Potential Cost Savings with Remote Therapy Monitoring for Outpatient Negative Pressure Wound Therapy

Mikaela M. Sifuentes, PhD
Medical Writer II, Medical Information and Publications

Mikaela M. Sifuentes received a Bachelor of Science in Biology from the University of Dallas and a PhD in Pharmacology and Certificate in Translational Science from the University of Texas Health Science Center in San Antonio. Her doctoral research investigating the role of thyroid hormone and fatty acid metabolism in mediating the severity of ischemic stroke was supported by grants from the American Heart Association, the Society for Neuroscience, and the American Society for Pharmacology and Experimental Therapeutics. After completing her doctorate, she became a medical writer at Acelity, assisting medical professionals with communicating their expertise in peer-reviewed journals and at conferences. Dr. Sifuentes is an employee of 3M.

Each year, millions of patients suffer from wounds or infections, accounting for billions of dollars in wound care costs to Medicare.[1] Of these costs, nearly half were incurred in the outpatient setting. Outpatient therapies provide significant advantages to patient comfort and independence; however, this setting also provides opportunities for therapy compliance to wane. For wounds managed with outpatient negative pressure wound therapy (NPWT), lapsed therapy adherence can compromise healing. Effective use of NPWT manages wound exudate, reduces the need for daily dressing changes, and can be more effective than alternative wound care.[2-4] In the outpatient setting, NPWT should be applied at least 22 hours per day and to support adherence, a remote therapy monitoring (RTM) program was integrated with existing portable 3M™ ActiV.A.C.™ Therapy Unit. This technology enables the secure transmission and monitoring of therapy use data by a remote health care team of virtual therapy specialists (VTS) who contact and guide patients throughout the duration of NPWT. This approach appeared effective in intial studies, which found that therapy adherence improved on the day following a phone call from the VTS, increasing therapy use by an average of 8.5 hours.[5] Average usage of 3M™ ActiV.A.C.™ Therapy System with iOn Progress™ Remote Therapy Monitoring was 18.6 hours per day, and the rate of wound size reduction increased with increased adherence.[6] When outpatient ActiV.A.C. Therapy System with iOn Progress Remote Therapy Monitoring use was compared against ActiV.A.C. Therapy System use alone, the median length of treatment was significantly shorter for the RTM group.[7] In 2018, 3M Company entered into a partnership with health insurer Highmark, Inc. (Pittsburgh, PA), creating a performance-based payment structure for reducing total wound care costs. In this study, Highmark patient data were analyzed to assess whether iOn Progress (Remote Therapy Monitoring) use helped reduce 90-day costs of wound care.[8]

The evaluation included Highmark patients beginning ActiV.A.C. Therapy System use between March 2018 and May 2019 in the post-acute setting.[8] When iOn Progress (Remote Therapy Monitoring) use was initiated, patients received a welcome phone call from the VTS team. The team monitored usage data from the NPWT unit and conducted alarm calls, customer care calls, and patient adherence calls as needed (**Table 1**). If multiple attempts to resolve non-compliance were unsuccessful, a call was made to the patient's healthcare provider to discuss how to improve the wound management plan.

Type of Call	Definition
Alarm Call	Calls to help resolve therapy alarms
Customer Care Call	Calls to obtain information or provide supplies and educational materials
Patient Adherence Call	Call to remove obstacles to therapy adherence

Table 1. Virtual therapy specialist call type and definition

Anonymized claims data within 90 days of initial NPWT placement were collected and categorized using ICD-10 coding.[8] The study included 1105 patients, 675 (61%) of whom received ActiV.A.C. Therapy System with iOn Progress (Remote Therapy Monitoring) and 430 (39%) received ActiV.A.C. Therapy System use alone. Patients in the RTM cohort were older ($p<0.0001$), had higher Charlson Comorbidity Index scores, higher rates of multiple comorbidities, higher percentage of ulcers, and had a higher percentage with Medicare Advantage insurance ($p<0.0001$).[8] The RTM patients received an average of 3.2 (range: 1 to 21) patient adherence support calls per patient. The average therapy hours on the day prior to the adherence call was 8.2 hours. The day after the call, therapy increased on average to 20.4 hours per day. The unadjusted mean 90-day wound-related costs for RTM patients were $12,464, verses $15,360 for non-RTM patients ($p=0.080$). After adjusting for baseline differences, the costs were $11,119 for the RTM group, compared to $14,752 in the non-RTM group ($p=0.013$) despite the higher upfront cost of NPWT with RTM (**Table 2**).[8] The RTM group had lower wound care costs unrelated to NPWT ($7,361), versus $11,462 in the non-RTM group ($p=0.005$). Overall, the per-patient cost of NPWT was $468 higher in the RTM group due to the additional costs of RTM integration. However, these costs were offset by a savings of $4,101 per patient in wound-related non-NPWT costs leading to a total cost savings of $3,753 per patient with the implementation of RTM.[8]

Cost	RTM (n=675)	Non-RTM (n=430)	P-value
Non-Wound Related	12,169	12,288	0.094
Wound Related	11,119	14,752	**0.013**
Total	$23,288	$27,041	0.084

Table 2. Adjusted per capita costs in patients receiving NPWT with or without RTM.
Adapted from Griffin et al 2022.[8]

The outcomes of this study are consistent with existing publications. Prior studies of ActiV.A.C. Therapy System with iOn Progress (Remote Therapy Monitoring) demonstrated that adherence increased by an average 8.5 hours on the day after the VTS call and that improved adherence to therapy correlated with a greater reduction in wound size.[5,6] The addition of RTM to outpatient NPWT supported adherence via patient engagement, helping to bridge the gap between the hospital and the home care environment. The 2022 Griffin et al study suggests that with RTM, a significant cost savings could be achieved despite the additional expense required for the RTM service.[8]

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