents, mostly antiseptic agents and local anaesthetics. Some products, such as the popular Bonjela, are sold under the same name

in various countries but have different formulations and different constituents.

Parental knowledge of the properties of over-the-counter medications is generally poor and it cannot be assumed that they will read the package instructions properly. Illustrative to that effect is the experience with a popular topical medication that was available over the counter in South Australia. Known as 'mouth paint,' it was produced at the Women's and Children's Hospital in Adelaide and contained chlorhexidine and lignocaine as its active ingredients. Over a period of two years, poison information centres received almost four calls a week related to misuse of the medication, mostly because parents had administered it orally mistaking it for children's paracetamol, as the bottles looked similar.<sup>30</sup> Fortunately, no serious ill effects occurred and the parents' distress may have exceeded that of their children.

As yet, no serious ill effects have been ascribed to teething gels, but no benefits have been demonstrated either. Their numbing effect is short and they can decrease the gag reflex and produce an irritating oral sensation in some children.<sup>31</sup> It is thought that their soothing effect is due more to rubbing the gums during application than to any of their constituents,<sup>32</sup> but there is no good evidence to that effect either. To what extent such agents, when used properly, are effective in alleviating a child's discomfort has remained largely unexplored. This may seem strange in the current era of evidence-based practice, but the difficulties of obtaining good evidence on this subject should not be underestimated.

The available evidence shows that many parents resort to systemic medications to alleviate teething symptoms.<sup>15</sup> However, this approach is not without hazards. The potential for masking more serious problems in young children through pain relief and sedation is

well known.<sup>26</sup> In some countries, such as Nigeria, paediatric paracetamol, the most commonly used oral medication to alleviate teething symptoms,<sup>2,15</sup> has caused deaths due to lethal contaminants.<sup>33</sup> Although such mishaps are unlikely to occur in Australia, the 'mouth paint' experience in South Australia should be a reminder that over-the-counter medications are not always used as intended.<sup>30</sup> Unless charted properly, it is not always easy to keep track of how many doses have been administered, especially when several carers are involved as may be the case for children at this age. Measuring an appropriate dose in a dimly lit room at night, when symptoms are likely to occur, is also not a small feat for a parent, whose distress may well rival that of the child. Of concern too is that paracetamol use in young children has been associated with an increased risk of asthma later in childhood,<sup>34,35</sup> although a firm causal link has not been established.

### WHERE DOES THAT LEAVE US?

Obviously, no one wants a return to the days when infants were considered incapable of feeling pain, irrespective of what was done to them. However, there is a strong argument for exploring other avenues before resorting to pharmacological strategies. Foremost should be a proper examination to exclude more serious problems, an explanation to parents of the physiological nature of the process and advising the use of simple remedies, such as cold teething rings, first. Given the frequency with which parents resort to over-the-counter medications, this may not always be enough. So, advising that they use only registered medications, use them as intended, measure doses accurately (not in a dimly lit room at night), and keep a record of how much has been administered and when (especially when several carers are involved) is not superfluous. **MT**

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A list of references is available on request to the editorial office.

COMPETING INTERESTS: None.

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