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# Best Practice in Basic Oral Care among Cancer Patients

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<p>Basic oral care maintains oral cleanliness, reduces the impact of oral microbial flora, prevents infections in the oral cavity, thereby preventing cancer treatment complications. Nurses caring for cancer patients are well situated to perform various roles that affect the patients' oral health such as identifying patients at risk of developing oral complications, and educating cancer patients about the importance and means of having good oral health throughout their treatment to prevent, mitigate or manage oral complications due to cancer treatment.</p> <p>The purpose of this final project is to describe the best practices in basic oral care among cancer patients. This final project applied principles of systematic literature review. The 13 selected articles and evidence summaries met our inclusion criteria and answered the research question. They were obtained from medical databases: Medline, Pubmed, Joanna Briggs Institute and CINAHL.</p> <p>The findings from the data analysis showed that a combination of patient education, oral care regimens and oral assessments are crucial in the provision of basic oral care in cancer patients receiving treatment therapies. In particular, education of patients and their carers, as well as the nurses on ways of performing effective oral assessments and cancer patients' oral care regimens is important.</p> <p>In conclusion, good basic oral care among cancer patients is fundamental in the prevention, mitigation and management of oral complications resulting from the treatment therapies, and this entails the use of oral care protocols; oral cavity assessments, consistent oral care regimen, and patient education.</p>	
Keywords	oral care/hygiene, best practice, cancer patient

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<p>Suun perushoito ylläpitää suun puhtautta, vähentää oraalisen mikrobikasvuston vaikutusta, estää suun pehmytkudoksen infektoita ja lievittää syöpähoitojen komplikaatioita. Syöpäpotilaita hoitavat sairaanhoitajat ovat hyvässä asemassa huolehtimaan erilaisista rooleista, jotka vaikuttavat potilaan suun terveyteen. He voivat esimerkiksi tunnistaa potilaan riskialtiuden oraalisten komplikaatioiden kehittymiseen, ja kouluttaa syöpäpotilaita hyvän oraalisen terveyden tärkeydestä ja välineistä koko hoidon ajan, jotta syöpähoidoista johtuvat oraaliset komplikaatiot voidaan estää tai niitä voidaan vähentää tai hallita.</p> <p>Tämän opinnäytetyön tarkoitus on kuvailla suun perushoidon hoitosuosituksia syöpäpotilaiden kohdalla. Opinnäytetyössä käytettiin systemaattisen kirjallisuuskatsauksen periaatteita. 13 valittua lähdettä, jotka koostuivat artikkeleista ja todisteyhteenvedoista, täyttivät sisällytyskriteerit ja vastasivat opinnäytetyön tutkimuskysymyksiin. Ne hankittiin seuraavista lääketieteellisistä tietokannoista: Medline, Pubmed, Joanna Briggs Institute ja CINAHL.</p> <p>Tietoanalyysin löydökset osoittivat, että potilaan koulutuksen, suunhoitorutiinien ja suun arvioinnin yhdistelmä on tärkeää suun perushoidossa syöpäpotilaille heidän hoitonsa aikana. Erityisesti potilaiden ja heidän hoitajiensa sekä sairaanhoitajien koulutus tehokkaan oraalisen arvioinnin suorittamiseen ja syöpäpotilaan suunhoidon rutiineihin on tarpeen.</p> <p>Hyvä suun perushoito on tärkeää syöpäpotilaille hoidosta johtuvien oraalisten komplikaatioiden estämiseksi, vähentämiseksi ja hallitsemiseksi. Tämä sisältää suun hoitoprotokollien käytön; suuntelon terveyden arvioinnin, jatkuvan suunhoitorutiinin ja potilaan ohjauksen.</p>	
Avainsanat	suun terveydenhoito, suuhygienia, hoitosuositus, syöpäpotilas

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## 1 Introduction

Good oral health is important in both healthy and unwell individuals because not only will it facilitate prevention of infections but will also enhance comfort and wellbeing in the individual (Huskinson & Lloyd 2009). Routine oral care is needed to obtain an optimum oral health which pertains to maintenance of health, integrity and function of the mucosa (Eilers & Million 2011; Harris et al. 2008; Rubenstein et al. 2004). Chemotherapy and radiotherapy are examples of treatments in cancer patients available in the MaZaFi countries; Malawi, Zambia and Finland. In Malawi and Zambia, these treatment therapies are still in their early stages, while in Finland, in addition to chemotherapy and radiotherapy other latest forms of treatment are readily available. (Kendig et al. 2013; Syöpäjärjestöt 2010.)

Oral care in cancer patients is very important throughout the disease trajectory, from diagnosis, treatment and post-treatment, because the oral tissues in these patients are highly susceptible to cancer treatments (Eilers & Million 2011; Taggart 2009: 38). Severe complications that may become life-threatening during cancer therapy may develop due to poor oral health and injuries to the oral soft tissues (Taggart 2009:38).

In case oral complications were to develop in cancer patients, the course of treatment and prognosis may be affected by many factors such as adjustments of dosage, management of secondary infections, and nutritional support that may be required (Eilers 2004; Lalla et al.: 2014). In addition, the patients' wellbeing and their quality of life are affected by oral complications because of their impact on their behaviour and social interaction (Eilers 2004; Wee et al. 2013).

Patients receiving cancer therapies, chemotherapy and radiotherapy, may develop oral complications such as oral mucositis (Brown & Wingard 2004, Harris et al. 2008). According to Brown and Wingard (2004), cancer treatments result in the development of oral complications in about 400,000 people per year receiving cancer treatments. They also note that oral mucositis develops in 40% of chemotherapy receiving patients, 80% of radiotherapy receiving patients, and 75% of patients receiving intensive high-dose chemotherapy during bone marrow transplant. Oral mucositis can be prevented by a

combination of performing oral care and pharmacological interventions (Harris et al. 2008).

In this final project, our focus will only be on the basic oral care and not on the pharmacological aspects of prevention and management of oral complications.

Basic oral care is fundamental in patients undergoing cancer treatment, and is considered the best practice by many in the healthcare profession; nurses, dentists, hematology-oncology department healthcare professionals, and dental hygienists (McGuire et al. 2013). Nurses caring for cancer patients are well situated to perform various roles that affect the patients' oral health such as identifying those patients at risk of developing oral complications and educating cancer patients about the importance and means of having good oral health throughout their treatment to prevent, mitigate or manage oral complications due to cancer treatment (Eilers & Million 2011; Sieracki et. al 2009).

Granted that oral care in patients undergoing cancer therapy is very important, it would be obvious that this is emphasized prior, during and post therapy. Surprisingly, there is inconsistency in the standard of oral care provided, or the standards are non-existent in many institutions. (Eilers 2004.)

This final project is part of the MaZaFi project carried out in several universities in Malawi, Zambia and Finland. In this final project we will describe the best practices in basic oral care among cancer patients with the aim of highlighting the available best practices in order to improve the basic oral care provided by nurses to this patient group.

## **2 Background**

The key concepts in this final project are best practice, basic oral care, and cancer patient. These are defined briefly in this section.

### **2.1 Best Practice**

Best practice is defined as the practice supported by evidence that integrates individual clinical expertise and patient preferences with the best available evidence from systematic research and practice generated data. Determination of this evidence-based practice

is the responsibility of clinicians who identify the up to date high quality scientific evidence that corroborates with the internal evidence. (Melnyk & Fineout-overholt 2011: 186.)

Evidence-based guidelines are defined by Burns and Grove (2011: 26) as rigorous, explicit clinical guidelines created by a team of experts that are founded on the best research evidence available in an area. This best research evidence is defined by as “the empirical knowledge generated from the synthesis of quality study findings to address a practice problem” (Burns & Grove 2011: 4-5).

Evidence-based practice is defined by LoBiondo-Wood and Haber (2006: 476) as “a broad term that encompasses the use of the best research evidence with clinical expertise and patient values/ preferences in deciding the evidence-base for practice”.

Best practice guidelines are thought to be conduits for information from published scientific evidence to clinical decisions, and that they help to reduce unnecessary variations in clinical practice (Melnyk & Fineout-overholt 2011: 187,194).

In nursing, the term best practice is used to define standard of care that was introduced to create uniformity in the care provided by nurses which is greater than basic standard but still achievable (Ducharme, 2013).

In this final project, the term best practice encompasses expert opinion, recommended guidelines, evidence-based practice, and clinical practice guidelines.

## 2.2 Basic Oral Care

Basic oral care is considered important by clinicians as a way of maintaining health of the oral mucosa, its integrity and function. Lack of basic oral care contributes to occurrence of dental complications such as caries and gingivitis. (McGuire et al. 2006.)

A clean oral cavity can be achieved and maintained by regularly performing basic oral care practices which include brushing teeth, tongue and gums; flossing in between the teeth; using a suitable mouthwash to rinse the mouth; and ensuring moisturisation of the lips and the oral cavity by maintaining good hydration and using moisturizers.



Basic oral care helps to lower the risk of infection in the oral cavity because normal flora is less likely to turn abnormal, thereby preventing infection that may have systemic consequences, thus helps to reduce the adverse effects of cancer therapy (Huskinson & Lloyd 2009; McGuire et al. 2013; Rubenstein et al. 2004.)

Poor oral health affects patient's behaviour, social interaction perhaps due to bad breath, and reduces their quality of life. Secondary health problems like pain, discomfort, and reduced nutritional intake maybe a consequence in presence of poor health and because of this, the nurses' role in preventing poor oral health in patients or promoting good oral health is very important. (Huskinson & Lloyd 2009; Wee et al. 2009.) This may be achieved by promotion of basic oral care practices and assessment of the mouth (Huskinson & Lloyd 2009).

### 2.3 Cancer Patient

In this final project, a cancer patient is a patient that has been diagnosed with cancer, who is to begin, or is receiving, or has finished treatment for the cancer.

Nurses must be aware that cancer patients often are psychologically distressed and have psychiatric disorders such as anxiety, depression because of the cancer (Bower & Waxman 2010: 78). This is notable particularly at the time when they learn about their diagnosis. At this point, these cancer patients are usually provided with information about their illness and treatment options. They are also expected to make decisions about their treatment, and if they decide to go ahead with the treatment, they are then provided information on the treatment's possible symptoms and their management. This simply means that the patients are often overwhelmed with vast information, of which the nurse must be sensitive. (Daniel et al. 2004.)

Caring for cancer patients by a nurse is stressful, challenging and emotionally draining. To this end, in addition to vast theory and practical knowledge, nurses need to have excellent communication and counselling skills. (Gill & Duffy, 2010.)

### **3 Purpose, Aim and Study Question**

The purpose of this final project is to describe the best practices in basic oral care in cancer patients with the aim of highlighting the available best practices so as to improve the basic oral care provided by nurses to this patient group.

The study question in this final project is: What are the best practices available in basic oral care among cancer patients?

### **4 Methodology**

#### **4.1 Literature review**

In this Final project, principles of systematic literature review were applied.

A literature review is a synopsis of current theoretical and scientific knowledge related to a particular topic, problem or concept (Burns & Grove 2011:189). The goal is to develop wide knowledge base required to perform research. It can bring forward what is known and unknown, any gaps, consistencies and inconsistencies in the literature. It can generate useful research questions and hypotheses and promote evidence-based revision and development of new practice protocol, policies, and projects. This can bring to light new practice interventions or support evidence for current interventions, protocols and policies. (LoBiondo-Wood & Haber 2006:80.)

In undertaking a literature review, research questions are identified and then answered by critically analysing relevant existing research or literature using systematic approach in which the previous studies are critiqued in an orderly, precise and analytic manner. (Aveyard, H. 2010:5-6, Coughlan et al. 2013: 2-4.) A literature review is therefore a tool to advancing practice as current practices are evaluated, logically summarized and discussed to highlight similarities and inconsistencies in the current knowledge, whilst also generating new research questions (Coughlan et al. 2013: 2-4).

## 4.2 Data collection

In this final project, data collection was achieved by the use of electronic databases and by manually searching the internet.

Final database searches were carried out on 20<sup>th</sup> February 2015 to 23<sup>th</sup> February 2015. For a comprehensive search, more than one database was used and similar strategies were applied in each database search. Four databases were used; CINAHL, MEDLINE, Joanna Briggs Institute and PUBMED. To ensure uniformity, search terms and quotation marks were similar in all database searches, as shown in **Appendix 1**. Articles that answered our research question that were not present in the database searches were obtained manually from the internet.

The inclusion criteria or limitation in all our database searches were consistently applied. In this final project, these criteria or limitation were as follows:

- Articles and evidence summaries published between 2004 and 2015.
- Articles and evidence summaries published in English.
- Articles and evidence summaries on adult patients.
- Articles and evidence summaries related to nursing and healthcare.

The exclusion criteria in all our database searches were applied and they are:

- Articles and evidence summaries published before 2004.
- Articles and evidence summaries published in other languages other than English.
- Article and evidence summaries that focused on pediatric patient group.
- Articles and evidence summaries that required payment.

Selection of articles and evidence summaries followed a systematic procedure. First, articles and evidence summaries that met the inclusion and exclusion criteria were recorded as HITS. Duplicate articles and evidence summaries from different database searches were not recorded as HITS. Second, articles were chosen as relevant by reading their title and then their abstract. Evidence summaries were chosen after reading the title. Third, the full text of these chosen articles and evidence summaries were then read to determine whether they answered the research question. Three articles were obtained by manually searching the internet. Selected for review were 13 articles and

evidence summaries that answered the research question, of which 10 were articles and 3 were evidence summaries.

#### 4.3 Data analysis

Content analysis is a research method that systematically and objectively describes and quantifies phenomena. Its application can be with both qualitative and quantitative data whether inductively or deductively. Inductive content analysis is used when there is limited previous knowledge about the phenomenon or when the knowledge available is fragmented. In inductive content analysis the categories are obtained from the data. (Elo & Kyngäs 2008.)

Principles of inductive content analysis were applied in this final project to analyze the selected data. All the selected articles and evidence summaries that met our study question were read one by one, by both authors at the same time. Data was discussed and then analyzed in a similar manner, from which three main categories were created according to recurrence of similar themes. From these categories, one category was further divided into six subcategories as shown in **Figure 1**.

Steps showing the data analysis are shown in **Appendix 2 and 3**.

## 5 Findings

In answering our study question: What are the best practices available in basic oral care among cancer patients? It was found out from data analysis that good basic oral care involves the use of oral care protocols, which are the best practices in basic oral care. These oral care protocols were identified as: oral cavity assessments, oral care regimens, and patient education.

Figure1.



## 5.1 Oral Cavity Assessment

Assessment of the oral cavity was promoted in oral care of cancer patients and was determined that it should be initiated before cancer treatment and continued during and after treatment (McTavish, R. 2014; Eilers & Million 2011; McGuire et al. 2006; Quinn et al. 2008; Eilers 2004). Eilers (2004) and Quinn et al. (2008), both noted that pre-treatment oral assessment involved a rigorous examination of lips, tongue, gingivae, and other surfaces to evaluate pain, function and integrity of the oral mucosa.

Baseline oral assessments of the oral cavity should be established prior to treatment (Eilers 2004 and Quinn et al. 2008). Quinn et al. (2008) noted that two kinds of baseline assessments were to be used; first, to be carried out by the dentists to determine pre-existing conditions and risk factors of oral mucositis and address them, second, to be carried out just before treatment to note the basis which can determine changes to the oral mucosa. In addition, Eilers and Million (2011) pointed out that the nursing role in pre-treatment period include assessment of the risks in developing oral mucositis.

During treatments systematic assessment of oral cavity using a valid and reliable tool was encouraged (McTavish 2014; Eilers & Million 2011; Harris et al. 2008; McGuire et al. 2006; Eilers 2004.) Patients were encouraged to carry out self-assessment at least once daily and report any changes (Eilers 2004; McGuire et al. 2006; McTavish 2014; Quinn et al. 2008). Eilers and Million (2011) further noted that in the event of oral cavity changes, the frequency of assessment can be increased. According to Daniel et al. (2004), the oncologist and oncology nurses are tasked with performing routine oral assessments.

Oral cavity assessment following treatment of either radiotherapy or chemotherapy is encouraged particularly in presence of oral mucositis because the symptoms might increase in severity before resolving (Quinn et al. 2008). Daniel et al. (2004) highlights that oral cavity assessment should be carried out by the dental team every 4 to 8 weeks for at least 6 months following radiotherapy.

## 5.2 Oral Care Regimen

Maintenance of a clean oral cavity can be achieved by having consistency when it comes to toothbrushing, flossing, and moisturizing. Having a regular and systematic brushing of teeth is advocated at least twice a day (Eilers 2004; Eilers & Million 2011; Harris et al. 2008; West & Mitchell 2004). Vijay (2014) stated that teeth should be brushed four times a day. The duration during a single session of toothbrushing is mentioned by Eilers (2004), Eilers and Million (2011), and Harris et al. (2008), as being at least 90 seconds. The quality of these toothbrushes should have soft bristles (Eilers & Million 2011; Harris et al. 2008; McGuire et al. 2006; McTavish 2014, and West & Mitchell 2004). Eilers and Million (2011), McGuire et al. (2006) and McTavish (2014) stated that these toothbrushes should be replaced regularly. Patients who are prone to bleeding were advised not to brush their teeth with toothbrushes, but instead clean their teeth using foam toothettes or swabs (Eilers & Million 2011; Moola 2014; West & Mitchell 2004). According to Eilers and Million (2011), patients can use both toothbrushes and toothettes at the same time; the toothbrush to clean the enamel surface of the teeth while the toothettes to clean the mucous membranes because they are less irritating. The toothbrush should be cleaned after toothbrushing and allowed to air dry before storage (Eilers & Million 2011; Harris et al. 2008; West & Mitchell 2004). West and Mitchell (2004) mentioned that toothpaste used should contain fluoride.

The role of flossing is to remove plaque, and patients are advised to include this in their daily oral care (Eilers & Million 2011). Flossing in between teeth was encouraged to be performed at least once a day or as recommended by clinicians (Eilers & Millions 2011; Harris et al. 2008). According to Salvador et al. (2012) and Vijay (2014), flossing should be performed when the patient's platelet count is above 50,000; when they are not thrombocytopenic.

Incorporation of mouthwash in oral care is considered important because it washes away loose debris and frequent use helps to remove organisms and decreases build-up of debris (Eilers & Million 2011). Use of non-alcohol based mouthwashes or bland rinses such as normal saline, sodium bicarbonate was advised (Eilers 2004; Eilers & Millions 2011; Harris et al. 2008; McGuire et al. 2006; McTavish 2014; Salvador et al. 2012; Vijay 2014). Harris et al. (2008) and Eilers and Million (2011) specified that rinsing the mouth can be performed four times a day, similarly, Lalla et al. (2014) mentioned that mouth rinsing should be performed more than once daily.

Good hydration moisturises the oral cavity and this was regarded important by Eilers and Million (2011), Harris et al. (2008), Salvador et al. (2012) and West and Mitchell (2004). Lip balms were considered important in the moisturisation and thus protection of the lips (Eilers & Million 2011; Harris et al. 2008; McGuire et al. 2006; Salvador et al. 2012). In particular, water-based lip moisturizers were promoted (Eilers 2004; Eilers & Million 2011; Harris et al. 2008).

Basic oral care also involves avoiding smoking, drinking alcohol, and irritating foods such as those that are spicy, hot, rough, and acidic (Eilers 2004; Eilers & Million 2011; Harris et al. 2008; Vijay 2014; West & Mitchell 2004).

The basic oral care in patients that wear dentures involves wearing dentures that fit properly, removing them when performing oral care, and ensuring that they are soaked in an antimicrobial solution and water daily (Eilers 2004; West & Mitchell 2004).

### 5.3 Patient Education

Patient education was considered fundamental in the provision of basic oral care because in this manner, patients are prepared on the potential oral complications and how to manage them. In addition, patient education also impacts the significance of good basic oral care. Education should not only be limited to the patients, but should instead extend to family and their carers because they not only help the patients to remember important details following education, but also provide support and assistance to the patient. (Daniel et al. 2004; Eilers & Million 2011; Harris et al. 2008; McGuire et al. 2006; McTavish 2014; Salvador et al. 2012; Vijay 2014.) Promoting patient education is achieved also through education of the healthcare providers of the patients undergoing cancer treatment (McGuire et al. 2006; Harris et al. 2008).

Through education and training of patients and carers about good oral hygiene principles and about the proper use of the oral assessment tools, patients would be able to notice changes in the oral mucosa, risks of developing oral mucositis, and improve their oral care practices (Quinn et al. 2008; West & Mitchell 2004). Eilers and Million (2011), and Quinn et al. (2008) added that the significance of educating and training on oral assessment tools guarantees high levels of reliability in oral assessments. Furthermore, patients were taught how to document or self-report the changes in oral mucosa accurately and



when to contact the healthcare provider (Eilers & Million 2011; Harris et al. 2008; McTavish 2014; Quinn et al. 2008; Salvador et al. 2012; Vijay 2014).

## 6 Validity and Ethical Consideration

### 6.1 Validity

According to LoBiondo-Wood and Haber (2006:172) the criteria for evaluating a qualitative research study consist of credibility, auditability, and fittingness. LoBiondo-Wood and Haber (2006:168, 192) defines these terms as follows:

*Credibility - "the truth of findings as judged by participants and others within the discipline".*

*Auditability - "Accountability as judged by the adequacy of information leading the reader from the research question and raw data through various steps of analysis to the interpretation of data".*

*Fittingness/ transferability - "Faithfulness to everyday reality of the participants, described in enough detail so that others in the discipline can evaluate importance for their own practice, research and theory development."*

Aveyard (2010:41) notes that identification of a research question is principle in a literature review methodology. The study question identified for the final project was clear and was referred to throughout writing the final project. The study question guided our data search from which selected articles for analysis were written by experts in their respective field.

In this final project, a strict plan was observed in the identification, critical appraisal and synthesis of relevant articles and evidence summaries in order to answer the study question. Data was obtained by systematically searching scientific databases and the internet. Logical search terms that stemmed from the study question and captured the essence of the research topic that were obtained together, were used in the database searches. To achieve focus of the database searches, clear and well defined inclusion

and exclusion criteria were used. Identified relevant literature was recorded appropriately, and every stage was noted. Data analysis was achieved by following principles of inductive content analysis and categories and subcategories were clearly labelled.

Every stage of the final project was done together and the supervisor's guidance was sort throughout writing of the final project.

Findings from data analysis in this final project is well detailed and clearly elaborates the best practices in basic oral care among cancer patients, that can be used by cancer patients, and their carers, and nurses caring for this patient group irrespective of whether or not they are receiving treatment for their cancer.

## 6.2 Limitations

Limitations observed in writing this final project are as follows:

1. The authors' lack of experience because they have never previously written an article or final project.
2. Most of the articles used to answer our study question were identified from articles mostly written in oral mucositis studies.
3. Articles that required payment were excluded due to financial limitation.
4. Limited time to complete the final project.

Despite the limitation named above, the resulting final project was complete and identified the best practices in basic oral care among cancer patients that can be incorporated in the oral care of a cancer patient.

## 6.3 Ethical Consideration

An ethically acceptable and reliable research must comply with the code of conduct of research for its results to be credible (Finnish Advisory Board on Research Integrity, 2012:30). In this final project, the results from articles and evidence summaries were cited and accurately documented giving credit to the authors so as to eliminate plagiarism. The contents from research articles and evidence summaries were recorded honestly and were not falsified by changing or omitting data or results. (Burns & Grove,

2011:137, 222; Finnish Advisory Board on Research Integrity, 2012:30-33.) There was no conflict of interest involved in this final project.

## **7 Discussion**

Good oral care is very important in cancer patients because the course of treatment in this patient group can be affected by the condition of the oral cavity. Poor state of the oral cavity as a result of poor oral health, may lead to the development of oral complications which may alter the course of treatment and prognosis. For example, cancer treatment may be delayed in presence of infection until it resolves, which could increase both the length of stay in hospital and the cost of treatment. Basic oral care can prevent and mitigate oral complication development, and also improve the quality of life of the patient since the condition of the oral cavity affects the patients' behavior and social interaction. (Huskinson & Lloyd 2009; Wee et al. 2013.)

Basic oral care is a fundamental supportive care in patients undergoing cancer treatment, and is considered a best practice by many in the healthcare profession. The best practice in basic oral care among cancer patients consists of patient education, oral assessments and oral care regimens such as toothbrushing, flossing, use of mouth rinses, hydration, which are collectively referred to as oral care protocols. (McGuire et al. 2013.)

Performing oral care should follow a systematic approach and this can be achieved by using oral care protocols. These oral care protocols should be feasible to implement, easy to achieve patient adherence, and patients must be comprehensively educated about them. (McGuire et al. 2006; Harris et al. 2008.)

Patient education is emphasized to be very important in this patient group because adherence to oral care protocols can be achieved if patients understand the significance of their oral health (Daniel et al. 2004). Patient education should ideally be started before cancer treatment and continued during and after treatment. The rationale for patient education prior to treatment is to gain cooperation of the patient especially about having a continuous, meticulous oral hygiene, and to inform them about the potential oral complications and their management. This promotes the patients' compliance with their treatment plan in the event of oral complications. (Daniel et al. 2004; McGuire et al. 2006; Taggart 2009: 44.) In particular, patients are taught the basics of achieving good oral hygiene, such as effectively assessing their oral cavity for any changes in oral mucosa,

documenting their findings, and when to report in time to the healthcare professional (Eilers & Million 2011; Quinn et al. 2008).

Daniel et al. 2004, notes that patient education in recently diagnosed patients may not be effective because these patients may retain only 20% of the information they receive. At this point, these patients may not only be anxious and fearful about their cancer diagnosis, but may also have a lot of information to digest about their condition. Effective patient education can be achieved by ensuring that the timing and conditions for the education is appropriate. Further still, using different modes of learning can promote effective patient education, such as incorporation of theory-based education, demonstration, use of pictures, videos, printed material, samples of oral hygiene products, encouraging questions and feedback, and lastly affirming patients' competence and understanding. (Daniel et al. 2004.)

The healthcare providers such as nurses that care for cancer patients are well situated to perform various roles that affect the patients' oral health. It is therefore crucial that the information these nurses incorporate in their care is evidence based because this will enhance the quality of the oral care, reduce cost, result in better outcomes in patients and identify sections that are in need of further research. (Eiler & Million 2011; Sieracki et. al 2009.) To that end, nurses should themselves be educated in matters encompassing oral health in cancer patients (McGuire et al. 2006).

Oral cavity assessment in cancer patients can be carried out by the patients themselves, their carers and healthcare professionals such as nurses. These individuals should all be taught how to perform oral assessments and document changes observed from these assessments. Oral cavity assessments should be initiated prior to cancer treatment and continued during and after treatment. By following a systematic approach in the assessment using a valid and reliable assessment tool, uniformity is achieved and assessment of the oral cavity is performed properly.

Regularly performing oral care regimens such as brushing of teeth and tongue with toothbrushes and/or toothettes, flossing in between teeth, rinsing the mouth with a suitable mouth wash, maintaining hydration and moisturizing lips with a water-based lip balm are emphasized as important.

## **8 Conclusion**

Good basic oral care among cancer patients is fundamental in achieving good oral health. Best practices or guidelines can be used to ensure uniformity in providing effective basic oral care. This entails using oral care protocols that consist of oral cavity assessments, oral care regimens, and education of patients, carers and nurses to develop the knowledge, skills, and behaviors necessary for effective care.

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## Appendix 1. Database search

DATABASE	SEARCH TERMS	Limitation	Number of Hits	Chosen by title	Chosen by abstract	Chosen by Full Text	Chosen Articles
<b>CINAHL</b>	Oral care + Cancer + Best practice	English + 2004 - 2015	1	0	0	0	0
	Evidence based guidelines+ "mouth care" + Cancer	English + 2004 - 2015	6	1	1	1	0
	Evidence based guidelines + Oral Health + Cancer	English + 2004 - 2015	12	4	0	0	0
	"Oral care protocol" + Cancer	English + 2004 - 2015	9	3	3	2	0
	"Best practice"+ "oral care"+ cancer	English + 2004 - 2015	3	0	0	0	0
	Clinical practice guidelines + oral hygiene+ cancer or Oncology	English + 2004 - 2015	0	0	0	0	0
<b>MEDLINE</b>	Oral care + Cancer + Best practice	English + 2004 - 2015	3	0	0	0	0
	Evidence-based guidelines + "mouth care" + Cancer	English + 2004 - 2015	3	0	0	0	0
	Evidence-based guidelines + "Oral Health" + Cancer	English + 2004 - 2015	3	2	2	1	1
	"Oral care protocol" + Cancer	English + 2004 - 2015	11	3	3	1	1
	"Best practice" + "oral care" + cancer	English + 2004 - 2015	0		0	0	0
	"Clinical practice guidelines"+ "oral hygiene"+ cancer or Oncology	English + 2004 - 2015	2	2	2	2	2
<b>PUBMED</b>	Oral care + Cancer + Best practice	English + 2004 - 2015	183	3	0	0	0
	Evidence-based guidelines+ "mouth care"+ Cancer	English + 2004 - 2015	5	0	0	0	0
	Evidence-based guidelines + "Oral Health"+ Cancer	English + 2004 - 2015	14	3	3	0	0
	"Oral care protocol" + Cancer	English + 2004 - 2015	16	5	3	0	0
	"Best practice"+ "oral care"+ cancer	English + 2004 - 2015	183	21	9	3	0
	"Clinical practice guidelines"+ "oral hygiene"+ cancer	English + 2004 - 2015	20	5	5	3	3
<b>Joanna Briggs Institute</b>	Oral care + Cancer + "Best practice"	English + 2004 - 2015	20	5		5	3
	Evidence-based guidelines+ "mouth care"+ Cancer	English + 2004 - 2015	2	0		0	0
	Evidence-based guidelines + "Oral Health"+ Cancer	English + 2004 - 2015	0	0		0	0
	"Oral care protocol" + Cancer	English + 2004 - 2015	1	0		0	0
	"Best practice"+ "oral care"+ cancer	English + 2004 - 2015	20	4		4	0
	"Clinical practice guidelines"+ "oral hygiene"+ cancer	English + 2004 - 2015	4	4		3	0
<b>Manually searched</b>						3	3
<b>Total</b>							13

## Appendix 2: Data Analysis

TITLE, AUTHOR AND JOURNAL	PURPOSE	SAMPLE	DATA COLLECTION AND ANALYSIS	MAIN FINDINGS
Daniel, B.T., Damato, K.L., Johnson, J. (2004) Educational Issues in Oral Care. <i>Seminars in Oncology Nursing</i> . 20 (1) 48-52.	To discuss patient, family, and health care professional educational models relative to enhancing oral care and adherence to treatment regimens.		A literature review	<p>Assessment</p> <ul style="list-style-type: none"> <li>➤ Routine oral assessments should be performed and a daily oral care regimen followed.</li> </ul> <p>Education</p> <ul style="list-style-type: none"> <li>➤ Schedule sufficient time for nurse-patient meeting for patient education, which should be reinforced at every meeting.</li> <li>➤ Primary carer is encouraged to attend meeting with the patient.</li> <li>➤ In initial patient education, possible side-effects of treatment and its impact on the patients' course of treatment should be discussed.</li> <li>➤ Different modes of education such as use pictures, videotapes, printed material, samples of oral hygiene products, should be used and questions encouraged.</li> <li>➤ Demonstration by patients is encouraged, for example, how patient's floss and/or brush their teeth, and how they examine their mouths to allow correction of mistakes while acknowledging their competence.</li> <li>➤ Inquire about the patient's preferences for learning. Does he or she learn by reading, seeing, doing? If possible, include all of the following: videotapes, printed material, and demonstration/return demonstration, as appropriate.</li> <li>➤ Assess the oral cavity and reinforce the steps in the oral care protocol, and emphasize the importance of adherence.</li> </ul>
Eilers, J. (2004) Nursing Interventions and Supportive Care for the Prevention and Treatment of Oral Mucositis Associated With Cancer Treatment.	To review novel approaches to assessing and managing patients with cancer who are at risk for oral mucositis.		A literature review	<p>Assessments</p> <ul style="list-style-type: none"> <li>➤ Oral assessment should begin early, from when the patient is introduced to the concept of self-care.</li> <li>➤ Thorough examination of the oral cavity; of the all surfaces, visible lesion palpation, and function evaluated.</li> </ul>

<p><i>Oncology Nursing Forum</i>. 31 (4) 13-23.</p>				<p>Oral Care Regimens</p> <ul style="list-style-type: none"> <li>➤ A soft bristled toothbrush should be used to brush tooth surfaces gently for a minimum of 90 seconds for at least twice daily.</li> <li>➤ The tongue should also be brushed.</li> <li>➤ When regular brushing becomes too painful, foams or swabs should be used instead to brush teeth.</li> <li>➤ Flossing should be performed at least once daily.</li> <li>➤ Oral rinses should be incorporated</li> </ul> <p>Dentures</p> <ul style="list-style-type: none"> <li>➤ When carrying out oral care, dentures should always be removed.</li> <li>➤ These dentures should be soaked daily in an antimicrobial solution and clean water.</li> <li>➤ Only dentures that fit should be worn.</li> </ul> <p>Lifestyle Choices</p> <ul style="list-style-type: none"> <li>➤ To be avoided are tobacco, alcohol, foods that are rough, course, salty, too hot, spicy, or acidic.</li> <li>➤ Water-based moisturizers should be used to moisturize the lips.</li> <li>➤ In the event of bleeding, discomfort, irritation, a clinician should be contacted immediately.</li> </ul>
<p>Eilers, J. and Million, R. (2011) Clinical update: Prevention and Management of Oral Mucositis in patients with cancer. <i>Seminars in oncology Nursing</i>. 27 (4) e1-e16.</p>	<p>To present a clinical update of evidence that applies to the development of a nursing plan of care for the prevention and treatment of oral mucositis related to cytotoxic therapy</p>		<p>A Literature Review</p>	<ul style="list-style-type: none"> <li>➤ Oral care protocols that involve basic oral care should be used.</li> <li>➤ A multidisciplinary team should be used in all phases of treatment</li> </ul> <p>Oral Assessment</p> <ul style="list-style-type: none"> <li>➤ A systematic oral cavity assessment using a valid and reliable oral assessment instrument should performed on an ongoing basis.</li> <li>➤ Nurses should assess patients for risks of developing oral mucositis prior to treatment.</li> </ul> <p>Patient Education</p>

				<ul style="list-style-type: none"> <li>➤ Education and training should be provided on how to use oral assessment tools</li> <li>➤ Written instructions should be used in patient education and the patient's understanding verified with return explanation and demonstration.</li> </ul> <p>Oral Care Regimens</p> <ul style="list-style-type: none"> <li>➤ A soft toothbrush should be used at least twice daily to brush all tooth surfaces for at a minimum of 90 seconds at each time.</li> <li>➤ Following use, the toothbrush should not be stored until air dried.</li> <li>➤ Flossing should be carried out at least once daily or according to the recommendation.</li> <li>➤ Bland rinse should be used to rinse the mouth at least four times a day.</li> <li>➤ Lips should be moisturized with a water-based moisturizer.</li> <li>➤ Adequate hydration should be maintained.</li> <li>➤ Tobacco, alcohol, irritating foods; acidic, hot, rough, and spicy, should be avoided.</li> </ul>
Harris, D.J., Eilers, J., Harri- man, A., Cashavelly, B.J., Maxwell, C. (2008) Putting Evi- dence into Practice: Evidence- Based Interventions for the Management of Oral Mucositi- s. <i>Clinical Journal of Oncol- ogy Nursing</i> . 12 (1) 141-152.	To review empirical evi- dence related to interven- tions for oral mucositis		A Literature review	<p>Oral Care regimens</p> <ul style="list-style-type: none"> <li>➤ Using a soft toothbrush, tooth surfaces should be brushed at least twice daily for least 90 seconds</li> <li>➤ The toothbrush should not be stored until air dried.</li> <li>➤ The toothbrush should be replaced on a regular basis.</li> <li>➤ Flossing should be performed at least once daily or as per the clinician's recommendation.</li> <li>➤ A bland rinse should be used to rinse the mouth at least four times daily. The rinse should be swished in the mouth for at least 30 seconds before being spat out.</li> <li>➤ Tobacco, alcohol, and irritating foods; acidic, hot, rough, and spicy, should be avoided.</li> </ul>

				<ul style="list-style-type: none"> <li>➤ Lips should be moisturized using a water-based moisturizer.</li> <li>➤ Hydration should be maintained.</li> </ul> <p>Patient education</p> <ul style="list-style-type: none"> <li>➤ The patients, their family members, and staff should all be provided with education</li> </ul> <p>Oral assessment</p> <ul style="list-style-type: none"> <li>➤ Valid and reliable instruments should be used routinely to perform oral assessment.</li> <li>➤ Changes in the oral cavity should be documented accordingly.</li> </ul>
Lalla, R.V., Bowen, J., Barasch, A., Elting, L., Epstein, J., Keefe, D.M., McGuire, D.B., Migliorati, C., Nicolatou-Galitis, O., Peterson D. E., Raber-Durlacher, J. E., Sonis, S. T., and Elad, S. (2014) MASCC/ISOO Clinical Practice Guidelines for the Management of Mucositis Secondary to Cancer Therapy. <i>Cancer</i> 120: 1453–1461.	To update the Multinational Association of Supportive Care in Cancer and International Society of Oral Oncology (MASCC/ISOO) Clinical Practice Guidelines for mucositis	570 articles were systematically reviewed.	A systematic literature review article	<p>Use of oral care protocol: a combination of toothbrushing, flossing and rinsing the mouth at least once daily, to maintain oral hygiene so as to prevent oral Mucositis during cancer treatment.</p> <p>Avoid mouthwash containing chlorhexidine for the prevention of oral mucositis in patients receiving H&amp;NRT.</p> <p>No guidelines for the use of oral care protocols for the treatment of oral mucositis.</p> <p>No guidelines to support using the following mouth rinses: saline, sodium bicarbonate, mixed medication mouthwashes, calcium phosphate, and chlorhexidine in patients receiving chemotherapy.</p>

<p>McGuire, D.B., Elvira, M.P., Johnson, C.J., Wienandts, P. (2006) The role of basic oral care and good clinical practice principles in the management of oral mucositis. <i>Support Care Cancer</i> 14: 541–547.</p>	<p>To present recommendations regarding the role of basic oral care and good practice principles in the prevention and management of oral mucositis, including bland rinses, systematic oral care protocols, and patient/family education.</p>		<p>A literature review</p>	<p>Patient education</p> <ul style="list-style-type: none"> <li>➤ Education should be to patients and their families and staff.</li> <li>➤ Quality improvement processes should be used to evaluate protocols and education.</li> <li>➤ Interdisciplinary team (nurse, physician, dentist, dental hygienist, dietician, pharmacist, and others as relevant) should be used in provision of oral care.</li> </ul> <p>Oral Care Assessment</p> <ul style="list-style-type: none"> <li>➤ Initial and ongoing oral assessment should be carried out using validated instruments.</li> <li>➤ Patient self-reporting and professional examination should be used.</li> </ul> <p>Oral Care Regimens</p> <ul style="list-style-type: none"> <li>➤ Perform Regular and systematic oral care that should include toothbrushing with a soft toothbrush that should be replaced regularly, flossing, rinsing with bland rinses, using moisturizing.</li> <li>➤ Preventive and therapeutic oral care regimen should be used.</li> </ul>
<p>McGuire, D.B., Fulton, J.S., Park, J., Brown, C.G. Correa, M.E., Eilers, J., Elad, S., Gibson, F., Oberle-Edwards, L.K., Bowen, J., Lalla, R.V., Mucositis Study Group of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO). (2013) Systematic review of basic oral care for the management of</p>	<p>To systematically review available literature related to basic oral care and formulate evidence based guidelines for the use of basic oral care, including oral care protocols, dental care, and various mouthwashes, for preventing and treating oral mucositis.</p>	<p>75 selected literature were systematically reviewed</p>	<p>A systematic literature review</p>	<p>Oral care protocols should be used in the prevention of oral mucositis in all age groups and across all cancer treatment modalities.</p> <p>Provision of professional dental care is important to the general well-being of patients receiving cancer therapy and should be considered a foundation of care.</p> <p>Bland rinses such as normal saline, sodium bicarbonate mouthwash can be used to maintain oral hygiene and for patient comfort.</p>

oral mucositis in cancer patients. <i>Support Care Cancer</i> 21: 3165–3177.				Avoid Chlorhexidine mouthwash in the prevention of oral mucositis in adult patients with head and neck cancer who are undergoing radiotherapy
McTavish, R. (2014) Cancer Patients: Oral Mucositis Prevention. <i>Joanna Briggs Institute</i> .	Identify the best available evidence regarding prevention of oral mucositis in patients with cancer receiving treatment		Evidence Summaries.	<p>Oral care regimens</p> <ul style="list-style-type: none"> <li>➤ Perform toothbrushing using a soft-bristled toothbrush that should be replaced regularly,</li> <li>➤ Perform flossing</li> <li>➤ Rinse the mouth using bland rinses, and</li> <li>➤ Use moisturizers.</li> <li>➤ Preventative oral care regimens should be in place, but therapeutic oral care regimens should be used in the event of oral mucositis development.</li> <li>➤ Avoiding Chlorhexidine mouthwash in patients undergoing treatment for head and neck cancer.</li> </ul> <p>Oral cavity assessment.</p> <ul style="list-style-type: none"> <li>➤ Perform oral assessments regularly using a validated tool.</li> <li>➤ Self-reporting by patients and professional examination should be incorporated</li> <li>➤ Assessment should be carried out prior to treatment and after that, it should be ongoing.</li> </ul> <p>Patient Education</p> <ul style="list-style-type: none"> <li>➤ Educating staff, and patients on oral mucositis and oral care protocols.</li> </ul>
Moola, S. (2014) Oral Care: Foam Swabs/Foam Sponges. <i>Joanna Briggs Institute</i> .	To list the best available evidence regarding the effectiveness of foam swabs or foam sponges in removing dental plaque?		Evidence summaries	Use foam swabs instead of toothbrushes in patients whom tooth brushing is not advisable such as those susceptible to bleeding.

<p>Quinn, B., Potting, C.M.J., Stone, R., Blijlevens, N.M.A., Fliedner, M., Margulies, A., Sharp, L. (2008) Guidelines for the assessment of oral mucositis in adult chemotherapy, radiotherapy and haematopoietic stem cell transplant patients. <i>European Journal of Cancer</i> 44: 61 –72.</p>	<p>To thoroughly analyse the assessment instruments currently available, their implementation and to formulate recommendations with which to address inconsistencies in the assessment of OM.</p>	<p>57 articles were chosen for review</p>	<p>A Literature review</p>	<p>Oral care assessments</p> <ul style="list-style-type: none"> <li>➤ Incorporate patient self- reported outcomes in all oral mucositis assessments</li> <li>➤ Assess oral cavity for oral mucositis using a standardized tool</li> <li>➤ Oral assessments should be carried out frequently throughout the course of any therapy, especially for patients who are most at risk of developing OM.</li> <li>➤ Oral assessments for OM prior, during and after treatment. Oral assessments continued until OM is fully resolved or the trend to resolution is established</li> <li>➤ Perform a comprehensive baseline oral assessment prior to treatment, which should be followed up by another assessment close to the administration of the first treatment dose as possible.</li> </ul> <p>Education and training</p> <ul style="list-style-type: none"> <li>➤ Training should be provided to ensure that examiners are familiar and proficient in using the assessment tool in question.</li> </ul>
<p>Salvador, P., Azusano, C., Wang, L., Howell, D. (2012) A Pilot Randomized Controlled Trial of an Oral Care Intervention to Reduce Mucositis Severity in Stem Cell Transplant Patients. <i>Journal of Pain and Symptom Management</i>. 44: 64-73.</p>	<p>To assesses the effectiveness of oral cryotherapy combined with a systematic oral care protocol in stem cell transplant populations</p>		<p>A pilot RCT with 46 participants. Two groups: 1.The study protocol group (oral cryotherapy plus oral care protocol) 2. usual care group (Oral care protocol alone).</p>	<p>Patient Education</p> <ul style="list-style-type: none"> <li>➤ Provide on information about OM, how to mitigate the symptoms, and on basic oral care.</li> <li>➤ Teach patients and their family members how to perform oral cavity assessment.</li> <li>➤ Written instructions should be provided on basic oral care.</li> </ul> <p>Oral care regiments</p> <ul style="list-style-type: none"> <li>➤ Perform toothbrushing and use also toothettes, sponges dipped in sodium bicarbonate mouthwash.</li> <li>➤ Mouth should be rinsed with bland rinses</li> <li>➤ Flossing should be performed if the patient is not thrombocytopenic</li> <li>➤ Moisturizers should be applied to lips or oral cavity as needed.</li> </ul>



<p>Vijay, A. (2014) Chemotherapy: Mucositis Management. <i>Joanna Briggs Institute</i>.</p>	<p>To identify the best available evidence regarding the management of oral mucositis in patients with cancer receiving treatment</p>		<p>Evidence Summaries</p>	<ul style="list-style-type: none"> <li>• Oral care protocols are recommended. These include: <ul style="list-style-type: none"> <li>➤ Use of soft this thistle toothbrush, flossing, bland rinses and moisturizers</li> <li>➤ Oral cavity assessment that includes professional examination and patient self-reports.</li> <li>➤ Assessments of risk factors for development of OM</li> <li>➤ Prior to the treatment, oral examinations and treatment should be performed, and continued during treatment.</li> <li>➤ Educating the staff and patient regarding treatment complications and oral care protocols</li> </ul> </li> </ul>
<p>West, F. and Mitchell, S.A. (2004) Evidence-Based Guidelines for the Management of Neutropenia Following Outpatient Hematopoietic Stem Cell Transplantation. <i>Clinical Journal of Oncology Nursing</i>. 8(6) 601-613.</p>			<p>Literature review</p>	<p>Oral Care Regimen :</p> <ul style="list-style-type: none"> <li>➤ Use a soft thistle toothbrush to gently brush the teeth at least twice daily. After toothbrushing, use hot water to cleanse the toothbrush and store it when it is air dry.</li> <li>➤ Use foam toothettes to clean the oral cavity when recommended by clinician.</li> <li>➤ The toothpaste used should contain fluoride.</li> <li>➤ In patients using dentures, they should ensure that they are the correct fit, and that these dentures should be removed to clean each time oral care is performed. When not in use, the dentures should be removed and stored in an antimicrobial solution. During periods of mucositis, the dentures should be removed and not used.</li> <li>➤ Rinse the mouth consistently with the recommended regimen best suited to the patient's needs and preferences.</li> <li>➤ Hydration should be maintained by drinking at least 3,000 cc of liquid daily unless otherwise contraindicated.</li> <li>➤ Tobacco, alcohol and irritating foods: too hot or cold should be avoided.</li> </ul> <p>Patient education:</p>

				<ul style="list-style-type: none"><li>➤ Provide education to patients, carers to develop knowledge, skills, and behavior needed to achieve effective care.</li><li>➤ Provide education about the significance of accurately and timely reporting of symptoms and self-care.</li></ul>
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**Appendix 3. Oral Care Protocols**

Authors	Patient Education	Oral Cavity Assessments	Documentation
Daniel et al. (2004)	<p>The nurse should ensure sufficient time for provision of oral health information to patients and primary carers, which should be repeated in future visits.</p> <p>In the initial meeting prior to treatment, education should include oral complications and its impact on the course of treatment. The importance of adherence to oral care regimens and assessments is emphasized.</p> <p>Check with the patient about their preferred learning method.</p> <p>Use different modes of education such as pictures, videotapes, printed material, samples of oral hygiene products, and encouragement of questions.</p> <p>Demonstration by patients about how they perform the oral care regimens and how they assess their mouth is encouraged so as to be able to correct mistakes and also acknowledge their competence.</p>	<p>Oral assessments should be performed routinely.</p> <p>Examination of the oral cavity by dental team every 4 to 8 weeks for 6 months post radiation therapy.</p>	

Eilers (2004)		<p>Assessment and monitoring should be initiated at about the same time that patients are being introduced to the concept of self-care.</p> <p>A baseline should be established during the initial assessment</p> <p>Assessment of the oral cavity including lips, tongue, gingivae, and other surfaces; palpation of visible lesions; and evaluation of function (e.g., swallowing, talking).</p> <p>Use a valid assessment tool that is chosen based on the goal of treatment.</p> <p>Patients should self-assess at least once daily and report in case of any changes.</p>	Use self-reporting in case of any changes following oral assessment.
Eilers and Million (2011)	<p>Provide education to patients, carers and staff.</p> <p>Utilize written modes of education.</p> <p>Verify understanding with return explanation and demonstration.</p>	<p>Use a valid and reliable instrument to assess the oral cavity.</p> <p>Assess the oral cavity systematically to prevent and treat OM</p> <p>Oral assessment should be continuous.</p> <p>Assessment of patients prior to treatment for risk factors of developing OM.</p>	
Harris et al. (2008)	Educate patients, staff and family members.	Assess the oral cavity on a routine basis using valid and reliable tools.	Document the changes in the oral cavity.
Lalla et al. (2014)			
McGuire et al. (2006)	<p>Provide education to staff, patients and carers / family members.</p> <p>Evaluate the education using quality improvement processes.</p>	<p>Use valid instruments to perform oral assessments prior and during treatment.</p> <p>Uses both professional examination and patient examination (self-reporting).</p>	Self-reporting encouraged.

McGuire et al. (2013)	Nothing specific		
McTavish (2014)	Educating patients and staff on oral mucositis and oral care	Using a validated tool to assess for oral pain. This tool must use self-reporting. Ongoing assessment of the oral cavity that starts before treatment. Incorporates professional examination and patient self-reports.	Self-reporting by patients
Moola (2014)			
Quinn et al. (2008)	Educate examiners, patients and staff, about how to effectively use the oral assessment tools.	Oral assessments for OM prior, during and after treatment. Oral assessments continued until OM is fully resolved or the trend to resolution is established  Incorporate patient self-assessment reports and include these outcomes in the OM assessments  Carry out oral assessment on a routine basis throughout treatment.  Perform a comprehensive baseline oral assessment prior to treatment, which should be followed up by another assessment close to the administration of the first treatment dose as possible.	Self-reporting should be used.
Salvador et al. (2012)	Provide on information about OM, how to mitigate the symptoms, and on basic oral care.  Teach patients and their family members how to perform oral cavity assessment.  Written instructions provided on basic oral care.	Basic oral care and pain assessment	Of the patients verbal response and the patients' oral care diary data.  Patients document changes in the oral care diary
Vijay (2014)	Educating patients on oral care and hygiene.  Educating patients about avoiding foods that irritate the oral mucosa such as hot, or spicy.  Educating both patients and staff about oral mucositis and oral care.	Initiating oral assessments prior to chemotherapy Assessments risk factors for the development of OM  Prior to beginning cancer therapy, dental examinations and treatment should be carried out, and continued during treatment	Self-reporting by patients

West and Mitchell (2004)	<p>Provide education to patients, carers.</p> <p>Aim of the education is to develop knowledge, skills, and behavior needed to achieve effective care.</p> <p>Educating patients about the significance of accurately and timely reporting of symptoms and self-care.</p>		Self-reporting by patients
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## Oral Care Regimens

Author	Toothbrush and toothettes	Mouth rinses	Hydration and Moisturizers	Flossing	Choices and Dentures
Daniel et al. 2004					
Eilers (2004)		Alcohol based mouth rinses should be avoided.			
Eilers and Million (2011)	Use a soft toothbrush to brush all tooth surfaces for at least 90 seconds.  Tooth brushing should be at least twice daily.  Air dry the toothbrushes after use before storing them.	A bland rinse should be used to rinse the mouth at least four times daily.	Use water-based moisturizers to protect lips.  Maintain adequate hydration.	Floss at least once daily or as instructed by the clinician.	Avoid tobacco, alcohol, irritating foods (acidic, hot, rough, and spicy).
Harris et al. (2008)	Brush all tooth surfaces for at least 90 seconds, twice daily using a soft-thistled toothbrush.  The toothbrush should be allowed to air dry before storage.  The toothbrushes should be replaced regularly.	A bland rinse should be used to rinse the mouth at least 4 times daily.  The duration during mouth rinsing should be at least 30 seconds and spit out the rinse.  Mouth rinses containing Chlorhexidine should be avoided.	Use water-based moisturizers to protect lips. Maintain adequate hydration	Floss at least once daily or as advised by the clinician	Avoid tobacco, alcohol, or irritating foods such as acidic, hot, rough, and spicy foods.
Lalla et al. (2014)					
McGuire et al. (2006)	Toothbrushing should be regular and systematic using a soft-thistled toothbrush.  The toothbrush should be replaced regularly.	Bland rinses should be used to rinse the mouth.	Moisturizers should be used.	Flossing should be performed.	

McGuire et al. (2013)					
McTavish, R. (2014)	Use toothbrushes that have a soft -bristle.  Replace toothbrushes replaced regularly.	Mouth rinses used should be bland.  Avoid Chlorhexidine mouthwashes in patients undergoing treatment for head and neck cancer.	Moisturizers should be used.	Perform flossing.	
Moola, S. (2014)	Foam swabs where tooth brushing is not advisable.  Perform tooth brushing.				
Quinn et al. (2008)					
Salvador et al. (2012)	Tooth brushing and toothettes, sponges dipped in sodium bicarbonate mouthwash.	Rinse the mouth with sodium bicarbonate mouthwash which could be made by mixing 2 teaspoons of sodium bicarbonate powder in a 500 mL bottle of sterile water.	Applying moisturizer to lips or oral cavity as needed.	Floss if the if until the platelet counts is above 50,000; the patient is not thrombocytopenic	
Vijay, A. (2014)	Use sponges and soft -bristled toothbrushes to brush teeth and gums, at least four times daily, or after meals and before bedtime.	Bland mouth rinses should be used such as saline solution.  Avoid alcohol based mouthwash.	Maintain adequate hydration and use lip balm.	Floss daily if patient is not thrombocytopenic	Avoid smoking and alcohol.
West and Mitchell (2004)	A soft thistle toothbrush should be used to brush the teeth at least twice daily.  After each use, the toothbrush should be cleaned with hot water and allowed to dry completely before storage.	Rinse the mouth consistently with the recommended regimen best suited to the patient's needs and preferences.	Drink at least 3,000 cc of liquid daily unless otherwise contraindicated.		Remove and clean dentures each time oral care is performed.  Dentures should be removed and store nightly in antimicrobial solution.



	Foam toothettes can be used with toothbrushes.  Use toothpaste that contain fluoride.				Remove and dentures during periods of mucositis.  Avoid tobacco, alcohol, and foods that are too hot or cold
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