Oral care principles for older adults: Part 1

Learning outcomes:

- understand the importance of systematic risk assessment when planning care for older adults;
- be familiar with the limitations of old teeth when designing fixed and removable prostheses; and,
- recognise the importance of individually tailored maintenance programmes.

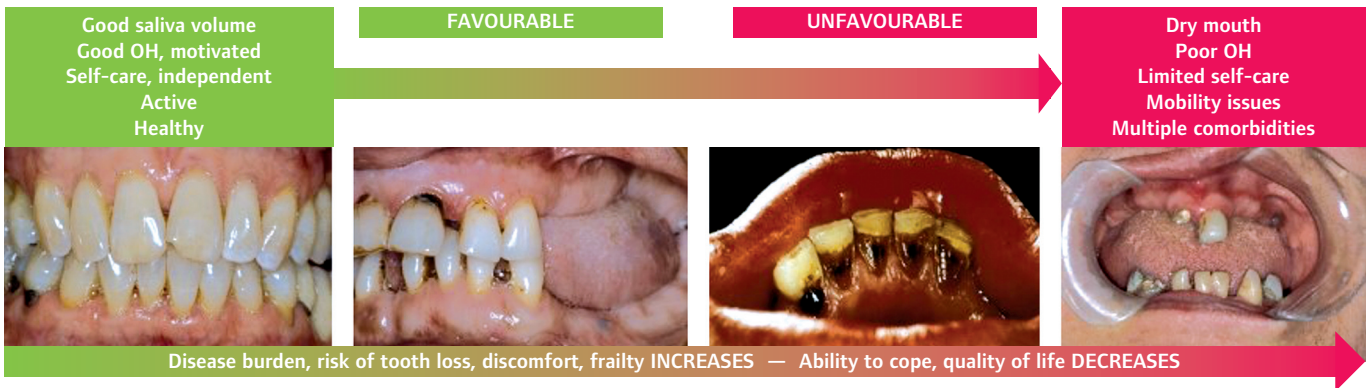


FIGURE 1: Oral presentations of older adults.

Introduction

As the population ages, increasing numbers of older adults are keeping natural teeth well into old age.[1] Over the course of a lifetime, teeth, periodontal tissues and oral mucosa are exposed to a wide range of risk factors for disease. Compared with young adults, older adults (>65 years of age) tend to have a higher prevalence of:

- decayed, missing and filled teeth;
- root caries;
- chronic, severe periodontitis;
- mucosal disease (e.g., chronic candidiasis, oral cancer);
- pathological and/or advanced physiological tooth wear;
- cracked teeth and associated pulpal symptoms;
- ill-fitting complete and partial removable dentures; and,
- hyposalivation (including medication-related reduced saliva flow).

As with any part of the life cycle, the severity and extent of oral disease is strongly related to patterns of sugar intake, oral hygiene practices, smoking habits and attitudes to dental health (e.g., frequency of dental attendance).

Finbarr Allen
BDS PhD MSc FDS (Rest Dent) RCPS

Finbarr is Professor/Consultant in Prosthodontics and Oral Rehabilitation in Univerity College Cork.

The extent and severity of oral disease is not a product of age per se. However, age-related risk factors for oral disease, including levels of dependence and socio-economic status, are associated with higher levels of dental disease and are predictive of future disease.

There is a wide range of oral disease presentation in older adults, and disease profile is strongly influenced by patient attitudes and behaviours, past dental experience, and medical and social factors (**Figure 1**). These factors must be identified as part of the risk stratification of the patient, which in turn should determine the care strategy.

In this paper, management principles of restorative dental care for healthy and independent older adults will be considered. Principles of management of frail, medically compromised, and semi-dependant older adults will be presented in part 2 of this series.

Principles of context-appropriate care

The care plan for older adults should be context appropriate, and planned in terms of the wider consideration of medical and social circumstances (**Figure 2**). Where an older adult is clearly well motivated, living independently and healthy, then the full range of treatment possibilities, including complex treatment, can be considered (**Figure 2**: basic or comprehensive treatment). This includes surgical procedures such as placing dental implants. Replacement of missing teeth with either fixed or removable prostheses may be indicated, but there will be a biological price and higher burden of maintenance. There may be a substantial functional improvement with this course of treatment, and so long as the patient understands the maintenance requirements, then this would be appropriate.

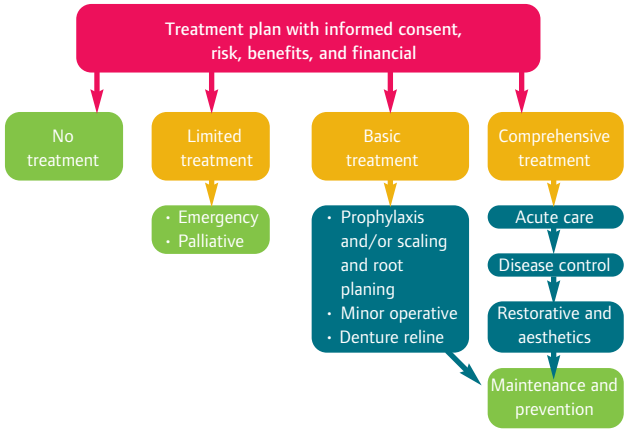


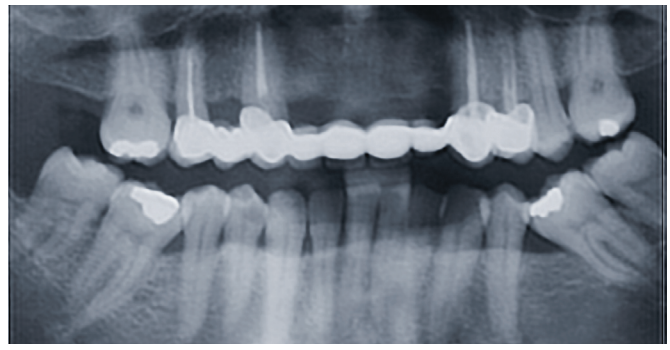
FIGURE 2: Decision-making tree for older adults taking into account patient attitudes, and medical and social circumstances.

Main planning issues

In many older adults, the dentition will be characterised by moderate to high levels of tooth loss, and high numbers of filled or decayed teeth. Root decay is much more common in older adults, and associated with exposed root surfaces, wearing a removable partial denture, and poor oral hygiene. Periodontal attachment loss may also lead to mobility and drifting of teeth. Tooth wear may be evident, and the occlusion may be unstable, complicated by missing occlusal units and worn occlusal surfaces with deflective occlusal contacts. When planning restorative dental care to replace missing teeth, key questions to answer include:

- what does the patient want and what are they willing to accept?;
- are risk factors for disease under control?;
- are damaged teeth restorable?;
- is the occlusion stable?;
- how many teeth are required to stabilise the occlusion?;
- what are the limitations of 'old' teeth as abutments for fixed and removable prostheses?;
- are they capable of maintaining a high standard of oral hygiene/plaque control?;
- is this an age- and circumstance-appropriate intervention?; and,
- what is the plan for future failure?

It is vital to plan treatment that is acceptable to the patient. Replacement of missing teeth can be achieved using either removable or fixed (tooth- or implant-retained) prostheses. Acceptance of removable dentures is reducing among older adults, and there is a high level of non-compliance with denture wearing.[2,3] Demand for implant-retained prostheses is growing, and it is important to ensure that patients' expectations will be met if that course of action is taken. It is also important to check if the patient has any medical issues that may complicate or contraindicate surgical procedures. This includes a history of taking anticoagulants (risk of bleeding), bisphosphonates or anti-angiogenic medications (risk of osteonecrosis). The patient's desire to 'avoid' wearing a denture should not result in attempting to provide a fixed prosthesis retained on teeth that are not suitable or when the occlusion is not stable (**Figures 3a** and **3b**). The likelihood of failure is high, especially when abutment teeth have been endodontically treated. When failure occurs, it is likely to be catastrophic and result in loss of abutment teeth. It is also unwise to provide restorative dental care when risk factors for disease are not controlled.



FIGURES 3a (above) and 3b (left): Nine-unit porcelain fused to metal fixed-fixed bridge retained on endodontically treated #15, 13, 23, and 24, which is mobile; fractured abutments #23 and 24. Patient did not want to have a removable prosthesis. Failure has occurred after less than 24 months of clinical service.

FIGURE 4a: 63-year-old female patient with reduced dentition in the lower jaw; #24 lost and four-unit conventional fixed bridge retained on #13 and 16, placed approximately one year previously. This had fractured due to occlusal trauma and deflective contacts were noted, with pain on these abutment teeth.

FIGURE 4b: Occlusion was stabilised and pain relieved with a new fixed bridge to replace missing #24, replacement bridge #16-13, and a removable partial denture to replace missing #35, 36, 37, 44, 45, 46, and 47.

How many teeth?

For older adults, the desired outcome of care is a natural, healthy, functional dentition for life. This may be achieved with a reduced dentition if a sufficient number of stable occlusal contacts remain, which is the essence of the shortened dental arch concept. When teeth are lost, for some patients, this may result in functional and/or aesthetic impact, which bothers the patient. In the longer term, drifting of adjacent and opposing teeth may also destabilise occlusal contacts and lead to unfavourable forces on the remaining dentition (**Figures 4a** and **4b**). In such cases, the patient is likely to request or need replacement of missing teeth.

Very extensive care with complex needs, including rehabilitation of the dentition with fixed prosthodontics and the ability to accept this care.

Extensive care, which may be solved by a combination of fixed and removable prosthodontics and the ability to withstand the care.

Intermediate care, which requires some alternatives to traditional therapies.

Limited care – these patients cannot tolerate extensive treatment time; need short appointments and a simplified treatment plan.

Very limited care – these patients should be treated for pain relief and infection control only.

FIGURE 5: Restorative care spectrum ranging from implant-retained restorations to replace multiple missing teeth, to transition to the edentate state.

Figure 5 shows some of the considerations along the restorative care spectrum, including full-mouth rehabilitation, application of the shortened dental arch concept, and a terminal dentition where transition to edentulism is the best option.

Older adults – limitations of 'old' teeth

At the tooth level, older teeth tend to be more brittle as a result of dehydration, loss of dental tissue to caries, and repeated replacement of dental restorations. For this reason, many teeth in older adults become unrestorable and require extraction (**Figure 6**). Clinical judgement must also be exercised when considering the use of heavily restored teeth as abutments for a removable or fixed partial denture. This is particularly relevant when the proposed abutment tooth has been endodontically treated or has lost more than 25% of its periodontal support. Furthermore, with a combination of uneven occlusal loading and expansion of old amalgam restorations, teeth may crack and cause painful symptoms. These can be difficult to diagnose and locate, but can be identified by biting on water-soaked cotton rolls and use of plaque-disclosing agent (**Figure 7**).

Tooth wear is common in older adults, both pathological and advanced physiological. Pathological tooth wear can be due to attrition (caused by parafunction/bruxism), acid erosion (caused by diet or gastro-oesphogeal reflux), or abrasion. In older adults, tooth wear is often multifactorial in aetiology and the diagnosis is established through the clinical presentation and history. Advanced physiological tooth wear is related to loss of occlusal units over time, with preferential wear on a reduced dentition. Tooth wear can result in compromised chewing function and appearance, and increased sensitivity. Loss of occlusal anatomy may also compromise guidance of excursive movements, manifested with repeated fracture of teeth and dental restorations.

Case 1 illustrates some of the management principles highlighted in this article where care is strongly influenced by both patient- and tooth-related factors.

FIGURE 6: 67-year-old female patient who is ASA3 and has severe saliva hypofunction. #43, 43 extensive caries, unrestorable.

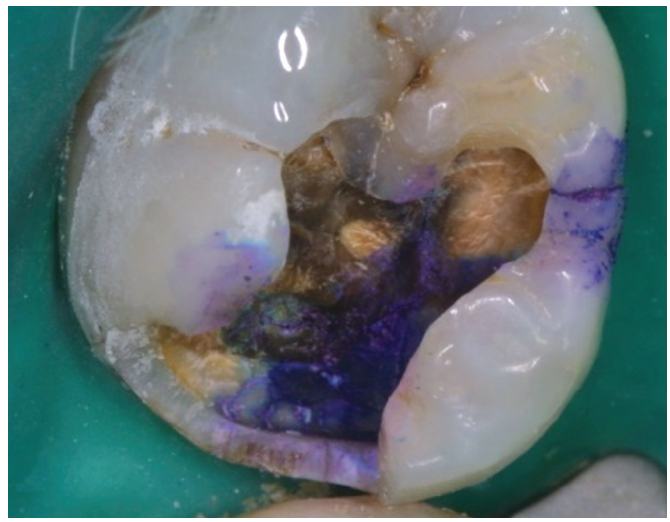
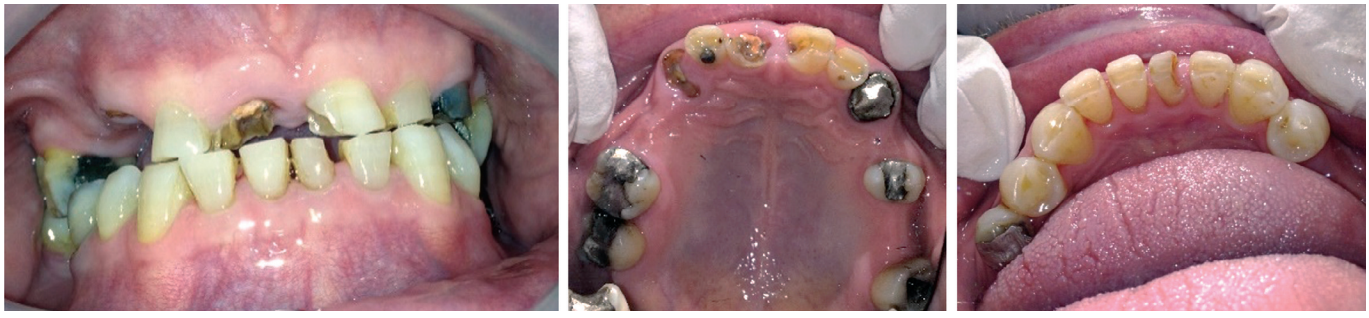


FIGURE 7: Patient had symptoms of "cracked tooth", located to #36 by biting onto a water-soaked cotton wool roll. Identification of extent of the crack confirmed using plaque-disclosing dye following removal of existing amalgam restoration.



Figures 8a, 8b and 8c: Pre-treatment dental status. Note the extensive tooth wear and short clinical crowns on #12, 21, and 22, and fractured #11.

CASE 1

Case details

- A 73-year-old male, irregular attender, had recently fractured #11 and was dissatisfied with the appearance of the resultant "gap".
- He reported that his chewing function had deteriorated over the past few years, and he would like to chew better. He had a large number of missing teeth and had never worn a denture before.
- Aside from taking Lipitor, he had no relevant medical history. He wanted to know if he should extract his remaining upper teeth and have a full replacement denture.

Key clinical examination findings

- He had a good standard of oral hygiene, with very low bleeding on probing and no periodontal pocketing greater than 3mm.
- He was missing #14, 15, 24, 26, 36, 37, 45, 46, and 47.
- Teeth #11 and 13 were extensively fractured and deemed unrestorable. Teeth #23 and 41 had extensive carious lesions, and secondary caries was noted in #17.
- There was evidence of tooth wear on the anterior dentition, which was consistent with anterior attrition. His occlusion was not stable, and he did not have a consistent pattern of guidance due to multiple missing occluding units and extensive anterior tooth wear. **Figures 8a, 8b** and **8c** show his pre-treatment dental status.

Treatment planning considerations

- Patient is not highly motivated to have complex dental treatment. He has not had any dentures before. Will he adapt? How many teeth does he need to create a stable occlusion?
- How restorable are the worn anterior teeth? He is not interested in complex treatment. Maxillary anterior teeth have short clinical crown height, so what are the alternatives to full coverage crowns?
- He is not interested in having a lower denture to replace posterior missing teeth. It is possible to restore to a shortened dental arch, with restoration of worn tooth surfaces and provision of an upper removable partial denture.
- He has a good standard of oral hygiene, and is well motivated to clean his teeth, so he should be able to maintain a denture to replace missing teeth.

Agreed treatment plan

- Extract #11, #13, and #23, which are deemed unrestorable, and restore carious lesions in #17 and #41.
- After suitable healing period, provide cobalt chromium-based removable partial denture with occluding vertical dimension increased by 3mm.
- Restore worn anterior tooth surfaces with directly placed composite resin build-ups at the raised occluding vertical dimension; multiple contacts achieved with restoration to a lower shortened dental arch.
- Reinforce oral hygiene instruction (OHI), including denture hygiene advice. Agree six-month review visits.

Outcome

The patient adapted well to having an upper removable partial denture, and feels that his appearance and chewing ability have significantly improved. His occlusal contacts appear to be stable and reproducible at one year post treatment (**Figure 9**), and he has not fractured any of the direct composite resin restorations. He continues to maintain a high standard of oral hygiene and commitment to review visits.

FIGURE 9: Post-treatment anterior view.

References

1. **Kassebaum, N.J, Bernabé, E., Dahiya, M., Bhandari, B, Murray, C.J.L., Marcenes, W.** Global burden of severe tooth loss: a systematic review and meta-analysis. *J Dent Res* 2014; 93 (7 Suppl.): 20S-28S.
2. **Allen, P.F., Jepson, N., Doughty, J., Bond, S.** Attitudes and practice in the provision of removable partial dentures. *Br Dent J* 2008; 204 (1): E2.
3. **Cronin, M., Meaney, S., Jepson, N.J.A., Allen, P.F.** A qualitative study of trends in patient preferences for the management of the partially dentate state. *Gerodontology* 2009; 26 (2): 137-142.