DIABETIC FOOT ULCERS AND AMPUTATIONS:

Expert Perspectives on Solutions, Practices and Policy for Prevention

podimetrics

THE PANEL

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Abstract

It is widely known that diabetic foot ulcers (DFUs) lead to morbidity and mortality. The statistics remain that **up to 34% of people living with diabetes will experience a DFU during the course of their lifetime.**[1] The pathway leading to amputation begins with a DFU in 80% of cases.[2] Many DFUs become infected leading to emergency department visits, hospitalizations, amputations, and eventual mortality. However, the literature also reports that **75% of DFUs are preventable**.[3]

In July 2025, a panel of podiatry experts convened to develop a consensus document aimed at guiding clinicians in DFU prevention. Part 1 of this comprehensive guidance outlines the burden of DFUs, the evidence-based strategies for DFU prevention, and the struggles facing the complex patient living with diabetes. Part 2 explores best practices in remote foot temperature monitoring (RTM) for DFU prevention. The International Working Group on the Diabetic Foot (IWGDF) has the most widely accepted best practice guidelines for DFU prevention but this consensus panel calls for further clarified standard practice guidelines.[4] These recommendations aim to prevent avoidable morbidity and mortality by standardizing care, integrating new technologies, and strengthening personalized and interdisciplinary approaches. A key theme throughout the consensus is the importance of awareness. This consensus document serves as a practical, evidence-based guide to support clinicians in the management of all patients living with diabetes towards avoiding lower extremity complications.

Foreword

DFUs are a major cause of lower extremity amputations and represent 30% of diabetes-related expenses.[1] Although this significant health issue is preventable with proper intervention, various challenges create barriers to effective prevention.

At the American Podiatric Medical Association (APMA) National Meeting in Dallas in July 2025, five podiatric experts discussed best practices in DFU management and prevention, including the role of remote foot temperature monitoring. This consensus document summarizes their recommendations to help health care providers reduce DFU-related morbidity and mortality.

Key topics included:

- Evidence-based guidelines for DFU prevention
- Best practices in DFU prevention and management
- Challenges supporting DFU prevention and management
- The role of RTM
- The role and responsibilities of all stakeholders in DFU prevention

This document presents clear recommendations from the panel and highlights the need to increase awareness of DFUs and their impact. By providing consensus guidance for providers, payors, and the healthcare system, it aims to facilitate the development and adoption of effective DFU prevention programs and policies.

PART 1:

DFU PREVENTION

The Burden of DFUs

DFUs and related amputations place a burden on both patients and the U.S. healthcare system. Among the estimated 37 million Americans living with diabetes, approximately 1.6 million develop a DFU each year, and the lifetime risk for a person with diabetes to develop a DFU is estimated at 19–34%.[1,5] These wounds precede up to 80% of non-traumatic lower extremity amputations in people living with diabetes, and each year thousands of Americans undergo limb amputations due to DFU-related complications.[2] The clinical trajectory of DFUs is particularly troubling: recurrence rates reach up to 65% within 3–5 years, and the five-year mortality rate following a major amputation can exceed 70%, outpacing mortality rates for many cancers.[4,6]

The consequences are not only clinical but also economic and social. DFUs are among the costliest complications of diabetes, accounting for an additional $9–13 billion in direct healthcare spending each year above the already immense costs of diabetes care.[7,8] Patients who develop foot ulcers experience longer hospital stays, increased need for home health services, more frequent outpatient visits, and a reduced quality of life.[9,10] These complications are associated with decreased mobility, psychological distress, increased risk of infection, and higher readmission rates, as well as significant losses in productivity and independence.[2]

Disparities in the burden of DFUs and amputations are striking. Black, Hispanic, Native American individuals, and those with lower socioeconomic status disproportionately experience higher rates of DFUs, delayed care, and amputations.[8] These differences reflect ongoing inequities in healthcare access, preventive services, and diabetes management. Despite advances in treatment and the creation of evidence-based guidelines, amputation rates have risen by as much as 50% in some regions.[11] The increase is especially notable among younger and minority populations and highlights gaps in both prevention and early detection.[12]

Given the high morbidity, mortality, and financial and social cost, DFUs and lower extremity amputations represent a public health crisis—one that can be prevented. Rigorous, interdisciplinary prevention strategies and equitable access to care has the potential to make a measurable difference. Addressing this burden is urgent, not only to save limbs and lives but also to reduce the strain on individuals, families, and the nation's healthcare system.

PANEL CONSENSUS:

Through sustained commitment to interdisciplinary, patient-centered strategies and equitable access to preventive care, the burden of DFU and lower extremity amputation can and must be reduced. This commitment will improve lives, advance health equity, and alleviate the strain on our healthcare system.

Current Evidence-Based Guidelines for DFU Prevention

The expert panel agrees the current landscape of diabetic foot ulcer prevention is shaped primarily by the IWGDF guidelines and the annual standards issued by the American Diabetes Association (ADA).[4,13] According to the panel, the IWGDF offers comprehensive, evidence-based recommendations covering annual risk assessment, practical stratification tools, routine foot examinations, focused patient education, and the use of preventive footwear and off-loading interventions.[4] These guidelines emphasize the importance of clinical vigilance, such as frequent and structured inspection for at-risk patients, as well as the adoption of advanced monitoring strategies, most notably at-home foot temperature monitoring.[14] However, while the IWGDF provides an actionable framework, the panel agrees the ADA's standards of care tend to function more as best practice recommendations; they are widely referenced but can be confusing in their structure and less prescriptive when it comes to specific preventive steps or innovative technologies. Notably, the ADA's recommendations lack consistent guidance on temperature monitoring and more detailed prevention protocols, highlighting a significant gap in US-focused resources for clinicians.

Panelists mentioned additional frameworks, such as the Veterans Health Administration's (VHA's) Prevention of Amputation in Veterans Everywhere (PAVE) program, the University of Texas risk classification system, particularly for risk stratification, and guidelines from endocrinology and vascular surgery societies that aim to improve DFU screening and risk stratification.[29,36] Despite this, the panel noted that many of these documents are not always practically useful for clinicians in day-to-day practice as they lack distinction between best practices and standards of care. Where best practices reflect current, evidence-informed approaches often set by international consensus, standards of care can vary by region and may reflect only the minimum expected effort. As a result, "standard of care" for DFU prevention is not consistent even within the United States, due to regional variation and healthcare disparities.[15]

In terms of risk assessment, several evidence-based tools are suggested for use, including the systems described by IWGDF, as well as simpler point-based assessments that combine monofilament testing, pedal pulse evaluation, and patient history.[4] These tools help identify those most at risk and determine who will benefit most from intensive preventive efforts, but the panel feels that these are underutilized. Although validated risk tools and international consensus exist around annual exams, education, and proper footwear, gaps remain in U.S. literature, especially in providing practical guidelines suited to U.S. healthcare and insurance models.

Examples include:

1. **Validated Risk Tools Exist but Are Underutilized[16]**
    - Numerous tools—such as the Simplified Diabetic Foot Risk Screening Tool and other models validated in 2024—effectively identify patients at high risk for DFU. However, these instruments are not consistently implemented in U.S. primary care or podiatry because of workflow and reimbursement barriers.
    - For instance, a 2024 study on the "brief diabetic foot risk screening tool" emphasized that lack of integration into electronic health records and absence of billing incentives impede widespread adoption in U.S. clinics.

2. **International Guidelines Are Not Optimized for U.S. Systems**[4]
    - The IWGDF 2023 Guidelines offer global consensus on risk-based foot surveillance, footwear, and education programs, but they are designed for broad international contexts and assume access to health systems with national preventive coverage.
    - The IWGDF acknowledges that its recommendations “should be locally adapted” and explicitly notes that health system differences (such as U.S. insurance-based care) limit direct applicability.

3. **Practical Implementation Gaps in the U.S.**[17-19]
    - A 2024 commentary on “Addressing the Gaps in Diabetic Foot Ulcer Management” observed that preventive care integration lags behind other high-risk chronic conditions. The study identified insufficient provider education, limited multidisciplinary team access, and lack of coverage for preventive technologies (such as temperature monitoring) as major U.S. gaps.
    - Medicare currently covers foot exams for patients with diabetes who have neuropathy or vascular disease, but not all preventive tools (e.g., home temperature monitoring or advanced insoles) are reimbursed.
    - Recognizing this gap, New Mexico House Bill 25-233 (2025) became the first state law to require private insurers to cover diabetic foot ulcer prevention and treatment devices—highlighting the previously missing policy infrastructure at the national level.

In essence, while *international consensus* supports annual exams, patient education, and protective footwear, the U.S. literature and healthcare infrastructure lag in translating these standards into reimbursable, practical, and scalable models. This means that preventive DFU care remains largely dependent on local resources, individual clinicians, and state-level initiatives rather than a standardized nationwide framework.

The expert panel agrees that effective prevention is further challenged by underutilization of screening in primary care, late referrals to podiatry, and disparities in access to preventive interventions. Although advances in device innovation and footwear technology show promise, issues of access and patient adherence persist.

PANEL CONSENSUS:

Current evidence-based guidelines for diabetic foot ulcer prevention are anchored by the internationally recognized IWGDF recommendations and ADA standards. However, significant gaps remain in practical, U.S.-specific protocols and consistent implementation across healthcare settings. Achieving meaningful progress will require widespread adoption of rigorous, interdisciplinary best practices and the development of actionable, locally relevant guidelines that empower all providers to proactively reduce DFU risk.

Consensus on Standard of Care Practices for DFU Prevention

The panel of experts were sent a pre-meeting questionnaire regarding the standard of care for DFU prevention. The results highlight a broad consensus around core evidence-based strategies. Patient education emerges as the foundational theme, regarded as essential for empowering individuals to engage in daily foot care and self-monitoring practices. This self-care is supported by routine foot examinations, both professional and at home, with an emphasis on early detection, prevention, and prompt management of potential problems.

A strong evidence-based example supporting the role of patient education in foot self-care and early detection comes from a 2023 systematic review and meta-analysis in Diabetes/Metabolism Research and Reviews. This meta-analysis included 29 randomized controlled trials (RCTs) (n = 3,891) examining structured patient education programs for diabetic foot prevention. The authors found that educational interventions significantly reduced the risk of foot ulceration (odds ratio 0.54; 95% CI 0.29–1.00) and amputations (OR 0.34; 95% CI 0.13–0.88), while also improving diabetes-related knowledge and self-care behaviors in most participants. The most effective programs were those that combined interactive education, demonstration of foot inspection techniques, and reinforcement over time. Patients trained in daily self-foot examination and proper hygiene demonstrated fewer pre-ulcerative lesions and reported earlier clinical presentation for minor issues.[20]

Proper footwear and the use of offloading devices are consistently identified as vital to reducing pressure and preventing ulcer formation, while ongoing nail and callus care, as well as structured post-ulcer follow-up, are recognized critical elements for reducing recurrence. The importance of proper footwear, offloading, and structured follow-up is evident from eight RCTs involving 1,587 people with diabetes and demonstrated that specialized therapeutic footwear with offloading properties reduced the incidence and recurrence of DFUs by approximately 50% compared with conventional footwear (risk ratio 0.49; 95% CI 0.28–0.84).[21] The trial emphasized that offloading insoles redistribute plantar pressure, protecting at-risk areas of the foot, and recommended periodic reassessment and replacement of footwear to maintain effectiveness.

Similarly, ongoing follow-up is shown to significantly reduce recurrence rates by Dupont, et al. In this 2025 prospective cohort, patients who received regular multidisciplinary post-ulcer follow-up (at least annually) had a recurrence rate of 21% compared with 42% among those with minimal follow-up, indicating nearly a twofold reduction in recurrence risk. The benefit was attributed to ongoing podiatric nail and callus care, timely footwear adjustments, and reinforcement of self-care adherence.[22]

Together, these studies illustrate that therapeutic footwear and insoles are essential for DFU prevention and recurrence reduction, while structured post-ulcer maintenance programs, including nail and callus management, play a decisive role in sustaining long-term healing outcomes.

Other central tenants for DFU mentioned by the panel include include maintaining optimal glycemic control (as measured by A1c), timely medical intervention for emerging foot issues, and comprehensive attention to vascular health, all of which have proven impacts on reducing DFU risk and improving wound healing outcomes.[23,24]

The importance of risk stratification based on ADA guidelines and tailoring interventions to individual risk profiles was also highlighted. The consensus panel especially valued the roles of caregiver and family involvement, along with strategies that encourage patient engagement and activation, reflecting increasing recognition of the broader social and behavioral context of DFU prevention.

Conversely, several approaches were considered less useful or effective. Standard-issue diabetic shoes and insoles, while frequently prescribed, were viewed as less impactful when not tailored to the individual or when they are not covered by insurance, limiting access and adherence. Generic instructions such as simply telling patients to “stay off their feet,” strategies not adapted to patient ability, or approaches relying solely on patients to self-recognize urgent issues were deemed insufficient, particularly for those with sensory loss or cognitive impairments. Methods hindered by patient limitations, such as visual impairment impeding foot checks, and those focused solely on broader health metrics rather than specific foot risk factors, were also viewed less favorably.

Evidence-based reviews support the centrality of multifactorial, personalized prevention strategies that actively engage patients and their support networks, employ routine risk-based screening, and deliver accessible, practical interventions aligned with guidelines such as those from the IWGDF and ADA.[25-28] The consensus panel members advocate for a patient-centered, interdisciplinary model supported by regular education, professional exams, proactive offloading, and individualized follow-up remains critical to the ongoing advancement of DFU prevention and improved patient outcomes.

PANEL CONSENSUS:

The standard of care for DFU prevention must be multifactorial and individualized. It should center on education, routine foot monitoring, tailored offloading, and timely intervention, all supported by risk stratification and multidisciplinary collaboration. Personalized strategies that empower patient engagement and enable accessible, guideline-driven interventions are essential to reducing ulcer incidence, recurrence, and complications.

Results from Pre-Meeting Questionnaire by Panel

MOST USEFUL INTERVENTIONS

- Frequent patient education
- Regular foot exams / self-monitoring
- Family / caregiver involvement
- Nail and callus care / post-ulcer follow-up
- Proper offloading / pressure reduction
- Patient engagement / activation

LEAST USEFUL INTERVENTIONS

- Shoes and insoles not tailored to the patient
- Strategies not covered by insurance
- Telling patients to “stay off their feet”
- Strategies not tailored to individual ability
- Patient self-recognition of early ulcer formation
- Foot checks limited by vision impairments

Moving from Education to Awareness

While patient education remains a cornerstone of DFU prevention, there was a growing consensus among the panel that raising broader awareness is needed both in the general public and throughout the healthcare system. Awareness must precede and complement education, targeting not only individuals at risk but also caregivers, families, and all members of the care team. Currently, most people, including many in the medical community, remain unaware of the severity and consequences of diabetic foot complications; even primary care providers may underestimate the importance and impact of early intervention. This lack of awareness extends to caregivers, who are critical but often overlooked partners in managing diabetes for complex patients.

To address these gaps, initiatives should include culturally sensitive awareness campaigns (for example, those tailored for Native American populations) and consider legislative action to prioritize prevention, making it not just a medical but a public health imperative. The disconnect between prevention and treatment is reflected in healthcare funding priorities, where insurers may deny claims for preventive exams but cover far more costly amputations.[8] This gap highlights the need to advance the health economics case for prevention, incorporating quality of life and cost-effectiveness into research and policy.

Examples of Policies and Models to Support Awareness:

Including concrete U.S. policy and programmatic examples strengthens the argument that diabetic foot prevention should be treated as a public health and economic priority. The following models and legislative initiatives offer strong, evidence-based precedents:

1. VHA's PAVE and Remote Monitoring Programs[29,30]

The Veterans Health Administration's (VHA's) PAVE program is a national model emphasizing early identification, foot risk stratification, and preventive care. Established by VHA Directive 1410 (2022), PAVE integrates podiatry, vascular, and diabetes care teams to decrease amputation rates among veterans.

Additionally, the VHA's RTM initiative, launched through The Initiative to End Diabetic Limb Loss, demonstrated a 37% reduction in 12-month mortality and improved early detection for over 900 participants across 2019–2021. These programs illustrate system-level adoption of prevention as a reimbursable, measurable quality metric, an approach that could be replicated nationwide.

2. State-Level Legislative Action: New Mexico HB25-233 (2025)[31]

In April 2025, New Mexico became the first U.S. state to mandate insurance coverage for DFU prevention and treatment equipment, including temperature-monitoring devices and therapeutic footwear. The law, supported by the ADA, requires all state-regulated health plans to cover clinically preventive technologies, noting that "each dollar invested in podiatric prevention saves $27–$51 in downstream costs." This policy serves as a model for other states linking cost-effectiveness to preventive reimbursement.

3. Native American and Tribal Health Programs[32]

Culturally tailored prevention is demonstrated by the Special Diabetes Program for Indians (SDPI), a federal initiative reauthorized in 2023 that funds community-led diabetes programs across tribes. SDPI sites report measurable improvements in A1c levels, foot health, and access to local podiatric screening, integrating traditional practices with evidence-based care. The initiative's local adaptability and incorporation of Indigenous health traditions are widely cited as contributing to its success as a national model for culturally sensitive prevention.

4. Public Health Policy Recommendations[33]

The American Public Health Association's policy statement "Prevention of Lower Extremity Amputations Due to Nontraumatic Loss of Sensation and Circulation" (2022) explicitly calls for federal reforms to:

- Expand Medicare and Medicaid preventive foot care coverage.
- Mandate inclusion of podiatrists as recognized preventive-care providers.
- Support the creation of limb preservation centers of excellence.
- Increase funding for Peripheral Artery Disease (PAD) and neuropathy prevention research.

5. Economic Evidence for Prevention[34,35]

Cost-effectiveness research confirms the financial rationale for preventive care. A multicenter RCT found that at-home temperature monitoring reduced ulcer recurrence and overall foot care costs by approximately 40%, proving it a cost-effective intervention at standard willingness-to-pay thresholds. Classic analyses, such as the Diabetes Care study Cost-Effectiveness of Prevention and Treatment of the Diabetic Foot, established similar results, showing cost per quality-adjusted life year under $25,000, well within U.S. value thresholds.

These examples, from VHA's PAVE model and RTM program, to SDPI's community-based prevention, to New Mexico's coverage law, demonstrate operational pathways for scaling diabetic foot prevention as a public health mandate, aligning reimbursement, cultural design, and legislative frameworks with measurable cost and health outcomes.

The consensus panel noted on the clinical side, providers need simpler risk stratification tools that make prevention more actionable and time-efficient. These tools should be usable not only by primary care physicians but also by physician assistants, nurse practitioners, medical assistants, and nurses. Direct-to-consumer promotion of foot health, along with empowering patients to conduct self- exams or tactile foot checks, even when they cannot visually inspect their feet, could help bridge the current gaps in awareness and engagement. One panelist added that employing strong, personalized messaging such as likening gangrene to a "heart attack of the foot" may also prompt more proactive behaviors among patients. Ultimately, the panel agrees systemic improvements in diabetic foot care will require a shift toward greater awareness and proactive action at every level, from the individual and family up to the legislator and insurer.

PANEL CONSENSUS:

While education is essential, elevating broad-based awareness among the public, care teams, and policymakers is critical to transforming DFU prevention from a reactive to a proactive endeavor. Achieving meaningful progress will require culturally sensitive outreach, legislative advocacy, and streamlined clinical tools that empower all stakeholders to recognize, prioritize, and act on the urgent need for early intervention and continuous prevention.

Interdisciplinary Approach to DFU Prevention

The panel aligned that prevention of DFU is most effective when approached through a interdisciplinary lens, engaging not only the core team of vascular surgeons, endocrinologists, podiatrists, primary care physicians, and physical therapists, but also actively including caregivers. This "it takes a village" philosophy is reinforced by successful collaborations between major professional organizations such as the APMA, Society of Vascular Surgery, and ADA.[36] These partnerships help establish best practices and foster professional synergy, but their benefits are not felt equally across all settings. Rural and underserved communities, in particular, face acute shortages of podiatrists and endocrinologists, leading to poorer outcomes and higher amputation rates, as illustrated by heatmap analyses from the American Heart Association.[37] Alarmingly, even in urban areas situated near leading academic medical centers, high amputation rates persist in disadvantaged neighborhoods, suggesting that gaps in access, care coordination, and socioeconomic barriers are as significant as provider shortages.[14]

To address this, the panel agreed that empowering advanced practice providers such as physician assistants and nurse practitioners to become more engaged in DFU education and prevention is critical, especially in areas where specialist access is limited. Improved care coordination, the use of telehealth, and remote patient monitoring (RPM) are promising ways to extend interdisciplinary expertise into these regions.[3] While reimbursement limitations have slowed RPM adoption for foot ulcer prevention, lessons can be drawn from the widespread use of continuous glucose monitoring, which succeeded after targeted payor education drove broader insurance coverage and patient empowerment.

Efforts to optimize the interdisciplinary model also depend on enhancing patient "activation" and adherence to self-care. Studies show that getting patients involved in daily routines, even simple interventions such as applying moisturizer or performing daily foot checks, remains challenging but essential.[38] Persistent education, community engagement, and awareness campaigns are needed to support self-management and encourage early intervention when problems are detected. Ultimately, the evidence supports that a robust interdisciplinary approach where every possible stakeholder is both informed and integrated leads to earlier risk identification, more timely intervention, and significantly improved outcomes for patients at risk of DFU.[2]

PANEL CONSENSUS:

An effective interdisciplinary approach to DFU prevention requires integrating the expertise of diverse clinical specialists alongside caregivers and community resources, with sustained collaboration across professional organizations. Overcoming persistent disparities in access, especially in rural and underserved regions, demands empowering all healthcare providers, expanding telehealth and care coordination, and prioritizing patient activation, ultimately leading to earlier risk identification, timelier interventions, and markedly improved patient outcomes.

Healthcare Disparities and Racial Inequities Regarding DFU & Amputation Outcomes

The expert panel agrees that healthcare disparities and inequities remain contributors to the disproportionate burden of DFUs and amputations among minority and underserved populations.[39,40] These disparities arise from a complex interplay of socioeconomic, cultural, and systemic factors. Increased diversity among healthcare providers as well as greater community involvement and culturally competent care are seen as essential strategies to address these gaps. The panel added that social workers can play a pivotal role in connecting patients with appropriate resources and helping to bridge care gaps driven by social determinants of health (SDOH).

The panel noted ensuring healthcare is culturally appropriate extends beyond language and basic education; it requires training clinicians to recognize signs of DFU and related complications across different skin tones and to tailor health education to resonate with diverse backgrounds. Many providers, including podiatrists, note challenges in effectively assisting patients when underlying SDOH barriers, such as unstable housing, food insecurity, or lack of transportation, are present. The expert panel stated while healthcare systems like the VHA often have stronger infrastructures to support patients and connect them with necessary resources, private and non-integrated health systems frequently lack the same level of coordinated support, making it more difficult to address these crucial non-medical needs.

Systemic racism and bias persist, impacting both provider-patient trust and health outcomes. This highlights the importance of humility, patience, and cultural sensitivity when caring for minority patients, who may approach the healthcare system with justifiable concerns or skepticism. Innovative community-based initiatives, such as the “hospital-at-home” model, where mobile care teams provide services such as at-home IV antibiotics and in-home health education demonstrate potential for improving access and outcomes by meeting patients where they are.[10]

Despite these efforts, significant challenges remain, including structural inequities in health coverage, limited availability of culturally competent providers, and ongoing gaps in the recognition and mitigation of SDOH. Continued progress will require targeted policy initiatives, investment in community health programs, provider training in cultural competence, and a sustained focus on dismantling the systems that perpetuate racial and socioeconomic health inequities in diabetic foot care and outcomes.

PANEL CONSENSUS:

Eliminating healthcare disparities and racial inequities is essential to reducing the disproportionate burden of DFUs and amputations among minority and underserved populations. Achieving equity will require dedicated investments in culturally competent care, community-based support, policy reform, and systemic efforts to recognize and address the social determinants and structural biases perpetuating these outcome gaps.

Are Podiatry Students Learning About DFU Prevention?

The panel came to an agreement that education on DFU prevention is recognized as an essential component of podiatric training, but notable gaps remain in how thoroughly and uniformly this content is delivered across educational programs. While all podiatry schools and residency programs address the basics of DFU prevention, the extent and depth vary considerably. Some institutions incorporate more comprehensive preventive education, clinical exposure, and systems-based approaches than others. Traditionally, curricula have been designed to prepare students for board examinations, which may not always align with the practical, preventive skills needed most in real-world practice. As a result, the instruction on identifying early DFU risk factors and conducting preventive interventions can be inconsistent, with prevention sometimes only briefly covered or not prioritized as much as surgical or acute management.

Panelists stated that educational experiences can include guest lectures, interdisciplinary workshops, student-led research, and participation in clinics, but many are optional or dependent on student initiative rather than integrated into the standard curriculum. Podiatric residents, who are primarily focused on meeting surgical training requirements, may not receive adequate practical training or reinforcement in prevention, despite the high prevalence and seriousness of DFUs among people with diabetes. The panel expressed a growing concern that the current system does not sufficiently prepare podiatry students and residents to deliver effective, evidence-based prevention, and that reforms are needed both in undergraduate and postgraduate training.

Evidence suggests that regular, structured exposure to prevention such as interprofessional education, patient self-care coaching, and involvement in interdisciplinary care improves both knowledge and patient outcomes.[41,42] Yet, many students are exposed to preventive and systems-based care models, like those operating in the VA's integrated network, only in limited settings, and even then, the quality of educational support can vary widely between institutions and training sites.

To bridge these gaps, the panel made suggestions for improvement including making DFU prevention a mandatory, reinforced part of the podiatric curriculum; increasing hands-on, patient-centered learning; and introducing research and quality improvement projects focused on prevention earlier in training. Additionally, interprofessional exchanges, mentorship in high-risk clinics, and ongoing professional development (for practicing podiatrists) are needed to promote up-to-date, practical knowledge. Ultimately, ensuring that all podiatry students, residents, and postgraduate fellows are thoroughly educated in DFU prevention is vital to reducing the incidence of ulcers and amputations and shifting the standard of care from reactive to preventive.

PANEL CONSENSUS:

While DFU prevention is addressed in podiatric education, variability and gaps persist in the depth, emphasis, and practical training across programs. To fully prepare future podiatrists for effective prevention, curricula must be standardized to prioritize hands-on, evidence-based learning, with prevention embedded as a core component at every stage of training and professional development.

PART 2:

RTM FOR DFU PREVENTION

Remote Temperature Monitoring

Remote temperature monitoring (RTM) represents a transformative advance in the prevention of DFUs, one of the most significant and costly complications of diabetes. The rationale for RTM is grounded in the physiological observation that localized increases in foot temperature often precedes visible ulceration, reflecting underlying inflammation or tissue injury. Early identification of these "hot spots" enables prompt intervention to prevent progression to ulceration.[43,44]

The concept of foot temperature monitoring for DFU prevention dates back over fifty years to the original works of Paul Brand and colleagues.[45-49] They famously recognized that "the foot will heat up before it breaks down." Formal studies in RTM occurred over two decades ago with the initial use of handheld dermal thermometers as a home-based tool. Foundational RCTs conducted between 2004 and 2007 established strong evidence for the approach, showing that routine temperature monitoring of specific plantar sites could reduce foot ulcer incidence by up to 85% in high-risk populations.[11,53,54] In these studies, a persistent temperature difference of more than 2.2°C (4.0°F) between matched anatomical sites on contralateral feet was used as an actionable threshold for increased risk, prompting patients to reduce activity and seek care.

Since then, innovations such as wireless thermometric mats and sensor-embedded socks and insoles have simplified the temperature collection process, improved patient adherence, and enabled seamless data transmission and remote surveillance for care teams.[3] Advances in RTM have made it feasible for use in both bilateral and unilateral limb monitoring, even in patients with partial foot amputation or ongoing wounds.

Multiple authoritative guidelines endorse RTM as a cornerstone of secondary prevention for diabetic foot ulcers. The IWGDF, the American College of Foot and Ankle Surgeons, and the Wound Healing Society all recommend daily temperature monitoring for patients at high risk, particularly those with a prior history of DFU or lower extremity amputation.[50-52] These organizations highlight once-daily foot temperature assessment as one of the few evidence-based practices that measurably reduces DFU recurrence.

The expert panel expressed that despite robust guideline support, real-world adoption has historically been limited by the time and effort required from both patients and clinicians when using older, manual protocols and most importantly, lack of insurance coverage despite sound science and evidence. Automated, user-friendly RTM devices are now mitigating these barriers and improving integration into clinical workflows but there is still work to be done from the payor perspective.

The clinical impact of RTM has been rigorously studied.

Key findings include:

Several early RCTs demonstrated that home-based temperature monitoring, coupled with behavioral interventions (e.g., offloading when a “hot spot” is detected), can substantially reduce DFU recurrence in high-risk patients.[11,53,54]

A 2017 effectiveness review for the Agency for Healthcare Research and Quality concluded that home skin-temperature monitoring is “effective for reducing foot ulcer incidence and recurrence.”[14]

Not all studies show reductions in major adverse outcomes such as lower-extremity amputation or hospitalization across all populations. However, consistently, RTM is associated with improved early detection, reduced severity of ulcer events, and even lower all-cause mortality in certain cohorts.[55]

In summary, RTM is a guideline-endorsed, evidence-based intervention that empowers both patients and clinicians to detect subclinical inflammation and intervene early, thus reducing the incidence, severity, and associated morbidity of DFUs. Ongoing innovations in remote monitoring technology are increasing the practicality and real-world impact of this important preventive strategy for people with diabetes at high risk of foot complications.

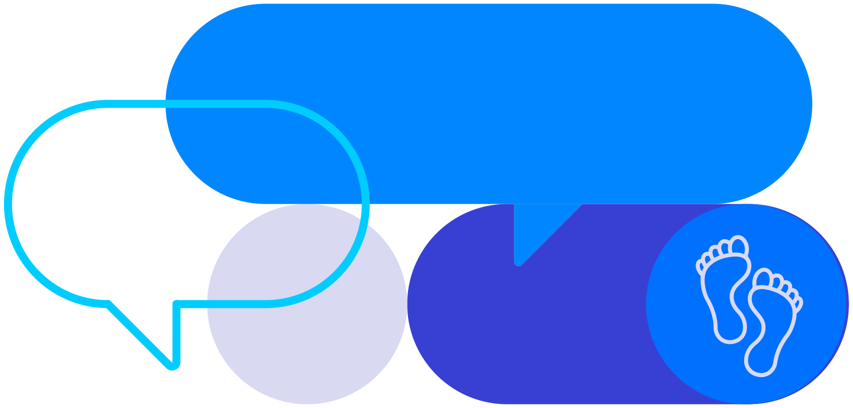
Top Patient Characteristics Identified by the Expert Panel for Potential Inclusion in an RTM Program

- **History of foot ulcers**
- **Neuropathy**
- **Difficulty inspecting feet**
- **Foot deformities (e.g., Charcot)**
- **Limited home support or independence**
- **Engaged patients open to monitoring**
- **Severe or pre-ulcerative foot conditions**
- **End stage renal disease**
- **Higher risk of foot complications (i.e. minorities, underserved populations)**
- **Patients with PAD, especially previous revascularization diagnosis**

The consensus panel agreed that the selection of patients for RTM should be a patient-centered process that integrates evidence-based risk stratification with individualized patient readiness and education. While guidelines strongly recommend RTM for secondary prevention in individuals with a history of DFU or amputation, panelists noted that optimal uptake requires more than simply identifying high-risk patients—it requires engaging them in shared decision-making. The provider's role is to inform and educate, not to force the intervention, underscoring that patient willingness is critical for successful long-term engagement. Introducing RTM at moments of heightened patient motivation such as after experiencing the challenges of wound healing can increase acceptance, especially when accompanied by a hands-on demonstration and involvement of supportive family members. Documentation in the medical record and follow-up at subsequent visits, along with clear communication of the benefits of RTM to both the patient and provider, further reinforce engagement.

The panelists highlighted that RTM acceptance can be enhanced by app-based features that allow caregiver involvement, offer positive reinforcement, and provide actionable feedback, pointing out that "no news is not always good news." Ongoing communication maintains motivation. Cognitive function must be considered: patients with significant impairment may require additional support from caregivers to participate effectively in RTM. Thought leadership supports an expanded approach to candidate selection, guided by risk stratification models that prioritize patients with previous DFUs or amputations, but also consider those with additional risk factors such as PAD and chronic kidney disease, who may also benefit from proactive monitoring. While most data support RTM for secondary prevention, there is evolving interest in exploring its value in selected patients for primary prevention based on individualized risk assessment.

Ultimately the panel conveyed, successful RTM selection combines evidence-based risk criteria with patient-centered communication, supportive technology, and timing that aligns with patient readiness to engage in preventive care.



PANEL CONSENSUS:

Selection for RTM should prioritize high-risk individuals such as those with a history of DFUs or amputations while ensuring that patient engagement, education, timing, and support are central to maximizing adherence, outcomes, and the preventive impact of this technology.

Advantages and Limitations of an RTM Program

In a pre-meeting questionnaire, the panelists were asked about their experience and use of RTM in their practices.
The following quotes were obtained from the panelists on the advantages of RTM:

> ***"It keeps diabetic foot care "fresh" in their mind since they stand on the mat daily. I feel like it is a "safety net" when they are not in the office for both of us and it provides a chance to be proactive."***

> *"Compliance and the ability to reach the patient earlier if issues are noted."*

> *"Good information about patients far from the clinic. Faster intervention."*

> *"Positive patient reception of the product has resulted in compliance. Ease of setup and use. Direct notification to the patient."*

> ***"I personally believe that many ulcers have been prevented by using RTM. It also has allowed for a way to increase patient engagement outside of scheduled appointments."***

Summarizing, the panelists expressed that RTM serves as a valuable "safety net" for both patients and clinicians, keeping diabetic foot care top-of-mind for patients through daily engagement. They noted that RTM enhances compliance, facilitates earlier identification and intervention for emerging issues, and provides crucial information on patients who live far from the clinic. Providers feel RTM enables faster responses to changes in patient status, supports proactive care, and likely helps prevent many foot ulcers that would not have been caught until clinic visits. Additionally, they observed that the ease of setup, direct notifications, and positive patient reception lead to higher adherence and sustained engagement outside of regular appointments, ultimately fostering better ongoing management and outcomes.

The following quotes were obtained from the panelists on the limitations of including RTM programs into their practices:

"A video component with the temperature monitoring would be great."

"Patient understanding how to enact the RTM properly."

"Patients have become frustrated with multiple calls/check-ins and find it too intrusive. Others, on the other hand, don't believe it is doing anything for prevention as they aren't receiving calls. It's both extremes!"

"Patient adherence. Some leaving the mat behind when going on vacation, etc, decreased use frequency over time."

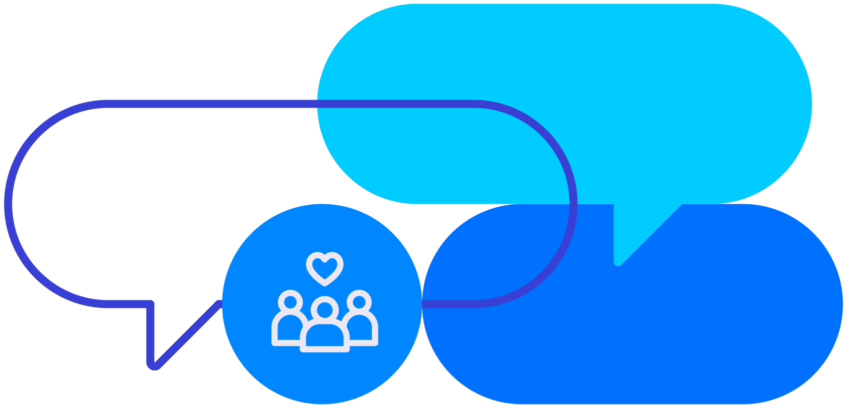
"Patients relate 'too frequent' contact with RTM company staff. I assure them the need to ensure no challenges with the product."

The panelists identified several limitations to incorporating RTM programs in practice. They highlighted challenges with patient adherence, noting that some patients forget to use the device consistently, such as leaving the mat behind when traveling or reducing their usage frequency over time. Ensuring that patients fully understand how to use RTM correctly also emerged as a concern. Communication was seen as a double-edged sword: while frequent check-ins help ensure proper use, some patients perceive repeated calls as intrusive and frustrating, while others question the program's utility if they do not receive contact, interpreting silence as a lack of preventive action. The panel also expressed a desire for enhanced features, such as a video component, to further improve the technology's effectiveness and patient engagement.

Measuring Success of an RTM Program

The panelists aligned that measuring the success of a RTM program requires a multidimensional approach that captures both clinical outcomes and broader impacts on patients, caregivers, providers, and healthcare systems. Key patient-centered metrics include reductions in DFU and amputation recurrence, fewer emergency department visits and hospitalizations, extended time living safely at home, and improved quality of life. RTM programs also have the potential to decrease reliance on advanced wound care modalities and skin substitutes, metrics of significant interest to payors and health systems aiming to reduce resource utilization. The panel agreed incorporating validated instruments such as the Technology Acceptance Model enables assessment of the usability and acceptability of the technology from the patient's perspective.[56] This includes features like rewards programs, positive reinforcement, and app-based customization, which can further support engagement and satisfaction.[56]

From the provider and system perspective, the panel noted success can be gauged by metrics such as reduced clinic workload, lower provider and office visit frequency, provider-reported workflow efficiency, and ability to focus resources on patients with more acute needs. Workflow reductions and decreased provider burden may be quantified by changes in relative value units, billing data related to preventive services, and the number of escalations caught early for lower-level acuity events. Additional factors such as enhanced caregiver confidence, reduced caregiver stress, and qualitative narratives from patients and families regarding their experiences with RTM highlight the program's value beyond numerical outcomes. Ultimately, the experts communicated that a comprehensive evaluation of an RTM program's effectiveness should integrate clinical, patient-reported, caregiver, and system-level metrics to fully demonstrate its benefits and support sustainability and adoption.

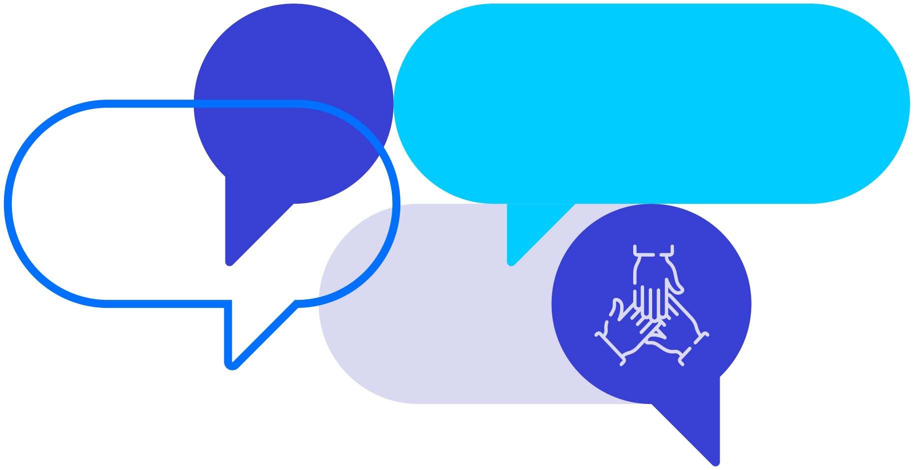


PANEL CONSENSUS:

The success of an RTM program should be measured through a combination of clinical outcomes such as reduced DFU recurrence and lower healthcare utilization alongside improvements in patient quality of life, caregiver confidence, technology acceptance, and provider workflow efficiency.

What is the Role of the Patient, the Provider, and the Payor in an RTM Program?

The expert panel unanimously agreed that the success of an RTM program depends on collaboration and shared responsibility among patients, providers, and payors. Patients play a central role by understanding the purpose and benefits of RTM, engaging consistently with the technology, adhering to monitoring protocols, and promptly reporting any technical issues or health concerns. RTM is most effective when patients recognize it as one tool among many in their self- care toolbox, not a substitute for other preventive measures. Providers are responsible for integrating RTM data into clinical care, promptly responding to alerts, educating patients, encouraging adherence, and ensuring that RTM fits seamlessly into existing workflows, ideally through electronic health record integration. This team-based approach may involve clinicians, administrative staff, and allied providers, all working to reinforce patient engagement and maximize the program's impact. The role of the provider in patient education cannot be underscored enough. Patient adherence is likely a direct reflection of the patient's understanding of "why" the provider wants them to participate in the program. Payors play a pivotal role by assessing program data, evaluating long-term return on investment, and supporting reimbursement models that incentivize preventive care and integration of RTM into healthcare delivery. However, achieving payor buy-in remains a significant hurdle, as many payors are more accustomed to paying for reactive interventions rather than proactive prevention. Demonstrating adherence, clinical outcomes, and cost savings will be essential to securing payor support and sustained integration of RTM technology into standard care pathways.



PANEL CONSENSUS:

Optimal implementation and sustainability of RTM programs require active patient engagement, integrated provider response, and payor support for preventive care, with all parties collaborating to ensure seamless adoption, clinical benefit, and long-term value.

Conclusion / Closing Statement

The panel acknowledges that patients with complex diabetes face significant, multifaceted challenges that extend far beyond medical management. Living with diabetes imposes a constant burden, with no respite from the demands of disease self-care. The mental health impacts including distress, depression, and the stigma associated with the condition are considerable and often lead to disengagement from care. Financial strain from medications, copays, and the cost of healthy food compounds these difficulties, as does the persistent challenge of maintaining a healthy lifestyle. Panelists also shared their personal experiences as caregivers, highlighting how the cognitive and psychological dimensions of diabetes are frequently overlooked yet deeply influence patient well-being. Addressing both the psychological and social aspects, alongside medical treatment, is vital for truly improving outcomes and quality of life for people living with diabetes. RTM gives both the patient and provider an opportunity to have at least one data point daily for potential early intervention around the multifactorial problem of diabetic foot ulcers.

In conclusion, this consensus document underscores that the prevention of DFUs requires a coordinated, patient-centered, and evidence-based approach that integrates proven interventions, embraces innovative technologies like RTM, and prioritizes education, awareness, and interdisciplinary collaboration. Addressing medical, psychological, and social challenges with empathy and tailored strategies is essential to overcoming both individual and systemic barriers. By involving patients, providers, caregivers, and payors in shared responsibility, and by advocating for equity and access across all settings, we can dramatically reduce the burden of diabetic foot complications. Utilizing existing evidence-based guidelines, the expert opinions, guidance and panel consensus recommendations herein serve as a practical roadmap to empower clinicians, inform policy, and ultimately enhance the lives and health outcomes of people living with diabetes.

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