Strategies for the prevention of dental caries in people with disabilities: a review of risk factors, adapted preventive measures and cognitive support

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Abstract

Aim: Individuals with disabilities have an increased caries risk mainly owing to impaired oral clearance, inappropriate food choices, difficulties in oral hygiene routines including use of fluorides, and low overall understanding of healthy behaviour. Although individuals with disabilities have an urgent need of effective preventive measures, their ability to accomplish such measures themselves is severely limited.

Objectives: This paper reviews methods and products adapted to cognitive, intellectual and physical disabilities intended to prevent dental caries.

Results: Training programmes that stimulate oral motor function and oral sensory perception can improve oral clearance. Frequency of meals and choices of food can be influenced by increased knowledge among care staff and the individuals themselves. Different kinds of cognitive support can also enable people with disabilities to independently make healthy food choices, and cognitive support and assistive devices can facilitate oral hygiene and use of fluorides. Impaired oral clearance leads to increased caries risk but, at the same time, increases the effect of fluorides. Tooth brushing with toothpaste is a population-based strategy used by most people. When supplemental fluoride is needed more frequent use of tooth brushing with fluoridated toothpaste or a higher concentration of fluoride becomes a useful method, well known by people with disabilities and care staff.

Conclusions: Adaptation of products and methods to the individual impairment accords with a person’s rights to autonomy and independence, and implies empowerment for people with disabilities.

Key words: Dietary habits, disability, fluoride, oral clearance, oral hygiene

Introduction

The World Health Organization (WHO) reports that in 2004, 2.9% of the world’s population were severely disabled and 12.4% had moderate disabilities: 18.6 and 79.7 million people, respectively (WHO, 2004). In adults aged 60 years and older, 46% are estimated to have severe or moderate disability, involving a considerable proportion of people with disabilities being old, especially in high-income countries with high average length of life. The report from WHO refers to loss of health described as limited functioning capacity concerning mobility, cognition, hearing and vision when defining severe and moderate disability (WHO, 2004). Individuals with cognitive disabilities, such as intellectual impairments and dementia, have an increased prevalence of dental caries (Gabre et al., 2001; Chalmers et al., 2002). In addition, elderly people in need of daily support and medically compromised persons have the highest prevalence of dental problems (Petersen and Yamamoto, 2005).
As early as 1948, the World Health Organization recognised the wide nature of health, defining it as a “complete state of physical, mental and social well-being and not merely the absence of infirmity” (WHO, 1948). This definition stresses that health is a synthesis of two dimensions: a medical-professional assessment and a self-perceived assessment. Oral health has improved in the Western world over the last few decades (WHO, 2003). Good oral health makes it possible for people to eat and enjoy their food, to communicate, to relate to others, and is important in relation to overall quality of life, self-esteem and social confidence (Locker, 1988). Health promotion programmes should demonstrate effectiveness measured as efficient interventions and best use of resources (Petersen and Kwan, 2004). In addition, in the Ottawa charter (WHO) of 1986, health promotion is defined as the process of enabling people to increase control over the determinants of health, and health programmes should be characterized by being empowering, participatory, holistic and marked by equality (Watt, 2005). Health is highly dependent on the structure of society and living conditions. In fact, living conditions are more important to improving health than medical progress (WHO, 2008).

Individuals with disabilities are often dependent on care staff or relatives in their daily lives. Education to increase the knowledge about health is needed for these support people (Wardh et al., 2003), and it is also important to design the environment so people with cognitive impairment can make healthy choices even when they lack knowledge (Sherer, 2005). Although people with disabilities have an urgent need of effective preventive measures, their ability to accomplish such measures themselves is strongly limited. However, improved prevention of oral diseases can be achieved by using methods and products adapted to cognitive, intellectual and physical disabilities (Cook and Hussey, 2002). This type of adaptation also accords with peoples rights to autonomy and independence, and implies empowerment for people with disabilities (Jönsson, 2006; Brummel-Smith and Dangio, 2009). This paper aims to review caries risk factors and give examples of adaptations useful in preventing dental caries among individuals with disabilities.

Cognitive skills are an individual’s ability to adopt, interpret and co-ordinate impressions to appropriate actions. These skills are essential to a person’s daily functioning (Kellogg, 1995). Cognitive skills include memory, problem solving, attention, initiative, understanding of time, reading, and verbal comprehension. A person with cognitive impairments has difficulties with motivation and finds it difficult to postpone satisfaction to a later occasion. Such impairments have great impact on dental caries among individuals with disabilities (Jönsson, 2006; Brummel-Smith and Dangio, 2009). Significant factors in the progression of dental caries in individuals with disabilities are oral clearance, dietary habits, the ability to maintain oral hygiene and the ability to use fluorides appropriately (Hänsel Petersson et al., 2003).

**Figure 1 Balance of pathological and protective factors working directly and indirectly in the process of developing caries among people with disabilities.**

**Oral clearance**

Oral clearance is defined as the time it takes for the oral cavity to become void after the intake of drink or food. The clearance is dependent on oral motor function, saliva secretion rate and oral sensory function (Swenander Lanke, 1957; Hase et al., 1987). In addition, an intellectual understanding of self-cleansing of the oral cavity and the consistencies of foods play a role in achieving sufficient oral clearance (Gustafsson et al., 1954; Engvall and Birkhed, 1997). People with disabilities have considerably prolonged oral clearance and their oral glucose levels seem to permanently remain at high levels irrespective of the period of time since their last meal (Gabre et al., 2005a; Alstad et al., 2008). An explanation for the constant high values of oral glucose may be extremely inefficient oral motor functions in combination with prolonged meals. The combination of high initial and prolonged glucose concentration in saliva results in long time periods when the pH in saliva and plaque are be-
low the critical levels at which the tooth surface becomes demineralised (Swenander Lanke, 1957). It is likely that individuals with slow oral clearance constantly have low pH levels in the oral cavity, indicating a serious caries risk. However, when a person with slow oral clearance uses fluoride, the disadvantage can be turned into an advantage; the concentrations of fluoride reach higher levels for longer as compared with those of individuals with normal clearance (Sjögren et al., 1993; Ekstrand, 1997).

**Dietary habits**
The Vipeholm study, performed at a hospital for individuals with intellectual disabilities, recognised the frequency of meals and the consistency of the food as significant factors in the aetiology of caries (Gustafsson et al., 1954). Effects of unbalanced nutrition are often seen among people with disabilities, shown as increased prevalences of both obesity and underweight, as compared with the normal population (Bhaumik et al., 2008). People with disabilities associated with swallowing difficulties and chewing problems are vulnerable to malnutrition (Kennedy et al., 1997) leading to advice by professionals to increase the meal frequency and the energy content of foods. Thus, there are several factors leading to long periods of low pH-levels in saliva: frequent intake of food, food choices with high sucrose content and inefficient oral clearance. In addition, oral motor disorders as such, lead to prolonged meals. These factors may be the explanation for the unexpected result that was found when a group of adults with intellectual disabilities moved from an institution to integration in society: individuals, who lost weight after the shift of living, in contrast to the weight gainers, developed significantly more caries (Gabre et al., 2002). Individuals with poorer dental status are known to have impaired food choices, involving higher intake of sucrose and lactose (Alstad, 2009). Since these carbohydrates are associated with food that is easy to chew, the results may be explained in terms of their chewing ability.

Consumption of sugary soft drinks and beverages has increased over the world owing to easy access, lower price, and intensive marketing. At the same time disabled individuals right to be integrated in society and choose their lifestyles is recognised. However, with lack of knowledge and intellectual capacity, it is hard to make healthy choices. Individuals with disabilities living independently, as well as those with mild degrees of intellectual disabilities, show a higher experience of caries and other lifestyle related ill-health than others (Gabre et al., 2002; Bhaumik et al., 2008).

**Oral hygiene and use of fluorides**
The association between dental plaque and caries is weak. The decrease of caries activity connected with tooth brushing can mainly be explained by the use of fluoridated toothpaste (The Swedish Council on Technology Assessment in Health Care, 2002). The advantage of tooth brushing with fluoridated toothpaste can be substantially improved by using toothpaste with a high concentration of fluoride and effective brushing techniques: apply a large amount of toothpaste (2cm), brush for two minutes and rinse only with a small amount of water afterwards (Sjögren et al., 1995). Effective oral hygiene presupposes fine motor skills, an ability disabled people often lack. In addition, people with cognitive impairments often do not understand how to behave to achieve good health (Jobling and Cuskelly, 2006). Furthermore, people with disabilities often have difficulties with routines and self-motivation. All these factors impede healthy behaviour.

**Preventive measures**

**Oral clearance**
Oral clearance can be improved by training oral motor functions. Training programmes have shown effects on oral clearance in persons with disabilities (Hase et al., 1992; Hägg and Anniko, 2008; Sheppard, 2008). The oral sensory function, which becomes less effective with increasing age, also plays an important role in the oral clearance process (Wohletz, 1996). Among both young and elderly persons the function can be stimulated by orofacial training as developed by Castillo Morales, a therapy based on muscle exercise and energizing the entire sensory-motor reflex arc involved in deglutition (Hägg and Larsson, 2004). Chewing gum immediately after a meal (Stookey, 2008), can also speed up oral clearance and probably sucking on a lozenge or rinsing with water after the meal, although less effective, can give similar effects. However, owing to the characteristics of the disability, e.g. making the individual dependent on medication causing low saliva secretion or with the individuals having a low understanding of the benefits of self-cleaning, the possibility for disabled individuals to influence oral clearance is often limited. Thus, improved and more frequent tooth brushing in combination with use of toothpaste with fluoride plays an important role in compensating for decreased oral clearance.

**Dietary habits**
Dietary changes with the purpose of preventing caries should include two aspects: choice of food and frequency of food intake. Choosing healthy food requires knowledge or aids to guide the person to the proper choices (Green and McIntosh, 1985). It is possible for people with intellectual disabilities to learn healthy food choices, but they need supervision or other support to convert the knowledge into independent action when food shopping (Matson, 1981). One good example of a useful aid is the keyhole symbol used as a label of healthy food in Sweden, identifying groceries with low sugar and high
fibre content (National Food Administration, 2009). One example of confusing marking on groceries is the text indicating that soft drinks are sugar-free. The companies show no consistency when presenting their products since all have chosen their own word for sugar free: ‘low’, ‘free’, ‘zero’, ‘max’ and ‘light’.

When counselling people with cognitive impairments, the pedagogy needs to be adapted:

- Give advice one piece at the time. Hold back the next piece of advice until you see that the first is working.
- Give substantial advice adapted to the person’s comprehension.
- Give consistent advice. This means that dental personnel, care staff and relatives need to agree about the advice given.
- Strengthen the advice with pictures, props and simple written messages. For example, if you want a person to replace the sugar in their coffee with artificial sweetener, show the product itself or a picture of the sweetening product.
- Reward desirable behaviour in a personal way.

**Oral hygiene and use of fluorides**

Slow oral clearance and impaired oral sensation are associated with a higher number of microorganisms in the oral cavity, and increase the need for oral hygiene (Engvall and Birkhed 1997; Lundgren et al., 1997). Tooth brushing is doubtless the most important way of achieving a fresh mouth, and using fluoridated toothpaste is more important than plaque removal. For tooth brushing, the main questions are how to make sure that tooth brushing really takes place and that the procedure is done correctly. For many people with cognitive impairments, remembering to brush can be a big issue and personally adapted aids therefore need to be available. Such aids could be pictures in the bathroom showing the different steps in the hygiene routines, collecting all hygiene products that should be used in a basket, or using a talking clock to remind the person about tooth brushing. Brushing in an appropriate way also needs to be supported with cognitive aids. The disabled person must get instructions at the right place, which means in his or her own bathroom. The instructions must include showing how to do it (modelling), learning one part at the time (stepwise learning) and readiness to teach tooth brushing in a flexible way. To compensate for physical disabilities several assistive devices are available such as toothbrushes working on three sides of the tooth at the same time (Figure 2). Powered toothbrushes show better plaque removal effects than manual brushes (Robinson et al., 2005) and some models support the user cognitively by measuring the time or regulating the pressure. Using a reduced water technique when brushing, improves the effects of fluorides (Sjögren et al., 1995). People with oral motor function disorders have difficulties in rinsing and have always used a technique involving less water, even before the effects were shown in studies.

Brushing with fluoridated toothpaste twice per day is a population-based strategy also applicable to people with disabilities. However, many individuals with disabilities have an increased risk of caries and therefore need daily supplementary fluoride. Several products are available, but most require an understanding of how to use them. Brushing with toothpaste is familiar to almost everyone and the habit can be maintained even when cognitive function is reduced. Thus, brushing with fluoridated toothpaste more than twice per day is a simple way to add fluoride. Using toothpaste with high fluoride concentration can strengthen the protective effect. Brushing with toothpaste containing 5,000ppm fluoride shows better effects than other toothpastes (Ekstrand et al., 2008; Nordström and Birkhed, 2009) and could be useful aid for people with an increased caries risk. However, people with impaired oral functions and cognitive impairment are at risk of gastro-intestinal irritation if they cannot spit after brushing and therefore swallow the entire amount of toothpaste.

Several other fluoride products for home care are available. Fluoride tablets and chewing gum stimulate saliva secretion, an important dimension for persons with hypo-salivation, but require oral motor functions and the ability to follow instructions. When using these products the whole amount of fluoride is swallowed, involving a risk of over dosage if the person likes the product and consumes more than recommended. Rinsing with fluoride solutions is an effective way of preventing caries (Fure et al., 1998). Rinsing leads to high fluoride concentrations in the whole oral cavity and, if the person can spit, few toxicological effects (Gabre et al., 2008). Use of the product presupposes understanding, sufficient oral motor function and a sense of time. Although the directions for use are to rinse for 60 seconds, sufficient effect is reached after rinsing for 20-30 seconds (Adachi et al., 2005). This shortened rinsing time makes it possible for many people with cognitive impairments to use the product. Daily rinsing is preferable with respect to the better caries preventive effect and helps make it a habit. Since the fluoride concentration determines the effect, a solution with high fluoride concentration, at least 0.05% F and preferably 0.2% F, should be used, as long as the person does not swallow the solution. To make sure that people with cognitive impairments can handle the products reliably it is necessary to demonstrate handling in a clear way. Use the product together, preferably with water instead of the product the first time to make sure that the person will not swallow the solution. Use aids to measure the time, a timer or an hourglass are excellent help.

New fluoride products for home care have been de-
veloped. A mucosal adhesive paste makes it possible to achieve high fluoride levels proximally and in saliva for at least six hours after application (Gabre et al., 2005b; Gabre et al., 2008). This paste is prepared with 0.1% F and applied in vestibulum in the region of the first molar in each quadrant. For patients who are unable to comply with traditional fluoride treatment, the adhesive paste has the potential to be a useful tool. However, this approach has not been subjected to a randomised control trial although work is underway in this area to contribute to the evidence base surrounding such a product. Fluoride gels can be used for people with extremely high caries activity or risk. To avoid swallowing gel, individually designed trays should be used. When used at home the disabled individuals must have assistance from carefully instructed nursing personnel and it is therefore safer to use fluoride gel at the dental clinic. An effective use of gel is to dip an interdental brush in 0.2% fluoride gel before cleaning the proximal areas (Särner et al., 2003). A summary of the merits of fluoride products for home care is shown in Table 1. As for all patients with caries risk, fluoride varnish is a useful option performed at the clinic. All fluoride treatments have the best effect when applied close to bedtime when oral clearance is lowest, and thus fluoride clearance will also be slowest.

Chlorhexidine can reduce microorganisms involved in the development of caries, but its clinical evidence for preventing caries is weak and therefore other preventive methods such as fluoride and diet modifications are preferable (Autio-Gold, 2008). It is important to remember that the use of fluoridated toothpaste twice per day shows strong evidence concerning the preventive effect on caries (The Swedish Council on Technology Assessment in Health Care, 2002). Therefore, it is never correct to replace fluoride with chemotherapeutic agents. If such agents are necessary to reduce gingivitis, fluoride must be added in some other way.

Discussion

Individuals with disabilities have an increased caries risk mainly owing to impaired oral clearance, improper food choices, difficulties with oral hygiene routines and low overall understanding of healthy behaviour. Thus, it is important to identify preventive measures adapted for people with cognitive disorders and other disabilities (Table 2). The purpose of the adaptation is to reach a balance between pathological and protective factors and, as a consequence of this balance, to give people with disabilities the opportunity to avoid caries (Figure 1).

Society should have a proactive approach to health, that is, focus on maintaining health instead of treating disease. Arenas for everyday life have great impact on people’s health. It is important to design the everyday environment to enable people to make healthier decisions. Health promotion aimed at the whole population is an efficient way of improving health, and such measures are most important for the people with the greatest needs. Clear labels on groceries showing healthy choices are a good example of population-based health promotion (National Food Administration, 2009). Guidelines from the authorities and collaboration with food producers should encourage further improvements in health promotion.

In addition to population-based strategies, effort must be invested in individual adaptations for the person who is disabled with respect to each person’s disability. In every situation the health care provider must ask:

- What is needed if home care is to work?
- How can I adapt my teaching to increase the person’s knowledge?
- What aids can I offer to clarify and facilitate?

A summary of adapted methods and products are shown in Table 1. When evidence-based treatment is available it must be given priority, but often there is not enough knowledge in an area to determine proven effects. In those cases the best knowledge available should be the guide. However, new, adapted methods and products need to be developed, especially methods that do not demand cooperation from the disabled individual. One example is adhesive fluoridated paste, which care staff can apply to the oral mucosa before bedtime, so that fluoride is released in plaque and saliva during the night (Gabre et al., 2008). Other interesting products are fluoridated gels for proximal use and powered toothbrushes that measure time and pressure. Creativity and the courage to develop new products are also needed. Could we invent a lollipop sweetened with xylitol, and supplemented with fluoride, to both stimulate the oral motor function and prevent caries? This suggestion might raise objections because the product would be so similar to confectionery, but it must be remembered that chewing gum had the same status a few decades ago, when all chewing gums were sweetened and their use led to long periods of low pH in the
<table>
<thead>
<tr>
<th>Product</th>
<th>Advantage</th>
<th>Disadvantage</th>
<th>Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toothpaste</td>
<td>Familiar method to care staff and the disabled</td>
<td>Requires some understanding for most effective use</td>
<td>Reminders: Pictures, Talking clock, Expose toothbrush + toothpaste clearly, Schedule</td>
</tr>
<tr>
<td></td>
<td>Easy management</td>
<td></td>
<td>Execution: Pictures showing - amount of toothpaste - brushing all teeth - rinsing with small amount of water</td>
</tr>
<tr>
<td></td>
<td>Same method for population and supplemental prevention</td>
<td></td>
<td>Execution: Schedule</td>
</tr>
<tr>
<td></td>
<td>Easy access and inexpensive</td>
<td></td>
<td>Execution: Schedule</td>
</tr>
<tr>
<td></td>
<td>Toothpaste with high F (5000 ppm) is available</td>
<td>5000 ppm toothpaste is expensive and hard to dose correctly owing to design of the tube</td>
<td>Simple written instructions, Modelling – show how to do</td>
</tr>
<tr>
<td></td>
<td>Strong scientific evidence</td>
<td>- risk of using too little of the paste</td>
<td>Measure time with timer, hourglass, music, etc.</td>
</tr>
<tr>
<td>Mouthrinse</td>
<td>Distribution in whole oral cavity</td>
<td>Requires understanding and sufficient oral motor function</td>
<td>Reminders: Pictures, Talking clock, Schedule</td>
</tr>
<tr>
<td></td>
<td>Limited scientific evidence</td>
<td>Risk of overdose if the solution is swallowed</td>
<td>Execution: Modelling</td>
</tr>
<tr>
<td></td>
<td>Low toxicological effect with proper use</td>
<td></td>
<td>Measure time with sandglass, timer etc.</td>
</tr>
<tr>
<td></td>
<td>Increase effect by using higher F concentration</td>
<td></td>
<td>Sorten time to 30 sec</td>
</tr>
<tr>
<td>Tablets and chewing gum</td>
<td>Stimulate saliva</td>
<td>Requires understanding and sufficient oral motor function</td>
<td>Reminders: Dose-tray showing correct dose, Pictures, Schedule</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uneven distribution</td>
<td>Execution: Modelling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insufficient scientific evidence</td>
<td>Written instructions</td>
</tr>
<tr>
<td></td>
<td>The product is considered to taste good</td>
<td>Risk of overdose</td>
<td></td>
</tr>
<tr>
<td>Gels</td>
<td>Easy management when used for brushing</td>
<td>Risk for overdose due to high F concentration</td>
<td>When used for brushing, see under Toothpaste</td>
</tr>
<tr>
<td></td>
<td>Combination with chemotherapeutic agents</td>
<td>Insufficient scientific evidence</td>
<td>In trays: Pictures, Schedule, Modelling</td>
</tr>
<tr>
<td></td>
<td>Can be used in individual trays</td>
<td>Time consuming</td>
<td>Written instructions</td>
</tr>
<tr>
<td></td>
<td>Approximal use on interdental brushes</td>
<td></td>
<td>Measure time with hourglass, timer, etc.</td>
</tr>
</tbody>
</table>
oral cavity. Today very few sweetened chewing gums are stocked by grocery stores and this product is a useful tool in preventing caries.

General health promotion measures should, as far as possible, recognise all individuals’ rights to choose their own lifestyle and their autonomy. The paternalistic perspective should be abandoned in favour of an empowering approach, i.e. enabling people to increase their control over the determinants of their health. Dental personnel should focus on a person’s abilities, not their deficiencies. This approach is easiest to implement among people with mild cognitive impairments, and this group is also the largest.

The present paper draws the following conclusions:

- People with disabilities have an increased caries risk
- People with disabilities need supplemental fluoride treatment in addition to toothpaste with fluoride
- Impaired oral clearance leads to an increased caries risk but at the same time increases the effects of fluoride
- Methods and products must be adapted with respect to the characteristics of the individual’s disability
- Simplicity is the solution - choose well-known methods and products that are easy to handle
- The disabled need support and aids to make home care treatment possible
- The best fluoride product is the one that will be used!

**Table 2 Adapted methods and products with respect to different preventive areas and the characteristics of the individual disabilities. (Fluorides are presented separately in Table 1)**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Area to improve</th>
<th>How to do it</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensory functions</td>
<td>Training programmes</td>
<td>Wohlert 1996; Hägg and Larsson 2004</td>
</tr>
<tr>
<td></td>
<td>Salivary rate</td>
<td>Stimulate through chewing</td>
<td>Stookey 2008</td>
</tr>
<tr>
<td></td>
<td>Self-cleaning</td>
<td>Increase knowledge and sensory functions</td>
<td>Engvall and Birkhed 1997</td>
</tr>
<tr>
<td></td>
<td>Length of meals-chewing time</td>
<td>Improve chewing capacity</td>
<td>Swenander Lanke 1957</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of assistive devices</td>
<td>Gabre et al. 2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training programmes</td>
<td>Mun-H-Center 2009</td>
</tr>
<tr>
<td></td>
<td>Choose non-sticky food</td>
<td>Increase knowledge</td>
<td>Gustafsson et al. 1954</td>
</tr>
<tr>
<td>Dietary habits</td>
<td>Frequency of meals</td>
<td>Increase knowledge</td>
<td>Kennedy et al. 1997; Hänsel Petersson et al 2003</td>
</tr>
<tr>
<td></td>
<td>Consistency of food</td>
<td>Increase knowledge</td>
<td>Gustafsson et al. 1954</td>
</tr>
<tr>
<td></td>
<td>Choice of food</td>
<td>Increase knowledge</td>
<td>Matson 1981; Green and McIntosh 1985; Jobling and Cuskelly 2006</td>
</tr>
<tr>
<td></td>
<td>Sugar-free alternatives</td>
<td>Increase knowledge</td>
<td>Johansson et al. 2007</td>
</tr>
<tr>
<td></td>
<td>Chewing capacity</td>
<td>Oral rehabilitation</td>
<td>National Food Administration 2009</td>
</tr>
<tr>
<td>Oral hygiene</td>
<td>Reduce amount of plaque</td>
<td>Training programmes</td>
<td>Jobling and Cuskelly 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Powered tooth brush</td>
<td>Robinson et al. 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cognitive support</td>
<td>Svensk 2001; Cook and Hussey 2002</td>
</tr>
<tr>
<td></td>
<td>Increase fluoride use</td>
<td>Use of assistive devices</td>
<td>Mun-H-Center 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Educate care staff</td>
<td>Wardh et al. 2003</td>
</tr>
</tbody>
</table>

• Impaired oral clearance leads to an increased caries risk but at the same time increases the effects of fluoride
• Methods and products must be adapted with respect to the characteristics of the individual’s disability
• Simplicity is the solution - choose well-known methods and products that are easy to handle
• The disabled need support and aids to make home care treatment possible
• The best fluoride product is the one that will be used!
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