Oral care principles for older adults: Part 2

Learning outcomes:

- understand the relevance of state of dependency on treatment planning for older adults;
- be familiar with the risk management for older patients taking bisphosphonates, anti-angiogenic and anticoagulant medications; and,
- recognise the need for atraumatic procedures in patients at risk of osteonecrosis.

Introduction

In the first article in this series, general principles of treatment planning for older adults were addressed. However, beyond purely dental considerations, clinicians will need to consider the wider ramifications of the social and medical status of older adult patients. In medically compromised older adults, the response to oral pathogens is compromised by immunosenescence (i.e., age-related diminished immune response) and reduced saliva flow. Furthermore, any surgical treatment may be compromised if the patient is taking anticoagulants, anti-angiogenics, bisphosphonates or immunosuppressants. In this paper, the focus will be on the potential for medical morbidity to compromise oral health and some medication-related challenges for the dentist in providing dental care for these patients.

Relevance of frailty and dependence

Depending on their social and medical circumstances, older adults can be defined as 'robust', 'frail' or 'dependant'. This, in turn, presents different levels of risk for oral disease and its treatment. A variety of frameworks that categorise older adults according to social and medical status are available. The Canadian Study of Health and Aging (CSHA) framework **(Table 1)** categorises older adults into levels of dependency, and this is useful when planning care, bearing in mind the status of the patient. The incidence of dental caries and periodontal disease tends to be higher in patients categorised in CHSA levels 4, 5, 6 and 7. Their risk of dental disease is elevated because:

- their capability to undertake oral hygiene procedures diminishes as they become more frail, cognitively impaired and dependent;
- they are reliant on carers to undertake oral hygiene procedures, particularly CHSA levels 6 and 7, where the patient is housebound or in residential care;
- they frequently consume refined carbohydrate-laden food and have decreased consumption of fibre and protein;
- they have increased comorbidity, and concurrent systemic chronic diseases; and,
- they take daily multiple medications (polypharmacy), potentially leading to hyposalivation.

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In the case of frail, immunocompromised older adults, the potential for respiratory pathogens to colonise dental plaque has been demonstrated, and there is significant risk of this precipitating bacterial pneumonia and death (El Solh et al., 2004). The potential for this to happen is much higher in patients with:

- poorly controlled diabetes mellitus;
- impaired swallowing reflex;
- dementia/moderate to severe cognitive impairment;
- Parkinson's disease; and,
- post stroke/cerebrovascular accident.

The patient shown in **Figure 1** was an 81-year-old male patient who had an impaired swallowing reflex following a recent stroke and had moderately advanced cognitive impairment. His health had deteriorated rapidly over the previous 18 months. As shown, there was a high level of plaque around all remaining teeth, extensive bone loss and grade 2 mobility. He had not previously worn any form of denture.

Medically compromised patient: clinical decision-making scenario (Figure 1). Extract all remaining teeth?

- Try to undertake non-surgical periodontal treatment and maintain the existing natural dentition?
- Retain some teeth to facilitate retention of partial dentures.

There is probably no "correct" answer.

- The patient is severely medically compromised, so they are unlikely to respond positively to non-surgical periodontal management and maintain good periodontal health.
- Extracting all of his remaining teeth eliminates the risk of bacterial pneumonia caused by oral pathogens, but he may not be able to tolerate complete replacement dentures. This may compromise his chewing and diet.
- Extraction of some teeth and provision of transitional removable partial dentures may be a good compromise, given that the patient has not worn a denture previously.

These options need to be discussed with the patient's carers/family and medical team. None of the options are risk free. As the patient is cognitively impaired, he may not be competent to give consent for treatment, and suitable arrangements for this need to be considered and applied appropriately. The final decision will be collectively agreed with carers.

Relevance of commonly prescribed medications to dental care

In all patients, it is vital to take a comprehensive social and medical history.

Table 1: The Canadian Study of Health and Aging dependency framework (adapted from 'Oral health: caring for older adults', FDI, 2019).

LEVEL OF DEPENDENCY	DEFINITION
No dependency: CSHA levels 1 and 2	Robust people who exercise regularly and are the most fit group for their age.
Pre-dependency: CSHA level 3	People with chronic systemic conditions that could impact oral health but, at the point of presentation, are not currently impacting oral health. A comorbidity whose symptoms are well controlled.
Low dependency: CSHA level 4	People with identified chronic conditions that are affecting oral health but who currently receive or do not require help to access dental services or maintain oral health. These patients are not entirely dependent, but their disease symptoms are affecting them.
Medium dependency: CSHA level 5	People with an identified chronic systemic condition that currently impacts their oral health and who receive or do not require help to access dental services or maintain oral health. This category includes patients who demand to be seen at home or who do not have transport to a dental clinic.
High dependency: CSHA levels 6 and 7	People who have complex medical problems preventing them from moving to receive dental care at a dental clinic. They differ from patients categorised in medium dependency because they cannot be moved and must be seen at home.

FIGURE 1: 81-year-old medically compromised male, high level of periodontal disease and missing teeth.

FIGURE 2: 68-year-old patient with a history of prolonged bisphosphonate medication. She had dental extractions in the right maxilla, and the extraction sites have failed to heal after two months. Note the exposed necrotic bone.

This includes accurate details of any medications the patient may be taking. Bear in mind that some older patients may be cognitively impaired and not fully aware of what medications they are taking and the dosage. In such cases, contacting the patient's general medical practitioner is advised.
Many older patients at risk of cardiovascular disease take medications that compromise the pathways that control bleeding. These include:

- anticoagulants, e.g., warfarin (Coumadin), and novel anticoagulants/direct oral anticoagulants (DOACs), e.g., rivaroxaban (Xarelto) and dabigatran (Pradaxa); and,
- medications that interfere with aggregation of blood platelets, e.g., clopidogrel (Plavix) or aspirin.

Patients likely to be taking these medications include those with a history of:

- stroke/cerebrovascular accident;
- myocardial Infarction;
- ischaemic heart disease;
- heart valve surgery; and,
- renal dialysis.

This is particularly relevant if planning surgical procedures such as dental extractions. Care must also be exercised when administering inferior dental block anaesthesia, as the risk of haematoma is elevated when administering the anaesthetic.

Table 2: Precautions when planning surgical care in patients taking anticoagulant, antiplatelet, bisphosphonate or anti-angiogenic medications.

MEDICATION	RISK	RISK MANAGEMENT
Vitamin K antagonist, direct oral anticoagulant (e.g., warfarin, apixaban) Anti-platelet (e.g., clopidogrel)	Prolonged bleeding, haematoma Higher risk of prolonged bleeding with multiple extractions, surgical extractions, implant surgery	■ Check INR 24 hours before surgical procedure ■ INR >4: try to delay treatment, liaise with medical practitioner to alter medications and reduce INR ■ INR between 2 and 4: low risk of prolonged post-surgical bleeding, careful technique, monitor; no need to stop medications ■ INR 2 or less: very low risk of prolonged post-surgical bleeding; no need to stop medications
Bisphosphonate (e.g., Fosamax, Actonel, Boniva, Zometa, Aredia) Denusomab (e.g., Prolia, Xgeva) Bevacimuzab (e.g., Avastin)	Osteonecrosis of the jaw	**Non-malignant disease/osteoporosis** ■ <5 years' duration of intake: lower risk of MRONJ, surgical procedure can be done with care ■ ≥5 years' duration of intake: higher risk of MRONJ, avoid surgery if possible; if not, atraumatic surgical technique and primary closure **Malignant disease** ■ High risk of MRONJ; avoid surgery ■ Check time of most recent dose; risk level drops if the drug used has a short half-life

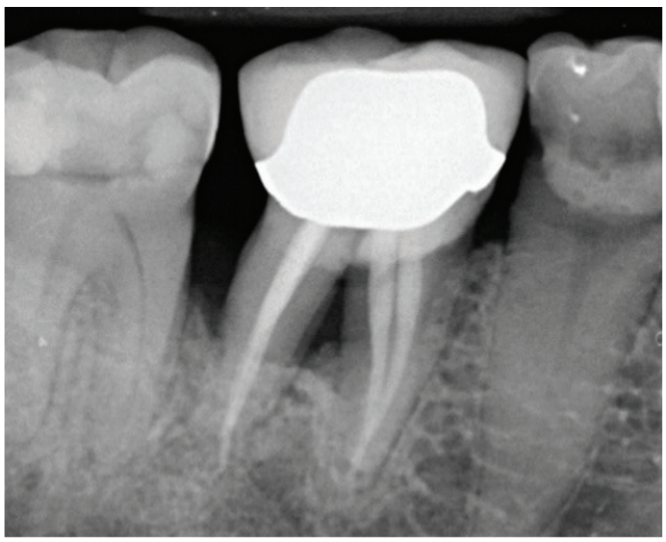

FIGURE 3a (left): Pre-treatment radiograph of 46 with full coverage crown in situ – significant bone loss associated with chronic periodontal disease.
FIGURE 3b (right): Tooth has been restored with a direct composite resin restoration retained on a fibre-reinforced composite resin post.

The risk of prolonged bleeding is elevated in cases of more invasive procedures (e.g., multiple extractions, elevation of mucoperiosteal flaps, placing of dental implants), than more minor procedures (e.g., uncomplicated single extractions). If the patient is only taking this medication (e.g., heparin) in the short term, it is sensible to delay surgical procedures for a period of time after the patient stops taking the medications and their blood clotting returns to normal (as measured by the international normalised ratio (INR)). In cases where the medication is being taken long term, then it is recommended to liaise with the patient's medical team.

The patient should not be asked to stop their medication without guidance, and this should only be considered if there is a high risk of bleeding with invasive surgical procedures, e.g., surgical extraction. Warfarin, which is a vitamin K antagonist, has a five- to seven-day half-life, whereas the active life of DOAC medications is much shorter. Accordingly, if required, the timeframe between stopping the medication and undertaking an invasive

surgical procedure will be longer if the patient is taking warfarin. Details of risk management when surgical treatment is needed are given in **Table 2**.

Medication-related osteonecrosis of the jaw (MRONJ)

Medication-related osteonecrosis of the jaw (MRONJ) is the term used to describe the failure of bone to heal post surgical procedures, and such a diagnosis is made when healing of bone post surgery is delayed for more than eight weeks **(Figure 2**). It can be a very difficult condition to manage, as removal of necrotic bone may result in a new cycle of adjacent bone becoming necrotic. MRONJ is associated with drugs taken to manage /prevent bone metastases related to malignant disease and osteoporosis (**Table 2**). These drugs impede osteoclasts and vary significantly in duration of action, with the bisphosphonate family of drugs (e.g., Fosamax) having a half-life of 10 years, and antiresorptive monoclonal antibodies (e.g., Prolia) having a half-life of approximately six months. The clinician needs to determine how long the patient has been taking one of these medications and, if the patient is no longer taking the medication, how long ago was the most recent dose. In this regard, the family of drug is important, as the risk of MRONJ is less if the drug taken has a short half-life. The clinician needs to be aware of the risk when planning dental care, and take steps to mitigate this risk depending on the risk stratification of the patient. This includes:

- avoiding surgical procedures if possible – retaining structurally compromised teeth or roots that are not infected; or,
- f it is not possible to avoid surgical procedures, then:

– improve oral hygiene before the surgical procedure;
– antibacterial mouthwashes before the procedure;
– atraumatic surgical technique; and,
– surgical wound closure to cover exposed bone.

There is a dose-related risk, and the likelihood of MRONJ is approximately 100 times higher in patients taking high-dose medications for treatment of malignant disease than in patients taking medications for managing/preventing osteoporosis. This is because the doses are much higher and taken more frequently when used to manage malignant disease (e.g., multiple myeloma, prostate, breast, lung and kidney malignant tumours). Furthermore, they may also be taking a glucocorticoid, which is thought to further increase the risk of MRONJ.

The mode of administration of the drug, i.e., oral or intravenous, does not appear to influence the risk of MRONJ. Where patients are taking these drugs for management of osteoporosis, there is a chance that they will be taking the drugs over a prolonged period of time. Current guidelines suggest that risk levels for MRONJ with bisphosphonates rise if they are taken continuously for five or more years.

In cases with a high risk of developing MRONJ, preserving a compromised tooth is preferable to extraction. **Figures 3a** and **3b** show an elderly male patient who has been taking bisphosphonate medication for more than five years. His mandibular right first molar (46) had been endodontically treated and restored with full coverage porcelain fused to metal crown some years previously.

This tooth had fractured with loss of the crown, and the prognosis for a replacement was limited due to loss of tooth structure. His medical history indicated that extraction of this tooth posed a high risk of MRONJ. Accordingly, a conservative approach to management was taken and the tooth was restored with a directly placed composite resin retained on a fibre-reinforced composite resin post. This restoration is still in place some three years after placement, and he continues to be reviewed.

References/further reading

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