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Oral health and dental care of elderly adults dependent on care

KEYWORDS

Gerodontology, dentistry for elders,
 dependency on care, oral hygiene,
 care concepts

Figure above: The oral health of persons dependent on care is often insufficient.

SUMMARY

The increase in life expectancy in Switzerland is posing new challenges, as more and more people are becoming dependent on care, both at home and in long-term care facilities. The dental profession must deal with patients retaining their own teeth until later in life with an increased incidence and severity of caries and periodontal diseases. The association between general and oral health is becoming important, particularly in older people with medical conditions. Aspiration pneumonia can develop as a result of pathogenic bacteria descending from the oral cavity to the bronchoalveolar system, which presents a frequent, potentially life-threatening danger.

By adapting care and treatment concepts, the masticatory ability can be preserved or restored, which in turn helps preventing malnutrition. Other aims include preventing infections as well as maintaining subjective well-being and an attractive dental appearance. Care standards should be defined for the provision of oral-health related dentistry for the vulnerable population of the care-dependent adults. These should be implemented by an interdisciplinary care team composed of nursing personnel, long-term care facility managers, Spitex staff, physicians, dentists as well as dental assistants and hygienists.

Introduction

When becoming dependent on care, a person is facing a new stage of life that is usually the last. Basically, dependency is characterized by a partial loss of autonomy, severe functional impairment, as well as one or more chronic diseases. According to the Swiss Federal Statistical Office, there are currently about 143,000 elderly persons in long-term care (LTC) facilities in Switzerland, which corresponds to about 6% of adults who are over 65 years old and 28% of those who are over 85 years old (www.bfs.admin.ch). The age at first admission to an institution is younger in German-speaking Switzerland, consequently the percentage of persons living in LTC facilities at the age of 80 is somewhat higher than in other parts of the country (Fig. 1). About 75% of residents of LTC facilities are women, and the time spent in the institution is 2.7 years on average. The demographic changes occurring in Switzerland are very similar to those in its European neighboring countries, with an increasing percentage of the population being significantly older than 80 years. Worldwide, healthcare policymakers and the public are dealing with this demographic change. While in 1982 life expectancy of a 60-year-old man was 18.2 years, in 2012, only 30 years later, a remaining life expectancy of 23.2 years applies. Life expectancy of 60-year-old women increased in the same period from 22.7 to 26.5 years (Fig. 2). With increasing age, and therefore successfully “mastered risks” in life, the remaining life expectancy becomes similar in men and women. Life expectancy of 99-year-old Swiss men is calculated to be even higher. The increasing age of the population is also reflected in the enormous rise in demand for places in LTC facilities, and it is assumed that demand will increase by about 10% per decade.

Changes in oral health

In recent years, the dental state of the population has changed. Thanks to intensive prophylaxis in schools, private practices and university institutes, the increased quality of medical and dental care available to the population of Switzerland as well as increasing financial resources and social security, more and more people are reaching advanced and very advanced ages

with their natural teeth, often with fixed and increasingly also with implant-assisted dentures (PETERSEN 2003). The shift in oral health of the population is also reflected in the Swiss health survey: While in the 1992/1993 survey the 65- to 74-year-old age group was missing on average 15.4 teeth, ten years later the same age group was missing only 10.4 teeth (ZITZMANN ET AL. 2008) (Fig. 3). Thanks to the newly introduced age group of 85 years and older in the health survey, we know that 97.4% of this population group are wearing dentures, of which 11.5% are fixed and 85.9% are removable (Tab. 1). The percentage of complete denture wearers in this age group is still 37.2%.

Aging – a biological, social, and economical challenge

The physiological aging process starts in early adulthood, yet a person's reserve capacity is lost well before they notice any limitations in their everyday life. Nature provides sufficient reserve to enable an independent life even in old age. A premature decline in cognitive ability must therefore be considered pathological. Every function of the human body shows signs of aging that are defined as progressive, irreversible, and general. Numerical age must be differentiated from biological age, which describes the physiological situation of an individual at a particular point in his or her chronological age. Biological aging can be affected by lifestyle and diet, but it is also dependent on genetic factors and the socio-economic context. Signs of aging, which are of immediate and direct importance to providing dental care, include deterioration in vision, the senses of smell and taste, as well as motor coordination, because these limitations affect the ability to maintain oral hygiene and/or to manage dentures. The decline in cognitive ability may also be associated with logistical problems and communication difficulties. The less responsive immune system must also be considered when providing dental care. In addition to physiological signs of aging, chronic diseases occur more frequently in old age (MOORE ET AL. 2014). According to the report from the Survey of Health, Ageing and Retirement in Europe (SHARE), 22% of people aged over 50 in Switzerland are multimorbid, i.e. they have two or

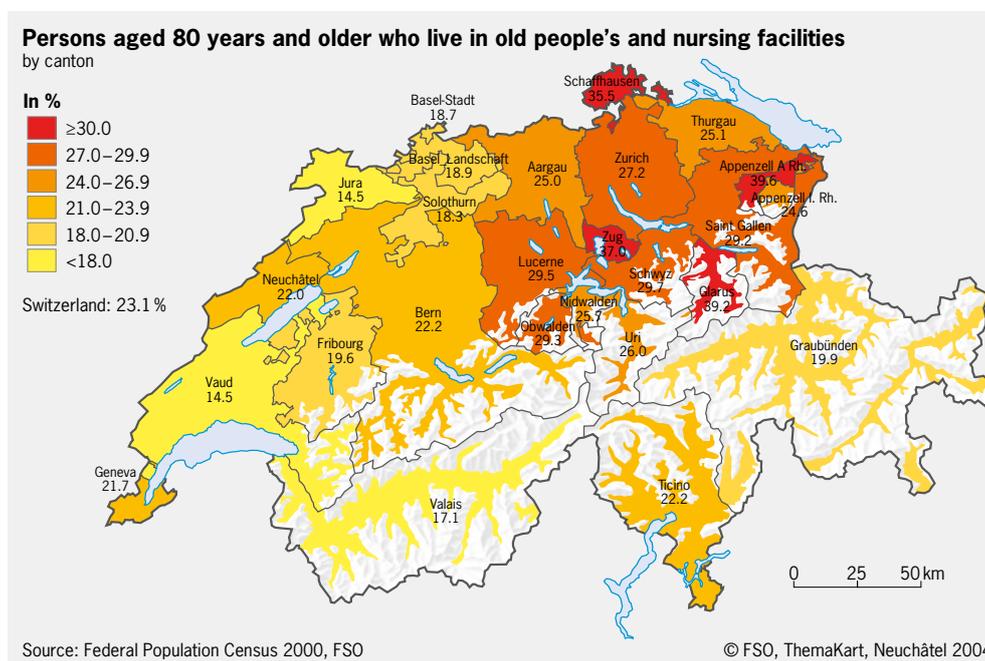


Fig. 1 Percentage of the population aged 80 years and older who live in a long-term care facility in the individual Swiss cantons (reprint permission granted by the Swiss Federal Statistical Office)

more chronic diseases that are treated with drugs (www.share-project.org). Switzerland is well placed in a European comparison, with only the Netherlands and Sweden having fewer multimorbid people.

According to the US National Nursing Home Survey (NNHS), the most common chronic diseases of residents of LTC facilities (percentage of men/women) with a mean age of 84 years were hypertension (53%/56%), dementia (45%/52%), depression (31%/37%), arthritis (26%/35%), diabetes (26%/23%), reflux (23%/23%), arteriosclerosis (24%/20%), cardiac insufficiency (18%/21%), cerebrovascular diseases (24%/19%), and anemia (17%/20%) (MOORE ET AL. 2012). This is also reflected in the self-perception of health. Of 1,954 Swiss people over the age of 75 years, 51.4% indicated that they had a permanent health

problem (www.bfs.admin.ch). The onset of dependency is usually associated with a severe deterioration in health. KATSOULIS ET AL. (2009) report from a geriatric hospital in Bern that 88% of the patients who were referred for a dental consultation had more than three chronic diseases. In the 90- to 99-year-old age group, this figure rose to 94%, with half of these patients also having a dementia syndrome.

Oral health in residents of long-term care facilities

Geriatric diseases or pathological aging have a negative effect on the oral health. Along with the effects of the diseases or their treatment, this can mainly be attributed to the quality and quantity of daily oral hygiene measures, but occasionally

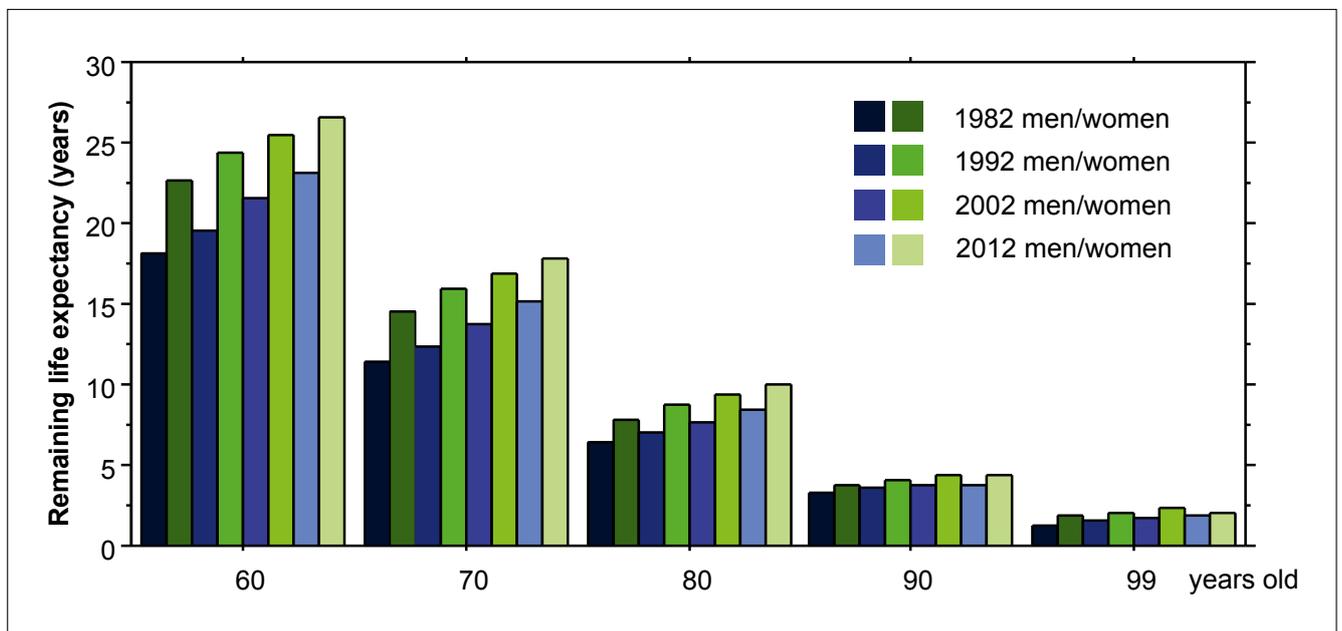


Fig. 2 Increase in life expectancy of 60-, 70-, 80-, 90-, and 99-year-old Swiss since 1982 (data from the Swiss Federal Statistical Office)

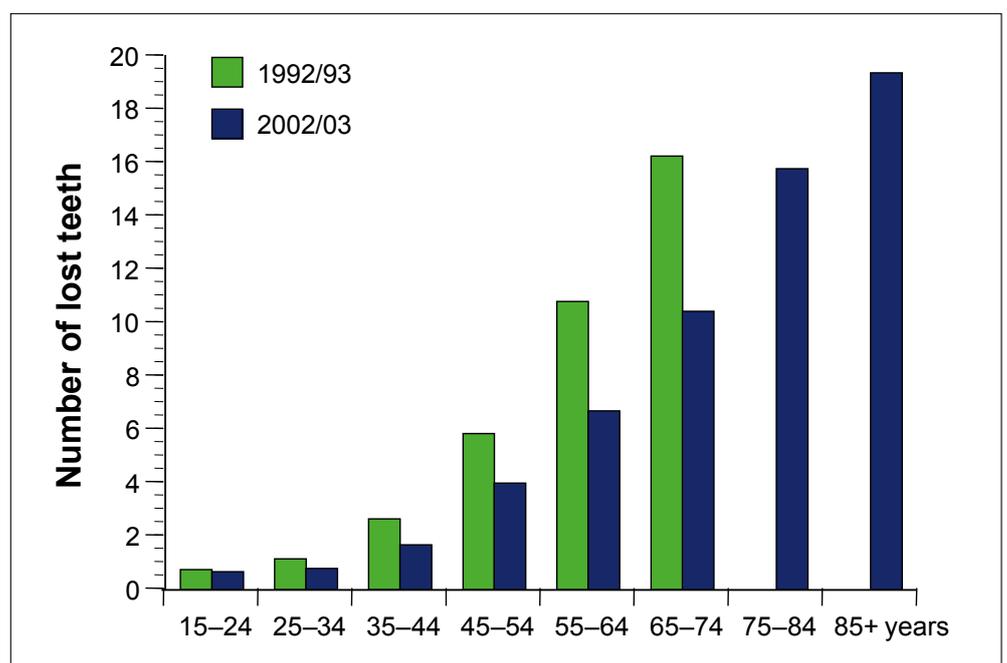


Fig. 3 Reduction in the number of teeth lost in the individual age groups between the health surveys 1992/1993 and 2002/2003 (data based on ZITZMANN ET AL. 2008)

Tab. I Reduction in the number of removable dentures and increase in the number of fixed dentures in the individual age groups between the health surveys 1992/1993 and 2002/2003 (data based on ZITZMANN ET AL. 2008)

| Age group | Dentures | Fixed | | Removable | | Complete dentures |
|-----------|----------|---------|---------|-----------|---------|-------------------|
| | | 1992/93 | 2002/03 | 1992/93 | 2002/03 | |
| 15–24 | 10.9 | 6.8 | 8.2 | 1.4 | 1.5 | 0.2 |
| 25–34 | 24.4 | 19.0 | 20.5 | 2.5 | 1.8 | 0.1 |
| 35–44 | 42.0 | 40.2 | 36.3 | 8.5 | 3.6 | 0.4 |
| 45–54 | 67.8 | 50.5 | 52.2 | 21.6 | 14.5 | 1.9 |
| 55–64 | 82.6 | 42.7 | 52.5 | 42.4 | 29.0 | 5.1 |
| 65–74 | 89.5 | 25.4 | 38.7 | 66.9 | 49.4 | 13.1 |
| 75–84 | 93.6 | | 23.3 | | 69.7 | 25.7 |
| 85+ | 97.4 | | 11.5 | | 85.9 | 37.2 |
| Total | 54.4 | 30.7 | 34.0 | 18.8 | 18.9 | 4.7 |

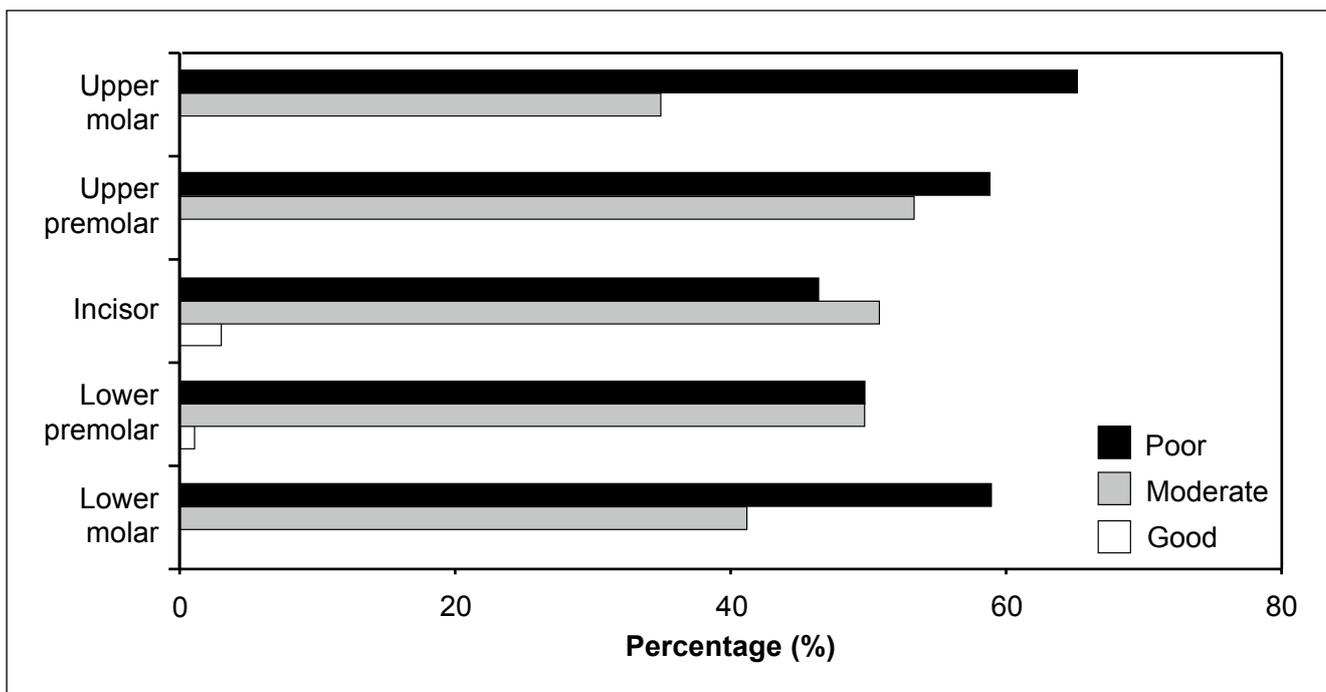


Fig. 4 Oral hygiene of 260 residents of long-term care facilities in Finland (based on PELTOLA ET AL. 2004)

also to difficulties in treating the masticatory system. Insufficient, neglected restorations and fillings form additional retention niches for plaque and food debris which encourage the development of caries and subsequent tooth loss if no appropriate treatment is carried out during the stable third stage of life. With the loss of autonomy priorities shift, which quite often implies a neglect of the oral cavity, the teeth, and dentures (PELTOLA ET AL. 2004) (Fig. 4). The number of visits at the physician increases significantly in multimorbid patients, while dental visits become scarce (www.bfs.admin.ch). Dental treatments are often only carried out to relieve pain or carry out repairs (NITSCHKE ET AL. 2001, SCHIMMEL ET AL. 2008). Both, Swiss and international studies on oral health in residents of LTC facilities have long shown the same picture (ADAM & PRESTON 2006, ANGELILLO ET AL. 1990, BACIERO ET AL. 1998, CHALMERS ET AL.

2003, CHALMERS ET AL. 2002, KATSOLIS ET AL. 2012, LEMASNEY & MURPHY 1984, MERELIE & HEYMAN 1992, NETZLE 1989, NITSCHKE ET AL. 2000, PELTOLA ET AL. 2004, SIMUNKOVIC ET AL. 2005, WIRZ ET AL. 1989, WIRZ & TSCHAPPAT 1989). The dental state and oral health of dependent elders are significantly worse than in persons of the same age living independently, although the situation described varies considerably between the individual studies (Tab. II). Due to different healthcare systems, rural and urban locations of the study participants, the size of the institution and the number of caregivers per resident, comparison of the figures presented in literature is difficult. A frightfully high percentage of up to 89% of edentulous adults is found in the United Kingdom in particular. Tobias & Smith reported that one in four edentulous patients did not even wear dentures (TOBIAS & SMITH 1990). The number of present natural teeth

Tab. II Dental status of institutionalized persons in various studies (selection of studies is random and incomplete)

| Author | Year | Country | Number (s) | Age (years) | Prevalence of edentulism | Natural teeth (n) | Results/comments |
|------------|------|-------------|------------|-----------------------------------|------------------------------|------------------------------------|---|
| LEMASNEY | 1984 | Ireland | 368 | 77 (58–99) | 78% | 5 | 27% of all edentulous patients used dentures |
| ANGELILLO | 1990 | Italy | 234 | 81.4 | 59.8% | 9.9 | 44.3% of all edentulous patients wore dentures; 68.1% of the patients with teeth required 3.9 extractions |
| TOBIAS | 1990 | UK | 151 | 81 | 71% | No data | 24% of the edentulous patients did not have dentures |
| MERELIE | 1992 | UK | 379 | <75 (n=68) 75+ (n=379) | 89% | No data | 96% indicated that they only visited a dentist if they had problems |
| BACIERO | 1998 | Spain | 3282 | 65–95+ | 52.4% | 3.4 | Data from 17 different institutions |
| FRENKEL | 2000 | UK | 412 | 84.5 (42–102) | 71.4% | 11.6 | 70% indicated they had not had a dentist's appointment for five years |
| NITSCHKE | 2000 | Germany | 170 | 79.4 (51–99) | 68.3% | 3.3 | 2.4% had neither teeth nor dentures |
| CHALMERS | 2002 | Australia | 224 | 83.2 | 66% | 11.9 | 76.6% female edentulous patients versus 28.4% men |
| CHALMERS | 2003 | Australia | 232 | 21% over 80 years | Excluded | 18.0 (D) 17.2 (ND) | Caries prevalence and incidence considerably higher among patients with dementia |
| PELTOLA | 2004 | Finland | 260 | 83.3 ± 8.1 | 42% | 12.4 ± 8.6 | 42% of volunteers required extractions |
| SIMUNKOVIC | 2005 | Croatia | 139 | 58–99 | 45.3% | 21.1 | 30.9% had destroyed teeth that needed treatment |
| ADAM | 2006 | GB | 135 | 85.5 (D) 80.8 (ND) (65–100) | 65.9% 70% (ND) 63% (D) | 11.7 (D) 11.7 (ND) out of 32 | Denture wearers were rare amongst patients with dementia (40% D vs. 90% ND) |
| KATSOULIS | 2012 | Switzerland | 192 | 83.7 ± 8.2 | 52% | 12 ± 6 | 72% edentulous maxilla, 54% edentulous mandible |

varies greatly between the individual studies, but all of the described cohorts did by far not meet the aim of having 20 natural teeth at the age of 80 years. This “magic” number of natural teeth is generally associated with no need to replace lost molars because the masticatory and esthetic limitations are mostly tolerated. A new functional equilibrium with a shortened dental arch implies that a stable situation can be expected in the long term (KAYSER 1981).

The polypharmacy associated with multimorbidity often reduces the flow of saliva as a side effect of the medication; about a third of residents of LTC facilities report the sensation of a dry mouth (LOCKER 2003). Dry oral mucosa reduces the self-cleaning function of the oral structures and makes daily oral hygiene measures more difficult. Further, the change in quality of the remaining saliva encourages the growth of a biofilm on natural teeth and dentures.

The oral health of demented patients is significantly worse than in healthy adults of the same age because following the onset of dementia oral hygiene is often forgotten and/or in the later stages of the disease, it can only be carried out with difficulty. ELLEFSEN ET AL. (2009) showed that people with dementia had a significant increase in caries within one year. The reduction in masticatory efficiency reduces the self-cleaning effect of teeth and dentures during chewing, particularly if pasty foods are served (MIURA ET AL. 2003). Patients with dementia

have fewer teeth and develop more caries and periodontal diseases than healthy adults of the same age (JONES ET AL. 1993). About twice the carious lesions remain untreated compared to a non-demented control group (ELLEFSEN ET AL. 2009). This is partly caused by the difficulties of performing restorative measures in demented patients. For treatments under general anesthesia, the risk-to-benefit ratio must be weighed carefully for each individual. Even edentulism is not without problems for patients with dementia, because the disease-related impaired motor control renders muscular control of complete dentures difficult. The cognitive ability required to insert and remove dentures may also be impaired; with a Mini-Mental State Examination (MMSE) score of 14 or less, the likelihood of using dentures decreases to 30% (TAJI ET AL. 2005). If a denture is presented to a patient upside down and he or she does not instantly rotate the denture, this can be interpreted as early sign of dementia (BESIMO 2013).

Risks associated with oral infections

Numerous studies report on links between systemic pathologies and periodontal diseases or oral biofilm. The quantity of the bacterial load and the change in flora in the oral cavity may present a risk to the general health of LTC residents. Untreated periodontitis and the associated pathogenic microbes show a multifactorial correlation with cardiovascular disease. Over the

last two decades, interest in these associations has rapidly grown (HUMPHREY ET AL. 2008, JANKET ET AL. 2003). However, despite many theories, a causal chain of effects has not yet been confirmed. The fact that the cardiovascular risk itself appears to persist after extraction of all teeth argues against a causality (DESVARIEUX ET AL. 2003, HUJOEL ET AL. 2001). Common genetic risk factors could also explain the parallel development of both diseases, as demonstrated recently by a research group from Kiel (BOCHENEK ET AL. 2013). Diabetes and periodontal disease also appear to interact, with reliable indications that there is a bidirectional link. The poorer the glycemic control of an individual, the more pronounced the signs and symptoms of periodontitis. On the other hand, adequate treatment of periodontitis can result in an improvement in glycemic control (MEALEY 2006).

Amongst the possible infection routes of the lower respiratory tract, aspiration is possibly the most significant one in institutionalized patients (KREISS ET AL. 2010). Classic aspiration pneumonia is caused by bacteria from the oral flora descending into the lower bronchia (VAN DER MAAREL–WIERINK ET AL. 2011). The high prevalence of dysphagia in institutionalized patients, particularly those with neurodegenerative diseases, increases the risk of aspiration. EMILSON & THORSELIUS (1988) found a very high prevalence of the cariogenic bacteria *S. mutans*, *S. sobrinus*, and *Lactobacilli* in LTC residents aged 85 years on average, in both, persons with their own teeth as well as edentates wearing dentures. In patients with removable dentures, the number of *Lactobacilli* was particularly high, which was attributed to the plastic and metal surfaces that facilitate the formation of biofilm. Anaerobic and facultative anaerobic microbes of the oral cavity play an important role in the development of aspiration pneumonia. Imsand et al. demonstrated the presence of pathogenic microbes from the oral flora in the lungs of pneumonia patients who had to undergo a bronchoalveolar lavage (IMSAND ET AL. 2002). Significant risk factors for aspiration pneumonia include poor oral and denture hygiene, niches that are difficult to clean in a natural dentition and dentures, as well as hyposalivation. The combination of a lack of saliva and poor oral hygiene can lead to rapidly advancing root caries until detachment of the clinical crowns from the remaining roots within just a few weeks. Since around one third of institutionalized patients present swallowing disorders, these “detached dental crowns or bridges” may be aspirated and therefore be a possibly life-threatening risk (OGHALAI 2002). Age, malnutrition and diabetes further increase the risk of developing pneumonia. Scannapieco et al. also mention that the teeth of patients in intensive care units are colonized with microbes from the respiratory tract, *Pseudomonas aeruginosa*, intestinal bacteria and *Staphylococcus aureus* (SCANNAPIECO ET AL. 1992). Other studies have confirmed that the teeth of LTC residents act as a reservoir for infections of the respiratory tract (RAGHAVENDRAN ET AL. 2007).

In randomized controlled trials, performing oral hygiene on a regular basis led to a reduction in the incidence of pneumonia in institutionalized patients; however, only a few studies on this topic have been published to date. The first study on this topic was carried out in Japan and is one of the very few dental studies that have been published in one of the most prestigious medical journals, the *Lancet* (YONEYAMA ET AL. 1999). Sjögren et al. later conducted a systematic literature review on this issue and concluded that one in ten deaths due to pulmonary infections in residents of LTC facilities can be prevented by correctly implemented oral hygiene (SJÖGREN ET AL. 2008). According to

the results of a systematic literature review by Claar Maarel–Wierink, brushing teeth after every meal, daily cleaning of dentures, and weekly professional oral hygiene appear to be the best prevention to the development of aspiration pneumonia (VAN DER MAAREL–WIERINK ET AL. 2013).

Besides the mentioned systemic risks, oral infections also present the known local risks, particularly changes to the oral mucosa and breakdown of periodontal tissue. Broken teeth and poor dentures can also present a mechanical risk of injury to the tongue, cheeks, and lips – particularly for those with impaired motor coordination. Persistent pressure points and recurrent ulcers due to dentures, bars, connectors, and clasps could increase the risk of malignant changes in the oral mucosa, but currently there is no scientific evidence to support this. On the other hand, the role of periodontal inflammations in carcinogenesis has been well documented (MANTOVANI ET AL. 2008, MOERGEL ET AL. 2013).

Risks and benefits of natural teeth in patients dependent on care

Considering the risks for institutionalized patients associated with neglected oral hygiene, the question arises as to whether it would make sense to extract the remaining natural dentition and replace it with an easy-to-clean complete denture at the onset of dependency. Obviously, “amputation” of an organ is not an option when the patient loses autonomy to take care of it. At this point, we should once again underline the biological value and importance of natural teeth.

Malnutrition is widespread among very old and demented elders and considerably compromises the quality of life but also the cognitive function. The general condition of aging persons is fundamentally affected by an inadequate intake of proteins, fats, and carbohydrates (GENTON ET AL. 2005). The risk and prevalence of mal- and undernutrition in those dependent on care can be as high as 90% (PAULY ET AL. 2007). The reasons for this are varied, and dental state is certainly only one piece in the mosaic. The loss of occlusal units in the posterior segments, mobile, fractured and injured teeth or snags, provisional or inadequate prosthetic restorations, as well as pressure points from prostheses, misfitting clasps, and denture stomatitis all contribute to malnutrition by reducing masticatory force and efficiency, and finally the desire to eat (MÜLLER & SCHIMMEL 2010). Painful inflammation of the oral mucosa, food remnants and hyposalivation impair chewing and swallowing. Loss of teeth and poor dentures can also have a detrimental effect on the psychological well-being and even foster depression, which in turn has a negative effect on the diet and oral hygiene. Dental state and diet have a close, yet multifactorial connection. The age- and disease-related impairment in masticatory force and muscle coordination, the loss of posterior tooth units, removable prostheses with often severely worn prosthetic teeth, and mouth dryness can all severely impact masticatory efficiency. As a result, there is often a subjectively unnoticed, yet gradually progressing change in food choices (MILLWOOD & HEATH 2000). Complete denture wearers eat what is easy to chew and prepare. Hard, tough, and sticky foods are just as much of a problem for denture wearers as thin salad leaves. Even small seeds that can get stuck under the dentures present a challenge. If all teeth have been lost, the intake of protein, calcium, and vitamins is lower (SHEIHAM ET AL. 2002), which has a negative effect on bone density (NICOPOULOU–KARAYIANNI ET AL. 2009). As persons dependent on care generally no longer select their own menu, there is the

possibility of disrupting this vicious cycle and providing a balanced diet with high-quality nutrients. Unfortunately, however, LTC facilities and hospitals all too readily serve soft and pureed meals, without checking and, where necessary, improving masticatory function by means of a dental treatment. A simple chewing test has been available since the 1980s in which the patient bites gently on the finger of the caregiver (HEATH 1982). Only if the patient is unable to leave a small dint in the finger of the caregiver he or she has too little masticatory force to eat a normal unmixed meal. Vigorous chewing, preferably with natural teeth, is beneficial for older adults because it trains the masticatory muscles, makes the heart beat faster and increases blood flow in the brain (FARELLA ET AL. 1999, HASEGAWA ET AL. 2009, MÜLLER ET AL. 2012). Chewing therefore has the same positive effect as other physical sports-activities. A possible relationship with cognitive functioning is increasingly debated (WEIJENBERG ET AL. 2011). Holm-Pedersen et al. were even able to observe over a period of 21 years that edentulism is associated with higher mortality, of course with no causal relationship being postulated (HOLM-PEDERSEN ET AL. 2008).

Concepts for dental care for residents of long-term care facilities

The scientific evidence currently available encourages dentistry to discuss new care concepts as part of health policies. What appears to be important is the inclusion of physicians, who should perform an initial oral screening at admission to a LTC facility and who can, where necessary, consult with dental specialists. Hence, any necessary dental treatment could be timely initiated in order to prevent infection and assure masticatory ability.

Like any other adult, those dependent on care have the right to freely choose their own clinician. Ideally, patients who move into an institution continue to be treated by their usual dentist. This presumes, however, that the dentist is willing to continue providing dental care and that the dental practice and nursing facility are not too far away from each other. Often dental practices close to nursing facilities are only contacted for dental emergencies and mobile dentists who come to the institution are scarce. Although dental hygienists are available for professional dental hygiene, the range of treatments they can provide is limited. Arranging the payments for external dental personnel is not usual in most nursing facilities and requires considerable additional logistic effort. Furthermore, often only a few minutes are allocated in the nursing plan to oral hygiene measures. The situation in Switzerland is very similar to other Western countries. MacEntee et al. described the dental care in 41 LTCs with 653 residents in Vancouver (MACENTEE ET AL. 1987). The edentulous patients (60%) made the fewest requests to see a dentist. Residents who were aware that they had an oral problem preferred being treated inside the facility. Of 603 dentists in the area, 334 responded to a survey. Although the respondents indicated their willingness to treat elderly patients, they felt unable due to the work-load in their dental practice and interference with their leisure activities. Only 19% of the dentists from the survey had already worked in a LTC facility. Further 37% would be prepared to do so if they had only been asked! The respondents complained about their services being often limited to emergency treatments and they felt ill-prepared for the task. The technical equipment was described not as ideal and the demand for treatments as low. In another survey of 180 dentists, Nitschke et al. described that barriers preventing



Fig. 5 Of course, visibility with a fixed dental chair is better than when treating a bedridden patient.

dentists from working in LTC facility were primarily of administrative nature (NITSCHKE ET AL. 2005). Being confronted with aging and death disturbed the respondents in this study the least. Comparable issues were also reported in an LTC project conducted by the Zurich Dental Association between 1989 and 1993 in ten LTC facilities in Zurich where dental hygienists and dentists were involved (BAUMGARTNER 2006, MAGRI ET AL. 1996).

Unfortunately, only a small number of LTC facilities have a well-equipped dental chair that would allow on-site treatment, although there are no precise figures available for Switzerland. Mobile treatment units may be an alternative, but the investment is only worthwhile if regular treatments of institutionalized patients take place. Therefore it seems sensible to share these mobile units amongst several dentists or to make them available within the local Division of the Swiss Dental Association. Preparing the equipment, organizing the necessary instruments, and the journey itself require a considerable amount of time, particularly if patients are only being treated occasionally. Mobile dentistry is often limited to emergency procedures and denture repairs and has to be arranged in addition to the practice routine. It seems logical that dentists would rather work in their own practice or in fixed dental units, if only for the better visibility in the mouth (BOTS-VANTSPIJKER ET AL. 2014) (Fig. 5).

In some regions, foldable dental chairs are set up in LTC facilities to install a temporary dental clinic within the premises of the institution. The most successful project using this concept is probably the Mobident unit from the Clinic for Dentistry for the Elderly and Disabled at the University of Zurich. A fixed treatment unit in a bus, which can travel from facility to facility, would require less installation time but is associated with high initial financial investments. However, the lower logistical effort would encourage also long-term treatments, such as the manufacturing of dentures. If none of the mentioned concepts is available, useful treatment measures can still be carried out even with very basic equipment and hand instruments. However, meeting the necessary hygiene standards requires some effort. A tray system with central sterilization proved useful in this context.

If planned treatment measures cannot be carried out on-site because they appear to be too complex or invasive or if from a medical perspective it is desirable to have emergency facilities nearby, patients who are dependent on care can also be transported to a dental clinic. Transport services offer patients in

wheelchairs a door-to-door service. Even bedridden patients can usually be transported, but a careful risk-benefit analysis must precede the indication.

Oral hygiene

Dental care of dependent adults is an integral aspect of medical care and can only be successful with a team approach. Seniors living at home could be cared for by mobile nursing services such as Spitex, their family or volunteers. Personal hygiene should certainly include the oral care. Contact with nearby dental practices rarely exists, and Spitex employees do not always have contact details of mobile dental services. Therefore the nursing personnel take the responsibility for the dental hygiene of patients living in LTC facilities or hospitals, but they complain about a lack of training and too little time to ensure good oral hygiene (Fig. 6). It is the duty of the LTC facil-



Fig. 6 The nursing personnel endeavored to clean the teeth of this elderly woman but did not think about holding the lower lip back to clean the vestibular surfaces of the lower incisors.

ity management to prepare a care plan that is individually tailored to the patient and his or her needs. Preserving a patient's autonomy is an important goal of care, and occupational therapy supports this objective particularly for patients with dementia (BELLOMO ET AL. 2005) (Fig. 7). An individual dental hygiene prescription, preferably prepared by the patient's own dentist, is a good basis for high-quality and individualized care. Although LTC facility managers are usually interested in oral prevention for their residents, there seem very little resources in terms of finances, time, and personnel. The high turnover of staff in the nursing sector is also problematic (DE VISSCHERE ET AL. 2011). It therefore seems useful to regularly repeat the education and training of nursing personnel and provide sustainable information materials such as books, guidelines, posters, or interactive CDs that remain in the institution. In the age of digital photography, a dental care plan could easily be individualized by including photos of a patient's mouth or denture for display in his or her bathroom.

Dental hygienists play an essential role and offer on-site professional oral hygiene for patients living in LTC facilities. The general training of dental hygienists includes patients who are dependent on care or bedridden, and they are devoted to this task with enthusiasm. A group of dental hygienists has been working since 2002 at a national level to provide nursing personnel with dental hygiene training throughout Switzerland. To date, more than 6,000 caregivers have attended these courses in LTC facilities. However, the subsequent implementation often fails due to a lack of time or the fact that the necessary and individually prescribed oral hygiene tools are missing as they must be bought by the resident himself or his/her family. Unfortunately, the turnover of LTC staff often implies that the newly acquired knowledge is lost, and the capacity of the LTC facilities to repeatedly finance training courses is limited. The dental hygienists' close contact with the patients means that they are in the front line for identifying a possible need for

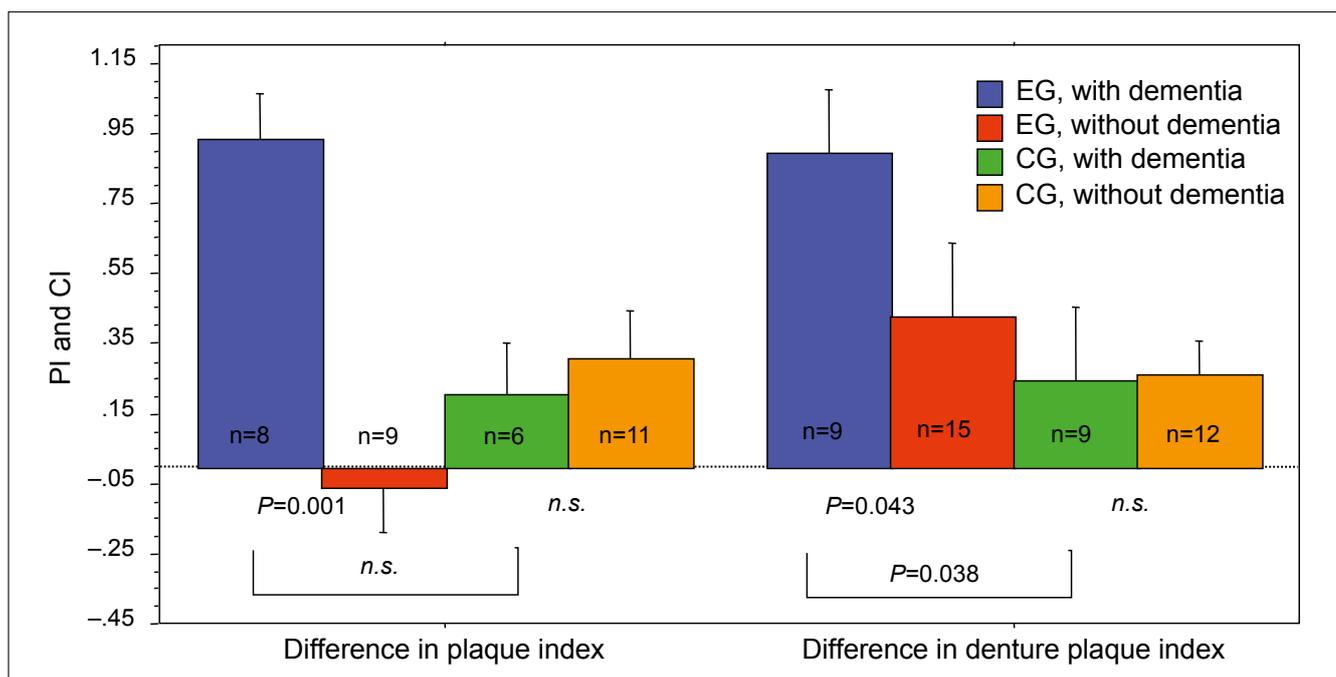


Fig. 7 Bellomo et al. showed that weekly occupational therapy over a period of three months for patients with dementia caused a significant improvement in oral and denture hygiene (based on BELLOMO ET AL. 2005). EG = experimental group (occupational therapy for oral hygiene), CG = control group (occupational therapy for manicure)

dental treatment, hence they may create the link to the dentist. A “team work concept” was used to treat 600 adults dependent on care in LTC facilities in and around Munich as part of a mobile dental prophylaxis study. It could be observed that after two years, from the 81% of study participants with initially dramatically poor oral hygiene 76% had a significantly improved oral hygiene. The authors recorded 65% less acute pain and 70% fewer extractions (BENZ & HAFFNER 2010). The frequency of dental hygiene visits in this project was determined by the individual risk, between once and three times per year. Any necessary dental treatments were carried out by associated dentists. This exemplary project emphasizes the importance of professional oral hygiene for adults dependent on care. In addition, dental hygienists can also play a key role in providing practical support for the nursing personnel in terms of instruction, acknowledgment and (re)motivation.

Care standard for institutionalized patients

Taking into consideration the poor oral health of residents of LTC facilities, their difficulty of carrying out oral hygiene measures, their declining ability to undergo dental treatment, and the associated increase in general health risks, it seems obvious that a standard of care needs to be defined. Katsoulis et al. conclude from their studies in Bern that providing regular dental care for older, independent adults or those living in LTC facilities could lead to a significant improvement in oral and general health and could furthermore keep the associated costs low (KATSOU LIS ET AL. 2009). A standard of care could increase the quality of life, oral well-being and geriatric condition of residents of LTC facilities to a medically and humanly desirable level. Based on the facts and considerations described above such standard of care could be described as follows:

- At the onset of dependence, a dental examination and, if necessary, an appropriate treatment are carried out, regardless of the fact if care is provided in an LTC facility or at home.

- At the onset of dependence, the patient’s own dentist or a dentist employed by the LTC facility prepares an oral care prescription as part of the basic care required by the Swiss health insurance act.
- In the following, patients dependent on care have access to emergency dental care as well as any other dental treatment by a dentist of their choice.
- A subsequent recall is offered with a frequency of appointments adjusted to the individual risk of the patient.
- Daily oral and denture hygiene is considered an essential part of the personal hygiene and is carried out by nursing personnel trained for this purpose.
- Any dependent seniors are offered the opportunity of regular professional oral hygiene carried out by dental hygienists.
- This standard of care for dependent residents is part of the health policy framework of the Swiss cantons.

Summary and conclusion

The oral health of dependent persons is generally poor, which has a negative impact on masticatory function and oral-health-related quality of life. Oral infections and biofilm also present general health risks, in particular aspiration pneumonia. The care concepts for persons dependent on care are arranged differently across the Swiss cantons. Any care concept requires an interdisciplinary team composed of nursing personnel, LTC facility managers, Spitex, physicians, dentists and their dental assistants and hygienists. The necessary logistics and infrastructure are often lacking, the administrative barriers are high, and the financial incentive is low. Providing dental treatment to adults dependent on care often requires a greater effort, and not only for the above mentioned reasons. It would therefore be desirable to improve the structure of the dental care provided to adults dependent on care and to incorporate it into the health policy framework of the Swiss cantons.

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