

Oral Mucositis, Eating Difficulties, and Supportive Nursing Care in Patients with Advanced Cancer

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Abstract

Oral mucositis in advanced cancer can affect comfort, eating, fluid intake, function, and quality of life, yet these consequences are often considered separately from nursing assessment and supportive-care escalation. This article develops a symptom-to-supportive-care interpretation of these relationships. A conceptual synthesis was constructed from contemporary supportive-care, oral oncology, nutrition, hydration, palliative-care, and nursing evidence. The analysis distinguishes mucosal injury from experienced symptoms, eating difficulty from actual nutritional intake, and symptom severity from the level of supportive intervention required. Oral mucositis may contribute to eating impairment through pain, mucosal sensitivity, xerostomia, and other coexisting oral symptoms. These pathways are conditional rather than deterministic. Cachexia, treatment burden, disease progression, dysphagia unrelated to mucosal injury, and psychosocial factors may independently or interactively reduce intake. Nursing oral assessment therefore functions as an observation and routing process linking oral findings to symptom relief, nutritional and hydration assessment, and interprofessional escalation. The clinical significance of oral mucositis in advanced cancer depends not only on mucosal severity but on how oral symptoms alter eating, drinking, function, and patient priorities. Supportive nursing care is strongest when these domains are assessed separately and then integrated proportionately.

Keywords: Oral mucositis, Advanced cancer, Eating difficulties, Supportive nursing care, Nutritional intake, Oral assessment

Introduction

Supportive care in cancer increasingly emphasizes coordinated responses to physical, psychosocial, functional, and practical needs rather than isolated management of individual toxicities. Integrated supportive-care models position symptom recognition, multidisciplinary management, and continuing reassessment across the disease course as connected activities [1]. Contemporary service evidence nevertheless shows substantial variation in how supportive care is organized, accessed, and evaluated [2]. In advanced and metastatic cancer, this problem is intensified because treatment toxicity, progressive disease, functional deterioration, changing goals, and survivorship needs can coexist [3].

Oral mucositis illustrates this integration problem. Mucosal injury may be clinically visible, but its importance for the patient is mediated by pain, oral dryness, swallowing or eating difficulty, reduced nutritional and fluid intake, and the feasibility of supportive interventions. Conversely, poor intake in advanced cancer cannot automatically be attributed to mucositis. The purpose of this article is therefore to distinguish these domains before

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Received: 19 October 2025; **Revised:** 18 December 2025;

Accepted: 20 December 2025

How to Cite This Article: Osei M, Larsen I, Menon R, O'Connor P. Oral Mucositis, Eating Difficulties, and Supportive Nursing Care in Patients with Advanced Cancer. J Integr Nurs Palliat Care. 2025;6(2):437-46. <https://doi.org/10.51847/LJ4As7zx3h>

reconnecting them in a symptom-to-supportive-care framework that preserves alternative explanations and goal-concordant escalation.

Conceptual approach

The analytical starting point is that an oral lesion, a symptom, a functional consequence, and a supportive-care requirement are related clinical phenomena but not interchangeable constructs. Expert guidance on oral problems in advanced cancer similarly emphasizes individualized evaluation of symptom type, severity, reversibility, prognosis, and patient priorities [4].

The symptom-to-supportive-care approach used here consequently separates five questions. First, what mucosal or salivary process is present? Second, what does the patient experience, including pain, dryness, altered oral sensation, or swallowing difficulty? Third, does that experience interfere with eating, drinking, communication, sleep, or other functions? Fourth, what can nursing assessment establish directly, and what requires additional dental, medical, dietetic, or palliative expertise? Fifth, what level of supportive response is proportionate to the observed consequences and goals of care?

This distinction prevents the conceptual model from becoming a treatment protocol. A severe-appearing lesion does not necessarily imply the same eating consequence in every patient, while comparatively modest oral findings may become clinically important when they coexist with xerostomia, frailty, poor reserve, or pre-existing nutritional vulnerability. The unit of interpretation is therefore the configuration connecting oral pathology, experienced symptoms, functional impact, and care need.

Oral mucositis in advanced cancer

Oral mucositis is a treatment-associated inflammatory injury of the oral mucosa that can produce erythema, ulceration, pain, and substantial interference with normal oral function. Contemporary synthesis emphasizes that its clinical burden extends beyond visible mucosal damage because oral intake and quality of life may also be affected [5]. Evidence-based mucositis guidance supports selected preventive and management strategies, but recommendations differ according to treatment modality and clinical setting rather than constituting one universal regimen [6].

For advanced cancer, an additional issue is variation in vulnerability. Severe mucositis can sometimes be predicted within defined treatment populations using clinical risk information, illustrating the value of stratified surveillance [7]. Such prediction does not provide a universal severity threshold for supportive care. The relevant question for this article is instead how observed mucosal injury interacts with symptoms and functional consequences in the individual patient.

Table 1. Distinguishing the analytical domains linking oral mucosal injury to supportive-care need

Analytical domain	What the domain captures	What it must remain distinct from	Clinical significance in this article
Mucosal injury	Observable treatment-related damage to oral tissues	Patient-reported symptom intensity	Establishes the biological and clinical substrate
Oral mucositis	Clinical syndrome encompassing mucosal inflammatory injury and its manifestations	A complete explanation for all oral or nutritional problems	Defines the focal condition without assuming downstream consequences
Symptom burden	Pain, dryness, sensitivity, altered oral sensation, or related experiences	Lesion appearance alone	Determines how tissue injury is experienced
Functional interference	Difficulty eating, swallowing, drinking, speaking, or maintaining oral routines	Actual nutritional or hydration deficit	Marks the transition from symptom to daily-life consequence
Nutritional/hydration consequence	Reduced energy, nutrient, or fluid intake and associated clinical concern	Eating difficulty without measurable intake change	Determines whether wider supportive assessment is required
Supportive-care response	Nursing care, symptom management, dietary adaptation, hydration review, or specialist escalation	A fixed intervention dictated by mucositis grade	Represents the proportionate care response to the whole configuration

Mucosal injury and inflammatory mechanisms

Mucositis develops through interacting biological processes rather than a single linear injury event. Contemporary accounts include epithelial and submucosal injury, inflammatory signaling, impaired mucosal repair, and interactions with the oral microbial environment. Updated evidence suggests that microbial dysbiosis may participate in amplification or persistence of mucositis, while the strength and direction of these relationships remain dependent on host and treatment context [8].

For the present framework, the importance of these mechanisms is explanatory rather than prescriptive. Biological injury establishes conditions under which symptoms may emerge, but neither inflammatory activity nor microbial alteration alone determines how much pain, eating difficulty, or nutritional compromise a patient will experience.

Oral pain

Pain is one of the most direct routes through which mucosal injury can impair eating and oral function. Ulceration and mucosal sensitivity can make chewing, swallowing, oral hygiene, and even fluid intake aversive. Cancer-pain guidance supports systematic assessment and individualized treatment according to pain mechanism, intensity, patient condition, and treatment goals [9].

Within this framework, oral pain functions as a mediator rather than a proxy for mucositis severity. Similar lesions can be experienced differently, and oral pain can also arise from infection, tumour involvement, neuropathic mechanisms, dental disease, or other conditions. Nursing assessment therefore requires attention to both the visible oral state and the patient's account of what provokes or limits eating and drinking.

Xerostomia and coexisting oral symptoms

Xerostomia can coexist with mucositis and independently intensify oral discomfort, chewing difficulty, swallowing problems, taste disturbance, and reduced enjoyment of food. In advanced cancer, xerostomia is clinically important because multiple disease-, treatment-, and medication-related causes can converge [10]. Subjective oral dryness should also be distinguished from objectively measured salivary gland hypofunction; the two overlap but are not equivalent [11].

This distinction has practical consequences. Assessment should capture both the patient's experience and relevant clinical signs rather than assuming that a single measure defines the problem. Management similarly depends on whether residual gland function can be stimulated or whether oral wetting and symptom-relief strategies are more appropriate [12]. Evidence-based guidance for cancer-therapy-related xerostomia is strongest in particular treatment populations, especially head and neck cancer, so direct transfer to every advanced-cancer context requires caution [13].

In the present synthesis, xerostomia is therefore treated as a co-symptom and possible independent pathway. It may magnify the effect of mucositis on eating, but it may also produce eating difficulty when mucositis is absent or mild.

Swallowing and eating difficulties

The transition from oral symptoms to eating difficulty is clinically important because functional impairment cannot be inferred from lesion appearance. Pain, dryness, altered taste, mucosal sensitivity, fatigue, and swallowing problems may act together, while the patient may modify food texture, meal frequency, temperature, or portion size before a measurable nutritional deficit appears.

Studies of nutrition-impact symptoms in advanced cancer show that eating-related difficulties often coexist with broader psychological and symptom burdens, including depression [14]. Longitudinal evidence also indicates that changes in nutrition-impact symptoms can accompany changes in nutritional intake and weight-related outcomes during cancer treatment [15]. These findings support active monitoring, but they do not establish oral mucositis as the sole or primary cause of reduced intake.

Eating difficulty is therefore positioned in the framework as a functional transition zone: it is more than an oral symptom, yet it does not by itself demonstrate nutritional compromise.

Reduced nutritional intake

Reduced nutritional intake represents a further step and requires independent assessment. In advanced cancer, appetite loss and eating-related distress may arise from cachexia and systemic disease processes even when oral symptoms are limited. Multicentre evidence demonstrates that eating-related distress varies according to cachexia and anorexia-related clinical configurations, reinforcing the need to preserve a nonoral competing pathway [16]. More broadly, malnutrition and nutritional risk are clinically important across oncology populations, including patients with advanced or metastatic disease [17]. The presence of mucositis may add to this burden, but disease progression, inflammatory and catabolic processes, gastrointestinal symptoms, treatment toxicity, fatigue, depression, and reduced appetite can all contribute.

Cancer nutrition guidance consequently recommends individualized assessment rather than relying on one symptom or body-weight change in isolation [18]. Contemporary multidisciplinary nutrition perspectives likewise emphasize that nutritional care is most appropriately embedded within broader supportive oncology rather than treated as a stand-alone intervention [19].

For this article, reduced intake is therefore a decision-relevant outcome, not an automatic consequence of mucositis. The analytical task is to determine whether oral symptoms are principal drivers, contributing factors, or incidental findings relative to other causes.

Hydration consequences

Fluid intake can be impaired by many of the same oral factors that affect food intake, particularly pain, dysphagia, mucosal sensitivity, xerostomia, and difficulty tolerating particular temperatures or textures. Advanced-cancer oral guidance recognizes that painful or dysfunctional swallowing can contribute to inadequate intake [4].

Hydration decisions nevertheless require separate reasoning. MASCC guidance on clinically assisted hydration in advanced cancer emphasizes individualized evaluation of potentially reversible causes, current intake and losses, prognosis, treatment goals, expected benefits, burdens, and patient preferences [20]. Reduced drinking associated with mucositis therefore identifies a need for assessment; it does not automatically establish an indication for clinically assisted hydration.

This distinction is especially important near the end of life, when reduced intake may reflect terminal physiological change rather than a reversible oral barrier. The framework consequently treats hydration as a parallel downstream domain with its own clinical and ethical conditions.

Functional and quality-of-life effects

Oral symptoms, eating difficulty, nutritional risk, and hydration problems may collectively affect energy, social eating, communication, mobility, independence, treatment tolerance, and perceived quality of life. These effects can be substantial even when no single oral symptom appears dominant [21].

The relationship between nutritional intervention and broader outcomes remains context-dependent. A systematic review of enteral tube feeding in advanced upper gastrointestinal cancer identified heterogeneous evidence concerning nutrition, survival, and quality-of-life outcomes [22]. That uncertainty is important because it prevents a simple progression from reduced intake to increasingly invasive nutritional intervention.

Functional and quality-of-life effects therefore serve as integrative outcomes in this article. They indicate whether oral and eating problems have become clinically consequential while retaining the possibility that tumour progression, frailty, systemic inflammation, psychosocial distress, and other conditions are contributing simultaneously.

Nursing oral assessment

Nursing assessment occupies a distinct position between symptom experience and supportive action. It can identify oral dryness, mucosal changes, pain, hygiene problems, swallowing difficulty, intake limitation, and changes in the patient's ability to perform oral self-care. Its purpose is not to assign every oral problem to mucositis but to determine what is present, what is affecting function, and what requires further intervention or referral.

A longitudinal study of terminally ill patients receiving palliative care found that both nurse-led oral care and dental-professional-led management were associated with improvement in several assessed oral-health domains, while some problems remained particularly relevant to specialist dental management [23]. The study supports the feasibility of structured nursing involvement without establishing a universal referral threshold [24-29].

Oral-health findings may also carry wider clinical information. In terminally ill cancer patients, poorer assessed oral-health status has been associated with shorter survival time [30]. Such an association should not be interpreted as evidence that oral care prolongs survival. It instead indicates that oral deterioration may coexist with broader illness burden and functional decline.

Within the symptom-to-supportive-care framework, nursing oral assessment therefore performs three linked functions: observation of mucosal and oral conditions, evaluation of their consequences for comfort and eating, and routing toward the appropriate level of supportive or specialist care.

Table 2. Routes to reduced intake and the nursing observations needed to distinguish them

Clinical route	How intake may be affected	Nursing observations that help characterize the route	Important competing explanation to assess	Initial supportive-care direction	Likely escalation domain when unresolved
Mucositis-associated pain	Chewing or swallowing becomes painful; meals are shortened or avoided	Lesion pattern, pain timing, foods or fluids that provoke pain, oral-care tolerance	Dental infection, tumour pain, neuropathic pain	Oral comfort measures and individualized symptom management	Medical, dental, or specialist palliative review
Xerostomia or salivary dysfunction	Dry foods become difficult to chew or swallow; oral comfort deteriorates	Subjective dryness, oral moisture, swallowing complaints, medication exposure	Dehydration, medication effects, salivary gland injury	Moisture support and cause-focused review	Medical/dental review when persistent or complex
Swallowing or eating difficulty	Food texture, meal duration, or swallowing safety limits intake	Coughing, effort, food avoidance, texture modification, fatigue during meals	Tumour-related dysphagia or neuromuscular impairment	Adapt food texture and monitor intake burden	Speech/swallow, medical, or dietetic assessment

Cachexia/anorexia pathway	Appetite and intake decline despite manageable oral symptoms	Appetite trajectory, weight/function change, systemic symptom burden	Metabolic and inflammatory disease processes	Nutrition assessment aligned with goals and prognosis	Dietetic and palliative/medical review
Broader treatment or disease burden	Fatigue, nausea, depression, gastrointestinal symptoms, or treatment effects reduce eating	Symptom pattern beyond the mouth, medication and treatment context	Progressive disease and treatment toxicity	Multisymptom supportive assessment	Relevant medical and supportive-care disciplines
Hydration-related difficulty	Pain or swallowing problems reduce fluid consumption	Fluid tolerance, thirst/dryness, swallowing, losses, urine or clinical hydration concerns where appropriate	Terminal decline, gastrointestinal loss, renal/cardiac limitations	Identify reversible contributors and clarify goals	Medical/palliative review for complex hydration decisions
Functional deterioration	Reduced endurance or independence interferes with meal preparation or eating	Ability to sit, feed oneself, maintain oral care, and complete meals	Frailty, sarcopenia, neurological or social factors	Adapt assistance and reassess nutritional risk	Dietetic, rehabilitation, social, or palliative support

Oral hygiene and mucosal protection

Basic oral care should continue when feasible because cleanliness, moisture, and atraumatic care support comfort and allow changing mucosal conditions to be observed. Current MASCC/ISOO guidance also shows that “basic oral care” contains areas of controversy and must be adapted to treatment context and patient tolerance [31]. Preventive topical agents have heterogeneous evidence across interventions and settings, so they should not be presented as interchangeable mucosal-protection measures [32]. In terminal cancer, oral care shortly before death may still address comfort and cleanliness, but the goals and intensity of care should reflect the patient’s condition and wishes [33].

Within this framework, oral hygiene is a supportive platform rather than a treatment for every cause of mucosal injury. Gentle technique, moisture support, and reassessment are linked to observed problems, while suspected infection, uncontrolled pain, bleeding, or complex dental disease requires escalation [24, 34-37].

Pain and symptom management

Pain management should respond to what limits oral function, not only to lesion appearance. Assessment should identify pain quality, triggers, duration, swallowing effects, and whether symptoms prevent oral care or intake [4]. Cancer-pain guidance supports individualized pharmacological and nonpharmacological management according to mechanism, severity, comorbidity, and goals [9]. Where xerostomia contributes, symptom-directed salivary management may reduce an additional barrier to eating and oral comfort [12].

Dietary adaptation and nutritional support

Dietary adaptation is appropriate when texture, temperature, dryness, taste, or meal duration becomes a barrier, but the response should remain proportional to the patient’s nutritional risk and goals. Cancer nutrition guidance supports individualized assessment and escalation when intake is persistently inadequate [18]. Multimodal nutrition care is best coordinated with wider symptom management rather than isolated from it [19]. More invasive nutritional support requires additional disease- and prognosis-specific reasoning because benefits in advanced cancer are context-dependent [22].

Patient education

Education should help patients and families recognize actionable oral changes, use tolerable oral-care measures, report pain or swallowing difficulty early, and understand when eating or drinking changes warrant review. Supportive-care models favor practical information linked to accessible services rather than information alone [1]. Xerostomia advice should likewise match the likely mechanism and available salivary function [12]. Nutrition advice is most useful when it is individualized and coordinated with symptom control [19].

Interprofessional escalation

Escalation is indicated when nursing assessment identifies problems beyond routine supportive management: severe or persistent pain, suspected infection, uncontrolled bleeding, progressive swallowing difficulty, inability to maintain adequate intake, complex xerostomia, dental pathology, or uncertain hydration decisions. Advanced-cancer oral problems may require dental, medical, dietetic, speech/swallow, and palliative expertise [4]. Service models vary, making clear referral routes important [2]. Hydration decisions may need medical and palliative

review because expected benefit depends on reversibility, prognosis, burdens, and patient goals [20]. Nurse-led care and dental-professional management can therefore be complementary rather than competing roles [23].

Proposed mucositis–eating–supportive-care framework

The proposed framework integrates the preceding evidence into a conditional clinical architecture. Mucosal injury can generate pain and other oral symptoms; xerostomia and coexisting oral problems can modify that burden. Symptoms may then interfere with chewing, swallowing, drinking, or oral self-care. Functional interference can reduce actual intake, but a parallel cachexia/anorexia and systemic-disease route can reach the same nutritional outcome without mucositis being the dominant cause [16].

Nursing oral assessment crosses these pathways by establishing what is observable, what the patient experiences, which function is impaired, and whether consequences are reversible or escalating. Supportive care is then matched to the configuration: oral care and mucosal protection, symptom management, dietary adaptation, nutrition or hydration review, education, and interprofessional referral. These connections constitute a proposed synthesis of the evidence, not a validated clinical prediction rule.

Table 3. Clinical application of the proposed mucositis–eating–supportive-care framework

Observed clinical configuration	Main decision question	Nursing/supportive-care response	Escalation condition	Boundary condition requiring reinterpretation
Mucosal injury with limited functional interference	Is comfort maintained and intake preserved?	Gentle oral care, symptom surveillance, patient education	Worsening pain, lesions, or function	Treatment phase and mucosal vulnerability
Oral pain or dryness affecting eating	Which symptom is creating the functional barrier?	Symptom relief, moisture support, food/fluid adaptation	Persistent limitation despite initial measures	Dental disease, infection, tumour involvement
Eating difficulty with declining intake	Is oral dysfunction the principal driver of reduced intake?	Document intake impact; initiate nutrition-oriented review	Sustained or clinically important intake impairment	Cachexia, anorexia, nausea, depression, systemic disease
Reduced drinking or suspected hydration problem	Is the problem reversible and consistent with goals of care?	Assess oral barriers and contributing symptoms	Complex hydration decision or inability to drink	Prognosis, losses, organ function, end-of-life physiology
Multiple severe or interacting problems	Can needs be managed safely within routine nursing support?	Coordinate symptom care and rapid reassessment	Need for dental, medical, dietetic, swallowing, or palliative expertise	Patient priorities, burden of intervention, care setting

Severity-dependent care pathways

Care intensity should reflect the combined severity of oral findings, experienced symptoms, functional interference, and nutritional or hydration consequences. A mucositis grade alone cannot represent that full configuration. Risk-prediction research supports closer surveillance in higher-risk treatment contexts [7]. Hydration guidance illustrates why downstream intervention still requires individualized judgment [20]. Nursing assessment can identify when routine oral support remains sufficient and when specialist involvement becomes necessary [23].

Figure 1 summarizes this proposed severity-responsive architecture and its competing pathway from systemic disease or cachexia to reduced intake.

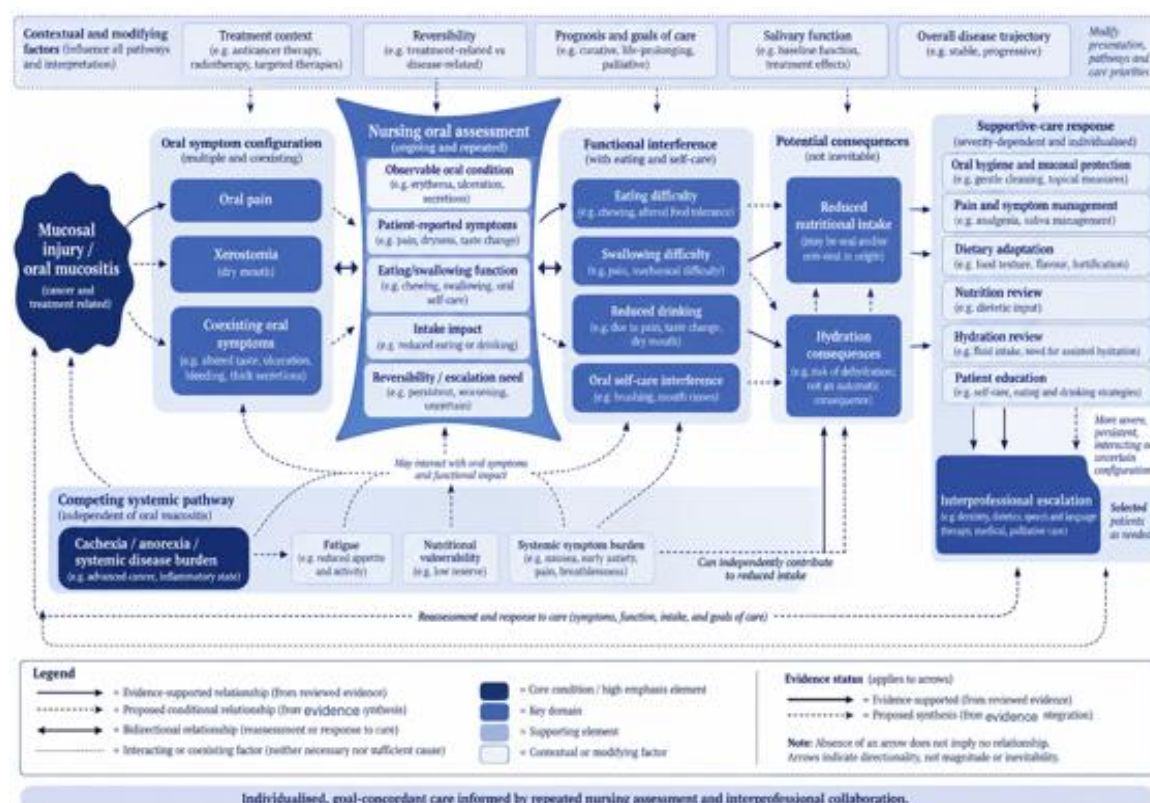


Figure 1. Conditional pathways from oral mucosal injury to eating consequences and supportive-care escalation

Boundary conditions

The framework changes interpretation when oral symptoms are not the dominant determinant of intake. Xerostomia may occur independently of mucositis [10]. Cachexia, anorexia, systemic inflammation, gastrointestinal symptoms, depression, disease progression, and treatment burden can produce parallel or stronger pathways to poor intake [16]. Nutrition and hydration decisions also depend on prognosis, reversibility, goals, and intervention burden [18, 20]. These conditions prevent lesion severity from functioning as a universal proxy for supportive-care intensity.

Practice implications

Practice should link repeated oral observation to functional questions: Can the patient clean the mouth, chew, swallow, drink, and complete meals with acceptable comfort? When the answer changes, the next step is to identify the limiting mechanism before escalating care. This approach supports nursing-led monitoring while preserving timely referral for dental, medical, dietetic, swallowing, and palliative needs [23]. Oral care remains important near the end of life, but comfort and proportionality become increasingly central [33].

Research agenda

Future studies should test whether repeated oral-symptom and functional trajectories add clinically useful information beyond disease severity, cachexia, and conventional mucositis grading. Risk-prediction approaches provide one methodological starting point [7]. Longitudinal nutrition-impact symptom research supports repeated measurement across time [15]. Studies should also examine whether structured nursing oral assessment changes referral timing, eating-related outcomes, or patient-reported comfort, while separating association from causal effect [30]. Comparative evaluation of preventive oral strategies remains relevant because intervention effects vary by context [32].

Results and Discussion

The synthesis supports a linked but non-deterministic relationship between oral mucosal injury, symptom burden, eating difficulty, intake consequences, and supportive-care need. Its main contribution is the separation of transitions that are often compressed into a single clinical narrative. Oral lesions may matter because they hurt, alter salivary or oral function, and disrupt eating, but the same downstream outcomes can arise through systemic pathways. Supportive care therefore depends on configuration, not on mucositis presence alone.

The proposed framework also clarifies nursing responsibility. Nursing oral assessment can repeatedly connect visible oral status with patient-reported symptoms and functional change, while escalation preserves specialist roles when causes or interventions exceed routine nursing scope. This organization is compatible with integrated supportive cancer care while remaining sensitive to prognosis and goals [1].

Limitations

The evidence base spans heterogeneous populations, including treatment-focused oncology, advanced or metastatic cancer, palliative care, hematologic settings, and terminal illness. Some relationships in the framework are therefore supported indirectly across adjacent populations rather than validated as one continuous pathway in advanced cancer. Much of the relevant evidence is observational, guideline-based, or context-specific. The framework should consequently be tested prospectively before use as a predictive or protocolized tool.

Conclusion

In advanced cancer, oral mucositis becomes most clinically consequential when mucosal injury is translated into pain or coexisting oral symptoms, functional difficulty with eating or drinking, and meaningful effects on intake, hydration, comfort, or daily function. Those transitions are not inevitable, and reduced intake may arise independently through cachexia or progressive disease. Nursing oral assessment can distinguish these configurations and connect them to proportionate supportive care and escalation. The strongest clinical approach is therefore one that treats oral findings, symptom experience, function, and care need as related but separately assessable domains.

Acknowledgments: None

Conflict of interest: None

Financial support: None

Ethics statement: None

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