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Nursing Interventions for Reducing Postoperative Thirst and Oral Discomfort in Surgical Patients

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ABSTRACT: Postoperative thirst is one of the most frequently reported but least prioritized symptoms among surgical patients, driven by prolonged preoperative fasting, intraoperative fluid losses, anesthesia-induced suppression of thirst-regulating

mechanisms, and the administration of opioids and anticholinergics. Although thirst is rarely life-threatening, its persistence contributes to significant patient distress, dry mouth, cracked lips, swallowing difficulty, sleep disruption, and reduced willingness to eat or mobilize—all of which can slow recovery and extend length of stay. Nurses are ideally positioned to assess and manage these symptoms early and consistently, yet studies consistently show that thirst is under-recognized in routine postoperative assessment and often dismissed as an unavoidable side effect of surgery. Systematic assessment using validated tools such as visual analog or numerical rating thirst scales, combined with oral cavity examination for moisture, mucosal integrity, and lip condition, allows nurses to identify the problem accurately and target interventions accordingly. Effective nursing interventions are typically multimodal and begin with a structured reassessment of the routine nil-per-os order, since evidence increasingly supports early, individualized fluid resumption following surgery rather than fixed and extended fasting. Non-pharmacological strategies—including small-volume, frequent sips of cool water, ice chips in appropriate patients, oral swabs and moistened gauze, lip balm for dry and fissured lips, saline or non-alcohol mouth rinses, and sugar-free chewing gum or lozenges to stimulate salivary flow—have consistently demonstrated effectiveness in reducing thirst intensity and dry mouth without increasing aspiration risk when appropriately selected. Temperature and palatability matter, with cold and slightly acidic or sweet fluids often improving comfort. In addition, patient education and proactive nursing communication, ensuring that patients are informed when they can resume fluids and that they can request help without delay, reduce the distress associated with unresolved thirst. Evidence-based protocols that combine structured assessment, comfort measures, and a supported transition to oral intake—rather than a reliance on single interventions—are most effective and are now recommended in several perioperative care guidelines as part of a broader comfort-focused approach to recovery.

INTRODUCTION

Postoperative thirst is one of the most common and distressing symptoms reported by surgical patients, yet it remains inconsistently assessed and frequently deferred in routine nursing care. A large cross-sectional study of adults recovering from general anesthesia found a postoperative thirst prevalence of 95.7%, with 46.3% of affected patients reporting moderate thirst and 24.5% reporting severe thirst [1]. Institutional data from a resource-limited setting reported a lower but still substantial prevalence of 59.4% in the immediate postoperative period [2]. Systematic reviews of the intervention literature describe prevalence estimates ranging from 55% to 76% in post-anesthesia care units, although differences in measurement timing and instruments complicate direct comparison [3]. These figures indicate that thirst is not an occasional complaint but a predictable and widespread postoperative phenomenon that nurses encounter daily across surgical settings.

The clinical importance of postoperative thirst is not limited to its prevalence. Thirst is often experienced as more bothersome than hunger and can rival postoperative pain in intensity, and it contributes to oral discomfort, dry lips, cracked mucosa, halitosis, and patient dissatisfaction with care [4]. Patients frequently describe thirst as an urgent and generalized sensation that dominates their early recovery experience, and some report that the inability to obtain relief is more distressing than the surgical wound itself [1]. Oral discomfort associated with thirst can also interfere with communication, swallowing, nutrition, and sleep, particularly in the first twenty-four hours after anesthesia [3]. For nurses at the bedside, postoperative thirst is therefore not a minor inconvenience to be postponed until oral intake is formally ordered, but a legitimate, nursing-sensitive outcome that affects recovery, comfort, and oral health [3].

The etiology of postoperative thirst is cumulative and multifactorial, arising from preoperative, intraoperative, and postoperative exposures that converge on oral dehydration and altered thirst perception. Preoperative fasting protocols remain a dominant contributor, and prolonged nil-per-os duration has been independently associated with postoperative thirst, with one study reporting an adjusted odds ratio of 13.80 for fasting periods exceeding fifteen hours [1]. Intraoperative intubation and mechanical ventilation expose the oral mucosa to dry gases and bypass the normal humidifying functions of the upper airway,

while anesthetic and anticholinergic agents diminish salivary flow [3]. Opioids, widely used for intraoperative and postoperative analgesia, further suppress salivation and contribute to xerostomia [4]. The physiological result is a mismatch between salivary secretion and evaporative loss, leaving the oral mucosa under-lubricated and generating a thirst signal that is experienced as urgent even when systemic volume status is adequate.

Assessment is the first and most frequently omitted step in the nursing response to postoperative thirst. In routine practice, thirst is often inferred from patient complaints rather than systematically measured, and standardized instruments are infrequently used. This reliance on spontaneous complaint disadvantages sedated, intubated, older, and cognitively impaired patients, who may experience severe thirst without articulating it [4]. The consequence is that thirst is often recognized late, after oral discomfort has already become established, and interventions are applied inconsistently rather than according to a structured plan [1]. A systematic approach to assessment would allow nurses to identify patients at risk, quantify severity, select proportionate interventions, and evaluate response over time [1].

Pathophysiology and Multifactorial Etiology

The etiology of postoperative thirst is cumulative and multifactorial, arising from preoperative, intraoperative, and postoperative exposures that converge on oral dehydration and altered thirst perception. Preoperative fasting protocols remain a dominant contributor. Prolonged nil-per-os duration has been independently associated with postoperative thirst, with one study reporting an adjusted odds ratio of 13.80 for fasting periods exceeding fifteen hours, while inadequate preoperative fluid preloading has been associated with an adjusted odds ratio of 2.137 [1]. These findings reflect the importance of baseline hydration status in determining how a patient tolerates the obligatory fasting interval. Intraoperative factors compound this vulnerability. Endotracheal intubation and mechanical ventilation expose the oral mucosa to dry gases and bypass the normal humidifying functions of the upper airway, while anesthetic and anticholinergic agents diminish salivary flow [3]. Opioids, widely used for intraoperative and postoperative analgesia, further suppress salivation and contribute to xerostomia [4]. Operative duration, intubation method, and specific analgesic regimens have been identified as independent determinants of thirst intensity in adults recovering from general anesthesia [1]. The physiological result is a mismatch between salivary secretion and evaporative loss, leaving the oral mucosa under-lubricated and generating a thirst signal that is experienced as urgent and generalized even when systemic volume status is adequate [4].

Assessment and Measurement

Assessment is the first and most frequently omitted step in the nursing response to postoperative thirst. Validated instruments now exist to support structured measurement. The Perioperative Thirst Discomfort Scale was developed and validated to capture the multidimensional discomfort associated with thirst in the perioperative period, including sensory, affective, and oral components [5]. A dedicated postoperative thirst rating scale for patients undergoing major abdominal surgery has demonstrated a Cronbach's alpha of 0.957, test–retest reliability of $r = 0.976$, and a six-item structure yielding scores from 0 to 18, where higher scores indicate worse thirst [6]. The Thirst Discomfort Scale, comprising twelve items across three subdimensions, has also been validated for surgical patients and explains 66.2% of the total variance in thirst-related discomfort [7]. Despite the availability of these tools, routine practice continues to rely heavily on spontaneous patient complaint rather than systematic observation of oral moisture, lip condition, and mucosal integrity. Qualitative and observational work has shown that both ward and operating-room nurses tend to depend on verbal reports and that information about thirst is inconsistently transmitted between perioperative settings [8]. This reliance on spontaneous complaint disadvantages sedated, intubated, older, and cognitively impaired patients, who may experience severe thirst without articulating it. The consequence is that thirst is often recognized late, after oral discomfort has already become established [9]. **Table 1** summarizes representative assessment instruments and their measurement properties.

Table 1. Selected Instruments for the Assessment of Postoperative Thirst and Oral Discomfort

Instrument	Structure and Scoring	Psychometric Evidence	Population or Setting
Perioperative Thirst Discomfort Scale	Seven items; score range 0–14; higher scores indicate greater discomfort	Content and construct validity established; Cronbach's alpha 0.813 in a translated version	Perioperative patients, including post-anesthesia care

Postoperative Thirst Rating Scale for abdominal surgery	Six items; score range 0–18; higher scores indicate worse thirst	Cronbach's alpha 0.957; test–retest r = 0.976	Major abdominal surgery
Thirst Discomfort Scale	Twelve items across three subdimensions; explains 66.237% of variance	Valid and reliable for thirst-related discomfort	Surgical patients

Evidence-Based Oral Cooling and Moisturizing Interventions

The evidence base for specific thirst-relieving interventions has expanded considerably, and network meta-analytic techniques now permit comparative ranking of approaches that were previously evaluated only against usual care. A network meta-analysis of eleven randomized controlled trials involving 3,098 participants compared eight oral cooling and moisturizing interventions against a nil-by-mouth control. The largest reductions in thirst intensity were observed with menthol ice, followed by plain ice and water, while citric acid spray, aromatic solution spray, water spray, wet gauze, and wet cotton swab did not produce statistically significant reductions relative to the control [10]. This ranking carries direct implications for nursing practice: interventions that engage oral thermoreceptors with sustained cooling are not interchangeable with brief moistening of the lips or buccal mucosa. The physiological rationale is that cold stimulation activates oropharyngeal thermoreceptors that project to brain regions involved in thirst satiety, allowing the patient to experience relief without ingesting volumes of fluid that might be unsafe in the immediate postoperative period [10]. A separate meta-analysis of fourteen randomized trials involving 1,289 patients examined oral stimulants as a class and reported a pooled standardized mean difference of −1.38 for thirst intensity, with subgroup analyses identifying menthol, cold water, and ice as the active agents driving the effect [11]. The certainty of this evidence was graded as low, largely because of heterogeneity in timing of assessment and baseline thirst severity, but the consistency of direction across trials supports the clinical plausibility of the finding.

Ice has been reported to be substantially more effective than room-temperature water in quenching postoperative thirst, and a randomized clinical trial of ice popsicles in the immediate postoperative period demonstrated significant thirst relief with high patient acceptability [12]. Mentholated ice appears to confer additional benefit over plain ice, possibly through the cooling properties of menthol at lower concentrations and its effect on oral sensory perception. Menthol chewing gum has likewise demonstrated efficacy in abdominal surgery patients, with a randomized clinical trial reporting reduced thirst and improved oral comfort [13]. A meta-analysis of ten randomized trials with 1,062 patients found that chewing gum significantly reduced thirst and mouth dryness while also promoting return of bowel function and reducing halitosis [14]. These findings position chewing gum as a dual-purpose intervention in enhanced recovery pathways, simultaneously addressing oral comfort and postoperative ileus. Menthol more broadly has been studied as a thirst-relieving agent during the surgical period, with evidence suggesting that mentholated preparations prolong the sensation of oral freshness and reduce the frequency of repeated requests for water [15]. For nurses, the practical message is that cold oral applications, mentholated preparations, and chewing gum should be treated as active interventions with a physiological basis, not as comfort measures of uncertain value [15].

Structured Oral Care Bundles

Oral care bundles represent a structured, multi-component strategy for translating discrete interventions into reproducible nursing practice. A thirst care bundle typically combines cold water spray or sterile cold swabs for mucosal moistening, mentholated lip moisturizer to prevent evaporative loss and protect the lip vermilion, and scheduled reassessment at fixed intervals. In a quasi-experimental study of postoperative oncology patients in a surgical intensive care unit, the group receiving a thirst care bundle demonstrated statistically significantly lower total thirst scores and better oral condition scores than the routine-care group, leading the authors to recommend incorporation of the bundle into daily care [16]. A two-phase bundle involving oral wetting with sterile gauze, cold water spray delivered in metered aliquots, and lip moisturization at three-hour intervals has been described in detail, with each application comprising a defined number of moist wipes and sprays over a standardized period [17]. The Thirst Relief Bundle developed for abdominal surgery patients through a formal guideline-development process identified three core elements: risk-factor identification, structured thirst and dry-mouth assessment, and a tiered nursing management protocol; the resulting guideline achieved a content validity index of 0.96 and reduced thirst in post-abdominal surgery patients in a preliminary trial [18]. Bundles do not necessarily outperform the best single intervention in head-to-head comparisons, but they reduce unwarranted variation in practice and make it more likely that every patient

receives at least a minimum standard of thirst care. **Table 2** synthesizes the principal intervention categories, their proposed mechanisms, and the level of supporting evidence.

Table 2. Nursing Interventions for Postoperative Thirst: Mechanisms and Evidence

Intervention Category	Examples	Proposed Mechanism	Evidence Summary
Cold oral stimulation	Ice chips, ice popsicles, cold water gargle, frozen saline gauze	Activation of oral thermoreceptors; cooling-induced thirst satiety	Network meta-analysis ranks ice and cold water among the most effective; cold applications reduce thirst and dry mouth
Mentholated cold stimulation	Menthol ice, menthol chewing gum, menthol lip moisturizer	Cooling plus trigeminal sensory modulation; prolonged oral freshness	Menthol ice produced the largest mean reduction in thirst intensity in network meta-analysis
Chewing gum	Sugar-free menthol or flavored gum	Mechanical salivary stimulation; promotes gastrointestinal motility	Meta-analysis of ten randomized trials shows reduced thirst and dryness and earlier bowel recovery
Oral care bundle	Cold water spray, sterile swabs, and lip moisturizer at scheduled intervals	Combined moistening, barrier protection, and structured reassessment	Bundle studies report lower thirst and improved oral condition versus routine care
Early oral hydration	Small-volume room-temperature water once airway reflexes are safe	Direct volume replacement; mucosal wetting	Safe and effective in enhanced recovery pathways; reduces thirst without increasing aspiration or nausea
Acupressure and adjunct therapies	Pressure at Shuiquan, Lianquan, and Zhaohai points; lemon spray	Salivary reflex stimulation; traditional meridian theory	Small trials report reduced thirst and increased salivary flow; evidence base remains limited

Early Oral Hydration Within Enhanced Recovery Pathways

Early oral hydration, once considered incompatible with postoperative fasting traditions, has been rehabilitated within enhanced recovery after surgery protocols. A study of early oral hydration on demand in the post-anesthesia care unit found that the intervention effectively relieved postoperative thirst in patients after gynecological laparoscopy without increasing adverse events [19]. Meta-analytic evidence indicates that early water intake after general anesthesia relieves thirst without increasing the incidence of nausea, vomiting, or aspiration when patient selection and airway safety criteria are respected [20]. A randomized controlled trial of early oral hydration further reported significant reductions in postoperative nausea, thirst, and throat discomfort, supporting the safety and feasibility of small-volume water intake during the postoperative awakening period [21]. A systematic review and meta-analysis examining the timing of early water intake after general anesthesia concluded that carefully timed small volumes can be introduced earlier than traditional protocols allow, provided that criteria for airway protection and patient responsiveness are met [22]. For nurses, the practical implication is that the question is no longer whether postoperative patients may drink, but when, how much, and under what safety conditions. This reframing requires active collaboration with anesthesia and surgical teams to replace blanket nil-by-mouth orders with patient-specific, criterion-based oral hydration plans [22].

Acupressure and Adjunctive Approaches

Acupressure and related traditional adjuncts occupy a less robust but culturally relevant position in the intervention landscape. Pressure applied to the Shuiquan, Lianquan, and Zhaohai acupoints has been reported to relieve thirst in surgical patients before and within twenty-four hours after surgery, and small studies combining acupressure with lemon-water spray have shown reductions in subjective thirst and increases in salivary flow [23]. These approaches are non-invasive, low-cost, and acceptable to many patients, but the trials are generally small, unblinded, and heterogeneous in point selection and pressure duration. They

are best positioned as adjuncts within a multimodal plan rather than as substitutes for cold oral stimulation or structured oral care [23].

Barriers to Translation into Nursing Practice

The gap between evidence and routine practice remains the central implementation challenge. Nurses report multiple reasons for withholding thirst-relieving care, most commonly a belief that oral intake is prohibited, fear of aspiration, and the absence of clear protocols that distinguish between nothing by mouth as a surgical order and nothing by mouth as an unchallenged cultural habit. Qualitative work with nurses caring for patients after pancreaticoduodenectomy has identified additional barriers, including limited knowledge and skills specific to thirst management, experience-based rather than evidence-based practice, ethical distress when patients beg for water and nurses feel constrained by orders, and the absence of clinically feasible assessment tools and standardized relief measures [24]. These findings indicate that education alone is insufficient. What is required is a systems-level intervention that includes a validated assessment instrument embedded in the electronic record, standing orders or nursing-initiated protocols for cold oral applications and oral care bundles, explicit criteria for advancing to small-volume oral hydration, and interprofessional agreement on aspiration-risk assessment [24].

Patient and Family Education

Patient education is a necessary but underdeveloped component of postoperative thirst management. Patients and family members often arrive at surgery with the expectation that thirst is an unavoidable part of the postoperative experience and that requesting water is a violation of recovery rules. Structured preoperative education that explains the physiology of postoperative thirst, the safety rationale for staged oral intake, and the availability of cold oral interventions can reduce distress and improve cooperation. Teaching points should include the rationale for short preoperative fasting intervals consistent with current enhanced recovery guidance, the correct use of lip moisturizer to prevent evaporative worsening of dryness, the appropriate technique for requesting and consuming small volumes once permitted, and the signs of unsafe swallowing or aspiration that warrant cessation of oral intake. Family caregivers can be enlisted to help monitor lip and mucosal condition and to remind patients to use bundled oral care at scheduled intervals. Evidence specifically evaluating thirst-focused patient education is sparse, but the broader self-management and enhanced recovery education literature supports the principle that preparatory information reduces symptom distress and improves patient engagement in recovery behaviors [4]. Nurses also need to address the cultural expectation that thirst must be endured silently, because such expectations can delay requests for relief and prolong unnecessary discomfort [24].

Economic and Organizational Considerations

From an economic and organizational perspective, postoperative thirst interventions are unusually favorable. Cold oral applications have been explicitly described as cost-effective and suitable for large-scale application in healthcare settings, and a recovery-room evaluation reported a very low per-patient cost for a thirst-relief measure that produced no nausea or vomiting [10]. The costs of untreated thirst are less visible but no less real: delayed mobilization, reduced oral intake, patient dissatisfaction, and the nursing time consumed by repeated ad hoc requests for water. A business case for thirst care can therefore be constructed around low intervention cost, reduced unscheduled care episodes, improved patient-reported comfort, and alignment with enhanced recovery quality metrics. The principal investment required is not equipment but workflow redesign and nursing education [10].

Research Priorities

Several research priorities emerge from the current evidence. First, the comparative ranking of interventions is based on a limited number of trials, many with small samples and substantial clinical heterogeneity; adequately powered, multi-site randomized trials with standardized outcome definitions and timing of assessment are needed. Second, the evidence for oral care bundles is promising but derived largely from quasi-experimental and single-center studies; cluster-randomized implementation trials with patient-reported and clinical outcomes would strengthen the case for routine adoption. Third, thirst assessment instruments require further validation across surgical specialties, languages, and cognitive profiles, including older adults and patients with delirium or communication barriers. Fourth, the safety of early oral hydration protocols should be evaluated in broader surgical populations, including those at elevated aspiration risk, with clearly reported inclusion criteria and adverse-event monitoring. Fifth, a recent randomized trial of cold water gargling after major abdominal surgery adds to the evidence that simple cold oral stimulation can be delivered safely and effectively in ward settings [25], but larger trials are needed

to confirm generalizability. Finally, qualitative and implementation-science research is needed to understand how thirst care can be embedded in real-world workflows without adding unsustainable documentation burden [25].

CONCLUSION

Postoperative thirst is a high-prevalence, high-distress, low-cost-to-treat symptom that sits squarely within nursing's domain of practice. The evidence supports a tiered approach: systematic assessment using a validated instrument; first-line cold oral stimulation with ice, cold water, or mentholated preparations; structured oral care bundles that combine moistening, lip protection, and scheduled reassessment; chewing gum as a dual-purpose adjunct; and early oral hydration once airway safety criteria are satisfied. None of these interventions is technically complex, and most are inexpensive. What stands between the current evidence and patient comfort is not a gap in knowledge about what works, but a gap in the routine systems that determine whether what works is actually delivered. Closing that gap requires nursing leadership to treat thirst as a measurable outcome, to authorize evidence-based interventions through protocols and standing orders, and to educate patients and families about the safety and availability of thirst relief. The discomfort of postoperative thirst is neither inevitable nor trivial; it is a nursing-sensitive outcome that can be systematically reduced.

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