

# Interprofessional Collaborative Strategies for Optimizing Antibiotic Adherence in Diabetic Foot Infections: A Review Evaluation of Nurse-led, Preventive Medicine Specialists-Led, Pharmacist-led, and Physician-Guided Interventions

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## Abstract

*Infections of diabetic feet (DFI) comprise a significant healthcare issue where poor adherence to antibiotics results in elevated morbidity, mortality, and healthcare costs. This review discusses inter-professional collaborative approaches for optimizing antibiotic adherence to DFI management. This paper examines the specific but collaborative roles of nurse-led interventions, preventive medicine specialist-led interventions, pharmacist-led interventions, physician-guided interventions, and contributions from medical device specialists. A combination of nurse-led interventions with structured educational programs and telehealth support reduced hospital readmissions by up to 30%. High-risk patients were detected at 40% before traditional methods through risk stratification programs developed by preventive medicine specialists. Simplified regimens and digital tracking tools enable pharmacists to lead interventions with a 25% increase in adherence rates. Physician-guided clinical decision-making helps customize treatment, reducing treatment complications by 35%. The technological solutions of medical device experts, such as wound monitoring and offloading devices, increase wound healing times by 45% when combined with antibiotic therapy. Implementation challenges include financial constraints, logistical barriers, and cultural competence requirements. Evidence shows that appropriately coordinated interprofessional teamwork increases the likelihood of better patient outcomes and reduces DFI-related healthcare expenses by up to 50%. Future studies must identify the best mix of interprofessional interventions and assess their cost-effectiveness. The findings highlight the critical role of established collaborative frameworks, technological integration, and policy reforms in supporting comprehensive DFI management.*

**Keywords:** *Diabetic Foot Infections, Interprofessional Collaboration, Patient Education, Antibiotic Adherence, Preventive Medicine, Clinical Decision-Making, Wound Care, Healthcare Technology.*

## Introduction

Diabetic foot infections (DFIs) represent a significant morbidity and mortality in diabetic individuals; hence, they pose a substantial burden to the health care system in all countries. The International Diabetes

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Federation claims that the adult diabetes population is over 460 million worldwide and is expected to rise in the coming decades. Foot ulceration and infection lead to diabetes complications that may lead to prolonged hospitalization and amputations and significantly decrease the quality of life of the patient. Among other approaches to managing DFIs, antibiotic therapy is crucial for controlling and preventing disease progression. Although suboptimal antibiotic administration compromises treatment outcomes, it exacerbates the likelihood of amputation and mortality [1,2].

Adherence to antibiotic therapy in DFIs is poor due to innocent physiological factors such as side effects, complicated dosing regimens, lack of patient education, psychological factors, and socioeconomic factors. A progressively higher volume of literature associates improved adherence rates with better clinical outcomes, fewer complications, and reduced healthcare expenditure. Since DFIs are most often polymicrobial etiology and have several levels of tissue damage, the pathology is complex, and antibiotic treatment may be complicated and prolonged and likely to attract patient noncompliance. Therapy may involve intravenous or oral administration of multiple daily doses over many weeks or more, and unique strategies are needed to maintain compliance [3–5].

Isolated disciplines, such as single professionals responsible for healthcare administration, often cannot provide optimal adherence outcomes. Interprofessional collaboration is thus an essential approach to patient-centered care for nurses, pharmacists, physicians, preventive medicine specialists, and medical device specialists with diverse skills, views, and resources on promoting antibiotic adherence. In a nurse-led initiative, focus is often placed on patient education, wound care, and direct follow-up; this can be enhanced through the pharmacist, who will simplify medication management by counseling and monitoring for drug interactions. Patient education involving specific preventive behaviors is performed intensively by a provider of population-level risk factors, who also modifies the patient's environment to reduce the development of the condition. This would be further complemented by an existing setting that, for instance, anchors medical decision-making to ensure that antibiotic therapy matches rigorously with microbiological and clinical evidence. Finally, medical device specialists often support the prescription and use of assistive technologies (e.g., offloading devices and continuous glucose monitors) that optimize the environment in which antibiotic therapy is provided [6–8].

This paper presents an in-depth review of the evidence regarding inter-professional collaborative strategies in optimizing antibiotic adherence among patients with DFIs. By laboring through interventions explicitly led by nurses, pharmacists, preventive medicine specialists, and those orchestrated by physicians, as well as involving medical device specialists, it presents best practices, flags knowledge lacunae, and proposes frameworks for integrated patient care that demand more excellent proficiency in meeting the requirements of improved antibiotic adherence quite obviously, not only about better information for the patient or new technology regarding the same but also about the prior expressiveness of a coherent and informed clinical team. It also focuses on how each professional discipline can address the multifactorial barriers impeding antibiotic adherence in DFIs [8,9].

Ultimately, at its core, antibiotic adherence in the DFI initiative is about teamwork and well-choreographed collaboration between disciplines that can result in markedly better patient outcomes. We will thus briefly inquire into the pathophysiology of antibiotic adherence in DFIs and then discuss different interventions, specifically nurse-led interventions, preventive medicine specialist-led interventions, pharmacist-led interventions, and physician-guided interventions, considering the most recent evidence in peer-reviewed literature and established clinical guidelines. We conclude with some practical suggestions and areas for future research that could further enhance interdisciplinary collaboration and improve patient adherence outcomes.

### *The Burden and Complexity of DFIs*

#### *Epidemiology and Impact*

Foot infections are one of the most severe conditions resulting from diabetes and are second to cardiovascular and renal complications in healthcare importance. Approximately 20% of more than 2

million patients with diabetes develop ulcers during their lifetime. Many of these ulcers are infected. The repercussions of DFIs involve huge socioeconomic costs because they require prolonged hospitalization, reduced productivity due to work absence, and a high demand for long-term care. Foot ulceration is perceived as the number one reason for non-traumatic amputation; it is responsible for more than 80% of amputations in individuals with diabetes. In addition to financial burden, DFIs restrict patients' quality of life by impairing mobility-limited reliance on caregivers and psychological distress. Reinfections and ulcerations are common even when amputations are entirely preventable. Thus promoting a vicious circle of chronic care, the latter of which must include constant medication, supportive therapies, and frequent clinical monitoring [10,11].

### *Microbiology and Treatment Challenges*

DFIs commonly present with polymicrobial infections that involve both aerobic and anaerobic bacteria. The most common pathogens identified were *Staphylococcus aureus* (including MRSA strains), *Streptococcus* species, *Enterococcus* species, *Pseudomonas aeruginosa*, and a collection of anaerobes. This complexity requires appropriate empiric antibiotic regimens that are broad-spectrum at the start and later focus on the culture results. Long durations of antibiotics are often needed because of compromised peripheral circulation in diabetic patients, which reduces the ability of the host to deliver the drug to the site of infection. The other primary concern in developing antibiotic resistance is that since treatment outcomes are poor, suboptimal adherence can encourage the emergence of resistant strains. The treatment guidelines of organizations such as the Infectious Diseases Society of America (IDSA) emphasize the importance of the correct dosing regimen and completing the entire course of prescribed antibiotics. However, in practice, actual rates of adherence fall short of these wonderful aspirations, primarily because treatment may be painful, the pill burden can be high, there may be an economic cost, and other factors are discussed later [12–14].

### *Barriers to Antibiotic Adherence*

Factors affecting adherence at the patient level include inadequate knowledge regarding the significance of completing the entire course, cultural influences, perceptions of side effects, and mere forgetfulness. The more significant socioeconomic factors included limited transportation for frequent follow-up visits and the inability to meet medication costs. Other patient-level barriers are a lack of helpful materials for patient education, short consultation times, and problems in fragmented care coordination. In the context of DFIs, coupled with peripheral neuropathy and visual impairment, impaired mobility also compromises the patient's capability to administer antibiotics appropriately. Therefore, not only is counseling inadequate, and neither are simplified regimens, but they also need a multi-component approach in which an intervention from each profession within a care team, tailored to individual needs, has been found to work best in the face of such complexities [15,16].

### *Nurse-led Interventions*

#### *Role of Nurses in DFI Management*

Nurses will likely undertake these assessments, including wound care, patient education, and subsequent review. The development of a strong patient-nurse relationship could be a factor that may influence patient retention of antibiotic regimens. The dressing procedure also involves a comprehensive wound assessment and dressing changes. This can help detect and intervene at the early onset of an infection that may recur. Nurses also commonly assume educational roles since patients must learn the significance of compliance with the prescribed antibiotics, identifying signs of infection, and proper foot care. This education can be tailored to an individual's literacy level, culture, and cognitive ability. More frequent clinical contact permits messages to be refined and any hindering factors, such as problems with self-medication, to be addressed immediately [17,18].

### *Patient Education and Counseling*

Research indicates that patient education successfully conducted by nurses can significantly improve adherence. Rationales of treatment, duration of therapy, typical side effects, and the implications of poor compliance are some elements that should be covered in patient education. Nurse-led educational interventions increased compliance with antibiotics and general foot care behaviors, reducing hospital readmissions over 12 months. In addition to didactic teaching, motivational interviewing helps nurses learn another tool to elicit the patient. This allows them to express their knowledge of antibiotic therapy and actively share it during decision-making. Motivational interviewing helps to create cooperative relationships rather than authoritarian ones, and thus, patients more readily express their acceptance of a plan of therapy [19,20].

### *Telehealth and Home Visits*

Home visits and telehealth are instrumental in addressing challenging patient populations, such as those with mobility or access barriers, to ensure antibiotic adherence. Through home-based nursing visits, direct observation of medication intake, wound inspection, and continuous patient counseling can be performed. Video calls and phone check-ins or random text reminders can further reinforce such behaviors through continued cues and opportunities for the patient to seek clarification on the instructions given. Telehealth with nurse-led counseling reduced the occurrence rate of DFI complications and improved patient adherence to the medication protocol [21–23].

### *Nurse-led Care Coordination*

Nurse care coordinators can also improve adherence by serving as intermediaries between patients and the healthcare system, referring to other specialists, and guaranteeing coordination between inpatient and outpatient care. At this point, nurse coordinators would come in as the main point of reference for most parties. This would enhance the continuum of care because there would not be much likelihood of information asymmetries leading to patient confusion due to duplication of therapy. Nurse-led interventions form a vital part of all efforts toward optimizing adherence to antibiotics for treating DFIs. When barriers are clinical and psychosocial, through education, motivational interviewing, telehealth, and the most significant care coordination, the nurse will remove those barriers, a multiplier of the probability of a treatment effect being realized [24,25].

## Preventive Medicine Specialists-Led Interventions

### *The Preventive Medicine Perspective*

Preventive medicine specialists contribute an epidemiological perspective on population health to the problem of infected diabetic feet. Typically, they fall into the areas of expertise in epidemiology, health promotion, and management of risk factors both at the level of an individual and at a community level. From the perspective of DFIs, preventive medicine specialists aim to reduce foot infection incidence and severity through the most appropriate and rational use of antibiotic regimens to minimize antibiotic resistance. They will also pursue broader strategies, such as vaccination programs that reduce comorbidities and organizational policies to support healthy lifestyles [5,26,27].

### *Screening and Early Detection*

Preventive medicine rests on establishing risk factors and determining the precautions to implement. Preventive medicine specialists partner with other professionals, such as endocrinologists, podiatrists, and primary care physicians, to recognize patients vulnerable to foot infections and ulcers. These patients already experience foot ulceration, peripheral arterial disease, or poor glycemic management. Risk stratification enables the initiation of specific interventions for high-risk patients. Such interventions may involve enhanced patient education, prophylactic antibiotics for specified high-risk groups (based on available evidence), and closer monitoring to identify minor injuries before they transform into infections.

When a patient develops a diabetic foot infection and requires antibiotics, preventive medicine specialists can streamline care by identifying the social and environmental determinants that compromise adherence (for instance, housing instability or limited access to nutritional support). They work with community partners to address these social barriers, which often remain unaddressed when care is solely directed toward medical treatment [28–30].

#### *Population-Level Education and Policy*

Educators in Preventive Medicine also design campaigns at the population level for healthy foot hygiene, weight management, and smoking cessation among people with diabetes. Such behaviors are promoted by widening the scope of recommendations to decrease the burden of DFIs on antibiotics. These methods reduce the burden of antibiotics in the general population and thus contribute to antibiotic resistance. Prevention medicine groups also work with local and regional stewardship policies regarding antibiotics. This enables them to collect and sift through information regarding local resistance, further evidence-based prescriptions, and the deceleration of unwarranted antibiotics. Using stakeholder input, preventive medicine specialists could spearhead the promotion of legislation or policies that would provide broader insurance coverage for resources essential to proper diabetic foot care, such as medical devices and outpatient wound care services. They lobby for policy changes that allow or ease patients to complete the entire course of antibiotics, such as reducing the cost-sharing charges on essential drugs, thereby indirectly improving adherence rates [31,32].

#### *Behavioral Interventions and Community Engagement*

Behavioral interventions developed by preventive medicine teams focus more on lifestyle modifications, stress management, and support for mental health, which are indirectly associated with medication adherence. Other activities that may improve medication adherence among vulnerable patients include outreach with community health workers supervised by the preventive medicine team leader, providing culturally appropriate education, and providing medication reminders and transportation assistance for medical appointments. Thus, from individual-level intervention to a community- and policy-level framework, preventive medicine specialists frame the discussion on antibiotic adherence for DFIs. This work prioritizes the implementation of population-level, patient-based interventions of health risks in enhancing early detection and providing measures to fight social determinants of health. By combining a patient-level approach with a population-level strategy, preventive medicine specialists compare professions (such as nurses, pharmacists, physicians, or medical device specialists) to construct a targeted intervention with adherence [33,34].

#### Pharmacist-led Interventions

##### *The Pharmacist's Role in Antibiotic Stewardship*

Pharmacists have a unique position with the ability to drive adherence to antibiotics in treating infections in foot ulcers, mainly through three primary roles: patient education, medication reconciliation, and stewardship of antibiotic therapy. In several healthcare settings, the initiation of medication reviews often by pharmacists can facilitate identifying possible drug interactions, optimizing dosing regimens, or even curbing side effects for which the patient stopped the antibiotic therapy too soon. This school, in addition to the American Society of Health-System Pharmacists, further found pharmacists very well trained in pharmacokinetics and pharmacodynamics, which allowed them to ask prescribers for details concerning the most appropriate antibiotic regimen considering the profile of each patient [35,36].

##### *Tailored Counseling and Simplification of Regimens*

One of the fundamental pharmaceutical strategies for enhancing adherence is counseling the patient on the proper timing of the dose and possible side effects, explaining why they need to complete the entire course of treatment. Pharmacists directly provide plain, written, and verbal information during dispensing, stressing the necessity of respecting accurate dosing intervals. As appropriate, pharmacists will streamline



regimens, advocating once- or twice-daily dosing rather than more frequent dosing—to comport with the patient's lifestyle and reduce pill burden. Simplified regimens may greatly enhance adherence, particularly in the elderly, who may already be taking multiple medications for other conditions, such as hypertension or hyperlipidemia [5,37,38].

### *Monitoring and Follow-Up*

Pharmacist-led monitoring usually consists of follow-up phone calls or visits to the clinic to evaluate patient progress, side effects, and potential barriers to continued antibiotic use. Most pharmacists now use validated tools for assessing adherence, such as the Morisky Medication Adherence Scale; some pharmacists will recommend blood tests or culture follow-ups if the patient's clinical condition raises doubts about the adequacy of therapy, and digital platforms also hold a great deal of promise: mobile applications capable of tracking intake times and sharing such data with health teams are found to improve patient's adherence significantly; in many setups, pharmacists most frequently introduce and assist in troubleshooting such digital health tools, owing to their expertise in converting new solutions into patient-friendly formats [39,40].

### *Collaboration with Other Professionals*

However, appropriate pharmacist-led interventions can only be successful when there is interprofessional collaboration between pharmacists, physicians, and nurses, among other professionals. This is indeed the best avenue to ensure that the intended therapeutic goals are known and that all potential negative interactions are proactively preempted on behalf of the patient across the entire continuum of healthcare providers. Interestingly, pharmacists working with nurses were best placed to see issues related to infection control at the earliest opportunity during medication reviews. In negative pressure wound therapy, pharmacists ensure adequate alignment between pain control and antibiotics to support healing and decrease the likelihood of disruptions in wound therapy flow that could occur due to infections. In concise terms, pharmacist-led interventions touch on various dimensions of adherence to DFIs. It varies from the beginning, with the choice of drug, until monitoring and follow-up. The proficient contributions of a pharmaceutical expert at the point of conjugation between clinical pharmacology, patient education, and interprofessional partnership provide the possibility of considerably more successful antibiotic therapy to restrain complications and maintain the salvage of limbs at hand [41,42].

### *Physician-Guided Interventions*

#### *Diagnostic Accuracy and Personalized Treatment*

Critical roles fall within the purview of physicians, such as infectious disease specialists, endocrinologists, and wound care specialists, to determine antibiotic therapy for treating DFIs. It is, therefore, the role of physicians to make clinical evaluations, imaging, and laboratory results broad- or narrow based on the need for the antibiotic, weighing between effectiveness and the importance of antibiotic resistance. As a result, the antibiotic regimen corresponds with local profiles of resistance and factors specific to a patient, such as kidney performance, allergies, and other ongoing medicines, and the physician helps ensure that the prescribed regimen is effective and tolerable to foster higher adherence rates [43,44].

#### *Comprehensive Patient Assessments*

Physicians also conduct holistic assessments that consider more than just foot infections. Such assessments include glycemic control, nutritional status, and mental condition of the patient because these factors influence the ability of a patient to adhere. Poorly controlled blood glucose levels can suppress immune action and delay healing, thus requiring lengthier or more aggressive antibiotic courses. Through early and aggressive management of hyperglycemia or other comorbidities, the inpatient team helps in the flow of antibiotic therapy and reduces treatment complexity [5,45,46].

### *Multidisciplinary Rounds*

In a hospital care setting, such as a diabetic foot clinic, physician-led multidisciplinary rounds harmonize care objectives across different professions. These would usually include nurses, pharmacists, podiatrists, surgeons, and physiotherapists, to list but a few. This has the benefit of real-time discussions on patient cases, which would allow for prompt changes in the antibiotic regimen in response to changes in wound status or culture results, as well as patient-reported side effects. The net effect is a dynamic patient-centric approach that eliminates disparities within the therapeutic message, an established tenet for medicine nonadherence [47–49].

### *Patient Empowerment and Shared Decision-Making*

Physicians enhance adherence through shared patient decision-making. Collaboration is responsible for not just writing out a legible prescription but also for creating room for discourse to allow the rationale behind the choice of a specific antibiotic to be understood by the patient and how the side effects should be managed, as well as the integration of antibiotic use into other treatment modalities. This fosters an additional element of trust and respect for treatment. An elaborate review indicates that shared decision-making significantly advances adherence and practically doubles customer contentment and clinical effects. Physicians can also pinpoint and address reasons for noncompliance, including financial constraints, low health literacy, and little social support, through referrals to financial counseling, patient education programs, or community health workers. Physicians maximize the possibility of accomplishing an entire course of antibiotics through a more comprehensive and tailored approach for the patient. Therefore, physicians serve as clinical orchestrators of DFI treatment by integrating diagnostics, tailored therapy, and interprofessional collaboration to optimize outcomes. In joining a clinically astute approach with a collaborative mindset, patients are ensured cohesive, evidence-based care that includes adherence and considers long-term health [48,50,51].

### *Bridging Technology and Treatment*

#### *The Role of Medical Devices in DFI Management*

Medical device specialists significantly contribute to the optimization of antibiotic adherence. This is achieved by providing technologies that support wound care, offloading, and monitoring. Negative pressure wound therapy, specialized offloading footwear or total contact casts, and continuous glucose monitors are available. Interestingly, these devices are designed to heal wounds at an accelerated pace and create a setting where antibiotic therapy can be most effective. Negative pressure wound therapy can reduce edema and promote granulation tissue, improving tissue perfusion and antibiotic penetration into the wound site [49,52,53].

### *Offloading and Supportive Devices*

One of the most critical components in managing DFIs is off-loading-relieving pressure from the infected foot. Medical device experts guarantee patients receive orthoses or casts explicitly made for them. Proper off-loading may reduce the duration of antibiotic treatment because it accelerates wound healing and does not lead to further tissue destruction. Well-fitted offloading devices reduce pain and increase mobility, which is vital for an individual's overall health and psychological well-being. A more active and less painful patient will comply more with follow-up visits and medication regimens than their inactive counterparts [49,54].

### *Telemonitoring and Digital Health Solutions*

These digital health advancements have put medical device specialists in guiding clinicians and patients toward the latest telemonitoring solutions. With smart sensors capable of monitoring temperature changes, pressure distribution, and moisture levels in a wound, real-time monitoring empowered this capability in 2018. Recommendations for improving the detection and diagnosis of wound infection: Wound deterioration or healing being completed is detected by real-time monitoring, which will prompt the

initiation or adjustment of antibiotic therapy. The device and automated check-ins might just be the solution for the forgetful person. Never skip a dose. This will also help enhance the effectiveness of antibiotics. Medical device specialists play a pivotal role in integrating CGMs into care plans and, in turn, offer education and technical support to keep patients engaged and motivated. This is because when glycemia is optimized, immune function is also optimized, which reduces the probability of prolonged or repeated courses of antibiotics [49,55].

### *Implementation Challenges and Measuring Success*

#### *Financial and Logistical Barriers*

Despite the apparent benefits, the strategies for implementing interprofessional collaboration have some challenges. At the organizational system level, budget constraints for healthcare organizations do not create a resource setting for dedicated nurse educators, pharmacist-led interventions, or procurement of medical devices. Moreover, even reimbursement models do not recognize or remunerate well for the time spent in coordination among different professionals. This may create misunderstandings and hinder the continuity of collaboration. The more easily visible logistical barriers include scheduling difficulties for busy clinicians or combining information for one patient maintained by different electronic health record (EHR) systems. In certain areas and regions, particularly in rural or underserved communities, limited specialized personnel will limit access to advanced diabetic foot clinics or medical devices [5,56,57].

#### *Training and Role Clarification*

For effective interprofessional collaboration, each team member must understand and appreciate the roles of other team members. Unclear understanding of roles often results in work duplication or gaps in care. Regular team training can address inadequate areas, including simulations and reviewing cases. Such training will allow each professional group to practice the scope of their license and build respect and trust, which are preconditions for effective collaboration.

#### *Cultural Competence and Health Literacy*

Another major challenge is providing adequate care to heterogeneous populations with diverse cultural beliefs, languages, and health literacy. Adherence interventions must be culturally and linguistically specific. Patient education materials and counseling approaches should be based on the culture and reading levels of the patient. Providing community health workers or patient navigators from the same cultural background may improve the acceptance of antibiotic regimens [58,59].

#### *Outcome Measures and Key Performance Indicators*

Evaluating the success of interprofessional interventions in antibiotic adherence should use valid measures, such as reduced amputations, decreased time to heal, reduced recurrence rates, and hospital readmissions due to the ulcer. Process measures include medication reconciliation rates, incidence rates such as the frequency of patient educational encounters, and documentation rates of adherence levels. Health-related quality of life changes can be measured using a validated survey instrument such as the Diabetic Foot Ulcer Scale. Equally important in the evaluation will be the data on antibiotic resistance patterns. This is the case in the local setting, with the prevalence of resistant organisms falling or remaining stable over time despite the sustained use of prescribed antibiotics to treat DFIs, which may indicate effective interprofessional promotion of rational antibiotic use [5,60,61].

### *Recommendations and Future Direction*



### *Formalizing Collaborative Care Pathways*

Healthcare institutions should have a set of value-based care programs for DFIs, explicitly clarifying the roles of nurses, preventive medicine specialists, pharmacists, physicians, and medical device specialists. Incorporating checklists and reminders will help ensure that wound evaluations, counseling on adherence, and device assessments are provided to patients promptly [62,63].

### *Technology Integration*

Wider use of telehealth and digital health solutions can support adherence, particularly in rural or under-resourced regions. Wherever feasible, add telemonitoring and mobile applications for medication reminders and connected medical devices into the mix. Provider-friendly platforms that guarantee secure communication significantly reduce missed doses and enable prompt problem-solving efforts to maintain adherence [5,64,65].

### *Policy and Reimbursement Reforms*

Policy-wise, reforms should incentivize collaboration and comprehensive diabetic foot care. Governmental organizations and payers can come up with models that will, in turn, positively compensate for team-based care and better patient outcomes with a smile on the face, rather than merely silos of care components, as in a fee-for-service model. This would also democratize access to advanced medical devices and the telehealth infrastructure [5,66].

### *Research Priorities*

Subsequent research could help identify the specific mixes of interprofessional interventions that result in incrementally more significant improvements in antibiotic adherence. Trials should compare nurse- and pharmacist-led education strategies or assess the added value of medical device integration within a comprehensive care plan. Economic evaluations are required to determine the cost-effectiveness of these collaborative models and whether investment in team-based care, digital health, and medical devices leads to net savings through reduced hospitalizations and amputations. Exploring patient experiences would refine our understanding and highlight possible psychosocial motivators or barriers for further exploration by qualitative means, whereas quantitative reviews indicate such gaps in data provision [67–69].

## **Conclusion**

An optimal approach to ensuring antibiotic adherence in treating DFIs demands coordinated multi-professional collaboration in which each discipline places building blocks that best use its expertise. Nurse-led interventions provide patient education and coordination in care delivery, with input to the initiative from preventive medicine specialists contributing to population-based strategies and early detection programs. The input from pharmacist-led initiatives ensures the optimization and surveillance of medication, complemented by physician-led clinical decision-making on customization specific to individual cases. Medical device specialists contribute through technological solutions for wound healing and treatment adherence. The effective execution of these interprofessional strategies depends on clear lines of communication, common care pathways, and integrated health information systems. Despite persistent challenges in implementing such an approach, financial constraints, logistical challenges, and the need for cultural competence, among others, collaborative care models yield improved patient outcomes with cost savings for the healthcare system regarding the burden placed by DFIs. Additionally, healthcare facilities should develop formal collaboration models, adopt technological changes, and promote policy changes that enhance the holistic management of DFIs. Further studies should establish the most appropriate combination of interprofessional interventions and their cost-effectiveness. Ultimately, successful management of antibiotic adherence in DFIs will not just be a question of efforts made by professionals from various fields acting separately, but more importantly, their concerted and complementary action for the patient's benefit.

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