

The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

- I Evidence obtained from a systematic review of all relevant randomised control trials.
- II Evidence obtained from at least one well designed randomised control trial.
- III Evidence obtained from well-designed controlled trials without randomisation.
- IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series
- V Evidence obtained from systematic reviews of descriptive and qualitative studies
- VI Evidence obtained from single descriptive and qualitative studies
- VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.)*. Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). *NHMRC levels of evidence and grades for recommendations for developers of guidelines* (2009). Australian Government: NHMRC.
http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/evidence_statement_form.pdf

OCEBM Levels of Evidence Working Group Oxford (2011). *The Oxford 2011 Levels of Evidence*. Oxford Centre for Evidence-Based Medicine. <http://www.cebm.net/index.aspx?o=1025>

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
American Academy of Pediatric Dentistry. (2009/2010) Guideline on Dental Management of Pediatric Patients Receiving Chemotherapy, Hematopoietic Cell Transplantation, and/or Radiation. <i>American Academy of Pediatric Dentistry Reference Manual</i> , 31(6), 232-238	VII	<ul style="list-style-type: none"> -the most frequent source of sepsis in the immunosuppressed cancer patient is the mouth; dentist plays key role in providing early individualized dental intervention and oral hygiene measures -key to success for a healthy oral cavity is patient compliance -paediatric recommendations provided on; <ul style="list-style-type: none"> -dental/oral care before initiation of cancer therapy -dental/oral care during immunosuppression periods -dental/oral care after cancer therapy is completed -specific considerations for HSCT patients
Birmingham, M., Berryman, J., De Graves, S., Ladd, A. & Windrum, H.A. (2010) Nursing Documentation Compliance to Oral Assessment Guidelines and Corresponding Nursing Interventions. 1-22 (Unpublished; Masters of Nursing Science – University of Melbourne)	IV	<ul style="list-style-type: none"> -retrospective study; 80 samples of data collated over 2 week period in a paediatric oncology unit -findings suggest nursing compliance in documenting an Oral Assessment Guideline (OAG) score was poor -nursing interventions provided for mouthcare were inconsistent with the observed OAG score -recommends appropriate education and better adherence to the documentation of the OAG score and subsequent nursing interventions for mouthcare in the paediatric oncology setting
Cheng, K.K.F., Chang, A.M. & Yuen, M.P. (2004) Prevention of oral mucositis in paediatric patients treated with chemotherapy: a randomized crossover trial comparing two protocols of oral care. <i>European Journal of Cancer</i> , 40, 1208-1216	II	<ul style="list-style-type: none"> -findings suggest that chlorhexidine together with oral care may be helpful in alleviating mucositis when given prophylactically to children on chemotherapy -findings indicated the use of chlorhexidine significantly reduced the severity of mucositis compare with benzydamine -chlorhexidine may assist in reducing oral mucosal damage during chemotherapy, possibly through plaque control and a reduction in the oral microflora

<p>Cheng, K.K.F., Molassiotis, A. & Chang, A.M. (2002) An oral care protocol intervention to prevent chemotherapy-induced oral mucositis in paediatric cancer patients: a pilot study. <i>European Journal of Oncology Nursing</i>, 6(2), 66-73</p>	<p>III</p>	<p>-small study (14 children) supports the use of oral care protocols -indicated the use of an oral care protocol alleviated the pain intensity associated with oral mucositis</p>
<p>Clarkson, J.E., Worthington, H.V. & Eden T.O.B. (2007) Interventions for preventing oral candidiasis for patients with cancer receiving treatment. <i>Cochrane Database of Systematic Reviews</i> 2007, Issue 1, 1-41. Art. No.: CD003807. DOI: 10.1002/14651858.CD003807.pub3. (Review content assessed as up to date 04/08/09)</p>	<p>I</p>	<p>-28 randomised controlled trials included in the review -strong evidence that drugs absorbed or partially absorbed from the GI tract prevent oral candidiasis in patients receiving cancer treatment -evidence that drugs absorbed or partially absorbed from the GI tract are significantly better at preventing oral candidiasis than drugs not absorbed from the GI tract</p>
<p>Clarkson, J.E., Worthington, H.V., Furness, S., McCabe, M., Khalid, T. & Meyer, S. (2010) Interventions for treating oral mucositis for patients with cancer receiving treatment. <i>Cochrane Database of Systematic Reviews</i> 2010, Issue 8, 1-69. Art. No.: CD001973. DOI:10.1002/14651858.CD001973.pub4.</p>	<p>I</p>	<p>-32 randomised controlled trials included in the review -limited evidence from 2 small trials that low level laser treatment reduces the severity of mucositis -morphine can effectively control pain, less opiate used per hour for PCA versus continuous infusion</p>
<p>Da Fonseca, M. (2004) Dental Care of the Pediatric Cancer Patient. <i>Pediatric Dentistry</i>, 26(1), 53-57</p>	<p>VII</p>	<p>-discusses recommendations for the dental care of the paediatric oncology patient primarily during the treatment phase</p>
<p>Dodd, M.J., Dibble, S.L., Miaskowski, C., MacPhail, L., Greenspan, D., Paul, S.M., Shiba, G. & Larson, P. (2000) Randomized clinical trial of the effectiveness of 3 commonly used mouthwashes to treat chemotherapy-induced mucositis. <i>Oral Surgery Oral Medicine Oral Pathology</i>, 90(1), 39-47</p>	<p>II</p>	<p>-the effectiveness of 3 mouthwashes to treat chemotherapy-induced mucositis was comparable; salt and soda, chlorhexidine, and "magic" mouthwash (lidocaine, Benadryl and Maalox) -as comparable results were obtained, authors suggest to use salt and soda as is the least costly mouthwash -non significant differences for pain ratings among the mouthwashes was observed</p>

<p>Harris, D.J., Eilers, J., Harriman, A., Cashavelly, B.J. & Maxwell, C. (2008) Evidence-Based Interventions for the Management of Oral Mucositis. <i>Clinical Journal of Oncology Nursing</i>, 12(1), 141-152</p>	<p>VII</p>	<ul style="list-style-type: none"> -outlined core elements of an oral care protocol -adherence to an oral care regimen can reduce the duration and severity of mucositis -2 interventions likely to be effective for managing oral mucositis in patients receiving treatment for cancer include; <ul style="list-style-type: none"> -cryotherapy for patients receiving bolus chemotherapy with short half-life -palifermin for patients undergoing autologous hematopoietic stem cell transplant (HSCT) for hematologic malignancies
<p>James, P.J., Howard, R.F. & Williams, D.G. (2010) The addition of ketamine to a morphine nurse- or patient-controlled analgesia infusion (PCA/NCA) increases analgesic efficacy in children with mucositis pain. <i>Pediatric Anesthesia</i>, 20, 805-811</p>	<p>IV</p>	<ul style="list-style-type: none"> -the addition of ketamine to a morphine NCA/PCA improves analgesic efficacy in children with mucositis pain with no increase in the incidence of side effects
<p>Keefe, D.M., Schubert, M.M., Elting, L.S., Sonis, S.T., Epstein, J.B., Raber-Durlacher, J.E., Migliorati, C.A., McGuire, D.B., Hutchins, R.D. & Peterson, D.E. (2007) Updated Clinical Practice Guidelines for the Prevention and Treatment of Mucositis. <i>Cancer</i>, 109(5), 820-831</p>	<p>VII</p>	<ul style="list-style-type: none"> -review and update of previous guidelines produced by the Multinational Association of Supportive Care in Cancer & the International Society for Oral Oncology (MASCC/ISOO) using literature review Recommendations included; <ul style="list-style-type: none"> -regular assessment of oral pain is required using validated pain tool; topical anesthetics or other agents should be used to provide adequate oral pain control -ongoing assessment of the oral cavity is required using validated tools -a preventative oral care regimen should be part of routine supportive care; a therapeutic oral care regimen should be provided if mucositis develops -an oral care protocol outlining regular oral care hygiene, brushing, flossing, bland rinses and moisturizers should be used for all patients -dental examinations & treatment are required prior to commencement of cancer treatment, during active treatment & as follow up post cessation of treatment

<p>Kumar, N., Brooke, A., Burke, M., John, R., O'Donnell, A. & Soldani, F. (2012) The Oral Management of Oncology Patients Requiring Radiotherapy, Chemotherapy and/or Bone Marrow Transplantation: Clinical Guidelines. <i>The Royal College of Surgeons of England / The British Society for Disability and Oral Health</i> http://www.rcseng.ac.uk/fds/publications-clinical-guidelines/clinical_guidelines/documents/clinical-guidelines-for-the-oral-management-of-oncology-patients-requiring-radiotherapy-chemotherapy-and-or-bone-marrow-transplantation Retrieved 14/05/13</p>	VII	<ul style="list-style-type: none"> -review and update of previous clinical guidelines, outlining oral management prior to, during and following cancer therapy with the aim to prevent or minimize oral complications in this patient group Recommendations include; -oncology patients should receive a comprehensive pretreatment oral assessment by a dentist, and should be continually monitored during the acute phase of cancer therapy and following completion -a multidisciplinary team is involved including dentistry, dietetics and nursing staff -oral hygiene advice includes tooth brushing at least twice a day with a fluoride toothpaste appropriate for the age of the child -oral hygiene practices are supplemented with an alcohol free chlorhexidine mouthwash or gel if gingival disease is diagnosed -use of aciclovir as a prophylactic agent in bone marrow transplant patients at high risk of viral infections -use of antifungal medication following detection of oral candida -dental treatment is avoided wherever possible during therapy -outline of management of orthodontic devices, dental treatment and osteoradionecrosis
<p>Marinho, V.C.C., Higgins, J.P.T., Logan, S. & Sheiham, A. (2003) Fluoride toothpastes for preventing dental caries in children and adolescents. <i>Cochrane Database of Systematic Reviews</i> 2003, Issue 1. Art. No.: CD002278. DOI:10.1002/14651858.CD002278.</p>	I	<ul style="list-style-type: none"> -74 randomised controlled trials included in the review -fluoride toothpastes are efficacious in preventing dental caries -the effect of fluoride toothpaste increased with higher baseline levels of decay, missing and filled permanent teeth (D(M)FS), higher fluoride concentration, higher frequency of use and supervised brushing, but was not influenced by exposure to water fluoridation
<p>McGuire, D.B., Correa, M.P., Johnson, J., Wienandts, P. (2006) The role of basic oral care and good clinical practice principles in the management of oral mucositis. <i>Support Cancer Care</i>, 14, 541-547</p>	VII	<p>Recommendations from the Basic Oral Care Group (MASCC/ISOO) regarding the role of basic oral care and good practice principles in the prevention and management of oral mucositis included;</p> <ul style="list-style-type: none"> -as listed in Keefe, D.M. et al, (2007) Updated Clinical Practice Guidelines for the Prevention and Treatment of Mucositis. <i>Cancer</i>, 109(5), 820-831

<p>Nashwan, A.J. (2011) Use of Chlorhexidine Mouthwash in Children Receiving Chemotherapy: A Review of Literature. <i>Journal of Pediatric Oncology Nursing</i>, 28(5), 295-299</p>	<p>II</p>	<p>-the use of oral assessment tools, oral hygiene care, dental consultations, patient teaching and nursing intervention can reduce the incidence of oral mucositis -majority of studies support the use of chlorhexidine mouthwash in reducing oral mucosal damage during chemotherapy in the paediatric oncology population, through plaque control and reduction in oral microflora</p>
<p>Potting, C.M.J., Uitterhoeve, R., Scholte Op Reimer, W. & Van Achterberg, T. (2006) The effectiveness of commonly used mouthwashes for the prevention of chemotherapy-induced oral mucositis: a systematic review. <i>European Journal of Cancer Care</i>, 15, 431-439</p>	<p>II</p>	<p>-the use of chlorhexidine as well as other mouthwash for preventing oral mucositis in patients undergoing chemotherapy is not recommended -one study indicated although there was no difference in mucositis between four different mouthwash regimens, bacterial and fungal oral infections were found less often among the patients using chlorhexidine</p>
<p>Qutob, A.F., Gue, S., Revesz, T., Logan, R.M. & Keefe, D. (2013) Prevention of oral mucositis in children receiving cancer therapy: A systematic review and evidence-based analysis. <i>Oral Oncology</i>, 49, 102-107</p>	<p>II</p>	<p>-supported the use of oral care protocols to prevent oral mucositis in children -oral sucralfate suspension, prostaglandin E2 tablets and GM-CSF mouthwash should not be considered in oral mucositis prevention -conflicting evidence on the use of chlorhexidine mouthwash, laser therapy and glutamine in mucositis prevention, further research required</p>

<p>Rubenstein, E.B., Peterson, D.E., Schubert, M., Keefe, D., McGuire, D., Epstein, J., Elting, L.S., Fox, P.C., Cooksley, C. & Sonis, S.T. (2004) Clinical Practice Guidelines for the Prevention of Cancer-Induced Oral and Gastrointestinal Mucositis. <i>Cancer</i>, Supplement, 100(9), 2026-2046</p>	<p>VII</p>	<ul style="list-style-type: none"> - guidelines produced by the Multinational Association of Supportive Care in Cancer & the International Society for Oral Oncology (MASCC/ISOO) using literature review Recommendations included; -recognised importance of basic oral care for the cancer patient; reduce impact of oral microbial flora, cancer therapy-related symptoms of pain and bleeding, and prevent soft tissue infections -insufficient evidence to conclude that actions such as tooth brushing, flossing or using topical fluoride will prevent or treat, cancer therapy-induced mucositis - patient-controlled analgesia (PCA) with morphine as the treatment of choice for oral mucositis pain in patients undergoing HSCT -benzydamine for the prevention and reduction of radiation-induced mucositis in head and neck cancer patients receiving moderate dose radiotherapy -chlorhexidine be used as part of an oral care protocol for its antiplaque and antifungal properties, however insufficient evidence for the use of chlorhexidine in treating established oral mucositis -rantidine or omeprazole for the prevention of epigastric pain after treatment with cyclophosphamide, methotrexate and 5-FU
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<p>UKCCSG-PONF Mouth Care Group. (2006) Mouth Care for Children and Young People with Cancer: Evidence-based Guidelines, Guideline Report, Version 1, http://www.rcn.org.uk/data/assets/pdf_file/0017/11276/mouth_care_cyp_cancer_guideline.pdf Retrieved 14/05/13</p>	<p>VII</p>	<ul style="list-style-type: none"> -oral complications occurring during and following cancer treatment are common and can cause pain, difficulty in swallowing and phonation, and poor nutrition, impacting on the patient’s quality of life -a multidisciplinary team approach to oral hygiene should occur, with the dentist identified as key member -parents and children should be given oral hygiene advice prior to commencing cancer treatment, and should be informed of the possible long-term dental effects from treatment for childhood cancer -daily oral hygiene includes tooth brushing at least twice a day with a fluoride toothpaste appropriate for the age of the child -the Oral Assessment Guide (OAG) by Eilers et al was identified as being appropriate for use in children and young people -nursing staff are best placed for the regular assessment of the child’s oral status -an appropriate pain assessment tool should be used to ensure adequate pain control -no interventions have demonstrated a clear benefit for the prevention of oral mucositis in children receiving cancer treatment, however several have been shown to be potentially beneficial in adults -antifungal prophylaxis is not recommended for most patients; when choosing an antifungal agent, one that is absorbed from the GI tract is recommended -absorbed or partially absorbed antifungal agents could be used for the treatment of visible oral candidiasis -saliva stimulants, artificial saliva, chewing sugar free gum or frequent sips of water for the relief of dry mouth should be considered -aciclovir is only recommended as a preventative therapy for herpes simplex in HSCT patients -aciclovir is effective for the treatment of herpes simplex in patients receiving chemotherapy and/or radiotherapy
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<p>Walsh, L.J. (2010) Clinical assessment and management of the oral environment in the oncology patient. <i>Australian Dental Journal</i>, Australian Dental Association, 55(1 Suppl), 66-77</p>	<p>VII</p>	<ul style="list-style-type: none"> -provides an overview of the role of the dental practitioner in the pre-treatment workup and post-treatment maintenance of oncology patients -discusses complications which occur during intensive inpatient phase and management which may reduce or prevent oral complications -discusses an Australian clinical trial that indicated systemic antifungal agents clearly more effective than topical antifungal agents in preventing candidosis; topical antifungal agents were also poorly tolerated -evidence based recommendations for use of products that support oral health in the oncology patient
<p>Worthington, H.V., Clarkson, J.E., Khalid, T., Meyer, S. & McCabe, M. (2010) Interventions for treating oral candidiasis for patients with cancer receiving treatment. <i>Cochrane Database of Systematic Reviews</i> 2010, Issue 7, 1-25. Art. No.: CD001972. DOI: 10.1002/14651858.CD001972.pub4.</p>	<p>I</p>	<ul style="list-style-type: none"> -10 randomised controlled trials included in the review -drugs absorbed from the gastrointestinal (GI) were beneficial in eradication of oral candidiasis compared with drugs not absorbed from the GI tract -insufficient evidence to support or refute a benefit of any antifungal agent in treating candidiasis, further trials needed -clinicians need to make a decision on whether to prevent or treat oral candidiasis in patients receiving cancer treatment
<p>Worthington H.V., Clarkson J.E. & Eden T.O.B. Interventions for preventing oral mucositis for patients with cancer receiving Treatment. <i>Cochrane Database of Systematic Reviews</i> 2007, Issue 4. Art. No.: CD000978. DOI: 10.1002/14651858.CD000978.pub3.</p>	<p>I</p>	<ul style="list-style-type: none"> -89 randomised controlled trials included in the review -weak evidence for several interventions (amifostine, benzydamine, calcium phosphate, Chinese medicine, bolus etoposide, honey, hydrolytic enzymes, ice chips, iseganan, oral care and zinc sulphate) that were found to have some benefit at preventing or reducing the severity of mucositis associated with cancer treatment -strength of the evidence was variable, benefits may be specific for certain cancer types and treatments
<p>Zhang, Q., van Palenstein-Helderman, W.H., van't Hof, M. & Truin, G.J. (2006) Chlorhexidine varnish for preventing dental caries in children, adolescents and young adults: a systematic review. <i>European Journal of Oral Sciences</i>, 114, 449-455</p>	<p>I</p>	<ul style="list-style-type: none"> -chlorhexidine is an effective antimicrobial agent used in the chemical control of plaque formation and for the prevention of caries -tentatively concluded that chlorhexidine varnish has a moderate caries-inhibiting effect when applied every 3-4 months when used in children, adolescents and young adults; however this effect seems to be diminished by 2 years after last application

