

## Background and Significance

Chemotherapy may lead to breakdown of nonkeratinized oral tissues causing:

- Negative nutritional impact
- Poorer quality of life
- Pain
- Dehydration
- Life-threatening infections
- Linked to poorer patient outcomes impacting mortality

Oral mucositis is a common complication of chemotherapy treatment

(Eilers et al., 2014; Campos et al., 2014; Carvalho, Medeiros-Filho, & Ferreira, 2018; Slade, 2017; Yarom et al., 2013; Panahi et al., 2016; Lee, 2013 & Cullen et al., 2018).

## PICOT

In patients receiving oncological treatments, does an oral care protocol with zinc sulfate supplementation, compared to the standard of care (oral protocol alone), reduce complications related to oral mucositis as measured by a patient-reported assessment tool over a six-week period?

## Review of Literature

**Keywords:** “oral mucositis” and prevent\* were used across all databases. “cancer” OR “chemo\*” and “adult” in select data bases

**Inclusion:** English, scholarly or academic, peer reviewed, 2013 and 2018, and goal to prevent OM.

**Exclusion:** pediatric populations, limited to one specific chemotherapy agent, use of drugs not approved in the US, failure to include recommendations, and timeliness of data at time of publication

Database	Yielded	Reviewed	Accepted
CINAHL	35	8	4
Medline	270	12	5
Cochrane	5	2	0
JBI	35	6	2
Nursing & Allied Health Database	18	3	0
National Guidelines Clearinghouse	16	1	0
Hand Searched	5	5	2
<b>Total</b>	<b>384</b>	<b>37</b>	<b>13</b>

## Evidence Appraisal

Level	Included	Quality	Design
Level 1	4	A A & B	(1) Meta-analysis of RCTs (2) RCTs
Level 2	2	A C	(1) Systematic review of RCTs (1) Prospective Cohort
Level 3	2	A A	(1) Descriptive Study (1) Prospective Cohort
Level 5	5	A A A & B A	(1) EBP Intervention (1) Literature review (2) Evidence Summaries (1) Systematic Review

**Appraisal of Evidence:** The Johns Hopkins Tools

**Quality:** Johns Hopkins Nursing Evidenced-Based Practice Model (JHNEBP Model) Research and Non-Research Evidence Appraisal (Dang & Dearholt, 2017).

## Decision to Change Practice

**Establish and implement an oral care protocol**

- Participant take-home materials
- Staff education

**Incorporate use of subjective tool to capture the patient experience of oral mucositis**

- Less painful than observational assessment
- Reinforces the importance of oral care to prevent symptoms

**Incorporate zinc supplementation as a preventive measure for experimental group and compare to group that is receiving oral care protocol alone**

- Participants to complete subjective survey
- Monitor for six weeks across patients receiving a wide variety of chemotherapies for different types of cancers

## Implementation

**Setting:** Outpatient oncology office

**Design:** Two-group pretest-posttest quasi-experimental design

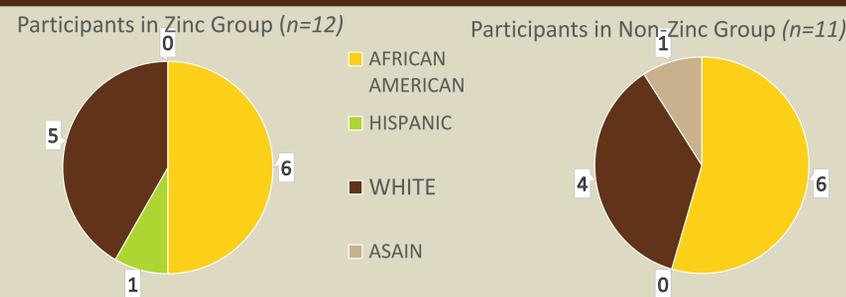
**Program Interventions:** Creation of an oral care protocol, extensive staff education, collection of data using the PROMS survey (a 100-mm visual analog scale) (Kushner et al., 2008)

**Theoretical Framework:** Self-Care Theory (Orem, 2001)

**Evidence-Based Practice Model:** Johns Hopkins Nursing Evidenced-Based Practice Model (JHNEBP Model) (Dang & Dearholt, 2017)

**Timeframe:** Rolling entry dates with data collected weekly over six-weeks

## Patient Characteristics



	Zinc group (%) (n=12)	Non-Zinc Group (%) (n=11)
Male	5 (41.7)	9 (81.8)
Female	7 (58.3)	2 (18.2)
Age Range		
41-55	1 (8.3)	2 (18.2)
56-65	5 (41.7)	5 (35.5)
66-75	3 (25.0)	2 (18.2)
76-85	2 (16.7)	2 (18.2)
86-90	1 (8.3)	0
Cancer Types		
Lung cancer	6 (50.0)	5 (45.5)
Breast cancer	2 (16.7)	1 (9.1)
Colorectal cancer	1 (8.3)	2 (18.2)
Non-Hodgkin's lymphoma	1 (8.3)	0
Leukemia	1 (8.3)	0
Pancreatic cancer	0	2 (18.2)
Other endocrine cancer	1 (8.3)	0
Laryngeal cancer	0	1 (9.1)
Metastases		
No Metastases	7 (58.3)	3 (27.3)
Metastases	5 (41.7)	8 (72.7)

## Evaluation

**Primary Outcomes:** Statistically significant differences were found in 8 out of 10 oral mucositis symptoms addressed on PROMS survey.

PROMS survey Assessment	Week 3 Zinc vs. Non-Zinc (p=)	Week 4 Zinc vs. Non-Zinc (p=)	Week 5 Zinc vs. Non-Zinc (p=)	Week 6 Zinc vs. Non-Zinc (p=)
Mouth Pain			2.91 vs. 8.75 (p = .046)	2 vs. 8.91 (p = .004)
Difficulty Swallowing		2.7 vs. 7.33 (p = .008)		1.18 vs. 3.36 (p = .036)
Difficulty Eating Soft Foods	2 vs. 4.2 (p = .024)		1.82 vs. 7.25 (p = .008)	
Restriction of Eating				3.45 vs. 11.82 (p = .017)
Difficulty Drinking			2 vs. 5 (p = .024)	1.36 vs. 3.7 (p = .023)
Restriction of Drinking	1.2 vs. 2.7, (p = .033)			
Difficulty Swallowing		2 vs. 6.89 (p = .048)	1.91 vs. 8.25 (p = .027)	
Change in Taste		6.3 vs. 14.33 (p = .045)	4.55 vs. 16.88 (p = .04)	
Restriction of speech				
Difficulty eating hard foods				

There were no statistically significant differences in the groups with regards to restriction of speech or difficulty eating hard foods.

## Conclusions

A multi-faceted intervention including the development of an oral care protocol, staff education, use of subjective oral mucositis tool, and zinc supplementation may:

- Increase knowledge of oral care during chemotherapy for both clinical personnel and the patients that they treat
- Use of a subjective patient survey is valuable in outpatient chemotherapy infusion centers
- Zinc supplementation may shorten duration and intensity of symptoms in 8 out of 10 subjective areas on the PROMS scale

## Recommendations

- Development and standardization of an oral care protocol is recommended for all outpatient settings that administer chemotherapy
- More sophisticated investigation is needed to explore if zinc supplementation is appropriate to prescribe to all patients receiving chemotherapy
- Future EBP project should preform analysis on a larger population of patients receiving chemotherapy in order to confirm the ability to generalize findings
- Future EBP projects should ensure consistency of zinc supplements to reduce possible inconsistencies
- Future EBP projects should provide supplies needed to complete oral care as recommended in their oral care protocol.