HAEMATOLOGY AND DENTISTRY 2:

IMMUNOCOMPROMISE (WBC) AND HAEMATOLOGICAL MALIGNANCIES

2026 DMD3 DENT5311 – Integrated Dental Practice 2 (Special Needs Dentistry)

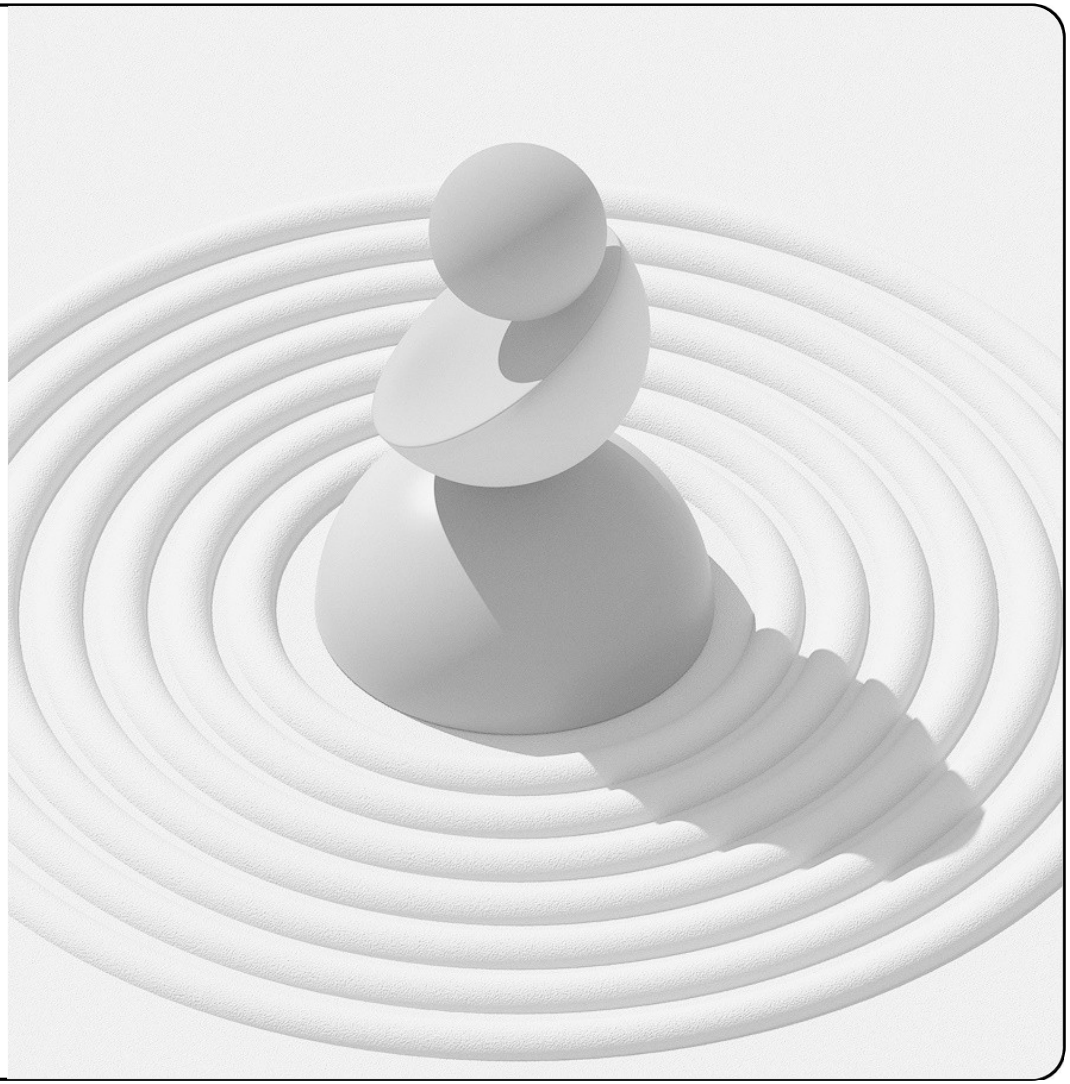
Dr Jee-Yun Leung *BDSc(Hons) MSc(SCD) DSCD(RCSEng) DClinDent(SND) MRACDS(SND)*

LECTURE OUTCOMES

1. Review the role of WBCs, systemic disorders and treatments which affect their structure and function, and general management

2. Review the oral manifestations of disorders of WBCs

3. Risk assess the implications of WBC disorders, and the treatment modifications required, when planning dental procedures



WHITE CELL DISORDERS

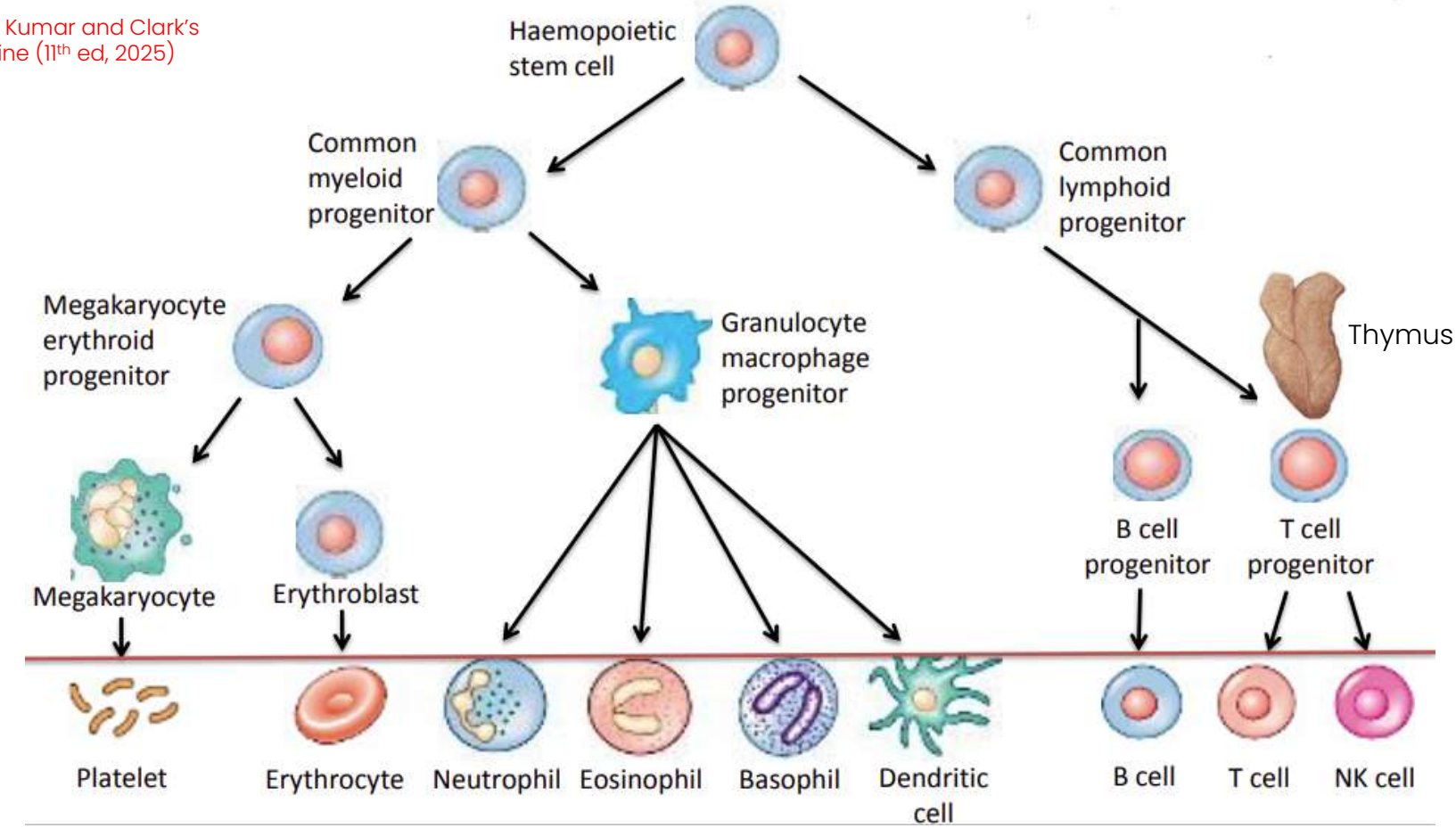
- Non-neoplastic disorders of white cells
  - Leukopenia
  - Reactive Leukocytosis
  - Reactive Lymphadenitis

- Neoplastic proliferations of white cells
  - *Leukaemias
  - *Myelodysplastic syndromes
  - *Myeloproliferative neoplasms
  - *Lymphomas: Hodgkin's and Non-Hodgkin's
  - *Plasma cell neoplasms (e.g. multiple myeloma)
  - Histiocytic neoplasms
  - Post-transplant lymphoproliferative disorder

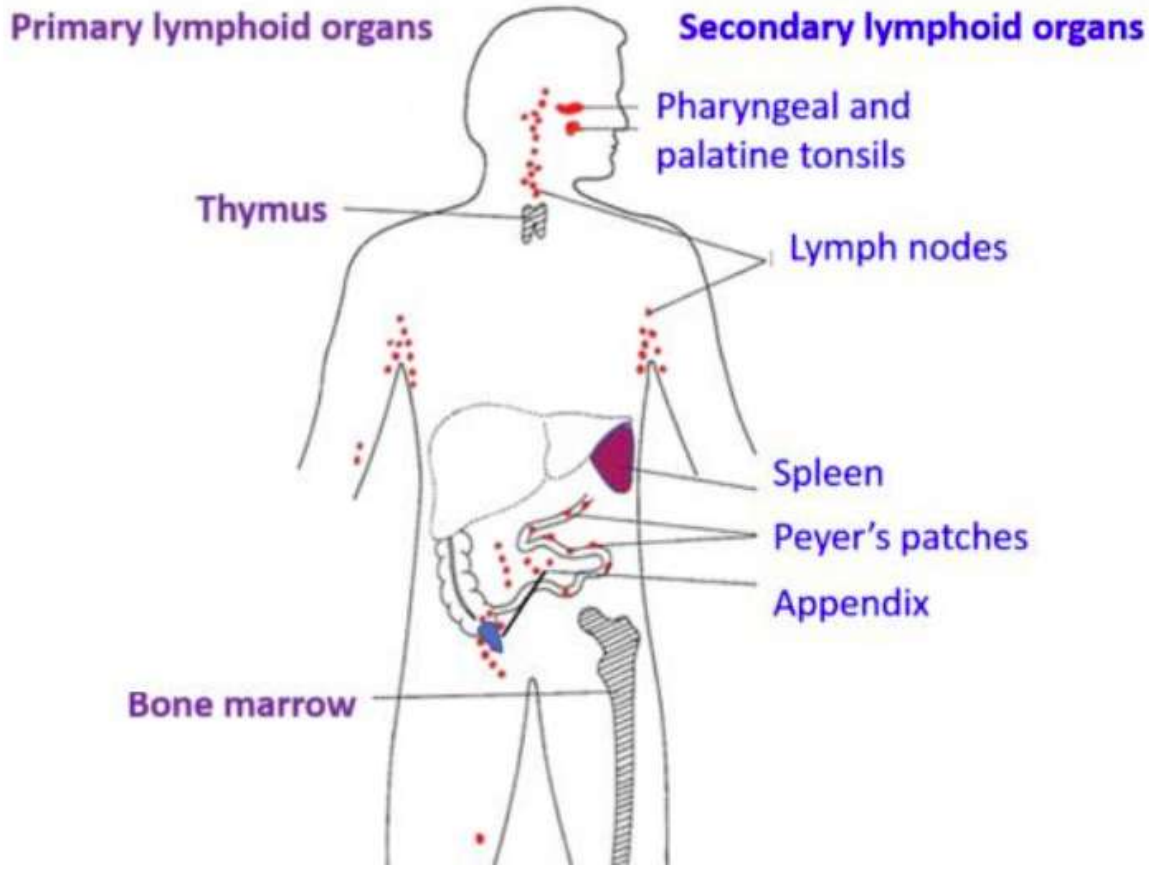
Adapted from Robins Basic Pathology ed11 2023 (Kumar, Abbas, Aster, Robbins)

FORMATION OF BLOOD CELLS

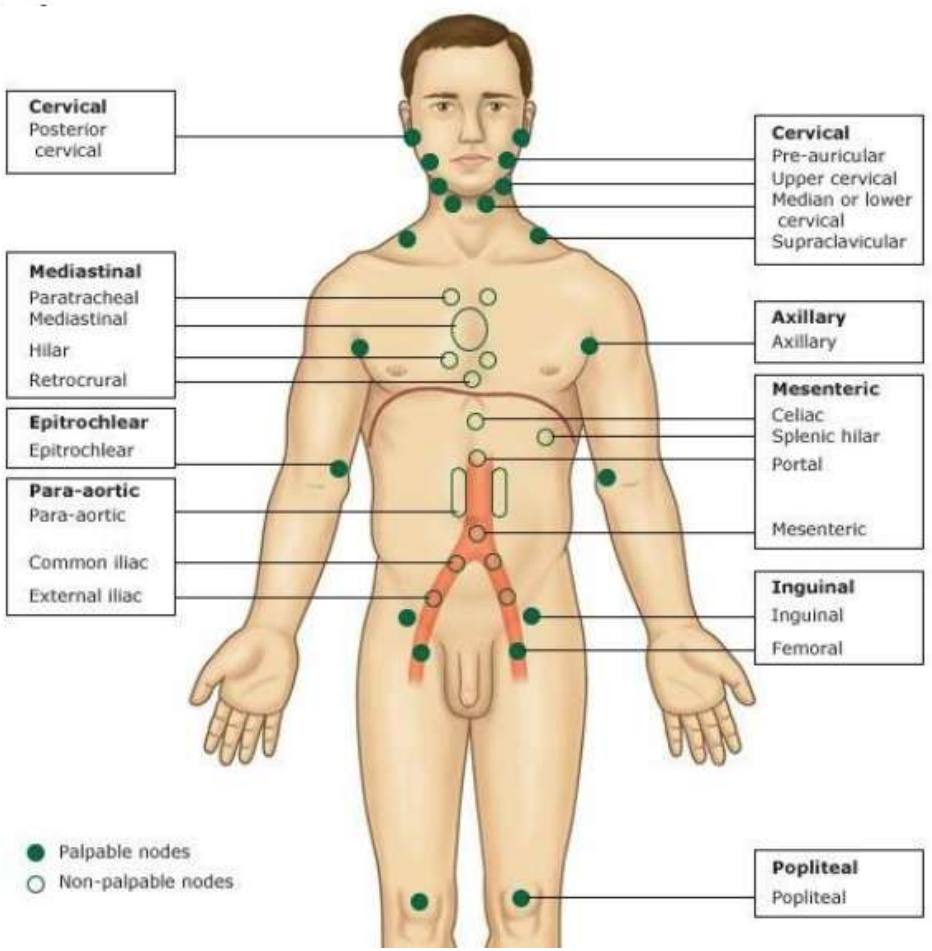
Adapted from Kumar and Clark's Clinical Medicine (11th ed, 2025)



LYMPHOID ORGANS



LYMPH NODE GROUPS



NON-NEOPLASTIC DISORDERS OF WHITE CELLS

NON-NEOPLASTIC DISORDERS OF WHITE CELLS

- **Leukopenia**
  - Most commonly due to neutropenia (reduced granulocyte count)
    - Agranulocytosis: severe reduction in granulocyte count
    - Mechanisms:
      - Decreased granulocyte production: marrow hypoplasia (chemo, aplastic anaemia), certain drugs
      - Increased granulocyte destruction: immune-mediated injury (e.g. drugs), overwhelming infections (increased peripheral "use"), sequestration from splenomegaly
  - Lymphopenia: less common – rare congenital immunodeficiency diseases, advanced HIV infection, high dose corticosteroids

- **Reactive Leukocytosis**
  - Inflammatory states caused by microbial and nonmicrobial stimuli
  - Infectious mononucleosis → lymphocytosis

- **Reactive Lymphadenitis**
  - Infections and nonmicrobial inflammatory stimuli activate immune cells residing in lymph nodes → lymphadenopathy

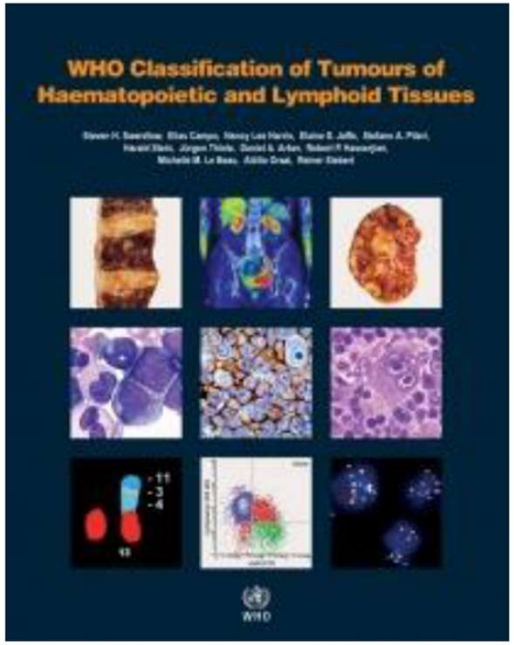
NEOPLASTIC DISORDERS OF WHITE CELLS

CLASSIFICATION SYSTEMS

WHO (World Health Organisation) -Very comprehensive

FAB (French American British) - Myeloproliferative disorders

WHO 2008



French American British (FAB) 1976 & 1982

British Journal of Haematology, 1976, **33**, 451.

Proposals for the Classification of the Acute Leukaemias

FRENCH–AMERICAN–BRITISH (FAB) CO-OPERATIVE GROUP

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(*Received* 23 *January* 1976; *accepted for publication* 26 *January* 1976)

British Journal of Haematology, 1982, **51**, 189–199

Proposals for the classification of the myelodysplastic syndromes

J. M. BENNETT,[1] D. CATOVSKY,[2] M. T. DANIEL,[3] G. FLANDRIN,[3] D. A. G. GALTON,[2] H. R. GRALNICK[4] AND C. SULTAN,[5] THE FRENCH–AMERICAN–BRITISH (FAB) CO-OPERATIVE GROUP [1]*University of Rochester Cancer Center, University of Rochester School of Medicine and Dentistry, Rochester, New York, U.S.A.,* [2]*MRC Leukaemia Unit, Royal Postgraduate Medical School, London,* [3]*Institut de Recherches sur les Leucémi*[illegible] *et les Maladies du Sang, Hôpital Saint-Louis, Paris, France,* [4]*Hematology Service, National Institutes of Health, Bethesda, Maryland, U.S.A., and* [5]*Service Central d'Hématologie-Immunologie, Hôpital Henri Mondor, Creteil, France*

Received 12 November 1981; accepted for publication 18 December 1981

CLASSIFICATION SYSTEMS

REAL (Revised European and American Lymphoma) – Lymphomas

EORTC (European Organisation for Research and Treatment of Cancer) -Lymphoma

Revised European & American Lymphoma (REAL) 1994



PERSPECTIVE

A Revised European-American Classification of Lymphoid Neoplasms: A Proposal From the International Lymphoma Study Group

By Nancy Lee Harris, Elaine S. Jaffe, Harald Stein, Peter M. Banks, John K.C. Chan, Michael L. Cleary, Georges Delsol, Christine De Wolf-Peeters, Brunangelo Falini, Kevin C. Gatter, Thomas M. Grogan, Peter G. Isaacson, Daniel M. Knowles, David Y. Mason, Hans-Konrad Muller-Hermelink, Stefano A. Pileri, Miguel A. Piris, Elisabeth Ralfkiaer, and Roger A. Warnke

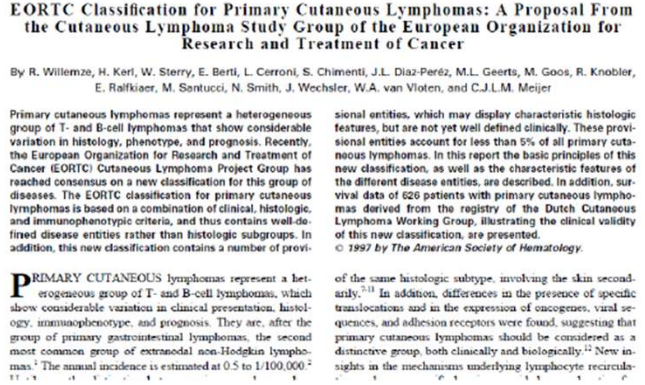
THE HISTOLOGIC categorization of lymphoma has been a source of frustration for many years for both clinicians and pathologists. In the last 10 years, much new information has become available about the lymphomas, resulting in recognition of new entities and refinement of previously recognized disease categories, raising the question of whether it is time for a new lymphoma classification. In this paper we report the result of an international review of lymphomas, which we hope may clarify some of the confusion surrounding this topic.

This review was conducted at a meeting of 19 hematopathologists with particular interest and experience in lymphomas (the International Lymphoma Study Group) in Berlin, Germany, in April 1993. At previous meetings in Europe and the United States, we had come to believe that, despite the variety of classification schemes used, many hematopathologists appeared to agree on a rather large number of distinct lymphoma entities that they recognize and diagnose

understanding lymphomas and suggest important new lines of research, our current understanding of both the immune system and the lymphomas appears to be inadequate to support a biologically "correct" lymphoma classification. Thus, a classification strictly based on a theoretical relationship of tumors to normal stages of differentiation is both unrealistic and unnecessary for the practical categorization of human lymphomas.

We concluded that the most practical approach to lymphoma categorization at this time is simply to define the diseases that we think we can recognize with the currently available morphologic, immunologic, and genetic techniques.[36] Thus, a lymphoma classification becomes simply a list of well-defined, "real" disease entities. Many of these entities are associated with distinctive clinical presentations and natural histories, even though treatment options may be limited. Cases that do not fit into one of these defined entities are best left unclassified, reflecting the fact that we do not

European Organisation for Research and Treatment of Cancer (EORTC) 1997



EORTC Classification for Primary Cutaneous Lymphomas: A Proposal From the Cutaneous Lymphoma Study Group of the European Organization for Research and Treatment of Cancer

By R. Willemze, H. Kerl, W. Sterry, E. Berti, L. Cerroni, S. Chimenti, J.L. Diaz-Peréz, M.L. Geerts, M. Goos, R. Knobler, E. Ralfkiaer, M. Santucci, N. Smith, J. Wechsler, W.A. van Vloten, and C.J.L.M. Meijer

Primary cutaneous lymphomas represent a heterogeneous group of T- and B-cell lymphomas that show considerable variation in histology, phenotype, and prognosis. Recently, the European Organization for Research and Treatment of Cancer (EORTC) Cutaneous Lymphoma Project Group has reached consensus on a new classification for this group of diseases. The EORTC classification for primary cutaneous lymphomas is based on a combination of clinical, histologic, and immunophenotypic criteria, and thus contains well-defined disease entities rather than histologic subgroups. In addition, this new classification contains a number of provisional entities, which may display characteristic histologic features, but are not yet well defined clinically. These provisional entities account for less than 5% of all primary cutaneous lymphomas. In this report the basic principles of this new classification, as well as the characteristic features of the different disease entities, are described. In addition, survival data of 626 patients with primary cutaneous lymphomas derived from the registry of the Dutch Cutaneous Lymphoma Working Group, illustrating the clinical validity of this new classification, are presented.

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PRIMARY CUTANEOUS lymphomas represent a heterogeneous group of T- and B-cell lymphomas, which show considerable variation in clinical presentation, histology, immunophenotype, and prognosis. They are, after the group of primary gastrointestinal lymphomas, the second most common group of extranodal non-Hodgkin lymphomas.[1] The annual incidence is estimated at 0.5 to 1/100,000.[2]

of the same histologic subtype, involving the skin secondarily.[3-11] In addition, differences in the presence of specific translocations and in the expression of oncogenes, viral sequences, and adhesion receptors were found, suggesting that primary cutaneous lymphomas should be considered as a distinctive group, both clinically and biologically.[12] New insights in the mechanisms underlying lymphocyte recircula-

COMMON HAEMATOLOGICAL MALIGNANCIES

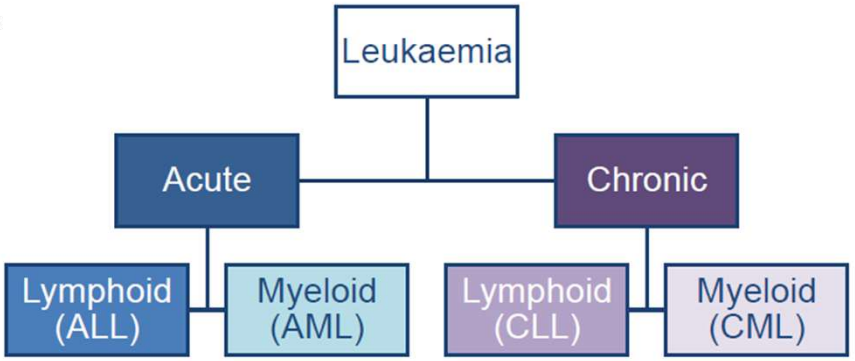
1. Leukaemias
2. Lymphomas
   a) Hodgkin's lymphoma
   b) Non-Hodgkin's lymphomas
3. Myelodysplastic syndromes
4. [Non-leukaemic] Myeloproliferative neoplasms
5. Plasma cell tumours

LEUKAEMIAS

LEUKAEMIAS

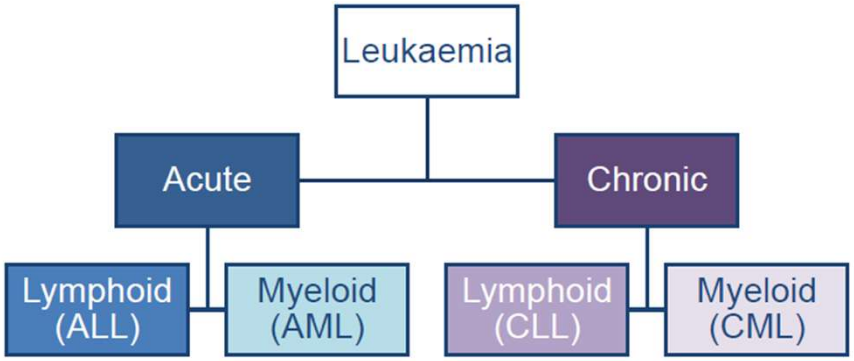
- **Definition**: Malignant neoplasms of haematopoietic tissue that progressively displaces normal blood forming elements of bone marrow with neoplastic cells

- **Classification**: on basis of cell type and maturity
  - Lymphoid or myeloid
  - Acute or chronic
    - Acute: >20% myeloblasts or lymphoblasts in bone marrow at clinical pres
    - Chronic: cells more differentiated



LEUKAEMIAS

- Main types of leukaemia:
  - **Acute lymphoblastic leukaemia (ALL):** most common type of childhood leukaemia
  - **Acute myeloblastic leukaemia (AML):** can occur at any age, more often older people
  - **Chronic lymphocytic leukaemia (CLL):** most common type of leukaemia in adults. Slow-growing, may be asymptomatic for months-years.
  - **Chronic myeloid leukaemia (CML):** mostly affects adults >40yo. Progresses over weeks or months.



ACUTE VS CHRONIC LEUKAEMIA

	Acute	Chronic
Cell Type	Primitive (immature) blast cells in blood and bone marrow	Excess mature leukocytes in blood and bone marrow
Epidemiology	50% of all malignancies in children	Mostly adults
Symptoms	Develop quickly	Develop gradually (20% have no symptoms at time of diagnosis), may progress to acute leukaemia

ACUTE LEUKAEMIA

Clinical features

Associated with:

- Bone marrow failure
- Tissue infiltration

Anaemia	Neutropenia	Thrombocytopenia
Fatigue	Infections	Bleeding
Breathlessness	Fever	Bruising
Pallor	Oral ulceration	Gingival bleeding

ACUTE LEUKAEMIA

Gingival hypertrophy associated with AML



Clinical features

Associated with:

- Bone marrow failure
- Tissue infiltration



https://dermnetnz.org/topics/leukaemia-cutis

Tissue infiltration	Features
Marrow	Bone pain
Lymph nodes	Lymphadenopathy
Liver/spleen	Hepatosplenomegaly
Gingiva	Gingival hypertrophy (AML)
Skin	Violaceous skin deposits (AML)
CNS	Headache, CN palsy (ALL)
Testes	Enlargement (ALL)

ACUTE LYMPHOBLASTIC LEUKAEMIA

- 65% of childhood acute leukaemia (most common leukaemia in children)
- Predominantly children (peak incidence 0-4yo), but can affect adults
- Risk factors:
  - Some congenital disorders: Down Syndrome (33-fold ↑ risk), Fanconi's anaemia
  - Philadelphia chromosome (25% adult cases, 3-5% of children)
  - Exposure to radiation, chemicals, reaction to viral infections

ACUTE LYMPHOBLASTIC LEUKAEMIA

- Features
  - CNS involvement (cranial nerve palsies, sensory disturbances)
  - Testes enlargement
  - Pain in bone/joints

  - Acute serious illness, infections
  - Purpura
  - Gingival bleeding on brushing

  - Bilateral salivary +/- lacrimal gland swelling (Mikulicz syndrome)



ACUTE LYMPHOBLASTIC LEUKAEMIA

- Prognosis
  - Complete remission / 5-year survival = 70-80% (combined children and adult)
    - <15 years old: 90%
    - 15-40 years old: 65%
    - >40 years old: 25%

ACUTE MYELOBLASTIC LEUKAEMIA

- Most common acute leukaemia in adults (especially males)
- Peak incidence older age (60-70yo)
- Risk factors:
  - Some congenital disorders: Down Syndrome (150-fold ↑ risk), Fanconi's anaemia, Boom syndrome
  - Some blood disorders: myelodysplastic syndromes and myelofibrosis, aplastic anaemia, paroxysmal nocturnal haemoglobinuria
  - Exposure to radiation, chemicals, chemotherapy, tobacco

ACUTE MYELOBLASTIC LEUKAEMIA

- Features
  - Violaceous skin deposits

violaceous skin deposits



Primary (direct infiltration)	Secondary (blood and immune changes)
Gingival enlargement (hypertrophy)	Mucosal pallor
Bone infiltration	Anaemia-related lesions
- Tooth mobility	Neutropenic ulceration
- Neuropathy	Susceptible to infection
- Jaw discomfort	Gingival bleeding



↳ gingival hypertrophy



↳ neutropenic ulcer

ACUTE MYELOBLASTIC LEUKAEMIA

- Prognosis
  - 5-year survival
    - <40yo: 55%
    - 40-49yo: 50%
    - 50-59yo: 25%
    - 60-69yo: 15%
    - 70-79yo: 5%
    - >80yo: 1%

CHRONIC LYMPHOCYTIC LEUKAEMIA

- Overpopulation of lymphocytes (B-cells) in blood and bone marrow
  - Shared features with small lymphocytic lymphoma (but cancer cells in lymph nodes)
- Most common type of leukaemia in adults
  - 2x as common as CML
  - 25% of all leukaemias
- Median age diagnosis 65yo (mostly older adults)
- Risk factors:
  - Gender – M:F = 2:1
  - Ethnicity = white European origin
  - Family history = 10% have parent, sibling, child
  - Exposure to high-risk chemicals e.g. pesticides, benzene, heavy solvents

CHRONIC LYMPHOCYTIC LEUKAEMIA

- Features
  - Often asymptomatic (1/3 diagnosed following routine FBC)
  - Recurrent/severe infections (e.g. shingles)
  - Painless lymphadenopathy

  - Anaemia
  - Fever
  - Splenomegaly
  - Thrombocytopenia

CHRONIC LYMPHOCYTIC LEUKAEMIA

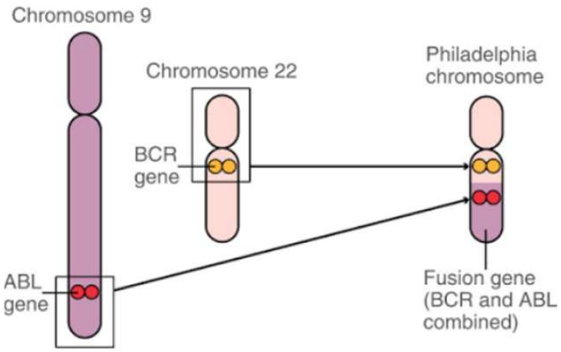
- Progression
  - Can live with slow-growing CLL for long periods (indolent)
  - Richter's syndrome (7% patients with CLL): transformation into aggressive NHL (diffuse large B-cell lymphoma) or HL

- Prognosis
  - 1 in 10 people may never require treatment (active monitoring, "watch and wait")
    - immune system fights to keep CLL under control
    - No survival/symptom benefit, avoid side-effects of treatment
  - No cure for CLL
    - But treatments are very effective at controlling symptoms (supportive care)
  - 5-year survival = 88%
  - Median survival = >10 years

CHRONIC MYELOID LEUKAEMIA

- Overpopulation of granulocytes (neutrophils, eosinophils, basophils, mast cells)
- Caused be genetic abnormality: Philadelphia chromosome (abnormal chromosome 22)

- Affects adults almost exclusively (usually >60yo)
- 14% of all leukaemias
- Risk factors:
  - Gender – M > F (slightly)
  - Exposure to radiation



CHRONIC MYELOID LEUKAEMIA

- Features
  - Symptomatic anaemia (SOB)
  - Fever and sweats in the absence of infection
  - Weight loss
  - Retinal damage
  - Lymphadenopathy – uncommon, suggests transformation to acute leukaemia
  - Progressive splenomegaly (>75%) and associated abdominal discomfort

CHRONIC MYELOID LEUKAEMIA

- Progression
  - Can transform to acute phase similar to AML
  - Classified by phase, defined by number of blasts in blood/bone marrow

- Prognosis
  - 5 year survival: 80%

Chronic phase	Accelerated phase	Blast phase
High WCC with <5% blast cells	Increase in blast cell counts	Significant increase in blast cell counts
asymptomatic	Some symptoms	More symptoms
if untreated will eventually progress to accelerated and/or blast phase	if untreated will eventually progress to blast phase	Most aggressive phase. Similar to AML or ALL.

LEUKAEMIA - TREATMENTS

Treatment depends on:

- Type of leukaemia
- Stage of disease
- Severity of symptoms
- Age
- General health
- Patient choice

LEUKAEMIA - TREATMENTS

Acute leukaemia

- Chemotherapy
- Stem cell or bone marrow transplant
- Radiotherapy
- Steroids
- Targeted therapy
- Leukapheresis
- Immunotherapy (e.g. CAR-T cell therapy)

Chronic leukaemia

- As for acute
- Active monitoring
- Splenectomy

Palliative Care

- Radiotherapy and/or chemotherapy
- Analgesics
- Blood transfusions
- Nutritional supplements / medications for nausea and appetite loss

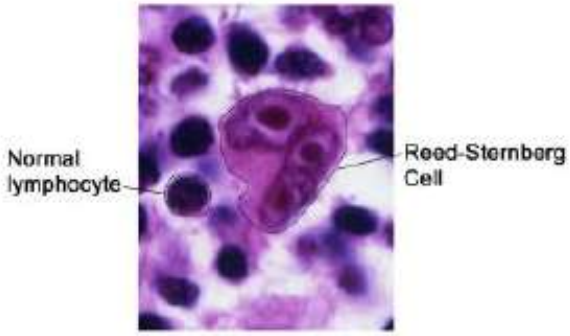
LYMPHOMAS

LEUKAEMIA VS LYMPHOMA

	Leukaemia	Lymphoma
Origins/affects	Originates in bone marrow, circulates through bloodstream	Lymphocytes in the lymph nodes, spleen and other lymphatic tissue Forms solid masses
Signs and symptoms	Bone pain, easy bruising or bleeding, petechiae, pallor, fatigue, fevers, frequent infections	Lymphadenopathy, itchy skin (without clear rash), fevers, coughing/SOB, weight loss, night sweats

LYMPHOMA - DEFINITIONS

- **Lymphoma** = B- and T-cell (lymphotcyle) malignancies of the lymphoid system
- **Hodgkin Lymphoma** = haematological malignancy arising from mature B-cells, with presence of Reed-Sternberg cells and Hodgkin cells
- **Non-Hodgkin Lymphoma** = haematological malignancy arising from mature B or T-cells (lymphocytes), without presence of Reed-Sternberg cells
  - More than 60 subtypes of NHL, including:
    - Follicular lymphoma
    - Diffuse Large B-cell lymphoma (DLBCL)
    - Burkitt's lymphoma
  - Divided into B-cell and T-cell NHLs
    - T-cell lymphomas generally harder to cure



LYMPHOMA - AETIOLOGY

- Unknown exact cause
- Risk factors:

Hodgkin Lymphoma	Non-Hodgkin Lymphoma

• Sex: M>F
• Age: 20-24yo, 75-79yo
• Low immunity (e.g. autoimmune condition, HIV 11x ↑ risk, AIDS 3x ↑ risk)
• Ebstein-Barr virus (assoc with 40% HL cases)
• Previous NHL (?tx for NHL)
• Family history HL, NHL or CLL
• Overweight
• Smoking
	• Sex: M>F
	• European origin
	• Age: any, but 35% are >75yo
	• Low immunity (e.g. autoimmune condition, immunosuppressants for transplant)
	• Infections
	  • H. pylori (MALT lymphoma in stomach)
	  • HIV (DLBCL lympohoma) → ↓ incidence since HAART
	  • T-cell lymphoma virus 1 (HTLV1)
	  • EBV
	  • Hepatitis C
	• Coeliac disease (EATL lymphoma)
	• Family history NHL
	• Previous cancer treatment
	• Breast implant associated anaplastic large cell lymphoma

LYMPHOMA
GENERAL MANIFESTATIONS

Hodgkin Lymphoma	Non-Hodgkin Lymphoma
Lymphadenopathy - Contiguous spread	Lymphadenopathy - Non-contiguous spread (often disseminated disease) - Predilection for GIT and CNS

- Fatigue
- B-symptoms: unexplained fevers, night sweats, weight loss
- Itchy skin
- Pressure on other organs/ducts/nerves

LYMPHOMA
H&N MANIFESTATIONS

- Hodgkin Lymphoma
  - Rarely affects mouth
  - If does, clinically indistinguishable from NHL

- Non-Hodgkin Lymphoma
  - Enlarged cervical lymph nodes (discrete, rubbery, painless)
    - initial complaint in 50% of cases
  - Swellings and ulcers
    - especially palate and fauces (often associated with AIDS)
    - Also gingiva, FOM
  - Isolated tooth mobility or lip paraesthesia
  - Rarely: involvement of Waldeyer's ring (more commonly in HIV-infected, NHL>HL)



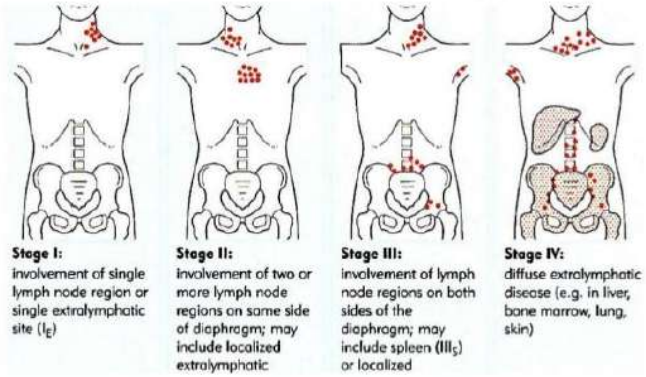
LYMPHOMA GENERAL MANAGEMENT

Staging

Ann Arbor staging

- How many areas affected
- Above, below or on both sides of diaphragm
- Whether has spread to bone marrow or other organs

Ann Arbor staging (1):



Treatment

- Watch and wait (active monitoring)
  - Low-grade slow-growing lymphomas
- Radiotherapy
- Chemotherapy
- Immunotherapy / targeted therapies
- Stem cell transplant
- Palliative Care

LYMPHOMA PROGNOSIS

Hodgkin Lymphoma

- HL:
  - 85-95% 5-year survival (stage 1-4)
  - 80% 10-year survival
- NHL
  - Prognosis variable based on type
  - Generally 65% 5-year survival, 55% 10-year survival

	Low grade NHL	High grade NHL
Growth	Indolent	Aggressive
Age	>50 years	Children / young adults
Cure rate	Rare Relapse common	Higher
Common types	Follicular	DLBCL Burkitt's Peripheral T cell

MYELODYSPLASTIC SYNDROMES (MDS)

(MYELODYSPLASIA)

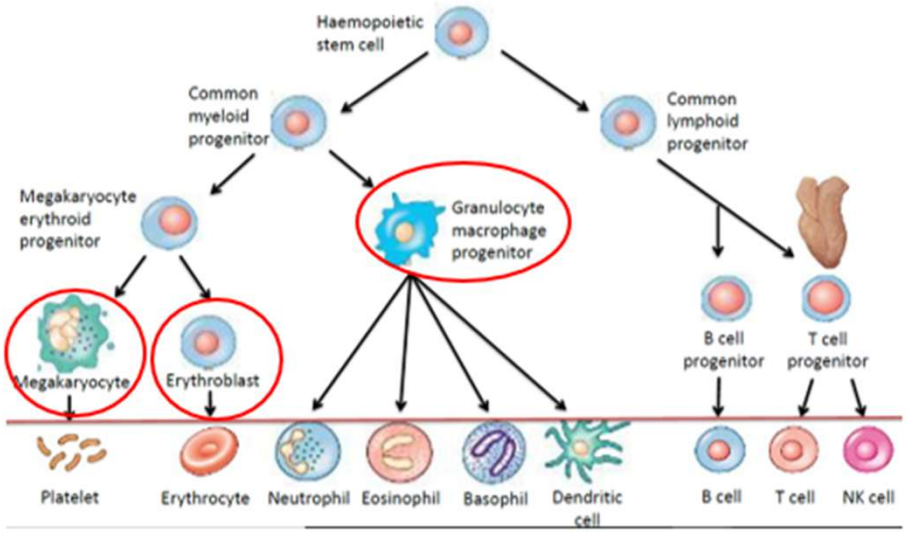
MYELODYSPLASTIC SYNDROMES

- **Definition**: group of clonal haematopoietic stem cell disorders caused by a mutation that results in abnormal proliferation of myeloid *progenitor* cells, usually in the presence of a hypercellular bone marrow and multilineage dysplasia.

Aetiology

- Mutation in ≥1 genes that control blood cell development
- Affected stem cell divides → "clones" of defective stem cell produced (preservation of mutation)
- Bone marrow gradually overtaken by abnormally functioning immature blood cells
- Results in lower production of mature myeloid cells (ineffective haematopoiesis)
- Bone marrow gradually overtaken by abnormally functioning immature blood cells (progressive cytopenia)

Usually all 3 cell lines (erythroid, megakaryocyte, granulocyte) involved, with increased risk of AML development.



MYELODYSPLASTIC SYNDROMES
MANIFESTATIONS

General Findings

- Related to increasing bone marrow failure
  - Red blood cells (macrocytic anaemia): weakness, tiredness/fatigue, SOB with minimal exercise, pallor.
  - White blood cells (neutropenia): frequent infections (especially chest infections), fevers.
  - Platelets (thrombocytopenia): bruising, easy bleeding (nosebleeds), purpura/petechiae (lower limbs initially)
- Enlargement of spleen or liver

Oral Findings

- Related to increasing bone marrow failure
  - White blood cells: sore mouth (mouth ulcers), oral infections (herpes, fungal, bacterial), exacerbation of chronic periodontitis and/or dental infection
  - Platelets: spontaneous gingival bleeding, petechiae
- Gingival infiltration and oral ulceration may develop in CMML subtype. May be first sign of acceleration of a stable disease process.
- Paraesthesia, burning mouth, xerostomia reported

MYELODYSPLASTIC SYNDROMES
GENERAL MANAGEMENT

Supportive Treatment

- Growth factor injections (erythropoietin, G-CSF)
- Blood transfusions (RBCs, platelets)
- Iron chelating agents
- Antibiotics (if low WBCs)
- Supplements: folic acid, Vit B6
- Systemic corticosteroids

Active Treatment

- Targeted therapy (e.g. lenalidomide)
- Chemotherapy
- Stem cell transplant
- Clinical trials

MYELOPROLIFERATIVE NEOPLASMS

MYELOPROLIFERATIVE DISORDERS

MYELOPROLIFERATIVE NEOPLASMS

- **Definition**: A heterogenous group of clonal haematopoietic stem cell disorders caused by a mutation whereby abnormal myeloid *progenitor* cells (erythroid, myeloid, megakaryocyte) produce excess numbers of one or more cell types.

- **Classification**: FAB / WHO
  - Usually described according to most affected blood cell type. Four commonest subtypes:

- **Polycythaemia vera (PV):** excessive RBCs
- **Essential thrombocythaemia (ET):** excessive platelets
- **Chronic myelogenous leukaemia (CML):** excessive WBCs
- **Myelofibrosis (MF):** replacement of the stem cells in the bone marrow by scar and fibrous tissue (fibroblasts), resulting in too few blood cells and often an enlarged spleen.

MYELOPROLIFERATIVE NEOPLASMS

- General Features
  - Symptoms related to deficient blood cells (RBC, WBC, platelets)
  - Thrombosis, blood hyperviscosity (MF, PV, ET): brain (stroke/TIA), eyes (vision), heart (MI), legs (DVT), lungs (PE)
  - Splenomegaly and hepatomegaly (MF, PV, ET): secondary to extramedullary haematopoiesis → abdominal pain, appetite loss, pain on respiration
  - Gout (MF, PV, ET): increased production and breakdown of blood cells → build up of uric acid
  - Aquagenic pruritis (PV): itchy skin following a contact with water
  - Bone pain (MF)
  - Night sweats, pyrexia, weight loss, pruritic, dizziness, weakness (MF)
  - Vasomotor symptoms: headaches, dizziness, tingling, erythromelalgia, visual disturbances (ET)

MYELOPROLIFERATIVE NEOPLASMS

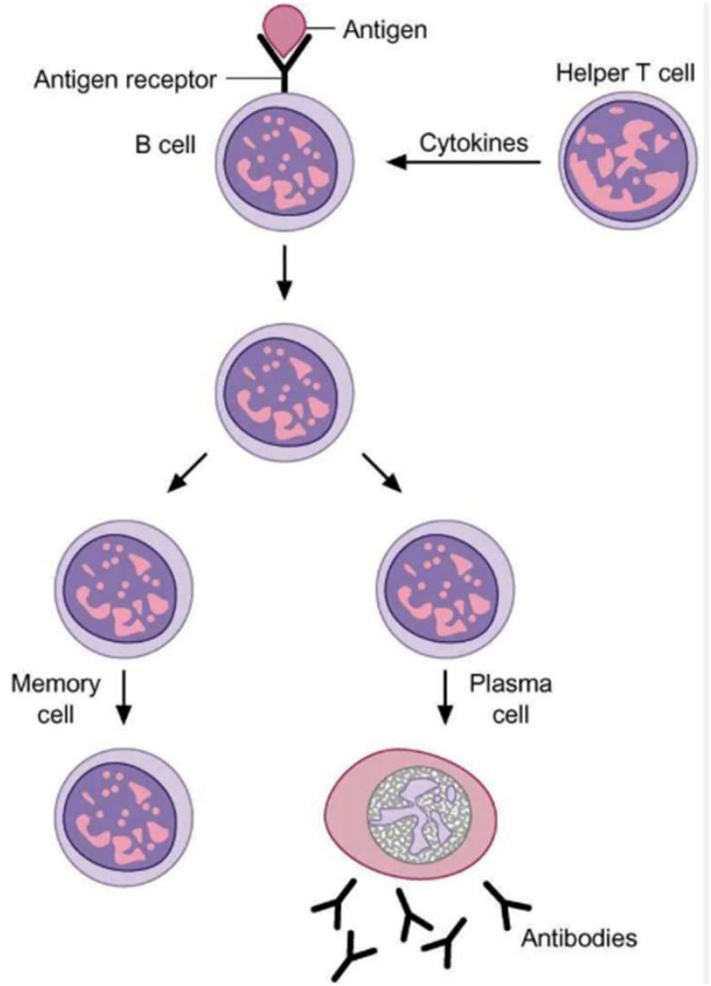
- General Management
  - Depends on specific subtype

Supportive Treatment (Symptom specific)	Active treatment
• Venesection: removal of measured amount of blood to lower RBC volume and thickness (PV) • Blood transfusions (MF) • Supplements: folic acid (MF) • Allopurinol: gout (MV, PV, ET) • Splenomegaly: hydroxycarbamide, interferon, radiation, splenectomy (MF) • Corticosteroids (MF) • Aspirin: prevent abnormal blood clotting and reduce cardiovascular risks (MF, PV, ET) • Antihistamines: itching (PV)	• Watch and wait • Cytoreductive therapy (e.g. hydroxycarbamide, interferon): slow bone marrow's production of blood cells • Chemotherapy • Targeted therapy (JAK inhibitors): symptoms, treat splenomegaly • Stem cell transplant

MYELOPROLIFERATIVE NEOPLASMS

- Dental Implications
  - Oral manifestations and risk management as per blood cells affected
  - Related to treatments provided
  - Paradoxical clotting and bleeding tendency
    - Haemostasis
    - Cardiovascular risks (e.g. MI, stroke)
  - Aquagenic pruritic (PV): ability to operate, oral hygiene at home
  - Erythromelalgia (burning pain of hands): oral hygiene ability
  - Splenic changes: infection risk

PLASMA CELL TUMOURS
(PARAPROTEINAEMIAS)



PLASMA CELL TUMOURS

1. *Multiple myeloma
2. Solitary myeloma
3. Waldenstrom's macroglobulinaemia
4. Heavy chain disease
5. Monoclonal gammopathy of undetermined significance (MGUS)

MULTIPLE MYELOMA

- **Definition**: Disseminated plasma cell neoplasm, predominantly causing bone lesions. Malignant plasma cells produce defective immunoglobulins and release osteoclast-activation factors, causing bone resorption and pain.

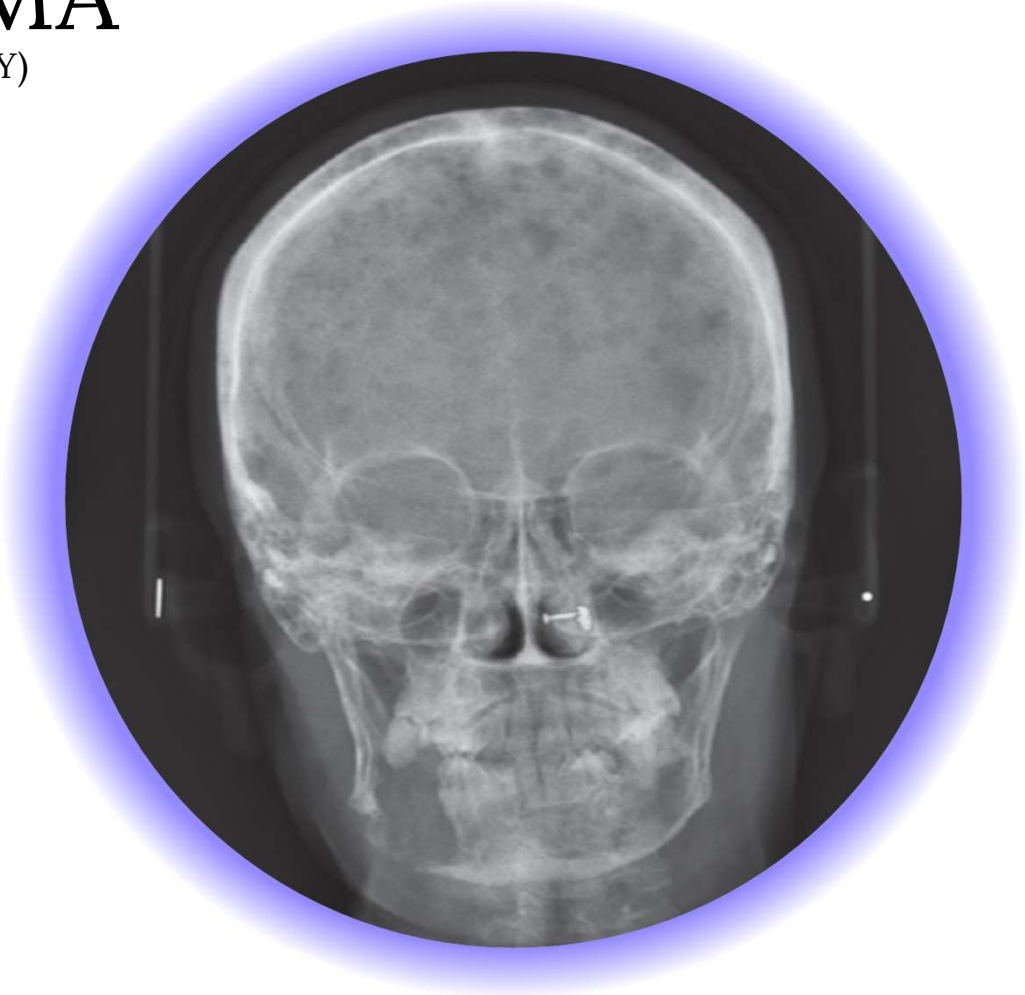
- **Aetiology:** Exact reason unknown.
  - Occasionally related to ionising radiation and petroleum products exposure.
  - Associated with MGUS (1/100 develop MM), ethnicity (twice as common in black population than white/Asians)
  - Mostly middle-age and elderly
  - Slight predilection for males

MULTIPLE MYELOMA

CLINICAL FEATURES (OF RELEVANCE TO DENTISTRY)

- **Neoplastic proliferation of plasma cells in bone marrow** → release of cytokines →
  - Osteolysis and bone destruction
    - Mandibular lesions: 5-14% of patients
    - Promote dental mobility, pain, paraesthesia, soft tissue swelling, pathological jaw fractures
  - Suppression of haemopoiesis and bone marrow replacement →
    - RBC: anaemia
    - WBC: increased risk of infections (leukopenia, abnormal antibody production)
    - Platelets: bleeding tendency (thrombocytopenia)

- **Defective immunoglobulin** (hyperglobulinemia with paradoxical hypogammaglobulinemia) →
  - Plasma hyperviscosity with clotting or bleeding tendency
  - Renal failure
  - Increased liability to infections
  - Neurological sequelae



Raghavan S, Nagaraj P, Ramaswamy B, Nayak D. Multiple Myeloma of the jaw: A Case Report. J Indian Acad Oral Med Radiol, 2014. 26(4):454-457.

Shows multiple punched out radiolucencies

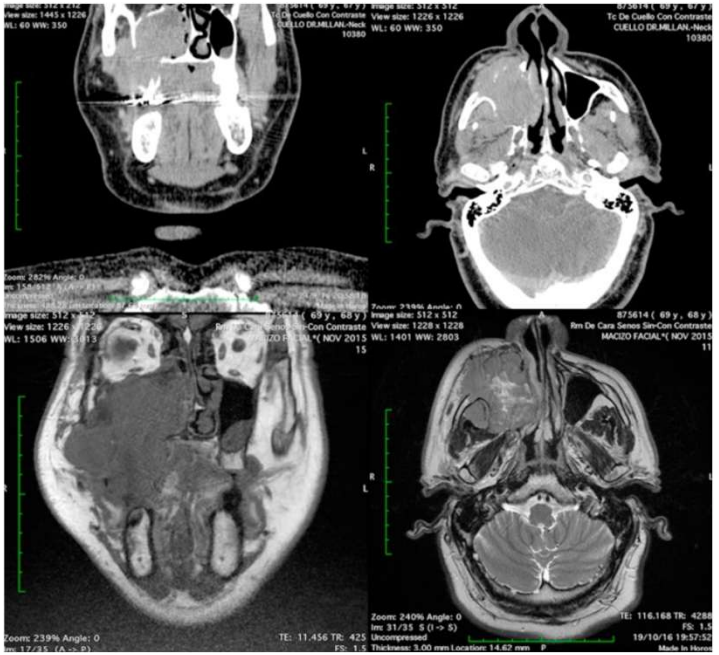
MULTIPLE MYELOMA

CLINICAL FEATURES (OF RELEVANCE TO DENTISTRY)

- Associated with extramedullary plasmacytoma







Merino F, Portillo Hernandez I, Sanchez Aniceto G, Ballestin C. Extramedullary plasmacytoma in the maxillofacial region: A review of the literature and case report. Oral Maxillofac Surg Cases. 2018; 4(4): 141-145.

MULTIPLE MYELOMA

TREATMENT (OF RELEVANCE TO DENTISTRY)

TREATMENT FOR CANCER

- Chemotherapy
- Corticosteroids
- Targeted therapy, immunotherapy, CAR-T cell therapy
  - Thalidamide-derived agents (e.g. lenalidomide)
  - Bortezomib
- Stem cell / bone marrow transplant (typically autologous)
- Radiotherapy (localised plasmacytic infiltration)

TREATMENT FOR SYMPTOMS (OF CANCER OR CANCER TREATMENT)

- Bisphosphonates
  - Reduce bone pain
  - Prevent pathological fracture
- Anticoagulants
  - Hyperviscosity of blood
  - Lenalidomide – clotting tendency
- Dialysis
  - Renal failure

DENTAL IMPLICATIONS

PRE-CANCER THERAPY DENTAL ASSESSMENT

- Patients should have a comprehensive dental assessment prior to commencing chemotherapy or a stem cell / bone marrow transplant
  - Comprehensive oral examination and xrays
- Goal: identify indications for dental treatment before cancer therapy starts
  - Infection
  - Teeth with poor prognosis
  - Potential causes of mucosal trauma (e.g. sharp teeth)
- Institute appropriate oral care program (oral side effects of cancer therapy)
- Dental interventions ideally completed before cancer therapy starts, but this may not be feasible
  - Cancer therapy should not be delayed

RISK ASSESSMENT

DISEASE

- **RBC**: anaemia
- **WBC**: infections
- **Platelets**: bleeding
- **Hyperglobulinaemia / hypogammaglobulinaemia**: infection [MM]
- **Renal failure**: dialysis [MM]

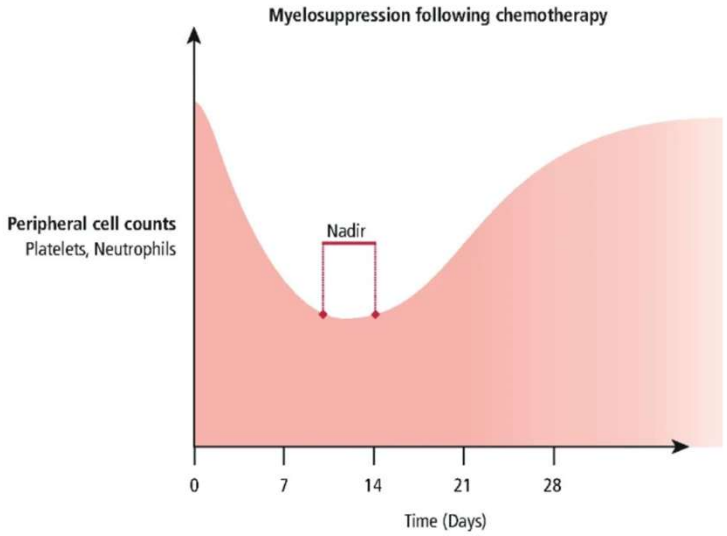
TREATMENT

- **Chemotherapy**: ↓ RBC/WBC/platelets, mucositis, hyposalivation, candidiasis, taste disturbances
- **Stem Cell / bone marrow transplant**: ↓ RBC/WBC/platelets, mucositis, hyposalivation, candidiasis, HSV (cold sores), gingival hyperplasia (ciclosporin), dental developmental disturbances (paeds), GVHD (allo), SCC
- **Corticosteroids:** adrenal suppression, fat redistribution, impaired wound healing, susceptibility infection, mood changes
- **Bisphosphonates** [MM] **+ emerging targeted therapies**: MRONJ
- **Anticoagulants**: bleeding [MM]
- **Radiotherapy**: mucositis, hyposalivation, candidiasis, increased caries risk, taste disturbances, osteoradionecrosis

DENTAL IMPLICATIONS (ACCESS)

Access

- Fatigue: time of day, may fatigue easily
- Timing of dental treatment: consult haematologist/oncologist
  - Defer elective treatment until remission phase
  - Dental pain: medical risks/timing weighed up against benefit of prompt dental treatment (usually infective source)
  - Chemotherapy: perform dental treatment day(s) before starting new cycle → chemotherapy nadir
  - [MM] Hemodialysis: book dental treatment on non-dialysis days (herparinisation)



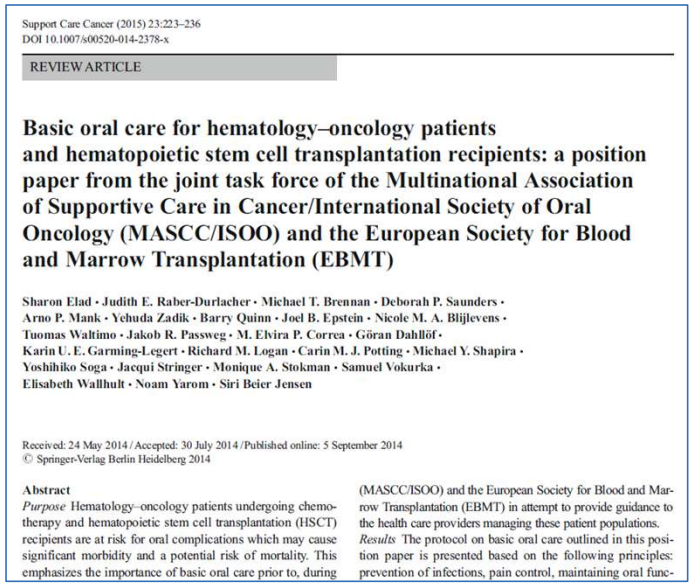
DENTAL IMPLICATIONS (ACCESS)

Communication/Consent

- Usually no issues
- Visual disturbances (written material)
- Cognitive/neurological sequelae
- Setting expectations re: treatment approach

DENTAL IMPLICATIONS

Education / Prevention



Support Care Cancer (2015) 23:223–236
DOI 10.1007/s00520-014-2378-x

REVIEW ARTICLE

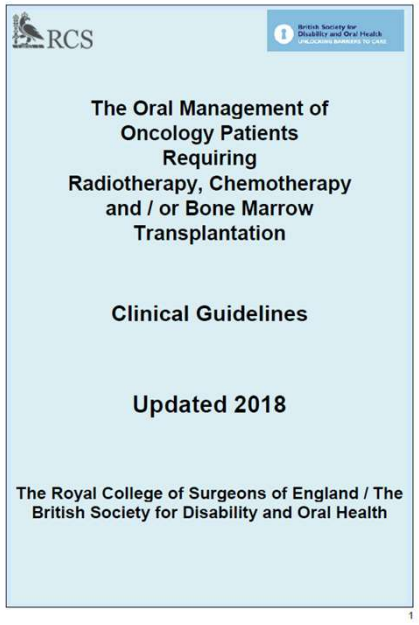
Basic oral care for hematology–oncology patients and hematopoietic stem cell transplantation recipients: a position paper from the joint task force of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO) and the European Society for Blood and Marrow Transplantation (EBMT)

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Received: 24 May 2014 / Accepted: 30 July 2014 / Published online: 5 September 2014
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Abstract
Purpose Hematology–oncology patients undergoing chemotherapy and hematopoietic stem cell transplantation (HSCT) recipients are at risk for oral complications which may cause significant morbidity and a potential risk of mortality. This emphasizes the importance of basic oral care prior to, during (MASCC/ISOO) and the European Society for Blood and Marrow Transplantation (EBMT) in attempt to provide guidance to the health care providers managing these patient populations.
Results The protocol on basic oral care outlined in this position paper is presented based on the following principles: prevention of infections, pain control, maintaining oral func-

MASCC/ISOO/EBMT 2015: Basic Oral Care for Haematology-Oncology Patients and HSCT Recipients position paper



RCS

British Society for Disability and Oral Health

The Oral Management of Oncology Patients Requiring Radiotherapy, Chemotherapy and / or Bone Marrow Transplantation

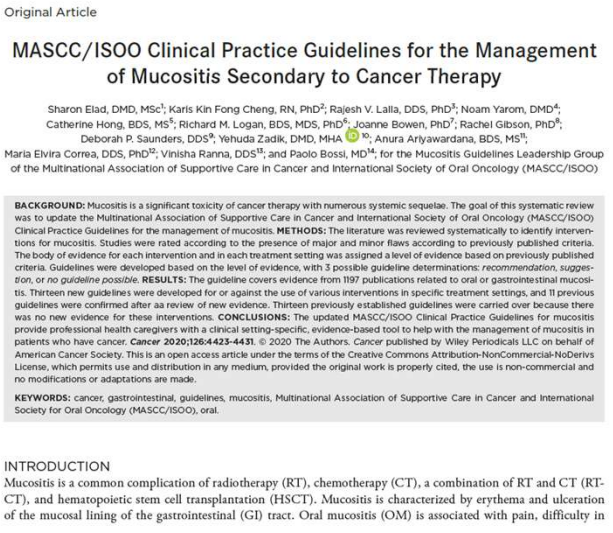
Clinical Guidelines

Updated 2018

The Royal College of Surgeons of England / The British Society for Disability and Oral Health

1

Royal College of Surgeons England / BSDH 2018: Oral Management of Oncology Patients Requiring Radiotherapy, Chemotherapy and/or Bone Marrow Transplantation



Original Article

MASCC/ISOO Clinical Practice Guidelines for the Management of Mucositis Secondary to Cancer Therapy

Sharon Elad, DMD, MSc[1]; Karis Kin Fong Cheng, RN, PhD[2]; Rajesh V. Lalla, DDS, PhD[3]; Noam Yarom, DMD[4]; Catherine Hong, BDS, MS[5]; Richard M. Logan, BDS, MDS, PhD[6]; Joanne Bowen, PhD[7]; Rachel Gibson, PhD[8]; Deborah P. Saunders, DDS[9]; Yehuda Zadik, DMD, MHA[10]; Anura Ariyawardana, BDS, MS[11]; Maria Elvira Correa, DDS, PhD[12]; Vinisha Ranna, DDS[13]; and Paolo Bossi, MD[14]; for the Mucositis Guidelines Leadership Group of the Multinational Association of Supportive Care in Cancer and International Society of Oral Oncology (MASCC/ISOO)

BACKGROUND: Mucositis is a significant toxicity of cancer therapy with numerous systemic sequelae. The goal of this systematic review was to update the Multinational Association of Supportive Care in Cancer and International Society of Oral Oncology (MASCC/ISOO) Clinical Practice Guidelines for the management of mucositis. **METHODS:** The literature was reviewed systematically to identify interventions for mucositis. Studies were rated according to the presence of major and minor flaws according to previously published criteria. The body of evidence for each intervention and in each treatment setting was assigned a level of evidence based on previously published criteria. Guidelines were developed based on the level of evidence, with 3 possible guideline determinations: *recommendation, suggestion, or no guideline possible*. **RESULTS:** The guideline covers evidence from 1197 publications related to oral or gastrointestinal mucositis. Thirteen new guidelines were developed for or against the use of various interventions in specific treatment settings, and 11 previous guidelines were confirmed after aa review of new evidence. Thirteen previously established guidelines were carried over because there was no new evidence for these interventions. **CONCLUSIONS:** The updated MASCC/ISOO Clinical Practice Guidelines for mucositis provide professional health caregivers with a clinical setting-specific, evidence-based tool to help with the management of mucositis in patients who have cancer. ***Cancer* 2020;126:4423-4431**. © 2020 The Authors. *Cancer* published by Wiley Periodicals LLC on behalf of American Cancer Society. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

KEYWORDS: cancer, gastrointestinal, guidelines, mucositis, Multinational Association of Supportive Care in Cancer and International Society for Oral Oncology (MASCC/ISOO), oral.

INTRODUCTION
Mucositis is a common complication of radiotherapy (RT), chemotherapy (CT), a combination of RT and CT (RT-CT), and hematopoietic stem cell transplantation (HSCT). Mucositis is characterized by erythema and ulceration of the mucosal lining of the gastrointestinal (GI) tract. Oral mucositis (OM) is associated with pain, difficulty in

MASCC/ISOO 2020: Clinical Practice Guidelines for the Management of Mucositis Secondary to Cancer Therapy

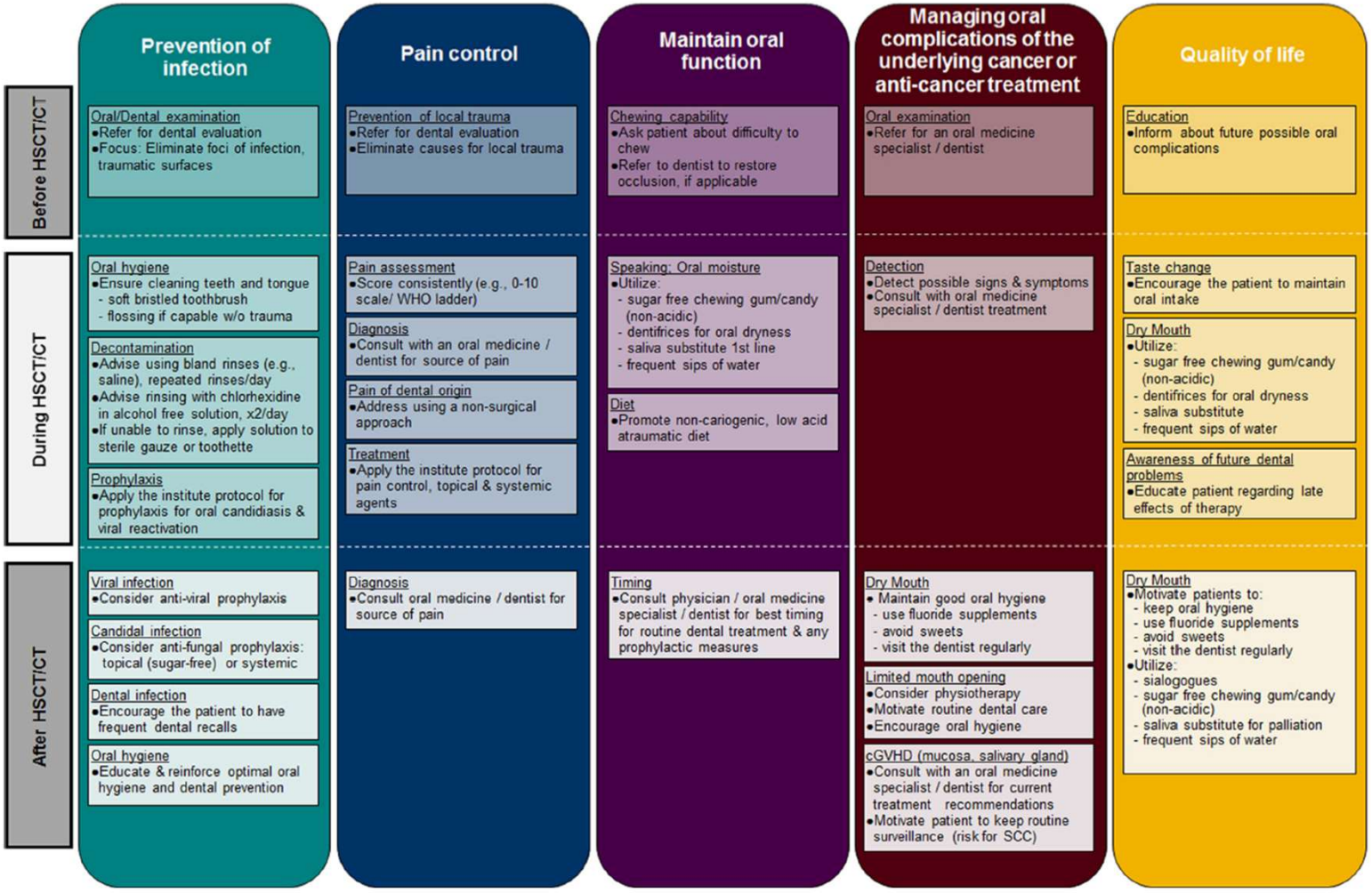


Fig. 1 *HSCT* haematopoietic stem cells transplantation, *CT* chemotherapy, *WHO* world health organization, *cGVHD* chronic graft versus host disease, *SCC* squamous cell carcinoma

MASCC/ISOO/EBMT 2015: Basic Oral Care for Haematology-Oncology Patients and HSCT Recipients position paper

DENTAL IMPLICATIONS

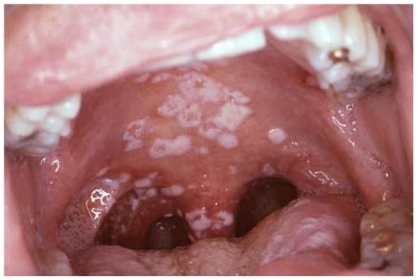


Education / Prevention

- Counsel on possible oral side effects of chemotherapy
  - Each chemotherapy agent has different adverse effects
  - Common examples: mucositis, reduced salivary flow, immune suppression
  - Increase risk of oral infections: oral and oropharyngeal candidiasis, herpes simplex virus, post-operative infection



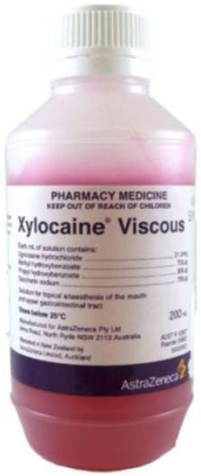




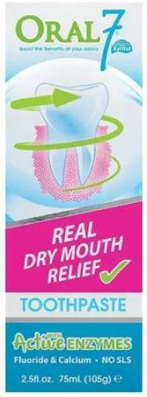
DENTAL IMPLICATIONS

Education / Prevention

- Chemotherapy / radiotherapy / HSCT
  - Pain:
    - Encourage compliance with oral hygiene (brush 2-3 times/day)
    - Suck ice chips 30min prior to chemotherapy
    - Topical anaesthetics: xylocaine viscous, Seda Lotion
    - Surgical ultra-soft toothbrush (Curaprox)
      - Air-dry between uses
      - Sponge brushes better than nothing, but not as effective
    - SLS-free toothpaste (e.g. Oral 7, Biotene)
    - Avoid spicy/rough/crunchy/acidic food and drinks
  - Hyposalivation:
    - Caries risk (buffering capacity; food stagnation; modified diet)
    - Bicarb + salt mouthrinses after meals
    - Saliva substitutes (e.g. Oral 7, Biotene gel, MW, spray)
    - Regular lip balm
    - Oral 7 gel for denture retention











DENTAL IMPLICATIONS

Education / Prevention



- Chemotherapy / radiotherapy / HSCT
  - Opportunistic infections (candida, periodontal pathogens, suprainfection of mucositis)
    - Maintain oral hygiene
    - Alcohol-free chlorhexidine rinse
      - add as short-term oral antiseptic if oral hygiene compromised
      - 0.2% ideal, substantivity at 0.1% (dilute 50:50 with water)
    - Bland rinses
    - Denture hygiene
  - Flossing?
    - "Measures to remove plaque from between teeth, crown & bridges or implants, and from tongue, should be continued using familiar devices to pt to avoid self-injury"
    - History of regular interdental cleaning? Or raging gingivitis?



MASCC/ISOO/EBMT 2015: Basic Oral Care for Haematology-Oncology Patients and HSCT Recipients position paper

DENTAL IMPLICATIONS

Surgery

- RBC (anaemia):
  - Check Hb levels prior to appointment– caution <80 g/L
  - Desaturation – stress of dental procedure
  - Consider pulse oximetry, nasal oxygen, RBC transfusioin
  - Pallor, atrophic glossitis, angular cheilitis, ulcers, glossodynia
- Platelets (bleeding)
  - Ideally check within 24hrs of dental procedure – caution <50 x 10^9/L
  - Consider platelet transfusion – rapid sequestration
  - Caution regional LA blocks and lingual infiltrations
  - Consider cushioning retraction instruments during extractions
  - Lip emollient to prevent cracking/bleeding
  - Local haemostatic measures post-extractions

Check bloods ➔ Consider specialist setting if deranged

DENTAL IMPLICATIONS

Surgery

- WBC (infections):
  - Ideally check counts within 24hrs of dental procedures
  - WBC: caution $<3 \times 10^9/L$, need to see profiling
  - Neutrophils: $<1 \times 10^9/L$ – risks of infection, poor wound healing, bacteraemia.
    - Liaise with haematologist/oncologist to support haematologically (e.g. G-CSF)
    - Surgical gown and sterile environment/equipment
    - Consider post-op 1 wk chlorhexidine rinse
    - Consider antibiotic prophylaxis.
  - Aerosol-generating procedures (e.g. S/C with u/s scaler) should be minimised if immunosuppressed immediately post-CT/HSCT

Check bloods ➔ Consider specialist setting if deranged

DENTAL IMPLICATIONS

Therapeutic Guidelines – Oral and Dental v4 2026

Immune compromise: dental considerations

Oral and Dental

Immune compromise: dental considerations

A patient's degree of immune compromise affects treatment decisions, including decisions on indications for antibiotic treatment of established infection or prophylaxis for a dental procedure.

Patients with profound immune compromise are at increased risk of infection which can spread rapidly. Their dental management requires a multidisciplinary approach that considers how invasive a procedure is and the associated risk of infection.

Risk of bleeding also requires evaluation because patients may have impaired haemostasis.

Causes of profound immune compromise include:

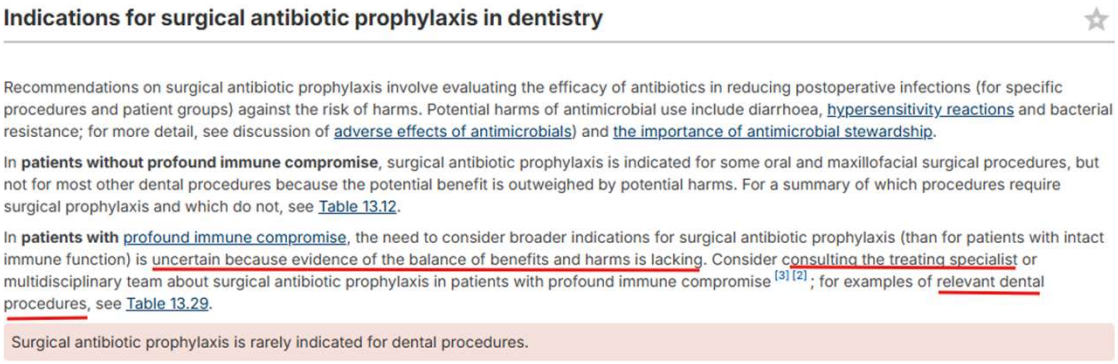
- kidney failure (end-stage kidney disease)
- liver failure (end-stage liver disease)
- active haematological malignancies (leukaemias, lymphomas, myelomas)
- some chemotherapies and immunotherapies (eg Chimeric Antigen Receptor T-Cell therapy [CAR T-cell therapy]) for malignancies, particularly for leukaemia and lymphoma
- immune suppressive drugs for peripheral blood stem cell and bone marrow transplants
- immune suppressive drugs for solid organ transplantation or autoimmune and inflammatory conditions (eg rheumatoid arthritis, psoriasis, inflammatory bowel disease, systemic lupus erythematosus, vasculitides)
- untreated or end-stage human immunodeficiency virus (HIV) infection
- primary immunodeficiency syndromes; see this guideline from the Royal Children's Hospital for features of these syndromes.

Not all immune compromise is profound. For example, suboptimally managed diabetes can compromise the immune system but is not a cause of profound immune compromise that may warrant broader indications for antibiotic use (than apply to patients who are immunocompetent). Parameters that can guide medical practitioners in assessing the severity of immune suppression include:

- a low neutrophil count – severe neutropenia is a manifestation of profound immunosuppression in many of the conditions listed above
- reduced antibody production (hypogammaglobulinaemia) (eg in patients with myeloma or lymphoma)
- other immune parameters (eg CD4 cell counts).

If a patient has a condition that may cause profound immune compromise, consult the patient's medical practitioner, specialist or multidisciplinary team to assess the severity of the immune compromise, and to determine an appropriate treatment plan (eg treatment for established infection, decisions on surgical antibiotic prophylaxis, assessment and management of bleeding risk). For classification of dental procedures by invasiveness and implications for risk management, see Table 13.29.

DENTAL IMPLICATIONS



Indications for surgical antibiotic prophylaxis in dentistry

Recommendations on surgical antibiotic prophylaxis involve evaluating the efficacy of antibiotics in reducing postoperative infections (for specific procedures and patient groups) against the risk of harms. Potential harms of antimicrobial use include diarrhoea, hypersensitivity reactions and bacterial resistance; for more detail, see discussion of adverse effects of antimicrobials) and the importance of antimicrobial stewardship.

In **patients without profound immune compromise**, surgical antibiotic prophylaxis is indicated for some oral and maxillofacial surgical procedures, but not for most other dental procedures because the potential benefit is outweighed by potential harms. For a summary of which procedures require surgical prophylaxis and which do not, see Table 13.12.

In **patients with** profound immune compromise, the need to consider broader indications for surgical antibiotic prophylaxis (than for patients with intact immune function) is uncertain because evidence of the balance of benefits and harms is lacking. Consider consulting the treating specialist or multidisciplinary team about surgical antibiotic prophylaxis in patients with profound immune compromise [3] [2]; for examples of relevant dental procedures, see Table 13.29.

Surgical antibiotic prophylaxis is rarely indicated for dental procedures.

Therapeutic Guidelines – Oral and Dental v4 2026

DENTAL IMPLICATIONS

Therapeutic Guidelines – Oral and Dental v4 2026

Table 13.29 Classification of dental procedures by invasiveness and considerations for risk management

Printable table

noninvasive procedures

minimally invasive procedures

- gingival retraction cord, subgingival matrix band placement, stainless steel crowns, rubber dam clamps
- supragingival debridement
- dental restorations requiring local anaesthetic or closed root canal procedure

invasive procedures

minimally invasive procedures: supragingival debridement		
bleeding risk considerations	antibiotic prophylaxis	other considerations
unlikely to cause prolonged bleeding, but see Table 13.30 for considerations to minimise risk	surgical antibiotic prophylaxis is not required for most patients; consider (with the patient's medical team) whether it is appropriate for patients with gingivitis and profound immune compromise infective endocarditis prophylaxis is indicated in patients with specific cardiac conditions	an increase in glucocorticoid replacement is not indicated for patients at risk of adrenal crisis

invasive procedures		
tooth extraction, periodontal surgery, biopsies, implant placement, subgingival debridement		
bleeding risk considerations	antibiotic prophylaxis	other considerations
prolonged bleeding is likely with invasive procedures; see Table 13.30 for considerations to minimise risk	for patients **without** profound immune compromise, surgical antibiotic prophylaxis is not indicated for most dental procedures; see Table 13.12 for patients **with** profound immune compromise, consider (with the patient's medical team) whether surgical antibiotic prophylaxis is appropriate infective endocarditis prophylaxis is recommended only for specific oral and dental procedures in patients with specific cardiac conditions	an increase in glucocorticoid dose is recommended in patients at risk of adrenal crisis (including patients on chronic glucocorticoids [eg prednisolone 5 mg or more daily for more than 3 weeks]); seek advice from the patient's medical practitioner risk of triggering medication-related osteonecrosis of the jaw (MRONJ) may be increased for patients taking certain medications

DENTAL IMPLICATIONS

Surgery

- Bisphosphonates [MM] and emerging targeted therapies
  - MRONJ (coming up soon!)
  - Well-fitting dentures
  - Consider if possible to avoid extraction (treat periodontally, endodontically)
- Antithrombotic therapy [MM]
  - Invasive dental procedures
  - Consult with haematologist/oncologist, since MM-induced thrombocytopenia, chemotherapy and antithrombotic drugs all contribute to bleeding risk
  - Consider withholding just prior to dental procedure (separate lecture - *Haemostasis*)

DENTAL IMPLICATIONS

*Therapeutic Guidelines – Oral and Dental v4 2026

Surgery

- Corticosteroids
  - Adrenal crisis – physiological stress/anxiety from dental procedure
  - Risk of adrenal suppression depends on dose, duration, potency and route of administration of glucocorticoid, individual susceptibility
  - *Oral prednisolone >5mg daily for >3 weeks
  - Multiple corticosteroid formulations concurrently (e.g. inhaled and oral)

  - Determining risk of adrenal crisis:
    - 1) Patient factors
    - 2) Procedural factors

DENTAL IMPLICATIONS

Therapeutic Guidelines – Oral and Dental v4 2026

Table 13.29

minimally invasive procedures: dental restorations requiring local anaesthetic or closed (nonsurgical) root canal procedure		
bleeding risk considerations	antibiotic prophylaxis	other considerations
unlikely to cause prolonged bleeding if local infiltration alone is used; if an inferior alveolar nerve block is required, see Table 13.30 for considerations to minimise risk	surgical antibiotic prophylaxis is not indicated infective endocarditis prophylaxis is not indicated	an increase in glucocorticoid dose is recommended for patients at risk of adrenal crisis (including patients on chronic glucocorticoids [eg prednisolone 5 mg or more daily for more than 3 weeks]); seek advice from the patient's medical practitioner [NB4]
invasive procedures		
tooth extraction, periodontal surgery, biopsies, implant placement, subgingival debridement		
bleeding risk considerations	antibiotic prophylaxis	other considerations
prolonged bleeding is likely with invasive procedures; see Table 13.30 for considerations to minimise risk	for patients **without** profound immune compromise, surgical antibiotic prophylaxis is not indicated for most dental procedures; see Table 13.12 for patients **with** profound immune compromise, consider (with the patient's medical team) whether surgical antibiotic prophylaxis is appropriate infective endocarditis prophylaxis is recommended only for specific oral and dental procedures in patients with specific cardiac conditions	an increase in glucocorticoid dose is recommended in patients at risk of adrenal crisis (including patients on chronic glucocorticoids [eg prednisolone 5 mg or more daily for more than 3 weeks]); seek advice from the patient's medical practitioner risk of triggering medication-related osteonecrosis of the jaw (MRONJ) may be increased for patients taking certain medications

DENTAL IMPLICATIONS

Therapeutic Guidelines – Oral and Dental v4 2026

For **dental procedures that do not warrant an increase in glucocorticoid dosing** (see Table 13.29), patients must take their usual glucocorticoid dose on the day of the dental procedure.

For **dental restorations requiring local anaesthetic, closed (nonsurgical) root canal procedures, or any** invasive procedures, an increase in glucocorticoid dose is recommended to minimise the risk of precipitating adrenal crisis. Patients may have a written action plan addressing the need for periprocedural dose increases; if not, seek advice from the patient's medical practitioner on glucocorticoid dosing adjustment. Advice for medical practitioners is available in Adrenal insufficiency and Adrenocortical suppression. Usually, the patient's regular glucocorticoid dose is doubled on the morning of the dental procedure (and in some situations, for up to 48 hours postoperatively). Dental practitioners should consult the patient's medical practitioner when a dose increase is required, to ensure all clinicians involved in the patient's care can consider the impact of any proposed short-term changes to their glucocorticoid regimen. Seek endocrinologist advice for patients at risk of adrenal crisis who are undergoing general anaesthetic, sedation or fasting.

Perform dental treatment in the morning so that if an adrenal crisis occurs, symptoms present while the patient is awake. After dental treatment, ensure the patient remains in the care of a responsible adult for the rest of the day, and the carer remains in contact with the patient for the following 2 to 3 days. Advise the patient and the carer to seek urgent medical attention if the patient experiences symptoms of adrenal crisis.

DENTAL IMPLICATIONS

*Therapeutic Guidelines – Oral and Dental v4 2026

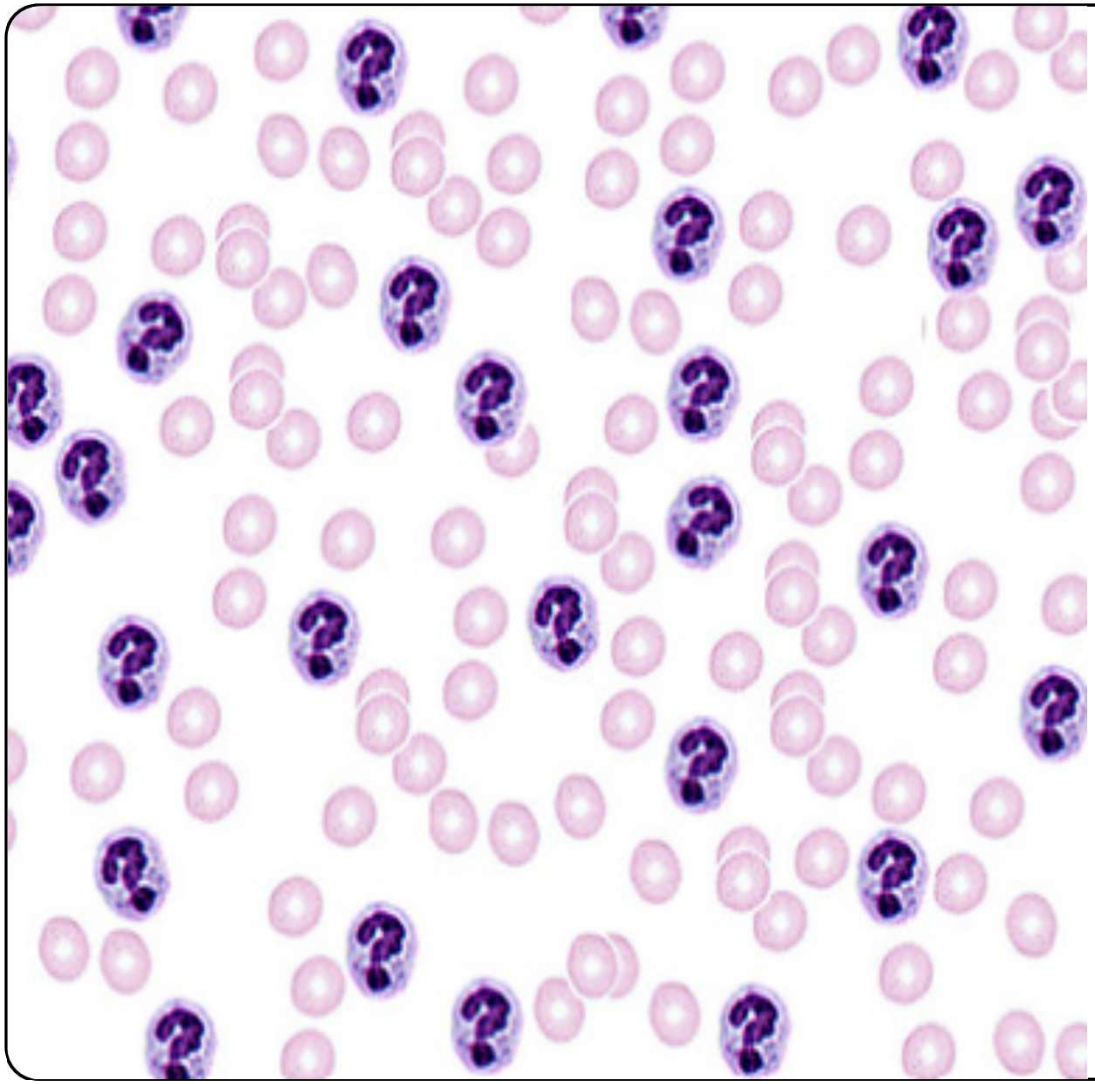
Surgery

- Renal dialysis [MM]
  - Drug doses may require reduction
  - Haemodialysis: treat on non-dialysis days (heparinisation)
  - Bleeding tendency, anaemia, infection tendency…
  - (topic of another lecture: *Renal Disease*)

DENTAL IMPLICATIONS

Spread

- Susceptibility to infection → infection control protocols
- Transfusions: screened for BBVs
- Immunocompromise/immunosuppression = may be on systemic antifungal (e.g. fluconazole), antiviral (e.g. valaciclovir), antibiotics (e.g. sulfamethoxazole/trimethoprim)
  - Predisposed to oral candida, herpes simplex, VZV, etc



QUESTIONS?

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