



Preventive Healthcare Across the Life Course: An Integrated Approach to Nursing, Oral Health, Rehabilitation, Informatics, and Health Administration

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Abstract

Background: The global burden of chronic and non-communicable diseases is escalating, necessitating a paradigm shift from reactive, disease-centric care to proactive, preventive healthcare. This shift requires an integrated, multidisciplinary approach that transcends traditional professional silos.

Aim: This narrative review aims to synthesize contemporary literature (2015-2024) to explore the conceptual underpinnings and practical applications of an integrated preventive healthcare model across the life course. It specifically focuses on the synergistic roles of nursing, oral health, rehabilitation, health informatics, and health administration.

Methods: A structured narrative review was conducted. Literature was sourced from electronic databases including PubMed, CINAHL, Scopus, and Web of Science.

Results: The review identified five key thematic pillars for an integrated preventive model: 1) Nursing as the coordinator and primary prevention advocate; 2) Oral health's critical role in systemic health and its links to chronic diseases; 3) Rehabilitation as a strategy to prevent disability; 4) Health informatics for risk stratification and population health management; and 5) Health administration for strategic vision and resource allocation. Barriers to integration include siloed funding, fragmented data systems, workforce shortages, and a culture of curative medicine.

Conclusion: An integrated, life course-oriented preventive healthcare model is essential and requires restructuring healthcare delivery through interprofessional education, shared data systems, and value-based payment models that incentivize prevention. The five examined disciplines can collaboratively shape this future, advancing from co-location to genuine collaborative practice.

Keywords: Preventive Healthcare, Life Course Perspective, Interprofessional Collaboration, Health Informatics, Population Health Management.

Introduction

The 21st century has witnessed a profound epidemiological transition. While the 20th century was dominated by the fight against acute, infectious diseases, the current global health landscape is primarily shaped by the relentless rise of chronic, non-communicable diseases (NCDs) such as cardiovascular disease, diabetes, cancer, chronic respiratory diseases, and mental health disorders (World Health Organization [WHO], 2022). This shift has placed an unprecedented strain on healthcare systems worldwide, many of which were originally designed for episodic, acute care. This structural mismatch is a primary driver of escalating healthcare costs and variable health outcomes. The prevailing model is predominantly "sick care"—a reactive

system that waits for pathology to manifest before intervening, often at a late and costly stage (Porter & Lee, 2013).

In response, there is a global consensus on the urgent need to pivot towards preventive healthcare. This paradigm shift emphasizes health promotion, risk factor modification, early detection, and timely intervention to avert the onset of disease or mitigate its progression. The World Health Organization has championed this approach through initiatives such as the Global Action Plan for the Prevention and Control of NCDs 2013-2020 (extended to 2030) and the more recent emphasis on Universal Health Coverage (UHC), which explicitly includes preventive and promotive services as core components (WHO, 2021). This is not simply a matter of individual clinical

encounters; it requires a population-level, systems-based approach.

However, effective prevention is not the domain of any single health profession. The complex, multifactorial nature of chronic diseases necessitates a coordinated, interdisciplinary effort. Traditionally, healthcare professions have operated in silos—medicine, nursing, dentistry, and allied health have often functioned with distinct curricula, separate regulatory bodies, and non-overlapping practice settings. This fragmentation is a significant barrier to delivering holistic, patient-centered care that addresses the myriad social, behavioral, and biological determinants of health (Spaulding et al., 2021). A patient with poorly controlled diabetes, for example, requires not only medical management but also nursing education, dietary counseling, psychological support, and, as emerging evidence suggests, meticulous oral health care. Without integration, these needs are addressed piecemeal, if at all.

This narrative review posits that a genuinely effective preventive healthcare strategy must be both integrated and life course oriented. An integrated approach dismantles professional silos, fostering interprofessional collaboration where diverse experts work together with shared goals and mutual respect. A life course perspective recognizes that health in later life is profoundly shaped by exposures, behaviors, and interventions from preconception through childhood, adolescence, and adulthood (Barker, 2004; Halfon et al., 2014). This framework provides a longitudinal lens through which to view health trajectories, identifying critical windows of opportunity for prevention. For instance, interventions that promote healthy nutrition and oral hygiene in early childhood can prevent obesity and dental caries, which are risk factors for diabetes and cardiovascular disease decades later (Dörfer et al., 2015).

This review uniquely brings together five critical disciplines—nursing, oral health, rehabilitation, health informatics, and health administration—to explore how their synergistic integration can build a robust framework for preventive care across the human lifespan. While each field has independently advanced its preventive agenda, a comprehensive synthesis of their collective potential is lacking. This review will first detail the methodology used, then delve into the specific contributions of each discipline, analyze the cross-cutting themes and barriers to integration, and finally synthesize a model for a unified preventive healthcare system.

Methodology

This study employed a narrative review design, chosen for its suitability in synthesizing a broad, multidisciplinary body of literature to generate new conceptual insights and frameworks (Green et al., 2006). Unlike a systematic review that answers a narrow clinical question, a narrative review allows for a more expansive exploration of a complex topic,

integrating theoretical perspectives, policy documents, and diverse research methodologies.

Search Strategy

The literature search for this narrative review was systematically conducted across four databases: PubMed, CINAHL, Scopus, and Web of Science, covering publications from January 2015 to December 2024. A combination of controlled vocabularies, including MeSH terms and free-text keywords, was employed. Three thematic search blocks were created: the first focused on concepts like "preventive healthcare" and "population health"; the second targeted core disciplines such as "nursing" and "health informatics"; and the third addressed integrative aspects, including "interprofessional collaboration" and "team-based care." Additionally, reference lists of key articles and policy documents from the WHO and CDC were reviewed to ensure comprehensive coverage.

Inclusion and Exclusion Criteria

Articles were included if they were: (a) published in English, (b) peer-reviewed empirical studies, systematic reviews, meta-analyses, theoretical papers, or major policy statements, (c) published between 2015 and 2024, and (d) focused on preventive healthcare in relation to at least one of the five target disciplines, with preference given to articles exploring integration. Articles were excluded if they were: (a) non-English, (b) editorials, commentaries, or conference abstracts lacking substantive content, (c) focused exclusively on acute, curative interventions with no preventive component, or (d) published before 2015. A total of 312 full-text articles were assessed for eligibility, from which 85 primary sources were synthesized for this review.

Data Analysis

A thematic analysis approach was used to synthesize the findings (Braun & Clarke, 2006). Data from the included articles were extracted and coded inductively. Codes were then grouped into descriptive themes, which were further refined into the five core analytical themes that structure this review: (1) Nursing as the Nexus of Prevention, (2) Oral Health as a Window to Systemic Wellness, (3) Rehabilitation as Proactive Prevention, (4) Informatics as the Digital Backbone of Prevention, and (5) Health Administration as the Architect of Preventive Systems. A final overarching theme, "Integration: The Synergy of Systems," was developed to synthesize these components and discuss barriers and facilitators.

The Pillars of an Integrated Preventive Model

Nursing

Nursing, as the largest healthcare profession globally, is fundamentally a discipline of care, and increasingly, of prevention. The very essence of nursing practice—holistic patient assessment, education, advocacy, and coordination—positions nurses as the natural linchpin of any integrated preventive strategy (Kemppainen et al., 2013). This role extends far beyond the hospital bedside into

communities, homes, schools, and virtual care settings. The International Council of Nurses (ICN) explicitly champions the nurse's role in health promotion and disease prevention as a core competency for the 21st-century workforce (Ismail et al., 2022).

The life course perspective is deeply embedded in nursing practice. From maternal-child health to geriatrics, nurses are present at every stage of life. During the prenatal and early childhood periods, nurse-led interventions such as home visiting programs (e.g., the Nurse-Family Partnership) have demonstrated profound and lasting effects on maternal and child health outcomes, including reduced rates of child maltreatment, improved cognitive development, and better family economic self-sufficiency (Olds et al., 2019). These programs are quintessential examples of primary prevention, building healthy foundations from the start. School nurses play a critical role in managing chronic conditions like asthma, promoting mental well-being, and instilling lifelong healthy habits related to nutrition and physical activity (Hoskote et al., 2023).

For adults and the elderly, Advanced Practice Registered Nurses (APRNs), including Nurse Practitioners (NPs) and Clinical Nurse Specialists, are increasingly at the forefront of preventive care. They are often the primary point of contact for patients in both primary care and specialty settings, managing risk factors for cardiovascular disease, performing cancer screenings, and providing complex care coordination for patients with multimorbidity (Newhouse et al., 2011). Evidence consistently shows that NP-led care achieves outcomes equivalent to, and sometimes better than, physician-led care, particularly in the domains of patient satisfaction, health promotion, and disease prevention (Swan et al., 2015). Nurses are also pivotal in secondary prevention, such as cardiac rehabilitation programs where they provide education on lifestyle modification and medication adherence to prevent recurrent events (Liljeroos & Strömberg, 2019).

However, the full preventive potential of nursing is often underutilized due to systemic barriers. These include workload pressures that prioritize acute care, lack of dedicated time for health promotion, and restrictive scope-of-practice regulations in some jurisdictions (Bodenheimer & Sinsky, 2014). To fully realize the nurse's role as the nexus of prevention, these barriers must be addressed through supportive leadership, adequate staffing ratios, and policies that empower nurses to practice to the full extent of their education and training.

Oral Health

For too long, oral health has been relegated to a silo, often viewed as a luxury or an add-on to "real" healthcare. This perception is not only outdated but dangerous. The mouth is a mirror of the body, and a growing body of compelling evidence has firmly established the inextricable link between oral health

and systemic health (Jin et al., 2016). This bidirectional relationship positions oral health as a critical, yet underappreciated, pillar of preventive healthcare across the life course.

The most well-established link is between periodontal disease and diabetes. Periodontitis, a chronic inflammatory disease of the gums and supporting bone, has been shown to adversely affect glycemic control in people with diabetes. Conversely, diabetes is a major risk factor for periodontitis. Importantly, this is a two-way street: effective periodontal treatment has been shown to lead to clinically significant reductions in HbA1c levels, a key biomarker for long-term blood sugar control (D'Aiuto et al., 2018; Engebretson et al., 2013). This means that a dental hygienist's scaling and root planing can be a potent intervention in managing a systemic metabolic disease.

Similarly, a robust association exists between periodontal disease and cardiovascular disease. The chronic inflammatory burden from oral pathogens is hypothesized to contribute to the pathogenesis of atherosclerosis, increasing the risk for heart attack and stroke (Sanz et al., 2020). Beyond these, links have been found between poor oral health and adverse pregnancy outcomes (e.g., preterm birth, low birth weight), respiratory infections (aspiration pneumonia), rheumatoid arthritis, and cognitive decline, including Alzheimer's disease (Dominy et al., 2019; Scannapieco & Cantos, 2016). The common pathway appears to be systemic inflammation and the translocation of oral bacteria and their byproducts into the bloodstream.

From a life course perspective, oral health begins before birth. Maternal oral health status influences the child's future risk for early childhood caries (ECC), as cariogenic bacteria like *Streptococcus mutans* can be transmitted vertically from mother to child (Starzyńska et al., 2022). Untreated caries in childhood can lead to pain, infection, poor nutrition, missed school days, and impaired growth and development. As individuals age, oral health continues to play a crucial role, affecting the ability to eat, speak, and socialize, which are directly linked to nutritional status and quality of life in the elderly (Petersen et al., 2020).

Integrating oral health into primary care is a key strategy for bridging this gap. Models of interprofessional practice, where nurses and primary care physicians conduct basic oral health screenings, provide fluoride varnish applications, and deliver oral health education during routine medical visits, have shown significant promise in improving access to preventive dental care, particularly for underserved populations (Bernstein et al., 2017). This integration is a cornerstone of a truly holistic preventive health system.

Rehabilitation

Rehabilitation is often misconstrued as a tertiary care service—a final step after an injury,

surgery, or illness to help a patient regain lost function. This reactive perspective overlooks the powerful preventive potential of rehabilitation principles and interventions. A modern understanding of rehabilitation positions it as a proactive strategy to preserve function, enhance resilience, and prevent the cascade of decline that often accompanies aging or chronic disease (Stucki et al., 2018). This is a fundamental shift from "fixing" to "enabling."

The life course perspective is essential here. From infants with developmental delays who benefit from early intervention therapies to elderly individuals at risk for falls, rehabilitation professionals—including physiatrists, physical therapists, occupational therapists, and speech-language pathologists—provide interventions that mitigate future disability. For a child with cerebral palsy, physical and occupational therapy are not merely treatments but essential preventive measures against contractures, scoliosis, and loss of mobility, thereby preventing future hospitalizations and improving lifelong functional capacity (Novak et al., 2020).

In adulthood, the most prominent example of rehabilitative prevention is in the context of chronic disease management. Pulmonary rehabilitation for patients with COPD is not only a management strategy but a powerful secondary prevention tool, reducing breathlessness, improving exercise capacity, and, critically, reducing the frequency of acute exacerbations and subsequent hospital readmissions (Casey et al., 2015). Similarly, cardiac rehabilitation is a cornerstone of secondary prevention, reducing cardiovascular mortality and improving quality of life through supervised exercise, education, and psychosocial support (Anderson et al., 2016). Perhaps the most impactful and universally relevant role of rehabilitation lies in fall prevention for older adults. Falls are a leading cause of injury-related morbidity and mortality in the elderly, and they represent a major "preventable problem." Multifactorial programs led by physical and occupational therapists—incorporating strength and balance training, home safety assessments, and medication review—have been definitively shown to reduce the rate and risk of falls (Gillespie et al., 2012).

Furthermore, the "prehabilitation" model is a cutting-edge application of preventive rehabilitation. In this approach, patients scheduled for major surgery (e.g., cancer resection, joint replacement) undergo a structured program of physical and psychological preparation in the weeks before their operation. This "prehab" has been shown to improve preoperative functional status, reduce postoperative complications, shorten hospital length of stay, and enhance overall recovery (Santa Mina et al., 2019). This is primary prevention applied to the surgical episode.

Integrating rehabilitation into the preventive health framework requires a shift in thinking among administrators, funders, and other clinicians. It requires moving from a model of episodic, post-acute

referral to one where rehabilitation professionals are embedded in primary care teams, community health centers, and health promotion programs, providing early assessment and intervention to build functional reserve and resilience.

The Digital Backbone of Prevention

The transition from a reactive, volume-based healthcare system to a proactive, value-based one is contingent on a robust digital infrastructure. Health informatics is not merely a support service; it is the central nervous system of a preventive healthcare model, enabling the collection, analysis, and dissemination of data to drive risk stratification, personalize interventions, and engage patients like never before (Bates et al., 2014). Without informatics, integration remains a theoretical ideal.

At the population health level, big data analytics and machine learning algorithms can process vast datasets from electronic health records (EHRs), insurance claims, and public health databases to identify at-risk populations and predict future health trajectories (Obermeyer & Emanuel, 2016). These models can flag individuals or communities with a high probability of developing type 2 diabetes, heart failure, or a serious mental health crisis, allowing health systems to proactively deploy targeted preventive resources. For instance, a health system might use a predictive model to identify patients with prediabetes and automatically enroll them in a virtual diabetes prevention program.

At the individual patient level, informatics tools empower clinicians and patients alike. Clinical decision support systems (CDSS) embedded within EHRs can provide real-time, patient-specific reminders and recommendations to clinicians at the point of care. This could include an alert for an overdue cancer screening, a prompt to administer a flu vaccine, or a guideline-based recommendation for managing a newly identified cardiovascular risk factor (Kawamoto et al., 2005). This helps to close the gap between evidence and practice, ensuring that preventive opportunities are not missed during busy clinical encounters.

The rise of telehealth, mobile health (mHealth), and wearable devices has revolutionized patient engagement and self-management. These technologies extend the reach of preventive care beyond the clinic walls, allowing for continuous monitoring and support. Patients with hypertension can use Bluetooth-enabled blood pressure cuffs to transmit readings to their care team, enabling timely medication adjustments. Wearable activity trackers and smartphone apps can promote physical activity, healthy eating, and medication adherence, turning patients from passive recipients of care into active participants in their health (Haleem et al., 2021). Nurses, in particular, have been at the forefront of using telehealth for chronic disease management and health coaching, leveraging these tools to deliver

personalized preventive care at scale (Stoltzfus et al., 2023).

Finally, informatics is the key to successful interprofessional collaboration. A truly integrated health record—one that is accessible and populated by all members of the care team, including the nurse, the dentist, the physical therapist, and the physician—is the cornerstone of coordinated, holistic care (Cresswell et al., 2015). For example, if a dental hygienist identifies signs of diabetes during an oral exam, they could, with patient consent, flag this in a shared EHR system, alerting the primary care team. Currently, the lack of interoperability between dental and medical records is a major barrier to achieving the vision of "one health, one record."

Architecting the System for Prevention

The most brilliant clinical innovations will fail to achieve population-level impact without the strategic vision, leadership, and resource allocation provided by effective health administration. Health administrators—including executives, policymakers, and public health leaders—are the architects of the healthcare system, and their decisions dictate which priorities, and therefore which health outcomes, are pursued (Berwick et al., 2008). In the context of preventive healthcare, their role is to build, finance, and govern a system that rewards health rather than sickness.

The most powerful lever at the administrator's disposal is the financial model. The traditional fee-for-service (FFS) payment structure, which reimburses clinicians for each individual service, actively penalizes prevention. There is no billable code for a nurse spending 20 minutes counseling a patient on diet and exercise, or for a dentist collaborating with a physician on a diabetic patient's care plan. FFS incentivizes volume over value, creating a powerful disincentive to invest in interventions that keep patients healthy and out of the clinic. The shift towards value-based care (VBC) models—such as accountable care organizations (ACOs), bundled payments, and capitation—is therefore a cornerstone of the preventive paradigm (de Silva Etges et al., 2016). Under these models, provider organizations assume financial risk for the health of a defined population, creating a direct financial incentive to invest in high-value preventive services that reduce costly downstream complications. Administrators are the ones who must navigate this complex transition, redesigning care processes and contracting structures to succeed in a value-based environment.

Beyond finance, administrators are responsible for building the organizational culture and infrastructure for prevention. This includes fostering interprofessional collaboration by dismantling traditional departmental silos and creating team-based care models. It involves investing in critical infrastructure, such as robust health informatics systems and data analytics capabilities. It also entails

strategic workforce planning to ensure an adequate supply of primary care providers, nurses, community health workers, and oral health professionals who are trained in and incentivized to deliver preventive care (Frenk et al., 2010).

Finally, policy advocacy is a crucial administrative function. Health leaders must advocate for policies that promote the social, environmental, and economic conditions necessary for health. This is the domain of "Health in All Policies" (HiAP), which recognizes that health is shaped by decisions made in sectors outside of healthcare, such as education, housing, transportation, and agriculture (Rudolph et al., 2013). An effective health administrator is not just a manager of a hospital or clinic; they are a steward of community health, working to create a society where the healthy choice is the easy choice.

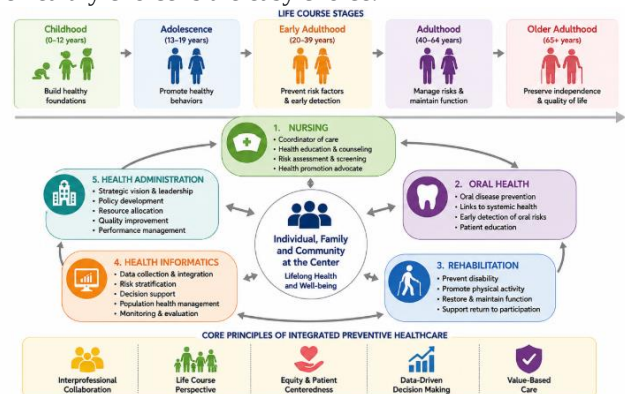


Figure 1: Integrated Preventive Healthcare Model Across the Life Course

Barriers, Facilitators, and the Synergy of Systems

The true power of the five pillars described above is not in their individual contributions but in their synergistic potential. An integrated system where a nurse identifies a patient's risk for diabetes, a health informatics tool tracks their lifestyle changes, a rehabilitation therapist helps them build an exercise routine, and a dental hygienist manages their periodontal disease—all under a coordinated administrative framework—is exponentially more powerful than the sum of its parts.

However, achieving this integration is fraught with challenges. One of the most significant barriers is the persistence of educational silos. Health professionals are trained in isolation, often unaware of the skills and knowledge of their counterparts in other disciplines. This fosters a lack of mutual respect and understanding, hindering effective team-based practice (Spaulding et al., 2021). Interprofessional education (IPE), where students from nursing, medicine, dentistry, and allied health learn with, from, and about each other, is a critical strategy for breaking down these barriers from the outset (Baker, 2010).

A second major barrier is data fragmentation. As noted, the inability of medical, nursing, and dental information systems to communicate with each other is a profound impediment to coordinated care. It leads

to duplicated effort, missed opportunities, and poor care coordination. Solving this requires not only technological solutions for interoperability but also agreements on data governance, privacy, and security (Adler-Milstein & Jha, 2017). Administrators play a key role in championing these complex, multi-stakeholder initiatives.

Thirdly, the dominant culture of curative medicine remains a formidable cultural barrier. In many societies, the prestige and financial rewards of healthcare are concentrated in high-tech, interventional specialties. Prevention is often seen as less "glamorous" and its long-term benefits are less tangible to a public conditioned to expect a "quick fix." This cultural bias permeates funding decisions, research priorities, and career choices (Fineberg, 2013). Overcoming it requires a long-term, multi-pronged strategy involving public education, policy change, and a recalibration of professional values.

Despite these challenges, there are clear facilitators that can accelerate the move towards integration. These include government and payer policies that

explicitly require and reward integrated care and prevention (e.g., VBC programs, quality metrics tied to preventive screenings). The rapid evolution of cloud-based platforms, APIs, and AI-powered analytics is making interoperability and population health management more feasible than ever before. Visionary leaders at all levels, from unit managers to health system CEOs, who prioritize prevention and collaboration, can drive profound cultural change (Shanafelt & Noseworthy, 2017). An increasingly informed and activated patient population is demanding more holistic, convenient, and prevention-oriented care.

Synthesis and Proposed Conceptual Model

Synthesizing the evidence from these five disciplines suggests a conceptual model where preventive healthcare is conceptualized as a continuous, coordinated process across the life course. This model can be visualized as a wheel or a ring (see Table 1). At the center is the person and their community, emphasizing the shift from a provider-centric to a person-centered approach.

Table 1: A Conceptual Model of Integrated Preventive Healthcare Across the Life Course

Life Stage	Core Preventive Goals	Nursing (Nexus)	Oral Health (Window)	Rehabilitation (Function)	Informatics (Backbone)	Administration (Architect)
Pre/Perinatal	Optimize maternal health; prevent preterm birth; promote healthy early development.	Home visiting; prenatal education; breastfeeding support.	Screen/treat maternal periodontitis; counsel on infant oral hygiene.	Address maternal musculoskeletal issues; early intervention for developmental delay.	EHR flag for high-risk pregnancy; telehealth monitoring.	Fund/design integrated maternity care models (e.g., CenteringPregnancy).
Childhood/Adolescence	Establish healthy habits; prevent obesity & caries; ensure full vaccination; support mental well-being.	School nursing; growth monitoring; mental health screening; health education.	Fluoride varnish; dental sealants; oral health literacy programs in schools.	Support for neurodevelopmental disorders; sports injury prevention.	School health portals; immunization registries; mHealth apps for teens.	Policy for integrated school health services; fund community health centers.
Adulthood	Screen for early disease; manage chronic condition risk factors (e.g., HTN, DM); maintain	Primary care NP-led health checks; chronic disease self-management education;	Periodontal screening/treatment as part of diabetes/cardiac care; oral cancer screening.	Worksite ergonomics; prehabilitation before surgery; management of early musculoskeletal pain.	CDSS for screening; patient portals for engagement; remote monitoring	Implement value-based contracts that reward risk factor control; promote integrated primary care-dental co-location.

	functional capacity; prevent periodontitis.	community health promotion.			g for HTN.	
Older Adulthood	Prevent falls & frailty; maintain cognitive function & independence; manage multimorbidity; ensure oral health for nutrition/QoL.	Geriatric assessment; medication management & reconciliation; caregiver support.	Prevent/treat dry mouth (xerostomia); prevent aspiration pneumonia; ensure access to dental care in LTC.	Fall prevention programs (balance/strength training); OT home safety assessments; pulmonary/cardiac rehab.	Telehealth for LTC residents; sensor-based fall detection; cognitive training apps.	Design age-friendly health systems; fund community-based fall prevention programs; integrate dental care into LTC funding.

Note: HTN=Hypertension, DM=Diabetes Mellitus, NP=Nurse Practitioner, QoL=Quality of Life, LTC=Long-Term Care, CDSS=Clinical Decision Support Systems.

This model illustrates how each discipline contributes to the preventive agenda at every life stage, moving in concert rather than in isolation. The role of the health administrator is to create the financial and policy environment that makes these interactions possible, while informatics provides the data and communication tools to coordinate them. Figure 2 summarizes the key preventive roles, practical contributions, and expected impacts of each discipline.

DISCIPLINE	KEY ROLES IN PREVENTION	EXAMPLES OF CONTRIBUTIONS	EXPECTED IMPACT
 1. NURSING Coordinator & Primary Prevention Advocate	- Health education & counseling - Risk assessment & screening - Care coordination & follow-up - Health promotion advocacy	- Lifestyle modification support - Vaccination & screening programs - Chronic disease self-management - Community outreach & home visits	 Improved health literacy, early detection & positive behavior change
 2. ORAL HEALTH Key to Systemic Health & Chronic Disease Prevention	- Oral disease prevention - Links to systemic conditions - Early identification of risks - Patient education	- Periodontal disease screening - Fluoride & sealant programs - Counseling on oral-systemic links - Tobacco cessation support	 Reduced oral diseases & lower risk of systemic complications
 3. REHABILITATION Prevent Disability & Promote Function	- Functional assessment - Prevent disability - Promote physical activity - Restore & maintain function	- Exercise & mobility programs - Fall prevention strategies - Pain management education - Return-to-work support	 Enhanced function, quality of life & independence
 4. HEALTH INFORMATICS Enable Data-Driven Prevention & Population Management	- Data collection & integration - Risk stratification - Decision support systems - Population health monitoring	- Predictive analytics for risk - Dashboards & registries - Care reminders & alerts - Patient portals & mHealth tools	 Timely interventions, personalized care & better outcomes
 5. HEALTH ADMINISTRATION Strategic Vision & Resource Stewardship	- Strategic planning & policy - Resource allocation - Quality improvement - Interprofessional leadership	- Prevention-oriented policies - Workforce development - Performance measurement - Partnerships with communities	 Efficient systems, equity & sustainable preventive care

 Together, these disciplines create a coordinated ecosystem that shifts care from reactive to proactive—improving population health and well-being across the life course.

Figure 2: Synergistic Roles of the Five Disciplines Implications for Practice, Policy, and Future Research

This review carries significant implications. For clinical practice, it underscores the need for every health professional to view themselves as a preventive agent and to actively seek opportunities for interprofessional collaboration. This requires a shift in mindset, fostered by new models of team-based care and shared workflows. For health professions education, the imperative is clear: IPE must be a core component of all curricula, and training in areas like

informatics, population health, and health equity must be prioritized.

For health policy and administration, the findings reinforce the need to accelerate the transition from fee-for-service to value-based payment models. Policymakers should incentivize the integration of oral health into primary care, expand the scope of practice for nurses and other non-physician providers, and invest in digital infrastructure. Public health campaigns should also work to reframe oral health as integral to overall health and to destigmatize seeking help for mental health and other preventable conditions.

Future research should move beyond describing the links between disciplines to evaluating the effectiveness and cost-effectiveness of specific integrated care models. Implementation science studies are needed to understand the contextual factors that facilitate or hinder the successful translation of these integrated models into real-world settings. Research on novel funding mechanisms, innovative uses of AI for personalized prevention, and strategies for engaging underserved populations in preventive services is also essential.

Conclusion

The escalating burden of chronic disease demands a radical reimagining of healthcare, shifting its center of gravity from treatment to prevention. This review has argued that this transformation is only possible through an integrated, life course-oriented approach that harnesses the unique strengths of diverse health disciplines. Nursing provides the holistic, patient-centered connection; oral health offers a crucial window into systemic wellness; rehabilitation proactively preserves function and independence; health informatics builds the digital backbone for coordination and personalized care; and health administration architects the system that makes

it all possible. By dismantling silos, aligning incentives, and centering care on the whole person across their entire lifespan, we can build a healthcare

system that is not just a "sick care" system, but a true system for health.

Table 2: Key Barriers and Facilitators to Integrated Preventive Healthcare

Domain	Barriers	Facilitators
Structural/System	- Fee-for-service payment models that reward volume. - Fragmented healthcare delivery systems. - Lack of interoperability between medical and dental records.	- Shift to value-based care (ACOs, bundled payments). - Policy mandates for integrated care (e.g., WHO UHC). - Investment in integrated data platforms.
Cultural/Professional	- Professional silos and "turf" battles. - Lack of mutual respect/understanding among disciplines. - Prevailing culture of curative medicine.	- Interprofessional education (IPE). - Champions and leaders who model collaborative practice. - Team-based care models (e.g., PCMH).
Workforce	- Shortages of primary care providers and public health professionals. - Inadequate training in prevention and informatics. - Restrictive scope-of-practice laws.	- Expanded scope of practice for nurses and pharmacists. - Training in telehealth and digital health tools. - New roles for community health workers.
Technological	- High cost of implementing new technologies. - Issues with data security, privacy, and governance. - Digital divide among patient populations.	- Widespread adoption of EHRs. - Rise of AI and machine learning for risk prediction. - Proliferation of mHealth apps and wearables for patient engagement.
Patient/Social	- Low health literacy. - Social determinants of health (poverty, food insecurity). - Lack of trust in the healthcare system.	- Patient-centered communication strategies. - Policy focus on "Health in All Policies" (HiAP). - Community-based participatory research to build trust.

Note: This table synthesizes the key constraints and enablers discussed throughout the review, providing a high-level overview of the factors influencing the success of integration efforts.

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