Bwrdd Iechyd Cwm Taf Health Board | Bwrdd Iechyd Aneurin Bevan Health Board | Bwrdd Iechyd Prifysgol Caerdydd a'r Fro Cardiff and Vale University Health Board

Managed Clinical Network – Special Care Dentistry
South East Wales

Care Pathway for Adult Oncology Patients requiring Dental Care

Version 1
January 2021

Planning and delivery of Special Care Dentistry is underpinned by legislation, most notably the Equality Act 2010[1].

Author
Grace Kelly
Senior Lecturer/Honorary Consultant Special Care Dentistry
Cardiff & Vale University Health Board

Support from South East Wales SCD MCN members

This guidance document will be reviewed in 2023

Contents

1. Introduction

Cancer therapy, including chemotherapy, stem cell transplantation and radiotherapy, can increase risk with regards to provision of dental treatment and maintaining good oral health, secondary to their therapy. It is imperative people receiving or having received cancer therapy are treated safely and in the appropriate dental setting, to avoid unnecessary systemic risks of infection and/or bleeding associated with their dentition.

Providing appropriate and timely dental treatment requires multi-disciplinary working between the patient, dental teams and their medical team, including oncologists and haematologists.

Dental care should focus on evidence-based preventive plans and high quality dental treatment to ensure patients experience minimal treatment needs. By making patients aware of how to prevent oral health problems, this may reduce the need for invasive dental treatment and associated health risks.

2. Aim

- To outline the care pathway which exists for the expedient and safe dental care of patients awaiting, undergoing or having completed oncology treatment (excluding head and neck cancer, as a dental restorative care pathway currently exists in South-East Wales)
- To promote preventive oral care and
- To reduce oral infection risk and deterioration of oral health for people having or who have had oncology treatment

3. Scope

All dentists and dental care professionals (DCPs) in South East Wales need to have a good understanding and appreciation of the effect of oncology care on dental care provision, to support quality and effective decision making leading to the best possible patient outcomes. It requires multi-disciplinary working with general medical practitioners (GMPs), oncology and haematology team, involved in the patients overall care.

The *Cancer Delivery Plan for Wales 2016-2020* reports new cases of cancer have risen on average by 1.5% per year since 2009. In 2017, there were almost 19,000 new cases, with the incidence in South East Wales illustrated in Table 1. However, survival rates continue to

improve and premature mortality (people dying before 75 year of age) from cancer has fallen by around 14% in the last ten years[1].

In Wales in 2017, the most common cancers, in terms of numbers, were female breast cancer, prostate, lung and bowel cancer[3]. Prostate, bowel, female breast, melanoma and lung cancer had the largest increases in numbers over 10 years (Welsh Cancer Intelligence & Surveillance Unit 2015), with lung cancer causing the largest number of deaths by cancer in Wales. Haematological cancers comprise 15% of all patients with cancer.

Table 1: New cancer cases diagnosed in Wales 2013 and 2017 (WCISU 2021)

Commented [v1]: the numbers for SE Wales who require chemotherapy on an annual basis

Health Board	2013	2017
Aneurin Bevan UHB	3716	3375
Cardiff & Vale UHB	2544	2559
Cwm Taf UHB	2717	2741

Table 2: Haem-oncology incidence in Wales 2017 (WCISU 2021)

Health Board	Non-Hodgkins	Hodgkin lymphoma	Myeloma	CLL	AML	CML	ALL
Aneurin Bevan UHB	104	14	46	28	30	8	6
Cardiff & Vale UHB	84	9	30	17	23	6	4
Cwm Taf UHB	106	8	34	12	32	6	2

3.1 Cancer Services

The Cancer Delivery plan for Wales was developed by Wales Cancer Network and the South East Wales Cancer Network was established.
There are cancer centres in:

Haematology Cancer Service, University Hospital of Wales: 02920-745442
Acute Oncology Services, UHW:
Llandough Hospital: 02920- 711711
Velindre Cancer Centre: 02920-615888
Royal Gwent Hospital, Newport:
Acute Oncology Service, Newport:
Nevill Hall:
Prince Charles Hospital, Merthyr:
Royal Glamorgan Hospital:

Velindre cancer centre provides radiotherapy and more specialised cancer therapies for all of South Wales.

There are Cancer Lead Clinicians in each SE Wales Health Board and Multidisciplinary Team (MDT) meetings are held weekly, including a Lead Clinician, co-ordinator/secretary, surgeon,

oncologist, radiologist, histopathologist, Clinical Nurse Specialist and Specialist Palliative Care Nurse.

The nurse specialist is the link between the MDT, the patient and their general medical practitioner, and can arrange dental referrals.

With increases in demand and the national recommendation that no patient is waiting longer than 62 days from the point cancer is suspected to the start of treatment (Welsh Cancer Network 2016), timeliness of care is crucial. It further requires: *"Cancer surgery services should be configured in a way that enables the highest standard of multidisciplinary care and outcome*."

In December 2015, 83.7% of patients diagnosed with cancer, via the urgent suspected cancer route, started definitive treatment **within 62 days** of receipt of the referral, with 97.5% of patients newly diagnosed with cancer, not via the urgent route starting definitive treatment **within 31 days** of decision to treat (Cancer Research UK 2016).

Table 3 shows the percentage of patients who started definitive treatment **within 62 days** of first suspicion of cancer via the single cancer pathway in South East Wales, with the ambition this waiting time is improved to 95% (Cancer Research UK 2020).

Table 3: Patients in SE Wales starting definitive cancer treatment within 62 days:

Health Board	2020
Aneurin Bevan UHB	72.7%
Cardiff & Vale UHB	79.7%
Cwm Taf UHB	69.7%

3.2 Chemotherapy

Chemotherapy has a wide variety of application including:

- The main treatment for cancers, including lymphomas and leukaemias
- In high doses, for stem cell or bone marrow transplant
- Before surgery or radiotherapy to reduce cancer size (neo-adjuvant chemotherapy)
- After surgery or radiotherapy to reduce the risk of cancer returning (adjuvant chemotherapy)
- With radiotherapy, to improve its effect (chemoradiation)
- To treat cancer spread into surrounding areas (locally advanced) or to other parts of the body (advanced).
- Palliatively, to relieve symptoms.

These include: cytotoxic drugs, immunomodulators, biological therapies, hormonal therapies, bisphosphonates and other bone metabolism therapies. The UK Medicines Information provides an appendix of cancer drug treatments (Appendix 1).

People undergoing chemotherapy with cytotoxic drugs often experience impairment of bone marrow function, suppressing formation of white blood cells, red blood cells and platelets (myelosuppression). Frequently, all blood cells are affected resulting in neutropenia,

thrombocytopenia and less frequently anaemia. This damage to the blood cells and immunosuppression commonly result in oral complications including infections, bleeding and anaemia-related oral manifestations.

Some biological therapies also cause myelosuppression, however hormone therapies and bisphosphonates are unlikely to affect blood cells.

All cytotoxic drugs, except vincristine and bleomycin cause bone marrow suppression, usually 7-10 days after administration but can be delayed for certain drugs, e.g. carmustine, lomustine and melphalan (UKMI 2016).
White cell count usually recovers within 14-26 days (UKMI 2016).

3.3 Oral effects of chemotherapy

Chemotherapy has direct and indirect effects on oral tissues including dry mouth, mucositis and altered taste.

Oral complications differ in their timing and duration with some early complications, while some develop later following cancer treatment and are common and estimated to affect 80% of patients. These oral complications have a significant impact on the patient's oral function, including the basic need to eat, drink or speak.

Pain is often associated with oral complications and may lead to increased need for systemic analgesia, increased length of stay at hospital and an increased risk for life-threatening systemic infections and may lead to impaired health-related quality of life.

3.4 Stem cell transplantation

Total body irradiation before stem cell or bone marrow transplantation, can cause thrombocytopenia (low platelet count) or neutropenia (low white cell count) and this can increase risk of bleeding if platelets are less than $100x10^9$/L or neutrophils are less than $1x10^9$/L.

Surgical procedures need to be planned with the haematology team, especially if platelets are lower than $50x10^9$ or neutrophils are less than $1x10^9$/L, as bleeding and infection risk are serious.

The infection risk for people who had stem cell or bone marrow transplantation may last for up to one year post treatment, even if blood counts are normal.

4. Objectives

- To identify people diagnosed with cancer (excluding head and neck cancer), who would benefit from early referral to oral healthcare, who require oncology treatment with chemotherapy or stem cell transplantation.
- To support the delivery of safe, high quality, patient-centred care, which encourages a system of robust and transparent quality assurance and the appropriate use of resources and encourages the use of a variety of service providers across dental services, including general dental practices (GDS), community dental services (CDS) and hospital dental services (HDS) in South East Wales.
- Development of clinical guidelines for provision of safe and appropriate dental care for adults requiring oncology care.

5. Criteria

The majority of dental treatment for oncology patients should be delivered, wherever possible and safe to do so, within the General Dental Services (GDS).
The Community Dental Service (CDS) and / or Hospital Dental Service (HDS) can offer care to patients, who because of their current condition, would not be suitable for treatment in the GDS.
Dental treatment is provided with close liaison with the patient's oncology team.

When a patient is diagnosed, the oncology team or GMP should ensure the patient is given oral health promotion and dental advice, including the need for a dental pre-assessment to identify and remove potential foci of infection.

5.1 Referral eligibility

There are a variety of clinical circumstances that may indicate the need for dental care, including those:

- With a diagnosis of a malignant disorder, awaiting chemotherapy or stem cell transplantation and can be subdivided into community out-patients and those currently in hospital
- Under the care of oncology team, requiring urgent dental treatment
- Post-oncology treatment requiring dental treatment

It is proposed the diagnosing clinician should give information to the patient indicating the need to visit the dentist, details of how to access dental services and a summary of instructions for dental care (Appendix 4).

The care pathway excludes cancer of the lip, oral cavity and pharynx, as these are covered under the Oral and Maxillofacial Care / Restorative Head and Neck Cancer Care Pathways and only includes patients who have been diagnosed with another malignant disorder.

6. Managing Dental referrals

New e-referral systems are in place for use for dental referring in Wales.

As part of the dental referral describing the reason for referral, the medical team need to:

- Highlight the underlying cancer diagnosis
- Provide details of cancer treatment proposed and
- Make the dental team aware of dental issues the oncology or medical teams consider important to address prior to cancer therapy.

Patients should be referred initially to primary care dental services or their own general dental practitioner for dental pre-assessment, prior to cancer treatment, by their general medical practitioner or oncology team, including those requiring:

1. Chemotherapy
2. Radiotherapy to the head and neck
3. Stem cell or bone marrow transplantation
4. Cancer therapy using bisphosphonates, anti-resorptive or anti-angiogenic drugs

Those who are accepted include those who:

- Have a general medical practitioner in South Wales
- Have a postcode in South Wales
- Are under the care of a haematologist/oncologist

Access to primary care dental services in South East Wales can be challenging. Primary care clusters and NCNs in Wales, include GMPs and other health care professionals including dentists, who have a role to support establishing these networks and supporting the development of this care pathway, including working in partnership with the MCN and Health Education and Improvement Wales to develop educational programmes and updates for GDPs.
Referrals should be made directly to their general dental practitioner or through the dental emergency service in their local Health Board, through the 111 NHS Wales Service or the NHS Dental Helpline:

- **Aneurin Bevan HB:** 01633-744387
- **Cardiff & Vale HB:** 029 20444550
- **Cwm Taf HB**: 01443-680166 or 01685-351325
- **Abertawe Bro Morgannwg UHB:** NHS 111
- **Hywel Dda UHB:** 0845 4647

Patients unsuitable for management in GDS for dental treatment include:

- Where a shared care approach required for safe management
- The individual dental practitioner's is not confident managing the patient
- Unsuitable for treatment, because of their current stage of oncology care

It is important to direct these patients to accessible dental care in the Community Dental Services in their Local Health Board for dental assessment and management, through a central triage point:

Aneurin Bevan UHB: 01633-623728
Cardiff and Vale University HB: 02920 190175
Cwm Taf UHB: 01685-351000
Abertawe Bro Morgannwg UHB: 01792 517838
Hywel Dda UHB: Pembrokeshire (01437 774274) Carmarthenshire (01554 784700) or Ceredigion (01970 627470).

Dental E-referral forms are accessible for GDPs wishing to refer these patients for treatment in the Community Dental Service at the following link: https://www.dental-referrals.nhs.wales/dentists/

A locally agreed special care dentistry referral form for the Community Dental Service has been developed for use for dental referrals by general medical practitioners, oncology and haematology teams to use to arrange dental assessments for oncology patients and will be available on the Special Care Dentistry website for South East Wales (Appendix 2), at the following web page:
http://www.wales.nhs.uk/ourservices/findannhsdentist/communitydentalservices/southeastwalesspecialcaredentistry.

6.2 Urgent Referrals of oncology out-patients

In cases where patients need to be assessed urgently or have dental pain and/or infection, without a dental practitioner, who need a dental pre-assessment, it is important to direct these patients to Community Dental Services in their local Health Board, through a central triage point:

Aneurin Bevan UHB: 01633-623728
Cardiff and Vale University HB: 02920 190175
Cwm Taf UHB: 01685-351000
Abertawe Bro Morgannwg UHB: 01792 517838
Hywel Dda UHB: Pembrokeshire (01437 774274) Carmarthenshire (01554 784700) or Ceredigion (01970 627470).

6.3 Referrals of oncology in-patients

Referrals are dependent on whether the patient can leave the ward for dental assessment or require assessment on the ward. Patients should be referred initially to the Hospital Dental Service in Cardiff:

- Referrals should be made directly by the oncology/haematology team or bone marrow transplant team to the HDS, by telephone, to allow the nurse administrator in the HDS

to complete a referral checklist and arrange an appropriate dental pre-assessment appointment by telephone at: **02920-742415**.

Cwm Taf oncology patients?
Aneurin Bevan oncology patients?

7. Dental Treatment of Oncology Patients

7.1 Dental Treatment Pre-Chemotherapy

7.1.1 Pre-assessment

A thorough dental and radiographic examination is important, prior to initiating oncology treatment to eliminate any potential foci of infection. The frequency of dental-related infections during chemotherapy after pre-cancer dental assessment ranges from 0 to 4%[11].

7.1.2 Preventive advice

Patients should have a comprehensive prevention plan to facilitate good oral health. Good preventive treatment planning, early in the patient's diagnosis, will reduce the prevalence of dental disease and reduce the resultant risk of oral infection.
All interventions and recommendations should be based on evidence-based prevention as per the BASCD toolkit 'Delivering Better Oral Health: An evidence-based toolkit for prevention[10].
Prevention advice and interventions can be provided by dentists and Dental Care Professionals.

The use of 0.12% chlorhexidine 3–4 weeks prior to head and neck radiation found significant reduction in plaque index at 6 months and the use of 0.2% chlorhexidine mouth rinse twice daily started 1 week prior to, and for 1 month following stem cell transplantation resulted in significant improvement of gingival index[11].

Good oral hygiene is important during chemotherapy. Recommended prevention routines include:

- Tooth brushing 2-3 times daily using a soft or ultra-soft toothbrush. Replace toothbrush between cycles of neutropenia.
- Prescription of high fluoride toothpaste (5000 ppm sodium fluoride), twice daily, especially if increased caries risk is anticipated.
- Non-mint toothpaste (e.g. Oranurse) or SLS-free toothpaste may be indicated, if mucosal irritation occurs.
- Good denture hygiene

7.1.3 Dental treatment prior to oncology treatment

The extent of dental treatment provided will depend on the time available prior to initiating oncology treatment (Table 4). Ideally, all dental treatment required should be completed, if there is sufficient time. Dental and oral infections need to be eliminated 10 days before initiating cancer therapy.

Treatment choice often depends on whether the patient is immunosuppressed or at risk of bleeding.

Obtain the patient's blood test results taken within the last 48 hours and liaise directly with the patient's oncology or haematology team whether treatment in primary care is suitable or if special precautions are needed.

If there is insufficient time for comprehensive dental treatment, prior to initiating oncology treatment, the following treatments are **indicated**[11]:

Extraction of:

- **Partially erupted third molars, with purulent pericoronitis**
- **Teeth with probing depth > or equal to 8 mm**
- **Teeth with Grade 3 mobility**
- **Symptomatic apical periodontitis or periapical lesions of > or equal to 5 mm**
- **Exposed traumatic sharp roots**

Additionally, it is important to consider eliminating potential sources of intra-oral trauma such as ill-fitting dentures, orthodontic appliances and rough restorations. Elective additional dental needs can be addressed after chemotherapy is completed.

Table 4: Dental treatment, depending on time, prior to oncology treatment (Hong et al. 2018)

Protocol Type Dental Pathology	Complete [19–21]	Partial [24–27]	Minimal/incomplete dental evaluation and/ or treatment protocols/not cleared [16, 18]
Caries	Restore all teeth	Mild/ moderate caries were restored if time permitted; otherwise these lesions were left alone and observed.	Intervention only if symptomatic
Severe Caries/ Pulp involvement/Dental abscess	Root canal treatment OR Extract		
Apical periodontitis	• Retreat • Apicoectomy • Extract	• Symptomatic lesions and lesions ≥5 mm were treated • Asymptomatic lesions and lesions <5 mm were observed	
Advanced periodontal disease	Extract teeth with • probing depth ≥ 6 mm • furcation I, II, III	Extract teeth with • probing depth ≥ 8 mm • mobility III • severe inflammation	
Mobile primary teeth	Extract teeth with >50% root resorption	Extract teeth with severe mobility and expected to exfoliate within a few weeks.	
Partially erupted third molars	Extract	• Asymptomatic teeth were observed • Partially erupted third molars with purulence of pericoronitis were extracted.	

7.1.4 Report for oncology or haematology team

Once dental treatment is completed, the dental team should complete a letter to the referring practitioner, to avoid delaying their cancer treatment. A sample report is in Appendix 3.
The information should include:

- The current state of the patients oral/dental health
- Any acute or chronic issues
- Proposed treatment to achieve better oral/dental health on understanding the medical team's needs
- A realistic timescale for dental treatment to be undertaken
- Possible future dental concerns
- Advice regarding post cancer treatment dental maintenance
- Details of proposed dental treatment the patient refused to consent to
- Any other concerns about their dental health important to share with medical team

7.2 Dental Treatment during chemotherapy:

Do not provide invasive or emergency dental treatment in primary dental care, without getting advice from the patient's oncology or haematology team, as there is a risk of systemic infection or bleeding if the patient:

- is currently receiving chemotherapy or radiotherapy to head or neck,
- received chemotherapy or radiotherapy to head or neck in the previous six months,
- had a stem cell/bone marrow transplant in the last six months, or
- has symptoms of neutropenic sepsis[8]

Infections should be managed aggressively with close monitoring.
If patients present with dental infection and is unwell, the dental team should suspect neutropenic sepsis and contact the oncology/haematology team urgently, and immediately refer to secondary or specialist dental services.

Symptoms of neutropenic sepsis include:

- fever or low body temperature,
- chills,
- rapid heart rate,
- increased respiratory rate,
- diarrhoea, vomiting, nausea,
- dizziness,
- slurred speech,
- disorientation or
- cold, clammy skin.

7.2.1 Biological therapies or hormonal treatments only

General dental practitioners should liaise with their oncology and/or haematology teams prior to providing emergency dental treatment, as invasive dental treatment may be safe to provide in primary dental services.

7.2.2 Oral mucositis

This inflammation and ulceration of oral mucosa can begin 5-10 days after chemotherapy starts, 2 weeks after radiotherapy starts and 1 week after bone marrow transplantation (UKMI 2016).
It usually resolves 3-4 weeks after chemotherapy ends or 6-8 weeks after radiotherapy.
It can impair the ability to eat, taste and swallow. Taste alterations can last weeks to months (UKMI 2016).

Topical agents and nociceptive analgesic recommended include:

- Topical analgesia/anaesthesia – 0.5% benzydamine hydrochloride 0.15% mouthwash or spray, if pain associated with mucositis or oral ulceration
- Use of 0.12-0.2% chlorhexidine mouthwash/gel or spray up to twice daily (alcohol-free and unflavoured preferable)
- Frequent rinsing salty water and/or baking soda rinse (0.9 % saline and/or 0.5 % sodium bicarbonate solution)

Nonpharmacologic modalities including low-level laser therapy, relaxation/imaginary techniques, hypnosis to relieve pain can be used adjunctively.

Diets should be adjusted to the mucosal sensitivity level; avoiding crispy/rough foods, acidic, spicy and hot foods.

Oral ulceration can occur especially associated with alemtuzumab, doxorubicin, capecitabine, epirubicin, flurouracil, methotrexate, vincristine).

7.2.3 Dry mouth management

Xerostomia or dry mouth usually resolves 2 months after completion of chemotherapy but can be permanent after radiotherapy or bone marrow transplantation, which increases caries risk long-term. Preventive advice to provide patients include:

- Sipping or spraying water or saliva substitutes and mechanical-taste stimulants (chewing gum, sugar-free lozenges) and frequent bland rinses.
- Dry mouth spray or mouth-wash during day and gel during night as moisturizing effect of the more viscous gel lasts longer.
- Lip lubrication with lanolin- or cocoa butter-based lipsticks/creams rather than petroleum-based products.
- Prescription high fluoride toothpastes, and recommending sodium fluoride 225ppm mouth washes at an alternate time to tooth brushing
- Diet advice should include avoiding crispy/rough foods, acidic, spicy and hot foods.

7.3 Dental Treatment Post-chemotherapy:

Immediately post-chemotherapy, white cell counts are low and oral infections are common, including herpetic and candida infections. Anti-fungals and anti-viral agents may be indicated. Multidisciplinary management and liaison with oncology teams, if dental treatment is indicated, is necessary to reduce infection risks for patients.
Avoid invasive procedures in immunosuppressed patients, including creation of aerosols as risk of aspiration.
It is important to be aware of medications patients may be taking. High dose steroids can result in osteoporosis and resultant bisphosphonates and anti-resorptive drugs and anti-angiogenesis drugs (e.g. denosumab, bevacizumab, sunitinib) may increase risks of MRONJ.

7.3.1 Prevention

Dental prevention strategies should be continued, including denture hygiene, if applicable.
Xerostomia or dry mouth should be managed carefully and patients advised of the increased risk of caries. The use of chlorhexidine and tooth mousse should be considered.

Graft versus Host Disease is a common and serious complication for patients receiving allogenic stem cell transplantation. Side-effects include scleroderma and reduced mouth opening. Regular dental reviews are indicated, as there is an increased risk of squamous cell carcinomas at least yearly. Risk of Graft-versus-host disease (GvHD): topical treatments

7.3.2 Remission: stable blood and immune status

Non-invasive dental treatment may be provided in primary care to all patients with cancer. Elective dental treatment should be avoided for six months after a stem cell/bone marrow transplant[8]. If the patient received chemotherapy, radiotherapy to head or neck or had a stem cell/bone marrow transplant in the last six months, contact the patient's oncology or haematology team, before proceeding.

Invasive dental treatment may be provided in primary care without taking advice from a specialist to patients who are:

- currently receiving radiotherapy to areas other than head or neck, or
- received chemotherapy more than six months ago, or
- are receiving biological or hormonal therapies for their cancer.

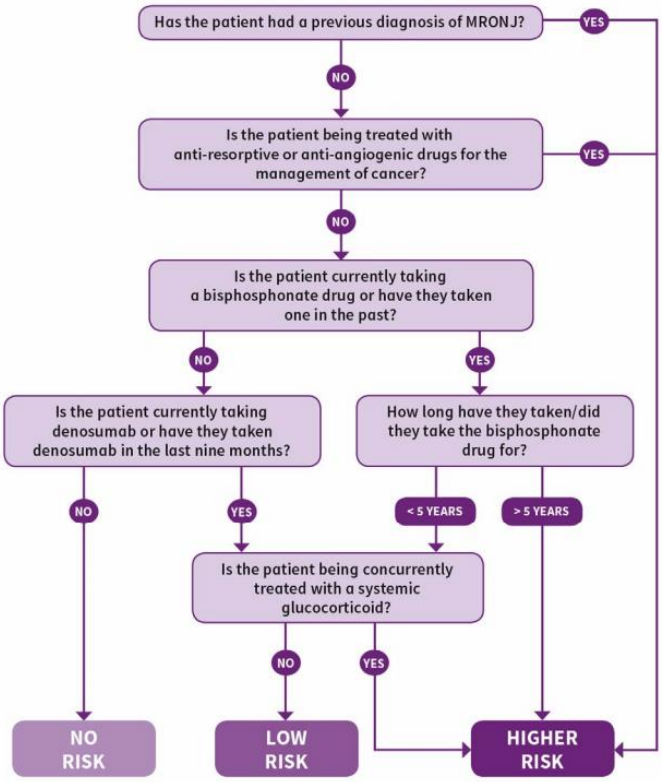
It is important to confirm with patients who have received chemotherapy more than six months ago, that their blood tests are normal, prior to providing invasive dental treatment. If patients are unsure, consult their oncology or haematology team. Additionally, it is important to confirm patients with blood cancer that they are in remission and blood tests are normal, prior to providing invasive dental treatment.

7.4 Medication-related osteonecrosis of Jaw

Some cancer treatment will involve the use of medications, which can increase patients' risk of developing medication-related osteonecrosis of the jaw (MRONJ), including bisphosphonate, denosumab or an anti-angiogenic drug.

It is important to discuss the risks and benefits of surgical procedures and the likelihood of the development of MRONJ, prior to undertaking these procedures. Figure 1 demonstrates the algorithm, produced by SDCEP (2017), to assess patient's risk of MRONJ, prior to undertaking invasive dental procedures, involving bony healing.

Figure 1: Algorithm to assess patient risk of MRONJ (SDCEP 2017)



Key points to manage these patients taking bisphosphonates, anti-resorptive or ant-angiogenic drugs[9]:

Low risk

Carry out all routine, non-invasive dental treatment, as normal, and continue to provide personalised preventive advice in primary care.

Perform straightforward extractions and other bone-impacting treatments in low risk patients in primary care. Do not prescribe antibiotic or antiseptic prophylaxis following extractions or other bone-impacting treatments specifically to reduce the risk of MRONJ. Review healing. If the extraction socket is not healed **at 8 weeks** and you suspect that the patient has MRONJ, refer to an oral surgery/special care dentistry specialist, as per local protocols.
If you suspect a patient has spontaneous MRONJ, refer to an oral surgery/special care dentistry specialist as per local protocols.

High risk

Adopt a more conservative approach in higher risk patients, giving greater consideration to other, less invasive alternative treatment options before performing extractions, e.g. root canal treatment, and other bone-impacting treatments in primary care. Consider consulting an oral surgery/special care dentistry specialist with regards to clinical assessment and treatment planning.

Do not prescribe antibiotic or antiseptic prophylaxis following extractions or other bone-impacting treatments specifically to reduce the risk of MRONJ.

8. Service user involvement

As part of the multi-disciplinary care pathway, patients will need to consent to referral to appropriate dental services.

For evaluation purposes, consultation and patient satisfaction surveys will be necessary to ensure regular continuing development and improvement of this care pathway.

9. Evaluation

The care pathway will need to be developed with oncology leads and nurse specialists to facilitate its use in each of the three Health Boards, within the South-East Wales managed clinical network to improve its efficacy and its continued development.
Training of general dental surgeons and general medical practitioners on managing and referring patients having or having had chemotherapy will need to be implemented.

10. References

1. *Together for Health: A National Oral Health Plan for Wales 2013-18*. http://www.wales.nhs.uk/documents/Together%20for%20Health%20NOHP%20-%20WG%2017977%20-%20%28English%29%20PDF%20WEB%20FINAL%20-%2015%2003%2013.pdf (Accessed 08.01.2017)
2. RCS/ British Society for Disability and Oral Health *The Oral Management of Oncology Patients Requiring Radiotherapy, Chemotherapy and / or Bone Marrow Transplantation Clinical Guidelines.* Navdeep Kumar (bsdh.org)
3. *Wales Cancer Network (2016) Cancer delivery plan for Wales 2016-2020.* 161114cancerplanen.pdf (wales.nhs.uk)
4. Cancer Research UK (2016) Where next for cancer services in Wales? An evaluation of priorities to improve patient care. https://www.cancerresearchuk.org/sites/default/files/cancer_services_in_wales_full_report.pdf (Accessed 25/4/2017)
5. Cancer Research UK (2020) Overview of cancer in Wales. aneurin_bevan_university_health_board_20200221.pdf (cancerresearchuk.org) cardiff_and_vale_university_health_board_20200221.pdf (cancerresearchuk.org) cwm_taf_university_health_board_20200221.pdf (cancerresearchuk.org) (Accessed 08/1/2021)
6. Elad S. et al (2015) Basic oral care for hematology–oncology patients and hematopoietic stem cell transplantation recipients: a position paper from the joint task force of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO) and the European Society for Blood and Marrow Transplantation (EBMT). *Support Care Cancer*; 23:223–236.
7. Welsh Cancer Intelligence and Surveillance Unit (WCISU) (2021) Cancer incidence in Wales , 2001-2017. WCISU Cancer incidence in Wales dashboard (shinyapps.io) (accessed 8.1.2021)
8. UK Medicines Information (2019) How should adults with cancer be managed by general dental practitioners if they need dental treatment? UKMi_QA_Cancer-in-dental-patients_update-Nov-2019.pdf (sps.nhs.uk)
9. Scottish Dental Clinical Effectiveness Programme (SDCEP) (2017). Oral Health Management of Patient at risk of medication-related osteonecrosis of the jaw. SDCEP-Oral-Health-Management-of-Patients-at-Risk-of-MRONJ-Guidance-full.pdf
10. Department of Health (BASCD). 2014. Delivering Better Oral Health. An Evidence-based toolkit for Prevention. British Association for the Study of Community Dentistry. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/367563/DBOHv32014OCTMainDocument_3.pdf (Accessed 8.1.2021).
11. Hong C. et al. (2018) A systematic review of dental disease management in cancer patients. Support Cancer Care. 26(1):155-174

Appendix 1: Cancer drug treatments (UKMi 2019)

* **Drugs associated with medication-related osteonecrosis of the jaw [see note below table]**
\# *Examples of systemic cancer treatment agents known to cause oral damage* [22]

Cytotoxic drugs or chemotherapy work by killing cancer cells [40]	
Alkylating drugs	Bendamustine, busulfan, carmustine, chlorambucil, chlormethine, cyclophosphamide, dacarbazine, estramustine, ifosfamide, *lomustine*#, *melphalan*#, streptozocin, temozolomide, *thiotepa*#, treosulfan
Anthracyclines & related drugs	*Daunorubicin*#, *daunorubicin with cytarabine*#, *doxorubicin*#, *epirubicin*#, *idarubicin*#, *mitoxantrone*#, pixantrone
Antimetabolites	Azacitidine, *capecitabine*#, cladribine, clofarabine, cytarabine, decitabine, fludarabine, *fluorouracil*#, gemcitabine, mercaptopurine, ***methotrexate****#, nelarabine, *pemetrexed*#, tegafur with gimeracil and oteracil, tioguanine, trifluridine with tipiracil
Cytotoxic antibiotics & related substances	Bleomycin, *mitomycin*#, *pentostatin*#
Platinum compounds	*Carboplatin*#, *cisplatin*#, *oxaliplatin*#
Taxanes	Cabazitaxel, *docetaxel*#, *paclitaxel*#
Topoisomerase I inhibitors	*Irinotecan*#, *topotecan*#
Vinca alkaloids	*Vinblastine*#, *vincristine*#, vindesine, vinflunine, *vinorelbine*#
Others	Amsacrine, arsenic, asparaginase, bexarotene, crisantaspase, dacarbazine, dexamethasone (high-dose – *Neofordex),* eribulin, *etoposide*#, hydroxycarbamide, mitotane, panobinostat, pegaspargase, porfimer, procarbazine, raltitrexed, temoporfin, temozolamide, trabectedin, tretinoin
Immunotherapies help the immune system recognise and attack cancer cells. Some immunotherapies are also called targeted treatments or biological therapies [41]	
Immunotherapies	Aldesleukin, axicabtagene ciloleucel, BCG, interferon, lenalidomide, mifamurtide, pomalidomide, talimogene laherparepvec, thalidomide, tisagenlecleucel
Monoclonal antibodies	Alemtuzumab, atezolizumab, avelumab, ***bevacizumab****#, blinatumomab, brentuximab, catumaxomab, cetuximab, daratumumab, dinutuximab, durvalumab, elotuzumab, *gemtuzumab*#, inotuzumab, ipilimumab, necitumumab, nivolumab, obinutuzumab, ofatumumab, olaratumab, panitumumab, pembrolizumab, *pertuzumab*#, ramucirumab, rituximab, siltuximab, *trastuzumab*#, *trastuzumab emtansine*#

Targeted cancer drugs work by 'targeting' differences in a cancer cell from a normal cell that helps it to survive and grow [42]	
Proteasome inhibitor	Bortezomib, carfilzomib, ixazomib
Protein kinase inhibitors	Afatinib, alectinib, axitinib, bosutinib, **cabozantinib***, ceritinib, cobimetinib, crizotinib, dabrafenib, dasatinib, *erlotinib*#, *everolimus*#, gefitinib, ibrutinib, idelalisib, imatinib, lapatinib, lenvatinib, midostaurin, nilotinib, nintedanib, osimertinib, palbociclib, *pazopanib*#, ponatinib, regorafenib, ribociclib, ruxolitinib, ***sorafenib****#, ***sunitinib****#, *temsirolimus*#, tivozanib, trametinib, vandetanib, vemurafenib
Other	**Aflibercept***, niraparib, olaparib, rucaparib, venetoclax, vismodegib

Hormone therapies block or lower the amount of hormones in the body to stop or slow down the growth of cancer [43]	
Anti-androgens	Abiraterone, bicalutamide, cyproterone, enzalutamide, flutamide
Anti-gonadotrophin-releasing hormones	Degarelix
Anti-oestrogens	Fulvestrant, tamoxifen, toremifene
Aromatase inhibitors	Anastrozole, exemestane, letrozole
Gonadotrophin-releasing hormones	Buserelin, goserelin, leuprorelin, triptorelin
Oestrogens	Diethylstilbestrol
Progestogens	Megestrol
Somatostatin analogues	Lanreotide, octreotide, pasireotide
Bisphosphonates and other bone metabolism therapies prevent or slow down bone thinning (osteoporosis) and/or treat some types of cancer that cause bone damage [44, 45]	
Oral	**Alendronic acid*, clodronate*, etidronate*, ibandronic acid*, risedronate***
Intravenous	**Ibandronic acid*, pamidronate*, zoledronic acid***
Monoclonal antibody	**Denosumab***
Other drugs used in patients with cancer	
Granulocyte-colony stimulating factors	Filgrastim, lenograstim, lipegfilgrastim, pegfilgrastim
Immunosuppressants	Antithymocyte immunoglobulin (rabbit), azathioprine, basiliximab, belatacept, belimumab, canakinumab, ciclosporin, mycophenolate, sirolimus, tacrolimus

List of drugs in the table is compiled from the BNF and electronic Medicines Compendium. Drugs associated with medication-related osteonecrosis of the jaw have been identified from the electronic Medicines Compendium.

Appendix 2: Community Dental Service Referral Form from General Medical Practitioners, Oncology/Haematology or Bone marrow transplant teams

PATIENT DETAILS (Elliot label)				Name of Referrer/stamp Contact details, including telephone number
Name:				
DOB:		Gender		
Address:				
Postcode:				
Tel No:				
Carer/Next of Kin:	Name:			
	Address:			
	Postcode:	Tel No:		

NATURE OF DENTAL PROBLEM	
URGENT ❑ Routine ❑	Dental Assessment ❑ Toothache/pain ❑ Other ❑ (Specify) _____

CRITERIA FOR REFERRAL

- ❑ Malignant disorder, awaiting chemotherapy
- ❑ Malignant disorder, awaiting stem cell/bone marrow transplant
- ❑Cancer treatment involves bisphosphonates, anti-resorptive, anti-angiogenic medication
- ❑ Post-oncology treatment, requiring invasive dental treatment

Other medical history and medication

Cancer diagnosis, if known:

COMMUNICATION

Verbal ❑ Limited ❑ No Communication ❑

MOBILITY

Mobile ❑ Walking frame ❑ Wheelchair ❑ Housebound ❑

Referrer's signature		Date	
Referred to Office use only			

Appendix 3: Dental assessment report

Re: Patient Details:

Date:.....

Thank you for referring this patient for a pre-operative dental assessment, prior to oncology treatment.

I have examined the patient, both clinically and radiographically, and:

- ☐ Appropriate oral condition for surgery. No dental treatment is required
- ☐ Potential oral focus infection evident. Dental treatment required.

Dental findings and treatment required include:

- ☐ This treatment plan is completed / can be completed (circle appropriate) by DATE:.....
- ☐ The patient refused this course of dental treatment

Details of refused treatment and future dental concerns:

I would appreciate your advice, after completion of their cancer therapy, on any precautions necessary for their post-operative dental care.

Yours sincerely,

DENTIST SIGNATURE……

CONTACT TELEPHONE..... PRACTICE STAMP:

Appendix 4: Patient Information

IMPORTANT

Patient Name & Address:
Oncologist/Haematologist Name & Contact Details:

Abscesses or gum infections can spread to your blood causing infections or sepsis during chemotherapy or following bone marrow or stem cell transplantation. It is important you have a dental check-up and any infected teeth are removed, before you initiate cancer treatment.

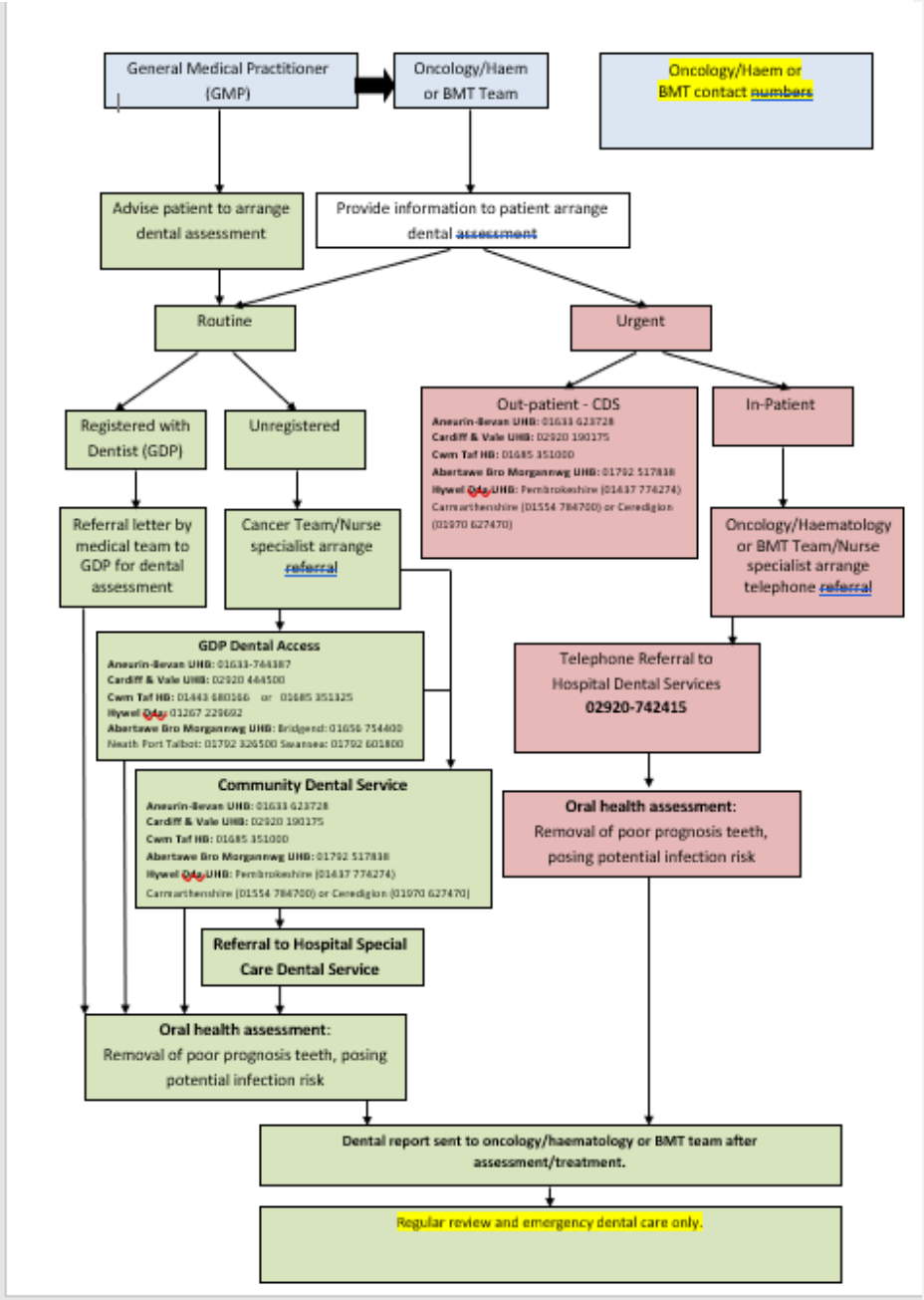
If you have a dentist, you should book an appointment as soon as possible before any cancer treatment and show this card.

If you do not have a dentist, you can contact NHS General Dental Practice Access**:**
Aneurin-Bevan UHB: 01633-744387 **Cardiff & Vale UHB:** 02920 444500
Cwm Taf HB: 01443-680166 or 01685-351325 **Hywel Dda:** 01267 229692
Abertawe Bro Morgannwg UHB: Bridgend: 01656 754400 Neath Port Talbot: 01792 326500
Swansea: 01792 601800

Practical Oral Care

	Notes
1. Tooth brushing	Use a medium, small headed brush, to brush teeth and gums, at least twice daily. Use 1450ppm sodium fluoride toothpaste. Spit out excess toothpaste, do not rinse.
2. Aqueous alcohol-free chlorhexidine gluconate mouthwash 0.2%	Recommended for short term use, if tooth brushing is inadequate. Rinse twice daily, with 10ml for 1 minute at an alternative time to tooth brushing.
3. Fluoride mouthwash 0.05% sodium fluoride	Use mouthwash additionally, at an alternate time to tooth brushing. Ask your dentist if you need high fluoride toothpaste prescribed or fluoride varnish applications.
4. Dietary advice	Try to choose healthy meal and snacks. Sugary food and drinks can decay your teeth. Have them at mealtimes only and avoid at night and in between meals.

Appendix 5: Dental Care pathway for Adults Oncology Patients requiring Dental Care



Notes:

Rebecca Bailey – H+N nurse specialist;

Oncology nurse specialist – Sherri Thompson

Velindre – no chemotherapy pt/yr (excl H+N)

No haem oncology pt/yr

Oncology acute services – key person

Dental sepsis/annum – dental referral during chemotherapy

Contact no's oncology and CDS/HDS