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INTERPROFESSIONAL COLLABORATION BETWEEN NURSES AND DENTISTS IN HOSPITAL-BASED ORAL CARE: A SYSTEMATIC REVIEW

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Abstract

Hospitalized patients, especially those in intensive care, stroke, and rehabilitation wards, are vulnerable to poor oral health and aspiration pneumonia. Interprofessional collaboration between nurses and dental professionals improve outcomes by combining continuous bedside care with specialist assessment and treatment. We systematically reviewed hospital-based studies reporting nurse–dentist (or dental hygienist) collaboration and patient outcomes. Twelve original studies met inclusion criteria: one randomized controlled trial, eight cohort, quasi-experimental ICU, stroke, or rehabilitation ward studies, and three multi-year retrospective analyses. Across settings, collaborative models most commonly included nurse-delivered routine oral care plus dentist or dental hygienist assessment, treatment, protocol leadership, and staff training. The randomized trial in a general ICU showed reduced lower respiratory tract infections when dentists added comprehensive oral care to nursing protocols. Several quasi-experimental ICU studies reported reductions in ventilator-associated pneumonia (VAP) or mortality when dentists or hygienists led intensive oral care programs; stroke and rehabilitation ward studies linked dentist/dental hygienist participation with lower pneumonia risk, better swallowing function, improved activities of daily living, and higher home-discharge rates. Evidence quality varied (nonrandomized designs and confounding were common). Nurse and dentist collaboration are beneficial and safe in hospital oral care, particularly for preventing pneumonia and supporting functional recovery. High-quality multicenter trials should refine team composition, workflow, and outcome-focused protocols.

Keywords: Interprofessional Collaboration; Nurses; Dentists; Dental Hygienists; Oral Care; Ventilator-Associated Pneumonia; Stroke-Associated Pneumonia; Rehabilitation; Hospital Dentistry.

INTRODUCTION

Pneumonia (ventilator-associated and non-ventilator hospital-acquired) remains a major source of morbidity and mortality in acute-care hospitals, where oral hygiene and

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secretion management are central to prevention bundles implemented largely by nursing teams [1]. Beyond standard nursing protocols, interprofessional models that embed dentists and dental hygienists into hospital care may improve prevention and outcomes by adding systematic oral assessment, definitive dental treatment, and staff training. A recent systematic review found ICU patients receiving care from oral health teams had a markedly lower risk of VAP, although mortality was unchanged and certainty of evidence was very low, underscoring the need for better trial designs focused on team-based delivery [2].

Debate continues over optimal oral care agents. Network meta-analyses and reviews have challenged chlorhexidine's effectiveness and safety in ventilated adults, suggesting it does not clearly reduce VAP or mortality and should not be used indiscriminately [3–5]; other syntheses and comparative analyses point to the potential importance of toothbrushing plus antiseptics, with low confidence in effect estimates and a call for rigorous head-to-head trials [4,6,9,10]. Guidelines emphasize consistent bedside practices (toothbrushing, secretion management, head-of-bed elevation) within multidisciplinary prevention strategies [1]. Interprofessional collaboration extends beyond ICU care. In convalescent rehabilitation, the presence of hospital dental hygienists (DHs) and integrated oral management has been associated with better swallowing function and activities of daily living, aligning with broader evidence that oral status influences nutrition, dysphagia, and functional recovery [7,8]. Conceptual and policy commentaries further argue that structural barriers to physician-dentist collaboration impede aspiration-pneumonia prevention in aging populations, and advocate early, team-based oral interventions during hospitalization [6].

Against this backdrop, our systematic review focuses specifically on nurse–dentist (including DH) collaboration in hospital-based oral care and patient outcomes. We summarize effects on VAP and respiratory infections, mortality, dysphagia, functional recovery, and discharge disposition across ICUs, acute stroke wards, and rehabilitation units. We also describe collaborative components (nurse-delivered routine care plus specialist assessment, treatment, and bedside coaching) and highlight research gaps for implementation at scale. This review complements and extends prior syntheses by concentrating on how nurses and dental professionals work together inside hospitals and what outcomes are linked to those shared workflows [1–5,7,8]. (Key background sources: prevention guidelines, meta-analyses on oral care agents and techniques, and team-based commentaries and reviews [1–5,7–10].)

METHODS

Protocol and reporting. This review followed PRISMA principles for identification, screening, eligibility, and inclusion, with predefined criteria on populations, interventions, comparators, outcomes, and study designs.

Eligibility criteria. We included original hospital-based studies (randomized trials, quasi-experimental cohorts, retrospective cohorts/analyses) in adult inpatients where oral care involved explicit interprofessional collaboration between nurses and a dentist or dental

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hygienist. Eligible settings were ICUs, acute wards (stroke), or post-acute/rehabilitation wards. We required patient-level or unit-level outcomes related to respiratory infection (VAP), mortality, dysphagia/swallowing function, functional status, discharge disposition, or length of stay. Exclusions: pediatric populations, outpatient or long-term care settings, studies without a dental professional collaborating with nursing, and purely educational surveys without patient or unit outcomes.

Information sources and search strategy. We searched biomedical databases (PubMed/MEDLINE and related indices) and scanned reference lists of relevant reviews and guidelines up to 18 October 2025 (Africa/Cairo). Search terms combined “hospital OR ICU,” “nurse,” “dentist OR dental hygienist,” “oral care,” and outcome terms (“pneumonia,” “ventilator-associated,” “dysphagia,” “activities of daily living,” “mortality”). We also considered authoritative guideline and compendium sources to map implementation components.

Study selection and data extraction. Two reviewers conceptually selected studies that met criteria (titles/abstracts, then full texts/abstracts where needed). We extracted: country and setting; design; sample size (if reported); collaboration components (who did what); comparators; outcomes/time frames; and adjusted/absolute results. Given heterogeneous designs, we synthesized narratively and tabulated characteristics and outcomes. When sample sizes or details were not reported in abstracts or accessible full texts, we labeled them NR.

Risk of bias and certainty. Randomized and nonrandomized studies were appraised conceptually (sequence generation and blinding; confounding; selection bias; outcome ascertainment). Multi-year ICU indicators and time-series were judged at risk for confounding by co-interventions (prevention bundles). We did not pool quantitatively due to heterogeneity and to avoid double-counting populations (reanalyses of the same cohort).

RESULTS

Overview

We included 12 original studies spanning ICUs (general/trauma), acute stroke wards, and post-acute/rehabilitation units. Designs comprised one randomized clinical trial in a general ICU, several quasi-experimental ICU cohorts (before/after or time-series), two dentist-led stroke cohorts (including a large ward-level program), two rehabilitation cohorts with ward-assigned dental hygienists, and multi-year ICU retrospective analyses. Collaboration typically paired nurse-delivered routine oral care (toothbrushing, suctioning, chlorhexidine when used) with dentist/DH activities (systematic assessment, targeted dental treatment, protocol leadership, bedside instruction, and staff training).

ICU studies

A randomized, observer-blind trial in a general adult ICU (Brazil; n=254) compared routine nursing oral care versus the same plus dentist-provided treatment 4–5×/week (toothbrushing, tongue scraping, calculus removal, atraumatic restorations, extractions).

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The intervention reduced lower respiratory tract infections (8.7% vs 18.1%; adjusted RR 0.44) and lowered VAP density (7.6 vs 16.5 per 1,000 ventilator-days), without a mortality difference; no severe adverse events occurred [11].

Two quasi-experimental ICU studies from Brazil implemented dentist-led intensive oral care. In a time-series across two ICUs (2016–2019), routine dental care ≥3×/week for critically ill adults (5,147 dental procedures among 355 patients) was associated with a significant reduction in ICU mortality during the intervention period (from =33–36% pre-intervention to 28.7%, P=0.015), while VAP incidence density was unchanged [12]. A separate before–after comparison in a general ICU (mechanically ventilated ≥48 h) reported VAP episodes decreased from 21.1% (45/213) to 3.65% (5/137) and deaths due to VAP dropped (10.3% to 0.73%) when a multidisciplinary protocol led by a dentist replaced baseline practice [13].

Longer-horizon ICU analyses suggest system-level benefits from adding dental professionals to ICU teams. An 8-year retrospective analysis (2011–2018) across three ICUs (21 beds) found that after incorporating a dental hygienist and dentist (2014) to evaluate patients and train nurses in oral hygiene, mechanical-ventilation–related HAI density declined significantly (from 7.15 to 4.41 per 1,000 MV-days; $p<0.001$) with multivariable confirmation [14]. In a 6-year retrospective ICU cohort, more frequent dental interventions (>3) were associated with lower mortality risk, without safety signals; VAP was not an independent mortality predictor [16].

A contemporary ICU cohort questioned the added value of chlorhexidine in the presence of intensive, dentist-composed oral care: removing chlorhexidine from the VAP bundle did not change VAP incidence, mortality, length of stay, or duration of ventilation, suggesting that team-delivered oral care quality may outweigh antiseptic choice per se [15]. These findings echo recent reviews and meta-analyses pointing to weak or inconsistent chlorhexidine effects [3–5,9,10].

Trauma ICU and oral status

In a ventilated trauma ICU, nurse-delivered general oral care every 8 h plus daily professional care by dental hygienists improved oral health status over 5 days versus nursing care alone, with significant advantages in soft-tissue condition and plaque scores after 72–120 hours [21]. While this reanalysis focused on oral health (not VAP), it documents a clear role for DHs alongside nurses at the bedside.

Acute stroke wards

A hospital Dental Care System (DCS) assigned a full-time dentist to an acute stroke ward and formalized collaboration with nursing (lectures/practical sessions, standardized oral assessment and care, and a workflow for nurse-initiated dental consults). In 945 acute stroke inpatients, pneumonia odds were higher before DCS (OR 3.16, 95% CI 1.65–6.05) and during DCS rollout (OR 2.80, 95% CI 1.48–5.31) compared with post-DCS, indicating a significant pneumonia reduction after full implementation [17]. A follow-on study of early dentist-team intervention in stroke wards similarly suggested prevention of stroke-

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associated pneumonia, underscoring the value of rapid, structured collaboration with nursing [18].

Post-acute rehabilitation

In convalescent rehabilitation, ward-assigned dental hygienists collaborating with nurses were associated with better functional and swallowing outcomes. In a multicenter cohort (n=656), wards with DHs had higher Functional Independence Measure scores at discharge, larger improvement in Food Intake Level Scale, and higher home-discharge rates than wards without DHs, even after adjustment for covariates [20]. In a single-hospital cohort (n=1,056), DH oral management was linked to improved ADLs, higher home discharge, and lower in-hospital mortality; authors emphasized early detection of oral problems, timely dental treatment, and cooperation between medical and dental staff [19].

Synthesis

The collaboration pattern is consistent: nurses provide continuous, protocolized bedside care, while dentists and DHs assess, treat, train, and standardize. ICU studies align on safety and show benefit signals for respiratory outcomes (LRTIs/VAP) or mortality; stroke/rehabilitation studies align on reduced pneumonia and functional gains (swallowing and ADLs) and home discharge. Heterogeneity, nonrandomized designs, and potential co-interventions (evolving VAP bundles) limit causal certainty. However, converging evidence suggests that embedding dental professionals within nurse-led hospital care improves clinically meaningful outcomes and may allow de-emphasis of chlorhexidine without harm when intensive, mechanically effective care (toothbrushing, suction, secretion control) is reliably delivered [11–21].

Table 1: Main outcomes linked to nurse–dentist and DH collaboration

Study	Primary outcomes	Key findings
Bellissimo-Rodrigues 2014 [11]	LRTIs, VAP density, mortality	LRTI 8.7% vs 18.1% (RR 0.44); VAP density 7.6 vs 16.5/1,000 vent-days; mortality similar; no severe adverse events.
Ribeiro 2022 [12]	ICU mortality; VAP density	ICU mortality fell to 28.7% during dental-care period (P=0.015); VAP density unchanged.
de Cássia Sabino 2022 [13]	VAP, VAP mortality	VAP 21.1% → 3.65%; deaths due to VAP 10.3% → 0.73% after dentist-led protocol.
Bezerra 2020 [14]	MV-related HAI density	Significant drop in MV-related infection density after adding DH and dentist; nurse training noted.
Pains 2024 [15]	VAP, mortality, LOS, ventilation duration	No differences after removing CHX when intensive dentist-composed oral care present.
Pains 2025 [16]	Mortality, safety	>3 dental interventions associated with lower mortality; no important adverse effects.
Ozaki 2022 [17]	Stroke-associated pneumonia	Lower pneumonia post-DCS (OR pre-DCS 3.16; during-DCS 2.80 vs post-DCS).
Ozaki 2023 [18]	Stroke-associated pneumonia	Early dentist-team intervention suggested prevention benefit.

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Shiraishi 2019 [19]	ADLs, home discharge, in-hospital mortality	Improved ADLs, higher home-discharge, lower mortality with DH oral management.
Suzuki 2020 [20]	ADLs, swallowing, home discharge	Higher FIM, better FILS improvement, higher home-discharge in DH-assigned wards.
Choi 2022 [21]	Oral health status	Improved soft-tissue and plaque scores with DH daily care + nursing vs nursing alone.
Wakabayashi 2023 [22]	Swallowing (FILS), ADLs	Greater FILS improvement with DH+dietitian involvement; ADL change not different.

DISCUSSION

This review synthesizes hospital studies where nurses and dental professionals collaborate on oral care. The overall pattern shows clinically relevant benefits across settings. In ICUs, collaboration frequently reduced lower respiratory tract infections or VAP (trial and before–after cohorts) and was sometimes associated with lower ICU mortality in time-series and retrospective analyses, despite mixed effects on VAP densities [11–16]. These results align with guideline priorities that emphasize consistent, mechanically effective care (toothbrushing, secretion management, head elevation) delivered reliably at the bedside [1], and with a recent systematic review suggesting oral health teams lower VAP while acknowledging very low certainty and limited RCTs [2].

The antiseptic debate illustrates why team processes matter. Network meta-analyses and reviews report no clear VAP or mortality benefit from chlorhexidine and raise potential safety concerns, while some comparative analyses still favor toothbrushing ± antiseptics with low confidence [3–5,9,10]. When intensive, dentist-composed oral care was implemented, removing chlorhexidine did not worsen outcomes, suggesting that nurse-delivered mechanical plaque control and secretion management, supported by dental expertise, may be the critical ingredients [15].

Beyond infection prevention, collaborative oral care influences functional recovery. In rehabilitation settings, ward-assigned dental hygienists working with nurses were associated with better swallowing function (FILS), higher ADLs, and increased home discharge [20], consistent with broader frameworks linking oral status to nutrition, dysphagia, and function [7,8]. In stroke wards, a full-time dentist embedded with nursing staff reduced pneumonia, particularly once educational and workflow elements matured (post-implementation) [17,18]. These findings echo conceptual arguments that healthcare systems should remove structural barriers to physician-dentist collaboration to prevent aspiration pneumonia in aging populations [6].

Hospitals should consider formal nurse–dentist/DH teams with clear roles: nurses provide frequent bedside hygiene and secretion control; dentists/DHs conduct assessments, deliver targeted treatment, standardize protocols, and train at the bedside. Protocol reliability (toothbrushing frequency, suctioning, moisture control) may be more impactful than antiseptic selection, aligning with guideline bundles [1,3–5,9,10]. Implementation science is needed: pragmatic, multicenter RCTs comparing collaborative models (team

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composition, visit frequency, early consult triggers) with patient-centered outcomes (VAP/SAP, mortality, delirium, dysphagia, ADLs, discharge).

Limitations of the evidence include nonrandomized designs, potential co-interventions (broader VAP bundle improvements), and heterogeneity in populations, measures, and protocols. Nevertheless, the directional consistency across ICU, stroke, and rehabilitation settings supports embedding dental professionals into nurse-led hospital care as a feasible, safe strategy with likely benefits.

CONCLUSION

Across ICUs, stroke wards, and rehabilitation units, interprofessional collaboration between nurses and dental professionals improves meaningful outcomes, lower respiratory infections and VAP, reduced stroke-associated pneumonia, better swallowing and ADLs, and higher home-discharge, while appearing safe. The most consistent elements are reliable, nurse-delivered mechanical oral care and secretion control, augmented by dentist and DH assessment, treatment, and bedside training. Evidence quality is limited by nonrandomized designs; however, converging signals justify implementation with evaluation, and high-quality multicenter RCTs should refine team composition, timing (especially early consults), and outcome-focused protocols.

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