

Care and treatment of frail older adults in the dental office

Learning outcomes

Readers should be able to:

- understand that ageing is a worldwide phenomenon, and has resulted in an increase in frail older adults who now have maintained all or part of their dentition and require continuing oral health services in the community;
- recognise that decision making and treatment planning for these frail older adults is complicated by their social circumstances, their systemic health, the consequences of the medication they are using, and their ability to access care and pay for it; and,
- develop a rational treatment plan for frail and dependent older adults who are still living in the community.

Introduction

According to national surveys, the population of the Republic of Ireland (ROI) and Northern Ireland (NI) is ageing.^{1,2} In 2019, the population in the ROI aged 65 years old or older was approximately 700,000, and approximately 315,000 in NI.¹⁻³ Currently, 14% of the ROI population and 17% of the NI population are aged 65 or older.³ The projection for 2051 is that these populations will make up 26% of both countries.³

There is greater heterogeneity among Irish older adults as compared to any other age groups.⁴ This heterogeneity is influenced by the person's genotype and modulated by environmental factors such as cultural, social, economic, and cohort experiences, which result in their lifestyle and health beliefs.⁵ These same factors also determine their oral health and the amount of oral healthcare they have received over their lifetime. Therefore, a dental provider should consider the consequences of how the proposed treatment fits into the patient's health, beliefs, and lifestyle.⁶

In medicine, once a diagnosis is made, there is usually enough scientific evidence to support a therapy. However, in dentistry there may be multiple treatment plans and many of these plans lack data to support them. Dentists, like surgeons, need complex operating equipment to remove plaque, calculus and infected carious tissue, extract teeth, and restore the dentition to shape and function.⁷

Dentists function best in their dental office with all their equipment. If an older adult can use public transport or drive their own vehicle, then access to dental care is not a limiting issue. However, it is estimated that half of people

aged 65 and over in NI and one-third in the ROI report limitations on their daily activities and lives.³ These older adults can be designated as frail, since they have lost some of their independence.⁵ Many still live independently or semi-independently with support from their family and friends, and whatever professional support services are available in their communities.⁵ The access to dental services is limited for these frail older adults, unless other people provide transport and the dental offices are accessible for patients using walkers and/or wheelchairs. Dentists treating frail older adults need to understand the implications of the patients' medical problems and pharmacology on oral health and oral healthcare. A critical evaluation is of the patient's ability to maintain daily oral hygiene independently.⁸ Also, the dentist must assess the patient's ability to tolerate the prescribed treatment.⁷

In this paper, the authors will discuss the care and treatment of frail older adults in the private dental office using a case history to illustrate some of the issues, problems and decision-making required for the care of this population.

Case history

Social history

Fred is a 67-year-old retired farmer who is living with his wife in a flat attached to the main farmhouse where his son and family live. He was brought for treatment by his son because he said "I need some teeth to chew with" and thought he might need complete dentures. His son drove him for one and a half hours to the appointment.

Medical history

Fred is allergic to sulfa drugs and tells us that he had a stroke about 10 years ago, which has left him with a minor weakness in his right leg that he now uses a walker for. He is taking clopidogrel, which acts as a platelet aggregation inhibitor. This prevents further strokes but can increase the risk of gingival bleeding.⁹ To control his hypertension, he has been prescribed lisinopril, an angiotensin-converting enzyme (ACE) inhibitor, which reduces peripheral arterial resistance and reduces his blood pressure.⁹

To access a dental clinic, Fred needs a parking spot near the entrance to the clinic with a ramp to the pavement. The clinic doors should be opened electronically and be wide enough to accommodate a walker/wheelchair. If the clinic is not on the ground floor, there needs to be a lift.



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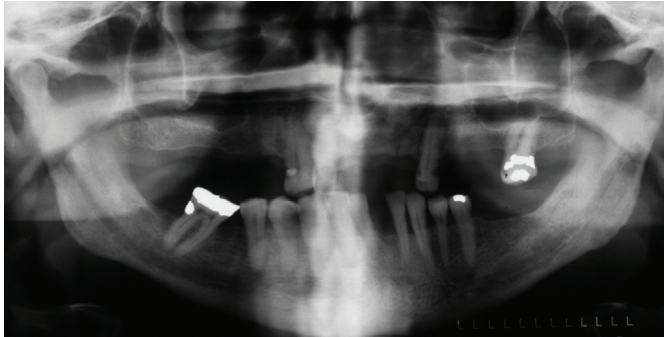


FIGURE 1: Orthopantomograph showing remaining teeth at the time the patient sought treatment, showing universal bone loss.

Fred's medical history also includes adult-onset diabetes, which he controls with oral antidiabetics, i.e., metformin and glyburide. His appointments should be in the mid-morning, after he has had breakfast and taken his medication. Blood glucose levels should be measured on a regular basis, which Fred does not do. Therefore, before any invasive surgical procedure, it is wise to measure his blood glucose levels so that the stress of the procedure does not cause any unwanted side-effect, such as a hypoglycaemic episode.¹⁰

Fred has benign prostate hyperplasia and takes oxybutynin for it, which has a very high xerostomic potential.¹¹ Oxybutynin contributes to a higher risk for caries and periodontal disease, as well as reducing the patient's ability to adapt to removable dentures. Fred should be escorted to the restroom prior to treatment in order to prevent an accident.

Fred reported osteoarthritis of his knees and back. Therefore, it is important to put pillows under his knees and to not tip the chair too far back so that he is comfortable in the dental chair. Also, seeing Fred in the mid-morning gives him time to stretch after lying flat in bed all night.¹² He has been prescribed 650mg of an enteric-coated aspirin three times daily for pain associated with his osteoarthritis.

Fred was diagnosed with Parkinson's disease three years ago, and presents with mild tremors, which he controls with levodopa/carbidopa and ropinirole HCL. Both of these medications are potentially very xerostomic and increase his risk of caries and periodontal disease.¹³

Fred has been very forgetful recently and has lost interest in his hobbies. Recently, he forgot to turn off the gas underneath a pot and nearly caused a fire. Consequently, his family had his physician administer a quick screening test for early dementia, as well as the clock drawing test. These tests suggested that Fred was suffering from early dementia and was frustrated. To help him control his frustration, his physician has prescribed sertraline, a selective serotonin reuptake inhibitor (SSRI) antidepressant.¹⁴

Dental history

Fred's dental history five years ago included two failing fixed partial dentures (FPDs) from #14 to #16, and from #24 to #26, which were found to have extensive root caries and periapical lesions. These teeth were extracted, and were not replaced with a prosthesis. On the mandibular arch, the molars were missing on the left side and tooth #31 was mobile with deep pockets and has been extracted.

All teeth remaining in the maxillary arch were periodontally involved and mobile, except for teeth #13 and #23 (Figure 1). In the mandibular arch, the

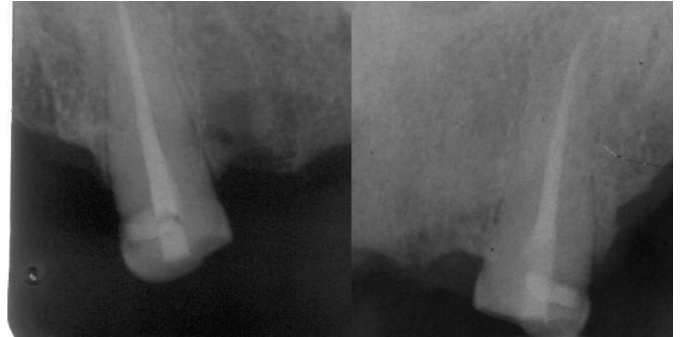


FIGURE 2: Periapicals of #13 and #23 after root canal therapy, and having been prepared as overdenture abutments.

remaining teeth were from #35 to #32 and from #41 to #45 and also #47. There was significant bone loss associated with these remaining teeth, with no significant mobility.

Treatment planning and implementation

After evaluation and discussion with the patient and his family, the chosen treatment plan was to maintain #13 and #23 as overdenture abutments after elective endodontics (Figure 2). This decision was made because the maintenance of the other maxillary teeth would have required intensive periodontal therapy followed by splinting of the mobile teeth, and either dentures or implants to replace missing teeth. This alternative treatment plan would require extensive and complex personal oral home care and has a high risk of failure because Fred's dementia will advance and result in progressive deterioration of daily oral hygiene.

The overdenture abutment teeth were cut down to 1.5mm above the free gingival margin, rounded, and restored with Fuji II LC (GC America, Alsip, IL). An immediate complete overdenture was fabricated opposing his mandibular dentition. The patient and his family were not concerned about the missing #31, so no removable partial denture (RPD) was planned as it would have increased his risk of caries and periodontal disease. The treatment provided for the mandibular arch was disease control, i.e., periodontal maintenance and direct restorations, as well as preventive care, which included fluoride varnish (22,600ppm sodium fluoride) applications on all remaining teeth and a prescription for 5,000ppm neutral sodium fluoride toothpaste.¹⁵

Patient

Fred's appointments were all at mid-morning, using stress reduction protocols, and limiting the use of epinephrine to a maximum of 2.5 carpules of lidocaine with 1:100,000 epinephrine.¹⁶ Stress reduction protocols for people with dementia include a quiet environment, minimal distractions, a familiar and consistent dental team, and short appointments. To prevent cheek biting, use of a short-acting anaesthetic was required for the procedure. To prevent confusion, we used simple commands, and to ensure co-operation during treatment, we made sure that Fred was comfortable in the chair by adjusting pillows and/or chair position as well as allowing restroom breaks. A family member had to be either at chairside or in the waiting room in case Fred had a panic attack, in which case all dental procedures would have to be ceased as quickly as possible, allowing Fred to leave the chair right away.⁷



FIGURE 3: Intra-oral photograph of the patient after three months, showing marginal gingivitis and demineralisation due to poor oral hygiene.



FIGURE 4: Intra-oral photograph taken two years after initial treatment. The photograph was taken after cleaning the teeth and the dentures, but the marginal gingivitis is still present, and the probing depths of the posterior teeth have increased. The patient has not returned for further care after this appointment.

Managing xerostomia

Several of Fred's medications have the potential to affect the quality as well as the quantity of saliva produced by the mucous and serous salivary glands and result in a dry mouth. Medications are the main cause of dry mouth among older patients.¹⁷ However, the patient's physician may be able to change a xerostomic medication for one that is less xerostomic. Often, such a change is not possible due to the patient's medical problems. Therefore, the dentist needs to try and manage xerostomia by using saliva stimulants and substitutes,¹⁷ including xylitol chewing gums and lozenges.¹⁸ Drugs can also be used to stimulate saliva production, such as pilocarpine and cevimeline. Saliva substitutes include liquid and gel formulations containing glycerin and water to provide lubrication and moisture, as well as a flavouring agent. Unfortunately, saliva substitutes seem only to be effective for a short period of time, unless they contain a mucin.¹⁸

To reduce caries risk due to xerostomia, in-office fluoride varnish applications are useful for remineralisation because the varnish adheres to the tooth surface and releases a high quantity of fluoride for a longer period of time.¹⁵ Additionally, the daily use of high-fluoride-concentration toothpastes constantly replenishes the oral cavity with fluoride. However, it is difficult for patients with progressive cognitive impairments to use a fluoride rinse.¹⁵

MI Paste (GC America, Alsip, IL) helps to supply calcium and phosphate to saliva, thus helping remineralisation. MI Paste is a useful preventive agent for patients with high caries rates as it can be easily applied to the tooth surface using fingertips after brushing and can be left on teeth. MI Paste should be applied at night, as the casein provides some moisturising capacity and helps to alleviate the patient's dry mouth. Another version of MI Paste is MI Paste Plus (GC America, Alsip, IL), which contains fluoride and should be used with 1,100ppm toothpaste and not with those containing 5,000ppm.¹⁹

Maintenance care

Fred returned after three months (Figure 3) complaining of a loose maxillary denture. On evaluation, he had marginal gingivitis associated with his mandibular dentition and a maxillary denture that was loose. His teeth were scaled and cleaned, and fluoride varnish was applied to all natural teeth, including the overdenture abutments. After cleaning the denture, the anterior intaglio was prepared for an in-mouth reline using Bosworth Truliner (Keystone Industries, Oss, Netherlands).

After six months, Fred returned for a regular recall with no complaints. His oral hygiene had not improved and the probing depths on the mandibular molars had increased slightly. An adult prophylaxis followed by fluoride varnish application was performed and oral hygiene instructions were re-emphasised to Fred and his family members. Fred returned after one year with no changes in his medical history, except for an increased level of confusion. His oral hygiene had not improved and his periodontal condition remained relatively stable with no visible caries lesions. Therefore, we scaled and cleaned his teeth and applied fluoride varnish. We also tried to convince his son to help him with brushing his teeth at least once a day.

At his two-year follow-up (Figure 4), Fred was a little more agitated and his oral hygiene was still poor. His probing depths had not increased very much, nor were there any visible caries. We were able to scale and clean his teeth, and apply a fluoride varnish. After this appointment, Fred did not return for any further appointments and all efforts to contact him or his family were unsuccessful.

Final considerations

This case history illustrates that it is possible to care for frail and dependent older adults in the office of a general dentist; however, the dentist needs to take a careful medical and drug history, and be able to interpret how these diseases and medications may influence the management and treatment planning for these individuals.^{7,8} The dentist also needs to be capable of modifying the concept of an ideal treatment plan to appropriately accommodate to the patient's individual health and social issues.²⁰ If patients have progressive cognitive impairments, it is important to simplify the treatment, and reduce the duration and number of appointments.¹⁴ This

kind of treatment has been called rational dental care, as it is the most appropriate treatment for that particular patient after evaluating all of the patient's modifying factors.²⁰ The principles of rational dental treatment planning are firstly to eliminate pain and infection, and secondly to try to improve oral function. All other treatment after that is elective, and dependent on the patient's desires, their capacity to tolerate that treatment, their ability to pay for the care required, and the dentist's skills to be able to deliver that care.²⁰

References

1. Central Statistics Office. Population and Migration Estimates April 2019. In: Office CS, ed. Cork; 2019.
2. Northern Ireland Statistics and Research Agency. 2018-based Population Projections for Northern Ireland (2019). In: Agency NISaR, ed. Belfast; 2019.
3. Sheehan AOS, R. Ageing and Public Health – an overview of key statistics in Ireland and Northern Ireland. In: Health IoP, ed. Dublin; 2020.
4. Nelson EA, Dannefer D. Aged heterogeneity: fact or fiction? The fate of diversity in gerontological research. *Gerontologist*. 1992;32(1):17-23.
5. Ettinger RL, Beck JD. The new elderly: what can the dental profession expect? *Spec Care Dentist*. 1982;2(2):62-9.
6. Marchini L, Hartshorn JE, Cowen H, Dawson DV, Johnsen DC. A teaching tool for establishing risk of oral health deterioration in elderly patients: development, implementation, and evaluation at a U.S. dental school. *J Dent Educ*. 2017;81(11):1283-1290.
7. Ettinger RL. Treatment planning concepts for the ageing patient. *Aust Dent J*. 2015;60(Suppl. 1):71-85.
8. Allen F. Oral care principles for older adults: Part 2. *J Ir Dent Assoc*. 2022;68(3):138-141.
9. Jeske AH. *Mosby's Dental Drug Reference*. Elsevier; 2022.
10. McKenna SJ. Dental management of patients with diabetes. *Dent Clin North Am*. 2006;50(4):591-606, vii.
11. Loesche WJ, Bromberg J, Terpenning MS, et al. Xerostomia, xerogenic medications and food avoidances in selected geriatric groups. *J Am Geriatr Soc*. 1995;43(4):401-407.
12. Malamed SF. Knowing your patients. *J Am Dent Assoc*. 2010;141(Suppl. 1):3s-7s.
13. Prete BRJ, Ouanounou A. Medical management, orofacial findings, and dental care for the patient with Parkinson's disease. *J Can Dent Assoc*. 2021;87:110.
14. Marchini L, Ettinger R, Caprio T, Jucan A. Oral health care for patients with Alzheimer's disease: an update. *Spec Care Dentist*. 2019;39(3):262-273.
15. Gluzman R, Katz RV, Frey BJ, McGowan R. Prevention of root caries: a literature review of primary and secondary preventive agents. *Spec Care Dentist*. 2013;33(3):133-140.
16. Rose LF, Mealey B, Minsk L, Cohen DW. Oral care for patients with cardiovascular disease and stroke. *J Am Dent Assoc*. 2002;133 (Suppl.):37s-44s.
17. Thomson WM. Dry mouth and older people. *Aust Dent J*. 2015;60(Suppl. 1):54-63.
18. Su N, Marek CL, Ching V, Grushka M. Caries prevention for patients with dry mouth. *J Can Dent Assoc*. 2011;77:b85.
19. Raphael S, Blinkhorn A. Is there a place for tooth mousse in the prevention and treatment of early dental caries? A systematic review. *BMC Oral Health*. 2015;15(1):113.
20. Marchini L, Ettinger RL. The prevention, diagnosis, and treatment of rapid oral health deterioration (ROHD) among older adults. *J Clin Med*. 2023;12(7):2559.