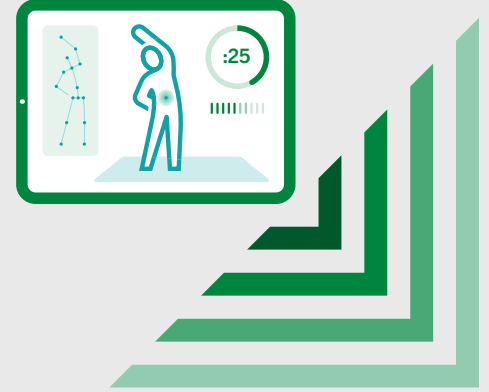


Virtual Musculoskeletal Solutions

HEALTH TECHNOLOGY ASSESSMENT | JUNE 2024



Executive Summary

Virtual musculoskeletal (MSK) solutions aim to expand access to care — particularly virtual, exercise-based physical therapy (PT) — that can improve pain and functional status for people with a range of MSK disorders. By making care more available and convenient, these solutions aim to improve patient outcomes and avoid unnecessary treatment, including surgery, injections, imaging, and pain medication.

These solutions vary in the technology they use, the degree of clinician involvement, and how they integrate with traditional in-person care models. The solutions in this report are assessed in three categories:

- 1 App-based exercise therapy solutions** provide self-directed exercise therapy using care plans that are primarily designed and updated by algorithms, based on data from computer vision analysis or on-body motion sensors. In these solutions, there is limited physical therapist involvement once an exercise program is established.
- 2 Physical therapist–guided solutions** offer virtual PT with a higher level of clinical involvement when onboarding participants, designing exercise therapy regimens, and managing their care. These offerings generally include self-directed exercise programs with feedback from computer vision and/or on-body sensors. They also offer more frequent human interaction with coaches and physical therapists through both video visits and asynchronous communication.
- 3 Remote therapeutic monitoring (RTM)-augmented PT solutions** supplement in-person PT with virtual care. These solutions support patients with self-directed exercises between in-person sessions and enable physical therapists to monitor their patient’s progress remotely. The primary in-person physical therapist continues to direct care and may bill for the use of these solutions via RTM billing codes.

App-based exercise therapy and **physical therapist-guided solutions** generally aim to replace in-person care, whereas **RTM-augmented PT solutions** are meant to supplement in-person care by improving adherence to care plans between in-person PT visits. PHTI assessed clinical outcomes of patients using these virtual MSK solutions,

including improvements in pain, function, and adherence, as well as their economic impact compared with in-person PT.

Included Solutions

The solutions evaluated in this assessment were identified through a wide initial scan of the virtual MSK management space using market analysis platforms and published

literature. A company-by-company analysis then examined eligible products and grouped those with similar characteristics, mechanisms of action, customers, and value propositions. Included solutions are those sold by DarioHealth, Hinge Health, Kaia Health, Limber Health, Omada Health, RecoveryOne, Sword Health, and Vori Health.

ASSESSMENT OF VIRTUAL MSK SOLUTIONS

WHAT IS THE GOAL OF THE TECHNOLOGY?

Virtual MSK solutions seek to expand convenient access to virtual PT to improve pain and functional status for patients and avoid unnecessary treatment and spending.

WHICH CATEGORIES ARE INCLUDED?

App-Based Exercise Therapy Solutions

Dario, Kaia

Physical Therapist–Guided Solutions

Hinge, Omada, RecoveryOne, Sword, Vori

RTM-Augmented PT Solutions

Limber

WHAT ARE THE CLINICAL BENEFITS?

- **App-based exercise therapy solutions** are shown to improve patients’ pain compared with no in-person PT.
- **Physical therapist–guided solutions** can improve patients’ pain and function at a level comparable with in-person PT.
- **RTM-augmented PT solutions** have limited but positive evidence indicating superior outcomes for pain and function compared to in-person PT alone.

WHAT IS THE BUDGET IMPACT?

- Absent sufficient pricing data, this report does not estimate the budget impact of **app-based exercise therapy solutions**.
- At current prices, **physical therapist–guided solutions** can decrease spending relative to in-person PT and generate savings from avoided care.
- **RTM-augmented PT solutions** increase total healthcare spending because estimated savings from avoided care do not offset increased costs of RTM billing.

WHICH TARGET POPULATIONS COULD BENEFIT MOST?

Virtual MSK solutions stand to improve access for populations who otherwise have barriers to in-person PT, including older adults, people who live in rural areas, and those with mobility limitations.

WHERE ARE THERE OPPORTUNITIES TO OPTIMIZE THESE SOLUTIONS?

Integrate into medical benefits

Encourage PT-first with virtual care as an option

Pursue value-based contracts

Improve evidence generation

Stakeholder Engagement

PHTI solicits input and advice from a diverse set of stakeholders, including health plans, employers, providers, digital health developers, and investors. During the assessment process, PHTI partnered with clinical advisors, experts in health technology assessment, and health economists. PHTI also conducted direct qualitative research with patients. All companies included in the report were given an opportunity to submit clinical, economic, and other commercial information to inform the assessment.

PHTI Analysis

This evaluation has two primary components — clinical effectiveness and economic impact.

Clinical effectiveness: The systematic literature review screened more than 2,000 pieces of evidence. In addition, five companies (Hinge, Limber, Omada, Sword, and Vori) submitted a combined 44 clinical references, and 9 additional references were identified from manual internet searches. Of these pieces of evidence, 48 articles met the inclusion criteria and were analyzed for findings on the primary outcomes of pain and function, along with secondary outcomes (workplace productivity, mental health, and overall healthcare resource utilization), user experience, and health equity. As described in the [ICER-PHTI Assessment Framework for Digital Health Technologies](#), the evaluation reviews the solutions' clinical effectiveness to understand how they

perform clinically on both primary and secondary endpoints of interest, and how long those benefits persist. It also seeks to clarify which populations stand to benefit the most from using the solutions.

Economic impact: The economic analysis was modeled based on low back pain, which has the strongest evidence, though findings suggest that virtual MSK solutions can be financially beneficial for a wide range of disorders. The model estimates the number of adults who use in-person PT for low back pain and could be eligible for virtual MSK solutions across commercial, Medicare, and Medicaid plans. The model estimates the eligible users with low back pain, the gross reduction in expected healthcare spending from improved access to PT, and the net impact on spending once the savings are offset by spending on the virtual MSK solutions.

Summary of Findings

Based on PHTI's review of clinical evidence, the virtual MSK solutions assessed in this report deliver clinically meaningful improvements in pain and function compared with usual care (which generally includes physician visits and pain management but not PT) for people with a range of MSK disorders. Across the three categories of solutions evaluated, **physical therapist–guided solutions** can be an effective alternative to in-person PT and have the potential to reduce healthcare spending. At the right price, **app-based exercise therapy solutions** may be appropriate for patients with

lower-acuity. **RTM-augmented PT solutions** have high clinical efficacy but increase costs, making them most appropriate for more serious MSK disorders. Virtual solutions can close access gaps, particularly among older and rural populations or individuals who cannot easily get to in-person PT clinics.









Category-Specific Findings

App-based exercise therapy solutions can improve pain and function compared with no PT, but there is no evidence that they improve functional status comparable to in-person PT, and are therefore unlikely to be an effective substitute. At an affordable price, these may be valuable solutions to provide broad-based virtual care for patients with lower acuity who may experience clinical benefits.

Evidence showed that **physical therapist–guided solutions**, which include clinician-designed care plans and oversight, improve patients' pain and function more than usual care (without PT) and healing naturally. These virtual solutions perform comparably well to in-person PT across most major indicators and, for some people, work as a reasonable substitute for in-person care. Virtual options may be particularly appealing for people who cannot easily reach in-person PT clinics, because of transportation or mobility limitations or geographic access barriers. In addition to lowering the cost of delivering PT, these solutions may improve adherence and speed up the

PHTI CATEGORY-LEVEL RATINGS FOR VIRTUAL MSK SOLUTIONS

● Positive ● Moderate ● Negative
 ● Higher Clinical Evidence Certainty ○ Lower Clinical Evidence Certainty

	Clinical Effectiveness	Economic Impact	Summary Rating ^b
App-Based Exercise Therapy^a Dario, Kaia	 Results: Improves pain but not function; not substitutable for in-person PT Evidence Certainty: Lower	N/A Pricing data not available	 Evidence supports broader adoption depending on price, particularly for patients with lower-acuity MSK conditions
Physical Therapist–Guided Solutions^a Hinge, Omada, RecoveryOne, Sword, Vori	 Results: Improves both pain and function; comparable to in-person PT Evidence Certainty: Lower	 Decreases net spending relative to in-person PT with savings from avoided care	 Evidence supports broader adoption
RTM-Augmented PT Solutions^a Limber	 Results: May perform better than in-person PT alone Evidence Certainty: Lower	 Increases net spending; savings from avoided care are less than added RTM billing	 Ongoing evidence generation needed; may justify broader adoption for patients with higher-acuity MSK conditions

Source: PHTI, Virtual MSK Solutions Assessment, June 2024. See PHTI.org for complete report, methods and recommendations.

Notes: ^a Not all solutions have clinical data that meet the inclusion standards for this report. Based on the similarity of approaches, it is fair to assume that companies without solution-specific data perform in line with the category. Purchasers and users will have to make their own assumptions about performance.

^b Summary rating reflects the combination of clinical and economic results.

initiation of therapy, resulting in lower average healthcare spending across the population of people with matched MSK disorders.

- If 25% of in-person PT users with low back pain shifted to these MSK platforms at a price of \$995 per year, it would save an estimated \$4.4 million per 1 million commercially insured individuals.

Though the evidence base is limited for **RTM-augmented PT solutions**, this category delivers superior clinical results on pain and functional improvement compared with in-person PT alone. However, even after accounting for the health benefits of improved adherence and earlier initiation of PT, these solutions

increase annual healthcare spending because they augment in-person care and the estimated savings from lower utilization do not offset the increased costs of RTM billed on top of existing treatment.

- If 25% of in-person PT users with low back pain shift to these MSK platforms, this could increase spending by \$1.7 million per million commercially insured lives.
- Future evidence should focus on how these platforms perform in full-risk, value-based care arrangements, where they may have a positive budget impact due to stronger clinical outcomes that may lead to surgical avoidance and reduce unnecessary care.

Evidence on healthcare resource use suggests that both **physical therapist–guided and RTM-augmented PT solutions** have the potential to significantly reduce downstream healthcare utilization, such as surgeries, injections, specialty visits, and imaging. These are areas that require further economic evidence development, particularly in support of growing purchaser interest in value-based contracting.

Realizing Full Potential and Next Steps for Stakeholders

While virtual MSK solution companies market themselves on improved access, their current business model and user acquisition strategies are structured as employee wellness benefits that are disconnected from medical benefits and spending. This makes it more difficult for providers and health plans to identify the patients who would benefit the most from these solutions and target them early. Virtual MSK solutions could deliver even better value by integration into the medical benefit, encouragement of earlier referrals to PT, and active management of other avoidable healthcare utilization.

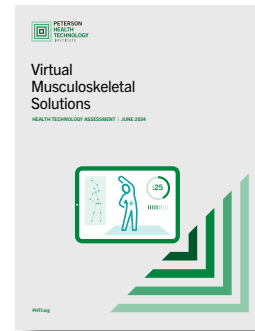
Many of these solutions — especially **physical therapist–guided solutions** — warrant broader adoption and thoughtful contracting to expand their clinical benefits while controlling healthcare spending.

Recommendations include:

- Virtual MSK solutions should be integrated into medical benefits, not wellness programs, to realize the full potential for savings in MSK care;
- Purchasers and providers should encourage more PT-first MSK care;
- Contracts between purchasers and companies should increasingly rely on value-based payment arrangements that build on the economic benefits of these solutions; and
- Solutions should partner with payers and providers to improve patient triage and build evidence for moderate and high complexity MSK care.

Accessing PHTI's Full Report

You can access the full report [here](#).



These findings are based on the criteria set forth in the ICER-PHTI Assessment Framework and the currently available evidence. Please see the full PHTI report and appendix for complete assessment, methods, and recommendations.
